ATTACHMENT I

PLAINTIFF'S EXHIBIT

SH-750

REPORT ON AIR QUALITY

HISTORY OF TEXAS MONITORING EFFORTS

- Periodic monitoring in Texas began with 5 hi-vols in 1957 sponsored by the Public Health Service. They were located in Corpus Christi, Houston, Dallas, San Antonio, and El Paso and measured TSP and organics.

- In 1966, state monitoring began under the Texas Department of Health with intermittent hi-volume air samplers (hi-vols). Total suspended particulates (TSP), nitrates, and sulfates were measured.

- In 1966, state continuous air monitoring began for community surveys. One of the first of these surveys was conducted in San Antonio; ozone and sulfur dioxide levels were measured. Over the next five years, similar short special studies were conducted in most major cities in Texas.

- In 1967, local program monitoring began in Houston with 17 hi-vols that measured TSP and organics.

- In 1969, state monitoring of the physical effects of air pollution began. Dustfall, particulate impingement, sulfation, corrosion and tarnishing of metals, and deterioration of textiles, dyes, and rubber data were collected at these stations.

- One local program, Houston, began continuous monitoring in 1971. There were three CAMS that measured total oxidants, NO_2, CO, total hydrocarbons, and SO_2.

- In 1973, the TACB began continuous air monitoring with 21 instruments at five stations: Corpus Christi, Dallas, Houston, El Paso, and Nederland. Continuous air monitoring stations (CAMS) measure H_2S, total hydrocarbon, nonmethane hydrocarbons, methane, total sulfur, O_3, CO, SO_2, NO_2, and weather information.

- The TACB laboratory began analyzing hi-vol filters with the x-ray fluorescence analyzer in 1973. This instrument measures each filter for 32 elements including lead, arsenic, cadmium, and nickel.

- In 1982, the TACB monitoring system included 31 CAMS with 75 monitors, and 111 periodic monitors. The local programs have 30 continuous instruments and 96 periodic monitors.

- To date, we have monitored at over 250 sites, in 48 different areas throughout the state, collecting data on some 50 air contaminants.

- Additional monitoring data has resulted from special studies conducted by TACB, EPA, industry, and others. For example, data on over 40 contaminants was collected in a special study in Houston in 1981 and monitoring was conducted for some 20 contaminants in the Deer Park area in 1982.

AMBIENT AIR QUALITY STANDARDS

POLLUTANT	PRIMARY (PROTECTS HEALTH)	SECONDARY (PROTECTS WELFARE)
OZONE	0.12 PPM* HOURLY AVERAGE, NOT TO BE EXCEEDED FOR AN AVERAGE OF MORE THAN ONE DAY FOR A 3 YEAR PERIOD	SAME AS PRIMARY
NON-METHANE HYDROCARBONS (USED IN ACHEIVING OZONE STANDARD)	0.24 PPM 6-9 A.M. AVERAGE, NOT TO BE EXCEEDED FOR AN AVERAGE OF MORE THAN ONCE A YEAR	SAME AS PRIMARY
TOTAL SUSPENDED PARTICULATE	260 $\mu G/M^3$** 24-HOUR AVERAGE NOT TO BE EXCEEDED MORE THAN ONCE A YEAR	150 $\mu G/M^3$ 24-HOUR AVERAGE, NOT TO BE EXCEEDED MORE THAN ONCE A YEAR
LEAD	1.5 $\mu G/M^3$ ARITHMETIC MEAN FOR ONE CALENDAR QUARTER	SAME AS PRIMARY
SULFUR DIOXIDE	365 $\mu G/M^3$ (0.14 PPM) 24-HOUR AVERAGE, NOT TO BE EXCEEDED MORE THAN ONCE A YEAR	1,300 $\mu G/M^3$ (0.5 PPM) 3 HOUR AVERAGE, NOT TO BE EXCEEDED MORE THAN ONCE A YEAR
	80 $\mu G/M^3$ (0.03 PPM) ANNUAL AVERAGE	SAME AS PRIMARY
NITROGEN DIOXIDE	0.05 PPM ANNUAL AVERAGE	SAME AS PRIMARY
CARBON MONOXIDE	35 PPM HOURLY AVERAGE, NOT TO BE EXCEEDED MORE THAN ONCE A YEAR	SAME AS PRIMARY
	9 PPM 8-HOUR AVERAGE, NOT TO BE EXCEEDED MORE THAN ONCE A YEAR	SAME AS PRIMARY

* PARTS PER MILLION
** MICROGRAMS PER CUBIC METER

MONITORING PRIORITIES

Six basic priorities are considered in allocating the Agency's monitoring resources:

- Health -- monitoring justified by demonstrated or suspected levels of toxic contaminants or certain criteria pollutants;

- Change/Growth in Industry -- monitoring in anticipation of switching from natural gas to coal or lignite, and changes in chemical industries;

- Special Community Interest -- monitoring of criteria pollutants because of specific public or community interest;

- Complaints/Nuisance -- monitoring justified by public nuisance problems such as odor or damage to materials;

- EPA Requirements -- federally mandated monitoring that requires a network of trend monitors and monitors in nonattainment and other selected areas where high concentrations of pollutants are expected. These data are submitted routinely to EPA for inclusion in their data base.

- Background/Historic -- background monitoring is sited to determine what pollutant levels are normal in a particular area. Historic monitors are sited to indicate long-term trends.

CONCENTRATIONS AFFECTING THE EVALUATION OF AIR QUALITY DATA

Several factors influence the measurement and analysis of air pollutant data. Some examples are:

- changes in monitoring techniques
  - 1973, TACB began changing from periodic (bubbler) monitoring of total oxidants, SO_2, and NO_2 to continuous monitoring of ozone, SO_2, and NO_2.
  - October 1979, SO_2 continuous monitors changed from gas chromatography to pulse fluorescence. This change increased instrument sensitivity. As a result, we could detect and quantify lower concentrations, where zero values had been reported previously.
  - January 1980, CO continuous monitors changed from gas chromatography to nondispersive infrared. This change increased instrument sensitivty. As a result, we could detect and quantify lower concentrations, where zero values had been reported previously.
- changes in air quality standards
  - February 1979, the ozone standard was raised from .08 ppm to .12 ppm.
  - May 1979, the lead standard was promulgated by EPA.
- changes in quality assurance procedures
  - November 1975, auditing of continuous monitoring equipment began. This procedure caused a decrease in the number of valid data. However, it increased instrument accuracy.
  - July 1979, the calibration method of ozone instruments was changed from wet chemistry to

ultraviolet absorption. As a result, the accuracy of ozone measurements was increased; ozone levels determined by ultraviolet absorption are 18% lower than pre-July, 1979 data.

- January 1981, the x-ray fluorescence analyzer was recalibrated using EPA standards. As a result, lead values increased by 25-35%.

° changes in siting criteria

- Improvements in the siting of ambient monitors have been made since the early 70's. Relocation of monitors to meet stricter TACB and EPA existing requirements (elevating monitors or moving them away from wind flow obstructions) are documented to ensure proper data comparison.

NATIONAL AMBIENT AIR QUALITY STANDARDS

- The Clean Air Act amendments of 1970 required EPA to identify and establish standards for major pollutants. In April 1971, EPA set primary and secondary national ambient air quality standards for six "criteria" pollutants -- photochemical oxidants, carbon monoxide, non-methane hydrocarbons, sulfur dioxide, nitrogen dioxide, and total suspended particulate. Primary standards were designed to protect public health, while more stringent secondary standards were set to protect public welfare.

- On September 14, 1973, the EPA revoked the annual and 24-hour secondary ambient air quality standard for sulfur dioxide.

- Following a 1976 court order to list lead as a criteria pollutant for the development of an ambient standard, and EPA's issuance of a proposed standard on December 14, 1977, the primary and secondary ambient air quality standards for lead were promulgated on October 5, 1978. National primary and secondary ambient air quality standards for lead are 1.5 ug/m^3, maximum arithmetic mean averaged over a calendar quarter.

- In 1979, EPA reviewed and revised the criteria upon which the primary and secondary photochemical oxidant standards were based. They raised the primary and secondary standard from .08 to 0.12 ppm, changed the procedures for determining attainment, and redefined the standard to refer only to ozone.

- The national ambient air quality standards for hydrocarbons were not based on direct health or welfare effects but were intended only as a guide for the States to determine the extent of hydrocarbon emission reductions required to attain ozone standards. On January 5, 1983, EPA revoked the primary and secondary standards for hydrocarbons, stating that there was insufficient evidence to establish a relationship between hydrocarbons and ozone.

1972 SIP DEVELOPMENT

- 1970 Amendments to the Federal Clean Air Act required states to measure or estimate ambient air quality and enforce rules to reduce emissions in areas identified to have actual or potential air quality problems.

- Measured air quality data in Texas was available for total suspended particulates, sulfur dioxide, nitrogen dioxide, and total oxidants, from a network of approximately 100 hi-vols and bubblers.

- A 1972 Texas State Implementation Plan was prepared, based primarily on estimated air quality, which included control strategies for TSP and SO_2 in all TACB regions, carbon monoxide in Region 11, ozone and hydrocarbons in Regions 3, 5, 7, 8, 9, and 11, and oxides of nitrogen in Regions 5 and 8.

- EPA substantially approved the proposed Texas plan in May 1972.

- As a result of state control regulations included in the 1972 SIP, emissions of nationally regulated pollutants were significantly reduced in most areas of the state. Although air quality was perceptibly improved in many areas, measured concentrations of the specified pollutants generally remained the same.

TACB MONITORING NETWORK

In 1977, the TACB monitoring network had expanded to 23 CAMS with 91 monitors and 162 periodic monitors.

- To monitor criteria pollutants, there were 23 O_3, 19 NO_2, 16 continuous SO_2, 19 CO, 19 hydrocarbon, and 95 TSP monitors. Some of this equipment had been in place for four years; others less than one year.

- Hi-vols filters had been routinely analyzed for nitrate, sulfate, organics, and the 32 XRF elements for four years. TSP measurements had been collected for 11 years.

- Bubbler monitors had been measuring NO_2, SO_2, ammonium, total oxidants, and aldehydes air pollutant levels for nine years.

AIR QUALITY IN TEXAS, 1977

- Sulfur dioxide: From 1975 through 1977, the sulfur dioxide standards were not exceeded anywhere in Texas. The second highest concentration of SO_2 recorded during this period was 0.23 ppm (3-hour average) in El Paso.

- Total suspended particulate: Increased road and building construction, and fugitive dust from unpaved roads and agricultural activities, caused many areas in Texas to exceed the national ambient air quality standard for particulate matter. In most cases, this was a localized problem in limited areas around the monitors. The highest annual geometric mean of 153 ug/m^3 was recorded in El Paso in 1977.

- Ozone: From 1975 to 1977 the 0.08 ppm, one-hour average ozone standard was exceeded at every site in Texas where ozone was measured. The second highest hourly reading, 0.26 ppm, was recorded in Houston (Aldine) in 1977.

- Hydrocarbons: The National Ambient Air Quality Standard for non-methane hydrocarbons was promulgated only as a guide to be used in developing strategies for the attainment of the ozone standard.

- Carbon Monoxide: Carbon monoxide levels, in general, remained well below the national standards in all areas in Texas. The second highest 8-hour average was 9.7 ppm recorded in El Paso.

- Nitrogen dioxide: Nitrogen dioxide levels remained well below the primary annual standard. The highest annual average (0.03 ppm) was recorded in Houston, Dallas, and Fort Worth.

- Chemical elements analyzed by XRF: An analysis of XRF results indicated that concentrations of the 32 elements measured at most sites throughout Texas were very low and presented no health hazards.

- Other contaminants (sulfate, nitrates, organics, aldehydes, etc.): Analyses of results indicated that concentrations measured throughout Texas presented no significant health or welfare problems.

FEDERAL CLEAN AIR ACT AMENDMENTS AND NONATTAINMENT AREAS

- In 1977, Congress amended the Clean Air Act to extend the attainment deadlines established in the 1970 amendments and to require additional controls in areas where air quality standards continued to be exceeded.

- States were required to submit to EPA a list identifying air quality regions which did not meet the NAAQS for the six criteria pollutants, based on monitored data or air quality modeling calculations.

- On January 9, 1978, the TACB submitted to EPA a list of areas for which state monitoring data showed ambient concentrations of TSP, ozone, and carbon monoxide to be higher than the NAAQS.

- On September 11, 1978, EPA identified 15 Texas counties as nonattainment areas for ozone, 25 areas in 10 counties as nonattainment for TSP, and one area as nonattainment for carbon monoxide. The remainder of the state was classified as attainment (acceptable air quality) or unclassifiable (unknown air quality).

- These "nonattainment" areas were to be addressed in a 1979 SIP revision outlining the methods by which the standards were to be attained by December 31, 1982. This revised SIP was submitted on March 30, 1979.

- The 1979 Texas SIP included control strategies for TSP in Regions 4, 5, 7, 8, and 11; CO in Region 11; and ozone and hydrocarbons in Regions 5, 7, 8, 9, and 11.

- EPA approved the Texas SIP on March 25, 1980, for all areas, with conditional approval of the Harris County ozone plan, for which an extension until 1987 had been requested and granted.

TACB MONITORING NETWORK

By 1982, the TACB monitoring network had changed in size and number of pollutants measured.

- The Agency monitored 48 pollutants at 31 CAMS and 111 periodic monitors. The decrease in periodic monitoring resulted from a reevaluation of monitoring priorities. Because of this, TSP monitoring in areas which had a history of low levels was discontinued.

- State continuous monitors for criteria pollutants have increased to 25 O_3, 24 SO_2, 14 NO_2, and 11 CO over the past 10 years. There are now 93 state hi-vols. We have measured particulate levels for 17 years and heavy metals for 10 years.

AIR QUALITY IN TEXAS, 1982

From 1977 to 1982, most areas of the state were in compliance with federal standards.

- Sulfur dioxide: Measured SO_2 concentrations across the state remained well below the federal standard. The second highest 3-hour average value of 0.37 ppm was reported in Port Arthur in 1982.

- Total suspended particulates: The highest annual geometric mean value of 177 ug/m^3 was recorded in El Paso in 1982. The second highest annual geometric mean of 155 ug/m^3 was also recorded in El Paso.

- Ozone: Most of the urban centers in Texas showed little change in highest ozone concentrations. Although annual variations are not uncommon because of weather changes, several years of measurements have shown no discernible changes or trends in ozone concentrations in Texas. The second highest hourly value of 0.27 ppm was recorded in Seabrook in 1981.

- Carbon monoxide: The one-hour standard for CO has not been exceeded in Texas; however, the eight-hour standard of 9.0 ppm averaged over an eight-hour period was exceeded in El Paso. All of the high values in El Paso occurred during the winter months when stagnant weather conditions reduced air movement and allowed CO to accumulate.

- Nitrogen dioxide: The nitrogen dioxide ambient air standard for NO_2 has never been exceeded in any of the urban areas of Texas. The highest annual arithmetic mean of 0.02 ppm was recorded in Houston, Dallas, and Fort Worth in 1982.

- Lead: Measured ambient lead concentrations were below the federal standard for most urban areas except for El Paso and Dallas. Analysis of elemental data indicated that automotive and lead smelter emissions are the major cause of high values at the nonattainment monitor site in El Paso. Two areas in the vicinity of secondary lead smelters in Dallas have also recorded lead values above the national standard. The highest concentration recorded in 1982 was 6.38 ug/m^3 in El Paso.

- Elemental pollutants: The concentrations of all elements measured were below levels known to be hazardous to human health.

NONATTAINMENT AREA REDESIGNATIONS

- Between 1979 and 1982 the following areas were redesignated from nonattainment to attainment because of improvement in air quality or a change in the ozone standard
  - Total suspended particulate: 8 areas in Eagle Pass, McAllen, Progresso, El Paso, Dallas, and Fort Worth.
  - Ozone (4 counties): Travis, McLennan, Ector, and Bexar.

- The following areas were redesignated as unclassifiable because the original designations were based on data from monitors not conforming with the latest EPA siting criteria.
  - Total suspended particulate: 8 areas in El Paso, Galveston, Houston, Fort Worth, and San Antonio.

EPA's RESPONSE TO AREAS NOT IN ATTAINMENT

On February 3, 1983, EPA published its proposal for dealing with those areas which have exceeded the NAAQS after December 31, 1982. Economic sanctions will be enforced in areas where the NAAQS have not been attained.

- EPA differentiates between areas where there is a high probability of attainment (Tier I) and areas where the agency believes such a demonstration cannot be made based on actual air quality data (Tier II). Sanctions are proposed for Tier II nonattainment areas.

- In Texas, seven counties have been designated Tier I for ozone: Brazoria, Galveston, Jefferson, Orange, Victoria, Gregg, and Nueces. Portions of four counties have been designated Tier I for total suspended particulates: El Paso, Nueces, Cameron, and Harris.

- Three counties, Dallas, Tarrant, and El Paso, have been designated Tier II for ozone, a portion of one county, El Paso, has been designated Tier II for CO, and a portion of four counties, Cameron, El Paso, Harris, and Nueces, designated Tier II for TSP. Sanctions have been proposed for these areas.

- The economic sanctions proposed for Tier II areas could include:
  - Ban on construction of all new major emitting facilities in the nonattainment areas.
  - Withholding federal funding for highways.
  - Partial or total withdrawl of federal funding for construction of wastewater treatment facilities.