

In State of California

Memorandum

To : DPR Environmental Monitoring
Air Protection Program
1001 I Street, P.O. Box 4015
Sacramento, CA 95812-4015

Date: February 13, 2025

Place: Sacramento

Phone: (916) 654-0321

From : **Barzin Moradi, Branch Chief, CAC** - 1220 N Street
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Subject : **VOC Air Analysis – Uncertainty in Reported Results with a proposal for adjustment**

The Center for Analytical Chemistry (CAC*), a branch of the Division of Inspection Services in the California Department of Food and Agriculture (CDFA), has discovered a calculation error CAC made in preparing analytical standards in the analyses of volatile organic compounds (VOCs) in ambient air collected via air canisters for the California Department of Pesticide Regulation. The miscalculation occurred with two fumigants: methyl bromide (bromomethane), and 1,3-D (*cis*- and *trans*-1,3-dichloropropene). As a result of the calculation error, the analytical results of all components within the VOC analyses in air canisters were underreported. After careful internal evaluation of the records, the following theoretical factors are proposed to be applied to reported data:

1. Data analyzed 02/16/2011 – 08/29/2011 need to be multiplied by 1.12
2. Data analyzed 09/9/2011 – 03/23/2023 need to be multiplied by 1.26
3. Data analyzed 05/04/2023 – 05/25/2023 need to be multiplied by 1.36
4. Data analyzed 06/01/2023 – 11/27/2024 need to be multiplied by 1.58

CAC recently discovered this calculation error during method evaluation, transfer, and improvement in the CAC Environmental Analysis (EA) section. While the magnitude of the error in calculation was small in data reported in 2011, it increased over time due to compounding effects of lowering reporting limits requiring multiple dilutions. CAC has a strong commitment to data integrity, transparency, and continuous improvements. Therefore, it has been engaged in a comprehensive evaluation and improvement of the analysis, lab processes, and measurement methods used.

TESTING AND PROCESS IMPROVEMENT DETAILS

Many factors were tested to understand all the uncertainties in VOC measurement methodology. Standard preparation and method parameters were evaluated to see their impact on analytical data. Varieties of autosampler lines, syringe type (*i.e.*, glass versus

acrylic), humidifying analytical standards, and changing the trap heat rate were within analytical measurement uncertainty.

Process improvements (carried out and proposed) include:

1. Preparing standards through static dilution by the addition of known volumes into canisters using gas-tight syringes
2. Utilizing a certified calibrated pressure gauge for final pressurization of canister
3. Use of multiple canisters at different concentrations in creation of standard curve and maintaining quality records of standard preparation

Sincerely,
Barzin Moradi, PhD
Branch Chief
Center for Analytical Chemistry
Division of Inspection Services
California Department of Food and Agriculture

**Established in 1920, CDFA's Center for Analytical Chemistry (CAC) is a regulatory laboratory specialized in detection, confirmation, and quantitation of agrochemicals in a variety of samples. The lab is ISO 17025 accredited with capabilities that include emergency response, investigation and data gathering, research and method development, and nationally and internationally recognized publications in chemical analysis. CAC provides analytical expertise for various federal, state, and local government agencies in the areas of environmental safety and monitoring, food safety, crop protection, pesticide and fertilizer label compliance, farmworker health and safety, and investigational analysis. CAC has provided analytical services to the California Department of Pesticide Regulations (DPR) since DPR's inception in 1991.*