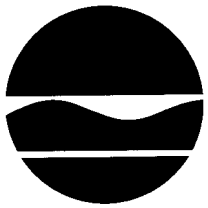
New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-3508



Michael D. Zagata
Commissioner

M E M O R A N D U M

*****N O T I C E*****

This document has been developed to provide Department staff with guidance on how to ensure compliance with statutory and regulatory requirements, including case law interpretations, and to provide consistent treatment of similar situations. This document may also be used by the public to gain technical guidance and insight regarding how the department staff may analyze an issue and factors in their consideration of particular facts and circumstances. This guidance document is not a fixed rule under the State Administrative Procedure Act section 102(2)(a)(i). Furthermore, nothing set forth herein prevents staff from varying from this guidance as the specific facts and circumstances may dictate, provided staff's actions comply with applicable statutory and regulatory requirements. This document does not create any enforceable rights for the benefit of any party.

Previous Date: June 1, 1989
Reissued Date:

TO: Regional Water Engineers, Bureau Directors, Section Chiefs

SUBJECT: Division of Water Technical and Operational Guidance Series (1.3.1.B)

TOTAL MAXIMUM DAILY LOADS AND WATER QUALITY-BASED EFFLUENT LIMITS

AMENDMENT - LOW AND INTERMITTENT FLOW STREAMS

(Originator - Al Bromberg/Hank Samide)

PURPOSE

This is an amendment to TOGS 1.3.1 to discuss the application of Waste Assimilative Capacity (WAC) analyses for discharges to low and intermittent flow streams. Results of the WAC analysis may be cause for requiring alternative disposal practices, a higher degree of treatment, or possibly denying a SPDES permit to an applicant for a new or expanded discharge. Individual review of proposed projects should be conducted to assure that the best usage of a waterbody will be protected and water quality standards will be met.

DISCUSSION

Expansion of urban and suburban areas typically results in the construction of new housing developments, apartment complexes, trailer parks, shopping centers, commercial office facilities, etc. The most common approach for the disposal of waste from these types of projects is through individual package type treatment facilities. More often than not, the resulting discharges are to small headwater streams which contain little or no natural flow. Proliferation of this type of situation should be cause for concern if the applicable water quality standards are to be protected.

TOGS 1.3.1, which discusses the assimilative capacity analysis of waste containing oxygen demanding substances, recognizes that the addition of a new discharge or the expansion of an existing discharge may cause violations of the dissolved oxygen standard. It is the intent of this amendment to further elaborate on discharge situations and conditions specifically related to those streams providing limited dilution and those that occasionally dry up (i.e.- intermittent streams). Such streams obviously have limited capacity to assimilate wastes, particularly during summertime periods when the waste flow may represent all, or a significant portion, of the total streamflow. In these situations, treatment requirements may range from secondary treatment (the minimum technology-based treatment level) to tertiary treatment to meet intermittent stream effluent limits (ISELs). ISELs are generally recognized as representing the highest degree of treatment that can reasonably be achieved for domestic type waste.

Discharges to low or no flow streams should be handled in one of two ways:

1. A Waste Assimilative Capacity (WAC) analysis should be performed. However, the limitations of the analysis need to be recognized. Typically, when dealing with low flow streams, there is little if any field data available. Consequently, the analysis is based on a variety of assumptions including professional judgement. On the positive side, the "judgement" of the Division of Water staff is enhanced by many years of review of discharges to low and intermittent flow streams. Although the results of these analyses are not exactly precise, they do provide an indication of the degree of treatment necessary to meet water quality standards.

2. Apply the Intermittent Stream Effluent Limits (ISELs) or an adjusted set of those limits based on the dilution available.

   A few words of explanation are in order regarding the intermittent stream effluent limits. The effluent limits were developed (consistent with policy applied in 1976) based on the assumptions that the receiving stream possesses the least favorable physical characteristics (in terms of self-purification potential), that no dilution is available, and that the stream standards, in effect, should be met in the effluent itself. This means that the ISEL limits, for the vast majority of situations, may really be

more stringent than they need to be and that, even though the ISEL limits have normally been associated with Class D streams, they can satisfy Class C and even C(T) dissolved oxygen standards. The rationale subscribed to is that the physical characteristics of a stream that justify a higher classification (such as Class C or C(T)) may also be responsible for better self-purification. Furthermore, since ISEL is considered to represent the highest degree of treatment that can reasonably be achieved by practical technology, it has traditionally been the maximum level of treatment that has been required regardless of the class of the receiving stream. It should be noted that ISELs were developed to avoid the necessity of performing a tedious (and questionable) WAC on literally thousands of discharges throughout the State and the need to justify case-by-case limits resulting from such a WAC analysis.

Whether performing a WAC analysis or utilizing ISEL guidelines to establish permit effluent limits, other available options, such as seasonal effluent limits, alternative disposal options like land application, sub-surface disposal, conveyance to less critical surface water areas or out-of-basin discharge as a permanent solution, or some combination of these to avoid discharge during critical seasonal time periods, should be considered.

Note - Trout Spawning

A special situation exists which should be carefully considered. A number of streams, with either existing or proposed dischargers, presently are classed or are proposed for reclassification to TS (trout spawning) designation. Since the minimum DO requirement of 7 mg/l for designated TS waters represents a condition that can barely be met under natural conditions, any waste discharge can only aggravate the water quality condition. In fact, the TS designation receives special recognition in the Department's Antidegradation Policy (NYSDEC Organization and Delegation Memo No. 85-40, September 9, 1985) which states: "Those waters protected for trout spawning purposes require compliance with extremely high water quality standards which prohibit degradation." Because a TS designated stream has virtually no margin for measurable degradation, it must be treated as a special case.

GUIDANCE

Recognizing the uncertainties associated with water quality analyses involving low or no flow streams, the following procedures should be followed to assure maintenance of the designated best use and the water quality standards.

For all streams:

1. The existing seasonal limits policy for discharges to water quality-limiting streams should continue to be applied. In summary, this policy recommends that discharges to intermittent streams provide intermittent stream effluent limits on a year-round basis. Also, discharges to low flow

streams should maintain the stipulated critical limits during June through October and all treatment processes should remain at their best operating capabilities during the remainder of the year. Of course, site-specific information may justify individual modification.

2. The permit applicant always has the prerogative to propose effluent limitations that are less stringent than those recommended by the Division of Water; however, it is incumbent upon the applicant to demonstrate, to the Division's satisfaction, through development and submittal of an engineering report or waste assimilative capacity analysis report, that the resulting lower quality effluent would not violate applicable water quality standards.

3. Alternatives, such as subsurface disposal, out-of-basin transfer, relocation of a discharge to a less critical stream segment, or denial of discharge, may be feasible and/or necessary in a given site-specific situation.

For other than TS designated streams:

4. All new or expanded discharges to streams that fall into the intermittent category, regardless of class, should be required to provide intermittent stream effluent limits. Existing discharges to intermittent streams which do not have intermittent stream effluent limits should be left alone unless there is evidence of a problem (i.e.-complaints such as odors or nuisance conditions, detrimental impacts on aquatic life, etc.).

5. On all other low flow streams, again regardless of class, new or expanded discharges agreeing to provide intermittent stream effluent limits should automatically be acceptable. However, a less stringent level of treatment may be acceptable; such factors as the dilution available, the physical characteristics of the stream and the presence or absence of other discharges (and their associated levels of treatment) will be taken into consideration. Existing discharges should be left alone unless there is evidence of a problem.

For TS designated streams:

6. New or expanded discharges to TS designated streams with a dilution ratio of 10:1* or less should not be permitted unless a waste assimilative capacity (WAC) analysis is conducted which assures compliance with water quality standards. Existing discharges will be required to upgrade to provide intermittent stream effluent limits. Any new/expanded discharge, having a 10:1 or better dilution available, will generally be allowed provided that intermittent stream effluent limits are met.

---

* While the selection of a specific dilution factor may be somewhat arbitrary, the intent is to minimize the potential impact of the discharge on stream dissolved oxygen depletion. A designated TS stream under ideal

conditions would have a dissolved oxygen saturation of about 8.1 mg/l @ 24°C, 0 mg/l chlorides and 1000' elevation. Given there may be some background organic loading from nonpoint sources, a natural decrease in dissolved oxygen of about 10% is assumed, bringing the dissolved oxygen level down to 7.3 mg/l (8.1 - 0.8 = 7.3). The effluent from an ISEL-limited discharge to a dry stream may cause a dissolved oxygen decrease of about 2.0 mg/l, or a 0.2 mg/l decrease in a stream with a 10:1 dilution. This would result in a stream dissolved oxygen of 7.1 mg/l, or just above the standard of 7.0 mg/l. This decrease is consistent with the practical limit of accuracy of 0.2 mg/l for the accepted chemical field procedure, the Azide Modified Winkler Method.

_____

N.G. Kaul, Director
Division of Water