NPDES Individual Permit

November 30, 2018

Memo to permit writers RE: Mixing Zones in Columbia River Waters Listed as Water Quality Limited for pH

To: NPDES Permit Writers
From: Ron Doughten, WQ Permit Program Manager

In May 2012, DEQ issued an Internal Management Directive for the allocation and evaluation of mixing zones, "*Regulatory Mixing Zone Internal Management Directive"*. The IMD discusses regulatory requirements related to Mixing Zones and provides recommendations related to these requirements. The purpose of this memo is to identify the specific regulatory requirements related to Mixing Zones in water that have been listed as water quality limited.

Introduction

When a point source discharges to a stream segment (segment) that is listed as impaired (listed) for pH on a 303(d) list, one presumption is that there is no assimilative capacity for the impairment pollutant within the segment and that the point source must meet the applicable water quality standard at the end of pipe. However, there are situations where the presence of assimilative capacity can be demonstrated. One such scenario is described below. In this instances a Regulated Mixing Zone (RMZ) may be allowed for the impairment pollutant.

The purpose of this memorandum is to describe various situations where the Department of Environmental Quality (DEQ) may authorize use of a RMZ for pH. These situations are limited to those existing1 NPDES permits that discharge to impaired waters and where there are no assigned Total Maximum Daily Load (TMDL) allocations. Permit development staff is directed to use the following procedures to determine if a RMZ can be allowed pursuant to state rule and applicable guidance.2 This memo is an addendum to the Mixing Zone IMD Volume 1, and its contents will be integrated into to the Mixing Zone IMD when the IMD is next amended.

Problem Statement

Based upon ambient water quality data showing an exceedance of the water quality standard (pH 7.0 to 8.5 s.u.), the Columbia River (River Mile 169 to 180) is listed as water quality limited for pH during the summer period. In general, when a water body is listed as impaired for a pollutant and assimilative capacity is not available, the Department does not allow a Regulated Mixing Zone (RMZ) and the factoring of a dilution into the water quality analysis for that pollutant during NPDES permit renewal. The result is that most permitted discharges will not be permitted a mixing zone and will need to meet the water quality standard at the point of discharge. This has the potential to impact permit development for facilities (i.e. the Dalles, Mosier, Multnomah Falls and Cascade Locks etc.) that discharge to the Columbia River.

[1] For new permit applications, the permit writer should seek specific technical assistance from the Surface Water Management Section of Headquarters.
[2] Mixing Zone IMD Volume I & II

State of Oregon Department of Environmental Quality

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Discussion

The pH criteria is unique in that it is expressed in a range where values above or below the range are deemed to demonstrate non-compliance. The water quality listing status for the Columbia River segment is general in nature and not specific as to being "limited" for exceedance, nor short-fall, of the standard (7.0 to 8.5 s.u.). The basis of the water quality listing was water quality data where fourteen of thirty-six (39%) samples exceeded the upper threshold of the pH standard of 8.5 s.u.. None of the samples exceeded the lower threshold of the pH standard of 7.0 s.u..

This fact set would indicate that there is a period in the summer where the river is in exceedance of the standard and (for the upper threshold) assimilative capacity would not be available. The same fact set would also indicate that the River is normally in compliance with the standard during the rest of the year, and with the lower threshold of the water quality standard in the summer. Accordingly, the Department may allow a mixing zone for the rest of the year and in the summer for the lower threshold of the standard. In these instances, a dilution factor may be applied in the water quality analysis to determine if Reasonable Potential is present. For all permittees, the Department must also consider the federal secondary treatment standards for domestic sewage treatment facilities of 6.0 to 9.0 s.u..

A recent example where this has been implemented is the 2014 City of Gresham NPDES Permit which discharges to a near-by segment of the Columbia River. Here, a mixing zone was permitted for the lower boundary of the criterion and used in the reasonable potential analysis and effluent limit calculation. The department proposed pH limits of 6.0 to 8.5 s.u.. The upper value of 8.5 reflected the local standard without a mixing zone. The lower value of 6.0 reflected use of a mixing zone and met the lower range of the Federal Secondary Treatment Standard. This permit was developed in consultation with EPA Region X permitting and standards staff, and was approved in June of 2014.

Conclusion

Where the majority of the State's water quality criteria are reflected as single value thresholds, pH is unique in that it is reflected in a range of values (vs a single point). Where a water body has been listed as "water quality limited" on the 303d list for pH, the permit writer should evaluate the local water quality data to determine if the water body is in exceedance or of in short-fall of the standard. A mixing zone may not be allowed for the portion of the standard where the water body's pH is determined to be in exceedance and/or short-fall of the standard. Where the water body is determined to be in compliance with the standard, the permit writer may grant a mixing zone and factor dilution into the RPA and limit determination process. At minimum, all pH limits must meet the minimum values of 6.0 to 9.0 to reflect Federal Secondary Treatment Standards.

Permit writers should confer with a subject-matter experts with any questions or concerns about developing a compliance schedule.

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request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

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