

Date Signed: December 16, 1993

MEMORANDUM

SUBJECT: Guidance and Clarification on the Use of Detection Limits in Compliance Monitoring

FROM: James R. Elder, Director  
Office of Ground Water and Drinking Water

TO: Water Management Division Directors  
Environmental Services Division Directors  
Quality Assurance Officers  
Regions 1-10

Several Regions and States have requested guidance and clarification on the use of detection limits in monitoring of drinking water samples for herbicides, pesticides and other synthetic organic chemicals (SOCs). The basic concern seems to be that some laboratories are having difficulty in achieving the detection limits specified in the regulations for some SOCs on a regular basis. As a result, contaminants may occur in public water systems at detectable levels even though laboratories report "no detect." Though EPA laboratory certification procedures specify performance criteria for SOCs, detection levels are not one of these criteria. Therefore, this guidance suggests an appropriate standard for determining when a finding of "no detect" should be considered "acceptable" for the purposes of the trigger for decreased monitoring.

In the attachment to this memorandum, EPA is suggesting detection limits that a laboratory must achieve in order to report an acceptable finding of "non-detect." By listing these concentrations, EPA affirms that results that may occur below these specified concentrations should not trigger continuing quarterly monitoring. Though existing regulations do not so require, results of "no detect" from laboratories that cannot achieve the upper confidence limit of the detection limits should not relieve the public water systems from the requirement for quarterly monitoring.

Section 141.24(h)(19) of the regulations provides that analysis for drinking water contaminants shall only be conducted by laboratories that have received certification from EPA or the State. At a minimum, certified laboratories are required to satisfy criteria, specifically relating to precision and accuracy. Laboratory certification requirements do not directly specify detection limits that laboratories must be able to achieve for herbicides, pesticides and other SOCs.

Section 141.24 requires that analysis for drinking water contaminants be conducted using the EPA methods or their equivalents. The approved EPA methods require the laboratories to use specific quality control procedures. One of the quality control procedures is the initial demonstration of laboratory capability which includes the determination of detection limit. The detection limit for a given contaminant by a specific method is associated with an inherent variability of measurement or a confidence interval. The method for determining is specified in 40 CAR Part 136 Appendix B. The Appendix includes an explicit procedure for calculating the lower confidence limit (LCL) and upper

confidence limit (UC) based on seven aliquots: The LCL = 0.64 times the detection limit and the UC = 2.2 times the detection limit.

In §141.24(h)(18), the Agency specifies detection limits for certain synthetic organic contaminants. If a public water system detects a contaminant, §141.24(h)(7) provides for continued quarterly monitoring. Although §141.24(h)(18) specifies detection limits for the purpose of "detection," EPA inadvertently failed to specify limits for "non-detection."

In addition, these detection limits did not have specific confidence intervals associated with them, even though these intervals are an essential part of the Part 136 Appendix B procedure. This memorandum explains that, although the published detection limits in 141.24(h)(18) are the applicable standards for "detection," the UC to the detection limit suggests an appropriate standard for a finding of "no detect" for those contaminants. By suggesting this standard, this memorandum does not alter pre-existing legal standards or obligations.

In the attachment, we have listed the detection limits from 141.24(h)(18) as well as the UCS that are appropriate for those herbicides, pesticides and other SOC analytes. If a regional, state, utility, or a private laboratory has demonstrated that their detection limit for a specific analyte, calculated by the Appendix B procedure, falls at or below the UC in the attachment, they should be considered to have achieved the detection limit for the purposes of reporting an acceptable finding of "no detect." If the laboratory reports "no detect," then the P.S. would be relieved from continuing quarterly monitoring pursuant to 141.24(h)(7). Of course, the States do have the option of enforcing more stringent requirements and are not in any way required to lessen their own requirements to meet the interpretations in this memorandum. This memorandum does not affect applicable standards when a laboratory reports "detects" at or above the detection limits in 141.24(h) (18).

This approach may still pose problems for some laboratories and we urge that you give the States and utilities as much technical assistance as you can in attempting to achieve the required detection limits or to use their compliance results as part of a waiver application.

I hope this provides clarification on the use of detection limits in compliance monitoring of drinking water samples. If you have any questions, please call James M. Conlon, Director, Drinking Water Standards Division on (202) 260-7575. You may also contact Balded L. Bathija, Ph.D., Chief, Methods and Monitoring Section, on (202) 260-3040.

#### Attachment

cc: James M. Conlon, DASD  
Robert J. Blanco, ENID  
Ramona E. Thrived, GWPD  
Alan A. Stevens, T.D.  
Frederick F. Stiehl, OE  
Susan G. Lepow, O.C.

ATTACHMENT

Analyze	MCLG mg/L	MCL mg/L	FR Detection Limits mg/L	UCL mg/L
Alachlor	0.002	0.002	0.0002	0.00044
Atrazine	0.003	0.003	0.0001	0.00022
Benzo(a)pyrene	zero	0.0002	0.00002	0.000044
Carbofuran	0.04	0.04	0.0009	0.00198
Chlordane	zero	0.002	0.0002	0.00044
Dalapon	0.2	0.2	0.001	0.0022
Dibromochloropropane	zero	0.0002	0.00002	0.000044
Di(2-ethylhexyl)adipate	0.4	0.4	0.0006	0.00132
Di(2-ethylhexyl)phthalate	0.006	0.006	0.0006	0.00132
Dinoseb	0.007	0.007	0.0002	0.00044
Diquat	0.02	0.02	0.0004	0.00088
2,4-D	0.07	0.07	0.0001	0.00022
Endothal	0.1	0.1	0.009	0.0198
Endrin	0.002	0.002	0.00001	0.000022
Ethylene dibromide	zero	0.00005	0.00001	0.000022
Glyphosate	0.7	0.7	0.006	0.0132
Heptachlor	zero	0.0004	0.00004	0.000088
Heptachlor epoxide	zero	0.0002	0.00002	0.000044
Hexachlorobenzene	zero	0.001	0.0001	0.00022
Hexachlorocyclopentadiene	0.05	0.05	0.0001	0.00022
Lindane	0.0002	0.0002	0.00002	0.000044
Methoxychlor	0.04	0.04	0.0001	0.00022
Oxamyl (Vydate)	0.2	0.2	0.002	0.0044
Pentachlorophenol	zero	0.001	0.00004	0.000088
Picloram	0.5	0.5	0.0001	0.00022
PCBs (as decachlorobiphenyl)	zero	0.0005	0.0001	0.00022

Simazine	0.004	0.004	0.00007	0.000154
Toxaphene	zero	0.003	0.001	0.0022
2, 3, 7, 8-TCDD (Dioxin)	zero	0.00000003	0.000000005	0.000000011
2, 4, 5-TP	0.05	0.05	0.0002	0.00044
Aldicarb*	(0.001)	(0.003)	0.0005	0.0011
Aldicarb sulfoxide*	(0.001)	(0.004)	0.0008	0.00176
Aldicarb sulfone*	(0.001)	(0.002)	0.0003	0.00066
			CFR Numbers	New Suggested “Non-detect”

\*MCLGs and MCLs for these contaminants have been stayed pending further rulemaking.