

INTRODUCTION

AIR POLLUTION ENGINEERING IN LOS ANGELES COUNTY

Los Angeles County, the largest heavily-industrialized, semi-tropical area in the world, is afflicted with a serious and well-publicized air pollution problem. This problem is accentuated by average wind speeds of less than six miles per hour, and temperature inversions on more than 260 days per year, which restrict dispersion of the air contaminants generated by the activities of seven million people. Sunlight acting upon the mixture of contaminants in the stagnant reservoir of air induces the phenomenon known as photochemical air pollution, commonly called smog. This type of air pollution is identified by distinctive eye irritation, ozone formation, vegetation damage, rubber cracking, and reduction in visibility.

Non-meteorological factors have been contributing to intensification of the smog problem over the years. Since 1939 population has more than doubled, industry has expanded from approximately 6000 establishments to more than 20,000 in 1966, and automobile registration, gasoline consumption and fuels usage have increased sharply. The only influence opposing this growth has been the stationary source control program. Eighteen years of prosecuting this vigorous program in Los Angeles County has demonstrated that industrial operations can be compatible with clean air in a community with strict air pollution laws. This program also has shown that remedies now are available for most types of air pollution problems wherever they may occur.

The program has not been cheap. In addition to nearly two decades of expenditures by the District for research, engineering and enforcement, industry has expended during this same period 127 million dollars for the installation of new control equipment units and 882 million dollars for basic production equipment. The cost of the basic equipment has undoubtedly been increased substantially to insure that it will comply with the exacting standards of the District's Rules and Regulations. Moreover, although there are no descriptive figures available, sizable sums also are spent each year to operate and maintain both basic and control equipment. Records indicate the cost of air pollution control equipment averages 25 per cent of the cost of the basic production equipment, but without these controls, air pollution in this area would be very measurably worse.

Table I shows that this program is preventing some 5085 tons of various air contaminants from entering the Los Angeles atmosphere each day. Of this total, control measures of the petroleum industry are responsible for removing some 3425 tons. The prohibition of burning of high sulfur fuels accounts for another 535 tons. The ban on single chamber incinerators and open burning prevents another 605 tons from entering the atmosphere. The control of air contaminants from mineral and metallurgical industries accounts for another 420 tons.

Of the 5085 tons of various air contaminants now prevented from entering the Los Angeles atmosphere from stationary sources each day, 1195 tons are hydrocarbons, 1320 tons are sulfur dioxide, 1945 tons are carbon monoxide, 470 tons are aerosols, and 155 tons are oxides of nitrogen.

Table II compares the emissions of each category of industry from 1948 to 1966. As low as the industrial emission levels of 1966 are, however, the program will not be complete and a problem will still be present in future years until effective control over the last remaining major sources of air pollution in Los Angeles County are achieved. These sources are the gasoline-powered vehicle, which is the largest source of air contaminants, fuel oil burning and organic solvent usage.

LEGISLATIVE SUPPORT

The accomplishments of the Los Angeles control program are attributable to strict application of effective air pollution legislation. This legislation stems from the enactment of the basic State law in 1947 by the California Legislature. This act was Assembly Bill No. 1 and was added as Chapter 2 to Division 20 of the State of California Health and Safety Code.

This act established the machinery for the adoption of Rules and Regulations for the Los Angeles County Air Pollution Control District. The statute enables a District to enact new and more stringent prohibitions when needed and when essential technical information becomes available. Over the years this provision has been utilized as shown by the addition of 13 new prohibitions and many amendments to existing prohibitions. Each addition or amendment followed a thorough investigation of the emissions, pollution problems and control potential.