

Air Quality Assessment of the New Jersey Pinelands

Prepared for the  
NEW JERSEY PINELANDS COMMISSION

by  
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

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## 1.0 EXECUTIVE SUMMARY

In the development of a Comprehensive Management Plan for the Pinelands, the Pinelands Commission will find it necessary to consider the effect of the Plan on air quality, water quality, wildlife, forests and many other natural resources of the Pinelands. This report is concerned with the air quality of the Pinelands. It describes the existing air quality of the area and the possible deterioration of the air quality as a result of development and growth in and around the Pinelands.

This report uses existing New Jersey Department of Environmental Protection (NJ DEP) air monitoring network data to describe air quality in the Pinelands (section 5.0). The data show that ozone is the only air pollutant known to reach unhealthful levels within the Pinelands National Reserve.

An inventory of air pollution sources is presented (section 6.0) based on reports produced by Engineering-Science, Inc. (1976, 1977) for NJ DEP and GCA Corporation (1977) for US EPA. Since atmospheric transport of pollutants makes it impossible to isolate Pinelands air quality from the impact of sources in the surrounding area, eight complete counties in southern New Jersey (Atlantic, Ocean, Cape May, Cumberland, Salem, Gloucester, Camden and Ocean) are included in the source inventory. The inventory reports the major sources of particulate (TSP), sulfur dioxide (SO<sub>2</sub>), and hydrocarbons (HC) and the estimated annual emissions of each pollutant by county. Estimates are made of the fraction of the total pollutant burden which is emitted within the Pinelands National Reserve. These estimates, summarized in Table 1.1, are useful as an indication of the relative contributions of certain types of sources in the Pinelands. Unpaved roads are identified as a major source of dust in the Pinelands; the B.L. England Power Plant in Upper Township, Cape May County, accounts for most of the SO<sub>2</sub> emissions in the Pinelands; and highway traffic makes a substantial contribution to the burden of all three pollutants which were examined, TSP, SO<sub>2</sub> and HC.

Finally, strategies for minimizing the air quality impact of development in areas where growth is encouraged by the Comprehensive Management Plan are recommended in section 7.0. The recommendations address two issues: the need to limit the extent of traffic in order to control the ozone levels in the Pinelands (section 7.1.1) and maintenance of the clean, clear air that already exists in the Pinelands, including Brigantine Wilderness Area which is a Class I area for the prevention of significant deterioration

TABLE 1.1 Summary Of Estimated Pollutant Emissions Within The Pinelands  
National Reserve

<u>Source Category</u>	<u>Particulates</u>		<u>Sulfur Dioxide</u>		<u>Hydrocarbons</u>	
	<u>Tons/Yr</u>	<u>% of Total</u>	<u>Tons/Yr</u>	<u>% of Total</u>	<u>Tons/Yr</u>	<u>% of Total</u>
Point	6590	35	35080	27	---	---
Area	214610	42	1840	9	---	---
Line	2454	31	1206	31	37036	31
Total	223654	41	38126	25	37036	31



(section 7.1.2). Strategies recommended to promote a reduction in the use of automobiles include:

- Land use plans and zoning regulations with restrictions on housing densities and the location of housing with respect to places of employment and community services which are consistent with a greater and more effective use of public transportation, bicycling and walking.
- Air quality review as a part of the regulatory or permitting process for major developments.
- Monitoring transportation programs in the surrounding urban areas for potential impact (both positive and negative) on air quality in the Pinelands.

Strategies recommended to maintain clean, clear air throughout the Pinelands include:

- Review of facilities requiring air pollution control permits coordinated with NJ DEP.
- Monitoring development in areas surrounding the Pinelands with regard to long-range transmission of pollutants.
- Encouraging appropriate local air pollution control programs in cooperation with the NJ DEP Local Program Review and Development personnel.
- Promoting the use of energy conservation measures.
- Promoting the use of vegetated open spaces as buffers between air pollution sources and sensitive receptors.



## 2.0 INTRODUCTION

The development of a Comprehensive Management Plan for the Pinelands must include an assessment of existing air quality in the Pinelands area and an understanding of the possible degradation of the air quality as a result of development and growth in and around the Pinelands. A thoughtful plan will attempt to minimize the air quality impact of development.

This report is intended to aid the Pinelands Commission in the preparation of the Comprehensive Management Plan by describing existing air quality in the Pinelands (section 5.0), identifying sources of air pollution already in the Pinelands (section 6.0) and recommending land use plans which will minimize the air quality impact of development (section 7.0). Two major issues are identified and discussed. First, ozone is the only pollutant known to reach unhealthful levels in the Pinelands. The ozone is generated during the warmer months from pollutants emitted from a variety of sources but the most important source in the Pinelands is the automobile. The extent of traffic in, through and around the Pinelands is, therefore, an important issue to be addressed by the Plan. The second major issue is maintenance of the clean air existing in the Pinelands. All air pollutants, other than ozone, which have been measured in the Pinelands are observed to be at low levels relative to the national ambient air quality standards and to the levels observed in the surrounding urban areas. It should be a goal of the Plan to maintain these low air pollution levels in order to protect the plant and animal species indigenous to the Pinelands, and to maintain the good visibility essential to recreational use of the Pinelands.



### 3.0 METHODS

This report is a compilation of data obtained by the New Jersey Department of Environmental Protection (NJ DEP). The air quality data in sections 4.0 and 5.0 are from the Department's air monitoring section. The source inventory in section 6.0 is based on information provided by reports produced by Engineering-Science, Inc. (1976, 1977) for NJ DEP and GCA Corporation (1977) for US EPA. Recommendations in section 7.0 are based on discussions with the Department staff.

For the purpose of this report, the Pinelands are defined by the boundary of the Pinelands National Reserve shown on the October 19, 1979 map, Pinelands of New Jersey, produced by the Pinelands Commission. Because of atmospheric transport of pollutants, a complete understanding of air quality in the Pinelands cannot be achieved by studying the Pinelands as if they were isolated from the surrounding area. The air quality must be examined in the context of the whole region which in this report is assumed to include eight southern New Jersey counties: Ocean, Atlantic, Cape May, Cumberland, Salem, Gloucester, Camden and Burlington.



#### 4.0 MONITORING NETWORK

Currently, the New Jersey Continuous Air Monitoring Network consists of twenty-six air monitoring stations. Most of these monitors are located in downtown commercial districts of large cities. Besides the twenty-six continuously operating monitoring locations, two auxiliary ozone monitors are operated from May to September in Bivalve and Sandy Hook. Table 4.1 lists the locations of the continuous monitors and the major pollutants monitored at each site.

In conjunction with the continuous air monitoring network, an air sampling network is operated for measuring suspended particulate concentrations. Suspended particulate (TSP) includes both solid and liquid material dispersed in the air. A 24-hour sample is taken once every six days using a high volume air sampler (hi-vol). The hi-vol network is currently being expanded; there are presently 98 hi-vol sites, including 10 sites which are a part of the National Air Surveillance Network (NASN). Figure 4.1 illustrates the location of the hi-vol sites as well as the continuous monitoring sites.

Several of the sites described above are located within the boundary of the Pinelands National Reserve. These sites are listed in Table 4.2. Another group of sites which are not within the Pinelands but are located in southern New Jersey may be important to consider in cases when data within the Pinelands are scarce. These southern N.J. sites are also included in Table 4.2. This table shows fairly good representation of air quality in the Pinelands by the hi-vol network with 8 sites within the boundary and 21 other sites in the vicinity. Five of these sites, including one in the Pinelands, are also being analyzed for lead (Pb) on a regular basis.

There is only one continuous monitor within the Pinelands, at Ancora State Hospital, for which historical data are available. There are several other sites available however which should be indicative of Pinelands concentrations of sulfur dioxide ( $\text{SO}_2$ ) and ozone ( $\text{O}_3$ ). Nearby sites measuring carbon monoxide (CO) will not be representative of Pinelands levels, since CO concentration is very sensitive to local sources of the pollutant. Very little can be said about nitrogen dioxide ( $\text{NO}_2$ ) levels in the Pinelands since the nearest monitor is in Camden. Historically,  $\text{NO}_2$  concentrations have been below the national standard throughout the State since the mid 70's so it is most likely that  $\text{NO}_2$  concentrations are not high in the Pinelands at present.  $\text{NO}_2$  concentrations will be monitored in the future by three new sites which will begin monitoring in southern N.J. during 1979. Concentrations of all of these pollutants which have been observed in the vicinity of the Pinelands are discussed in section 5.0.

TABLE 4.1 New Jersey Continuously Operating Air Monitoring Network and Auxiliary Sites

<u>Site</u>	<u>Pollutants Monitored</u>			
	<u>SO<sub>2</sub></u>	<u>CO</u>	<u>O<sub>3</sub></u>	<u>NO<sub>2</sub></u>
Bayonne Laboratory	X	X	X	X
Camden Laboratory	X	X	X	X
Elizabeth Laboratory	X	X		X
Newark Laboratory	X	X		X
Ancora	X	X	X	
Asbury Park	X	X	X	
Atlantic City*	X	X		
Bivalve			X	
Burlington	X	X		
Camden	X	X		
Chester	X		X	
Elizabeth	X	X		
Freehold	X	X		
Hackensack	X	X		
Jersey City	X	X		
Morristown	X	X		
Nacote Creek	X		X	
New Brunswick	X	X	X	X
Paterson	X	X		
Paulsboro	X	X		
Penns Grove	X	X		
Perth Amboy	X	X		
Phillipsburg*	X	X		X
Sandy Hook			X	
Somerville	X	X	X	
Toms River	X	X		
Trenton	X	X	X	
Vineland	X	X	X	X

\* Auxiliary site operated from May to September.



FIGURE 4.1

# NEW JERSEY

## Air Monitoring Network

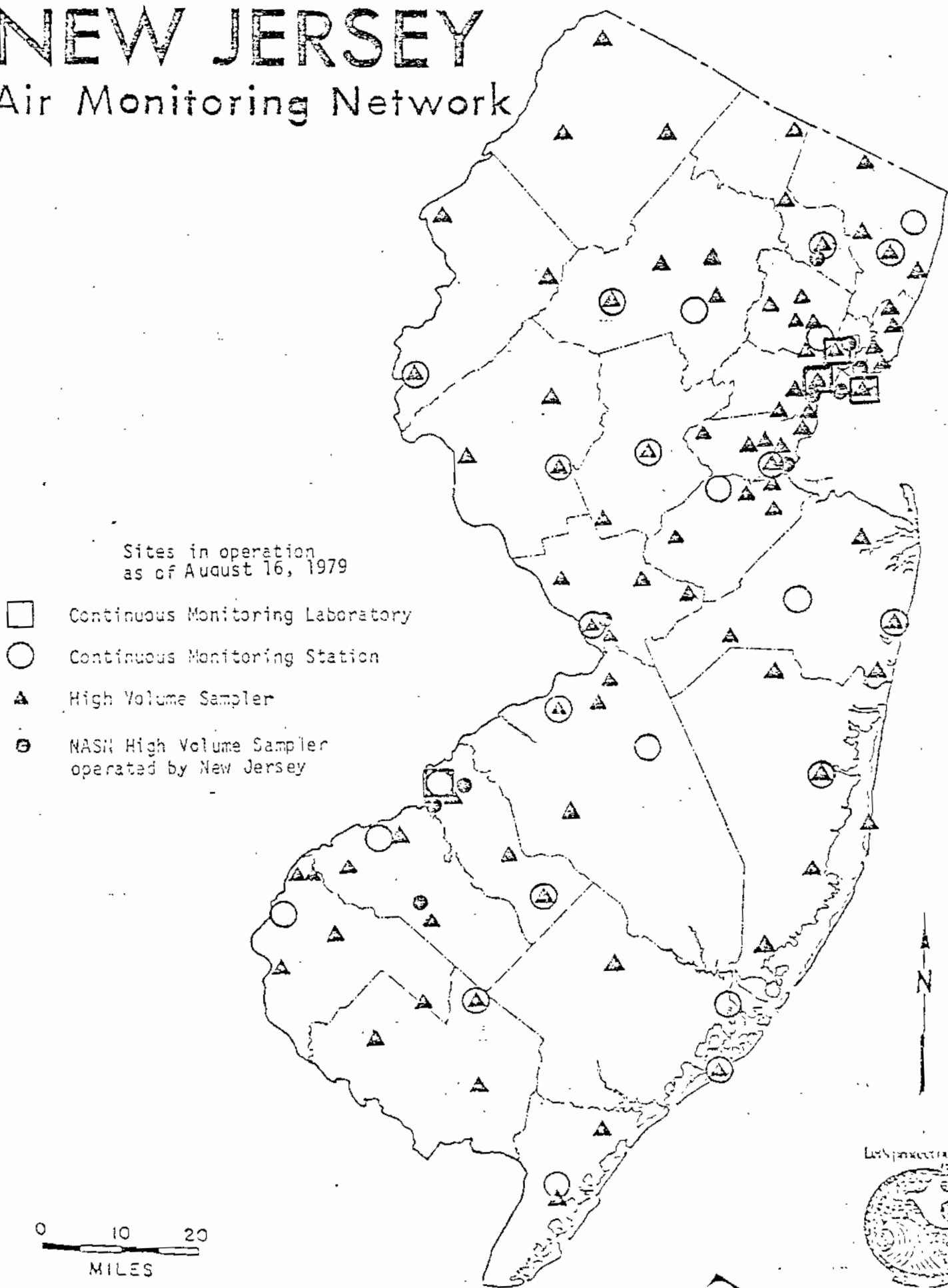


TABLE 4.2 Air Quality Monitoring Site In The Vicinity  
Of The Pinelands National Reserve

<u>Pollutant Measured</u>	<u>Pineland Sites</u>	<u>Other Southern New Jersey Sites</u>	
TSP	Ancora State Hosp. Hammonton Island Beach St. Pk. Jackson Twp. Medford Twp. Tuckahoe Tuckerton Waretown	Atlantic City Berlin Twp. Bridgeton Buckshutem Burlington Twp. Camden Cape May Crt. Hse. Cherry Hill Chesterfield Twp. Clayton Collingswood	Glassboro Parvin St. Pk. Pedricktown Pilesgrove Twp. Salem Springfield Toms River Vineland Woodbury Woolwich Twp.
Pb	Hammonton	Bridgeton Camden	Pedricktown Salem
SO <sub>2</sub>	Ancora State Hosp. Nacote Creek Res. Sta. *	Atlantic City Burlington Camden (2) Freehold	Paulsboro Penns Grove Toms River Vineland*
CO	Ancora State Hosp.	Atlantic City Burlington Camden (2) Freehold	Paulsboro Penns Grove Toms River Vineland*
O <sub>3</sub>	Ancora State Hosp. Nacote Creek Res. Sta. *	Bivalve Camden	McGuire A.F.B. # Vineland*
NO <sub>2</sub>		Camden	Vineland*

\* Began operation in 1979.

# Data available from 1975-1977.

## 5.0 AIR QUALITY INVENTORY

Air quality in the Pinelands area can be described using data from the monitoring sites identified in section 4.0. The concentration of six major pollutants (particulates, lead, sulfur dioxide, carbon monoxide, ozone and nitrogen dioxide) are examined as an indicator of local air quality. These are the pollutants for which primary and secondary ambient air quality standards have been set. The primary standards have been set to protect the public health while the secondary standards are intended to protect the public welfare (e.g. to prevent damage to vegetation, deterioration of visibility, etc.). In this section, pollutant concentrations in the Pinelands are compared to the air quality standards. In addition, concentrations observed in the Pinelands are compared to concentrations in other parts of southern New Jersey and some of the trends in pollution levels over the last six years are examined. The data used in this discussion are available from the New Jersey Bureau of Air Pollution Control.

### 5.1 Particulates

There are currently eight high volume particulate monitors operating within the Pinelands National Reserve area. The suspended particulate concentrations observed at these sites from 1973 to 1978 are reported in Table 5.1 and Figure 5.1, expressed in terms of the annual geometric mean. The data indicate that particulate levels in the Pinelands are low relative to the secondary standard of  $60 \text{ ug/m}^3$ . Four sites - Ancora State Hospital, Hammonton, Jackson Township and Tuckerton - show some deterioration in particulate air quality over the six year period, while two sites - Island Beach State Park and Tuckahoe - show some improvement and the two remaining sites - Medford Township and Waretown - show little change.

A survey of other southern New Jersey monitoring sites reveals a similar distribution of sites which show deterioration, improvement and no change. However, the average concentration at these sites was  $40.7 \text{ ug/m}^3$  in 1978 while the average at the eight sites within the Pinelands was lower,  $35.2 \text{ ug/m}^3$ .

### 5.2 Lead

The New Jersey Bureau of Air Pollution Control began monitoring lead (Pb) concentrations at ten sites around the state in 1978. One of these sites,

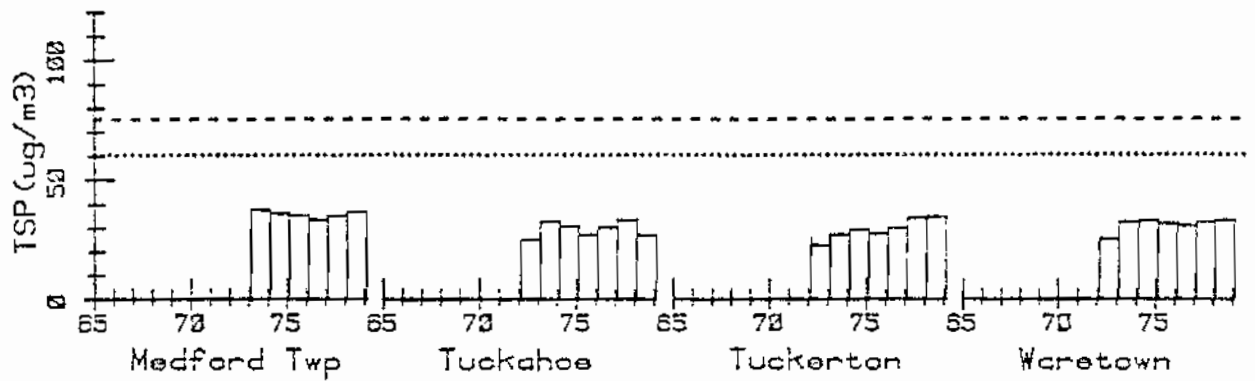
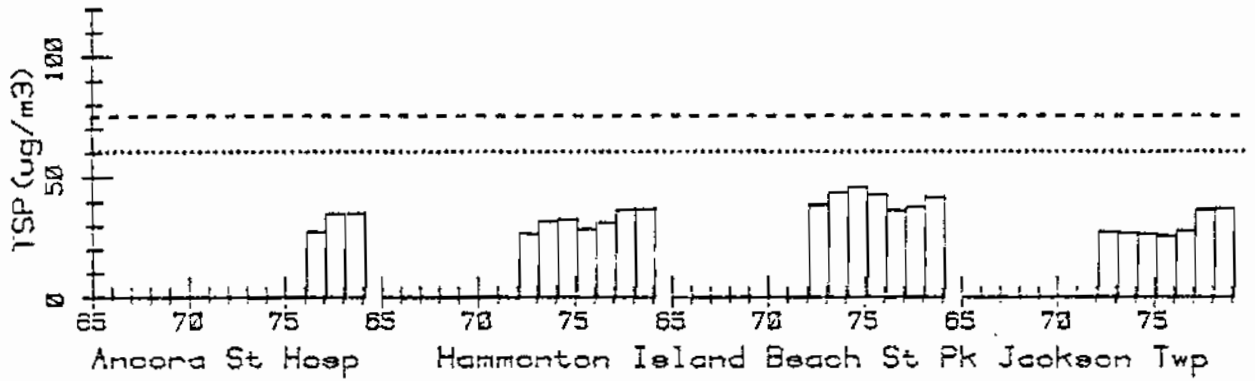
TABLE 5.1 Annual Geometric Mean Particulate Concentrations  
In The Vicinity Of The Pinelands  
( $\mu\text{g}/\text{m}^3$ )

Primary Std: 75  $\mu\text{g}/\text{m}^3$   
Secondary Std: 60  $\mu\text{g}/\text{m}^3$

<u>Pineland Sites</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ancora State Hospital	--	--	--	27.2	34.9	34.9
Hammonton	31.6	32.5	28.5	31.2	36.4	36.8
Island Beach St. Pk.	43.7	45.7	42.7	36.3	37.6	41.6
Jackson Twp.	26.7	26.3	25.4	27.5	36.5	37.0
Medford Twp.	37.4	36.0	35.0	33.5	35.0	36.6
Tuckahoe	32.5	30.7	27.0	30.2	33.3	26.8
Tuckerton	27.1	28.9	27.3	29.9	34.0	34.6
Waretown	32.3	33.0	31.5	30.7	32.3	32.9
<u>OTHER SOUTHERN NEW JERSEY SITES</u>						
Atlantic City	--	--	34.3	42.5	43.8	43.2
Berlin Twp.	43.7	47.3	44.3	41.2	47.2	48.6
Bridgeton	--	--	--	26.5	38.7	36.1
Buckshutem	--	--	--	30.3	37.4	32.3
Burlington Twp.	39.7	41.1	38.4	38.5	39.7	41.4
Camden	--	--	--	--	--	74.0
Cape May Crt. Hse.	27.5	26.9	25.8	27.0	29.0	27.3
Cherry Hill	--	--	--	--	58.6	39.3
Chesterfield Twp.	37.3	34.4	34.6	36.9	41.9	36.0
Clayton	--	33.8	30.7	33.4	39.9	39.6
Collingswood	--	49.1	37.2	42.3	44.6	46.2
Glassboro	--	--	--	--	44.5	43.1
Parvin St. Park	--	--	--	27.0	35.5	37.9
Pilesgrove Twp.	--	34.5	32.4	29.6	36.6	38.5
Pedricktown	--	--	--	--	42.8	41.4
Salem	--	--	--	30.0	42.8	42.1
Springfield Twp.	43.5	42.7	41.6	39.3	46.6	43.5
Toms River	--	34.5	32.4	29.6	36.6	38.5
Vineland	--	--	--	33.7	37.2	35.9
Woodbury	42.5	43.7	39.8	40.6	44.6	45.8
Woolwich Twp.	--	35.1	32.9	33.5	31.9	24.5

SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

FIGURE 5.1 Annual Geometric Mean Particulate Concentrations in the Pinelands



----- PRIMARY STANDARD  
 ..... SECONDARY STANDARD

Hammonton, is located in the Pinelands. The maximum quarterly mean concentration at this site was observed to be  $0.953 \text{ ug/m}^3$  during the fourth quarter (October, November, December) of 1978. This level of Pb is low relative to the standard of  $1.5 \text{ ug/m}^3$ . There are four more sites in southern New Jersey monitoring Pb. These sites show a wide range of observed concentrations, from a maximum quarterly average of  $0.555$  to  $1.450 \text{ ug/m}^3$ . This wide range may be best explained by the sensitivity of ambient Pb concentration to local sources of Pb. Most of the Pb observed at the Hammonton site is probably due to traffic nearby on State Route 30, a major route across the Pinelands to the shore. Data for Hammonton and the other southern New Jersey sites are reported in Table 5.2.

### 5.3 Sulfur Dioxide

Sulfur dioxide ( $\text{SO}_2$ ) is monitored in the Pinelands at Ancora State Hospital. The levels observed at this site, and reported in Table 5.3 and Figure 5.2, are much lower than the New Jersey secondary standard of 0.02 ppm annual average concentration. Data from 1973-1978 show a slight increase in  $\text{SO}_2$  concentrations at Ancora. Seven other sites in southern New Jersey all report higher  $\text{SO}_2$  levels than the Ancora site with concentrations at these sites ranging from 0.010 to 0.019 ppm in 1978. However, most of these sites are still well below the secondary standard.

### 5.4 Carbon Monoxide

Carbon monoxide (CO) is monitored in the Pinelands at Ancora State Hospital. The levels observed at this site, and reported in Table 5.4 and Figure 5.3, are much lower than the standard of 9 ppm for an eight hour average. Data from 1973 to 1978 show a decrease in the CO concentration at Ancora, probably due to improved controls on automobiles which took place during that period. Seven other sites in southern New Jersey all report higher CO levels than the Ancora site with concentrations at these sites ranging from 9.3 to 18.5 ppm in 1978. All of these sites exceed the standard; however, there have been decreases in CO concentrations similar to that observed at Ancora.

One important difference between Ancora and the seven other sites should be noted. The seven sites located outside the Pinelands are in the downtown area of cities where traffic congestion is likely to occur. The Ancora site, on the other hand, is not in a built up area. It is located near the Hospital parking lot which is usually free of traffic congestion. Actual CO levels throughout the Pinelands most likely range from something less than the Ancora concentration, in areas far from the main highways, to something less than the 9 ppm standard, in the most developed areas of the Pinelands.

### 5.5 Ozone

The single ozone ( $\text{O}_3$ ) monitor in the Pinelands, at the Ancora State Hospital, shows maximum one hour concentrations that are well above the national air quality standard (see Table 5.5 and Figure 5.4). Three other sites in southern New Jersey show similar high levels over the 1973-1978 period. These levels reflect the high  $\text{O}_3$  concentrations observed throughout the state. Phenomena

TABLE 3.2 Maximum Quarterly Mean Lead Concentrations  
 In The Vicinity Of The Pinelands ( $\mu\text{g}/\text{m}^3$ )  
 Standard: 1.5  $\mu\text{g}/\text{m}^3$

<u>Pineland Sites</u>	<u>1978</u>
Hammonton	0.953
<u>Other Southern New Jersey Sites</u>	
Bridgeton	0.555
Camden	1.450
Pedricktown	1.113
Salem	0.664

SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

TABLE 5.3 Annual Average Sulfur Dioxide Concentrations In  
The Vicinity Of The Pinelands (ppm)

Primary Std: 0.03 ppm  
Secondary Std: 0.02 ppm

<u>Pineland Sites</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ancora State Hosp.	0.005	0.005	0.006	0.006	0.010	0.008
<u>Other Southern New Jersey Sites</u>						
Atlantic City	--	0.006	0.007	0.008	0.008	0.011
Burlington	0.010	0.013	0.010	0.017	0.015	0.013
Camden	0.022	0.021	0.020	0.021	0.021	0.018
Freehold	0.012	0.017	0.012	0.006	0.009	0.010
Paulsboro	0.018	0.017	0.018	0.015	0.018	0.019
Penns Grove	0.012	0.015	0.013	0.016	0.015	0.015
Toms River	0.006	0.008	0.006	0.006	0.009	0.010

SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION



FIGURE 5.2 Annual Average Sulfur Dioxide Concentrations in the Pinelands

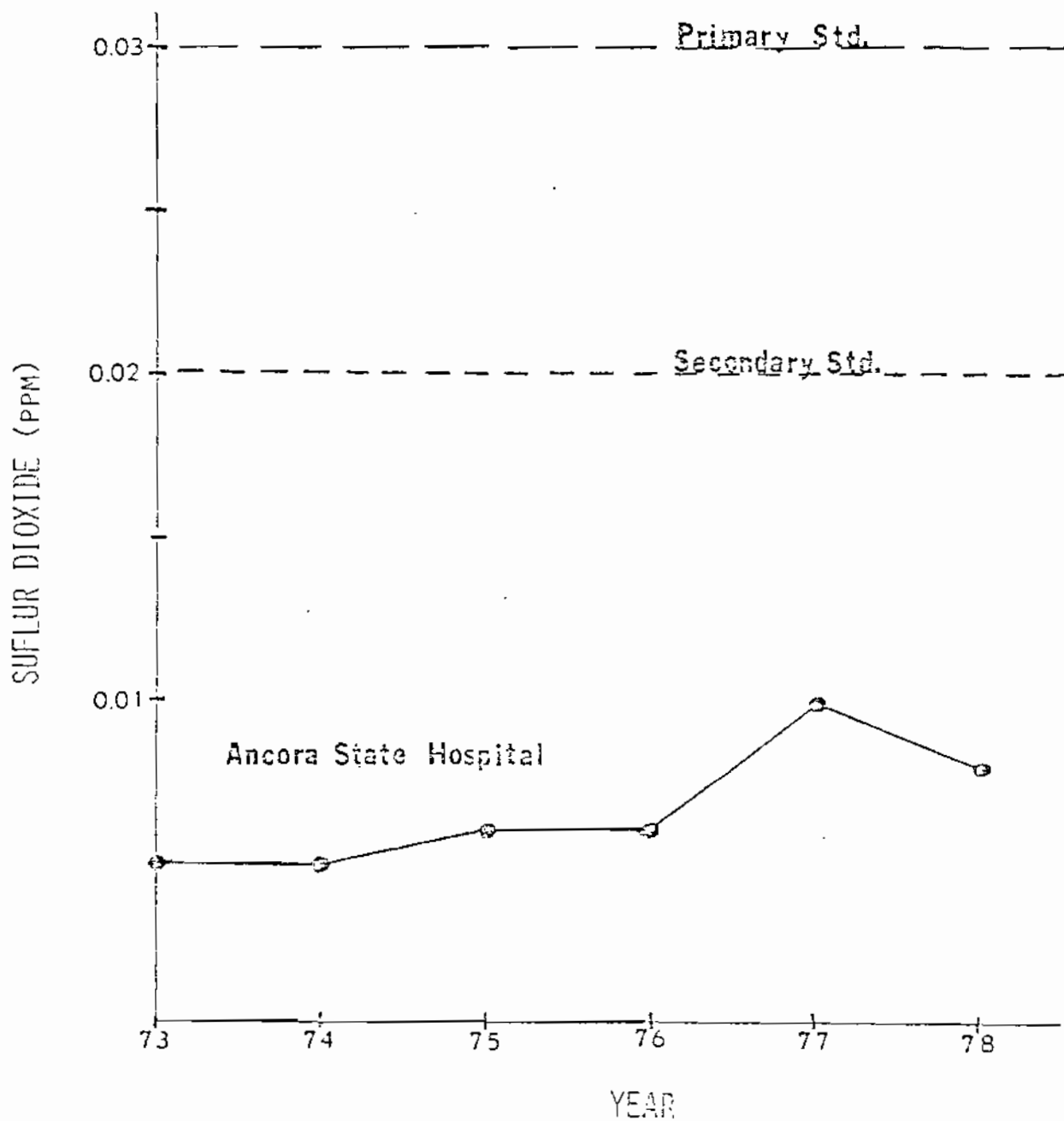


TABLE 5.4 Maximum 8 Hour Carbon Monoxide Concentrations  
In The Vicinity Of The Pinelands  
(ppm)

Standard: 9 ppm

<u>Pineland Sites</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ancora State Hosp.	6.0	6.1	4.3	3.7	5.0	4.1
<u>Other Southern New Jersey Sites</u>						
Atlantic City	13.2	22.2	14.4	11.9	10.2	13.3
Burlington	19.9	18.2	20.3	14.3	15.7	15.1
Camden	12.9	17.7	9.4	12.8	8.4	9.3
Freehold	23.6	14.8	12.6	13.4	12.2	10.7
Paulsboro	23.4	14.6	17.6	9.2	10.0	11.7
Penns Grove	21.3	9.4	11.9	10.9	9.9	10.0
Toms River	24.3	15.8	18.3	15.3	15.2	18.5

FIGURE 5.3 Maximum 8 Hour Carbon Monoxide Concentrations in the Pinelands

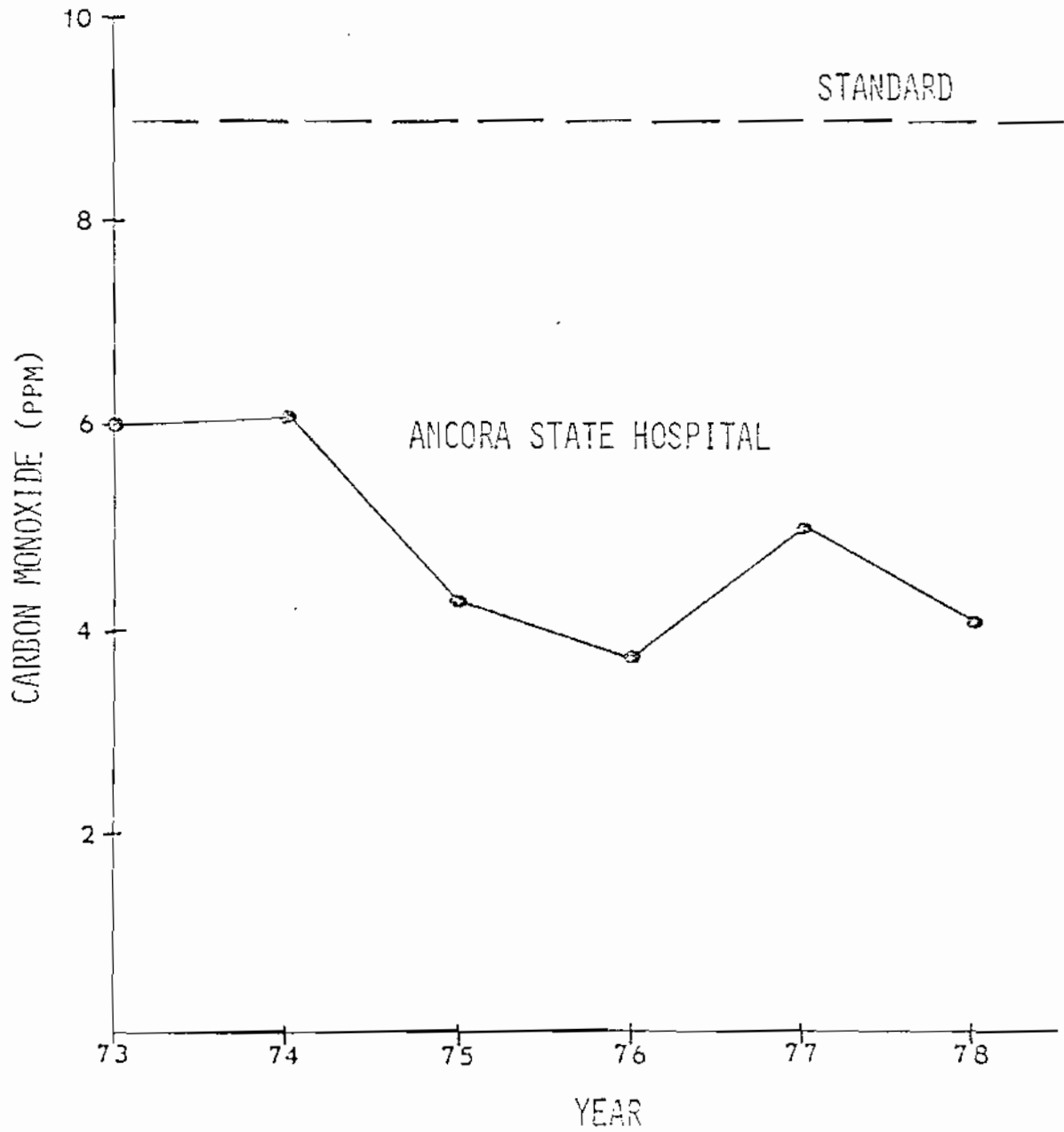


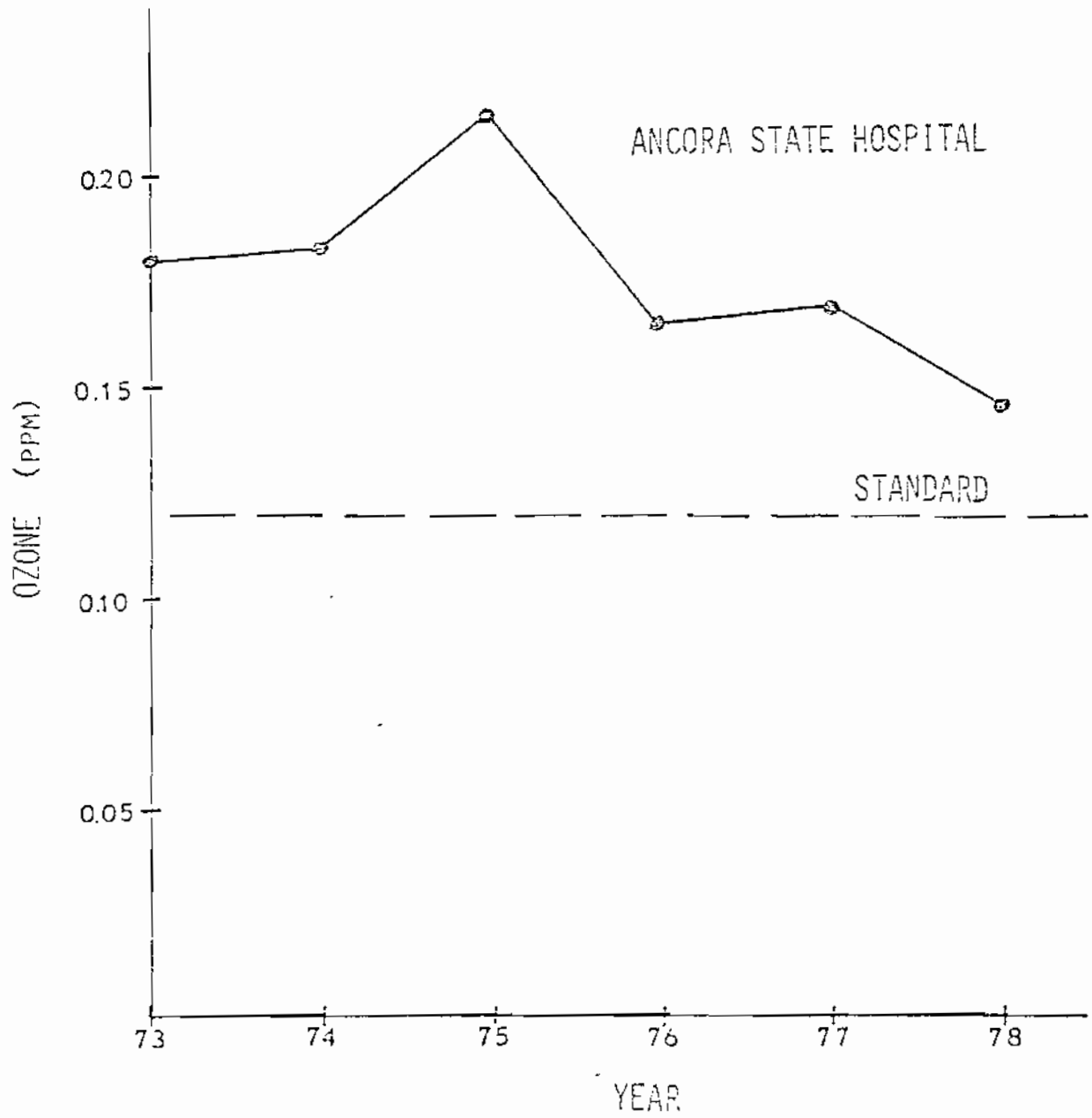
TABLE 5.5 Maximum 1 Hour Ozone Concentrations In The Vicinity of the Pinelands (ppm)

Standard: 0.12 ppm

<u>Pineland Sites</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Ancora State Hosp.	0.182	0.184	0.216	0.166	0.170	0.147
<u>Other Southern New Jersey Sites</u>						
Bivalve	--	--	0.195	0.153	0.120	0.168
Camden	0.200	0.199	0.263	0.182	0.158	0.218
McGuire A.F.B.	--	0.168	0.290	0.205	--	--

SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

FIGURE 5.4 Maximum 1 Hour Ozone Concentrations in the Pinelands



such as transport of pollutants, from the Philadelphia-Camden metropolitan area for example, and the speed of chemical reactions are responsible for making  $O_3$  a regional problem in which local sources of ozone's precursors, hydrocarbons and nitrogen oxides, have little effect on local concentrations of ozone.

#### 5.6 Nitrogen Dioxide

There are no nitrogen dioxide ( $NO_2$ ) monitors located within the Pinelands National Reserve area. In fact, there is only one  $NO_2$  monitor in all of southern New Jersey although there are plans to increase the network in the very near future. Presently, this lack of  $NO_2$  data is not a serious problem since levels at the five monitoring sites throughout the state are very low relative to the air quality standard. Data from the one site in southern New Jersey, in Camden, are reported in Table 5.6 and Figure 5.5. They show that there has been some improvement in  $NO_2$  levels over the past six years.

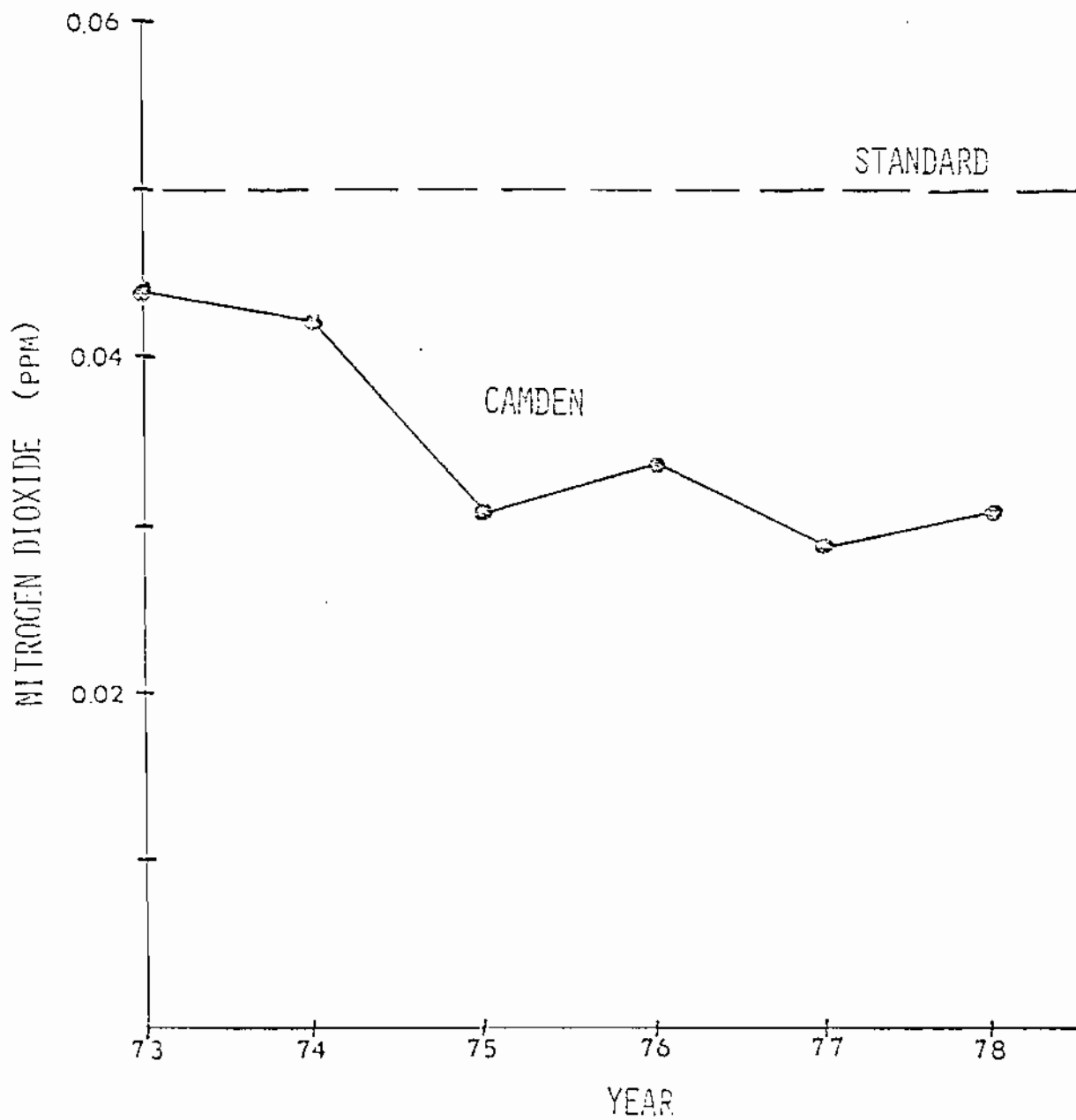
TABLE 5.6 Annual Average Nitrogen Dioxide Concentrations In the Vicinity  
of The Pinelands (ppm)

Standard: 0.05 ppm

<u>Site</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Camden	0.044	0.042	0.031	0.034	0.029	0.031

SOURCE: NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

FIGURE 5.5 Annual Average Nitrogen Dioxide Concentrations in Vicinity of the Pinelands





## 6.0 SOURCES OF AIR POLLUTION

The concept of local air basins is generally not relevant for air pollution dispersion in the Atlantic coastal region. For this reason, the Pinelands National Reserve cannot be isolated from the air pollution generated in the urban areas surrounding it. The prevailing winds across the country are from the west; consequently, the Pinelands often receive a pollution burden from the metropolitan Philadelphia area. During the summer, southwesterly winds commonly occur carrying pollution to the Pinelands from areas to the southwest, and in the winter, northwesterly winds may carry in pollutants from that direction. In addition, during periods of light winds, a sea breeze can carry pollution from the Atlantic City area into the Pinelands. To account for these effects, pollution sources throughout the southern part of New Jersey will be considered here. Wherever possible, those sources which are actually located in the Pinelands will be identified.

Two reports on the air quality of southern New Jersey published in the past three years contain information on emissions by county. The first report, An Air Quality Study of the New Jersey Intrastate Air Quality Control Region (Atlantic, Cape May, Cumberland and Ocean Counties), Part I: Sulfur Dioxide and Part II: Particulates, was completed by Engineering- Science (ES) in 1976 and 1977. The second report, Emission Inventory and Sulfur Dioxide Alternatives for the Metropolitan Philadelphia Region, was completed by GCA Corporation in 1977. The GCA report includes sulfur dioxide (SO<sub>2</sub>), particulate (TSP) and hydrocarbon (HC) inventories for several Pennsylvania and New Jersey counties including Burlington, Camden, Gloucester and Salem Counties. The source strengths reported here are based on 1974 emission estimates provided by these two reports.

Air pollution sources can be divided into three types: point, line and area sources. Point sources are generally the type that emit large quantities of pollutants to the atmosphere through a stack, power plants and industrial plants, for example. Line sources are transportation related sources such as traffic on highways or railroads. Area sources include all sources that are not point or line sources. Examples of area sources are residential fuel combustion, airports and forest fires. Point, area and line sources will be discussed separately in the following sections.

### 6.1 Point Sources

There are five fossil fuel burning power plants and a variety of industries in southern New Jersey which account for a total of almost 1000 point sources. The approximate distribution of these point sources is

indicated in Table 6.1. Only about 3% of these sources are actually located in the Pinelands, but they account for about 35% of the TSP emissions and 27% of the SO<sub>2</sub> emissions in the Pinelands area (ES, 1976, p. IV-3; ES, 1977, p. II-3; GCA, 1977, pp. 8-10).

The B.L. England Power Plant at Beesley's Point in Upper Township, Cape May County is located right on the Pinelands National Reserve boundary. This large plant is responsible for most of the TSP and SO<sub>2</sub> point source emissions in Cape May County. In Table 6.1 the B.L. England plant is included among the point sources located in the Pinelands. If it were not included in the Pineland totals, point sources in the Pinelands would only be responsible for about 11% of the TSP emissions and less than one percent of the SO<sub>2</sub> emissions in southern New Jersey.

## 6.2 Area Sources

### 6.2.1 Particulates

The most common area sources of TSP in the Pinelands area are fugitive dust related sources and fuel combustion related sources. Fugitive dust can come from forest fires or unpaved roads, for example, while pollutants from fuel combustion can be emitted by residential space heating systems, boats and aircraft. Table 6.2 provides estimates of the annual TSP emissions from 15 types of area sources in the southern New Jersey counties (ES, 1977, pp. III-74-77; GCA, 1977, p. 23).

To get a rough estimate of area source TSP emissions in the Pinelands, five source categories which are expected to be common in the Pinelands are considered: residential fuel combustion, commercial and institutional fuel combustion, prescribed fires, uncontrolled forest fires and unpaved roads. Emissions from the two fuel combustion categories are allocated according to the fraction of each county population estimated by the Pinelands Commission to be living within the Pinelands National Reserve boundary. All emissions from prescribed and uncontrolled forest fires are assumed to be from within the Pinelands. All dust emissions from unpaved roads in Atlantic, Burlington, Cape May and Ocean Counties and half of the emissions in Camden and Gloucester Counties are assumed to be from within the Pinelands. Although these estimates for unpaved roads appear to be biased toward high emissions from the Pinelands, any bias is probably corrected by dust emissions from paved roads in the Pinelands. These rough emission estimates, which are listed in Table 6.3, probably comprise a lower limit on TSP emissions in the Pinelands. They represent 42% of the total estimated TSP emissions for southern New Jersey. It should be noted here that although the TSP emission rates from unpaved roads are orders of magnitude larger than the other sources, these particles are generally large and non-respirable and are not likely to constitute a health problem.

### 6.2.2 Sulfur Dioxide

Almost all SO<sub>2</sub> emissions in the Pinelands area come from fuel combustion related sources. Table 6.4 provides estimates of the annual SO<sub>2</sub> emissions from eight types of area sources in the southern New Jersey counties (ES, 1976, p. V-19; GCA, 1977, p. 22). Of these eight source categories, only two are expected to have significant emissions within the Pinelands: residential fuel combustion, and commercial and institutional fuel combustion. Emissions from these two fuel combustion categories are divided between the

TABLE 6.1 Estimated Emissions From Major Point Sources In  
The Vicinity Of The Pinelands (Tons/yr) \*

County	# Of Pt. Sources		TSP Emissions		SO <sub>2</sub> Emissions	
	Total	In Pines	Total	In Pines	Total	In Pines
Atlantic	34	6	180	70	960	70
Burlington	125	3	2090	1300	11450	0
Camden	243	3	2250	450	4120	200
Cape May	22	4	4760	4540	34830	34720
Cumberland	130	0	4400	0	7010	0
Gloucester	253	2	1580	150	9240	30
Ocean	68	9	820	80	43430	0
Salem	96	0	2720	0	18970	0
<b>Total</b>	<b>969</b>	<b>32</b>	<b>18800</b>	<b>6590</b>	<b>130010</b>	<b>35030</b>

\* Based on 1974 data.

TABLE 6.2 Estimated Particulate Emissions From Area Sources In  
The Vicinity Of The Pinelands (Tons/yr) \*  
County Totals

<u>Source Category</u>	<u>Atlantic</u>	<u>Burlington</u>	<u>Camden</u>	<u>Cape May</u>
Residential Fuel Combustion	60	150	240	30
Commercial/Institut. Fuel Combustion	40	100	210	10
Industrial Fuel Combustion	0	150	420	0
Ships and Boats	0	10	30	110
Aircraft	10	500	0	0
Off-Highway Fuel Usage	50	30	40	10
Incineration	20	10	10	10
Open Burning	10	0	10	0
Prescribed Fires	20	- -	- -	0
Forest Fires	70	- -	- -	20
Paved Roads	1500	- -	- -	750
Unpaved Roads	8570	126720	37400	1570
Agricultural Tilling	50	370	50	50
Construction	80	40630	76330	40
Miscellaneous	30	30	50	10
<b>Total</b>	<b>10510</b>	<b>153700</b>	<b>114790</b>	<b>2610</b>
<b>Grand Total</b>	<b>513290</b>			

\* Based on 1974 data.

TABLE 6.2 continued

<u>Source Category</u>	<u>Cumberland</u>	<u>Gloucester</u>	<u>Ocean</u>	<u>Salem</u>
Residential Fuel Combustion	70	30	30	30
Commercial/Institut. Fuel Combustion	30	40	10	20
Industrial Fuel Combustion	90	150	10	120
Ships and Boats	160	40	0	100
Aircraft	0	20	10	0
Off-Highway Fuel Usage	60	20	30	10
Incineration	10	90	0	10
Open Burning	0	190	0	0
Prescribed Fires	10	- -	0	- -
Forest Fires	420	- -	140	- -
Paved Roads	1390	- -	2520	- -
Unpaved Roads	3520	102520	6370	55830
Agricultural Tilling	250	310	10	330
Construction	40	31220	100	9320
Miscellaneous	70	20	30	10
<b>Total</b>	<b>6230</b>	<b>134760</b>	<b>9810</b>	<b>65620</b>

\*Based on 1974 data.

TABLE 6.3 Estimated Particulate Emissions From Area Sources (Tons/yr) \*  
In The Pinelands

<u>Source Category</u>	<u>Atlantic</u>	<u>Burlington</u>	<u>Camden</u>	<u>Cape May</u>	<u>Cumberland</u>	<u>Gloucester</u>	<u>Ocean</u>
Residential Fuel Combustion	20	40	10	10	10	10	30
Commercial/Institut. Fuel Combustion	10	30	10	0	10	0	0
Prescribed Fires	20	--	--	0	10	--	0
Forest Fires	70	--	--	20	480	--	140
Unpaved Roads	8570	126720	18700	1570	--	51260	6870
Total	8690	126790	18720	1600	510	51270	7040
Grand Total	214620						

\*Based on 1974 data.

TABLE 6.4 Estimated Sulfur Dioxide Emissions From Area Sources In The Vicinity Of The Pinelands (Tons/yr)\*  
County Totals

<u>Source Category</u>	<u>Atlantic</u>	<u>Burlington</u>	<u>Camden</u>	<u>Cape May</u>	<u>Cumberland</u>	<u>Gloucester</u>	<u>Ocean</u>	<u>Salem</u>
Residential Fuel Combustion	670	810	1400	280	860	820	760	460
Commercial/Institut. Fuel Combustion	450	1320	1500	150	1070	300	140	350
Industrial Fuel Combustion	0	40	240	10	1080	90	40	70
Ships and Boats	10	10	110	1580	4390	50	20	120
Aircraft	20	150	0	0	0	0	10	0
Off-Highway Fuel Usage	30	20	30	10	40	10	20	0
Incineration	10	0	0	0	0	30	0	0
Miscellaneous	0	70	100	0	0	50	0	10
Total	1190	2420	3380	2030	7440	1350	990	1010
Grand Total	19810							

\*Based on 1974 data.

Pinelands and the rest of southern New Jersey according to the percentage of each county population estimated by the Pinelands Commission to be living within the Pinelands National Reserve. These rough estimates of SO<sub>2</sub> emissions in the Pinelands, shown in Table 6.5, account for about 9% of the total SO<sub>2</sub> emissions in the Pinelands area. This figure is most likely a lower bound on the actual emissions in the Pinelands.

### 6.3 Line Sources

The most important line source in the Pinelands is automobile traffic on the major highways which cut across the area. Automobiles are responsible for the emissions of TSP and SO<sub>2</sub> as well as carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>) and hydrocarbons (HC). These last two pollutants, NO<sub>x</sub> and HC, are precursors of ozone, the only pollutant known to reach unhealthy levels in the Pinelands. The ozone generated in the air flowing over the Pinelands is primarily the product of automobile traffic and industry in the Philadelphia area with contributions from other areas to the south and west, and from the automobile traffic through the Pinelands between the urban areas and the shore resorts.

Only TSP, SO<sub>2</sub> and HC emissions are available for the southern New Jersey counties. The annual emissions of these pollutants by county are given in Table 6.6 (ES, 1976, p. V-19; ES, 1977, pp. III-74-77; GCA, 1977, pp. 22-24). Because of the important role of automobile emissions in the ozone problem, an attempt should be made to estimate how much automobile exhaust is being emitted within the Pinelands. Informal studies done by the New Jersey Bureau of Air Pollution Control show that about half of the vehicle miles travelled (VMT) on highways each year in Atlantic and Ocean counties are within the Pinelands and the other half of the VMT's are in the urban areas outside the Pinelands. This ratio can also be applied in Burlington County which has a similar distribution of Pinelands and urban areas. The section of Cape May County within the Pinelands is assumed to encompass about one third of the total county line source emissions since it includes the Garden State Parkway within its boundaries. Only a small portion of the VMT's in Camden, Cumberland and Gloucester Counties are likely to be within the Pinelands since only small parts of these counties are included in the Pinelands National Reserve. Therefore, an estimated 10% of the total VMT's for these three counties has been assigned to the Pinelands. The result of these estimates is shown in Table 6.6. Based on these estimates, about 31% of the total auto emissions in southern New Jersey are actually being emitted within the Pinelands National Reserve.



TABLE 6.5 Estimated Sulfur Dioxide Emissions From Area Sources (Tons/yr) \*  
In The Pinelands

<u>Source Category</u>	<u>Atlantic</u>	<u>Burlington</u>	<u>Camden</u>	<u>Cape May</u>	<u>Cumberland</u>	<u>Gloucester</u>	<u>Ocean</u>
Residential Fuel Combustion	230	210	80	60	90	100	250
Commercial/Institut. Fuel Combustion	150	340	90	30	120	40	50
<b>Total</b>	<b>380</b>	<b>550</b>	<b>170</b>	<b>90</b>	<b>210</b>	<b>140</b>	<b>300</b>
<b>Grand Total</b>	<b>1840</b>						

\*Based on 1974 Data.

TABLE 6.6 Estimated Line Source Emissions In  
The Vicinity Of The Pinelands (Tons/yr) \*

County	TSP Emissions		SO <sub>2</sub> Emissions		HC Emissions	
	Total	In Pines	Total	In Pines	Total	In Pines
Atlantic	920	460	500	250	13930	6965
Burlington	1530	765	650	325	23070	11535
Camden	1450	145	590	59	21450	2145
Cape May	440	147	220	73	6630	2210
Cumberland	350	85	440	44	12630	1263
Gloucester	840	34	400	40	12730	1273
Ocean	1540	770	830	415	23290	11645
Salem	330	0	170	0	4490	0
<b>Total</b>	<b>7880</b>	<b>2454</b>	<b>3800</b>	<b>1206</b>	<b>118220</b>	<b>37036</b>

\*Based on 1974 data.

## 7.0 ISSUES, POTENTIAL IMPACTS AND LAND MANAGEMENT TECHNIQUES

There are two basic air quality problems to be addressed by the Comprehensive Management Plan for the Pinelands. The first problem is that ozone concentrations in the Pinelands, as described in section 5.5, are currently at unhealthful levels. The solution to this problem requires a statewide plan and Pinelands development must be consistent with this larger plan. The second problem is the necessity of maintaining the clean, clear air which exists in the Pinelands with respect to visibility and all the major pollutants other than ozone. In this section issues related to these two problems are identified and the potential air quality impact of development is discussed in terms of each issue. Land management techniques for limiting these impacts are then recommended.

### 7.1 Issues And Potential Impacts

#### 7.1.1 Traffic Related Air Pollution

Development in the Pinelands, whether residential, commercial or industrial, will generate additional traffic to and from the new facility. Since automobiles emit carbon monoxide, nitrogen dioxide, lead and other particles, and the precursors of ozone, an increase in automobile traffic could have a significant impact on air quality. Where growth is encouraged, the air quality impact of transportation related pollution sources can be minimized by land use plans and zoning regulations which promote sufficient housing density to support public transportation. In addition, encouraging innovative methods for reducing low occupancy automobile use in, through and around the Pinelands could have a beneficial effect on air quality.

#### 7.1.2 Prevention Of Significant Deterioration

The Federal Clean Air Act (1977, pp. 76-94) provides for specific requirements for the prevention of significant deterioration (PSD) of air quality. Most of the State of New Jersey has been designated as a Class II area, meaning that an increase in sulfur dioxide or particulate concentrations greater than a specified increment cannot be allowed. The Brigantine Wilderness area, however, has been designated Class I. This designation imposes stricter allowable increments in sulfur dioxide and particulate concentrations and also protects visibility in the area. The designation of the Brigantine Wilderness area as Class I requires the evaluation of any new major source of sulfur dioxide or particulates in southern New Jersey for its potential contribution to the existing concentration in the Class I area as well as for its contribution in its own immediate area.

If any of the Class I air quality increments allowed at the Brigantine Wilderness area are likely to be exceeded as a consequence of any growth in emissions in the surrounding area, the State may have to provide more stringent limits on emissions from existing sources or disapprove new sources affecting Brigantine unless the Department of Interior agrees that the new sources will have no adverse impact on the air quality related values of the wilderness area as provided in Section 165 (d) (2) (c) of the Clean Air Act.

On the other hand, the State can consider applying the same stringent limits that now apply to Brigantine to other areas, for example, the Pinelands Preservation Area. In order to redesignate this area as Class I, the State must meet the requirements of Section 164 (b) of the Clean Air Act with respect to an analysis of the effect of redesignation, public hearing, and notice to the Federal government.

#### 7.1.3 Sulfur In Fuel Regulations

The State of New Jersey currently has two regulations restricting the sulfur content of fuel. They are Sulfur In Fuel (NJAC 7:27-9) which regulates oil and Sulfur in Coal (NJAC 7:27-10). If the State were to respond to the energy crisis by relaxing these restrictions in the southern part of the State, sulfur dioxide levels may increase slightly. However, the regulations would not be relaxed so far as to cause violations of the National Ambient Air Quality Standards (NAAQS) or the PSD increments.

### 7.2 Recommended Land Use Strategies and Standards

The solution of the two problems to be addressed by the Management Plan requires decisions in regard to the extent and type of development to be allowed and emission regulations that may be needed.

#### 7.2.1 Reduction Of Automobile Use

The following strategies are recommended to promote a reduction in the use of automobiles needed to attain the NAAQS for ozone:

- Land use plans and zoning regulations, including restrictions on housing densities and the location of housing with respect to places of employment and community services which are consistent with a greater and more effective use of public transportation, bicycling and walking. Guidelines for the magnitude of housing density which is required to support public transportation can be found in the report Where Transit Works (1976, p. 4).
- In areas where it is not feasible or desirable to have housing densities of this magnitude, it would be preferable to keep the area rural by setting a minimum lot size of, say, 5 acres. This type of very low density housing would limit the total traffic generated pollutants emitted in the Pinelands.
- Include air quality review as part of the regulatory or permitting process for major developments. This usually includes all industrial proposals, most commercial proposals, and any large housing developments (e.g. more than 100 units) or parking lots (e.g. more than 300 spaces).

- An outline of information required by the New Jersey Bureau of Air Pollution Control for the evaluation of impacts on air quality by major developments is provided in Appendix A as an example of what could be included in the review.
- Monitor transportation programs in the surrounding urban areas, particularly Atlantic City and the Camden-Philadelphia area, and review proposed changes in highways and in public transportation in, through and around the Pinelands. Evaluate the relevant proposals for potential impact on air quality and then indicate to the responsible transportation agencies support of those plans which are consistent with the air quality goals of the Management Plan and objections to plans which may have an adverse impact on air quality.

#### 7.2.2 Maintenance Of Clean Air

The following strategies are recommended in order to maintain clean, clear air throughout the Pinelands:

- Coordinate review of facilities requiring air pollution control permits with the New Jersey Bureau of Air Pollution Control. These facilities include manufacturing processes involving surface coating or surface cleaning or emitting more than 50 pounds per hour; all facilities equipped with air pollution control apparatus; liquid storage tanks with capacities greater than 10,000 gallons or solids storage tanks with capacities greater than 2,000 cubic feet; conveyORIZED material handling equipment; commercial fuel burning equipment with capacity greater than or equal to 1,000,000 BTU per hour; equipment for burning non-commercial fuel; and incinerators in multi-unit dwellings. There is a complete list of these facilities in NJAC 7:27-8 which is Appendix B of this report.
- Monitor development in areas surrounding the Pinelands with regard to long-range transmission of pollutants and make recommendations to appropriate agencies.
- Encourage appropriate local air pollution control programs in cooperation with NJ DEP Local Program Review and Development personnel. As guidance, the Department has produced a Model Ordinance for local air pollution control regulations which is included in Appendix C along with guidelines for state approval of local ordinances. Fugitive dust sources are not included in the ordinance. However they are identified as one of the major sources of particulates in the Pinelands and they may be best controlled at the local levels. A table of control techniques for fugitive dust sources from a report by PEDCO (1973, p. 4-21) is reproduced here as Table 7.1.
- Promote the use of energy conservation measures, including innovative methods for reducing low occupancy automobile use in and through the Pinelands, use of solar and other non-polluting space heating methods in new construction and performance standards for new fuel oil burners.
- Promote the use of vegetated open space as buffers between air pollution sources, including roadways, and sensitive receptors. For more information on this issue, see the report by DeSanto, et. al. (1976).

TABLE 7.1 Control Techniques for Fugitive Dust Sources

Source	Practicality of Regulation <sup>a</sup>	Control Method	Control Efficiency
Unpaved Roads	2-3	Paving and right of way improvement	85%
	4	Surface treatment with penetration chemicals	50%
	3	Soil stabilization chemicals worked into the roadbed	50%
	1-2	Speed control	25 mph-25% 20 mph-35% 15 mph-40%
Construction Activity	1-2	Watering	50%
	2	Chemical stabilization of completed cuts and fills	80%
	3	Treatment of temporary access and haul roads on or adjacent to site Minimal exposure periods (controlled by permit; good practice with watering or chemical stabilization)	50%
Agriculture	3	Continuous cropping	25%
	3	Limited irrigation of fallow fields	20%
	5	Windbreaks	5%
	5	Inter-row plantings of grain on widely-spaced row crops	15%
	5	Stubble, crop residue, or mulch left on fields after harvest for wind protection	10%
Tailings Pile	5	Spray-on chemical stabilization	40%
	2	Chemical stabilization	80%
	2-3	Vegetation	65%
Aggregate Storage	2	Combined chemical-vegetative stabilization	90%
	2	Continuous spray of chemical on material going to storage piles	90%
	1-2	Watering of haul roads and storage areas	50%
	3	Treatment of haul roads and traffic areas	50%
Cattle Feed Lots	2	Watering (sprinklers or truck)	80%
	5	Manure scraping	80%
	4	Chemical stabilization and water alone	40%

1 = Excellent    2 = Good    3 = Fair    4 = Poor    5 = Not Recommended

## 8.0 DATA GAPS AND ISSUES REQUIRING FURTHER STUDY

### 8.1 Expansion Of The Air Monitoring Network

The New Jersey air monitoring network, described in section 4.0, provides limited data on Pb, SO<sub>2</sub>, CO, O<sub>3</sub> and NO<sub>2</sub> concentrations in the Pinelands. Currently there is only one site monitoring each of these pollutants within the Pinelands boundary, with the exception of NO<sub>2</sub> for which there are no monitors in the Pinelands. Monitoring sites in the area surrounding the Pinelands are fairly scarce for Pb, O<sub>3</sub> and NO<sub>2</sub>. The situation should improve in the next year as new sites begin operation. New sites at Nacote Creek Research Station and in Vineland are already operating, a site at Cape May Court House is being established and the McGuire Air Force Base site is being reactivated. The pollutants to be monitored at these new sites are listed below in Table 8.1.

TABLE 8.1 New Air Monitoring Sites

<u>NEW SITE</u>	POLLUTANTS TO BE MONITORED				<u>Comments</u>
	SO <sub>2</sub>	CO	O <sub>3</sub>	NO <sub>2</sub>	
Nacote Creek Res. Station	X		X		Began operation in 1979.
Vineland	X	X	X	X	Began operation in 1979.
McGuire AFB	X		X	X	Monitored O <sub>3</sub> from 1975-77
Cape May Court House	X		X	X	

The data provided by these new sites should prove helpful in monitoring the effect of development on air quality in the Pinelands. A need may still exist for expanding the Pb monitoring network by designating more high-vol sites for Pb analysis. This matter should be addressed to monitoring personnel in the New Jersey Bureau of Air Pollution Control.

### 8.2 Improvement Of The Pollution Source Inventory

Although fairly good estimates of county wide emissions are available for southern New Jersey from reports by GCA (1977) and Engineering-Science (1976, 1977), data on distribution of emissions within each county are limited. The estimates provided in section 6.0 are useful as an indication

of the relative contributions of certain types of sources to the pollution burden of the Pinelands. If more detailed information on the source distribution is needed in order to complete or implement the Management Plan, a new source inventory may have to be compiled.

### 8.3 Reclassification Of The Pinelands Preservation Area

As discussed in section 7.1.2, the Brigantine Wilderness area is the only part of New Jersey which has been designated as a Class I area for the prevention of significant deterioration (PSD). This designation imposes stricter allowable increments of sulfur dioxide and particulate concentrations and also protects visibility in the area. It may be desirable to redesignate, as Class I, the Pinelands Preservation Area which is currently designated Class II along with the rest of the state. The Class I designation would impose more rigid requirements on development in the Preservation Area and would also affect development in the surrounding areas which might have an air quality impact on the Preservation Area. The question of PSD reclassification of the Preservation Area should be examined jointly by the Pinelands Commission and the New Jersey Department of Environmental Protection.

### 8.4 Acid Rain

As noted in section 6.0, the Pinelands are not isolated from the air pollutants generated in the urban areas surrounding it. Atmospheric transport of these pollutants plays an important role in producing high ozone levels in the Pinelands. Another consequence of long range atmospheric transport is the production of acid rain, precipitation with pH lower than that expected in unpolluted rainwater. This phenomenon occurs when sulfates and nitrates emitted elsewhere are transported long distances and are finally washed out somewhere downwind. A decrease in pH in Pinelands' streams has already been observed (Johnson, 1979). This phenomenon and its effect on the Pinelands may require further study.



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APPENDIX A

Information Required For The Evaluation  
Of Impacts On Air Quality By Major Developments

INFORMATION REQUIRED FOR THE EVALUATION OF IMPACTS  
ON AIR QUALITY BY MAJOR DEVELOPMENTS

1. Information required for all facilities:
  - 1.1 Meteorological conditions affecting the dispersion of pollutants in the vicinity of the facility:
    - 1.1.1 Prevailing wind direction
    - 1.1.2 Extent of inversions
    - 1.1.3 Average morning and afternoon mixing heights
    - 1.1.4 Effect of local topography on air flow patterns
    - 1.1.5 Number of degree days
    - 1.1.6 Identification of stability wind rose used when diffusion modeling is required (See Section 1.4)
  - 1.2 Ambient air quality in the vicinity of the facility expressed in terms of sulfur dioxide, particulates and carbon monoxide concentrations compared with all respective ambient air quality standards:
    - 1.2.1 The data should be obtained from on site monitoring or from the nearest New Jersey State continuous monitoring sites and hi-volume particulate monitoring sites.
    - 1.2.2 Monitoring for carbon monoxide background at nearby sensitive receptors and at locations of expected maximum concentrations, such as major intersections, will be required before construction for all highways with projected annual average daily traffic (AADT) of 20,000 or more. The Bureau of Air Pollution Control should be consulted at an early stage in the planning of the project about the monitoring to be required.
    - 1.2.3 Monitoring for sulfur dioxide and particulate background before construction will be required for large fossil fuel power plants if monitors do not already exist within a half mile of the site. The Bureau of Air Pollution Control should be consulted at an early stage in the planning of the project about the monitoring required.
    - 1.2.4 Monitoring or modelling for carbon monoxide background before construction may be required for any facility that would increase traffic in an area already congested or that would create a new congested area. The Bureau of Air Pollution Control should be consulted at an early stage of the planning of the project about the possible need for monitoring for carbon monoxide background and for measuring traffic volume.
    - 1.2.5 Attachment 1 is a sample format comparing measured ambient air quality with the standards.
  - 1.3 Emissions generated by the operations at the facility:
    - 1.3.1 The latest edition of U.S. Environmental Protection Agency's Publication, "AP-42, Compilation of Air Pollution Emission Factors" can be used to calculate emissions if more definitive information is not available. The publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

- 1.3.2 Emissions from space heating:
- 1.3.2.1 Type and amount of fuel used, and pollution emission factors used to calculate emissions. Only the type of fuel used need be reported for housing developments with less than 100 units.
  - 1.3.2.2 Emission rates of sulfur dioxide, particulates, carbon monoxide, hydrocarbons and oxides of nitrogen
    - (a) In pounds per hour for maximum short term rate during heating season, and
    - (b) In tons per year for total annual emissions.
    - (c) No emissions need be calculated for housing developments with less than 100 units.
- 1.3.3 Emission rates of all pollutants, including hazardous or odorous substances, from industrial processes or from process heating at industrial plants:
- 1.3.3.1 Process and material flow rates, schedule of operation, sources of pollutant emission factors used to calculate emissions, and nature and efficiency of emissions control equipment.
  - 1.3.3.2 Peak emission rates in pounds per hour.
  - 1.3.3.3 Emission rates in tons per year for annual totals.
- 1.3.4 Emission rates of all pollutants including any hazardous or odorous substances, from incinerations:
- 1.3.4.1 Material flow rates, schedule of operation, sources of pollutant emission factors used to calculate emissions, and nature and efficiency of emission control equipment.
  - 1.3.4.2 Peak emission rates in pounds per hour.
  - 1.3.4.3 Emission rates in tons per year for annual totals.
- 1.3.5 Measures to reduce emissions during construction and to minimize fugitive dust emissions from the completed facility in accordance with the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et. seq. Standards for dust control are available in the New Jersey Department of Agriculture's publication "Standards for Soil Erosion and Sediment Control in New Jersey".
- 1.3.6 Compliance with the provisions of the New Jersey Administrative Code, Title 7, Chapter 27 and of the U.S. Code of Federal Regulation, Title 40, Section 52.21.
- 1.3.7 Other existing sources and projected new sources within a half mile of the proposed facility, and emission rates from those sources, as in Section 1.3.2 and 1.3.3, to the extent that such data are available.
- 1.3.8 In the case of a major facility such as a sewer system, highway with projected AADT of 20,000 or more, housing development of over 1,000 units, or a facility with more than 2,000 parking spaces, growth induced by the facility during the next ten years, and emission rates of particulates sulfur dioxide, carbon monoxide, hydrocarbons and oxides of nitrogen from the induced growth: Projections of growth and of emission rates should also be made for the "no-build"

alternative. "Growth Effects of Major Land Use Projects: Volume III-Summary" Publication No. EPA-450/3-76-012-C, September 1976, and the U.S. Environmental Protection Agency's "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 7: Projecting County Emissions" Publication No. EPA-450/4-74-008 (QAQPS Guidelines No. 1.2-026), provide methodology for the analysis of the growth. These documents are available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, Virginia 22151.

1.3.9 The amount of electrical energy to be used by the facility and the name of the utility providing it.

1.4 An analysis of the effect of the emissions generated by the facility on the ambient air quality:

1.4.1 Diffusion modeling is required for carbon monoxide, nitrogen dioxide, lead, sulfur dioxide, or particulates only when direct emissions from the facility are greater than 100 tons a year from all sources in a facility. However, diffusion modeling will be required for any emissions of hazardous or odorous substances. Modeling will include the effect of the facility, existing sources, and projected new sources independent of the facility. The U.S. Environmental Protection Agency's document "Guideline Series, Guideline on Air Quality Models", Publication No. QAQPS No. 1.2-080, April, 1978 recommends air quality modeling techniques that may be applied to new source reviews. This document is available from NTIS.

1.4.2 Description of model used: The U.S. Environmental Protection Agency's document "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10: Reviewing New Stationary Sources" Publication No. EPA-450/4-77-001, October 1977 (QAQPS Guideline No. 1.2-029R) provides methodology. This document is available from NTIS.

1.4.3 Concentrations of carbon monoxide, sulfur dioxide, and particulates compared with ambient air quality standards and the increments of significant deterioration at:


(a) Places of maximum concentrations

(b) Critical locations

(i) Monitor sites

(ii) Sensitive receptors (hospitals, schools, nursing homes, residences and playgrounds)

1.4.4 Diffusion modelling of sulfur dioxide and particulates for a major facility such as a sewer system, highway with projected AADT of 20,000 or more, or housing development with over 1,000 units, shall be done for induced as well as direct emissions when total direct and induced emissions exceed 100 tons per year. The U.S. Environmental Protection Agency's "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 12: Applying Atmospheric Simulation Models to Air Quality Maintenance Areas"



Publication No. EPA-450/4-74-013 (CAQPS Guideline No. 1.2-031), and "Growth Effect of Major Land Use Project Vol. II Summary" EPA-450/3-76-012, Sept. 1976 provide methodology for the analysis. These documents are available from NTIS.

- 1.4.5 Concentrations of odorous substances compared with odor threshold as given in the Manufacturing Chemists Associations Research Report by Arthur D. Little, Inc. "Odor Threshold of 53 Commercial Chemicals" or other appropriate source. The source should be referenced.
- 1.4.6 Concentrations of toxic or flammable substances compared with the critical concentrations given in "Merck Index" (Merck & Company, Inc.), the "Handbook of Dangerous Materials" by N. Irving Sax, or other appropriate source. The source should be referenced.

1.5 Measures to reduce emissions by conservation of energy:  
Measures that might be appropriate are given in U.S. Environmental Protection Agency's "Guidelines for Air Quality Maintenance Planning and Analysis Volume 3: Control Strategies, available from NTIS, and in the American Society of Heating, Refrigerating and Air Conditioning Engineering Standards 90P.

1.6 Density of housing developments in units per acres

1.7 Any other specific information about the proposed facility relevant to its impact on ambient air quality.

2. Information required for highway or for projects generating substantial vehicular traffic, including housing projects of over 100 units or facilities with parking lots with over 250 spaces:

2.1 Road data for highway projects or for roads providing access to housing projects or parking lots:

2.1.1 Current traffic volume in vehicles per hour for peak hour and peak eight hour period and for average day.

2.1.2 Traffic capacities in vehicles per hour:

Methods for calculating traffic capacities are given in Highway Capacity Manual 1965, Highway Research Board Special Report 87, NAS-NRC Publication 1326 available from NTIS.

2.2 Traffic volumes to be generated by the facility in vehicles per hour for the peak hour and peak eight hour period at the time of completion of construction and ten years later.

2.3 Parking facilities:

2.3.1 Locations

2.3.2 Number of spaces

2.3.3 Number of levels

2.3.4 Open or covered

2.3.5 Fees

- 2.4 Motor vehicle emissions generated by the facility and where appropriate, growth induced by the facility (see Section 1.3.8) based on annual average daily traffic, expressed as tons per day of carbon monoxide, hydrocarbons, nitrogen oxides, sulfur dioxide and particulates. (See Publication AP-42, referenced in Section 1.3.1.)
- 2.5 Effect of carbon monoxide motor vehicle emissions on air quality:
- 2.5.1 Carbon monoxide concentrations, compared with ambient air quality standards and with concentrations in the absence of the facility, at the locations specified in 1.4.3
  - 2.5.2 The U.S. Environmental Protection Agency's document "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources" <sup>Revised, Sept. 1977</sup> Publication No. EPA-450/4-750-001 (OAQPS No. 1.2-026) provides methodology for carbon monoxide microscale analysis. This document is available from NTIS.
- 2.6 The availability of public transportation and, for housing projects, the accessibility (distance, safety and convenience of routes) by automobile and by other modes of transportation (e.g., busses, bicycles and walkways) of the following facilities:
- 2.6.1 Medical (including professional offices and hospital)
  - 2.6.2 Recreational
  - 2.6.3 Educational
  - 2.6.4 Commercial (including personal shopping)
  - 2.6.5 Places of Employment
- 2.7 Measures to reduce vehicle miles travelled:  
Measures that might be appropriate are described in the U.S. Environmental Protection Agency's "Guidelines for Air Quality Maintenance Planning and Analysis, Volume 3: Control Strategies" (Chapter II, Section E) Publication No. EPA-450/4-74-003 (OAQPS No. 1.2-002), available from NTIS, in the Federal Register, Volume 39, No. 164-Thursdays, August 22, 1974, pages 30458-62, and in Section 108 (f)(1)(A) of the Clean Air Act Amendments of 1977.



ATTACHMENT 1  
1976  
NEW JERSEY AIR QUALITY DATA SUMMARY

NEWARK LAB

CARBON MONOXIDE (PPM)

Maximum 1-Hour Average:	18.4
2nd Highest 1-Hour Average:	17.4
# of Times Exceeding 1-Hour Std. (35 ppm):	0
Maximum 8-Hour Moving Avg.:	13.7
# of Times Exceeding 8-Hour Std. (9 ppm):	12

SULFUR DIOXIDE (PPM)

Maximum 3-Hour Moving Avg.:	.168
2nd Highest 3-Hour Moving Avg.:	.155
# of Times Exceeding 3-Hour Std. (0.5 ppm):	0
Maximum Daily Avg.:	.091
2nd Highest Daily Avg.:	.058
# of Days Exceeding Prim. Std. (0.14 ppm):	0
# of Days Exceeding Sec. Std. (0.10 ppm):	0
Annual Avg. (Prim. Std. 0.03 ppm):	
(Sec. Std. 0.02 ppm):	.019

NITROGEN DIOXIDE (PPM)

Annual Avg. (Prim. Std. 0.05 ppm):	.044
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NEWARK HI-VOL SAMPLER

SUSPENDED PARTICULATES ( $\mu\text{g}/\text{m}^3$ )

Maximum 24-Hour Average:	135
2nd Highest 24-Hour Average:	125
# of Times Exceeding Prim. Std. (260):	0
# of Times Exceeding Sec. Std. (150):	0
Annual Geometric Mean (Prim. Std. 75, Sec. Std. 60):	56.3

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APPENDIX B

New Jersey Administrative Code 7:27-8  
Permits and Certificates

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

NEW JERSEY ADMINISTRATIVE CODE

TITLE 7, CHAPTER 27

SUBCHAPTER 8

PERMITS AND CERTIFICATES

Filed: November 15, 1967  
Effective: January 15, 1968  
Amendment Filed: January 4, 1973  
Amendment Effective: March 5, 1973  
Second Amendment Filed: March 29, 1976  
Second Amendment Effective: June 1, 1976

Subchapter 8, PERMITS and CERTIFICATES, of Title 7, Chapter 27, New Jersey Administrative Code, which became effective March 5, 1973, is hereby repealed. This repeal shall not affect actions, proceedings, or departmental orders pending or outstanding on the effective date of the new regulation; said actions, proceedings or departmental orders may be prosecuted, defended and continued in the same manner and to the same effect as if the new regulation had not been adopted. The text of the new regulation follows.

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7:27-3.1 Definitions  
7:27-3.2 Permits and Certificates Required  
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7:27-3.1 Definitions

The following words and terms, when used in this Subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Air contaminant" means solid particles, liquid particles, vapors or gases which are discharged into the outdoor atmosphere.

"Alteration" means any change made to equipment or control apparatus or the use thereof, or in a process; including but not limited to any physical change, change in material being processed or a change in the rate of production except where such a production rate change does not increase the quantity of air contaminant emitted or does not change the quality or nature of the air contaminant emitted.

"Commercial fuel" means solid, liquid, or gaseous fuel normally produced, manufactured, used or sold for the purpose of creating useful heat.

"Control apparatus" means any device which prevents or controls the emission of any air contaminant.

"Department" means the Department of Environmental Protection.

"Equipment" means any device capable of causing the emission of an air contaminant into the open air, and any stack, chimney, conduit, flue, duct, vent or similar device connected or attached to, or serving the equipment. This shall include equipment in which the preponderance of the air contaminants emitted is caused by the manufacturing process.

"Equivalent stack diameter" means the diameter of a circular cross section having the same area as the non-circular cross sections at the point of emission discharge.

"Incinerator" means any device, apparatus, equipment or structure used for destroying, reducing or salvaging by fire any material or substance including but not limited to refuse, rubbish, garbage, trade waste, debris or scrap or a facility for cremating human or animal remains.

"Liquid particles" means particles which have volume but are not of rigid shape and which upon collection tend to coalesce and create uniform homogeneous films upon the surface of the collecting media.

"Manufacturing process" means any action, operation or treatment embracing chemical, industrial, manufacturing, or processing factors, methods or forms including, but not limited to, furnaces, kettles, ovens, converters, cupolas, kilns, crucibles, stills, dryers, roasters, crushers, grinders, mixers, reactors, regenerators, separators, filters, reboilers, columns, classifiers, screens, quenchers, cookers, digesters, towers, washers, scrubbers, mills, condensers or absorbers.

"Non-commercial fuel" means solid, liquid or gaseous fuel not normally produced, manufactured, used or sold for the purpose of creating useful heat.

"Particles" means any material, except uncombined water, which exists as liquid particles or solid particles at standard conditions.

"Person" includes corporations, companies, associations, societies, firms, partnerships and joint stock companies as well as individuals, and shall also include all political subdivisions of this State or any agencies or instrumentalities thereof.

"Solid fuel" means a fuel which is fired as a solid, such as anthracite or semianthracite coal, bituminous or sub-bituminous coal, lignite, coke breeze, wood or any solid by-product of a manufacturing process that may be substituted for any of the above specifically mentioned fuels.

"Solid particles" means particles of rigid shape and definite volume.

"Source operation" means any manufacturing process or any identifiable part thereof emitting an air contaminant into the outdoor atmosphere through one or more stacks or chimneys.

"Stack or chimney" means a flue, conduit or opening designed, constructed, and/or utilized for the purpose of emitting air contaminants into the outdoor air.

"Stack diameter" means the internal diameter of a circular stack at the point of emission discharge.

"Standard conditions" shall be 70°F and one atmosphere pressure (14.7 psia or 760 mm Hg).

#### 7:27-8.2 Permits and Certificates Required

(a) Control apparatus and equipment for which a permit to construct and a certificate to operate are required include:

1. All control apparatus;
2. Equipment used in a manufacturing process involving surface coating, including but not limited to spray and dip painting, roller coating, electrostatic depositing or spray cleaning, which emits air contaminants into the open air and in which the quantity of material used in any source operation is in excess of 10 pounds in any one hour;
3. Equipment used in a manufacturing process involving surface cleaning or preparation, including but not limited to degreasing, etching, pickling, or plating, which emits air contaminants into the open air from a tank or vessel, the capacity of which is in excess of one hundred gallons;
4. Equipment, used in a manufacturing process, other than as set forth in subsections (a)2 and (a)3 of this Section, which emits air contaminants into the open air either directly or indirectly and in which the combined weight of all materials, excluding air and water, introduced into any one source operation is in excess of 50 pounds in any one hour;
5. Tanks, reservoirs, containers and bins used for the storage of:
  - i. Liquids except water, including, but not limited to, acids, solvents, diluents or thinners, inks, colorants, lacquers, enamels, varnishes, liquid resins, gasolines, crude oils, petrochemicals, commercial fuels, non-commercial fuels and petroleum derivatives; and having a capacity in excess of 10,000 gallons;
  - ii. Solid particles including, but not limited to, binders, fillers, foodstuffs, detergents, fluxes, catalysts, mineral wools, resins, plastics, pigments, construction materials and solid fuels; and having a capacity in excess of 2,000 cubic feet;
6. Stationary material handling equipment using pneumatic, bucket or belt conveying systems which emit air contaminants into the open air either directly or indirectly;
7. Commercial fuel burning equipment having a heat input rate of 1,000,000 BTU per hour or greater to the burning chamber;
8. Any equipment used for the burning of non-commercial fuel, crude oil or process by-products in any form;
9. Any incinerator, except incinerators constructed, installed or used in one or two-family dwellings or in multi-occupied dwellings containing (6) six or less family units, one of which is owner occupied.

7:27-8.3 General Provisions

(a) No person shall construct, install or alter any equipment or control apparatus without first having obtained a "Permit to Construct, Install or Alter Control Apparatus or Equipment" from the Department. Such permits may be cancelled if construction, installation or alteration is not begun within one year from the date of issuance.

(b) No person shall use or cause to be used any new or altered equipment or control apparatus without first having obtained a "Certificate to Operate Control Apparatus or Equipment" from the Department. Such certificates shall be valid for a period of five years unless sooner revoked by the Department, and such certificates may be renewed only after application to the Department not less than 90 days prior to their expiration date.

(c) Upon receipt of an application for the issuance of a "Certificate to Operate Control Apparatus or Equipment" or any renewal thereof, the Department may issue a temporary certificate valid for a period not to exceed 90 days.

(d) Any person in possession of a "Certificate to Operate Control Apparatus or Equipment" shall maintain said certificate readily available on the operating premises.

(e) No person shall use or cause to be used any equipment or control apparatus unless:

1. all conditions and provisions of the "Permit to Construct, Install or Alter Control Apparatus or Equipment" and Certificate to Operate Control Apparatus or Equipment" are fulfilled and

2. all components connected or attached to, or serving the equipment and/or control apparatus are functioning properly and are in use in accordance with the "Permit to Construct, Install or Alter Control Apparatus or Equipment" and "Certificate to Operate Control Apparatus or Equipment."

(f) A "Certificate to Operate Control Apparatus or Equipment" shall not be transferable either from one location to another or from one piece of control apparatus or equipment to another. A transfer from one person to another is permissible provided such transfer is reported to the Department within 90 days of the occurrence.

(g) The possession of a "Certificate to Operate Control Apparatus or Equipment" does not relieve any person from the obligation to comply with all other provisions of this Chapter.

(h) Permits and certificates issued under this Subchapter are based on emissions of air contaminants only and do not in any way void the applicant's obligation to obtain necessary permits from other governmental agencies.

(i) The provisions of subsections (a) and (b) of this Section shall not apply to structural changes, repairs or maintenance, if such changes, or repairs or maintenance will not change the quality, nature or quantity of the air contaminants emitted.

#### 7:27-3.4 Applications for permits and certificates

(a) Applications for a "Permit to Construct, Install or Alter Control Apparatus or Equipment" or a "Certificate to Operate Control Apparatus or Equipment" shall be made to the Department on forms provided by the Department.

(b) The Department may require such details regarding the equipment or control apparatus as it considers necessary to determine that the equipment or control apparatus is designed to operate without causing a violation of any provisions of the New Jersey Air Pollution Control Act or any provisions of codes, rules or regulations promulgated thereunder and that the equipment or control apparatus incorporates advances in the art of air pollution control developed for the kind and amount of air contaminant emitted by the applicant's equipment. Such information may include description of processes, raw materials used, operating procedures, physical and chemical nature of air contaminants, volume of gas discharge and such other information as the Department considers necessary.

(c) Before a "Certificate to Operate Control Apparatus or Equipment" or any renewal thereof is issued, the Department may require the applicant to conduct such tests as are necessary in the opinion of the Department to determine the kind and/or amount of air contaminants emitted from the equipment or control apparatus. Such tests shall be conducted in a manner approved by the Department and shall be made at the expense of the applicant who shall give the Department no less than 48 hours advance notice of the time of the start of the test. The test results shall be reviewed and certified by a New Jersey licensed Professional Engineer, or by an Industrial Hygienist who has been certified by the American Board of Industrial Hygiene.

(d) Any person applying for a "Certificate to Operate Control Apparatus or Equipment" or a renewal thereof, or to whom such certificate has been issued shall, when requested by the Department, provide such sampling facilities exclusive of instrumentation and sensing devices as may be necessary for the Department to determine the kind and/or amount of air contaminants emitted from the equipment or control apparatus. During such testing by the Department, the equipment and/or control apparatus shall be operated under such conditions within their capacities as may be requested by the Department. The facilities may be either permanent or temporary, at the discretion of the person responsible for their provision, and shall conform to all applicable laws and regulations concerning safe construction and safe practice.

#### 7:27-3.5 Service Fees

(a) Any person subject to the provisions of this Subchapter, except as noted in subsection 3.5 (g), shall submit with each application for a "Permit to Construct, Install or Alter Control Apparatus or Equipment", as an integral part thereof, a service fee in accordance with the following schedule:



\$40.00 Base fee per "Permit to Construct, Install, or Alter Control Apparatus or Equipment" which fee shall also include the associated initial temporary "Certificate to Operate" and initial permanent "Certificate to Operate Control Apparatus or Equipment".

Plus

An Incremental Additional Service Fee to be derived from the Table shown below

INCREMENTAL ADDITIONAL SERVICE FEE

Stack Diameter or Equivalent Stack Diameter		Additional Fee	INSTRUCTIONS
1	2	3	
Not Less Than	But Less Than		<ol style="list-style-type: none"> <li>1. Determine the stack diameter range or equivalent stack diameter range (feet).</li> <li>2. From Columns 1 and 2, locate the applicable stack diameter range.</li> <li>3. Add the additional service fee in the corresponding entry of Column 3 to the base fee.</li> </ol>
--	5ft.	\$ 0.00	
5	7	50.00	
7	9	100.00	
9	12	150.00	
12	15	250.00	
15	20	350.00	
20ft. and Greater		450.00	

(b) Any person subject to the provisions of this Subchapter shall submit with an application for renewal for a permanent "Certificate to Operate Control Apparatus or Equipment", as an integral part thereof, a service fee of \$20.00 for each such renewal.

(c) Any person applying for a transfer of title from one person to another for a permanent or a temporary "Certificate to Operate Control Apparatus or Equipment" shall submit a service fee of \$10.00 as an integral part of each group of such applications, regardless of the number of Certificates affected by such applications.

(d) Service fees shall be submitted in the form of a certified check or postal order payable to the order of the New Jersey Bureau of Air Pollution Control.

(e) No service fee(s) or portions thereof rendered in accordance with any provisions of this Subchapter shall be returnable except in the case of overpayment due to miscalculation of the required fee.

(f) No additional service fee(s) will be levied if the information on the first submittal is found deficient and the applicant is required to provide additional information provided the additional information does not affect the service fee established in subsection 8.5 (a).

(g) Any person submitting an application for a "Permit to Construct, Install or Alter Control Apparatus or Equipment" for any storage tank shall include, as an integral part thereof, a service fee of \$10.00 provided that such an application is solely for the painting of said storage tank subject to the provisions of Subchapter 16 of this Chapter.

APPENDIX C

Model Ordinance for Local Air Pollution  
Control Regulations

MODEL ORDINANCE

(Revised 9/15/77)

1: TITLE AND POLICY

1:1 Title: This Ordinance shall be known and cited as the Air Pollution Control Code of the \_\_\_\_\_.

1:2 Findings and Declaration of Policy: It is hereby declared that air pollution is a menace to the health, welfare and comfort of the residents of the \_\_\_\_\_ and a cause of substantial damage to property. For the purpose of preventing and reducing atmospheric pollution, it is hereby declared to be the policy of the \_\_\_\_\_ to minimize air pollution as herein defined and to establish standards governing the installation, maintenance and operation of equipment and appurtenances relating to combustion, which is a source or potential source of air pollution.

2: DEFINITIONS

2:1 Meaning of Certain Words: The following terms wherever used herein or referred to in this Code shall have the respective meanings assigned to them unless a different meaning clearly appears from the context:

2:2 AIR CONTAMINANT: Solid particles, liquid particles, vapors or gases which are discharged into the outdoor atmosphere.

2:3 AIR POLLUTION: The presence in the outdoor atmosphere of one or more air contaminants in such quantities and duration as are, or tend to be injurious to human health or welfare, animal or plant life or property, or would unreasonably interfere with the enjoyment of life or property.

2:4 ASBESTOS: means actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite.

2:5 DIRECT HEAT EXCHANGER: Equipment in which heat from the combustion of fuel is transferred to a substance being heated so that the latter is contacted by the products of combustion and may contribute to the total effluent.

2:6 DIRECTOR OF AIR POLLUTION CONTROL OR DIRECTOR: The person or persons who are authorized by this Ordinance to exercise the powers prescribed by this Code.

2:7 ECONOMIC POISONS: Those chemicals used as insecticides, rodenticides, fungicides, herbicides, nematocides or defoliantes.

2:8 FRIABLE MATERIAL: Means any material which can be crumbled, pulverized, or reduced to powder by hand pressure.

- 2:9 FUEL: Solid, liquid or gaseous materials used to produce useful heat by burning...
- 2:10 GARBAGE: Waste animal or vegetable matter from houses, kitchens, restaurants, hotels, produce markets or any other source, or food or any kind to be thrown away.
- 2:11 INCINERATOR: Any device, apparatus, equipment or structure used for destroying, reducing or salvaging by fire any material or substance including but not limited to refuse, rubbish, garbage, trade waste, debris or scrap; or a facility for cremating human or animal remains.
- 2:12 INDIRECT HEAT EXCHANGER: Equipment in which heat from the combustion of fuel is transferred by conduction through a heat-conducting material to a substance being heated, so that the latter is not contacted by and adds nothing to the products of combustion.
- 2:13 INTERNAL CROSS-SECTIONAL DIMENSION: Any maximum linear perpendicular distance from an inside wall of a stack or chimney to the inside of an opposite wall, such as the diameter of a circular cross-section or the length or width of a rectangular cross-section.
- 2:14 LIQUID PARTICLES: Particles which have volume but are not of rigid shape and which, upon collection, tend to coalesce and create uniform homogenous films upon the surface of the collecting media.
- 2:15 MANUFACTURING PROCESS: Any action, operation or treatment embracing chemical, industrial, manufacturing or processing factors, methods or forms including but not limited to furnaces, kettles, ovens, converters, cupolas, kilns, crucibles, stills, dryers, roasters, crushers, grinders, mixers, reactors, regenerators, separators, filters, reboilers, columns, classifiers, screens, quenchers, cookers, digesters, towers, washers, scrubbers, mills, condensers or absorbers.
- 2:16 MOTOR VEHICLES: Includes all vehicles propelled otherwise than by muscular power, excepting such vehicles as run only upon rails or tracks.
- 2:17 ODOR: The property of a substance which affects the sense of smell.
- 2:18 OPACITY: The property of a substance which renders it partially or wholly obstructive to the transmission of visible light expressed as the percentage to which the light is obstructed.
- 2:19 OPEN BURNING: Any fire wherein the products of combustion are emitted into the open air and are not directed thereto through a stack or chimney of an incinerator.

- 2:20 OPERATOR: Any person who has care, custody, or control of a building or premises, or a portion thereof, whether with or without knowledge of the owner thereof.
- 2:21 OUTDOOR ATMOSPHERE: Air space outside of buildings, stacks or exterior ducts.
- 2:22 OWNER: Any person who alone or jointly, or severally with others, shall have legal or equitable title to any premises, with or without accompanying actual possession thereof; or shall have charge or control of any dwelling or dwelling unit, as owner or agent of the owner, or as fiduciary including but not limited to executrix, administrator, administratrix, trustee, receiver or guardian of the estate; or as a mortgagee in possession regardless of how such possession was obtained. Any person who is a lessee subletting or reassigning any part or all of any dwelling or dwelling unit shall be deemed to be a co-owner with the lessor and shall have a joint responsibility over the portion of the premises sublet or assigned by said lessee.
- 2:23 PARTICLES: Any material, except uncombined water, which exists in finely divided form as liquid particles or solid particles at standard conditions.
- 2:24 PERSON: The word "Person" means and shall include corporations, companies, associations, societies, firms, partnerships and joint stock companies, as well as individuals, and shall also include all political subdivisions of this State or any agencies or instrumentalities thereof.
- 2:25 PLANT LIFE: Vegetation including but not limited to trees, tree branches, leaves, yard trimmings, shrubbery, grass, weeds and crops.
- 2:26 REFUSE: Rubbish, garbage, trade waste and plant life.
- 2:27 RINGELMANN SMOKE CHART: Ringelmann's Scale for Grading the Density of Smoke, as published by the United States Bureau of Mines, or any chart, recorder, indicator or device which is approved by the New Jersey Department of Environmental Protection as the equivalent of said Ringelmann's Scale for the measurement of smoke density.
- 2:28 RUBBISH: Waste solids not considered to be highly flammable or explosive including but not limited to rags, old clothes, leather, rubber, carpets, wood, excelsior, papers, ashes, furniture, tin cans, glass, crockery, masonry and other similar materials.
- 2:29 SALVAGE OPERATION: Any operation or activity from which is salvaged or reclaimed any product or material including but not limited to metals, chemicals or shipping containers.

- 2:30 SMOKE: Small gasborne or airborne particles, exclusive of water vapor, arising from a process of combustion in sufficient number to be observable.
- 2:31 SOLID PARTICLES: Particles of rigid shape and definite volume.
- 2:32 SOURCE OPERATION: Any manufacturing process or any identifiable part thereof emitting an air contaminant into the outdoor atmosphere through one or more stacks or chimneys.
- 2:33 STACK OR CHIMNEY: A flue, conduit or opening designed and constructed for the purpose of emitting air contaminants into the outdoor air.
- 2:34 STANDARD CONDITIONS: Shall be 70°F and one atmosphere pressure (14.7 psia or 760 mm Hg).
- 2:35 TRADE WASTE: All waste solid or liquid material or rubbish resulting from construction, building operations, or the prosecution of any business, trade or industry including but not limited to plastic products, cartons, paint, grease, oil and other petroleum products, chemicals, cinders and other forms of solid or liquid waste material.
- 2:36 VISIBLE SMOKE: Smoke which obscures light to a degree readily discernible by visual observation.

### 3: PROHIBITION OF AIR POLLUTION

- 3:1 No person or owner of property, or person or persons having possession or control thereof, shall cause, suffer, allow or permit to be emitted into the open air substances in such quantities as shall result in air pollution. The provisions of this section shall not apply to the use of economic poisons.

### 4: PROHIBITION OF OPEN BURNING

- 4:1 No person shall cause, suffer, allow or permit a salvage operation by open burning.
- 4:2 No person shall cause, suffer, allow or permit the disposal of rubbish, garbage or trade waste, or buildings or structures, by open burning.
- 4:3 No person shall cause, suffer, allow or permit the disposal of any type of plant life by open burning.
- 4:4 The provisions of this section shall not apply to:

- (a) Variances approved and issued by the New Jersey Department of Environmental Protection in accordance with N.J.A.C. 7:27-2 of the New Jersey Administrative Code.

- (b) Open burning of refuse for training or research exercises when conducted at a permanent facility or training center designed to be used solely for such purposes on a continuing basis.

5: PROHIBITION OF SMOKE FROM COMBUSTION OF FUEL

- 5:1 No person shall cause, suffer, allow or permit visible smoke to be emitted into the outdoor air from combustion of fuel in any stationary indirect heat exchanger except as provided in Subsection 5.2 hereof.
  - 5:2 No person shall cause, suffer, allow or permit smoke the shade or appearance of which is darker than No. 1 on the Ringelmann Smoke Chart, or greater than 20 percent opacity, exclusive of water vapor, to be emitted into the outdoor air from the combustion of fuel in any stationary indirect heat exchanger having a rated hourly capacity of 200 million BTU or greater gross heat input, and discharging through a stack or chimney having all internal cross-sectional dimensions of 60 inches or greater.
  - 5:3 The provisions of Section 5:1 and 5:2 shall not apply to smoke which is visible for a period of not longer than three minutes in any consecutive 30-minute period.
  - 5:4 The provisions of this section shall not apply to direct heat exchangers or manufacturing processes, or any motor vehicle while operating on the public highways.
  - 5:5 Any person responsible for the construction, installation, alteration or use of an indirect heat exchanger shall, when requested by the Director, provide the facilities and necessary equipment for determining the density or opacity of smoke being discharged into the open air.
- 6: STANDARDS FOR THE EMISSION OF SOLID PARTICLES
- 6:1 No person shall cause, suffer, allow or permit particles to be emitted from any stack or chimney into the outdoor air the shade or appearance of which is greater than 20 percent opacity, exclusive of water vapor.
  - 6:2 The provisions of this section shall not apply:
    - (a) to particles the shade or appearance of which is greater than 20 percent opacity, exclusive of water vapor, for a period of not longer than three minutes in any consecutive 30-minute period;



- (b) to source operations issued a variance by the New Jersey Department of Environmental Protection in accordance with N.J.A.C. 7:27-6.5 of the New Jersey Administrative Code;
- (c) to indirect heat exchangers;
- (d) to incinerators.

7: REGULATION OF STACK AND CHIMNEYS

- 7:1 Except as herein provided, persons burning solid or liquid fuel whose products of combustion are discharged into the open air from a stack or chimney shall submit to the Director information for each such stack or chimney relating to place, type of fuel burned, heat content in fuel burned, quantity of fuel burned per hour and/or year, description of combustion equipment, usual period of operation, height and size of outlet, and description of air pollution control equipment, and such other and pertinent information as may be requested on forms provided for that purpose by the Director. The application forms shall also require submission of name, address and telephone number of person or persons responsible for day-to-day operation and, also, of person or persons responsible for maintenance of any such equipment. Any change in the name, address or telephone number of such person or persons shall be reported within ten days of the occurrence of such change to the Director.
- 7:2 Such information shall be submitted to the Director within 90 days after either new installations are placed into service or existing installations are altered. Nothing herein shall be construed as relieving any person from the requirements of the Building Code of the State of New Jersey. Additional reports concerning these items may be requested by the Director.
- 7:3 The provisions of Section 7 shall not apply to equipment designed or used for a heat input rate not more than one million British Thermal Units (BTU) per hour unless the equipment is designed for or actually using #4, #5 or #6 fuel oil or coal.

8: REGULATION OF OPERATION AND INSTALLATION OF INCINERATORS

- 8:1 No person shall operate or permit the operation of an incinerator in the \_\_\_\_\_ without a permit issued by the Director in accordance with this Code. The Director shall recommend issuance of a permit for the operation of an incinerator after examining the application and inspecting the facility and being satisfied that it may be operated in accordance with this Code. Said permit may be conditioned on improvements made within a prescribed time or on certain operating restrictions if necessary, to comply with this Code. All permits shall be issued by the \_\_\_\_\_ and shall expire \_\_\_\_\_ following their issuance, or at such time prior thereto as any conditions or restrictions shall be complied with. Each incinerator shall require a permit which the annual fee shall be \$25, payable to the \_\_\_\_\_.
- 8.2 No person shall operate or permit the operation of an incinerator in the \_\_\_\_\_ before 9:00 a.m. after 5:00 p.m., and all operation shall be completely terminated by 5:00 p.m., including complete extinction of the fire and removal of materials from the firebox to a noncombustible container and in a safe manner, provided, however, that the Director may issue a Special Permit, because of exceptional circumstances, permitting different hours of operation under such conditions as he shall deem necessary for the health, safety and welfare of the public or of persons in the vicinity.
- 8.3 Where the operation of an incinerator constitutes an immediate and substantial menace to public health and safety, or is a substantial source of air pollution causing irritation and discomfort to persons in the vicinity, and the owner or operator fails upon written or oral notice to take immediate corrective measures, the Director may take all necessary measures to abate the condition including but not limited to ordering the cessation of use of the equipment and sealing the same, pending a hearing in the Municipal Court.
- 8:4 No person shall cause, suffer, allow or permit smoke from an incinerator the shade or appearance of which is darker than No. 1 of the Ringelmann Smoke Chart to be emitted into the air; or emissions of such opacity within a stack or chimney exclusive of water vapor, of such opacity leaving a stack or chimney to a degree greater than the emission designated as No. 1 of the Ringelmann Smoke Chart.
- 8:5 The provisions of Section 8:4 shall not apply to smoke emitted during the building of a new fire, the shade or appearance of which is not greater than No. 2 of the Ringelmann Smoke Chart.

for a period of three consecutive minutes; or emissions of such opacity within a stack or chimney, or exclusive of water vapor, of such opacity leaving a stack or chimney to a degree greater than the emission designated as No. 2 of the Ringelmann Smoke Chart, for a period no greater than three consecutive minutes.

8:6 No person shall cause, suffer, allow or permit the emission of particles of unburned waste or ash from any incinerator which are individually large enough to be visible while suspended in the atmosphere.

8:7 No person shall construct, install, use or cause to be used any incinerator which will result in odors being detectable by sense of smell in any area of human use or occupancy.

9: CONTROL AND PROHIBITION OF AIR POLLUTION FROM ASBESTOS SURFACE COATINGS

9:1 No person shall cause, suffer, allow or permit surface coating by spraying on any building, structure, facility, installation or internal or external portion thereof, asbestos or friable material containing in excess of 0.25% (by weight) asbestos.

9:2 Tests

(a) Any person responsible for the manufacture, application or use of any coating, which the Director, or any agent thereof, has reason to believe contains asbestos shall, when requested by the Director, conduct such tests as are necessary in the opinion of the Director to determine the presence and the amount and/or kinds of asbestos in the coating. Such tests shall be conducted in a manner approved by the Director and shall be made at the expense of the person responsible.

(b) The Director may waive the testing requirements of subsection (a) of this Section upon receipt of a materials specification report from the material manufacturer certifying that the asbestos content of the surface coating for which testing is required complies with the provisions of Section 9.1 hereof.

10: DIRECTOR OF AIR POLLUTION CONTROL

10:1 The Health Officer of the \_\_\_\_\_ shall in addition to his other duties, enforce and administer the provisions of this Code and, in exercising his powers and duties hereunder, shall be known as the Director of Air Pollution Control.

The Director may appoint or designate other employees or officers of the \_\_\_\_\_ to perform duties necessary for the enforcement of this Code.

10:2 The Board of Health, pursuant to N.J.S.A. 26:3-90, may appoint any person employed by the \_\_\_\_\_, or its successor, to administer and enforce this Code in addition to the powers and appointments provided by Section 10:1 hereof.

#### 11: INSPECTIONS AND RIGHT OF ENTRY

11:1 Emergency inspections may be authorized without warrant if the Director has reason to believe that a condition exists which poses an immediate threat to life, health or safety. Such procedure shall only take place where the time taken to apply for and secure the issuance of a warrant would render ineffective the immediate action necessary to abate the condition.

11:2 Emergency inspections may also be authorized by the Governor in times of air pollution emergencies in accordance with R. S. 26:2C-32.

11:3 Where the Director or his agent is refused entry or access, or is otherwise impeded or prevented by the owner, occupant or operator from conducting an inspection of the premises, such person shall be in violation of this Code and subject to the penalties hereunder.

#### 11:4 SEARCH WARRANT OR ACCESS WARRANT

The Director may, upon affidavit, apply to the Judge of the \_\_\_\_\_ for a search warrant setting forth factually the actual conditions and circumstances that provide a reasonable basis for believing that a violation of the Code may exist on the premises, including one or more of the following:

- (a) that the premises require inspection according to the cycle established by the town for periodic inspections of premises of the type involved;
- (b) that observation of external conditions (smoke, ash, soot, odors) of the premises and its public areas has resulted in the belief that violations of this Code exist;
- (c) circumstances such as age and design of fuel-burning equipment and/or system, type of incinerator, particular use of premises or other factors which render systematic inspections of such buildings necessary in the interest of public health and safety.

If the Judge of the \_\_\_\_\_ is satisfied as to the matter set forth in the said affidavit, he shall authorize the issuance of a search warrant permitting access to and inspection of that part of the premises on which the nuisance or violation may exist.

11:5 All buildings and premises subject to this Code are subject to inspection from time to time by the Director of Air Pollution Control or his duly authorized representatives. All rooms and areas in the building shall be available and accessible for such inspection which shall be made during usual business hours if the premises are used for non-residential purposes, provided, however, that inspections may be made at other times if (a) the premises are not available during the foregoing hours for inspection; (b) there is reason to believe that violations are occurring on the premises which can be determined and proved by inspection only during other than the prescribed hours; or (c) there is reason to believe a violation exists of a character which is an immediate threat to health or safety requiring inspection and abatement without delay.

## 12: PENALTIES

12:1 Any person who shall violate any of the provisions of this Code, or who shall fail to comply therewith or with any of the requirements thereof, shall be punishable by a fine not to exceed \$500 or imprisonment for a term not to exceed 90 days, or both, for each violation. Each day that such violation shall continue shall constitute a separate offense.

12:2 The violation of any section or subsection of this Code shall constitute a separate and distinct offense independent of the violation of any other section or subsection, or of any order issued pursuant to this Code.

## 13: CONSTRUCTION AND SEPARABILITY

13:1 This Code is to be liberally construed to effectuate the purpose herein described. Nothing herein is to be construed as repealing or abridging the emergency powers of any agency of government except to the extent expressly set forth herein.

13:2 If any section, subsection, paragraph, sentence, clause, phrase, or word contained in this Code shall be declared invalid for any reason whatsoever, such decision shall not affect the remaining portions of this Code which shall remain in full force and effect.

13:3 This Ordinance is promulgated and adopted in accordance with Section 26:2C-8 of P.L. 1954, c.212 (Title 26:2C-1 to 2C-23), amended by P.L. 1962, c.215; P.L. 1967, c.105; and P.L. 1967, c.106; and nothing contained herein or any action taken hereunder is to be interpreted as being in conflict with the New Jersey Air Pollution Control Act and the New Jersey Administrative Code.

14: REPEALER

14:1 All ordinances or parts of ordinances inconsistent with the provisions of this ordinance are hereby repealed.

15: EFFECTIVE DATE

15:1 This ordinance shall take effect upon final adoption and publication in accordance with the law.



## State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
DIVISION OF ENVIRONMENTAL QUALITY  
JOHN FITCH PLAZA, P. O. BOX 2807, TRENTON, N. J. 08625

### GUIDELINES

#### For Approval of Local Government Ordinances and Applications for Federal Grants for Air Pollution Control

The New Jersey Air Pollution Control Act requires approval by the State Department of Environmental Protection of ordinances enacted by local government which are more stringent than the provisions of the said act or of the New Jersey Administrative Code.

All ordinances subject to approval will be considered initially as to their conformity with the State program plan for air pollution control and activities thereunder.

1. The Department will approve any ordinance which is more stringent than codes, rules or regulations adopted by the Department if the requirements are compatible with the State and federal codes, rules and regulations and relate to activities as follows:
  - a. Control of air pollution from open burning of refuse, rubbish, garbage, trade wastes, plant life, buildings and structures, and open burning associated with salvage and demolition operations.
  - b. Regulation of the burning and disposal of vegetation, including leaves, on residential properties and in land-clearing operations.
  - c. Control of emissions from fuel burning equipment when standards are expressed in terms of a level of visible emissions. NOTE: Section 5 of the model ordinance, which establishes a visible emission standard for fuel burning equipment, incorporates the terms "indirect-fired heat exchanger" and "direct-fired heat exchanger". Indirect-fired heat exchangers include oil burning equipment, wood-burning or coal burning stoves, and some fireplaces. Direct-fired heat exchangers include most conventional fireplaces. In keeping with the general conservation policy of the State to reduce unnecessary consumption of fuels, such as oil and natural gas, you may wish to exempt wood-burning stoves or fireplaces from this ordinance. Upon your request, the Department will provide you with assistance in developing suitable language for such exemptions.

Wood-burning stoves and fireplaces, if designed, maintained and operated properly, will comply with the model ordinance and can contribute significantly to the nation's energy conservation effort.

- d. Control of air pollution from common incinerators of less than 2,000 lbs. per hour capacity.
- e. Control and prohibition of air pollution from asbestos surface coatings.
- f. Controls involving orderly, systematic maintenance of space heating equipment.
- g. Control of public nuisances which result from sources of air pollution not subject to standards contained in codes, rules or regulations adopted by the Department.
- h. Coordination with the State Department of Environmental Protection in the enforcement of requirements for permits to construct, install and alter control apparatus or equipment which is a source of air contamination, and for certificates to operate such sources.
- i. Assistance to the State Department of Environmental Protection in investigating air pollution complaints, determining the sources of air pollution, and assembling the facts related to complaints which may lead to providing witnesses in legal actions undertaken by the Department.
- j. Cooperation and assistance to the State Department of Environmental Protection in the enforcement of air pollution control regulations applicable to the storage, sale and use of fuels which are subject to standards adopted by the State Department of Environmental Protection.
- k. On-the-road-enforcement, by the local police officers or other appropriate local officials, of standards adopted by the State for the control of emissions from motor vehicles.
- l. Enforcement of orders issued by the Governor in connection with air pollution emergencies.

Penalties assessed for violations of local ordinances are not regarded as being subject to approval by the Department.

2. In evaluating applications made by a local government for federal grants, individually or by regional cooperative arrangements, to establish or improve air pollution control programs, the Department will view unfavorably any application to fund a program whose



proposed activities are not in accord with those enumerated in Section 1 above; except that applications made for research or development projects or special health projects, with the goal of developing standards more restrictive than the state standards, will be considered on the basis of logic, feasibility, and potential for achievement of goals.

\* \* \* \* \*

By way of further information concerning the subject of air pollution control by local government, it is pointed out that:

Codes, rules or regulations promulgated by the Department under authority contained in the Act, with certain exceptions which relate to motor vehicles and declared air pollution emergencies, are not enforceable by a local government unless the provisions are adopted in a local ordinance.

The Department will conduct or promote periodic training courses designed to provide the necessary skills to enforce air pollution ordinances adopted in accordance with the criteria set forth herein.

It is not intended that these guidelines in any way modify the responsibility of local government to enforce the State Sanitary Code.

The Department believes that the ultimate control of the air pollution menace requires action at all levels of government, including federal, state, municipal, intermunicipal and regional agencies. In considering the appropriate role of each level of government, it is vital to avoid the establishment of regulatory programs which will result in duplication of effort, ineffective and inefficient use of financial and manpower resources, and conflicting or inconsistent layers of regulation upon those regulated.

Revised: January 23, 1979

Rogers & Colten

REVIEW COMMENTS ON AIR QUALITY DRAFT REPORT

... assess the report as a well and tightly written report. It could be improved by including more maps, summary tables and a more complete discussion of the need for air quality standards. The appendix material will be included as a separate coordination element to the Comprehensive Management

... See Table of Contents.

1. Summary 1, par. 1

... needs sentence on what's in sections 1-4 - *only enough*

2. Summary 2, par. 1

"Land use plans and zoning regulations with restrictions on housing densities." Can the type of restriction be specified?

3. Summary 3, par. 1

"Review of facilities..." Reword--"Coordinate review of facilities requiring air pollution control permits with NJDEP."

4. Preamble, par. 1

"This report is a compilation of data." This report is much more than a compilation of data. Perhaps "This report contains..."

5. ... indicate Pinelands boundaries on map.

6. ... par. 1

This is the pivotal paragraph in the report and should be considerably expanded. It connects the issue of air quality to protection of health and property. It would be useful to discuss each air pollutant in terms of its specific effects on health and property, particularly vegetation and its most common sources, and to relate this damage to the standards. Estimates of damage done to health and property (crops and forests, too) by air pollutants on a national or statewide basis could bolster this discussion. A table that summarizes the standards (both primary and secondary) and their rationale would also be useful.

7. ... par. 3

"reveals a similar distribution of sites which show..." What is meant by "similar distribution" if the sites examined are different?

8. ...

Lead. It would be useful to state the safety margin built into the 1.5 mg/m<sup>3</sup> standard.

9. ...

Ozone. What impact does ozone at the concentrations reported have on vegetation? Is this an issue of concern?

10. ...

An interstate map (NJ, S.C. PA, NY, DEL) showing major industrial centers and Pinelands and indicating with large arrows

What are the types of sources that are defined. Why are unpaved roads and parking lots not line sources in the tables? If they are not line sources, they should be mentioned in this paragraph.

It is suggested that you create Table 6.7 to summarize the data from Tables 6.1, 6.2, and 6.3 for the Pinelands. The following format is suggested:

Source	Point TPS SO <sub>2</sub>	Area TPS SO <sub>2</sub>	Line TPS SO <sub>2</sub> HC
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TOTAL

The table could be accompanied by a short paragraph that highlights the findings shown in the table. Or alternatively, expand Table 1.1 to this format and reference it in Section 6 at this point.

- 7.1.1. What are innovative methods for reducing low occupancy automobile use, where have they been tried and how effective are they? Alternatively, can references to such innovative methods be cited?
- 7.1.2. "PSO increments"--jargon: what does prevention of significant deterioration increments mean?
- 7.1.3. par. 1 "restrictions on housing densities" Restate: can type of restriction be specified?
- 7.1.3. par. 2 "Monitor development." Is this existing or future development? What kind of development? What are the appropriate agencies? What should be monitored? Why? What aspects of Pinelands are sensitive to what is monitored?
- 7.1.3. par. 3 "Fugitive dust sources." What is impact of this dust on Pinelands? Does it impact vegetation?
- 7.1.3. par. 4 "Innovative methods for reducing low occupancy automobile use." What are they?
- 7.1.3. par. 5 "Use of vegetated open spaces as buffers." Can the buffer size be specified as a function of generating source and receptor?
- 7.1.4. Justification of the pollutants to be monitored should be made. Why these? What in Pinelands is sensitive to these pollutants?

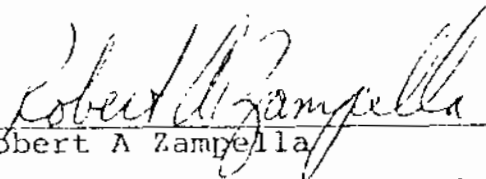
OFFICE MEMORANDUM

February 13, 19 80

TO Joanne Held

SUBJECT Air Quality Assessment

I have enclosed the comments which we discussed during our telephone comments. I will contact you when I receive EPA's comments.

  
Robert A Zampella

The preparation of this document was financed in part through a planning grant from the National Park Service, Department of Interior, under the provisions of the Land and Water Conservation Fund Act of 1965 (Public Law 88-578, as amended).