

# California Aeration Plan (CAP) for Structural Fumigations



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# California Aeration Plan (CAP)



- Developed by the Pest Control Operators of California (PCOC) as a Fumigation Safety Program
- Allows pesticide handlers to safely remove tarps from a fumigated structure without the use of PPE
- Only plan in California accepted by the Director (3CCR 6780)

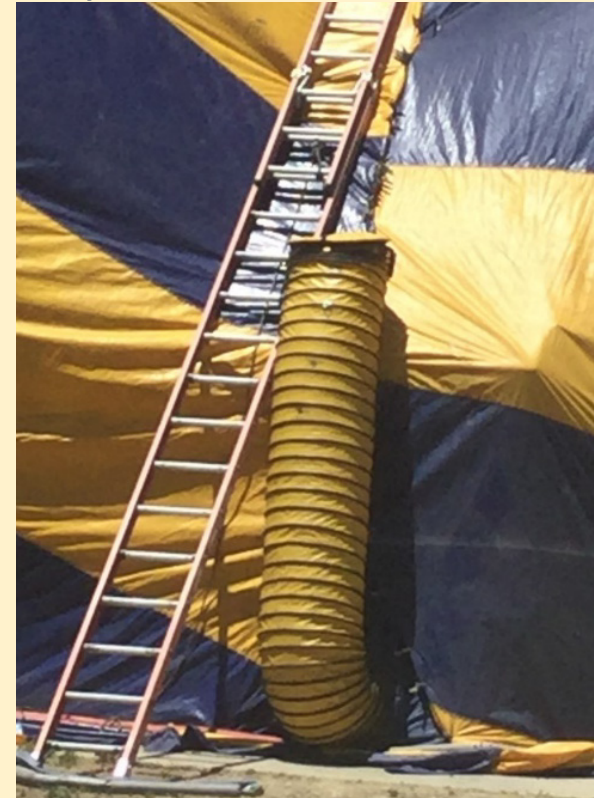
# 3CCR 6780\*

- 6780(c) Upon written application by an employer, the director will review and may accept a Fumigation Safety Program that describes methods, work practices, devices, or processes which the Director determines will ensure that employees will not be exposed to concentrations of fumigants in excess of the Permissible Exposure Limit (federal OSHA PEL).

\*NOTE: Violation of CAP must be documented as a violation of 6780(b), NOT subsection (c).

# California Aeration Plan (CAP)

- Fumigant aeration conducted remotely
- Prepositioning equipment
  - Inlet devices, ducts and aeration fans
- CAP supersedes label aeration procedures 1 and 2
- SCBA is required to enter the fumigated structure in case of equipment malfunction prior to the completion of aeration





# CAP Fume Prep: Aeration Devices

Aeration equipment is installed  
PRIOR to the fumigation,  
so aeration can be initiated  
from outside the fumigated space



# CAP Fume Prep: Internal Openings

“Direct a circulation fan into each attic”



Open the internal door between the attached garage and the house



# CAP Fume Prep: External Openings

- Open at least one operable window 3” for each room
- Circulation fan in the hallway could be used to aid in aeration for bathrooms, walk in closets, pantries or rooms without windows
- In multi-story structures, ground level windows can be closed if there is a common interior space and fans are placed to create air movement



# CAP Fume Prep: Aeration Devices

## Minimum thickness/durability

- Aeration ducting, duct covers, inlets, and inlet covers... must be constructed of material w/same retention & durability capabilities (at least 4 mil thickness) as required by SF labeling & 16 CCR 1970.1(b)







Duct covers must be sealed to keep the SF gas from escaping the structure until the cover is open or removed per CAP step 1.



Duct covers made out of food bagging material is NOT acceptable



# CAP Fume Prep: Aeration Ducting

## Ducting Reinforcement

- Aeration ducting shall be constructed in a manner that maintains its minimum 18-inch diameter without being inflated by the airflow of the fan...
- Intention is for ducting to have the same internal size...whether the fan is operating or not...

# CAP Fume Prep: Aeration Ducting

## Ducting Installation

- Connect [18-inch fan to ducting...] so the ducting does not easily collapse or restrict air flow when installed through the tarpaulin or when it is extended...





# CAP Fume Prep: Aeration Ducting

## Ducting Placement

Duct opening must be placed at the:

- First story roof line

OR

- At least 10-feet above ground level





# CAP Fume Prep: Aeration Ducting

## Ducting Placement

- Position the ducting so the release point...is outside the tarp and fumigant is discharged vertically.
- Place aeration ducting in an open area away from sensitive sites such as occupied structures.



# CAP Fume Prep: Aeration Ducting

## Duct Cover

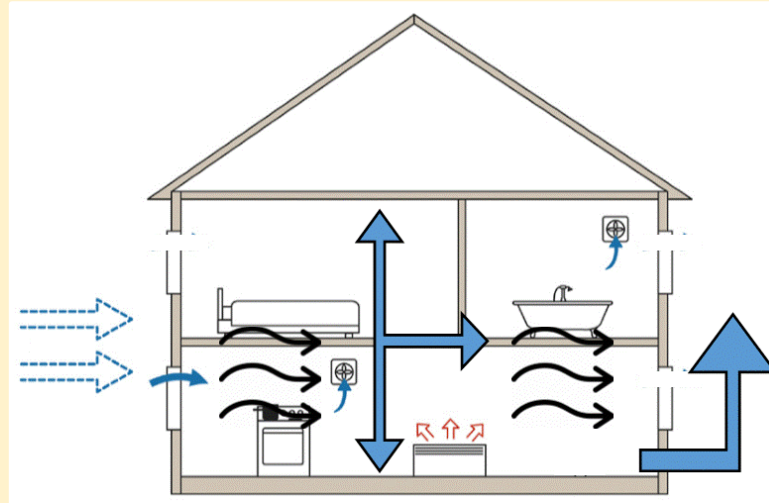
- The duct cover shall not restrict or block the aeration duct opening after the duct cover is removed...

[in CAP Step 1]



# CAP Fume Prep: Inlet Devices

## Inlet Devices Advisory



- Objective of inlets...draw in fresh air & promote cross-ventilation
- Inlet size & spacing across side of structure...influence/help facilitate aeration of the structure

# CAP Fume Prep: Inlet Devices

## Inlet Requirements

“Inlet Devices MUST...”

1. Maintain the integrity of required opening
2. Have an opening of at least 240 square inches minimum up to a maximum opening of 381 square inches





# CAP Fume Prep: Inlet Devices

## Inlet Requirements

“Inlet Devices MUST...”

3. Have the opening covered w/material allowing ventilation, such as mesh, net, or wire...
4. Be located where the opening is not blocked & will draw in fresh air to create negative pressure & promote cross-ventilation of the structure...



# CAP Fume Prep: Inlet Devices

## Inlet Requirements

“Inlet Devices MUST...”

5. Have the entire inlet opening be at least 4 feet above exterior grade
6. Be sealed in a way that allows external\* opening during aeration



\*INLETS ARE NOT REQUIRED TO BE OPENED “REMOTELY” LIKE DUCTING, BECAUSE FANS ARE ALREADY TURNED ON

# CAP Table 1 (aeration fans and inlets)

When the structure's size in cubic feet has been determined by the PCB, review CAP

**TABLE 1**

**Determining the Number of Ducted Aeration Fans and Inlet Devices**

<b>Fumigated Structure Size (cubic feet)</b>	<b>Number of Ducted Aeration Fans</b>	<b>Number of Inlet Devices</b>	<b>Total Inlet Size Range: (minimum of 240 sq. inches, maximum of 381 sq. inches for each Inlet Device)</b>
60,000 or less	1	2-3	480 sq. inches to 762 sq. inches
60,001 to 120,000	2	3-4	720 sq. inches to 1,143 sq. inches
120,001 to 180,000	3	4-5	960 sq. inches to 1,524 sq. inches
180,001 to 240,000	4	5-6	1,200 sq. inches to 1,905 sq. inches
for each additional 60,000 over 240,000	1 additional ducted aeration fan unit AND	1-2 additional inlet device(s)*	adding a minimum of 240 sq. inches up to a maximum of 381 sq. inches per additional inlet device



# Inlet Size Range

- Minimum Inlet Size = 240 square inches
  - 2 inlets this size = 480 sq. inches
  - 3 inlets this size = 720 sq. inches
  - 4 inlets this size = 960 sq. inches
- Maximum inlet size = 381 square inches
  - 2 inlets this size = 762 sq. inches
  - 3 inlets this size = 1,143 sq. inches
  - 4 inlets this size = 1,524 sq. inches

# CAP Table 2: Aeration Hours

Once the structure's cubic feet is measured and the sulfuryl fluoride label calculations for concentration of fumigant are known

**TABLE 2**

**Determining Minimum Aeration Time**

<b>Determining Minimum Aeration Time Initial Concentration of Sulfuryl Fluoride Introduced (ounces per thousand cubic feet)</b>	<b>Minimum Aeration Time (hours)**</b>
16 or less	12
17 to 32	14
33 to 48	16
49 to 64	18
65 to 96	20
97 to 112	22
> 112	24

# “Aeration & Reentry”

## 6 Steps

All of the following CAP steps (1-6) must be completed in sequence...

- [But when multiple] tasks in each step, they may be accomplished in any order
- Licensee (B1 Operator or Field Representative) must be present for & assure completion of Steps 1-6

# CAP Step 1 - Initiating Aeration ("Aeration Fans On")

## Step 1

Remove seal(s) from each  
previously installed exterior duct(s)

AND

Activate aeration fans from outside  
(by "remote activation")





# CAP Step 2 - Initiating Aeration ("Inlets Opened")

## Step 2

["After ALL (ducted) aeration fans are activated..."]

Remove inlet cover (seals) from each of the previously installed inlet devices

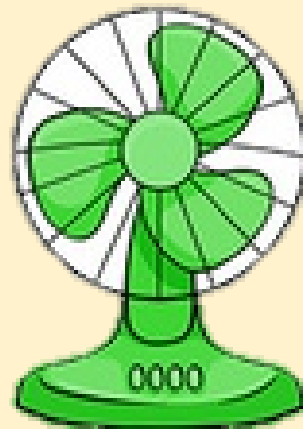


# CAP Step 3 - (“Fans Off”)

## Step 3

Anytime after the required # hours of aeration specified in Table 2 are completed...

Turn off the aeration fans



# CAP Step 4 - (“Tarps Off”)

## Step 4

(After fans turned off)

Remove all tarpaulins  
and/or seals  
from the structure...

Do Not Enter the  
structure w/o SCBA or  
Continuous  
Monitoring until Step  
6 completed



## CAP Step 5 -

### Licensee assures:

- IF central air/heating systems, turn on the fan/blower ONLY for each operational unit...
- OR a circulation fan may be placed in front of furnace inlet to blow air into the heating/cooling ducts
- Remove all chloropicrin pans from the fumigated space





Furnace Inlet blocked  
and the central air is  
not turned on





# CAP Step 6 - (Ready To Clear For Re-entry)

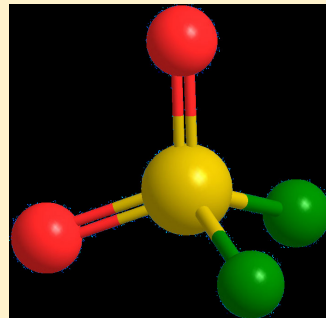
- Next measure the concentration of fumigant in breathing zones using approved fumigant detection device per the registered label. If structure tests  $\leq 1.0$  ppm, it's ready for certification...



# CAP Step 6 - (Ready To Clear For Re-entry)

OR...

- If concentration measures  $> 1.0$  ppm, or warning agent detected, open operable doors & windows for additional ventilation (usually just a few minutes) until detection device confirms  $\leq 1.0$  ppm & structure may be re-occupied



$\leq 1$  ppm

# “Blow Opens”



Photo contribution for training purposes from Santa Barbara CAC

# “Blow Opens”

CAP states the options depending upon what time in the fume process the tarps open...

- First paragraph clarifies PCB must still comply with 3CCR 6780 for “blow opens” ...
  - Determine SF level in the exterior workspace before resealing or removing tarps. If SF level > 1.0 ppm in the exterior use SCBA when reseal/remove tarps...

# “Blow Opens”

- If fume is “finished” (estimated # hours exposure long enough to control the pest treated):
  - Can be resealed & aerated using CAP
    - OR
- If cannot be resealed, tarps can be removed BUT aeration must be completed using SF labeling “Aeration Procedure 1 or 2”



# “Blow Opens”

If fume is NOT “finished” (insufficient # hours exposure to control the pest treated):



- Can be resealed, more fumigant added if necessary, & aerated using CAP
- If cannot be resealed (fume job to be rescheduled), tarps can be removed BUT aeration must be completed using SF labeling “Aeration Procedure 1 or 2”

The End