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MEMORANDUM

TO: Kean S. Goh, Ph.D.
Agricultural Program Supervisor IV
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FROM: Frank Spurlock, Ph.D.
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DATE: May 17, 2002

SUBJECT: DETERMINATION IF THE PTRL WEST, INC., LIQUID
CHROMATOGRAPHY/ATMOSPHEREIC-PRESSURE CHEMICAL-
IONIZATION/MASS SPECTROMETRY/MASS SPECTROMETRY
METHOD FOR SELECTED HERBICIDES AND DEGRADATES IN
WATER (PTRL METHOD 1000Wymsms7b), MEETS THE
"UNEQUIVOCAL DETECTION" CRITERIA

Background

The Pesticide Contamination Prevention Act (Food and Agricultural Code [FAC] sections 13141 et seq.) was passed in 1985 to prevent further pesticide pollution of ground water which may be used for drinking water supplies. FAC section 13149 specifies the conditions under which a pesticide is considered "found" in ground water or soil, and thus, subject to formal review as specified. As originally adopted, FAC subsection 13149(d) specified that a finding of a pesticide shall be verified by a second analytical method or a second analytical laboratory approved by the Department of Pesticide Regulation (DPR). However, Senate Bill 810 amended the law in 1995 to allow a finding of a pesticide in ground water or soil to be based on a single analytical method conducted by a single analytical laboratory if the analytical method provides unequivocal identification of a chemical. Following this change, criteria were established to identify methods providing unequivocal identification of a chemical (Biermann, 1996).

Issue

Does the PTRL West, Inc., high pressure liquid chromatography/mass spectrometry (LC/MS) analytical method 1000Wymsms7b, for atrazine, bromacil, diuron, hexazinone, norflurazon, prometon, simazine, deethylatrazine, deisopropylatrazine, and diaminochlorotriazine meet the definition of an unequivocal detection method?

Discussion and Recommendation

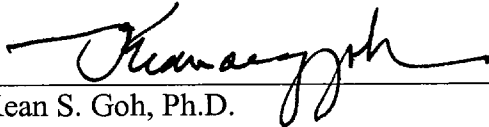
The PTRL West, Inc., method uses an LC/MS/MS system for the detection of the herbicides and degradates. For each of the ten chemicals analyzed, the first mass spectrometer is set to reject all species with mass/charge values that do not correspond to the analyte's molecular ion eluting at



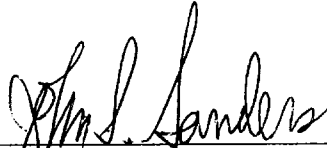
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that analyte's particular retention time. Each molecular ion is then fragmented in the next stage, and the final mass spectrometer quantifies the herbicide or degradate based on either one or two characteristic fragments. Three stepwise factors are used to eliminate possible interferences for each analyte: chromatographic retention time, analyte molecular ion mass, and either one or two specific daughter ion masses depending on the analyte. Consequently, analysis of the ten analytes by this method is highly specific and qualifies for the designation as unequivocal. Therefore, analysis by a second laboratory or a second method is not necessary for well water samples analyzed using this method.

If you have any questions, please feel free to contact me.

APPROVED: 
Kean S. Goh, Ph.D.
Agricultural Program Supervisor IV

Date: 5-21-2002

APPROVED: 
John S. Sanders, Ph.D., Chief
Environmental Monitoring Branch

Date: 5/21/02