



California Department of Pesticide Regulation
Environmental Monitoring Branch, Air Program
1001 I Street, Sacramento, CA 95814-2828
P.O. Box 4015, Sacramento, CA 95812-4015
Date approved: September 5, 2014

MONITORING INDOOR CONCENTRATIONS OF SULFURYL FLUORIDE DURING STRUCTURAL FUMIGATIONS

Study # 294

1.0 INTRODUCTION

Sulfuryl fluoride (SF), a chemical commonly used in structural fumigations, is designated as a toxic air contaminant (Warmerdam, 2006). As outlined in the Risk Management Directive (Gosselin, 2007), the Department of Pesticide Regulation (DPR) is developing mitigation to address acute exposures of SF to bystanders near fumigations. Computer modeling will be employed to estimate the distribution of SF air concentrations near fumigated structures. A crucial input parameter for these computer models is the flux of SF from a structure being fumigated, which is a parameter that DPR has limited data on. DPR will monitor the concentration of SF inside structures being fumigated to estimate SF flux. This monitoring data will be used to profile SF flux for input into computer models.

2.0 OBJECTIVES

1. To monitor instantaneous indoor concentrations of SF
2. To profile SF flux for air modeling

3.0 PERSONNEL

The Environmental Monitoring Branch, under the supervision of Pam Wofford, project supervisor, will conduct this study. Other key personnel include:

- Project leader: Joanna Nishimura
- Research Science IV: Terrell Barry
- Statistician/modeler: Jing Tao

Please direct questions regarding this study to Pam Wofford at (916) 324-4297 or pam.wofford@cdpr.ca.gov.

4.0 STUDY PLAN AND SAMPLING METHODS

DPR will conduct environmental monitoring of as many structural fumigations as possible from September 2014 through June 2015. DPR will not know the location of these structural fumigations until a few days before the fumigation event due to the fast-paced nature of professional pest control fumigations. The Environmental Monitoring and Worker Health and Safety branches of DPR will work in conjunction with pest control business to identify and coordinate the monitoring of these structural fumigations.

DPR will collect relevant information from each fumigation including the date, time, type, location and footage of the structure to be fumigated, volume and amount of pesticide applied, target concentration, soil surface temperature, duration of fumigation, and duration of aeration.



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Monitoring will be conducted using a Fumiscope[®], which is a device that measures the concentration of SF in air. The Fumiscope continuously draws air through an intake tube from inside the fumigation structure at a controlled rate. The air is passed through the Fumiscope[®], which measures the concentration of SF (ounces/1,000 ft³) in the sample by comparing the thermal conductivity of the air sample to that of ambient air. The analyzed air is then returned to the fumigation structure through an outflow tube (Key Chemical & Equipment).

The Fumiscope[®] provides instantaneous, real-time readings of the concentration of SF. The intake tube will be positioned approximately 1--2 meters above the ground inside the fumigation structure. After the start of fumigation, DPR will keep observing the Fumiscope[®] readings until they reach the initial equilibrium concentration. From the time of equilibrium, the Fumiscope[®] readings will be recorded every hour for 6 hours, and then be recorded at 8th, 12th, 18th and 24th hour.

Monitoring may also be conducted using a Remote Data Acquisition (RDA) Fumiscope[®]. The RDA Fumiscope[®] uses the same methods of analysis as the basic Fumiscope[®], but the real-time readings can be accessed remotely via cell phone or computer. If using the RDA Fumiscope[®], SF concentrations will be recorded every hour for 24 hours after concentrations reach equilibrium.

5.0 DATA ANALYSIS

The following information will be requested from the applicator:

- Condition of tarp
- Condition of seal (where tarp joins soil, steps, wires, fences, etc.)
- Type of underseal (slab, clay, loam, sandy loam, or sand)
- Volume of structure
- Wind velocity

This data will be used with monitoring data to calculate half-loss time and SF flux, which are used for computer modeling.

6.0 TIMETABLE

DPR will conduct environmental monitoring of as many structural fumigations as possible from September 2014 through June 2015.

7.0 REFERENCES

Gosselin, P. 2007. Memorandum to Jerry Campbell on "Risk Management Directive for Sulfuryl Fluoride." April 6, 2007.

http://www.cdpr.ca.gov/docs/whs/pdf/sulfuryl_fluoride_rmd_040607.pdf.

Key Chemical & Equipment. Fumiscope Version 5.1 Manual.



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Warmerdam, M-A. 2006. Memorandum to Paul Gosselin on "Director's Proposed Decision Concerning Sulfuryl Fluoride as a Toxic Air Contaminant." September 18, 2006.
http://www.cdpr.ca.gov/docs/emon/pubs/tac/tacpdfs/sulfluor/sf_dirdecision.pdf.

8.0 AMENDMENTS