



# A Lack of Coordination

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*EPA's wet weather policies, often interpreted and applied in a piecemeal fashion, prevent permittees from implementing truly effective SSO and CSO management solutions.*

For the past decade, the U.S. Environmental Protection Agency (EPA) has been developing numerous requirements for the design and permitting of facilities intended to properly manage wet weather flows. These requirements have been issued in a number of contexts and have, at times, been subject to widely varying interpretation across the country, leading to dramatically different treatment requirements. EPA's actions include issuing various combined sewer overflow (CSO) policies, developing draft regulations addressing the elimination of sanitary sewer overflows (SSOs), taking enforcement actions based on interpretations of various National Pollutant Discharge Elimination System (NPDES) regulations adopted under different circumstances to prohibit CSOs and SSOs, objecting to state permits intended to regulate wet weather discharges, providing informal guidance to regional offices; and creating regional office initiatives.

The problem with EPA's current approach to regulating wet weather flows is its piecemeal fashion. Consequently, it is fraught with regulatory and technical inconsistencies. In particular, EPA has done little to ensure that the legal and technical flexibility that is espoused in its NPDES permit regulations and described in guidance docu-

ments is actually allowed by regional offices when a community proposes a wet weather flow management program. The net result of the lack of coordination and regional consistency is that some communities are unable to develop cost-effective, appropriate remedial measures that comply with the Clean Water Act. Others are required to expend resources that bear no relationship to environmental benefit or the goals of the regulatory program.

## The Stumbling Block: The Bypass Regulation

Due to the lack of specific regulatory requirements for CSOs and SSOs, EPA has sought to limit them by invoking the bypass regulation—a regulation whose adoption has little to do with either of these wet weather conditions. The regulation, first promulgated by EPA in 1979, became part of the consolidated permit regulations a year later that established permitting requirements for several programs, including the NPDES program. Its express purpose was to address two issues: to allow a defense to certain permit exceedances that were beyond the control of the facility (assuming an appropriate plant design) and to ensure that unit processes were operated consistent with the effluent guideline requirements for the particular type of facility. Thus, the rule prevented the discharge of untreated

or inadequately treated effluent. The rule generally prohibited turning off unit processes even if effluent limits could be achieved without further treatment.

When the rule was last amended in 1984, EPA explained that one of the rule's purposes was to require permittees to operate control equipment at all times, thus reducing pollutants at levels consistent with technology-based requirements. Otherwise, the agency said, dischargers could avoid technology-based requirements. This aspect of rule is sometimes known as the "continuous operation requirement." It is clear that EPA was concerned that a bypass would undermine its ability to regulate certain pollutants under effluent guidelines, particularly for industrial categories in which all pollutants of concern are not directly regulated. If a plant were to shut off some processes yet still meet pollutant standards, EPA reasoned that there would be no assurance that the plant would address other pollutants properly. However, this concern cannot be directly applied to municipal discharges, as only conventional pollutants are regulated under secondary treatment.

In the preamble to the final regulation and in subsequent regulatory notices, EPA clarified that the bypass regulation was not intended to prevent seasonal operation of certain unit processes, nor was it intended to dictate any particular technology or plant design. In short, the rule does not establish requirements beyond those specifically intended under the adopted technology-based standards. EPA has always been clear that the permittee had the discretion in choosing treatment processes to meet effluent limits, such as those established under secondary treatment. In fact, the bypass regulation preamble noted that industries could shut down processes if they requested so by permit modification. Thus, the rule did not preclude different modes of operation, as long as the plant was designed to operate in those modes, and EPA had been informed and approved the intended facilities.

After the 1984 rule modification, a group of industries challenged the bypass regulation, particularly EPA's right to force continuous operation under lower production conditions. In the Federal Court of Appeals for the District of Columbia, the industries claimed that the bypass regulation was not authorized under the Clean Water Act and that it was inconsistent with the act's policies. The court upheld the bypass regulation, stating that "the regulation thus ensures that treatment systems chosen by the permittee are operated as anticipated by the permit writer, that is, as they are designed to be operated and in accordance with the conditions set forth in the permit." The court also noted that the rule does not force the selection of a particular technology or plant design, which the parties said would be inconsistent with the structure of the act.

It is apparent from the rule's historical context that the bypass regulation was intended to prevent facilities from turning off processes to save money, not to dictate design or operation under wet weather events. Of course, an inadequate plant design would not allow a bypass defense, but the underlying premise was that a permit violation of the effluent guideline occurred. The secondary treatment rule was primarily meant for typical plant operational conditions, not

unusual peak wet weather flows. To the degree that the secondary treatment rule even mentions wet weather flows, the rule authorized less restrictive percent-removal provisions where weak influent wastewater concentrations are treated (see 40 CFR 133.103). Moreover, EPA was explicit that the bypass rule does not modify adopted effluent guideline requirements. As no such requirements were ever adopted for CSO- or SSO-related discharges, it is hard to imagine how the bypass rule may be used to preclude various wet weather flow management solutions when no such activity was covered in any published effluent guideline. Nowhere does the bypass or secondary treatment regulation state that any wet weather flow design approaches are precluded, as long as applicable effluent limits are met.

## Blending and the Bypass Rule

For the past 10 years, EPA has been developing regulatory approaches to ensure that wet weather pollutant discharges meet technology- and water-quality-based requirements. While considerable effort has been focused on wet weather water quality standard compliance and the conditions under which CSO and SSO events are deemed uncontrollable, little attention has been paid to subtle changes in EPA's implementation of its bypass regulation as it applies to treatment plant peak flows.

Numerous EPA guidance documents recognize that biological treatment of peak flows may be ineffective and can jeopardize the viability of the biological system. Consequently, engineers have sought to limit the impact of peak flows on plant operations while meeting applicable permit limitations. One option for processing peak flows that has come under attack as a bypass rule violation is the blending of primary treated peak flows with other influent flows that are biologically treated. The violation, a "reinterpretation" of the rule, has occurred on a case-by-case basis as communities seek federal and state approval of SSO and CSO strategies, and it has dramatically affected the level of treatment required of such flows. EPA's narrowing of the bypass rule could easily result in billions of dollars in additional costs for municipal facilities and will place many publicly owned treatment works (POTWs) in ongoing violation of the Clean Water Act—even though they are still meeting permit limitations.

Those who interpret the rule narrowly point to the prohibition against "intentional diversions" and "no feasible alternative" in Sec. (4)(i)(B). They say these provisions preclude blending and mandate larger plant designs and equalization basins so that all flows enter every unit process. It is clear from the 1979 and 1984 preamble discussions that the focus of the regulation was to address concerns about industrial processes and their level of redundancy. The "feasible alternatives" section has nothing to do with wet weather flow treatment alternatives. The preamble discussion does not indicate that innovative designs that meet permit requirements will be considered illegal as "intentional diversions."

Blending peak wet weather flows is consistent with the objectives of the bypass regulation as long as the system is "operated as designed." It does not constitute shutting off a treatment facility and "coast-

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ing,” which the Federal Court of Appeals agreed would not meet the objectives of the Clean Water Act. As long as this planned operational regime is disclosed to the permit writer and ensures that the facility is in compliance, it works for the treatment system in an approvable manner. Therefore, blending is in full accord with the objectives of the bypass regulation as addressed by the Court of Appeals.

## CSOs and Blending

Contrary to its narrow interpretation of the bypass rule for blending procedures, EPA's current CSO policy requires the “maximization of flow to the POTW for treatment” and requires only that such flows receive at least primary treatment. Thus, it is clear that all flows do not require biological treatment. The CSO policy recognizes that “in some communities, POTW treatment plants may have primary treatment capacity in excess of their secondary treatment capacity.” Through this statement, EPA is recognizing decades of EPA-funded and—approved plant designs that were specifically intended to address wet weather flows and were considered allowable under the secondary treatment regulation when approved.

Despite the fact that no federal law requires biological treatment of CSO flows, the CSO policy assumes that diverting any flows from the secondary treatment process for direct discharge is a bypass, although it could be permitted. To obtain authorization, the permittee is required to provide specific information on the feasibility of increasing secondary treatment capacity or storage and the cutoff point at which a discharge after primary treatment may occur: “Such a permit must define under what specific wet weather conditions a CSO-related bypass is allowed and also specify what treatment or what monitoring, and effluent limitations and requirements apply to the bypass flow.” Thus, while the bypass rule is applied to CSO flows entering the POTW, the policy continues to recognize that compliance with the secondary treatment rule is not mandated for such flows.

The blending approach is consistent with the CSO policy to maximize flow to the headworks and provide at least primary treatment and disinfection. In fact, the 1992 draft CSO policy published for public review specifically concluded that blending was allowable and not covered by the bypass regulation. Moreover, as the blended flow will achieve compliance with secondary treatment effluent limitations (a 7- and 30-day average basis), it constitutes a more restrictive requirement than primary treatment and discharge, as allowed by the CSO policy.

## SSOs and Blending

The EPA draft SSO regulation identifies all collection system overflows as unlawful discharges. In very limited instances where the overflow is unavoidable (during a tsunami or hurricane), certain defenses could apply. In essence, this rule will force the elimination of extraneous flows entering the system and transport greater peak flows to the POTW.

As with CSOs, the degree of treatment required for peak wet weather flows is under review. EPA has stated that all SSO-related flows must meet secondary treatment objectives, while admitting that secondary treatment processes are ill-suited for processing such weak influent wastewaters. The bypass regulation, however, does not distinguish between the sources of a flow reaching the headworks. If peak CSOs may be blended and discharged, there is no legal barrier for treating SSOs differently. EPA's options paper on peak excess flow treatment facilities (PEFTFs) recognizes that, to date, the NPDES permits issued to PEFTF discharges have not established consistent requirements, have used different regulatory approaches, and, in some cases, have approved anticipated bypasses and blending.

As part of a revised SSO policy, EPA is planning to impose secondary treatment effluent limits (45 mg/L weekly average or 30 mg/L monthly average). The agency's draft documents recognize that percent-removal provisions may need adjusting given the nature of the wastewater being treated. Absent a regulatory change addressing this issue, blending could be an appropriate means of addressing SSO flows (as long as all effluent limits are met). Under EPA's reinterpretation of the bypass rule, however, unless blending is expressly authorized, POTWs across the country will be required to spend enormous amounts to construct expanded secondary facilities or massive storage tanks so that SSO flows will pass through every treatment unit. The costs and environmental effects of implementing such a policy have never been publicly disclosed or evaluated.

## The Problem with Interpreting Bypass

The blending issue is not a hypothetical one. It's a real concern that has significant financial implications for municipalities. Due to the varied interpretations of the bypass regulation and the regulatory vacuum of effluent guideline requirements for CSOs and SSOs, some states and EPA regions take dramatically different positions on the ability of municipalities to use blending as a cost-effective wet weather management alternative. One EPA region objected to a state's implementation of the bypass rule on the grounds that, among other things, it authorized peak-flow bypasses around the secondary process. The statewide impact of eliminating all such “bypasses” is estimated to exceed \$2 billion.

Another EPA region issued objection letters about at least nine state-issued NPDES permits, claiming that blending was prohibited. Moreover, EPA and U.S. Department of Justice enforcement attorneys have taken a very stringent reading of the bypass regulation, potentially resulting in expensive fixes by municipalities where blending would have saved scarce municipal resources. The enforcement actions claim that all flows must go through every unit process, regardless of whether other design approaches will meet permit limits. Another EPA region claims that the secondary treatment rule justifies the imposition of holding basins, unless infeasible, to meet the bypass regulation objectives.

However, other EPA regions and states allow blending as authorized in numerous NPDES permits. The schematic diagram for or

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permit includes piping that would permit flows to bypass secondary treatment, although the fact sheet states that there are no bypass points. Some at EPA may think the two provisions are contradictory, as they view all blending as bypassing. Others at EPA would view the two provisions as totally compatible—that intentional blending is not a bypass but rather a wet weather management technique allowed under the bypass and secondary treatment rules.

A recent court case, *U.S. v. Toledo*, 49 ERC 1469 (N.D. Ohio, 1999), stands out because of its proposition that the approval of blending must be subject to the bypass rule “feasibility” test. A feasibility test may force construction of additional facilities to handle all flows. The case involved an EPA enforcement action against the City of Toledo, Ohio, for discharging untreated wastewater directly into receiving water during wet weather. The city claimed that the discharge was authorized by the generic regulatory bypass language of its NPDES permit, and EPA’s approval of the plant design justified that there were no feasible alternatives to the bypass. The court, however, agreed with EPA, indicating that “feasible alternatives” included the placement or construction of additional treatment units or storage. The city was found liable for an illegal discharge associated with its wet weather events.

It should be noted that the Toledo case involved the discharge of wastewater without blending. Moreover, the court based its rationale on the fact that two basic reasons exist for the NPDES bypass provision: to ensure the constant operation of all existing equipment and to avoid any violations of permit effluent limitations. Blending generally accomplishes these objectives. Although Toledo did not involve blending, it demonstrates the general presumption that a court may make in favor of construction as a reasonable alternative to avoiding conditions that constitute a bypass.

## Conflicts with Secondary Treatment Rule

As noted earlier, the bypass rule is part of EPA’s technology-based implementation strategy, but it is not intended to add new requirements to the guideline implementation. The development of secondary treatment technology-based regulations for POTWs in 1973 was based on EPA’s review of data from well-operated and -maintained secondary treatment plants. In the review, outliers (for example, data appoints associated with extreme wet weather events) were not considered part of the guideline requirements. In other words, the secondary treatment regulations were not based on the expectation that a well-operated and—maintained plant was to force all flows through every unit process, regardless of the magnitude of flow entering the plant.

The secondary treatment rule was a product of its time, reflecting then-existing engineering practices. The Water Environment Federation’s Manual of Practice No. 8, which evidences standard engineering practices of the time, indicates that blending peak flows around the biological process is a frequently used peak-flow management method. As indicated by the manual’s authors, this ap-

proach involves primary treatment of all flows, with a percentage of the peak flow reentering the main flow stream just ahead of disinfection. The federal rule was subsequently amended in 1984 to allow more flexible permit limits when treating weak influent wastewaters. The purpose of this modification was to avoid the unnecessary construction of additional facilities to treat wet weather flows. Thus, attempts to interpret the bypass rule to force construction of larger treatment units has no basis in the rule or its development documents.

Under the federal construction grants program, blending has been encouraged, if not required, by EPA and most states, because they require internal unit process bypasses to be included in the design of treatment plants receiving federal grants. EPA’s construction grant implementation guidance required that a bypassing system be able to control the diverted flow such that only that portion of the flow is bypassed (blended, in other words). It is apparent that EPA’s position that blending violates this rule is a recent, unsupported one not intended by the original rule or contemporaneous construction grant design guidance.

## Coalition Efforts Lead to Clarification

In response to EPA’s various actions that deny the ability to use blending as a cost-effective wet weather flow-control alternative, municipal organizations from two key states (Pennsylvania and Tennessee) contacted other states that were to be adversely affected. Soon, municipal organizations from Connecticut, Indiana, Iowa, Kansas, Maryland, Michigan, Minnesota, Oregon, Virginia, and West Virginia were participating. These organizations contacted EPA, objecting to the restrictive bypass rule interpretation and requesting that the matter be clarified. In addition to these efforts, national organizations such as the Association of Metropolitan Sewerage Agencies (Washington, D.C.) became involved and participated in meetings with EPA.

A number of the municipal organizations also contacted their congressional delegations to request assistance. In particular, the delegations from Pennsylvania and Tennessee sent letters of inquiry to EPA and demanded that the matter be appropriately addressed. In March 2001, after months of inquiry and congressional oversight, EPA issued a clarification letter to the delegations. That letter stated that blending was allowable as long as conditions under which blending would occur were identified in the permit. If the permit does not approve blending, blending would be considered an unlawful bypass under 40 CFR 122.41(m). Thus, the letter made clear that blending is not prohibited under the bypass regulation, and the “feasible alternatives” test does not apply to approval of blending.

EPA’s letter identified five key principles that should be considered by the NPDES issuing authority when approving blending:

- the final discharge meets effluent limitations based on the secondary treatment regulation (40 CFR 133) or any more stringent water quality limitations;

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- the NPDES permit application notes that blending will be used, and the permit specifically recognizes the treatment scheme that will be used for peak-flow management;
- alternative flow-routing scenarios are used only when flows exceed the capacity of storage or equalization units, and biological treatment units based on accepted good engineering practices and criteria as defined in the permit;
- during peak-flow conditions, the treatment system is operated as it is designed to be and in accordance with the conditions in the permit; and
- the permit contains appropriate requirements for the collection system, including, at a minimum, that the permittee properly design, operate, and maintain its collection system and, for permittees that own or operate combined sewers, that the permit contain conditions that conform to the 1994 CSO Control Policy.

Finally, EPA stated that any blended flow must undergo a minimum of primary treatment prior to disinfection, although it has not stated how such primary treatment must be accomplished. While EPA's clarification letter provides some discretion in the approval of blending, it is clear that the bypass rule feasibility test is not the basis for approval and that good engineering practices are the key factor in determining whether the proposed approach is consistent with the intent of the secondary treatment regulation.

## Satellite Systems

At the request of various municipal organizations, EPA also issued correspondence addressing requirements that must be achieved by facilities treating SSOs, often referred to as "peak excess flow treatment facilities" or satellite facilities. Such facilities are typically used where it is impractical or too costly to transport flows to an existing facility.

As expected, EPA indicated that such facilities receive an NPDES permit only if they are capable of meeting secondary treatment requirements. Under most conditions, satellite facilities using innovative physical-chemical technologies will be able to meet the concentration-based requirements of the federal rule. EPA acknowledged that biological treatment of SSO flows is not required by the secondary treatment regulation. This is consistent with EPA's published position that biological treatment is largely impracticable for treatment of intermittent, weak influent wastewaters. The key issue for permitting satellite facilities, as recognized in earlier EPA-generated issue papers prepared as part of the SSO policy discussion, is attainment of the 85 percent conventional pollutant removal requirement.

As satellite systems are expected to process only weak influent wastewaters, like their continuously operating biological counterparts, they will often be incapable of meeting an 85 percent removal objective. EPA acknowledged that satellite systems are eligible for

modified percent-removal requirements when meeting the criteria specified in 40 CFR 133.103(d), including

- demonstrating that failure to meet the 85 percent removal requirement is due to less concentrated influent wastewater;
- demonstrating that meeting the 85 percent removal requirement would cause the permittee to meet a biochemical oxygen demand or total suspended solids limitation of 5 mg/L more restrictive than that required by the rule; and
- demonstrating that less concentrated wastewater is not caused by "excessive infiltration and inflow."

The final criteria is often the most difficult to evaluate. It is governed by the definition of excessive infiltration/inflow (I/I) in construction grant regulations and is basically a cost-effectiveness comparison (cost of reducing the I/I versus the cost of transportation and treatment). Many states have limited experience with applying the percent-removal modification regulation and consequently impose requirements more restrictive than that intended. For example, Pennsylvania regulators believed that the cost-effective analysis could only compare I/I reduction versus expansion of the downstream treatment works. As defined in the construction grant regulations, the cost-effectiveness analysis compares I/I reduction measures versus the most cost-effective option to meet applicable technology- and water-quality-based requirements. This could be a satellite system that discharges only under wet weather flow conditions.

## Other Issues: Water-quality-based Permitting

EPA has stated that treated CSO- or SSO-related discharges must comply with limitations based on water quality as well as technology. Properly deriving water-quality-based requirements is a critical issue in developing cost-effective wet weather control measures. A major concern is that most methodologies used to derive water-quality-based limits assume that the discharge is continuous and occurs under drought flow conditions. These assumptions by NPDES permit writers often produce stringent limits, especially for ammonia, because of the limited dilution available under drought flows. Ammonia is a pollutant of concern, because the technologies available to treat intermittent CSOs and SSOs do not remove this dissolved substance. However, as CSOs and SSOs occur only during rainfall events and for a limited time, in general, application of dry weather-based permit limits (at 7/Q/10 flows) and chronic criteria is not necessary or appropriate under federal rules.

EPA has a longstanding policy specifying that variable water-quality-based limits may be established using expected instream conditions. For SSOs and CSOs, this often means that significantly greater dilution may be available, because receiving water flows will not be at drought conditions. In addition, proper consideration of criteria averaging periods may make most human health criteria and chronic aquatic life criteria inapplicable, as the assumed exposure period necessary to produce adverse effects will be far longer than a wet weather event. This is particularly important to properly derive

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ammonia limitations. EPA's latest criteria indicate that chronic ammonia criteria are based on a 30-day average exposure. Applying the long-term ammonia criteria to short-term wet weather conditions is improper. Consequently, it may be necessary to restructure the permit limits at the main discharge location or satellite facility to ensure that the standards are properly applied to infrequent peak-flow discharge events.

Numerous issues arise when permitting wet weather discharges that do not fit within the typical framework used to write NPDES permits. However, many options and opportunities exist for cost-effective permits, as long as the appropriate regulatory relief is requested. Use of blending, flow-based permits, and satellite facilities are a few of the options that conserve resources and minimize exposure to state and federal liability. Permittees must be wary that their state officials and EPA regional office are using the latest regulatory guidance on wet weather flow management. Prior interpretations of the bypass regulation, in particular, may pose a serious roadblock to developing a cost-effective program. In light of the EPA clarification letters on proper application of the bypass and secondary treatment regulations, prior NPDES program objections to blending and satellite systems should be revisited by the affected party. ■

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## Correction

**Navarro & Wright Consulting Engineers, Inc.** address and phone number was incorrectly listed in the Business Directory. We apologize for any inconvenience this may have caused. The correct address is:

151 Reno Avenue  
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