State of California

Memorandum

To: John S. Sanders
Branch Chief

Date: December 10, 1997

From: **Department of Pesticide Regulation** - 1020 N Street, Room 161
Sacramento, California 95814-5624

Subject: METHYL BROMIDE MONITORING RESULTS FROM A RAISED TARP - NURSERY APPLICATION IN SANTA BARBARA COUNTY

Introduction - Methyl bromide is widely used as a preplant soil fumigant for control of nematodes, fungus, diseases, and weeds. In 1995, approximately 13 percent of the methyl bromide use in California was in nursery applications. Nursery applications are made within a greenhouse or as a field application, and may be shanked in and tarped, or applied as a hot-gas at the soil surface under tarpaulin placed prior to application. The Department of Pesticide Regulation (DPR) and county agricultural commissioners have implemented permit conditions, including buffer zones, to mitigate unacceptable methyl bromide exposure. Buffer zone distances are set so that concentrations measured at this distance do not exceed 0.21 parts per million (ppm; 24-hour time-weighted average). The buffer zone distances for the methods have been determined from data received and evaluated by DPR to date. Additional monitoring was made to test and evaluate the effectiveness of the buffer zone distances.

Materials and Methods - The first field monitored was treated by raised tarp hot-gas application to a 0.32-acre field at a nursery in Carpenteria (Santa Barbara County) on August 27, 1997. In this application type, tarpaulin is secured over the field prior to application and the methyl bromide is heated and introduced under the tarp. In this case, the methyl bromide was passed through a manifold and injected under the tarp through drip irrigation lines. The equipment for this application allowed the entire field to be fumigated at one time. The irrigation lines were placed on the soil surface down the entire length of the field. Because of large clods in the roughly tilled soil, a second tarp layer was laid down over the application area to contain the methyl bromide in case holes occur in the bottom tarp. The field was to be replanted with flowers. The application rate was 435 pounds per acre of formulated product, 98 percent methyl bromide, two percent chloropicrin. The application took approximately **35** minutes.

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Ambient air samples were collected at 16 locations using charcoal tubes and SKC air samplers. Eight samplers were located at the expected resident buffer zone distance, approximately 95 feet out from each edge. Eight other samplers were located approximately 30 feet from the field, three on the long sides and one on each narrow side. Two of the resident buffer zone distance samplers were located within a nearby greenhouse which had the sides open from four feet above the ground. Table 1 and Figure 1 indicate the position of each sampler. A series of five samples was collected at each of the 16 locations beginning with the start of fumigation at 11:21. Samples were collected for two 6-hour and three 12-hour periods, for a total of 48 hours.

The weather was clear and sunny during daylight and clear at night with temperatures which ranged from 62 degrees Fahrenheit to 83 degrees Fahrenheit. Wind speeds ranged from very calm up to 10 miles per hour, with speeds 5 miles per hour or less for 70 percent of the time during monitoring.

Results - Off-site air concentrations did not exceed DPR's target level of 0.21 parts per million (24-hour time weighted average) at the resident buffer zone distance (Table 1). Air concentrations ranged from no detectable amounts to 0.029 parts per million (24-hour time weighted average) at the buffer zone distance. The highest concentrations were detected during the second 6-hour monitoring interval.

If you have any questions please contact either one of us at the numbers below.

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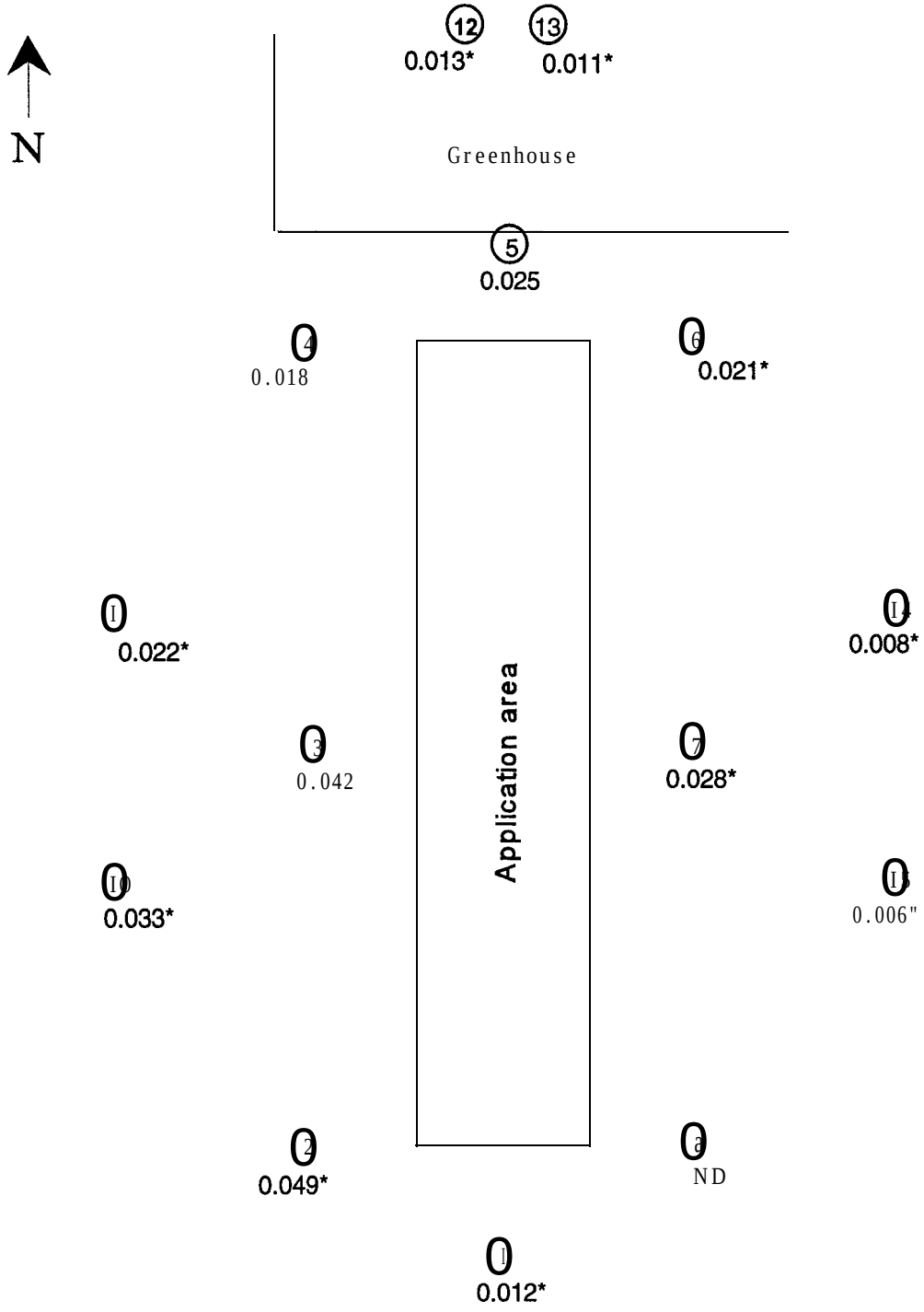
Figure 1. The application site, sampling sites and highest 24-hour time weighted averages (parts per million). (* indicates a period of no detectable amount where ½ the detection limit was used).



Sites l-8 are 30 feet from edge of field
Sites 9- 16 are 95 feet from edge of field

Table 1. Ambient methyl bromide air concentrations.

Sampler Location			Methyl Bromide (ppm) for Each Sampling Period					
Site	Direction	Distance (ft)	**11:20 - 17:20[1]** (6 hrs)	**17:20 - 23:20[1]** (6 hrs)	**23:20 - 11:20[1]** (12 hrs)	11:20 - 23:20 (12 hrs)	23:20 - 11:20 (12 hrs)	24-hr Peak' (24 hrs)
1	south	30	ND"	0.018	0.012	**ND**	ND	**0.012***
2	west	30	ND	0.074	0.058	0.008	0.015	**0.049***
3	west	27	0.020	0.084	0.032	0.011	0.018	0.042
4	west	30	0.018	0.035	0.010	0.005	0.007	0.018
5	north	28	0.066	0.022	0.005	**ND**	**ND**	0.025
6	east	30	0.065	0.011	**ND[b]**	0.008	**ND**	**0.021***
7	east	30	0.091	0.014	ND	0.011	**ND**	**0.028***
8	east	30	ND	ND	ND	**ND**	**ND**	**ND**
9	south	95	ND	ND	0.008	ND	**ND**	**0.006***
10	west	92	ND	0.054	0.036	0.040	**0.018**	**0.033***
11	west	92	ND	0.045	0.019	0.006	**0.015**	**0.022***
12	north	95	0.032	0.013	ND	ND	**ND**	**0.013***
13	north	95	0.035	ND	ND	**ND**	ND	**0.011***
14	east	95	0.021	ND	ND	**ND**	**ND**	**0.008***
15	east	95	0.013	ND	ND	**ND**	**ND**	**0.006***
16	south	95	ND	ND	0.005	ND	ND	**0.005***

[1] the time-weighted average of the concentrations in bold represent the peak 24-hour concentrations
* indicates a period of no detectable amount where ½ the detection limit was used
ND = No detectable amount; "reporting limit = 0.010 ppm [b] reporting limit = 0.005 ppm