C26 A Study of Several Case Histories of Successful Method Detection Limit (MDL) Studies Consistent With 40CFR136, Appendix B

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The goals of this presentation are to address the studies of analytes and methodologies (organic compounds, GC/CD and GC/MS), nonmetals (e.g., Total Cyanide Distillation with automated colorimetry) metals (by ICP/GFAA), pesticides (GC/CD, GC/MS). A comparison will be made which demonstrate the often dramatic differences in EPA published MDLs versus those defined in real-world industrial wastewater matrices.

This preparation addresses several of some 15 Method Detection Limit studies conducted by the author for industrial facilities in four different states. All were successful from both a technical and a regulatory perspective.

The strategic objective of each study was straightforward: to determine a matrixspecific, analyte-specific method detection limit in an industrial wastewater discharge and to accomplish this in a manner consistent with USEPA's methodology given at 40CFR136, Apdx B. Prior to each study, the responsible State (or Federal) permitting agency had been informed of the need and the intent to execute such a study and in no case did the responsible agency veto the necessity of conducting such a study.

This presentation will address the studies of analytes and methodologies (organic compounds, GC/CD and GC/MS), non-metals (e.g., Total Cyanide distillation with automated colorimetry) metals (by ICP/GFAA), pesticides (GC/CD, GC/MS). A comparison will be made which demonstrate the often dramatic differences in EPA published MDLs versus those defined in real-world industrial wastewater matrices.

The implication of the matrix-specific MDL is demonstrated by a significant drop in the number of NPDES permit limitation violations.

The introduction by USEPA of the concept of the Minimum Level (ML) as, effectively, a limit of quantitation (LOQ) will be shown to further ease the compliance burden on permitted industries. Unhappily, the EPA has not incorporated the ML concept into binding regulation (as is the case with the MDL) but has presented the ML as mere guidance. Some states (e.g., Texas) have adopted the ML concept and incorporated it into their state water permitting regulations.

Interestingly, all new and updated 40CFR136 methods include not only the MDL but also the ML for the analytical method. In this paper, the most frequently evaluated MDLs have been one form or other of cyanide (e.g., Total Cyanide, Cyanide-Amenableto-Chlorination, Weak Acid Dissociable Cyanide).

Impetus to conduct such MDL (and ML) studies resides in the growing tendency of both USEPA and State agencies to set discharge limits below the limits of detection. The success of the various LEAF (Legal Environmental Advocacy Fund) lawsuits and the rapidly expanding program of re-classification of streams and rivers (leading to Total Maximum Daily Loads) have resulted in water quality driven mass discharge limits which translate into immeasurably low concentrations in wastewater discharges. Unhappily, many NPDES permit writers do not seem to understand that compliance with a mass-based limit in contingent not only on flow (thus, total mass of wastewater) but upon a measurement of concentration of the offending species. This aspect of the compliance problem will also be addressed in this presentation.

Method Detection Limit, Matrix-Specific, Analyte-Specific

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