

**National Pollutant Discharge Elimination System (NPDES)  
Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting  
Federal Register / Vol. 79, No. 160 / Tuesday, August 19, 2014**

**Effective Date: September 18, 2014**

**SUMMARY**

EPA finalized minor amendments to its Clean Water Act (CWA) regulations to require "sufficiently sensitive" analytical test methods under the National Pollutant Discharge Elimination System (NPDES). The rulemaking [1] clarifies that NPDES applicants and permittees must use EPA-approved analytical methods capable of detecting and measuring pollutants at or below applicable water quality criteria or permit limits. This final rule is based on CWA requirements and clarifies existing EPA regulations. The amendments in this rulemaking affect only chemical-specific methods; they do not apply to Whole Effluent Toxicity methods or their use [2].

***Sufficiently Sensitive Method*** – is defined by EPA in the Federal Register notice as:

- The method minimum level [Kentucky defined as minimum reporting level - MRL] is at or below the level of the applicable water quality criterion or permit limitation for the measured pollutant or pollutant parameter; or
- In the case of permit applications, the method minimum level [MRL] is above the applicable water quality criterion, but the amount of the pollutant or pollutant parameter in a facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or
- The method has the lowest minimum level [MRL] of the EPA-approved analytical methods.

**IMPACT TO KENTUCKY KPDES PERMITTEES**

Required Reporting Limits (RRL)

Permitted (KPDES) facilities in Kentucky must ensure that their laboratory, or contracted laboratory, is utilizing an EPA approved method that is sufficiently sensitive to detect and measure at or below the permit required reporting limit (RRL) [3]. Such that:

$$\mathbf{MRL \leq RRL}$$

Alternate Reporting Limit (ARL)

Kentucky Division of Water (DOW) recognizes that there are several analytes that have RRL's that are lower than any current laboratory instrument capability. In these instances, laboratories may utilize the alternate required reporting limit (ARL) [3] – without prior permission from DOW. Such that:

$$\mathbf{MRL \leq ARRL}$$

## **SELECTION OF AN EPA APPROVED METHOD THAT IS SUFFICIENTLY SENSITIVE**

If a permitted facility's laboratory, or contracted laboratory, is not utilizing an EPA approved method that is sufficiently sensitive to meet the KPDES permit RRL or ARRL - then the facility is required to either: 1) use another EPA approved method with a demonstrated MRL that is equal to or less than the permit RRL or ARRL; 2) submit a request to KWLCPC for a matrix specific reporting limit (MSRL, see below); or 3) contract with a laboratory that can demonstrate a MRL that is sufficiently sensitive (unless the facilities discharge is high enough that the method detects/quantifies the level of the pollutant parameter in the discharge).

## **MATRIX EFFECT AND ITS' IMPACT ON SUFFICIENTLY SENSITIVE METHOD(S)**

If a permitted facility's laboratory, or contracted laboratory, experiences an elevated MRL due to the affect of a particular matrix (i.e. matrix effect) – then the facility may submit a written request to DOW for a matrix specific reporting limit (MSRL) [4]. Such that:

$$\text{RRL (or ARRL)} \leq \text{MSRL (approved by DOW)}$$

The facility must provide all of the required documentation to allow DOW to make an informed decision regarding the impact of matrix effect. Matrix Interference (i.e. matrix effect) in a specific sample matrix - is defined as a sample matrix which possesses properties that affect the detection of a particular analyte or group of analytes [5]. A matrix interference can cause either a high bias or a low bias.

In order for a laboratory to demonstrate that a specific sample matrix is creating a matrix interference, the laboratory must document the interference using the method of standard additions (MSA) or utilize a combination of the following quality assurance / quality control parameter result options:

### QA/QC Parameters Which Demonstrate Matrix Effect:

1. Blank(s) – analytical results for all associated blanks (e.g. reagent, method, etc)
2. Laboratory Control Sample (LCS) – primary or second source analytical standard
3. Sample result (which contains the subject matrix)
4. Sample Duplicate (DUP)
5. Laboratory Fortified Blank (LFB)
6. Laboratory Fortified Blank Duplicate (LFB D)
7. Matrix Spike (MS) – aliquot of sample spiked with a known amount of analyte of concern
8. Matrix Spike Duplicate (MSD) – a second aliquot of sample spiked with the same amount of analyte of concern

### QA/QC Parameter Assessment:

Matrix effect can be successfully demonstrated if the analytical system is free of contamination of any analytes of interest, produces acceptable spike recoveries from laboratory fortified spikes (LCS, LFB, LFBD), but has unacceptable sample accuracy and precision results (e.g. sample and sample duplicate or matrix spike and matrix spike duplicate).

[1] – Federal Register / Vol. 79, No. 160 / Tuesday, August 19, 2014. [Click here](#) for the complete rule.

[2] – EPA National Pollutant Discharge Elimination System (NPDES): Use of Sufficiently Sensitive Test Methods for Permit Applications and Reporting Factsheet (August 2014), [click here](#).

[3] – For a complete list of Kentucky’s DOW KPDES Required Reporting Limits (RRL) and Alternate Required Reporting Limits (ARRL), [click here](#).

[4] – Matrix Specific Reporting Limit (MSRL) – [click here](#) for the requirements for preparing a written request to KWLCF.

[5] – Laboratory Detection and Reporting Limit Issues Related to Risk Assessments, E. Corl, R. Owens, A. Pollack, S. Brauning and M. Holdred – Issue Papers (Detection/Reporting Limit Issues; April 2002).