



KVB 5804-714

CONTROL OF HYDROCARBON EMISSIONS ...
FROM STATIONARY SOURCES IN THE
CALIFORNIA SOUTH COAST AIR BASIN

FINAL REPORT, VOLUME I
(VOLUME II, APPENDIX)

CONTRACT ARB 5-1323

PREPARED FOR:
CALIFORNIA AIR RESOURCES BOARD
SACRAMENTO, CALIFORNIA

PREPARED BY:
H. J. TABACK
T. W. SONNICHSEN
N. BRUNETZ
J. L. STREDLER
KVB, INC.
JUNE 1978

RECEIVED
MAY 11 1979
CALIFORNIA AIR RESOURCES BOARD
SACRAMENTO, CALIFORNIA

000241

2. Orchard heaters--Orchard heaters were in common use in Ventura, San Bernardino and Riverside Counties to protect the citrus orchards from frost damage. It was estimated by the Ventura APCD (Ref. 2-48) that there were approximately 22 heaters per acre in citrus growth in that county.

Organic compound emissions resulted primarily from the evaporation of fuel oil and not as a result of the combustion process (Ref. 2-4). Therefore, even if the orchard heaters were used relatively infrequently, organic compound emissions were still present any time there was standing fuel exposed to the atmosphere. Emission estimates have been made in Reference 2-48A. The summer evaporation (March through November) averaged 2 gal./heater while the winter evaporation averaged 0.25 gal./heater, for a total of 2.25 gal./heater-year.

Emission estimates for the current program were based on published figures by the local control agencies. Total emissions from these sources were estimated to be 1200 tons per year.

3. Animal wastes--The existence of methane and other components in the gas generated by the biological decomposition of animal wastes had been extensively studied. These investigations had been aimed both at the potential for energy recovery (Ref. 2-49) as was the case with landfill gases and also to assess the harmful effects of these gases on livestock production in confined areas (Ref. 2-50).

Results from a recent study (Ref. 2-51) were employed to estimate the emission rates from these sources. A summary of the calculations is presented in Table 2-34. Inventories of the livestock population for each county were obtained from the County Agricultural Reports (Ref. 2-46). For these data, it was estimated that 77 tons per day of gases from animal wastes were generated in the agricultural areas shown in Figure 2-2.

TABLE 2-34. ORGANIC COMPOUND EMISSIONS FROM ANIMAL WASTES

	Total Inventory (10 ³ Head)	Emission Factor (lb TOC/10 ³ head-day)	Emissions (tons/day)
Cattle	147	440.5	32.4
Chickens	9992	7.0	35.0
Pigs	5	160.0	0.4
Horses	73	229.3	8.4
Sheep	87	33.2	1.4
Total			77.6

KVS 5804-714

- 2-46. County Agricultural Commissioner's Report, 1975.
- 2-47. Personal communication with Art Dawson, Sunkist Growers, Inc.
- 2-48. Personal communication with Craig Barbario, Ventura County APCD.
- 2-48a. Linnard, H., "Air Pollution in Ventura County," June 1966.
- 2-49. Horton, R. and Hawkes, D., "The Energy and Fertilizer Potential of Natural Organic Wastes," June 1976.
- 2-50. Aschbacher, P. W., "Air Pollution Research Needs Livestock Production Systems," Journal of APCA, Vol. 23, No. 4, April 1973.
- 2-51. Keller, R. M. and Cowherd, C., "Identification and Measurement of Atmospheric Organic Emissions from Natural and Quasi-Natural Sources," report for EPA Contract 68-02-2524, July 1977.
- 2-51a. "Pesticide Use Report," Annual 1976, Department of Food and Agriculture, Agricultural Chemicals and Food.
- 2-51b. Personal communication with Dr. Ming-yu Li, University of California-Davis, Department of Food Protection and Toxicology Center.
- 2-51c. Wiens, F. J., "Reactive Organic Gas Emissions from Pesticide Use in California," CARS, December 1977.
- 2-52. Guziak, K. E., "The Oil Industry and Air Quality in the Southern Coastal Santa Barbara County," presentation to the Air Quality Maintenance Plan Policy Task Force, May 1977.
- 2-53. Harrison, P. R. and Maas, S. J., "Monitoring of Natural Seeps in the Santa Barbara Channel Off Coal Oil Point," Meteorology Research, Inc., Report 76-R-1408, March 1976.
- 2-54. Personal communication with E. R. Wilkinson, California Division of Oil and Gas.
- 2-55. Taylor, O. C., "Oxidant Air Pollution Effects on a Western Coniferous Forest Ecosystem," Statewide Air Pollution Research Center, 1976.
- 2-56. Personal communication with P. R. Zimmerman, Washington State University.
- 2-57. Personal communication with Mike Welsh, San Bernardino National Forest.
- 2-58. Personal communication with David Henderson, EPA Region IX.
- 2-59. Annual Fire Reports of the National Forest Service, 1975.
- 2-60. "Experimental Study on Solvent Discharge from Dry Cleaning Establishments to the Environment," International Fabricare Institute Research Center," Contract OS-061, May 1975.
- 2-61. Personal communication with Edward Scott, Asphalt Institute, Los Angeles.