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A Study of Ambient TSP Levels Near Major Steel Facilities

(1978-1980 Update)

Volume I

EPA-340/1-83-024a

A Study of Ambient TSP Levels Near Major Steel Facilities

(1978-1980 Update) Volume I

by

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ABSTRACT

Ambient air quality statistics have been updated to include 1978-1980 data for TSP, BaP, and BSO for the vicinities of the 50 major integrated steel facilities in the United States. For each mill, conclusions have been drawn concerning the impact of the mill as discerned through pollution roses and analyses of the conditions occurring on days on which the National Ambient Air Quality Standards have been exceeded. Trends in the 12-month running geometric means of TSP have been examined. Statistical summaries of the data are presented such that the attainment status of the vicinity of each mill could be easily determined. Data included in the analyses were composed of those available from the National Aerometric Data Bank as well as special study data obtained from EPA and state and local agencies.

Seventy percent of the stations used in the analyses demonstrate long-term downward trends in TSP levels. During 1980, there were seven steel mills for which the nearby monitoring stations indicated no violations of the primary TSP standards.

The methodology for the analysis is described and the results are presented in a separate section for each steel mill.

Table of Contents

	Page
VOLUME I	
Acknowledgment	ix
Methodology	xi
Summary	xxv
Armco Steel, Hamilton, Ohio	1-1
Armco Steel, Middletown, Ohio	2-1
Armco Steel, Ashland, Kentucky	3-1
Armco Steel, Houston, Texas	4-1
Bethlehem Steel, Sparrows Point, Maryland	5-1
Bethlehem Steel, Lackawanna, New York	6-1
Bethlehem Steel, Bethlehem, Pennsylvania	7-1
Bethlehem Steel, Burns Harbor, Indiana	8-1
CF & I Steel, Pueblo, Colorado	9-1
Crucible Steel, Midland, Pennsylvania	10-1
Ford Motor Company, Dearborn, Michigan	11-1
Inland Steel, East Chicago, Indiana	12-1
Interlake Steel, Chicago, Illinois	13-1
Jones & Laughlin Steel, Aliquippa, Pennsylvania	14-1
Jones & Laughlin Steel, East Chicago, Indiana	15-1
Jones & Laughlin Steel, Pittsburgh, Pennsylvania	16-1
Jones & Laughlin Steel, Cleveland, Ohio	17-1
Jones & Laughlin Steel, Youngstown, Ohio	18-1
Kaiser Steel, Fontana, California	19-1
Lone Star Steel, Lone Star, Texas	20-1
National Steel, Weirton, West Virginia	21-1
National Steel, Granite City, Illinois	22-1
National Steel, Detroit, Michigan	23-1
Republic Steel, Buffalo, New York	24-1
Republic Steel, Birmingham, Alabama	25-1
VOLUME II	
Republic Steel, Gadsden, Alabama	26-1
Republic Steel, Canton, Ohio	27-1
Republic Steel, Chicago, Illinois	28-1
Republic Steel, Cleveland, Ohio	29-1
Republic Steel, Warren, Ohio	30-1
Republic Steel, Youngstown, Ohio	31-1
Sharon Steel, Fairmont, West Virginia	32-1
Sharon Steel, Farrell, Pennsylvania	33-1

(Continued)

Table of Contents (Concluded)

	Page
VOLUME II (Continued)	
United States Steel, Braddock, Pennsylvania	34-1
United States Steel, Clairton, Pennsylvania	35-1
United States Steel, Duquesne, Pennsylvania	36-1
United States Steel, Fairless Hills, Pennsylvania	37-1
United States Steel, Homestead, Pennsylvania	38-1
United States Steel, Saxonburg, Pennsylvania	39-1
United States Steel, Fairfield, Alabama	40-1
United States Steel, Chicago, Illinois	41-1
United States Steel, Cleveland, Ohio	42-1
United States Steel, Gary, Indiana	43-1
United States Steel, Lorain, Ohio	44-1
United States Steel, Youngstown, Ohio	45-1
United States Steel, Geneva, Utah	46-1
Wheeling-Pittsburgh Steel, Follansbee, West Virginia	47-1
Wheeling-Pittsburgh Steel, Monessen, Pennsylvania	48-1
Wheeling-Pittsburgh Steel, Steubenville, Ohio	49-1
Wisconsin Steel, Chicago, Illinois	50-1

Appendix A--ANNUAL ARITHMETIC MEANS FOR 1978-1980

Appendix B--TSP STANDARD EXCEEDANCE LISTING (available from authors upon request)

Steel Mills Indexed by EPA Region

	Page
REGION II	
Bethlehem Steel, Lackawanna, New York	6-1
Republic Steel, Buffalo, New York	24-1
REGION III	
Bethlehem Steel, Sparrows Point, Maryland	5-1
Bethlehem Steel, Bethlehem, Pennsylvania	7-1
Crucible Steel, Midland, Pennsylvania	10-1
Jones & Laughlin Steel, Aliquippa, Pennsylvania	14-1
Jones & Laughlin Steel, Pittsburgh, Pennsylvania	16-1
National Steel, Weirton, West Virginia	21-1
Sharon Steel, Fairmont, West Virginia	32-1
Sharon Steel, Farrell, Pennsylvania	33-1
United States Steel, Braddock, Pennsylvania	34-1
United States Steel, Clairton, Pennsylvania	35-1
United States Steel, Duquesne, Pennsylvania	36-1
United States Steel, Fairless Hills, Pennsylvania	37-1
United States Steel, Homestead, Pennsylvania	38-1
United States Steel, Saxonburg, Pennsylvania	39-1
Wheeling-Pittsburgh Steel, Follansbee, West Virginia	47-1
Wheeling-Pittsburgh Steel, Monessen, Pennsylvania	48-1
REGION IV	
Armco Steel, Ashland, Kentucky	3-1
Republic Steel, Birmingham, Alabama	25-1
Republic Steel, Gadsden, Alabama	26-1
United States Steel, Fairfield, Alabama	40-1
REGION V	
Armco Steel, Hamilton, Ohio	1-1
Armco Steel, Middletown, Ohio	2-1
Bethlehem Steel, Burns Harbor, Indiana	8-1
Ford Motor Company, Dearborn, Michigan	11-1
Inland Steel, East Chicago, Indiana	12-1
Interlake Steel, Chicago, Illinois	13-1
Jones & Laughlin Steel, East Chicago, Indiana	15-1
Jones & Laughlin Steel, Cleveland, Ohio	17-1
Jones & Laughlin Steel, Youngstown, Ohio	18-1

(Continued)

Steel Mills Indexed by EPA Region (Concluded)

	Page
REGION V (Continued)	
National Steel, Granite City, Illinois	22-1
National Steel, Detroit, Michigan	23-1
Republic Steel, Canton, Ohio	27-1
Republic Steel, Chicago, Illinois	28-1
Republic Steel, Cleveland, Ohio	29-1
Republic Steel, Warren, Ohio	30-1
Republic Steel, Youngstown, Ohio	31-1
United States Steel, Chicago, Illinois	41-1
United States Steel, Cleveland, Ohio	42-1
United States Steel, Gary, Indiana	43-1
United States Steel, Lorain, Ohio	44-1
United States Steel, Youngstown, Ohio	45-1
Wheeling-Pittsburgh Steel, Steubenville, Ohio	49-1
Wisconsin Steel, Chicago, Illinois	50-1
REGION VI	
Armco Steel, Houston, Texas	4-1
Lone Star Steel, Lone Star, Texas	20-1
REGION VIII	
CF & I Steel, Pueblo, Colorado	9-1
United States Steel, Geneva, Utah	46-1
REGION IX	
Kaiser Steel, Fontana, California	19-1

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The assistance of personnel from the state and local agencies in the jurisdictions in which the steel mills are located is acknowledged. These individuals, too numerous to mention their names, helped in the identification of monitoring sites impacted by steel mill emissions. Special appreciation is extended to staff in the Pennsylvania, New York, New Jersey, Alabama, Jefferson County (AL), and Allegheny County (PA) agencies who provided special study data to be included in the report. Also, special thanks are extended to CF&I Steel Corporation, U.S. EPA Region V, and the Ontario Ministry of the Environment who also provided data.

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METHODOLOGY

PURPOSE OF THE STUDY

This document is intended to serve as a site-specific reference volume that outlines available information concerning total suspended particulate (TSP), benzo-a-pyrene (BaP), and benzene soluble organics (BSO) levels in the vicinities of the 50 large integrated steel mills in the United States. This document updates the previous analyses (Pickering et al. 1979) performed by GEOMET Technologies, Inc., on TSP data observed, during the period 1972-1977, in the vicinities of the 50 major steel facilities in the United States. The update extends the data record analyzed through 1980. The original document as well as the update are intended to provide both EPA headquarters and regional enforcement staff with an easily accessible reference containing air quality data and interpretation for the vicinities of the steel mills for which they are involved in enforcement activity.

SELECTION OF MONITORING SITES

All monitoring sites for which data had been employed in the original analysis were reviewed, and only those that had best demonstrated mill impact or served as background stations were chosen. Mill impact was determined primarily through the use of pollution roses. State and local air pollution control agencies were contacted to determine if the selected stations were in continued operation and to determine if any new stations had been established in the vicinities of the mills. The stations employed in the original analysis, but not in this update, include those that demonstrated minimal impact of the mill due to either their distance from the mill or their being situated in a direction from the mill that seldom has persistent winds blowing toward it. Also included in the group of stations not considered in this report are those for which the impact of the mill is masked due to other sources of TSP, such as road dust in the case of stations improperly sited according to EPA guidelines or other urban sources in the case of a site located between a steel mill and a downtown area. Data were not repeated in this report for special study sites that existed only in the year 1977 or earlier.

The original analyses (the 1972-1977 report) contained an assessment of the adequacy of the hi-vol networks in the vicinity of each of the mills. This assessment was based on an evaluation of the sites relative to the EPA siting guidelines for TSP monitors (Federal Register 1979) and on an evaluation of the monitor locations relative to the frequencies of persistent winds by direction. A network was judged to be adequate to represent the air quality in the vicinity of the mill if the monitors met EPA guidelines and at least one monitoring site was situated such that it would be downwind of the steel mill frequently during persistent wind conditions. The original analysis showed that during 1972-1977 the monitoring networks were fully adequate to demonstrate representative TSP levels in the vicinity of 11 steel

mills. These mills are listed in Table 1. Most of the mills not adequately monitored were so due to the lack of monitors in locations that would be downwind of the mill frequently under persistent wind conditions. All 11 of these mills remained adequately monitored during 1978-1980. Seven additional mills became adequately monitored during the 1978-1980 period. These steel mills are listed in Table 2. However, at five of these seven mills the improved network was the result of special studies conducted by EPA Region V. After the termination of these special studies, the five mills reverted to being inadequately monitored.

During the course of the station selection activity, contacts were made with the state and local agencies performing the monitoring to obtain information regarding monitoring site changes during the 1978-1980 period. If more information is desired concerning the monitoring sites than is presented in this report, the reader may refer to Table 3, which presents relevant agency addresses and telephone numbers.

DATA ACQUISITION

The vast majority of the TSP data was obtained through retrievals from EPA's National Aerometric Data Bank (NADB) maintained by the EPA National Air Data Branch on the EPA UNIVAC computer at Research Triangle Park, North Carolina. These data were supplemented by data on hard copy obtained from the state and local agencies for periods unavailable from NADB. These periods consisted mainly of the last quarter of 1980 that, in a number of cases, had not yet been entered into NADB. In addition, TSP data were also obtained from Region V and from CF & I Steel, who have operated special study hi-vol networks. The Ontario Ministry of the Environment contributed data from stations impacted by one of the mills. There were two mills for which no TSP monitors are located in close enough proximity to be useful in assessing mill impact.

Wind data from NADB were retrieved for appropriate sites where available. For most of the mills, however, local airport wind data was used. These data are summarized for each day in the National Climatic Center publication, Local Climatological Data. There were four mills for which no computer-compatible wind data were available for the 1978-1980 period.

Data for BaP or BSO are available for the vicinities of 20 mills. These data were obtained from state and local agencies, and from EPA Region V (Regan 1983). BaP and BSO are products of incomplete combustion and pyrolysis. BaP, one of several polynuclear aromatic hydrocarbons that are emitted, has proven to be carcinogenic in animal studies; coke ovens are the major source of BaP within integrated steel mills.

TABLE 1. STEEL MILLS WITH TSP NETWORKS JUDGED ADEQUATE FOR 1972-1977

Armco Steel--Middletown, OH
Bethlehem Steel--Lackawanna, NY
CF & I Steel--Pueblo, CO
National Steel--Detroit, MI
Republic Steel--Buffalo, NY
Republic Steel--Canton, OH
Republic Steel--Warren, OH
Sharon Steel--Farrell, PA
U.S. Steel--Homestead, PA
Wheeling-Pittsburgh--Steubenville, OH
Wheeling-Pittsburgh--Monessen, PA

TABLE 2. STEEL MILLS WITH TSP NETWORKS THAT BECAME ADEQUATE DURING 1972-1977

Bethlehem Steel--Burns Harbor, IN*
Inland Steel--East Chicago, IN*
Jones & Laughlin Steel--East Chicago, IN*
National Steel--Granite City, IL
U.S. Steel--Fairless Hills, PA
U.S. Steel--Gary, IN*
U.S. Steel--Lorain, OH*

* Became adequate due to special study.

TABLE 3. STATE AND LOCAL AGENCIES OPERATING TSP MONITORING NETWORKS NEAR MAJOR STEEL MILLS

Steel mill number	Agency	Address	Telephone
26	Alabama Air Pollution Control Commission	645 S. McDonough Street Montgomery, AL 36130	205-834-6570
25, 40	Jefferson County Department of Health	1400 Sixth Avenue, South Birmingham, AL 35202	205-933-9110
19	South Coast Air Quality Management District	9150 Flair Drive El Monte, CA 91731	213-572-6200
9	Pueblo City/County Health Department	151 Central Main Street Pueblo, CO 81003	303-544-8376
	Colorado Air Pollution Control Division	4210 E. 11th Avenue Denver, CO 80220	303-320-4180
13, 22, 28, 41, 50	Illinois Environmental Protection Agency	2200 Churchill Road Springfield, IL 62706	217-782-7326
8, 12, 15, 43	Indiana State Board of Health	1330 W. Michigan Street Indianapolis, IN 46206	317-633-0644
3	Kentucky Division of Air Pollution Control	Ft. Boone Plaza 18 Reilly Road Frankfort, KY 40601	502-564-3382
5	Maryland Air Management Administration	201 W. Preston Street Baltimore, MD 21201	301-383-3245
11, 23	Wayne County Air Pollution Control Division	1311 E. Jefferson Street Detroit, MI 48207	313-224-4650
37	New Jersey Bureau of Air Pollution Control	CN027 Trenton, NJ 08625	609-292-5450
6, 24	Erie County Department of Environment and Planning	95 Franklin Street Buffalo, NY 14202	716-846-6370
	New York State Department of Environmental Conservation	50 Wolf Road Albany, NY 12223	518-457-7127
1, 2, 17, 18, 21, 27, 29, 30, 31, 42, 44, 45, 47, 49	Ohio Environmental Protection Agency	361 E. Broad Street Columbus, OH 43215	614-462-8674
7, 10, 14, 33, 48	Pennsylvania Bureau of Air Quality Control	200 N. Third Street P.O. Box 2063 Harrisburg, PA 17120	717-787-9702
16, 34, 35, 36, 38	Allegheny County Health Department .	301 39th Street Pittsburgh, PA 15201	412-578-8101
4	Texas Air Control Board	6330 Highway 290 East Austin, TX 78723	512-451-5711
46	Utah Department of Health	150 W. North Temple Salt Lake City, UT 84110	801-533-6108
21, 32, 47, 49	West Virginia Air Pollution Control Commission	1558 Washington Street, East Charleston, WV 25311	304-348-3286
23	Ontario Ministry of the Environment (Southwestern Region)	985 Adelaide Street, South London, Ontario N6E 1V3 Canada	519-681-3600

ELEMENTS OF THE ANALYSES

This document contains a section dealing with each of the 50 mills that contains the following items:

- Updated monitoring site characteristics table* including new stations
- TSP roses for 1978-1980 on an area map of the mill environs
- Trend graphs of 12-month running geometric means of TSP for the period 1973-1980
- Statistical summaries of the TSP data for 1972-1980 (one page per station)
- Air quality standard exceedance roses in tabular form for both the primary and secondary 24-hour TSP standards, giving both the number of occurrences and the mean value of the exceedance cases for each wind direction over the period 1972-1980
- BaP or BSO roses for 1978-1980 on an area map of the mill environs (if available)
- Graphs of monthly average, monthly composite, or quarterly composite BaP or BSO values (if available)
- A summary page that discusses the trend graphs and discusses the roses and the attainment status indicated for individual stations for the individual years.

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* Table includes all sites that have been identified near the mills (i.e., all those used in the 1973-1977 analysis, plus new sites). Data have been analyzed in this report for a subset of this list containing those sites best demonstrating air quality impacts of the mills.

CALCULATIONS

Geometric mean values of TSP were computed for each month from January 1973 through December 1980 using data for the 12-month period ending that month. Computations were made as follows:

$$M_g = \exp\left(\frac{\sum_{i=1}^{N} \ln C_i}{N}\right)$$

Where C_i are the individual 24-hour TSP readings and N is the number of readings in the 12-month period being considered. Computer graphics were employed to display the trends of the geometric means. The same summary criteria as used by the EPA Monitoring and Data Analysis Division were employed in the computation of geometric means (at least five observations had to be distributed representatively throughout each quarter of the 12-month period).

Wind speed and direction data from the vicinity of each mill (1 or more stations) were used to compute a value of a wind persistence index (ω) for each day. The index used is the ratio of the resultant wind speed for the day to the scalar average wind speed for the day and is computed as follows:

$$\omega = \frac{\sqrt{\left[\sum_{i=1}^{24} R_i \cos \theta_i\right]^2 + \left[\sum_{i=1}^{24} R_i \sin \theta_i\right]^2}}{\sum_{i=1}^{24} R_i}$$

Where R_i is the hourly wind speed and θ_i is the hourly wind direction.

Values of ω range from 0 to 1. On a day with high wind persistence one can say with greater confidence that a particular hi-vol loading came from a source in the direction from which the wind was blowing than on a day with a lower value of ω.

The impact on TSP by the steel mills was illustrated through the construction of pollution roses using monitoring data for days with persistent winds (with ω greater than or equal to a designated cut-off value). Mean values of TSP were computed for each of 16 wind direction sectors after matching each TSP value with its corresponding 24-hour average wind direction and wind persistence value. Cut-off values of ω were generally chosen such that each sector could be represented. The length of each ray on the pollution rose is equivalent to the averaged TSP received from that direction during the period.

Statistical summary pages for the period 1972-1980 were generated for each monitoring station. The summaries include the following parameters:

- Number of observations
- Geometric mean
- Geometric standard deviation
- Extrapolation of highest expected 24-hour TSP value using Larsen's method (Larsen 1971)
- Highest and second-highest observed TSP values along with their dates of occurrence
- Number of observations exceeding the Federal Primary 24-hour Standard of 260 $\mu g/m^3$
- Number of observations exceeding the Federal Primary 24-hour Standard of 150 $\mu g/m^3$
- Frequency distribution of the observed data.

The geometric standard deviation was computed as follows:

$$S_g = \exp \left[\frac{\sum_{i=1}^{N} \ln^2 C_i}{N} - \frac{\left(\sum_{i=1}^{N} \ln C_i \right)^2}{N^2} \right]^{1/2}$$

The observed data were used to extrapolate the highest expected 24-hour TSP value in each calendar year using the Larsen method which assumes that the TSP values are log-normally distributed:

$$C_{max} = M_g S_g^{2.94}$$

For some applications of the data contained in these volumes, the annual arithmetic mean of the TSP concentrations may be more useful than the annual geometric mean. Therefore, annual arithmetic means have been computed from the raw data for all sites considered in these volumes for the years 1978, 1979, and 1980. These values appear in Appendix A.

Two added features were included in the updated analyses: (1) the computation of the Spearman rank correlation coefficient for each station and (2) the construction of standard exceedance roses for each monitoring site.

The Spearman rank correlation coefficient was used to evaluate the long-term trend of the 12-month running geometric means at each station. The coefficient ranges from -1.0 to +1.0 and is a measure of the direction and constancy of a trend. The geometric means were ranked from low to high, and the months were ranked from least to most recent. For the data covering the period 1973-1980, the month of January 1973 would be ranked first and the month of December 1980 would be ranked last. The coefficient (r_s) is computed by the following formula:

$$r_s = 1 - \frac{6 \sum_i d_i^2}{(n-1)n(n+1)}$$

where

d_i = the difference in ranks for the ith pair

n = number of paired ranks.

The standard exceedance roses consist of two tables (one for the primary 24-hour standard and one for the 24-hour secondary standard) for each mill, which for each station give both the number of occurrences and the mean value of the standard exceedance cases associated with each wind direction. Also, the exceedance cases are broken down within each wind direction according to whether they were associated with winds that were persistent (i.e., above some criteria value of ω, the wind persistence indicator) or variable. In addition, listings were generated of all individual exceedances of the secondary 24-hour standard (150 $\mu g/m^3$) for all the monitoring stations. For each exceedance case, the date, the resultant wind direction, wind speed, and persistence indicator are also listed. These listings appear in Appendix B, which may be obtained from the authors upon request.

WIND DATA REPRESENTATIVENESS

Table 4 lists the meteorological stations from which wind data were employed for constructing the pollution roses and standard exceedance roses. Wind data obtained from NADB was more prone to have missing values than the airport winds; therefore, a backup airport station was employed for mills using a NADB site as the primary source of wind data, unless use of airport data would be obviously inappropriate.

The question of how well the meteorological data used in constructing the pollution roses represents the monitoring sites is critical in this study. The term point-to-point representativeness is used for this purpose following the convention of Nappo et al. (1982) and distinguishes this concept from measurement representativeness and from point-to-volume representativeness.

TABLE 4. METEOROLOGICAL DATA STATIONS (1978-1980) USED IN UPDATED ANALYSES

Mill Number	Primary Station	Secondary Station
1	Greater Cincinnati Airport	
2	Greater Cincinnati Airport	
3	NADB #180080010	Huntington Tri-State Airport
4	NADB #452560034	
5	Baltimore-Washington Int'l Airport	
6	Buffalo Airport	
7	NADB #390780017	
8	NADB #153420011	Chicago Midway Airport
9	No digitized data available	
10	Greater Pittsburgh Airport	
11	Morton Dock-Windsor, Ontario	Wayne County Airport
12	NADB #153420001	Chicago Midway Airport
13	Chicago Midway Airport	
14	NADB #390440004	Greater Pittsburgh Airport
15	NADB #153420001	Chicago Midway Airport
16	Greater Pittsburgh Airport	
17	Cleveland Hopkins Airport	
18	Youngstown Municipal Airport	
19	No digitized data available	
20	No analysis possible	
21	NADB #366420012	
22	St. Louis Airport	
23	Morton Dock-Windsor, Ontario	Wayne County Airport
24	Buffalo Airport	
25	Birmingham Airport	
26	Birmingham Airport	
27	NADB #361000001	Akron-Canton Airport
28	Chicago Midway Airport	

(continued)

TABLE 4. (concluded)

Mill number	Primary station	Secondary station
29	Cleveland Hopkins Airport	
30	Youngstown Municipal Airport	
31	Youngstown Municipal Airport	
32	No digitized data available	
33	Youngstown Municipal Airport	
34	Greater Pittsburgh Airport	
35	Greater Pittsburgh Airport	
36	Greater Pittsburgh Airport	
37	NADB #391080012	
38	Greater Pittsburgh Airport	
39	No analysis possible	
40	NADB #011300003	Birmingham Airport
41	Chicago Midway Airport	
42	Cleveland Hopkins Airport	
43	NADB #153420011	Chicago Midway Airport
44	Cleveland Hopkins Airport	
45	Youngstown Municipal Airport	
46	No digitized data available	
47	NADB #366420012	
48	Greater Pittsburgh Airport	
49	NADB #366420012	
50	Chicago Midway Airport	

Nappo et al. point out a number of the important elements that influence point-to-point representativeness, including but not limited to changes in surface roughness, topography, or atmospheric stability. In addition, there is the combined influence of the separation distance and the local synoptic and mesometeorological situation. Nappo et al. also describe the differences that will result, depending on the meteorological parameter that is of concern. They conclude with recommendations for further literature review/research, for the use of their described statistical techniques in intensive field programs/meteorological monitoring networks, for the inclusion of representativeness assessments in reporting, and for further joint efforts such as the workshop that they report. Their final recommendation is for the development of evaluation criteria "...although value judgment will be properly exercised in the scientific community."

A limited literature search has produced several references that provide data indirectly related to the subject of concern in this study, but that could only prove of limited value after considerable additional effort (Cormier 1975, Shreffler 1983, and Fujita and Wakimoto 1982).

In view of the limited and indirectly related quantitative data on this subject, and our agreement with Nappo et al. that value judgments be properly exercised, we have followed the approach of developing experienced judgments as to the representativeness of the meteorological sites to the TSP monitoring sites. In order to make the approach as objective as we could, and to take advantage of the fact that we have a number of experienced micrometeorologists/diffusion meteorologists readily available to us, we employed what has been called the Delphi approach. This involves defining the problem separately to a number of different experts in the field, and soliciting their best individual judgments as to the answer. These judgments are then combined, the degree of consistency is determined, and where significant disagreements are observed, if any, these are resolved by further consultation with experts, separately or together.

The question was posed to our experts in the form of the table in which we later present the results. It combines the two primary critical parameters (distance and topography, including surface roughness). The experts were asked to enter in each cell in the matrix their judgment of the representativeness of the meteorological station to the monitor site as Excellent (E), Very Good (VG), Good (G), or Unknown (U). The fourth rating (Unknown) was originally set as Poor, but it soon became evident that the word Poor implied a known degree of unrepresentativeness, when in fact it usually arose because the distance between the two sites became great enough as to cast doubt, but not to ensure nonrepresentativeness. In some specific cases, in fact, when the rating scheme was applied to the sites being studied, it was the judgment of the rater that there was a fair (but undefinable) chance that the meteorological data were applicable to the monitor site. A case in point is when the sites are juxtaposed similarly on a lake shore (implying representativeness), but are simply too far apart (say, greater than 25 km) to provide any assurance.

The raters vary widely in experience: education ranges from a Bachelor's to a Doctorate in Meteorology; field experience from a year or so to as much as 20 years; and research and theoretical experience from none to many years. There were seven of them, and the results were as follows: 6 of the 56 cells had unanimous results, in that all seven raters assigned the same rating. Seventeen of the cells (30%) had five or more of the raters (70%) giving the same rating. An additional 24 cells had two adjacent ratings (E-VG or VG-G or G-U) with scores of 3 and 3 or 4 and 2 for a total of six raters with adjacent ratings. These two situations account for 41, or 73% of the cells.

Of the remaining 15 cells, 14 more (total of 55, or 96%) had a single rating with at least three raters' entries, and one had no consensus (not more than two votes for any one rating). Of the total ratings given (392, or 56 cells times 7 raters), 10, or 2-1/2 percent, were considered "outliers" in that the rater assigned a rating which appeared significantly different from the pattern of the ratings assigned by the other raters for that cell.

All things considered, we believe that there is a gratifying degree of consistency in these findings. While the results could undoubtedly be refined by further recycling through these raters, or by the inclusion of more raters from other sources, we believe that careful examination of the resulting table will show that significant improvement is unlikely and not worth the effort. Accordingly, Table 5 is both the result of our Delphi Method Study and the basis for the representativeness ratings given with the pollution roses for each steel mill.

Once the table was established, it was unnecessary for any further joint action on the part of the raters. The subsequent analysis was simply a matter of establishing the terrain and distance characteristics of the meteorological and TSP stations in the vicinity of each mill; this was done by a single analyst. That action defines the terrain/distance combination cell in the table, which results in the assignment of the representativeness rating from that cell. In some cases the analyst was moved to comment on the significance of an "Unknown" rating, and that is included with the terrain/distance combination and the representativeness rating for the plant being considered (see for example Mill No. 43, U.S. Steel, Gary, Indiana).

TABLE 5. REPRESENTATIVENESS OF ONE METEOROLOGICAL STATION COMPARED TO ANOTHER AS A FUNCTION OF DISTANCE OF SEPARATION AND TERRAIN FEATURES (24-HR AVERAGE METEOROLOGICAL DATA)

		Distance, km							
		A	B	C	D	E	F	G	H
	Terrain	0 to 0.5	0.6 to 1.0	1+ to 3	3+ to 6	6+ to 10	10+ to 15	15+ to 25	>25
I	Level*	E	E	E	E	E-VG	VG	VG-G	G
II	Gently Rolling†	E	E	E-VG	VG	VG-G	VG-G	G	G-U
III	Hilly#	E-VG	VG	G	G	U	U	U	U
IV	Mountain/ Valley (similar**)	E-VG	VG	G	G	G	G	G-U	U
V	Mountain/ Valley (different††)	G	G	U	U	U	U	U	U
VI	Local Circulation (Lake or Sea Breeze) (similar**)	E-VG	VG	VG	G	U	U	U	U
VII	Local Circulation (Lake or Sea Breeze) (different††)	VG-G	G	G-U	U	U	U	U	U

Key to Cell Entries: E = Excellent, VG = Very Good, G = Good, U = Unknown (see text)

* <100 feet variation in 1 kilometer.

† 100 to 500 feet variation in 1 kilometer.

500 to 800 feet variation in 1 to 2 kilometers.

** The meteorological station and the TSP monitor site are in similar orientations and locations with respect to the terrain feature (mountain/valley or waterfront).

†† The meteorological station and the TSP monitor site are in different orientations and locations with respect to the terrain feature (mountain/valley or waterfront).

SUMMARY

Ambient air quality statistics have been updated to include 1978-1980 data for TSP, BaP, and BSO for the vicinities of the major integrated steel facilities in the United States. For each mill, conclusions have been drawn concerning the impact of the mill as discerned through pollution roses and analyses of the conditions occurring on days on which the National Ambient Air Quality Standards have been exceeded. Trends in the 12-month running geometric means of TSP have been assessed.

The long-term trends (over several years), as evidenced by the Spearman rank correlation coefficients computed from the time series of 12-month running geometric means, are generally downward; 70 percent of the stations used in the analyses demonstrate long-term downward trends. Of course, the degree to which the geometric means trends are representative of peak steel mill ambient impacts is to a great extent affected by how well the monitors are sited to take advantage of the greatest frequency of persistent wind conditions. The original 1973-1977 analysis document assessed the adequacy of the hi-vol networks in the vicinity of each of the mills; it was shown that the networks were truly adequate to assess the ambient impacts at only 11 (22 percent) of the mills. Monitoring networks became adequate in the vicinities of seven additional mills during 1978-1980.

The TSP roses show considerably more ambient impact of some mills than of others, because the average TSP values for the wind directions blowing from the mill are not only a function of the mill emissions, but also of how well the monitor is sited and the representativeness of the wind data. Generally, at mills with stations showing 24-hour standard exceedances, there is at least one site where some of the cases of exceedance can be tied to mill emissions through the wind direction analysis presented in the standard exceedance roses.

Tables 6 through 10 present a summary of the history of primary standard attainment status for the vicinity of each mill as determined solely by the data from the stations that existed during the eight quarters ending at the end of each given year. In the tables, "A" indicates attainment of both the annual and 24-hour primary standards, "N" indicates nonattainment of either the annual or 24-hour standard, and "I/D" indicates insufficient data to determine the status. During 1980, there were seven mills at which no violations of the primary standards were recorded.

TABLE 6. PRIMARY STANDARD ATTAINMENT STATUS

Region II

Plant	1973	1974	1975	1976	1977	1978	1979	1980
Bethlehem-Lackawanna	N	N	N	N	N	N	N	N
Republic-Buffalo	N	N	N	N	N	N	N	N

TABLE 7. PRIMARY STANDARD ATTAINMENT STATUS

Region III

Plant	1973	1974	1975	1976	1977	1978	1979	1980
Bethlehem-Sparrows Pt.	A	A	N	N	A	A	A	A
Bethlehem-Bethlehem	I/D	A	A	N	N	N	N	N
Crucible-Midland	N	N	N	N	N	N	N	N
J&L-Alquippa	N	N	N	N	N	N	I/D	N
J&L-Pittsburgh	N	N	N	N	N	N	N	N
National-Weirton	I/D	N	N	N	N	I/D	N	N
Sharon-Fairmont	I/D	N	N	N	N	I/D	N	N
Sharon-Farrell	I/D	N	N	N	N	N	I/D	N
USSC-Braddock	I/D	N	N	N	N	N	N	N
USSC-Clairton	N	N	N	N	N	N	N	N
USSC-Duquesne	N	N	N	N	N	N	N	N
USSC-Fairless Hills	A	A	A	A	A	A	A	A
USSC-Homestead	N	N	N	N	N	N	N	N
USSC-Saxonburg	I/D	I/D	I/D	I/D	I/D	I/D	I/D	I/D
Wheel.-Pgh.-Follansbee	I/D	N	N	N	N	N	N	N
Wheel.-Pgh.-Monessen	I/D	N	N	N	N	N	I/D	N

TABLE 8. PRIMARY STANDARD ATTAINMENT STATUS

Region IV

Plant	1973	1974	1975	1976	1977	1978	1979	1980
Armco-Ashland	N	N	N	N	N	N	N	N
Republic-Birmingham	N	N	N	N	N	N	N	N
Republic-Gadsden	I/D	I/D	I/D	N	N	N	N	A
USSC-Fairfield	N	N	N	N	N	N	N	N

TABLE 9. PRIMARY STANDARD ATTAINMENT STATUS

Region V

Plant	1973	1974	1975	1976	1977	1978	1979	1980
Armco-Hamilton	I/D	I/D	I/D	A	A	A	A	A
Armco-Middletown	N	N	N	N	N	N	N	I/D
Bethlehem-Burns Harbor	I/D	I/D	I/D	I/D	I/D	I/D	N	N
Ford-Dearborn	N	N	N	N	N	N	N	N
Inland-East Chicago	N	N	N	N	N	N	N	N
Interlake-Chicago	N	N	N	N	N	N	N	N
J&L-East Chicago	N	N	N	N	N	N	N	N
J&L-Cleveland	N	N	N	N	N	N	N	N
J&L-Youngstown	N	N	N	N	N	N	N	N
National-Granite City	N	I/D	N	N	N	N	N	N
National-Detroit	N	N	N	N	N	N	N	N
Republic-Canton	N	N	N	N	N	N	N	N
Republic-Chicago	N	N	N	N	N	N	N	N
Republic-Cleveland	N	N	N	N	N	N	N	N
Republic-Warren	N	N	N	N	N	N	N	N
Republic-Youngstown	N	N	N	N	N	N	N	N
USSC-Chicago	N	N	N	N	N	N	N	N
USSC-Cleveland	N	N	N	N	N	N	N	N
USSC-Gary	N	N	N	N	N	N	N	N
USSC-Lorain	N	N	N	N	N	N	N	N
USSC-Youngstown	N	N	N	N	N	N	N	N
Wheel.-Pgh.-Steubenville	N	N	N	N	N	N	N	N
Wisconsin-Chicago	N	N	N	N	N	N	N	N

TABLE 10. PRIMARY STANDARD ATTAINMENT STATUS

Region VI

Plant	1973	1974	1975	1976	1977	1978	1979	1980
Armco-Houston	N	I/D	N	N	N	N	N	N
Lone Star-Lone Star	I/D	I/D	I/D	I/D	I/D	I/D	I/D	I/D

Region VIII

Plant	1973	1974	1975	1976	1977	1978	1979	1980
CF&I-Pueblo	N	N	N	N	N	N	N	N
USSC-Geneva	I/D	N	N	N	N	N	N	N

Region IX

Plant	1973	1974	1975	1976	1977	1978	1979	1980
Kaiser-Fontana	I/D	I/D	I/D	N	N	N	N	N

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ARMCO STEEL

Hamilton, Ohio

EPA Region V

HiVol Monitoring Sites - Armco Steel Corporation, New Miami, Ohio

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation (in meters) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance		Volume
X #1	36-2700-002H01	Hamilton Municipal Bldg Monument & High Streets Hamilton, Ohio	Blast furnaces 42° Boilers, 40° Coal Crusher and Coking Operations	3.9 km 4.5 km	19	198	15	Rooftop Center City Commercial	High Street U.S. Rt. 127 This roadway runs in line between the monitoring site and the steel mill	S NE	9 m 1 km to 4 km	4-lane moderate 4-lane moderate
#2	36-0900-001 36-2700-003H01	North Water Works U.S. Rt. 127 South New Miami, Ohio	Blast furnaces 19° Boilers, Coal Crusher and Coking Operations 26°	0.7 km 1.3 km	4.5	183	0	Rooftop Open field	Baltimore & Ohio Railroad U S Rt 127	W W	400 m 425 m	2-tracks 4-lane moderate

NOTE: The North Water Works site was activated 2/6/76. SAROAD # 36-0900-001 used for 1976. SAROAD # 36-2700-003H01 used for 1977.

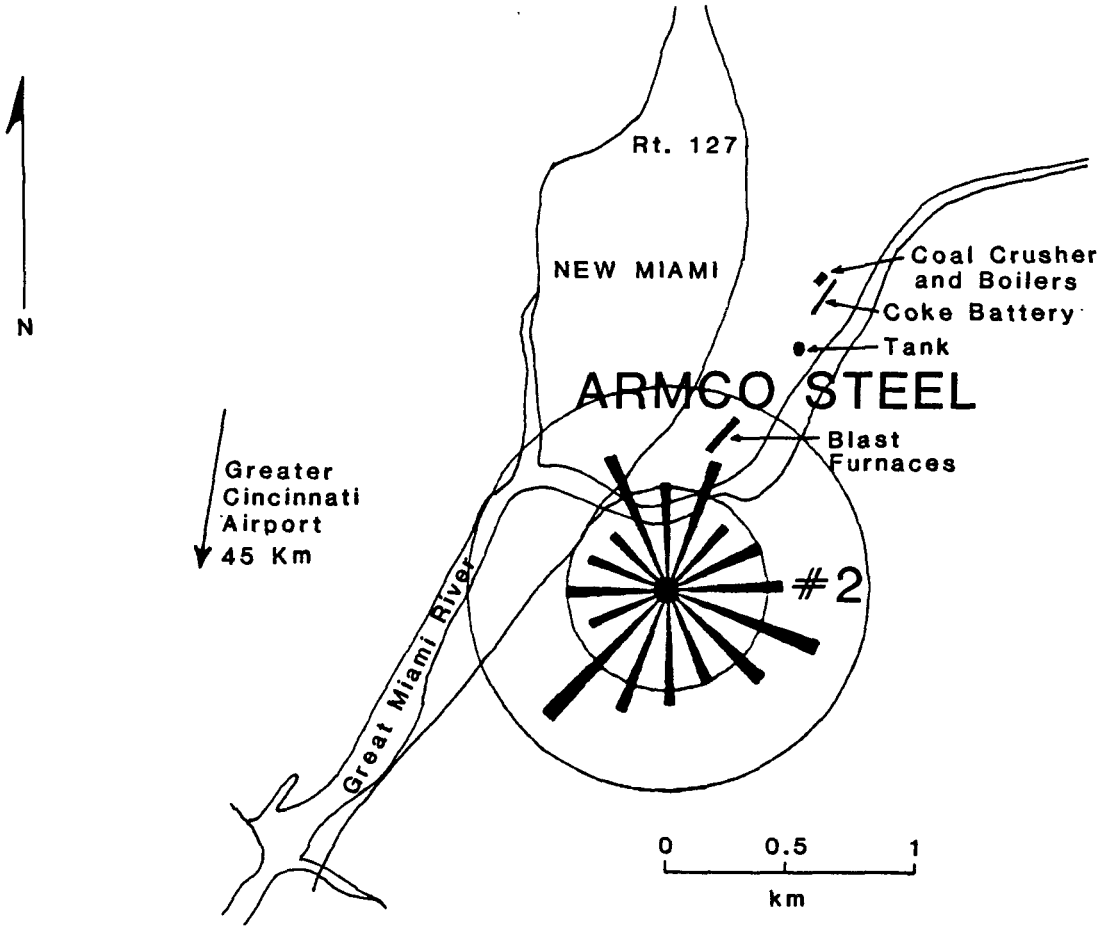
X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Wind Data Representativeness

Station #	Terrain	Distance	Rating
2	II	H	U

Comment: At this distance the representativeness of the meteorology is questionable.

N.B. See Table 5 in Methodology section.



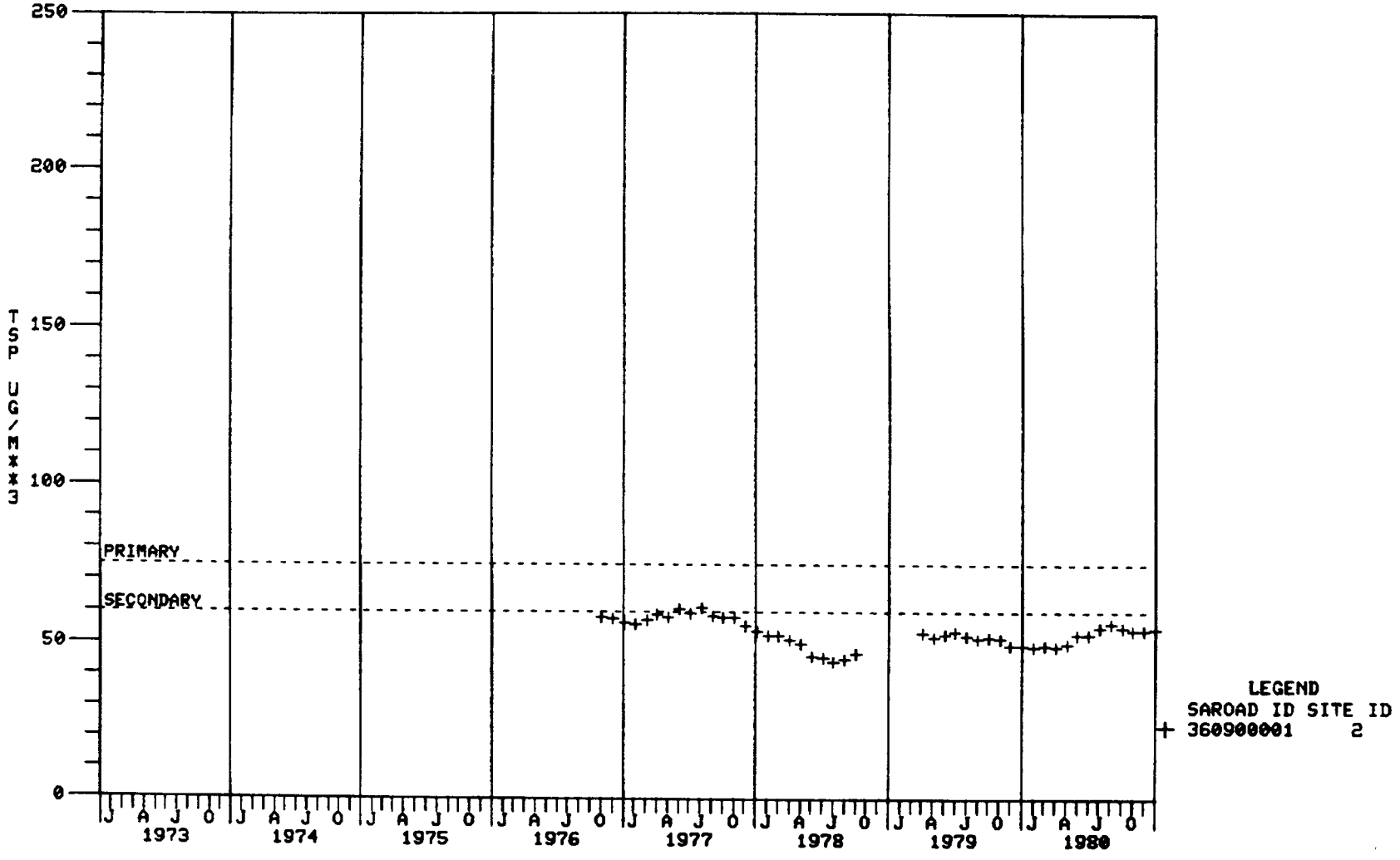
TSP roses for Armco Steel - Hamilton, Ohio, for the period 1978-1980 for cases of $\omega>0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Armco--Hamilton, OH

Wind Direction	Monitoring Site Numbers #2
N	4
NNE	4
NE	2
ENE	6
E	7
ESE	3
SE	1
SSE	2
S	6
SSW	7
SW	8
WSW	6
W	9
WNW	6
NW	1
NNW	1
Total	73

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - HAMILTON, OH



TSP DATA SUMMARY FOR ARMCO - HAMILTON, OH
SAROAD STATION # 360900001 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	54	50	44	43	53
GEOMETRIC MEAN:	******	******	******	******	56.7	54.0	******	49.4	54.9
GEOMETRIC S.D.:	******	******	******	******	1.6	1.7	******	1.5	1.4
HIGHEST BY LARSEN EXTRP:	******	******	******	******	227.2	245.1	******	175.2	153.1
1ST HIGHEST:	******	******	******	******	207.0	139.0	114.0	95.0	133.0
DATE :	******	******	******	******	760611	770519	781104	790322	800509
2ND HIGHEST:	******	******	******	******	125.0	132.0	108.0	95.0	104.0
DATE :	******	******	******	******	761015	770513	780911	790526	800614
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	1	0	0	0	0
RANGE									
0- 65:	0	0	0	0	33	34	31	30	37
66-130:	0	0	0	0	20	14	13	13	15
131-195:	0	0	0	0	0	2	0	0	1
196-260:	0	0	0	0	1	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - HAMILTON, OH
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD # 360900001
SITE ID # 2

DIRECTION		W>=X	W<X
N	COUNT:	0	0
	AVE TSP:	0.	0.
NNE	COUNT:	0	0
	AVE TSP:	0.	0.
NE	COUNT:	0	0
	AVE TSP:	0.	0.
ENE	COUNT:	0	0
	AVE TSP:	0.	0.
E	COUNT:	0	0
	AVE TSP:	0.	0.
ESE	COUNT:	0	0
	AVE TSP:	0.	0.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	0	0
	AVE TSP:	0.	0.
S	COUNT:	0	0
	AVE TSP:	0.	0.
SSW	COUNT:	0	0
	AVE TSP:	0.	0.
SW	COUNT:	0	0
	AVE TSP:	0.	0.
WSW	COUNT:	0	0
	AVE TSP:	0.	0.
W	COUNT:	0	0
	AVE TSP:	0.	0.
WNW	COUNT:	0	0
	AVE TSP:	0.	0.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	0	0
	AVE TSP:	0.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - HAMILTON, OH
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD # 360900001
SITE ID # 2

DIRECTION		W>=X	W<X
N	COUNT:	0	0
	AVE TSP:	0.	0.
NNE	COUNT:	0	0
	AVE TSP:	0.	0.
NE	COUNT:	0	0
	AVE TSP:	0.	0.
ENE	COUNT:	0	0
	AVE TSP:	0.	0.
E	COUNT:	0	0
	AVE TSP:	0.	0.
ESE	COUNT:	0	0
	AVE TSP:	0.	0.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	0	0
	AVE TSP:	0.	0.
S	COUNT:	0	0
	AVE TSP:	0.	0.
SSW	COUNT:	0	0
	AVE TSP:	0.	0.
SW	COUNT:	0	0
	AVE TSP:	0.	0.
WSW	COUNT:	1	0
	AVE TSP:	207.	0.
W	COUNT:	0	0
	AVE TSP:	0.	0.
WNW	COUNT:	0	0
	AVE TSP:	0.	0.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	1	0
	AVE TSP:	207.	0.

UPDATED AIR QUALITY EVALUATION - ARMCO STEEL, HAMILTON, OHIO

Stations used in update:

Continued operation:	#2
New stations:	None
Discontinued stations:	None

Trends in geometric means:

The Spearman rank correlation coefficient for station #2 is -0.47, implying a slight downward trend. However, this is based on a limited number of measurements between 1976 and 1980. Annual geometric means are generally near 50 $\mu g/m^3$ during this period.

Attainment status:

Station #2 was in attainment of the primary TSP standard in 1978-1980.

Pollution roses:

There are no drastic changes in the pollution rose for station #2. The rose remains generally circular with no clearcut contribution from the mill.

Standard exceedance roses:

No excursions beyond 24-hour primary or secondary standards were recorded by station #2 in 1978-1980. The lone excursion beyond standards for the entire period of sampler operation (1976-1980) occurred in 1976 when west-southwest winds coincided with an excursion beyond the 24-hour standard.

ARMCO STEEL

Middletown, Ohio

EPA Region V

Hi Vol Monitoring Sites - Armco Steel Corporation, Middletown, Ohio

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation (in meters) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance (meters)	Volume
X #1	36-4340-001-H01	Middletown High School Gerald & Baltimore Streets Middletown, OH	Boiler #2 157° BF #3 157° Coke #2 158° Coke #3 153° Recycling 157° BOF 151° Open Hearths 151°	3.1 km 3.25 km 3.85 km 4.1 km 3.5 km 3.75 km 3.3 km	15*	216*	15*	Rooftop Center City	Verity Pkwy (St. Routes 4 & 73)	W 275	4-lane Moderate to Heavy
#2	36-4340-002-H01	Armco East Works Highland St. & Lefferson Rd. Middletown, OH	Boiler #2 219° BF #3 210° Coke #2 186° Coke #3 167° Recycling 199° BOF 167° Open Hearths 186°	0.65 km 0.75 km 1.2 km 1.25 km 0.85 km 0.9 km 0.5 km	3.2	206	5	Rooftop Industrial Residential	Highland St. Lefferson Rd. Railroad	E 15 S 8 SW 30	2-lane Moderate 2-lane : dead ends at plant gate Heavy: railroad yard for mill
#3	36-4340-003-H01	Middletown Verity School Bonita & Johns Streets Middletown, OH	Boiler #2 251° BF #3 249° Coke #2 237° Coke #3 232° Recycling 245° BOF 239° Open Hearths 248°	2.95 km 2.95 km 3.05 km 2.7 km 2.95 km 2.55 km 2.55 km	3.5	209	8	Rooftop Residential	Breiel Blvd.	SW 150	4-lane Moderate
X #4	36-4340-004-H01	Middletown CAM Hook Field 1711 N. Verity Pkwy. Middletown, OH	Boiler #2 172° BF #3 171° Coke #2 170° Coke #3 166° Recycling 170° BOF 166° Open Hearths 168°	4.85 km 5.0 km 5.6 km 5.7 km 5.2 km 5.35 km 4.9 km	3.5	201	0	Rooftop Airport	Main Runway Verity Pkwy.	NW 250 SSE 360	Light 4-lane moderate
#5	36-4340-005-A05	Wilson School Middletown, OH	205°	3.4 km	3.6	195	-2	Suburban Residential	Highview Rd.	E	Medium duty
#6	36-4340-006-A05	Armco Research Facility Middletown, OH	140°	2.9 km	3.6	195	-2	Center City Commercial	Unknown	Unknown	Unknown

(Continued)

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi Vol Monitoring Sites - Armco Steel Corporation, Middletown, Ohio

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Plant Location from Site Distance	Elevation (in meters) Above Ground	Elevation (in meters) MSL	Elevation (in meters) Plant	Site Description	Nearest Roadway Name	Nearest Roadway Direction/Distance (meters)	Nearest Roadway Volume
#7	36-4340-007-A05	Yankee Road Gate Middletown, OH	140°	1.2 km	3.6	195	-2	Suburban Industrial	Yankee Road	Unknown	Unknown
#8	36-4340-009-A05	Coke Plant Gate Middletown, OH	20°	0.6 km	3.6	195	-2	Suburban Industrial	Unknown	Unknown	Unknown
#9	36-4340-010-A05	Replaces old Wilson School site	205°	3.4 km	3.6	195	-2	Suburban Industrial	Highview Road	E	Unknown

Note: Middletown High School site was discontinued in 1975. The hi-vol sampler location was not accurately determined and elevations were estimated.

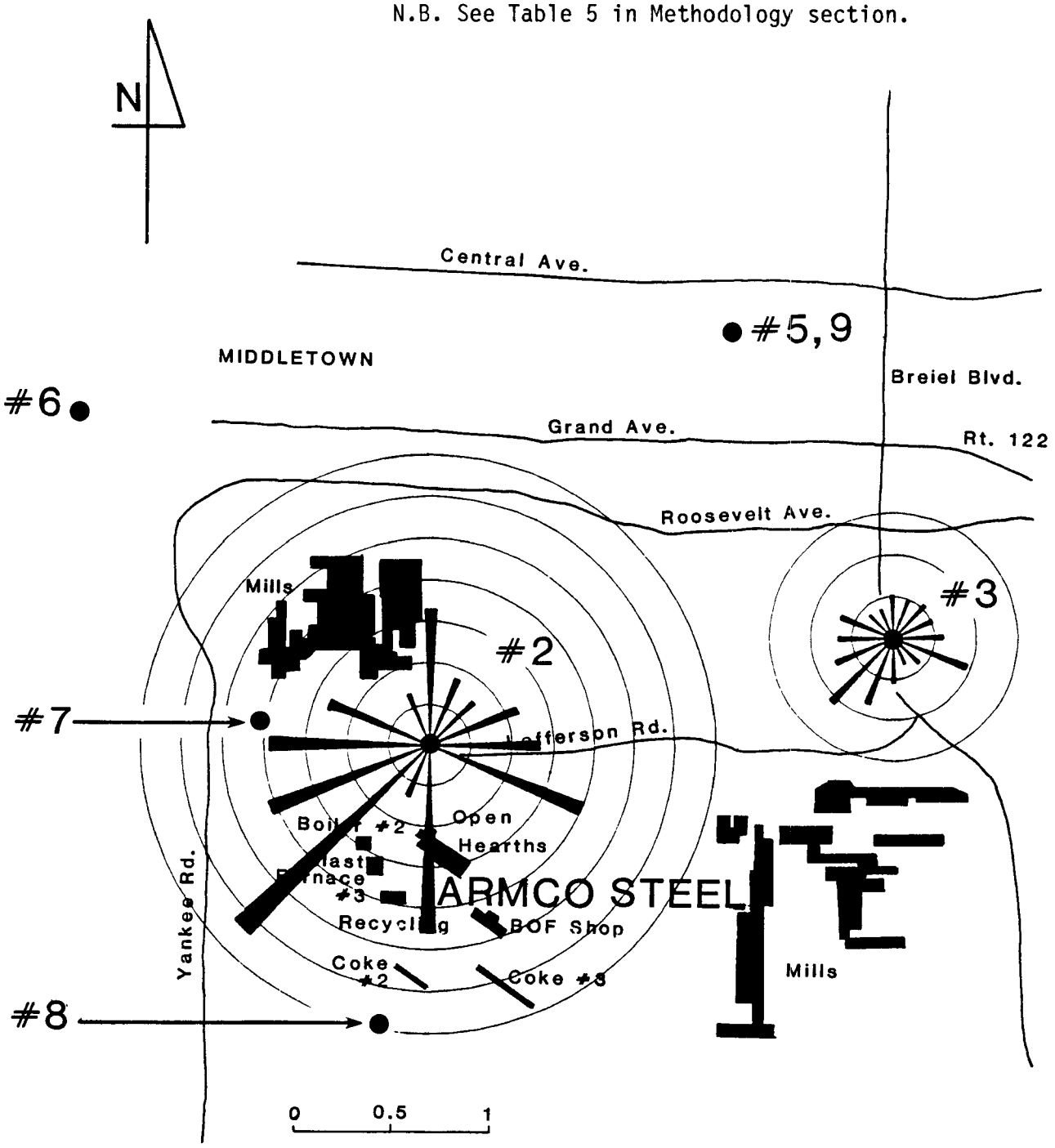
X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Wind Data Representativeness

Station #	Terrain	Distance	Rating
2, 3	II	H	U

Comment: At this distance the representativeness of the meteorology is questionable.

N.B. See Table 5 in Methodology section.



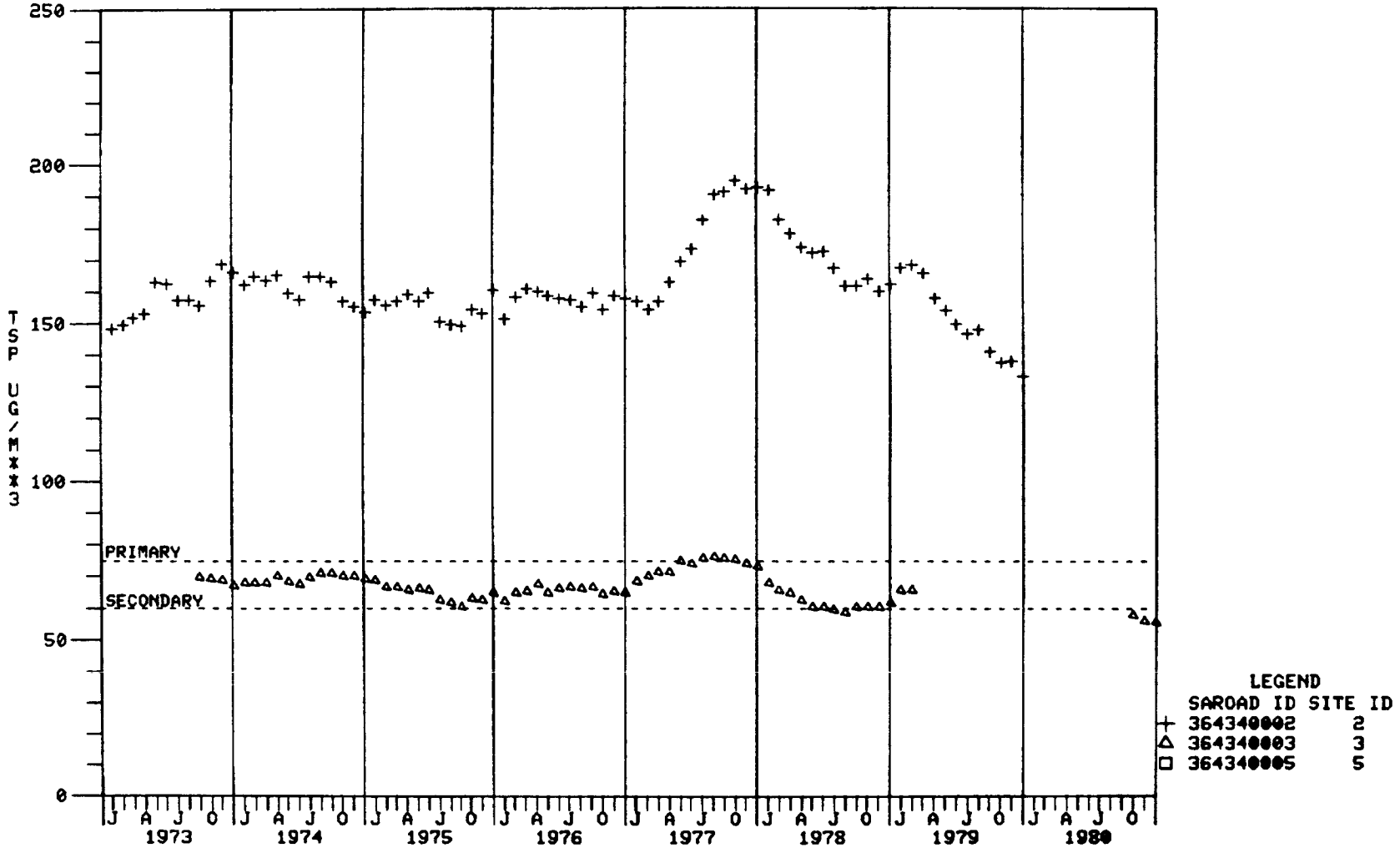
TSP roses for Armco Steel, Middletown - Ohio, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

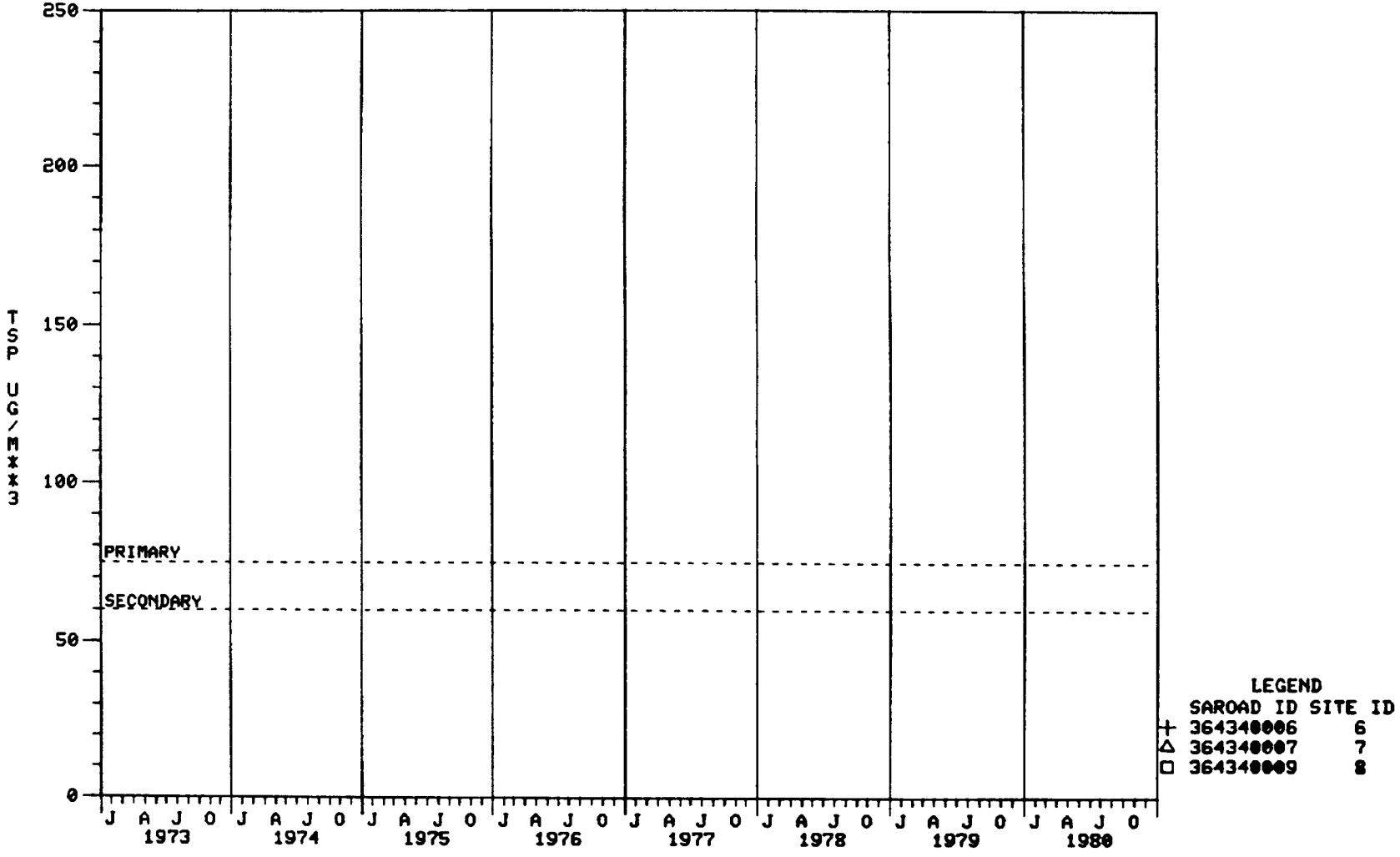
Armco--Middletown, OH

Wind Direction	Monitoring Site Numbers #2	#3
N	3	4
NNE	1	4
NE	2	2
ENE	6	7
E	3	6
ESE	2	3
SE	0	1
SSE	0	1
S	5	6
SSW	1	5
SW	7	9
WSW	4	8
W	7	6
WNW	7	5
NW	0	1
NNW	5	3
Total	53	71

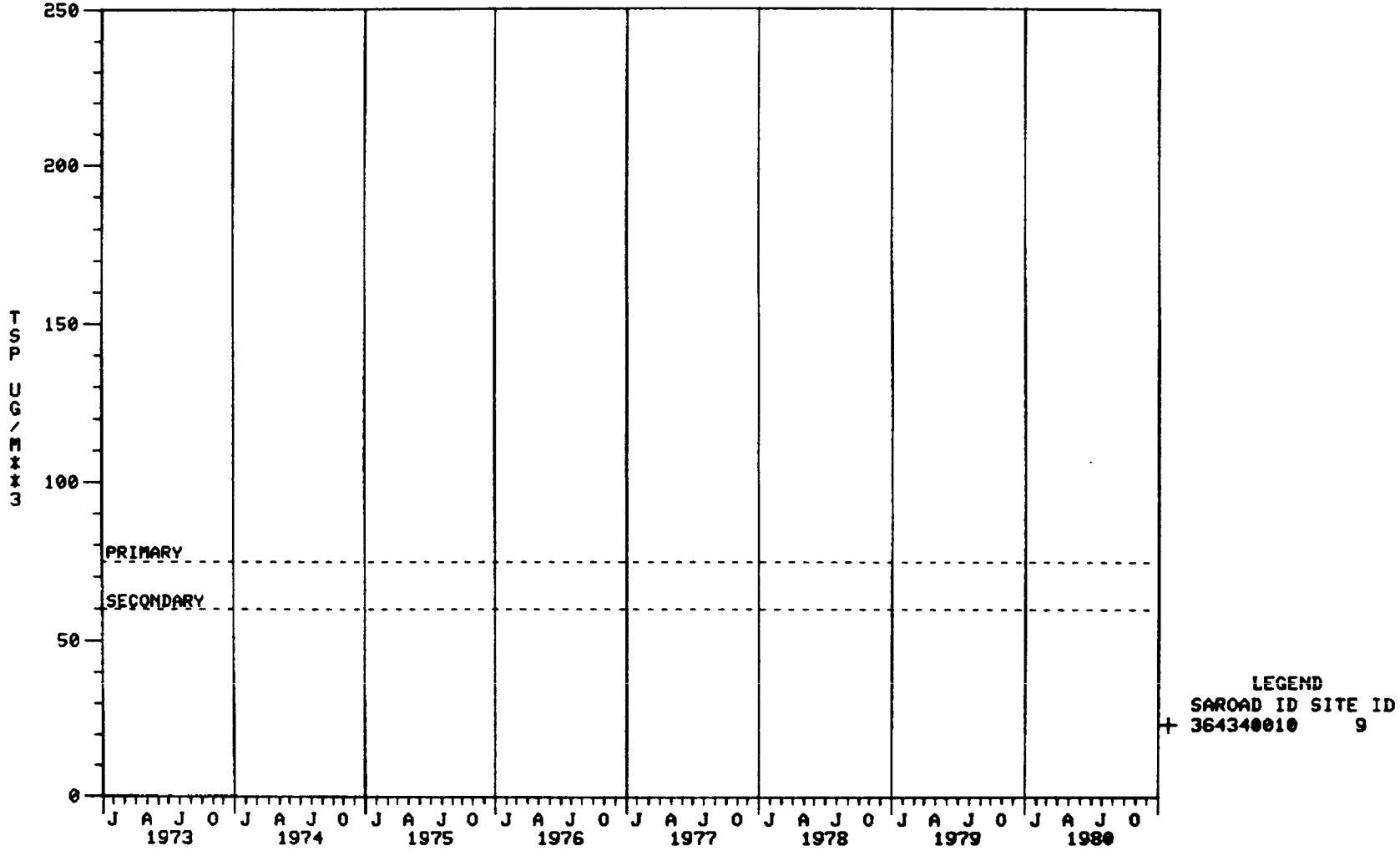
TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - MIDDLETOWN, OH



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - MIDDLETOWN, OH



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - MIDDLETOWN, OH



TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SAROAD STATION # 364340002 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	57	58	59	53	58	56	54	41	0
GEOMETRIC MEAN:	142.8	166.2	153.6	160.6	157.7	192.6	162.2	132.9	******
GEOMETRIC S.D.:	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.6	******
HIGHEST BY LARSEN EXTRP:	448.7	532.0	642.7	585.1	760.5	923.1	948.9	553.8	******
1ST HIGHEST:	366.0	450.0	416.0	631.0	537.0	707.0	475.0	301.0	******
DATE :	720714	730516	740710	750418	760506	770916	780414	790608	******
2ND HIGHEST:	333.0	351.0	355.0	438.0	469.0	483.0	434.0	294.0	******
DATE :	720614	730416	741014	751214	760224	771115	780601	790316	******
# OF READINGS EXCEEDING 260 :	4	7	8	8	9	20	10	3	0
# OF READINGS EXCEEDING 150 :	20	35	33	28	32	37	36	19	0
RANGE									
0- 65:	1	0	3	0	2	0	4	3	0
66-130:	21	16	21	18	20	17	13	18	0
131-195:	24	21	12	20	14	9	13	12	0
196-260:	7	14	15	7	13	10	14	5	0
261-325:	1	5	6	5	4	10	4	3	0
326-390:	3	1	1	0	1	5	2	0	0
391-455:	0	1	1	2	2	3	3	0	0
>455:	0	0	0	1	2	2	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SARDAD STATION # 364340003 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	60	59	59	58	54	52	23	56
GEOMETRIC MEAN:	******	66.6	69.2	64.6	64.6	73.0	61.6	******	55.7
GEOMETRIC S.D.:	******	1.5	1.5	1.5	1.6	1.6	1.6	******	1.4
HIGHEST BY LARSEN EXTRP:	******	209.1	225.3	201.7	241.6	270.7	239.9	******	156.0
1ST HIGHEST:	******	190.0	198.0	151.0	174.0	263.0	203.0	119.0	131.0
DATE :	******	730516	740710	751015	760611	770805	780911	790906	800509
2ND HIGHEST:	******	142.0	160.0	134.0	157.0	150.0	140.0	114.0	101.0
DATE :	******	730709	740920	750822	761015	770513	780601	790807	800614
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	1	0	0	0
# OF READINGS EXCEEDING 150 :	0	1	2	1	2	1	1	0	0
RANGE									
0- 65:	0	28	24	30	31	25	27	11	37
66-130:	0	30	32	27	23	27	22	12	18
131-195:	0	2	2	2	4	1	2	0	1
196-260:	0	0	1	0	0	0	1	0	0
261-325:	0	0	0	0	0	1	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SARDAD STATION # 364340005 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	30
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	109.0
DATE :	******	******	******	******	******	******	******	******	800506
2ND HIGHEST:	******	******	******	******	******	******	******	******	93.0
DATE :	******	******	******	******	******	******	******	******	800825
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	0
RANGE									
0- 65:	0	0	0	0	0	0	0	0	19
66-130:	0	0	0	0	0	0	0	0	11
131-195:	0	0	0	0	0	0	0	0	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SAROAD STATION # 364340006 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	56
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	122.0
DATE :	******	******	******	******	******	******	******	******	800506
2ND HIGHEST:	******	******	******	******	******	******	******	******	122.0
DATE :	******	******	******	******	******	******	******	******	800702
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	0
RANGE									
0- 65:	0	0	0	0	0	0	0	0	26
66-130:	0	0	0	0	0	0	0	0	30
131-195:	0	0	0	0	0	0	0	0	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SAROAD STATION # 364340007 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	57
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	173.0
DATE :	******	******	******	******	******	******	******	******	800829
2ND HIGHEST:	******	******	******	******	******	******	******	******	167.0
DATE :	******	******	******	******	******	******	******	******	800325
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	2
RANGE									
0- 65:	0	0	0	0	0	0	0	0	15
66-130:	0	0	0	0	0	0	0	0	35
131-195:	0	0	0	0	0	0	0	0	7
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SAROAD STATION # 364340009 SITE ID # 08
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	54
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	232.0
DATE :	******	******	******	******	******	******	******	******	801009
2ND HIGHEST:	******	******	******	******	******	******	******	******	189.0
DATE :	******	******	******	******	******	******	******	******	800328
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	11
RANGE									
0- 65:	0	0	0	0	0	0	0	0	12
66-130:	0	0	0	0	0	0	0	0	27
131-195:	0	0	0	0	0	0	0	0	14
196-260:	0	0	0	0	0	0	0	0	1
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - MIDDLETOWN, OH
SAROAD STATION # 364340010 SITE ID # 09
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	57
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	329.0
DATE :	******	******	******	******	******	******	******	******	801009
2ND HIGHEST:	******	******	******	******	******	******	******	******	122.0
DATE :	******	******	******	******	******	******	******	******	800506
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	1
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	1
RANGE									
0- 65:	0	0	0	0	0	0	0	0	36
66-130:	0	0	0	0	0	0	0	0	20
131-195:	0	0	0	0	0	0	0	0	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	1
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - MIDDLETOWN, OH
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	364340002		364340003		364340005		364340006		364340007		364340009	
SITE ID #	2		3		5		6		7		8	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	262.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	1	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	270.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SE COUNT:	0	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	262.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	4	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	310.	302.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSW COUNT:	19	3	0	0	0	0	0	0	0	0	0	0
AVE TSP:	403.	290.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SW COUNT:	12	8	1	0	0	0	0	0	0	0	0	0
AVE TSP:	328.	345.	263.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WSW COUNT:	5	2	0	0	0	0	0	0	0	0	0	0
AVE TSP:	329.	297.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
W COUNT:	1	2	0	0	0	0	0	0	0	0	0	0
AVE TSP:	292.	395.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	1	3	0	0	0	0	0	0	0	0	0	0
AVE TSP:	274.	376.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	1	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	279.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	44	21	1	0	0	0	0	0	0	0	0	0
AVE TSP:	354.	332.	263.	0.	0.	0.	0.	0.	0.	0.	0.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - MIDDLETOWN, OH
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD # 364340010
SITE ID # 9

DIRECTION		W>=X	W<X
N	COUNT:	0	0
	AVE TSP:	0.	0.
NNE	COUNT:	0	0
	AVE TSP:	0.	0.
NE	COUNT:	0	1
	AVE TSP:	0.	329.
ENE	COUNT:	0	0
	AVE TSP:	0.	0.
E	COUNT:	0	0
	AVE TSP:	0.	0.
ESE	COUNT:	0	0
	AVE TSP:	0.	0.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	0	0
	AVE TSP:	0.	0.
S	COUNT:	0	0
	AVE TSP:	0.	0.
SSW	COUNT:	0	0
	AVE TSP:	0.	0.
SW	COUNT:	0	0
	AVE TSP:	0.	0.
WSW	COUNT:	0	0
	AVE TSP:	0.	0.
W	COUNT:	0	0
	AVE TSP:	0.	0.
WNW	COUNT:	0	0
	AVE TSP:	0.	0.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	0	1
	AVE TSP:	0.	329.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - MIDDLETOWN, OH
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD # 364340010
SITE ID # 9

DIRECTION		W>=X	W<X
N	COUNT:	0	0
	AVE TSP:	0.	0.
NNE	COUNT:	0	0
	AVE TSP:	0.	0.
NE	COUNT:	0	1
	AVE TSP:	0.	329.
ENE	COUNT:	0	0
	AVE TSP:	0.	0.
E	COUNT:	0	0
	AVE TSP:	0.	0.
ESE	COUNT:	0	0
	AVE TSP:	0.	0.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	0	0
	AVE TSP:	0.	0.
S	COUNT:	0	0
	AVE TSP:	0.	0.
SSW	COUNT:	0	0
	AVE TSP:	0.	0.
SW	COUNT:	0	0
	AVE TSP:	0.	0.
WSW	COUNT:	0	0
	AVE TSP:	0.	0.
W	COUNT:	0	0
	AVE TSP:	0.	0.
WNW	COUNT:	0	0
	AVE TSP:	0.	0.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	0	1
	AVE TSP:	0.	329.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - MIDDLETOWN, OH
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	364340002		364340003		364340005		364340006		364340007		364340009	
SITE ID #	2		3		5		6		7		8	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	3	1	0	0	0	0	0	0	1	0	0	0
AVE TSP:	182.	206.	0.	0.	0.	0.	0.	0.	167.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	2	0	0	0	0	0	0	0	0	0	3
AVE TSP:	0.	217.	0.	0.	0.	0.	0.	0.	0.	0.	0.	193.
ENE COUNT:	2	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	192.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	1	3	0	0	0	0	0	0	0	0	2	1
AVE TSP:	182.	166.	0.	0.	0.	0.	0.	0.	0.	0.	165.	155.
ESE COUNT:	2	1	0	0	0	0	0	0	0	0	0	1
AVE TSP:	236.	156.	0.	0.	0.	0.	0.	0.	0.	0.	0.	189.
SE COUNT:	1	5	0	0	0	0	0	0	0	0	0	0
AVE TSP:	151.	191.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	4	10	0	0	0	0	0	0	0	0	0	0
AVE TSP:	179.	202.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	10	13	0	0	0	0	0	0	1	0	1	1
AVE TSP:	247.	208.	0.	0.	0.	0.	0.	0.	173.	0.	158.	152.
SSW COUNT:	32	14	0	1	0	0	0	0	0	0	0	0
AVE TSP:	325.	217.	0.	160.	0.	0.	0.	0.	0.	0.	0.	0.
SW COUNT:	31	22	2	2	0	0	0	0	0	0	1	1
AVE TSP:	252.	249.	233.	194.	0.	0.	0.	0.	0.	0.	165.	179.
WSW COUNT:	13	7	2	1	0	0	0	0	0	0	0	0
AVE TSP:	262.	231.	163.	157.	0.	0.	0.	0.	0.	0.	0.	0.
W COUNT:	9	13	0	0	0	0	0	0	0	0	0	0
AVE TSP:	199.	219.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	9	7	0	0	0	0	0	0	0	0	0	0
AVE TSP:	190.	266.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	2	2	0	0	0	0	0	0	0	0	0	0
AVE TSP:	249.	153.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	201.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	119	101	4	4	0	0	0	0	2	0	4	7
AVE TSP:	256.	222.	198.	176.	0.	0.	0.	0.	170.	0.	163.	179.

UPDATED AIR QUALITY EVALUATION - ARMCO STEEL, MIDDLETOWN, OHIO

Stations used in update:

Continued operation:	#3
New stations:	#5, #6, #7, #8, #9, (all 1980)
Discontinued stations:	#1 (1975), #2 (1979)

Trends in geometric means:

Only stations #2 and #3 have a record of sufficient length to develop systematic tendencies for the geometric mean. The 12-month running geometric means for station #2 were consistently above primary standards until the end of its operation in 1979. Typical values were on the order of 150 $\mu g/m^{-3}$, in late 1977. The Spearman rank correlation coefficient for the entire period was near 0.10, indicating no trend. However, running geometric means were in steady decline for 1978 and 1979. Station #3 gave an oscillating record characterized by values consistently above secondary standards and usually below primary. The Spearman rank correlation coefficient for this station was -0.4 for the entire period indicating a slight downward trend.

Attainment status:

Station #2 indicates primary standard nonattainment during 1978 and 1979. Station #3, more distant from the major mill sources, indicates attainment through the period.

Pollution roses:

Pollution roses for stations #2 and #3 are generally unchanged from the previous analysis and tend to show elevated levels of TSP when the wind blows persistently from production facilities to samplers.

Standard exceedance roses:

The standard exceedance rose for station #2 indicates that nearly all exceedances (primary and secondary) occurred under steady winds whose directions contain plant activities. A similar situation holds for station #3. At the newer stations, exceedances were rarer. Station #2 registered only one exceedance of primary standards under variable winds. Similarly, for excursions beyond secondary standards at the newer stations, the majority came under variable winds.

ARMCO STEEL

Ashland, Kentucky

Region IV

Hi Vol Monitoring Sites - Armco Steel Corporation, Ashland, Kentucky

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Plant Location from Site Distance	Elevation (m) Above Ground	Elevation (m) MSL	Elevation (m) Plant	Site Description	Nearest Roadway Name	Nearest Roadway Direction/Distance (m)		Nearest Roadway Volume
#1	36-3080-003-H01	WIRO Radio Station Box 299 Ironton, Ohio	Sinter 181° #3 Boiler 173° BOF 170° Blast Furnaces 178°	4.1 km 3.9 km 4.7 km 4.2 km	1	227	59	Ground level Residential	U. S. Rt. 52 State Rt. 93	SW NW	200 75	4-lane moderate to heavy 4-lane moderate
X #2	36-3080-004-H01 36-3080-009-P01	Ironton Junior High School 302 Delaware Street Ironton, Ohio	Sinter 154° #3 Boiler 147° BOF 148° Blast Furnaces 151°	6.1 km 6.2 km 7.0 km 6.3 km	5	168	0	Rooftop Residential	U. S. Rt. 52	NE	350	4-lane moderate to heavy
X #3	36-3080-005-H01	2827 South 10th Street [1] Ironton, Ohio	Sinter 226° #3 Boiler 220° BOF 195° Blast Furnaces 220°	2.1 km 1.6 km 2.1 km 2.0 km	3	170	2	Rooftop Residential Source oriented to coke facility	No major roadways Semet-Solvey (Ironton Coke)	S	800	
X #4	36-3080-006-H01	Lawrence-Ironton Health Center 2120 South 8th Street Ironton, Ohio	Sinter 205° #3 Boiler 191° BOF 179° Blast furnaces 198°	2.2 km 1.8 km 2.5 km 2.2 km	5	173	5	Rooftop Urban Residential	8th St.	NE	25	2-lane light to moderate
X #5	36-3080-007-H01	Memorial Building [1] 403 Railroad Street Ironton, Ohio	Sinter 169° #3 Boiler 160° BOF 158° Blast Furnaces 165°	4.0 km 3.9 km 4.7 km 4.0 km	17	183	15	Rooftop Urban Downtown	Railroad Street	SE	10	light to moderate
#6	36-3080-010-H09	Lawrence County Hospital 2228 South 9th Street Ironton, Ohio	Sinter 205° #3 Boiler 191° BOF 179° Blast Furnaces 198°	2.2 km 1.8 km 2.5 km 2.2 km	10	178	10	Rooftop Urban Residential	8th Street 9th Street	SW 1 NE	30 60	2-lane light to moderate 2-lane light to moderate

(Continued)

[1] Discontinued sites. Elevations and distances were estimated by Portsmouth City Health District field personnel

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi Vol Monitoring Sites - Armco Steel Corporation, Ashland, Kentucky (Continued)

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation (m) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance (m)		Volume
#7	18-0080-003-F01	Human Resources Building 19th and Carter Ashland, Kentucky	Sinter 309° #3 Boiler 317° BOF 313° Blast Furnaces 311°	4.4 km 4.2 km 3.4 km 4.3 km	7.5	177	9	Rooftop Urban Residential Commercial	19th Street Carter Ave.	SE SW	20 15	2-lane light 2-lane light to moderate
#8	18-0080-005-F01	Water Treatment Plant 4051 Winchester Ashland, Kentucky	Sinter 314° #3 Boiler 318° BOF 317° Blast Furnaces 315°	7.6 km 7.5 km 6.6 km 7.4 km	25	189	21	Rooftop Residential Industrial	Winchester Ave. (Rt. 23 & 60) Semet Solvey Coke (Allied) Railroad	E NNE E	50 500 70	4-lane moderate 4-tracks
#9	18-0080-006-F01	Millseat School 1922 Hood Street Ashland, Kentucky	Sinter 0° #3 Boiler 16° BOF 37° Blast Furnaces 8°	1.7 km 2.1 km 1.5 km 1.7 km	6	198	30	Rooftop Residential	Hood Street	SE	75	2-lane light
#10	18-0080-007-F01	Poage School 29th and Beech Ashland, Kentucky	Sinter 341° #3 Boiler 347° BOF 350° Blast Furnaces 344°	5.6 km 5.7 km 4.8 km 5.5 km	6	212	44	Rooftop Residential	29th Street	SE	100	2-lane light to moderate
#11	18-0080-008-F01	23rd and Lexington Ashland, Kentucky	Sinter 314° #3 Boiler 321° BOF 319° Blast Furnaces 316°	5.1 km 4.9 km 4.0 km 4.0 km	4.5	180	12	Rooftop Urban Residential Commercial	Lexington Ave.	NNE	8	2-lane light
#12	18-1540-001-F01	Bellefonte School Bellefonte, Kentucky	Sinter 37° #3 Boiler 46° BOF 76° Blast Furnaces 46°	1.2 km 1.7 km 1.7 km 1.3 km	4.5	209	41	Rooftop Residential	State Rt. 5	NW	100	2-lane light to moderate

(Continued)

Hi Vol Monitoring Sites - Armco Steel Corporation, Ashland, Kentucky (Continued)

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Plant Location from Site Distance	Elevation (m) Above Ground	Elevation (m) MSL	Elevation (m) Plant	Site Description	Nearest Roadway Name	Nearest Roadway Direction/Distance (m)		Nearest Roadway Volume
X #13	36-3080-002-P01	Arting Hotel [1] 202 Park Avenue Ironton, Ohio	Sinter 168° #3 Boiler 158° BOF 157° Blast Furnaces 164°	3.7 km 3.6 km 4.5 km 3.8 km	25	191	23	Rooftop Urban Downtown	Park Ave.	NW	10	light to moderate
X #14	36-1380-001-H02	George's Electric Co. [1,2] 203 Marion Pike Coal Grove, Ohio	Sinter 276° #3 Boiler 287° BOF 258° Blast Furnaces 275°	2.2 km 1.7 km 1.3 km 1.9 km	4	176	8	Rooftop Residential Commercial	Rt. 243 Rt. 52	NW NE	50 100	2-lane moderate 4-lane moderate to heavy
X #15	36-3380-003-H01	Holiday Inn U.S. Rt. 52 South Point, Ohio	Sinter 308° #3 Boiler 311° BOF 310° Blast Furnaces 309°	9.4 km 9.2 km 8.4 km 9.2 km	5	176	8	Rooftop Residential	U.S. Rt. 52	E	200	4-lane moderate to heavy
#16	36-1380-002-H02	Coal Grove Day Care [2] Center 300 Marion Pike Coal Grove, Ohio	Sinter 271° #3 Boiler 279° BOF 251° Blast Furnaces 270°	2.4 km 1.8 km 1.5 km 2.1 km	4	177	9	Rooftop Residential	Rt. 243 Rt. 52	SE W & SW	30 75	2-lane moderate 4-lane moderate to heavy
#18	18-0080-012-F01	41st & Winchester Fire Station Ashland, Kentucky	Sinter 315° #3 boiler BOF 318° Blast Furnaces 317°	7.67 km 6.66 km 7.55 km	6.1	170	0	Rooftop	Winchester 41st Street		30 60	major roadway side road
#19	18-1540-003-F02	Riverview Nursing Home U.S. 123 Greenup County	Sinter 157° #3 boiler BOF 144° Blast Furnaces 153°	1.72 km 2.58 km 1.94 km	4.2	170	0	Rooftop	U.S. 123		30	well-traveled

[1] Discontinued site. Elevations and distances were estimated by Portsmouth City Health District field personnel.

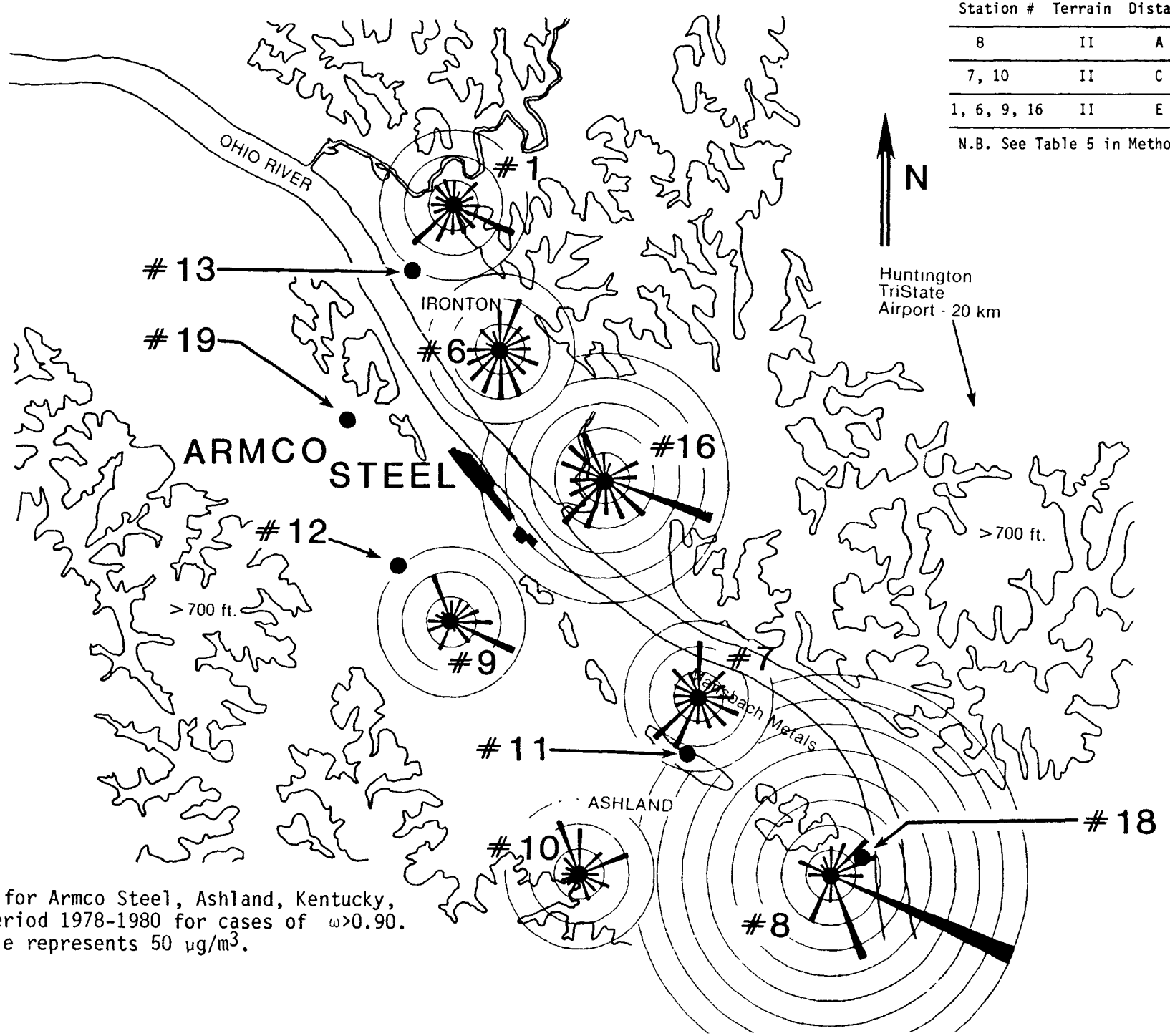
[2] George's Electric Company (SAROAD # 361380001H02) is a SO_2 bubbler site. Coal Grove Day Care Center (SAROAD # 361380002H02) is a hi-vol site. Hi-vol data filed under 361380001 is for 361380002.

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Wind Data Representativeness

Station #	Terrain	Distance	Rating
8	II	A	E
7, 10	II	C	E-VG
1, 6, 9, 16	II	E	VG-G

N.B. See Table 5 in Methodology section.



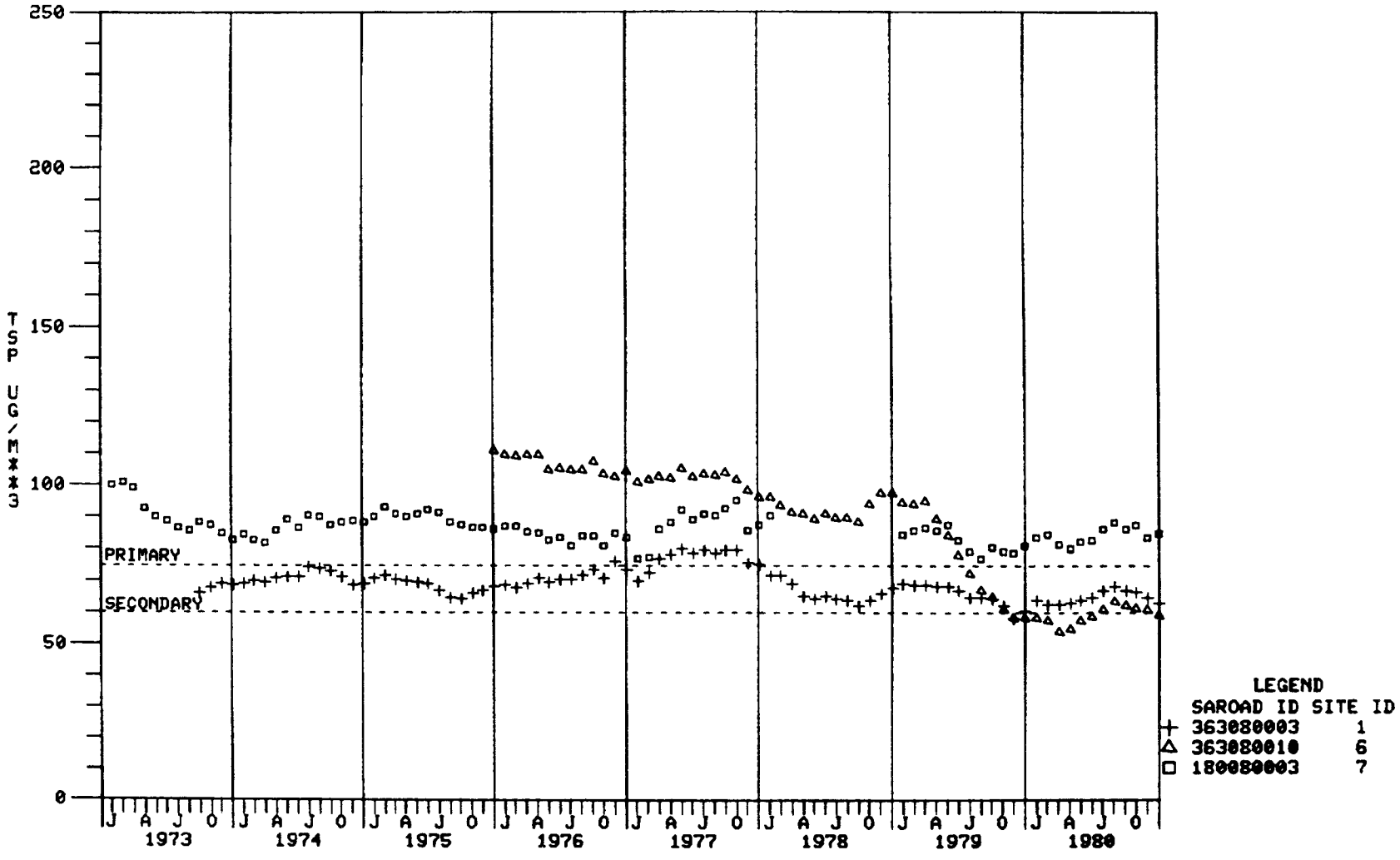
TSP roses for Armco Steel, Ashland, Kentucky, for the period 1978-1980 for cases of $\omega>0.90$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

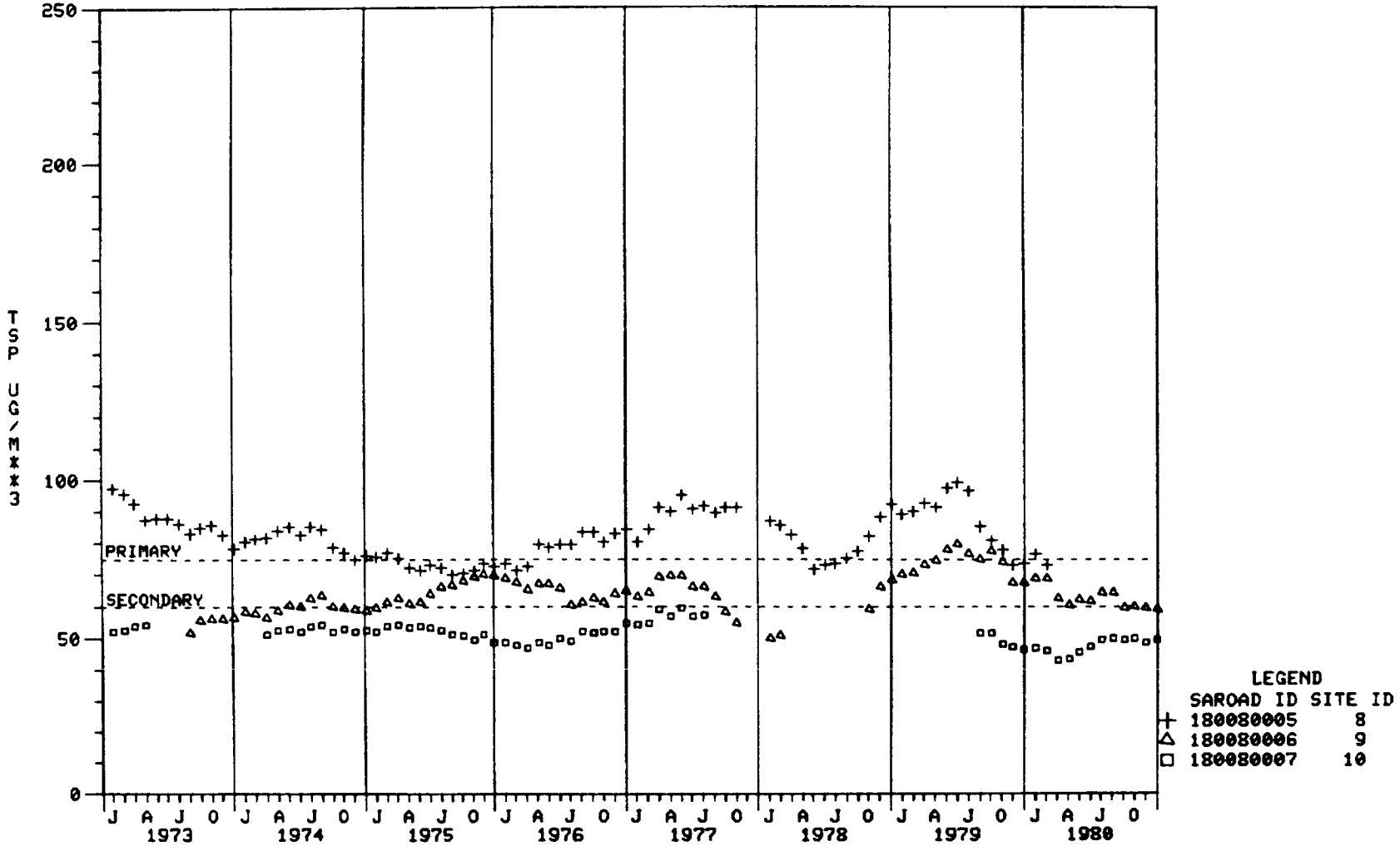
Armco--Ashland, KY

Wind Direction	Monitoring Site Numbers						
	#1	#6	#7	#8	#9	#10	#16
N	1	12	1	1	1	1	1
NNE	1	3	0	1	1	0	1
NE	1	3	1	1	1	1	0
ENE	3	9	2	2	3	1	3
E	3	11	3	1	3	2	3
ESE	4	15	4	1	3	4	4
SE	3	16	2	0	2	3	3
SSE	3	7	2	1	1	2	3
S	2	9	2	1	0	0	2
SSW	7	21	8	6	7	6	8
SW	1	19	1	0	0	1	1
WSW	3	11	2	1	2	2	3
W	7	21	6	6	5	6	7
WNW	2	7	2	2	2	2	2
NW	2	10	2	1	1	2	2
NNW	3	5	1	2	3	3	3
Total	46	179	39	27	35	36	46

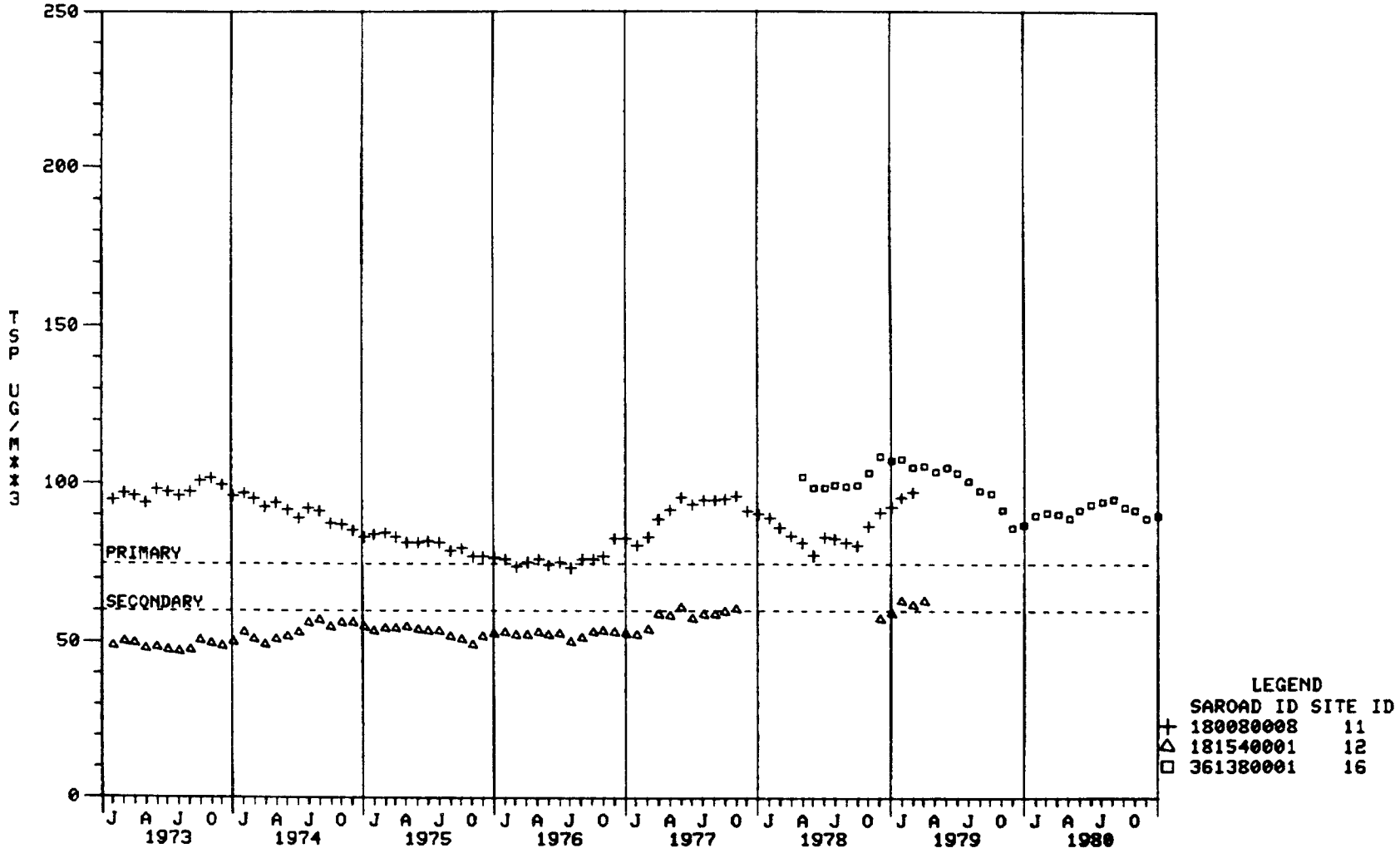
TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - ASHLAND, KY



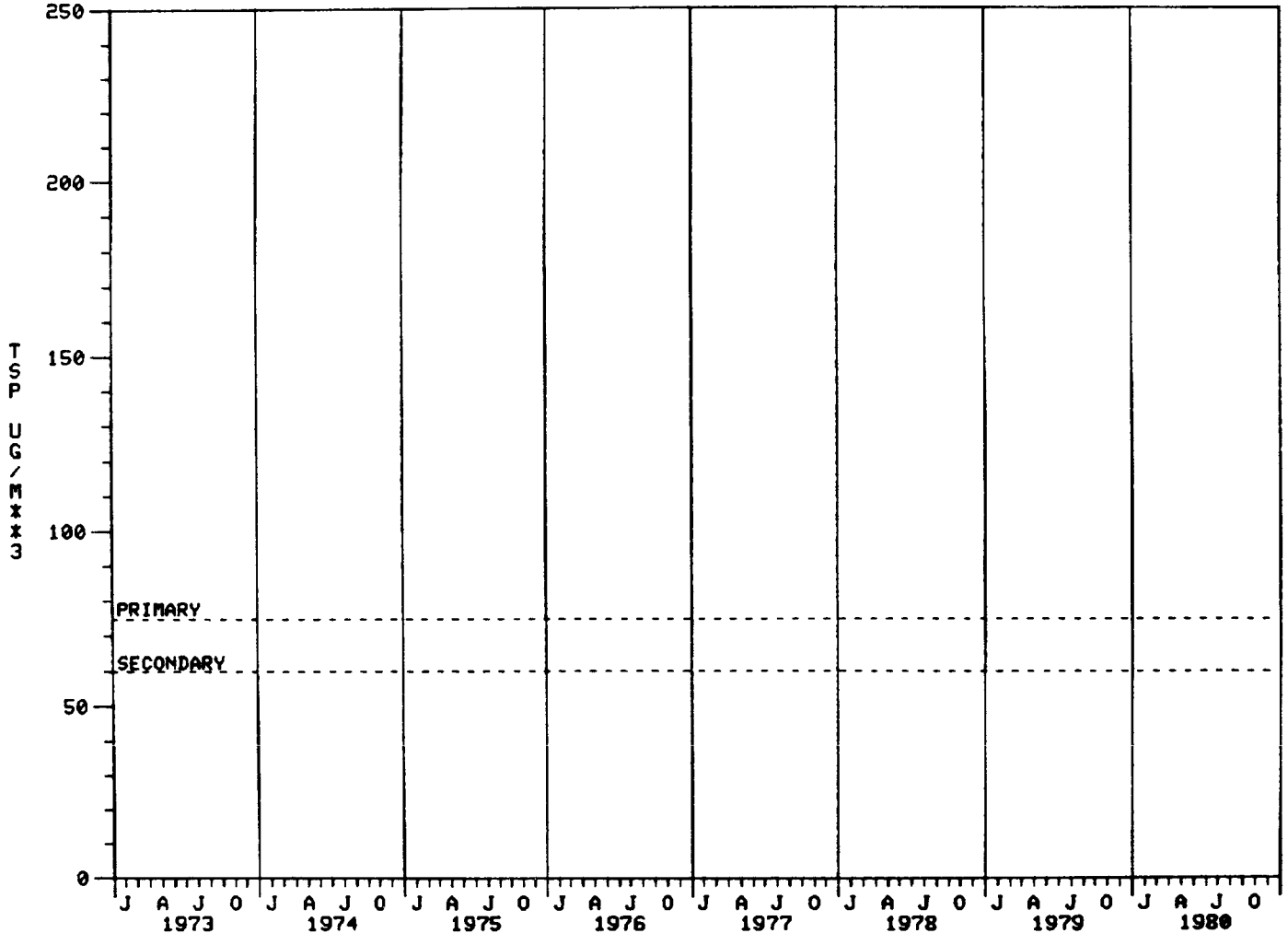
TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - ASHLAND, KY



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - ASHLAND, KY



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - ASHLAND, KY



LEGEND

SAROAD ID	SITE ID
181540003	19
180080012	18

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 363080003 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	61	58	53	59	61	60	58	58
GEOMETRIC MEAN:	******	68.5	69.2	68.2	73.3	75.4	67.7	60.4	63.2
GEOMETRIC S.D.:	******	1.6	1.5	1.6	1.8	1.7	1.7	1.6	1.4
HIGHEST BY LARSEN EXTRP:	******	252.4	250.1	276.6	395.9	343.1	336.7	246.1	187.2
1ST HIGHEST:	******	170.0	210.0	293.0	438.0	200.0	360.0	205.0	137.0
DATE :	******	731112	741207	750124	761102	771022	781110	790220	800110
2ND HIGHEST:	******	155.0	147.0	175.0	322.0	198.0	231.0	175.0	119.0
DATE :	******	730416	740728	751214	761114	770308	780201	790322	800215
# OF READINGS EXCEEDING 260 :	0	0	0	1	2	0	1	0	0
# OF READINGS EXCEEDING 150 :	0	2	1	2	7	6	5	2	0
RANGE									
0- 65:	0	30	25	28	29	26	28	34	31
66-130:	0	25	30	20	23	25	25	21	26
131-195:	0	6	2	4	4	8	4	2	1
196-260:	0	0	1	0	1	2	2	1	0
261-325:	0	0	0	1	1	0	0	0	0
326-390:	0	0	0	0	0	0	1	0	0
391-455:	0	0	0	0	1	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SARDAD STATION # 363080010 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	193	254	248	268	246	241
GEOMETRIC MEAN:	******	******	******	110.5	104.2	96.0	97.5	58.4	59.2
GEOMETRIC S.D.:	******	******	******	1.7	1.8	1.8	1.8	1.7	1.7
HIGHEST BY LARSEN EXTRP:	******	******	******	537.9	616.7	570.1	538.1	270.7	285.3
1ST HIGHEST:	******	******	******	502.0	405.0	368.0	570.0	239.0	582.0
DATE :	******	******	******	751028	761117	770209	781106	790221	801114
2ND HIGHEST:	******	******	******	340.0	384.0	348.0	421.0	195.0	201.0
DATE :	******	******	******	751120	760415	770203	781010	791122	800506
# OF READINGS EXCEEDING 260 :	0	0	0	12	24	13	14	0	1
# OF READINGS EXCEEDING 150 :	0	0	0	58	71	65	55	14	5
RANGE									
0- 65:	0	0	0	33	62	68	54	157	134
66-130:	0	0	0	89	108	99	142	64	97
131-195:	0	0	0	42	41	52	39	24	8
196-260:	0	0	0	17	19	16	19	1	1
261-325:	0	0	0	8	14	9	6	0	0
326-390:	0	0	0	3	9	4	6	0	0
391-455:	0	0	0	0	1	0	1	0	0
>455:	0	0	0	1	0	0	1	0	1

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 180080003 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	58	56	61	60	61	45	36	52	55
GEOMETRIC MEAN:	104.2	82.6	88.3	86.0	83.4	87.3	******	80.9	84.6
GEOMETRIC S.D.:	1.6	1.7	1.7	1.7	1.9	1.9	******	1.7	1.5
HIGHEST BY LARSEN EXTRP:	450.0	418.2	425.3	425.8	522.3	567.3	******	369.3	302.7
1ST HIGHEST:	350.0	208.0	254.0	350.0	434.0	373.0	553.0	347.0	202.0
DATE :	721229	731025	740728	750124	761102	770823	781104	790322	800116
2ND HIGHEST:	345.0	185.0	234.0	265.0	378.0	251.0	389.0	259.0	202.0
DATE :	720103	730116	741207	750903	761114	770904	780607	790220	800215
# OF READINGS EXCEEDING 250 :	2	0	0	2	2	1	2	1	0
# OF READINGS EXCEEDING 150 :	9	6	12	10	12	9	4	5	4
RANGE									
0- 65:	7	18	18	19	24	15	14	20	16
66-130:	34	27	27	29	22	15	17	24	33
131-195:	12	10	13	8	11	10	2	5	5
196-260:	3	1	3	2	2	4	1	2	2
261-325:	0	0	0	1	0	0	0	0	0
326-390:	2	0	0	1	1	1	1	1	0
391-455:	0	0	0	0	1	0	0	0	0
>455:	0	0	0	0	0	0	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 180080005 SITE ID # 08
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	59	54	59	59	56	45	58	48	0
GEOMETRIC MEAN:	99.3	78.2	76.0	72.6	84.3	******	92.2	73.5	******
GEOMETRIC S.D.:	1.8	1.9	1.7	1.7	1.9	******	2.1	2.1	******
HIGHEST BY LARSEN EXTRP:	538.6	480.4	362.6	345.0	550.6	******	820.8	671.7	******
1ST HIGHEST:	340.0	189.0	187.0	195.0	306.0	242.0	588.0	342.0	******
DATE :	720831	730901	740728	750124	760705	770823	781104	790322	******
2ND HIGHEST:	254.0	186.0	166.0	192.0	230.0	233.0	399.0	225.0	******
DATE :	720906	730925	740210	751021	761114	770419	781110	790421	******
# OF READINGS EXCEEDING 260 :	1	0	0	0	1	0	4	1	0
# OF READINGS EXCEEDING 150 :	13	8	6	4	9	13	14	6	0
RANGE									
0- 65:	13	18	21	26	16	16	21	16	0
66-130:	25	25	31	25	25	15	19	24	0
131-195:	14	11	7	8	9	10	10	5	0
196-260:	6	0	0	0	5	4	4	2	0
261-325:	0	0	0	0	1	0	2	0	0
326-390:	1	0	0	0	0	0	0	1	0
391-455:	0	0	0	0	0	0	1	0	0
>455:	0	0	0	0	0	0	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SARDAD STATION # 180080006 SITE ID # 09
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	29	53	61	57	54	43	46	44	48
GEOMETRIC MEAN:	******	56.4	58.7	69.4	64.9	******	68.3	57.6	59.3
GEOMETRIC S.D.:	******	1.6	1.8	1.8	1.7	******	1.9	1.7	1.8
HIGHEST BY LARSEN EXTRP:	******	233.4	330.0	422.8	314.6	******	441.1	345.1	313.7
1ST HIGHEST:	221.0	157.0	166.0	222.0	147.0	151.0	338.0	209.0	288.0
DATE :	720103	730209	741008	750629	760903	770419	781104	790226	800906
2ND HIGHEST:	136.0	147.0	163.0	201.0	143.0	150.0	315.0	206.0	137.0
DATE :	720427	730323	740716	750717	761214	770302	781110	790421	800215
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	2	0	1
# OF READINGS EXCEEDING 150 :	1	1	3	5	0	1	4	4	1
RANGE									
0- 65:	12	33	37	24	24	25	22	22	24
66-130:	15	18	18	24	25	16	20	17	22
131-195:	1	2	6	7	5	2	1	3	1
196-260:	1	0	0	2	0	0	1	2	0
261-325:	0	0	0	0	0	0	1	0	1
326-390:	0	0	0	0	0	0	1	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 180080007 SITE ID # 10
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	63	38	58	59	57	32	33	46	54
GEOMETRIC MEAN:	53.4	******	52.5	48.7	54.6	******	******	46.6	49.5
GEOMETRIC S.D.:	1.6	******	1.7	1.6	1.6	******	******	1.8	1.5
HIGHEST BY LARSEN EXTRP:	202.2	******	234.1	206.7	207.4	******	******	246.4	169.9
1ST HIGHEST:	135.0	127.0	254.0	149.0	121.0	247.0	186.0	261.0	127.0
DATE :	721229	730323	741213	750506	760804	770823	781017	790226	800503
2ND HIGHEST:	118.0	117.0	116.0	115.0	117.0	147.0	127.0	135.0	122.0
DATE :	720304	730209	740728	750217	761015	770904	780219	790315	800602
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	1	0
# OF READINGS EXCEEDING 150 :	0	0	1	0	0	1	1	1	0
RANGE									
0- 65:	40	24	38	39	35	21	20	34	41
66-130:	22	14	19	19	22	8	12	10	13
131-195:	1	0	0	1	0	2	1	1	0
196-260:	0	0	1	0	0	1	0	0	0
261-325:	0	0	0	0	0	0	0	1	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 180080008 SITE ID # 11
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	44	54	59	60	61	50	50	0	0
GEOMETRIC MEAN:	92.1	96.1	82.9	76.7	82.6	90.4	92.6	******	******
GEOMETRIC S.D.:	1.5	1.4	1.6	1.6	1.7	1.8	1.7	******	******
HIGHEST BY LARSEN EXTRP:	295.1	268.2	305.2	314.8	412.4	488.1	458.8	******	******
1ST HIGHEST:	300.0	282.0	201.0	280.0	372.0	355.0	472.0	******	******
DATE :	721229	730203	740728	750124	761102	770823	781110	******	******
2ND HIGHEST:	198.0	177.0	185.0	253.0	325.0	253.0	284.0	******	******
DATE :	720608	730522	740210	750106	761114	770218	781011	******	******
# OF READINGS EXCEEDING 260 :	1	1	0	1	2	1	2	0	0
# OF READINGS EXCEEDING 150 :	5	4	6	5	10	13	10	0	0
RANGE									
0- 65:	9	8	18	23	20	21	14	0	0
66-130:	28	36	31	28	26	15	22	0	0
131-195:	5	9	9	7	12	8	11	0	0
196-260:	1	0	1	1	1	5	1	0	0
261-325:	1	1	0	1	1	0	1	0	0
326-390:	0	0	0	0	1	1	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 181540001 SITE ID # 12
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	56	50	56	58	50	40	47	0	0
GEOMETRIC MEAN:	52.6	49.8	54.6	52.6	52.5	******	59.1	******	******
GEOMETRIC S.D.:	1.7	1.6	1.8	1.7	1.7	******	2.0	******	******
HIGHEST BY LARSEN EXTRP:	256.1	192.0	311.6	233.3	241.1	******	484.6	******	******
1ST HIGHEST:	201.0	182.0	147.0	173.0	144.0	176.0	293.0	******	******
DATE :	720103	730209	740815	751114	761102	770823	781110	******	******
2ND HIGHEST:	149.0	122.0	131.0	113.0	130.0	153.0	193.0	******	******
DATE :	720328	730913	741207	750506	760903	770922	781104	******	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	1	0	0
# OF READINGS EXCEEDING 150 :	1	1	0	1	0	2	3	0	0
RANGE									
0- 65:	34	38	33	35	30	23	25	0	0
66-130:	20	11	21	22	19	14	19	0	0
131-195:	1	1	2	1	1	3	2	0	0
196-260:	1	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	1	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 361380001 SITE ID # 16
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	25	51	60	60
GEOMETRIC MEAN:	******	******	******	******	******	******	107.6	87.0	90.2
GEOMETRIC S.D.:	******	******	******	******	******	******	1.8	1.5	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	618.1	273.8	288.2
1ST HIGHEST:	******	******	******	******	******	450.0	591.0	266.0	198.0
DATE :	******	******	******	******	******	771022	781110	790322	800310
2ND HIGHEST:	******	******	******	******	******	263.0	393.0	202.0	178.0
DATE :	******	******	******	******	******	771115	781104	790220	800110
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	2	4	1	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	4	11	4	5
RANGE									
0- 65:	0	0	0	0	0	4	10	13	14
66-130:	0	0	0	0	0	16	26	36	35
131-195:	0	0	0	0	0	1	8	9	10
196-260:	0	0	0	0	0	2	3	1	1
261-325:	0	0	0	0	0	1	0	1	0
326-390:	0	0	0	0	0	0	2	0	0
391-455:	0	0	0	0	0	1	1	0	0
>455:	0	0	0	0	0	0	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SAROAD STATION # 180080012 SITE ID # 18
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	6	29
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	158.0	265.0
DATE :	******	******	******	******	******	******	******	791229	800115
2ND HIGHEST:	******	******	******	******	******	******	******	98.0	249.0
DATE :	******	******	******	******	******	******	******	791211	800110
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	1
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	1	4
RANGE									
0- 65:	0	0	0	0	0	0	0	2	7
66-130:	0	0	0	0	0	0	0	3	16
131-195:	0	0	0	0	0	0	0	1	2
196-260:	0	0	0	0	0	0	0	0	3
261-325:	0	0	0	0	0	0	0	0	1
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - ASHLAND, KY
SARDAD STATION # 181540003 SITE ID # 19
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	54	44
GEOMETRIC MEAN:	******	******	******	******	******	******	******	79.5	101.5
GEOMETRIC S.D.:	******	******	******	******	******	******	******	1.7	1.7
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	350.5	443.7
1ST HIGHEST:	******	******	******	******	******	******	******	335.0	259.0
DATE :	******	******	******	******	******	******	******	790220	800122
2ND HIGHEST:	******	******	******	******	******	******	******	255.0	215.0
DATE :	******	******	******	******	******	******	******	790322	800316
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	1	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	7	8
RANGE									
0- 65:	0	0	0	0	0	0	0	22	7
66-130:	0	0	0	0	0	0	0	22	25
131-195:	0	0	0	0	0	0	0	7	7
196-260:	0	0	0	0	0	0	0	2	5
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	1	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - ASHLAND, KY
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	363080003		363080010		180080003		180080005		180080006		180080007	
SITE ID #	1		6		7		8		9		10	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	3	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	312.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	2	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	310.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	2	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	310.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	1	0	0	2	0	1	1	2	1	0	0	0
AVE TSP:	360.	0.	0.	436.	0.	347.	399.	324.	315.	0.	0.	0.
SE COUNT:	0	0	0	2	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	288.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	1	5	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	308.	328.	0.	373.	0.	0.	0.	0.	0.	0.
S COUNT:	1	0	0	7	1	1	0	1	0	1	0	0
AVE TSP:	293.	0.	0.	345.	350.	553.	0.	588.	0.	338.	0.	0.
SSW COUNT:	0	1	1	3	1	1	0	0	0	0	0	0
AVE TSP:	0.	322.	267.	332.	389.	378.	0.	0.	0.	0.	0.	0.
SW COUNT:	0	1	3	13	0	1	0	0	0	0	0	0
AVE TSP:	0.	438.	332.	316.	0.	434.	0.	0.	0.	0.	0.	0.
WSW COUNT:	0	0	3	9	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	310.	345.	0.	0.	0.	274.	0.	0.	0.	0.
W COUNT:	0	0	0	6	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	291.	0.	0.	0.	312.	0.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	2	0	1	0	0	0	1	1	0
AVE TSP:	0.	0.	0.	305.	0.	265.	0.	0.	0.	288.	261.	0.
ALL COUNT:	2	2	8	56	2	6	1	5	1	2	1	0
AVE TSP:	327.	380.	313.	326.	370.	392.	399.	364.	315.	313.	261.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - ASHLAND, KY
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	180080008		181540001		361380001		180080010		181540003		180080012	
SITE ID #	11		12		16		17		19		18	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	265.
E COUNT:	0	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	335.	0.	0.	0.	0.	0.	0.
ESE COUNT:	1	0	1	0	1	1	0	0	0	0	0	0
AVE TSP:	472.	0.	293.	0.	591.	266.	0.	0.	0.	0.	0.	0.
SE COUNT:	0	0	0	0	0	0	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	335.	0.	0.
SSE COUNT:	1	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	284.	355.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	1	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	280.	0.	0.	0.	0.	393.	0.	0.	0.	0.	0.	0.
SSW COUNT:	0	1	0	0	1	1	0	0	0	0	0	0
AVE TSP:	0.	325.	0.	0.	263.	450.	0.	0.	0.	0.	0.	0.
SW COUNT:	0	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	372.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WSW COUNT:	1	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	282.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
W COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	354.	0.	0.	0.	0.	0.	0.
ALL COUNT:	4	3	1	0	2	5	0	0	0	1	0	1
AVE TSP:	330.	351.	293.	0.	427.	360.	0.	0.	0.	335.	0.	265.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - ASHLAND, KY
(All Gases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	363080003		363080010		180080003		180080005		180080006		180080007	
SITE ID #	1		6		7		8		9		10	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	2	3	0	2	0	1	0	0	0	0
AVE TSP:	0.	0.	212.	198.	0.	178.	0.	166.	0.	0.	0.	0.
NNE COUNT:	0	1	0	4	0	1	0	0	0	4	0	0
AVE TSP:	0.	162.	0.	274.	0.	152.	0.	0.	0.	164.	0.	0.
NE COUNT:	0	0	0	7	0	1	1	5	0	1	0	0
AVE TSP:	0.	0.	0.	228.	0.	251.	164.	188.	0.	199.	0.	0.
ENE COUNT:	0	0	0	3	1	4	1	5	0	3	0	1
AVE TSP:	0.	0.	0.	180.	168.	176.	225.	171.	0.	188.	0.	186.
E COUNT:	0	1	1	7	0	1	1	1	0	0	0	0
AVE TSP:	0.	231.	191.	219.	0.	187.	179.	169.	0.	0.	0.	0.
ESE COUNT:	1	1	2	13	1	6	1	5	1	2	0	0
AVE TSP:	360.	175.	217.	223.	170.	209.	399.	238.	315.	173.	0.	0.
SE COUNT:	1	2	1	7	1	2	0	2	1	0	0	0
AVE TSP:	210.	180.	249.	231.	234.	212.	0.	198.	159.	0.	0.	0.
SSE COUNT:	1	1	1	17	0	6	1	7	0	2	0	1
AVE TSP:	155.	168.	308.	243.	0.	216.	175.	191.	0.	178.	0.	247.
S COUNT:	1	2	5	27	2	10	1	7	0	1	0	0
AVE TSP:	293.	183.	183.	226.	268.	226.	195.	242.	0.	338.	0.	0.
SSW COUNT:	2	3	7	18	1	6	1	6	0	0	0	0
AVE TSP:	174.	240.	196.	227.	389.	222.	197.	197.	0.	0.	0.	0.
SW COUNT:	0	3	21	42	0	5	0	6	0	0	0	0
AVE TSP:	0.	281.	196.	230.	0.	231.	0.	198.	0.	0.	0.	0.
WSW COUNT:	0	2	7	36	1	3	0	2	0	0	0	0
AVE TSP:	0.	160.	233.	230.	159.	169.	0.	216.	0.	0.	0.	0.
W COUNT:	0	2	4	17	0	5	0	3	0	1	0	0
AVE TSP:	0.	169.	179.	224.	0.	182.	0.	214.	0.	152.	0.	0.
WNW COUNT:	0	0	1	4	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	189.	185.	0.	174.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	1	4	0	1	0	2	0	1	0	1
AVE TSP:	0.	0.	182.	193.	0.	212.	0.	217.	0.	206.	0.	254.
NNW COUNT:	0	1	0	6	0	1	1	0	1	1	1	0
AVE TSP:	0.	155.	0.	223.	0.	265.	151.	0.	209.	288.	261.	0.
ALL COUNT:	6	19	53	215	7	55	8	52	3	16	1	3
AVE TSP:	228.	202.	202.	227.	236.	208.	211.	204.	228.	194.	261.	229.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - ASHLAND, KY
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	180080008		181540001		361380001		180080010		181540003		180080012	
SITE ID #	11		12		16		17		19		18	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	1	2	0	0	0	0	0	0	0	0	0	0
AVE TSP:	190.	170.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	1	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	182.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	2	0	1	0	0	0	0	0	0	0	0
AVE TSP:	0.	206.	0.	163.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	1	2	0	0	0	1	0	0	0	0	0	1
AVE TSP:	183.	168.	0.	0.	0.	174.	0.	0.	0.	0.	0.	265.
E COUNT:	0	1	0	0	0	2	0	0	0	1	0	1
AVE TSP:	0.	193.	0.	0.	0.	257.	0.	0.	0.	207.	0.	249.
ESE COUNT:	1	4	1	1	2	1	0	0	0	2	0	0
AVE TSP:	472.	173.	293.	153.	371.	266.	0.	0.	0.	212.	0.	0.
SE COUNT:	0	1	0	0	0	1	0	0	1	1	0	0
AVE TSP:	0.	165.	0.	0.	0.	202.	0.	0.	197.	335.	0.	0.
SSE COUNT:	1	4	0	1	1	2	0	0	0	2	0	0
AVE TSP:	284.	234.	0.	176.	169.	208.	0.	0.	0.	200.	0.	0.
S COUNT:	1	6	0	1	0	3	0	0	0	2	0	0
AVE TSP:	280.	172.	0.	193.	0.	282.	0.	0.	0.	206.	0.	0.
SSW COUNT:	0	6	0	0	1	4	0	0	1	3	0	1
AVE TSP:	0.	227.	0.	0.	263.	268.	0.	0.	193.	213.	0.	232.
SW COUNT:	0	7	0	0	0	2	0	0	0	0	0	1
AVE TSP:	0.	203.	0.	0.	0.	188.	0.	0.	0.	0.	0.	203.
WSW COUNT:	1	1	0	0	0	1	0	0	0	0	0	0
AVE TSP:	282.	151.	0.	0.	0.	185.	0.	0.	0.	0.	0.	0.
W COUNT:	1	2	0	0	0	0	0	0	0	1	0	1
AVE TSP:	211.	174.	0.	0.	0.	0.	0.	0.	0.	171.	0.	158.
WNW COUNT:	0	1	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	157.	0.	0.	0.	180.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	1	0	0	1	0	0	0	1	0	0
AVE TSP:	0.	0.	173.	0.	0.	178.	0.	0.	0.	177.	0.	0.
NNW COUNT:	0	2	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	157.	0.	0.	0.	354.	0.	0.	0.	0.	0.	0.
ALL COUNT:	7	41	2	5	4	20	0	0	2	13	0	5
AVE TSP:	272.	192.	233.	173.	294.	238.	0.	0.	195.	213.	0.	221.

UPDATED AIR QUALITY EVALUATION - ARMCO STEEL, ASHLAND, KENTUCKY

Stations used in update:

Continued operation:	#1, #6, #7, #8, #9, #10, #12, #16
New stations:	#18, #19 (both 1979)
Discontinued stations:	#8, #11, #12 (all 1979)

Trends in geometric means:

Recent 12-month running geometric means show no clear cut interrelationships. The data from each station can be characterized as cyclic. However, there is very little sustained phasing of cycles between stations. One anomalous structure of the trend graphs is the rapid decline of values for station #6 to sustained lower values starting in 1979.

Station #6 displayed a strong overall negative trend (Spearman correlation coefficient of -0.94). The remainder of the stations nearest the Armco facility displayed a moderately negative overall trend (Spearman correlation coefficient near -0.5). An exception to this was the slight positive trend computed for station #9 (Spearman correlation coefficient of +0.41). However, there is a substantial gap in the 1977-78 portion of the data for this station.

Attainment status:

Of the stations nearest the Armco facility (#6, #7, #9, #16), none were in attainment of primary TSP standards during the period 1978-1980. For the remainder of the network, stations #1 and #10 were in attainment. Both of these sites are generally removed from industrial sources.

Pollution and standard exceedance roses:

Because this area is characterized by complex terrain, and because the nearest available wind data (Huntington Tri-State Airport) is 20 km away and on higher ground, inferences regarding pollutant transport cannot be made with acceptable reliability. Therefore, roses constructed with this data should be treated with caution.

Under very light regional winds, the entire network frequently records extremely high values. In 1978 and 1979, annual extremes (highest, second highest) occurred simultaneously at four or more stations twice each year. This reflects both the diversity of industrial sources and the confining nature of the terrain.

ARMCO STEEL

Houston, Texas

EPA Region VI

Armco Steel - Houston, Texas

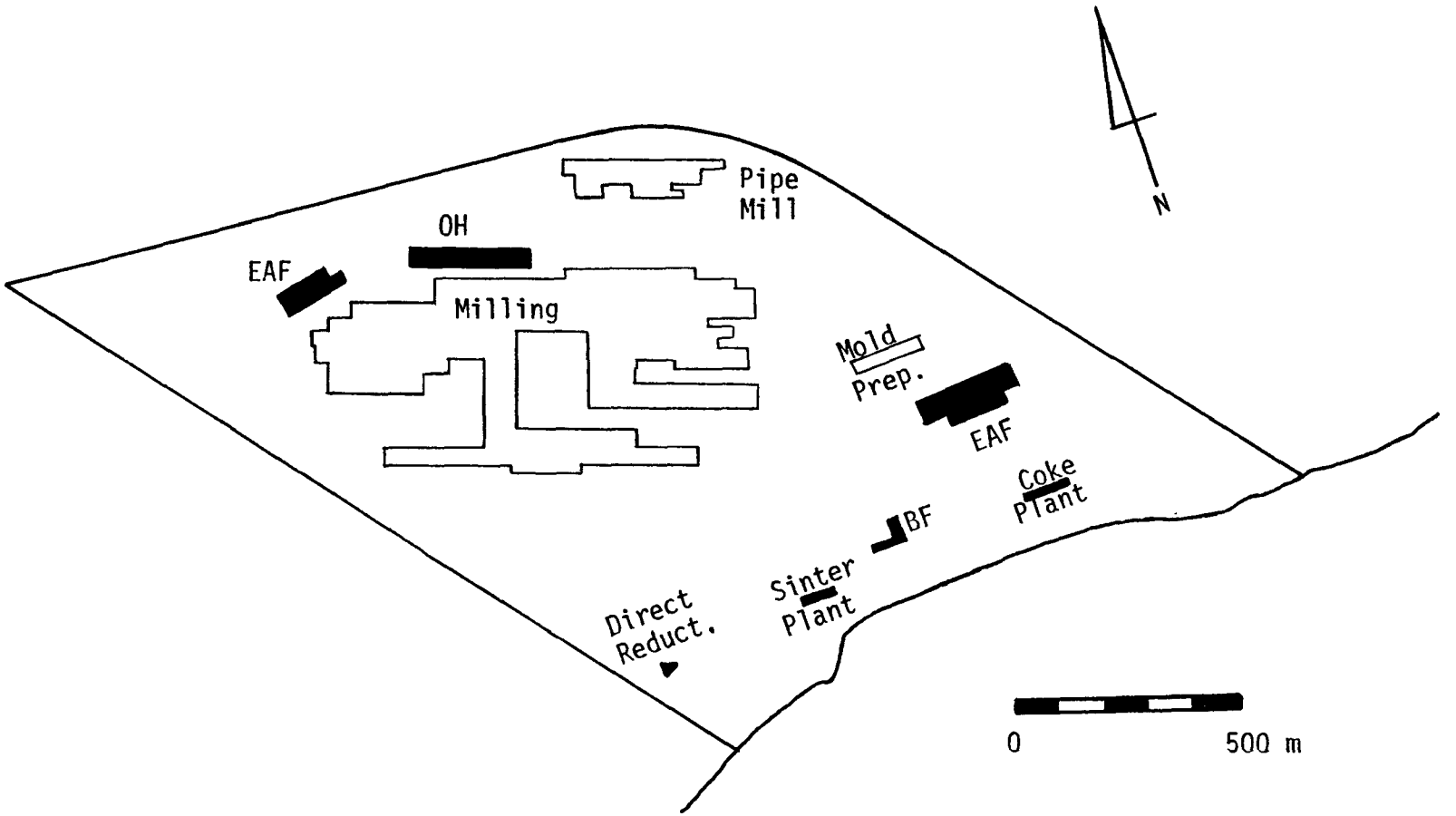
	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance		Volume
#1	451370001	Deer Park 13th and Center Streets	312	8.8km	1	8	0.5	Ground level	Center Street 13th Street	E N	30 5	Moderate Light
X #2	452330006	Channelview 828 Sheldon Road	238	8.1km	8	20	12	Roof mount	Sheldon Road	W	45	Moderate
#3	452560017	Houston #17 12550 Clinton @ Federal	046	2.7km	1	7	0	Ground level	Federal Road Clinton Road	E S	45 45	Heavy Heavy
#4	452560028	Addams Terminal	344	3.8km	6	15	7	Roof mount	(unnamed) paved	N	18	Moderate
#5	452560034	Cams #1* 1224 Mae Drive	127	3.3km	4	12	5	Roof mount	Mae Drive I-10	E N	10 100	Light Heavy
#6	454060002	Pasadena 208 W. Shaw	024	4.6km	10	17	10	Roof mount	W. Shaw Ave.	W	10	Moderate
#7	452560015	Houston #15* 12759 Market Street	145	1.8km	1	15	8	Ground level	unpaved drive (dirt/crushed shell)	E	12	Moderate

NOTE· All ground based TSP monitors are sited in violation of guidelines by virtue of being too close to the surface; all sites (ground level as well as roof mounted) have adequate separation from obstruction. The Houston #15 site was located very close to an unpaved road prior to January 1978. It is now atop a 1 story building within the same compound: any data from this site for the study period must be viewed with care. Wind speed and direction are measured at the CAMS #1 site; the record starts in April of 1973.

The CAMS #1 and HOUSTON #15 sites are most likely to see consistent downwind impact from Armco Steel. The most frequent persisting minds would transport material from the steel mill to these sites.

* Critical sites

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

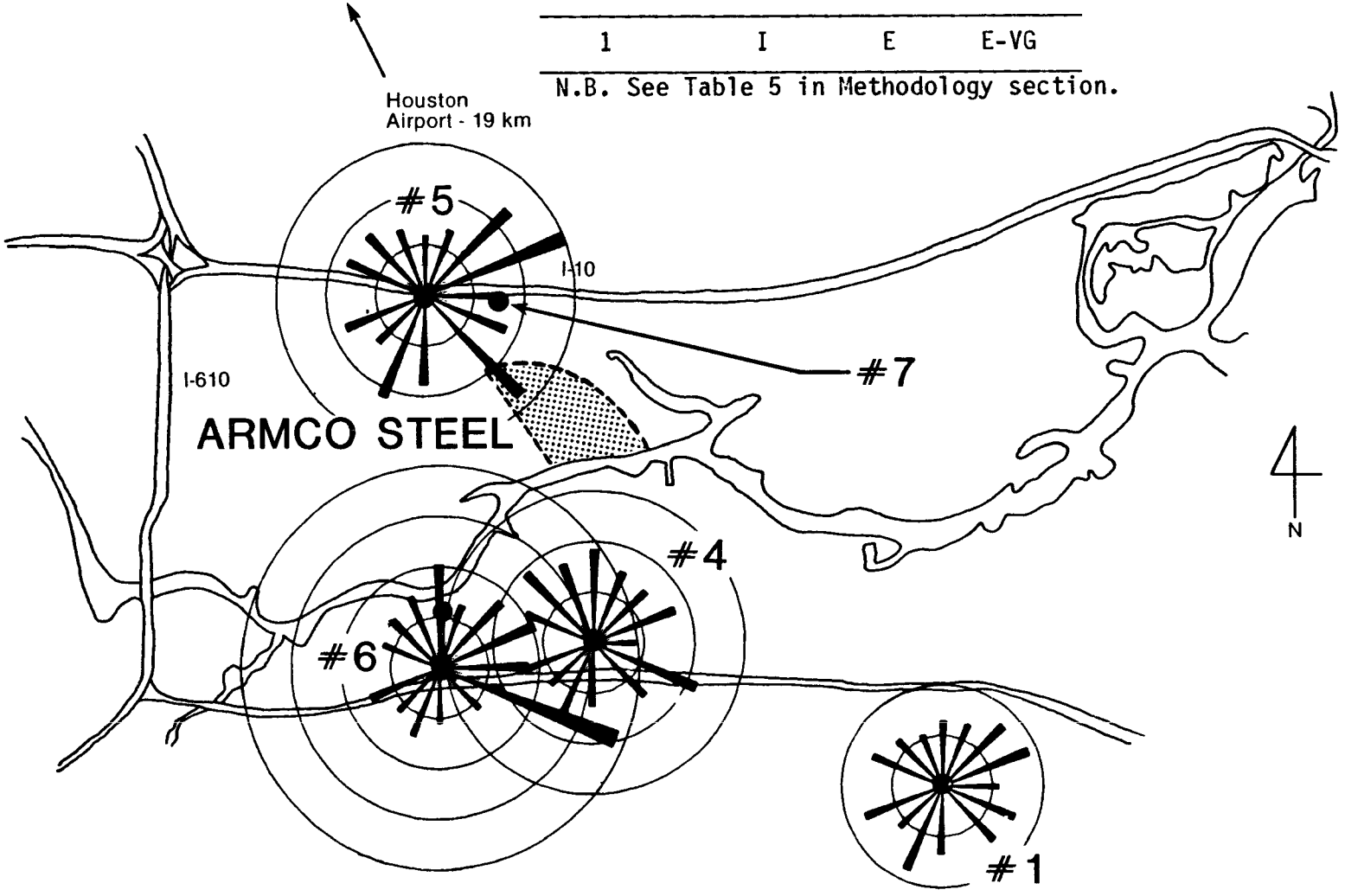


Armco Steel - Houston Works

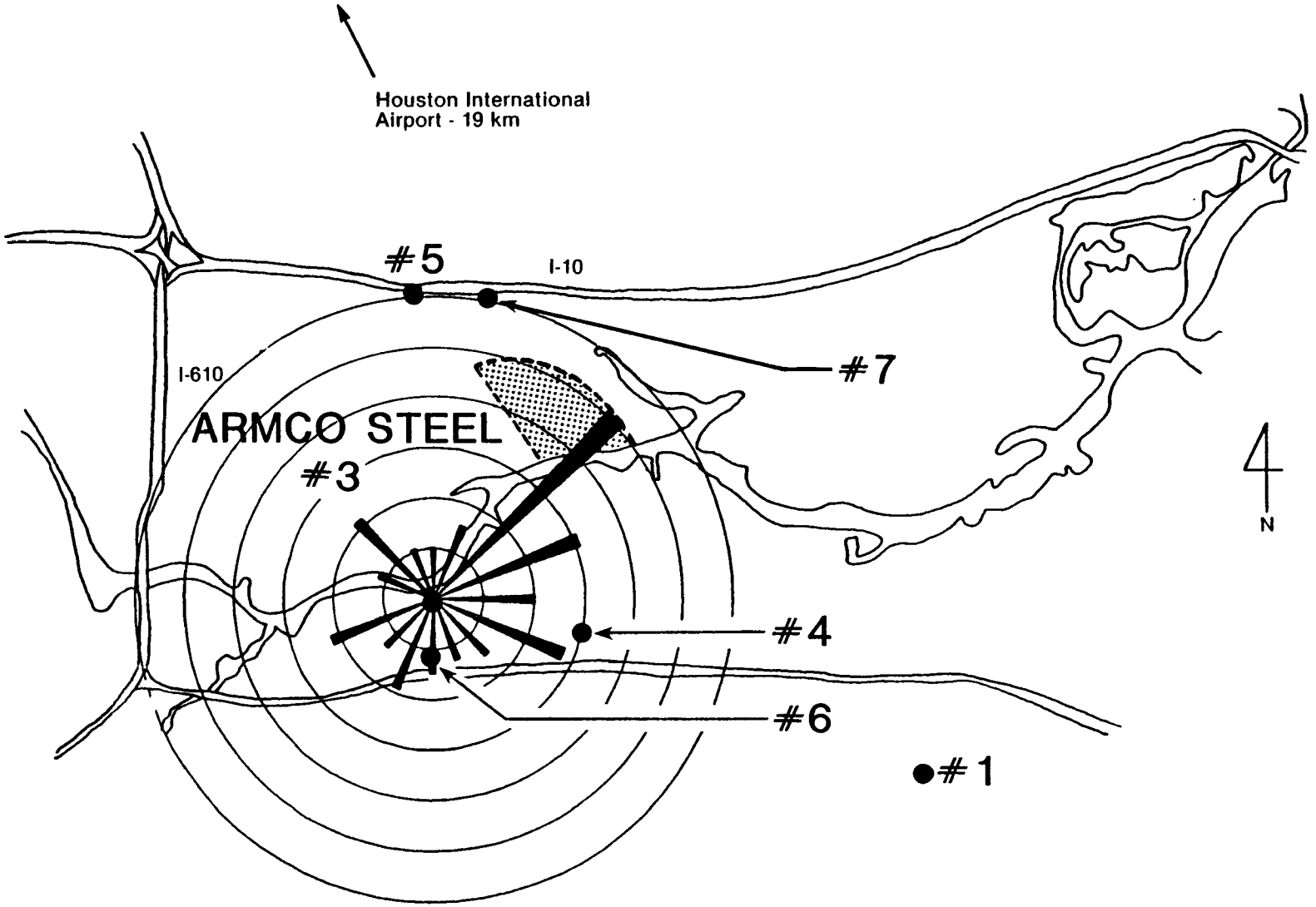
Wind Data Representativeness

Station #	Terrain	Distance	Rating
4	I	A	E
3,5,6	I	D	E
1	I	E	E-VG

N.B. See Table 5 in Methodology section.



TSP roses for Armco Steel, Houston, Texas, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.



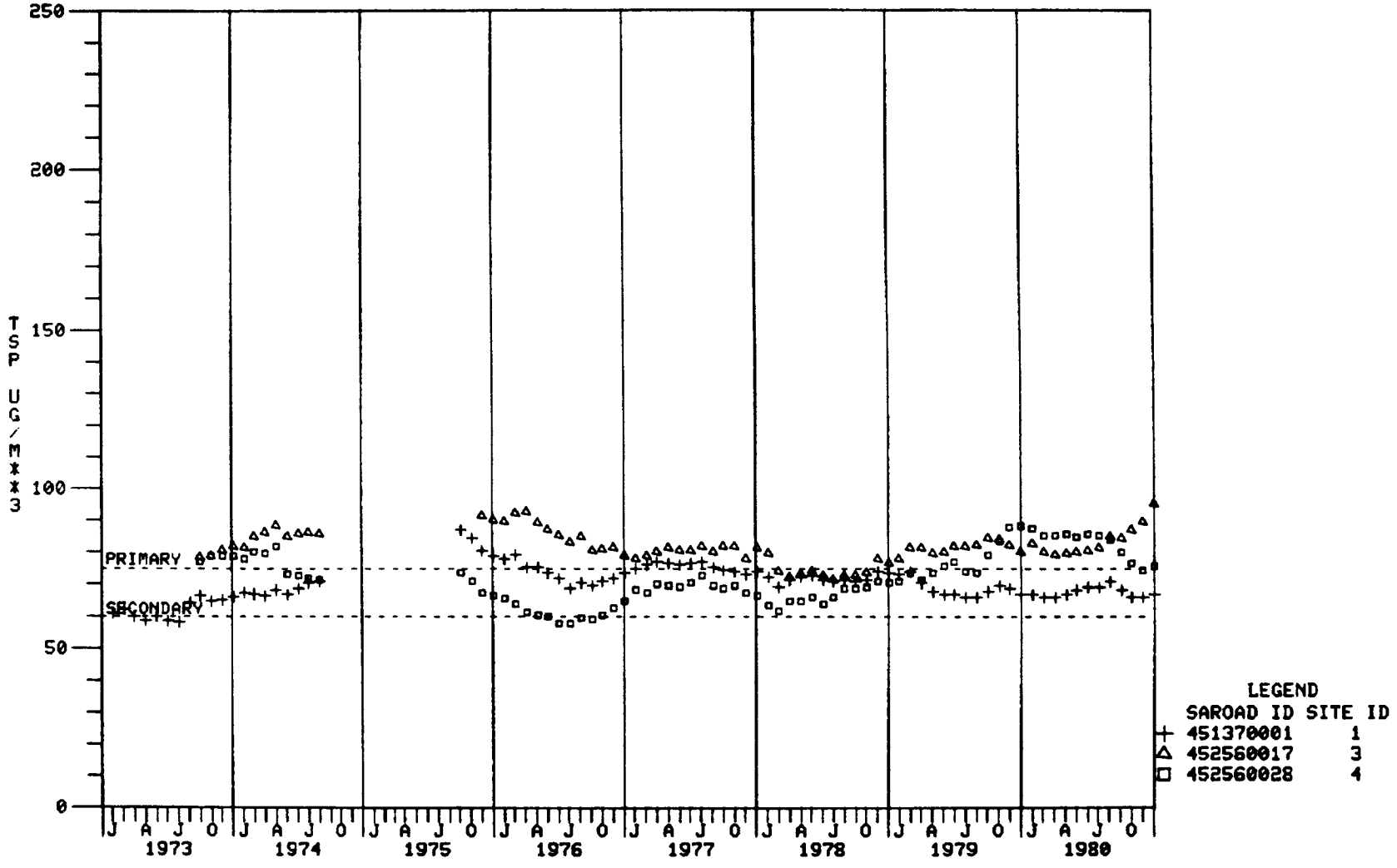
TSP roses for Armco Steel, Houston, Texas, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

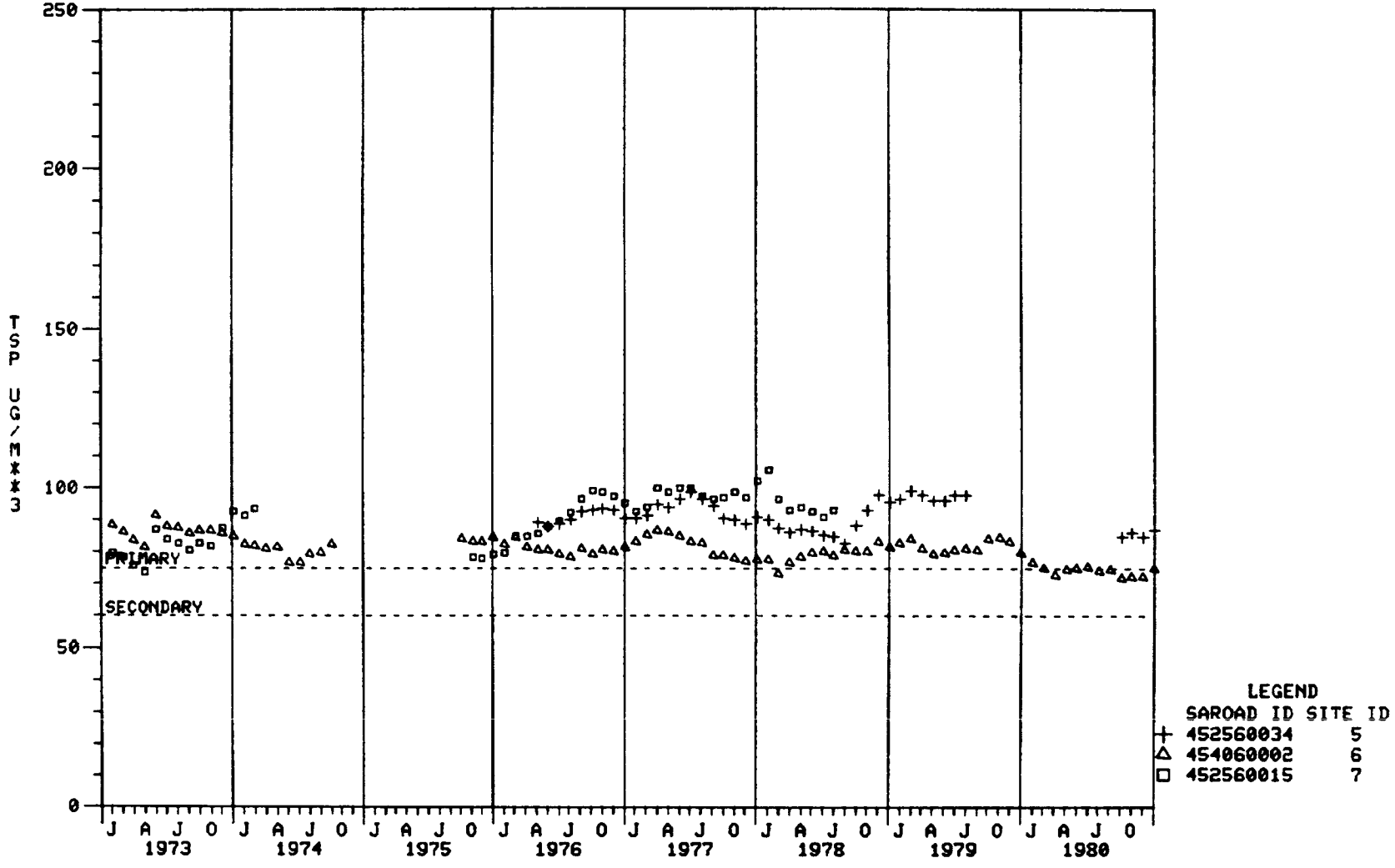
Armco--Houston, TX

Wind Direction	Monitoring Site Numbers #1	#3	#4	#5	#6
N	6	6	5	5	6
NNE	5	4	3	4	3
NE	2	3	3	3	3
ENE	2	2	2	2	2
E	2	2	1	2	2
ESE	2	2	1	2	2
SE	2	1	1	2	1
SSE	0	1	0	0	0
S	4	5	5	4	3
SSW	7	7	4	3	7
SW	4	4	4	3	5
WSW	2	1	2	2	2
W	0	0	0	0	0
WNW	1	1	1	1	1
NW	2	2	3	3	2
NNW	9	7	7	8	8
Total	50	48	42	44	47

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - HOUSTON, TX



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR ARMCO - HOUSTON, TX



TSP DATA SUMMARY FOR ARMCO - HOUSTON, TX
SAROAD STATION # 451370001 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	60	56	23	45	51	48	53	57	53
GEOMETRIC MEAN:	58.8	66.2	******	78.6	73.3	73.7	73.5	67.1	67.0
GEOMETRIC S.D.:	1.9	1.6	******	1.5	1.4	1.8	1.4	1.4	1.5
HIGHEST BY LARSEN EXTRP:	400.5	275.2	******	253.1	211.2	407.1	188.5	197.3	217.3
1ST HIGHEST:	135.0	325.0	158.0	230.0	248.0	1259.0	174.0	131.0	174.0
DATE :	720608	730528	740405	750729	760218	770224	780315	791012	800801
2ND HIGHEST:	130.0	152.0	158.0	163.0	141.0	337.0	118.0	125.0	148.0
DATE :	720316	730510	740511	750325	761208	771221	780414	791030	800203
# OF READINGS EXCEEDING 260 :	0	1	0	0	0	2	0	0	0
# OF READINGS EXCEEDING 150 :	0	2	2	2	1	4	1	0	1
RANGE									
0- 65:	33	28	8	15	23	22	16	25	20
66-130:	26	24	12	25	26	22	36	31	30
131-195:	1	3	3	4	1	2	1	1	3
196-260:	0	0	0	1	1	0	0	0	0
261-325:	0	1	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	1	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	1	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - HOUSTON, TX
SARDAD STATION # 452560017 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	59	25	48	48	55	56	54	51
GEOMETRIC MEAN:	******	82.5	******	89.9	78.9	81.5	76.5	80.0	95.1
GEOMETRIC S.D.:	******	1.6	******	1.5	1.5	1.8	1.5	1.6	1.7
HIGHEST BY LARSEN EXTRP:	******	324.8	******	303.7	264.4	449.5	266.7	310.8	466.4
1ST HIGHEST:	******	269.0	171.0	171.0	239.0	1346.0	164.0	168.0	609.0
DATE :	******	730528	740505	751003	760218	770224	780315	790924	801006
2ND HIGHEST:	******	148.0	151.0	165.0	161.0	236.0	164.0	156.0	534.0
DATE :	******	730104	740628	750325	760107	771221	781017	790115	800825
# OF READINGS EXCEEDING 260 :	0	1	0	0	0	1	0	0	3
# OF READINGS EXCEEDING 150 :	0	1	2	3	2	4	3	2	5
RANGE									
0- 65:	0	17	8	9	12	17	22	16	12
66-130:	0	34	14	31	32	31	27	30	32
131-195:	0	7	3	8	3	4	7	8	3
196-260:	0	0	0	0	1	2	0	0	1
261-325:	0	1	0	0	0	0	0	0	1
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	1	0	0	2

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - HOUSTON, TX
SARDAD STATION # 452560028 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	53	28	54	58	43	56	38	50
GEOMETRIC MEAN:	******	79.1	******	66.4	64.9	66.5	70.4	88.1	75.6
GEOMETRIC S.D.:	******	1.6	******	1.6	1.4	1.6	1.5	1.5	1.5
HIGHEST BY LARSEN EXTRP:	******	333.2	******	262.8	188.4	261.1	233.2	315.3	233.2
1ST HIGHEST:	******	325.0	210.0	333.0	229.0	354.0	272.0	205.0	255.0
DATE :	******	730528	740210	750223	760218	770107	780719	791105	800128
2ND HIGHEST:	******	253.0	180.0	216.0	149.0	281.0	203.0	199.0	164.0
DATE :	******	730510	740405	750112	760131	771221	780818	791030	800328
# OF READINGS EXCEEDING 260 :	0	1	0	1	0	2	1	0	0
# OF READINGS EXCEEDING 150 :	0	3	2	2	1	3	3	3	2
RANGE									
0- 65:	0	17	13	30	34	22	20	9	17
66-130:	0	30	12	22	21	17	33	22	31
131-195:	0	3	2	0	2	2	1	4	1
196-260:	0	2	1	1	1	0	1	3	1
261-325:	0	1	0	0	0	1	1	0	0
326-390:	0	0	0	1	0	1	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - HOUSTON, TX
SAROAD STATION # 452560034 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	27	31	36	58	112	57	31	44
GEOMETRIC MEAN:	******	******	******	******	90.3	90.8	95.7	******	86.9
GEOMETRIC S.D.:	******	******	******	******	1.4	1.5	1.5	******	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	******	236.4	296.4	317.6	******	264.1
1ST HIGHEST:	******	310.0	172.0	204.0	198.0	842.0	206.0	155.0	152.0
DATE :	******	730528	740129	751202	760218	770224	780414	790427	800322
2ND HIGHEST:	******	158.0	151.0	135.0	162.0	297.0	202.0	159.0	152.0
DATE :	******	731112	740417	751114	760810	771221	781017	790409	801111
# OF READINGS EXCEEDING 260 :	0	1	0	0	0	2	0	0	0
# OF READINGS EXCEEDING 150 :	0	2	2	1	3	6	7	3	2
RANGE									
0- 65:	0	3	11	8	9	18	12	9	8
66-130:	0	20	17	25	42	83	31	18	32
131-195:	0	3	3	2	6	8	12	4	4
196-260:	0	0	0	1	1	1	2	0	0
261-325:	0	1	0	0	0	1	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	1	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - HOUSTON, TX
SAROAD STATION # 454060002 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	54	50	30	54	52	50	53	46	50
GEOMETRIC MEAN:	87.8	85.0	******	84.4	81.1	77.6	81.3	79.4	74.7
GEOMETRIC S.D.:	2.0	1.5	******	1.3	1.5	1.7	1.4	1.5	1.4
HIGHEST BY LARSEN EXTRP:	698.4	302.6	******	199.6	248.4	370.3	232.7	262.1	218.6
1ST HIGHEST:	176.0	348.0	189.0	156.0	252.0	1196.0	205.0	281.0	158.0
DATE :	720608	730528	740222	750319	760218	770224	780315	790115	801111
2ND HIGHEST:	166.0	206.0	153.0	142.7	168.0	348.0	145.0	170.0	157.0
DATE :	720831	730227	740628	750106	761102	771221	780414	791024	800825
# OF READINGS EXCEEDING 260 :	0	1	0	0	0	2	0	1	0
# OF READINGS EXCEEDING 150 :	4	5	2	1	3	2	1	3	2
RANGE									
0- 65:	9	17	11	13	17	19	17	16	14
66-130:	33	27	14	37	30	27	34	24	33
131-195:	12	4	5	4	4	2	1	5	3
196-260:	0	1	0	0	1	0	1	0	0
261-325:	0	0	0	0	0	0	0	1	0
326-390:	0	1	0	0	0	1	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	1	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR ARMCO - HOUSTON, TX
SAROAD STATION # 452560015 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	49	48	16	53	44	48	21	0	0
GEOMETRIC MEAN:	76.7	92.8	******	79.2	95.4	102.2	******	******	******
GEOMETRIC S.D.:	2.4	1.7	******	1.6	1.6	1.9	******	******	******
HIGHEST BY LARSEN EXTRP:	962.8	438.0	******	304.2	357.3	696.9	******	******	******
1ST HIGHEST:	194.0	306.0	239.0	190.0	298.0	1510.0	175.0	******	******
DATE :	720403	730528	740517	750325	760218	770224	780414	******	******
2ND HIGHEST:	186.0	250.0	173.0	185.0	183.0	398.0	152.0	******	******
DATE :	720626	731218	740429	750130	760119	771221	780321	******	******
# OF READINGS EXCEEDING 260 :	0	1	0	0	1	3	0	0	0
# OF READINGS EXCEEDING 150 :	5	8	6	3	4	6	2	0	0
RANGE									
0- 65:	14	11	5	15	7	11	3	0	0
66-130:	27	25	5	29	27	26	13	0	0
131-195:	8	10	5	9	9	6	5	0	0
196-260:	0	1	1	0	0	2	0	0	0
261-325:	0	1	0	0	1	1	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	1	0	0	0
>455:	0	0	0	0	0	1	0	0	0

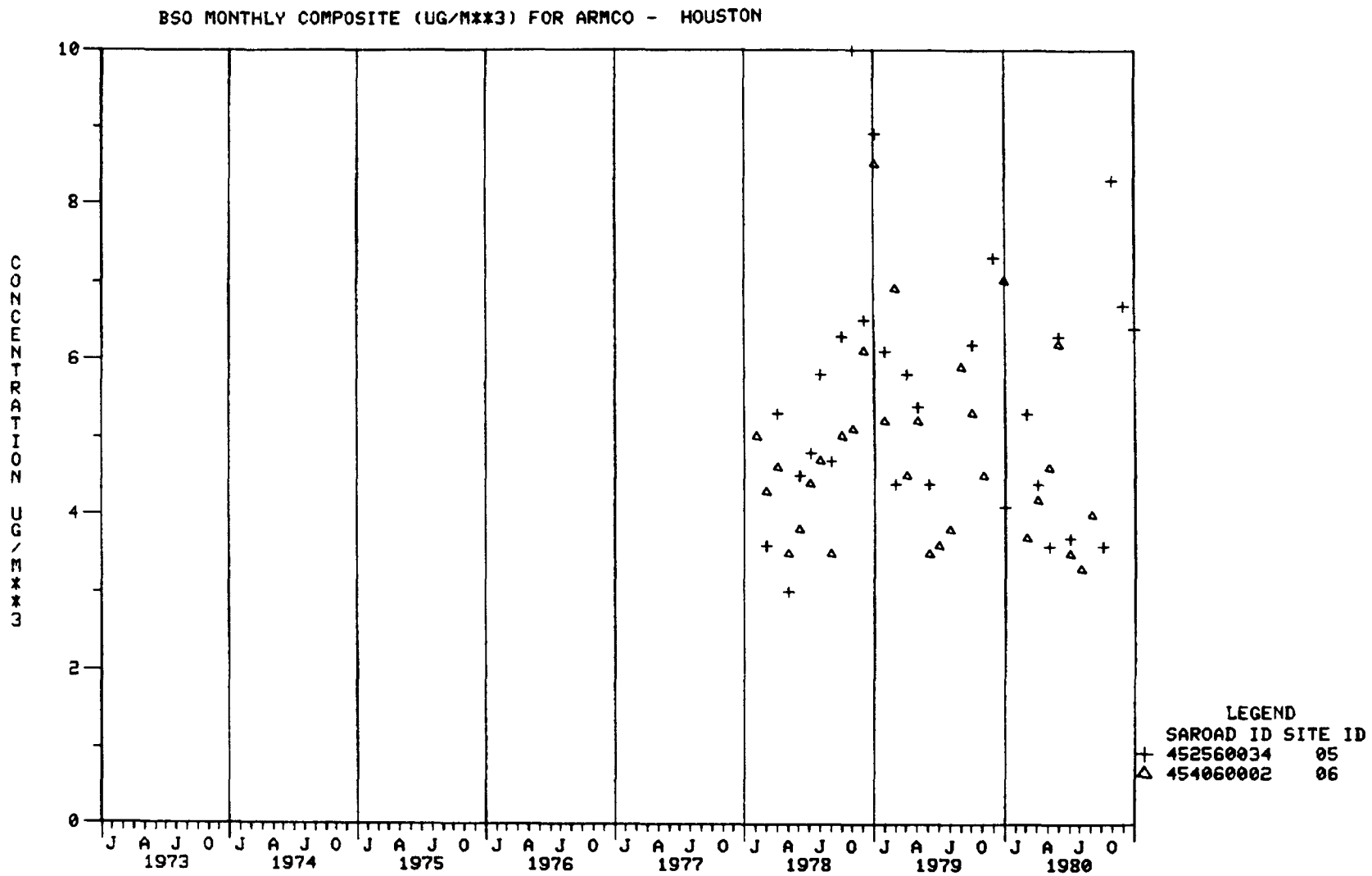
****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - HOUSTON, TX
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	451370001		452560017		452560028		452560034		454060002		452560015	
SITE ID #	1		3		4		5		6		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	1	1	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	609.	301.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0	0	0	1	0	1	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	281.	0.	291.	0.
SE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	0	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	354.	0.	0.	0.	0.	0.	0.
SSW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SW COUNT:	1	0	1	0	0	0	1	0	1	0	1	0
AVE TSP:	1259.	0.	1346.	0.	0.	0.	842.	0.	1196.	0.	1510.	0.
WSW COUNT:	0	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	272.	0.	0.	0.	0.	0.	0.
W COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	1	0	0	0	1	0	1	0	1	0	1	1
AVE TSP:	337.	0.	0.	0.	281.	0.	297.	0.	348.	0.	398.	298.
NW COUNT:	0	0	0	0	1	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	333.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	1	0	1	0	1	0	1	0	1	0	1	0
AVE TSP:	325.	0.	269.	0.	325.	0.	310.	0.	348.	0.	306.	0.
ALL COUNT:	3	0	3	1	3	2	3	0	4	0	4	1
AVE TSP:	640.	0.	741.	301.	313.	313.	483.	0.	543.	0.	625.	298.

24-HR STANDARD EXCEEDANCE ROSE FOR
ARMCO - HOUSTON, TX
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SARDAD #	451370001		452560017		452560028		452560034		454060002		452560015	
SITE ID #	1		3		4		5		6		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	2	0	1	2	0	0	0	2	1	0	0
AVE TSP:	0.	194.	0.	171.	206.	0.	0.	0.	184.	170.	0.	0.
NNE COUNT:	0	0	1	0	0	0	0	1	0	1	0	0
AVE TSP:	0.	0.	168.	0.	0.	0.	0.	172.	0.	168.	0.	0.
NE COUNT:	0	0	2	1	0	0	1	2	1	1	0	0
AVE TSP:	0.	0.	390.	301.	0.	0.	160.	161.	175.	158.	0.	0.
ENE COUNT:	0	0	1	0	0	1	1	1	0	0	0	0
AVE TSP:	0.	0.	164.	0.	0.	164.	202.	159.	0.	0.	0.	0.
E COUNT:	0	0	0	1	0	0	2	1	0	1	0	0
AVE TSP:	0.	0.	0.	156.	0.	0.	164.	151.	0.	157.	0.	0.
ESE COUNT:	0	1	2	1	0	1	2	3	1	0	2	3
AVE TSP:	0.	163.	184.	165.	0.	255.	186.	174.	281.	0.	234.	170.
SE COUNT:	0	0	0	0	0	1	2	1	0	0	7	2
AVE TSP:	0.	0.	0.	0.	0.	205.	155.	184.	0.	0.	198.	161.
SSE COUNT:	1	0	1	3	2	0	1	1	0	1	3	2
AVE TSP:	162.	0.	171.	177.	179.	0.	189.	154.	0.	153.	179.	167.
S COUNT:	1	1	0	0	1	2	0	2	0	2	2	1
AVE TSP:	152.	159.	0.	0.	253.	277.	0.	151.	0.	155.	159.	175.
SSW COUNT:	1	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	174.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SW COUNT:	1	0	1	0	0	1	1	0	1	0	1	1
AVE TSP:	1258.	0.	1346.	0.	0.	210.	842.	0.	1196.	0.	1510.	196.
WSW COUNT:	0	0	0	0	0	1	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	272.	0.	0.	0.	0.	0.	152.
W COUNT:	0	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	203.	0.	0.	0.	0.	0.	0.
WNW COUNT:	1	1	1	1	1	1	1	1	1	1	1	1
AVE TSP:	337.	248.	236.	239.	281.	229.	297.	198.	348.	252.	398.	298.
NW COUNT:	0	0	1	0	1	0	0	0	1	1	0	1
AVE TSP:	0.	0.	162.	0.	333.	0.	0.	0.	189.	176.	0.	162.
NNW COUNT:	2	0	1	1	2	0	1	0	1	0	1	0
AVE TSP:	242.	0.	269.	161.	253.	0.	310.	0.	348.	0.	306.	0.
ALL COUNT:	7	5	11	9	9	9	12	13	8	9	17	12
AVE TSP:	367.	192.	333.	190.	238.	232.	251.	172.	363.	172.	290.	179.


BSO MONTHLY COMPOSITE (UG/M**3) FOR ARMCO - HOUSTON
CONCENTRATION UG/M**3
10
8
6
4
2
0
J A J O
1973
1974
1975
1976
1977
1978
1979
1980
LEGEND
SAROAD ID SITE ID
452560034 05
454060002 06

UPDATED AIR QUALITY EVALUATION - ARMCO STEEL, HOUSTON, TEXAS

Stations used in update:

Continued operation:	#1, #3, #4, #5, #6
New stations:	None
Discontinued stations:	#7 (1978)

Trends in geometric means:

Graphs of the 12-month running geometric means are not very different from pre-1978. Station #1 displayed no significant overall trend (Spearman correlation coefficient of -0.07). A moderately negative trend was apparent at station #6 (-0.62). A slight negative trend was indicated for station #3 (-0.21). Station #4 indicated a slightly positive overall trend (Spearman correlation coefficient of +0.37).

Attainment status:

Station #1 remained in attainment of the primary TSP standards in 1978-1980. Stations #3 and #5 were not in attainment (station #5 had insufficient data in 1979). Station #4 went from attainment in 1978 to nonattainment for 1979 and 1980 (the 1980 annual geometric mean was just barely in violation at 75.6 $\mu g/m^3$). Station #7 did not generate sufficient data to estimate attainment status in 1978.

Pollution roses:

The pollution rose for station #3 implies a substantial impact from the Armco facility. Substantial impact from the southeast is noted at both stations #3 and #6; the source of this impact is not known.

Persistent winds from the southeast are infrequent; however, Station #5 shows a minor increase in TSP levels from this direction, which contains the Armco facility. The apparent large contribution from the northeasterly direction is dominated by a single event.

Standard exceedance roses:

Even though most recorded excursions beyond the primary 24-hour standards occurred under steady wind conditions, very few involved winds that would directly transport plant emissions to one (or more) of the hi-vols. However, none of the hi-vols are sited to make strategic use of most frequently occurring persistent winds.

BSO:

Benzene-soluble organics were monitored at stations #5 and #6. Monthly composite concentrations generally ranged between 3 and 10 $\mu g/m^3$.

BETHLEHEM STEEL

Sparrows Point, Maryland

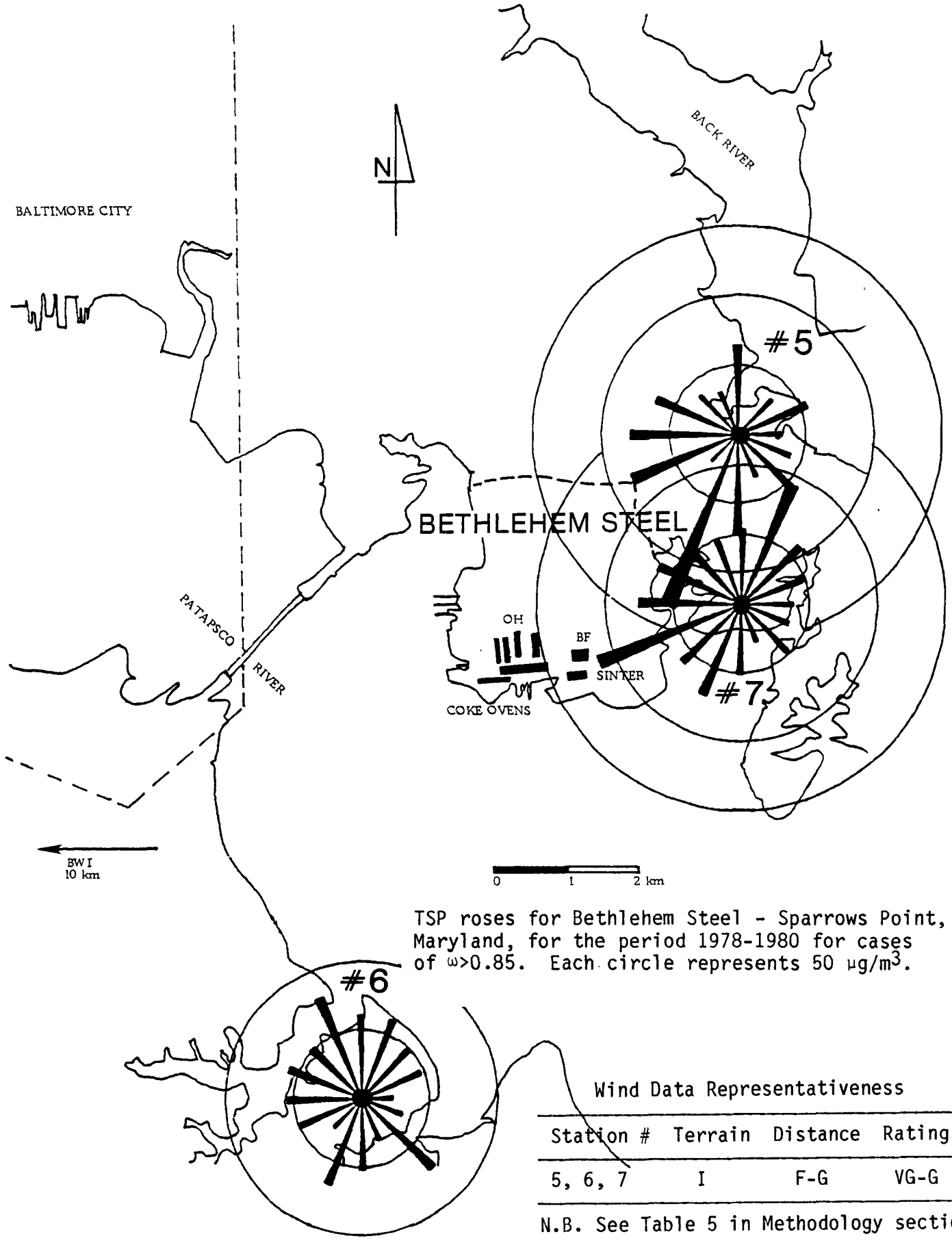
EPA Region III

Bethlehem Steel - Sparrows Point

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance		Volume
X #1	21014002	Fort Howard * grounds of Veterans' Hospital	312	4.1km	3	6	3	Ground level	(unknown) paved road	NE	10	Very light
X #2	210620001	Sollers Point 325 Sollers Point Road	132	3.4km	8	11	8	Roof mount	Sollers Pt. Rd.	NW	35	Heavy
X #3	210620002	Cleaners Hangars 8801 Wise Avenue	202	4.2km	5	10	7	Roof mount	Wise Avenue Gray Avenue	NE NW	15 15	Heavy Heavy
X #4	210620003	Sandy Plains 8330 Kavanaugh Road	175	4.3km	10	20	10	Roof mount	Kavanaugh Rd.	SW	20	Moderate
#5	210645001	Edgemere Edgemere Fire Station	234	3.7km	5	14	11	Roof mount	Greenhill Road Md. Route 20	NW SW	25 30	Light Heavy
#6	211360002	Riviera Beach Riviera Beach Elementary School	21	7.4km	4	14	11	Roof mount	Jenkins Road	SE	10	Light
#7	210140006	Chesapeake Terrace * Chesapeake Terrace Elementary School	271	2.9km	5	10	7	Roof mount	Lodge Farm Rd. Ellen Avenue	E S	20 15	Moderate Very light

* Critical sites

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.



TSP roses for Bethlehem Steel - Sparrows Point, Maryland, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

Wind Data Representativeness

Station #	Terrain	Distance	Rating
5, 6, 7	I	F-G	VG-G

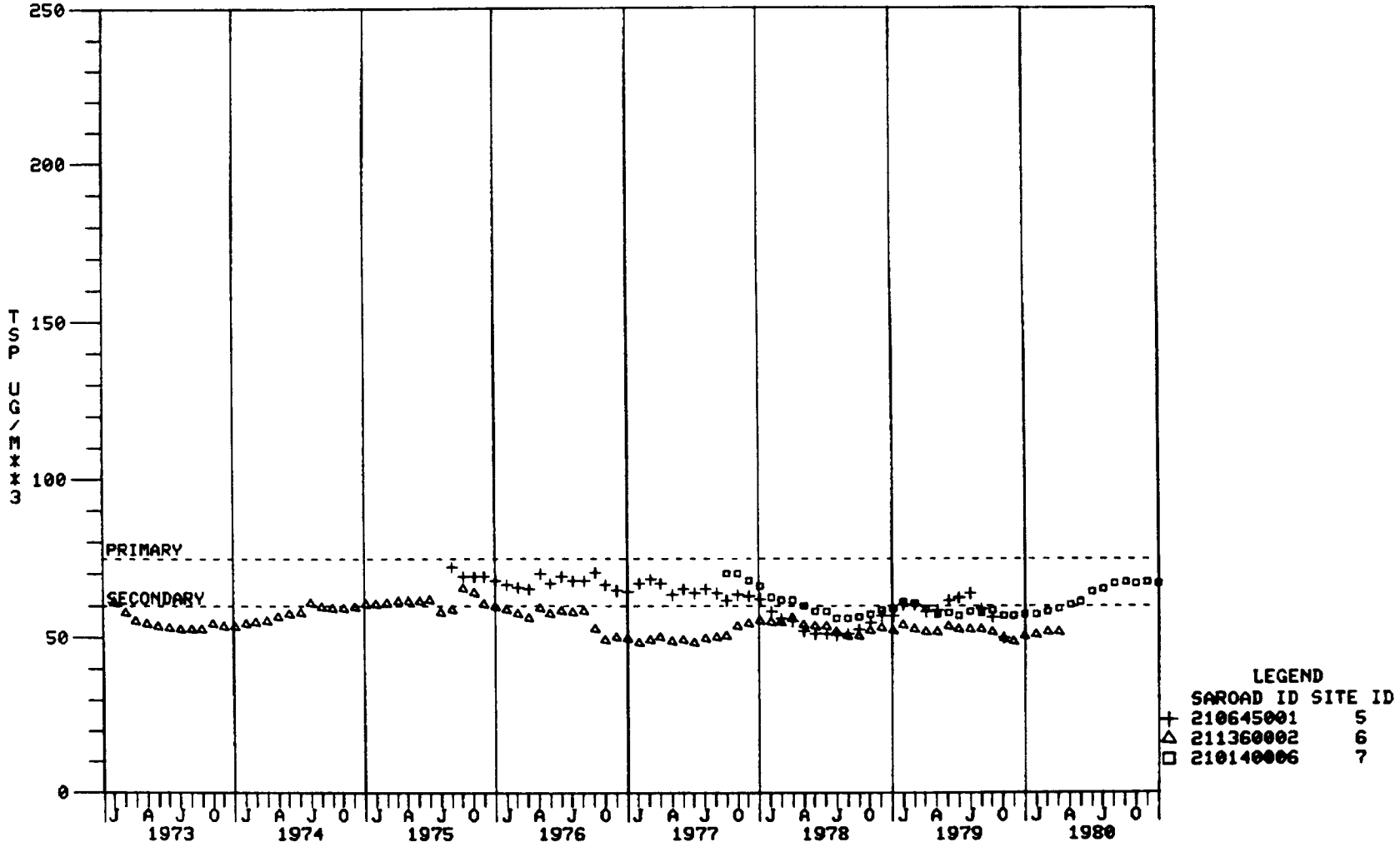
N.B. See Table 5 in Methodology section.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Bethlehem Steel--Sparrows Point, MD

Wind Direction	Monitoring Site Numbers		
	#5	#6	#7
N	3	3	3
NNE	0	1	1
NE	2	5	6
ENE	1	3	3
E	1	1	2
ESE	1	1	1
SE	1	2	3
SSE	1	1	2
S	7	8	8
SSW	2	6	5
SW	2	3	4
WSW	3	3	4
W	6	9	12
WNW	7	11	15
NW	4	8	8
NNW	1	1	2
Total	42	66	79

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - SPARROWS POINT, MD



TSP DATA SUMMARY FOR BETHLEHEM - SPARROWS POINT, MD
SAROAD STATION # 210645001 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	4	59	56	56	52	36	0
GEOMETRIC MEAN:	******	******	******	67.9	64.4	62.2	57.1	******	******
GEOMETRIC S.D.:	******	******	******	1.6	1.9	1.4	1.6	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	247.1	424.3	185.4	212.0	******	******
1ST HIGHEST:	******	******	109.0	217.0	475.0	162.0	146.0	162.0	******
DATE :	******	******	741213	750325	760418	770413	780824	790503	******
2ND HIGHEST:	******	******	100.0	166.0	231.0	118.0	130.0	132.0	******
DATE :	******	******	741225	751015	760430	770718	781023	790316	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	1	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	2	4	1	0	1	0
RANGE									
0- 65:	0	0	1	31	33	29	32	20	0
66-130:	0	0	3	23	15	26	19	14	0
131-195:	0	0	0	4	6	1	1	2	0
196-260:	0	0	0	1	1	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	1	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - SPARROWS POINT, MD
SAROAD STATION # 211360002 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	95	61	106	43	56	54	52	59	34
GEOMETRIC MEAN:	61.0	53.4	60.4	59.5	49.5	55.3	52.1	50.5	******
GEOMETRIC S.D.:	1.5	1.5	1.4	1.9	1.6	1.4	1.5	1.4	******
HIGHEST BY LARSEN EXTRP:	218.8	180.5	176.2	388.2	209.0	136.9	171.2	140.3	******
1ST HIGHEST:	261.0	171.0	163.0	406.0	156.0	123.0	132.0	114.0	89.0
DATE :	720201	731025	740429	750903	760418	770419	781110	790503	800801
2ND HIGHEST:	168.0	117.0	134.0	357.0	146.0	103.0	98.0	106.0	85.0
DATE :	720112	730901	740710	750909	760611	770823	781104	791223	800714
# OF READINGS EXCEEDING 260 :	1	0	0	3	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	2	1	1	3	1	0	0	0	0
RANGE									
0- 65:	53	40	67	27	40	40	37	47	15
66-130:	39	20	37	13	14	14	14	12	19
131-195:	2	1	2	0	2	0	1	0	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	1	0	0	1	0	0	0	0	0
326-390:	0	0	0	1	0	0	0	0	0
391-455:	0	0	0	1	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - SPARROWS POINT, MD
SARDAD STATION # 210140086 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	58	60	59	55
GEOMETRIC MEAN:	******	******	******	******	******	65.8	59.3	57.3	67.0
GEOMETRIC S.D.:	******	******	******	******	******	1.4	1.5	1.4	1.4
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	187.5	204.1	157.4	181.2
1ST HIGHEST:	******	******	******	******	******	193.0	187.0	131.0	147.0
DATE :	******	******	******	******	******	770413	780824	790906	800801
2ND HIGHEST:	******	******	******	******	******	120.0	156.0	131.0	138.0
DATE :	******	******	******	******	******	770630	781023	791117	800502
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	1	2	0	0
RANGE									
0- 65:	0	0	0	0	0	30	33	38	27
66-130:	0	0	0	0	0	27	25	19	26
131-195:	0	0	0	0	0	1	2	2	2
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

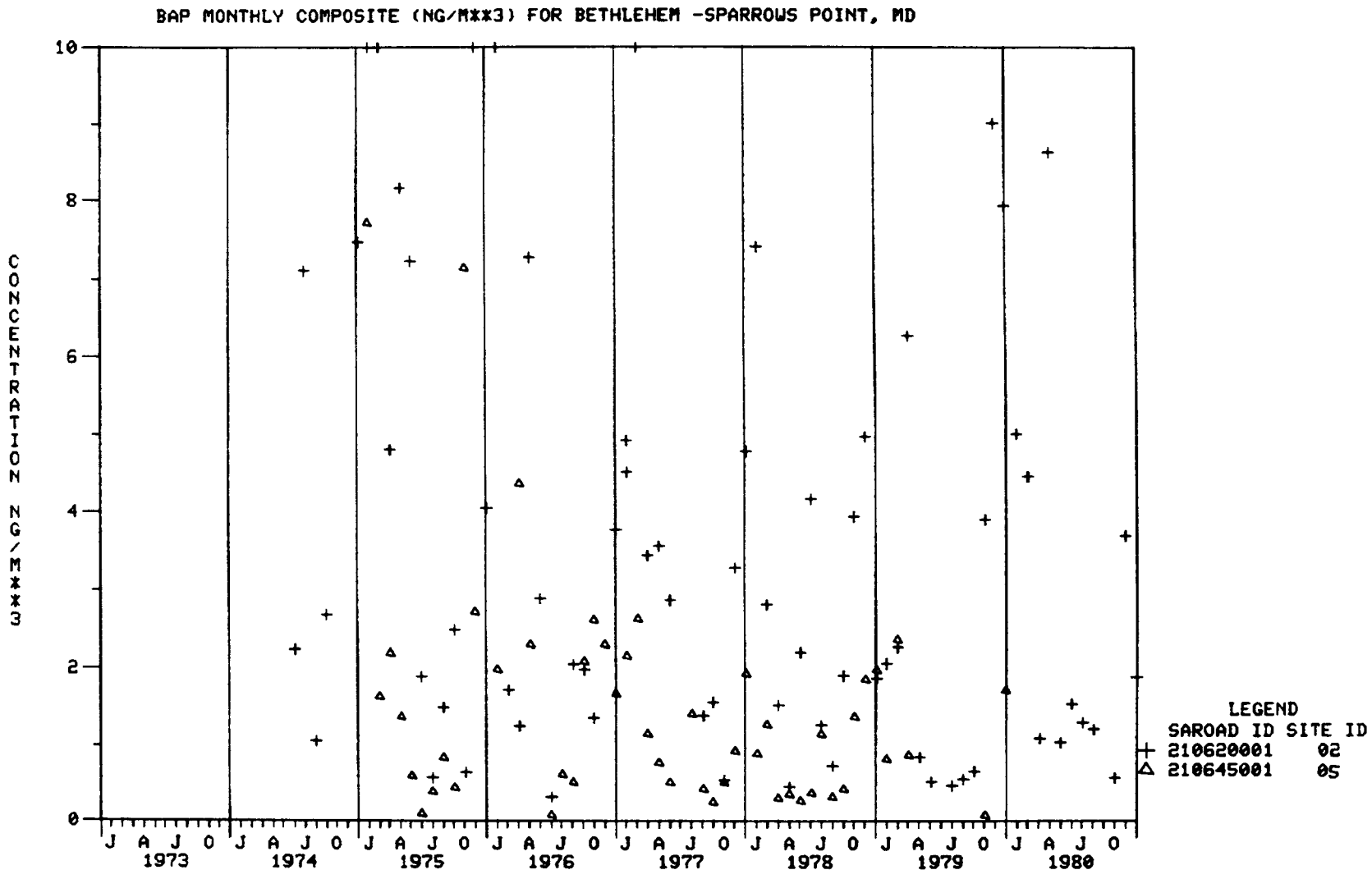
****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - SPARROWS POINT, MD
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	210645001		211360002		210140006	
SITE ID #	5		6		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	271.	0.	0.
SE COUNT:	0	1	0	0	0	0
AVE TSP:	0.	475.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
S COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
SSW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
SW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
WSW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
W COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	1	1	0	0
AVE TSP:	0.	0.	406.	357.	0.	0.
NNW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ALL COUNT:	0	1	1	2	0	0
AVE TSP:	0.	475.	406.	314.	0.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - SPARROWS POINT, MD
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	210645001		211360002		210140006	
SITE ID #	5		6		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	171.	0.	0.
ENE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	271.	0.	0.
SE COUNT:	0	1	0	1	0	0
AVE TSP:	0.	475.	0.	156.	0.	0.
SSE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
S COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
SSW COUNT:	1	0	0	0	0	0
AVE TSP:	162.	0.	0.	0.	0.	0.
SW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
WSW COUNT:	1	0	1	0	0	0
AVE TSP:	166.	0.	163.	0.	0.	0.
W COUNT:	1	1	0	0	1	0
AVE TSP:	170.	217.	0.	0.	187.	0.
WNW COUNT:	1	0	0	0	0	1
AVE TSP:	165.	0.	0.	0.	0.	156.
NW COUNT:	0	0	1	1	0	0
AVE TSP:	0.	0.	406.	357.	0.	0.
NNW COUNT:	0	1	0	0	0	0
AVE TSP:	0.	231.	0.	0.	0.	0.
ALL COUNT:	4	3	2	4	1	1
AVE TSP:	166.	308.	285.	239.	187.	156.


BAP MONTHLY COMPOSITE (NG/M**3) FOR BETHLEHEM -SPARROWS POINT, MD
CONCENTRATION NG/M**3
10
8
6
4
2
0
J A J O
1973
1974
1975
1976
1977
1978
1979
1980
LEGEND
SAROAD ID SITE ID
210620001 02
210645001 05

5

UPDATED AIR QUALITY EVALUATION - BETHLEHEM STEEL, SPARROWS POINT, MARYLAND

Stations used in update:

Continued operation:	#7
New stations:	None
Discontinued stations:	#5 (1979), #6 (1980)

Trends in geometric means:

Station #6 continued displaying running geometric means generally below the secondary standard with a moderate downtrend indicated with a Spearman rank correlation coefficient of -0.55. Station #5 showed a strong negative trend (Spearman correlation coefficient of -0.83). Station #7's record, showing essentially no long-term trend, was composed of a decline in TSP levels from late 1977 through mid-1978 and a rise in 1980.

Attainment status:

All stations indicate attainment of the primary standards.

Pollution roses:

Station #5 continued to demonstrate apparent impact from the plant. Station #7 also demonstrated apparent impact from the plant.

Standard exceedance roses:

For the three excursions beyond the 24-hour primary TSP standard in the period 1972-1980, wind conditions were either variable or were such that they would not be expected to transport plant emissions to the sampler.

BaP:

BaP was sampled at station #5 (through 1979) and at station #2 (through 1980). Monthly composite concentrations at station #5 were generally lower than those at station #2. Monthly composite concentrations at both sites were generally lower than those measured prior to 1978.

BETHLEHEM STEEL

Lackawanna, New York

EPA Region II

HiVol Monitoring Sites in the Vicinity of Bethlehem Steel, Lackawanna, New York

	SAROAD #	Site Name and Address	Plant Location from Site Bearing		Distance (km)	Elevation (m) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance (m)		Volume
#1	333520001 *	Lackawanna Sewage Treatment Plant	Coking	288°	1.9	5	178	0	Building roof	Lehigh St.	W	12	2 lane-light
			Blast furn	293°	1.7								
			Sintering	258°	1.3								
			BOF	238°	1.4								
#2	333520002*	Our Lady of Victory Hospital	Coking	268°	3.3	14	187	9	Building roof	Ridge Road	S	45	2 lane-moderate
			Blast furn	269°	3.0								
			Sintering	250°	2.9								
			BOF	240°	3.0								
X #3	330500001	Blasdell Village Hall	Coking	323°	4.0	8	180	2	Building roof	Miriam St.	S	12	2 lane, light, dirt
			Blast furn	320°	3.8								
			Sintering	316°	2.9								
			BOF	311°	2.5								
#4	333520004 *	Public School #4	Coking	247°	1.0	9	178	0	Building roof	Rt. 5	WSW	45	4 lane-expressway
			Blast furn	242°	0.5								
			Sintering	193°	1.3								
			BOF	186°	1.7								
#5	330660006	Holy Family School	Coking	231°	3.8	15	180	2	Building roof	Tifft St.	S	15	2 lane-moderate
			Blast furn	229°	3.5								
			Sintering	219°	4.1								
			BOF	210°	4.4								
X #6	337450002	West Seneca High School	Coking	263°	7.1	15	192	14	Building roof	Seneca St.	W	30	2 lane-moderate
			Blast furn	263°	6.8								
			Sintering	255°	6.7								
			BOF	251°	6.7								
#7	330660014	Buffalo Port Terminal	Coking	167°	3.4	9	178	0	Building roof	Rt 5	NE	90	4 lane-expressway
			Blast furn	162°	3.4								
			Sintering	162°	4.3								
			BOF	162°	4.8								
#8	333520001 A07	Lackawanna Wilmuth Street Water Treatment Holbrook Avenue Lackawanna, NY	Coking	297°	1.7	6	182	4	Rooftop center city Residential	Holbrook Ave.	Unknown		Unknown
			Blast furn	305°	1.48								
			Sintering	267°	.95					Wilmuth Ave.	W		Unknown
			BOF	239°	1.03								

* Critical sites.

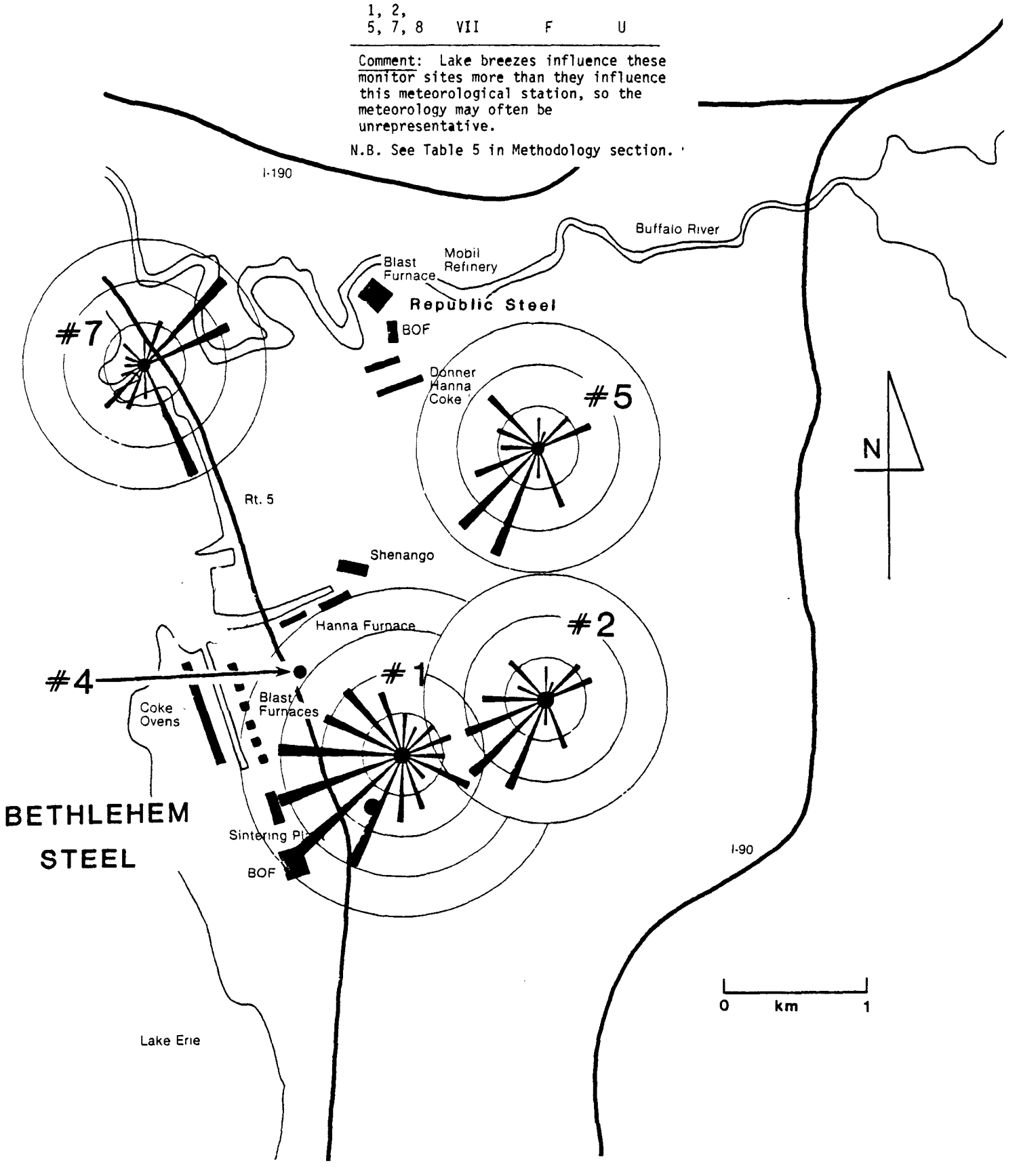
X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Wind Data Representativeness

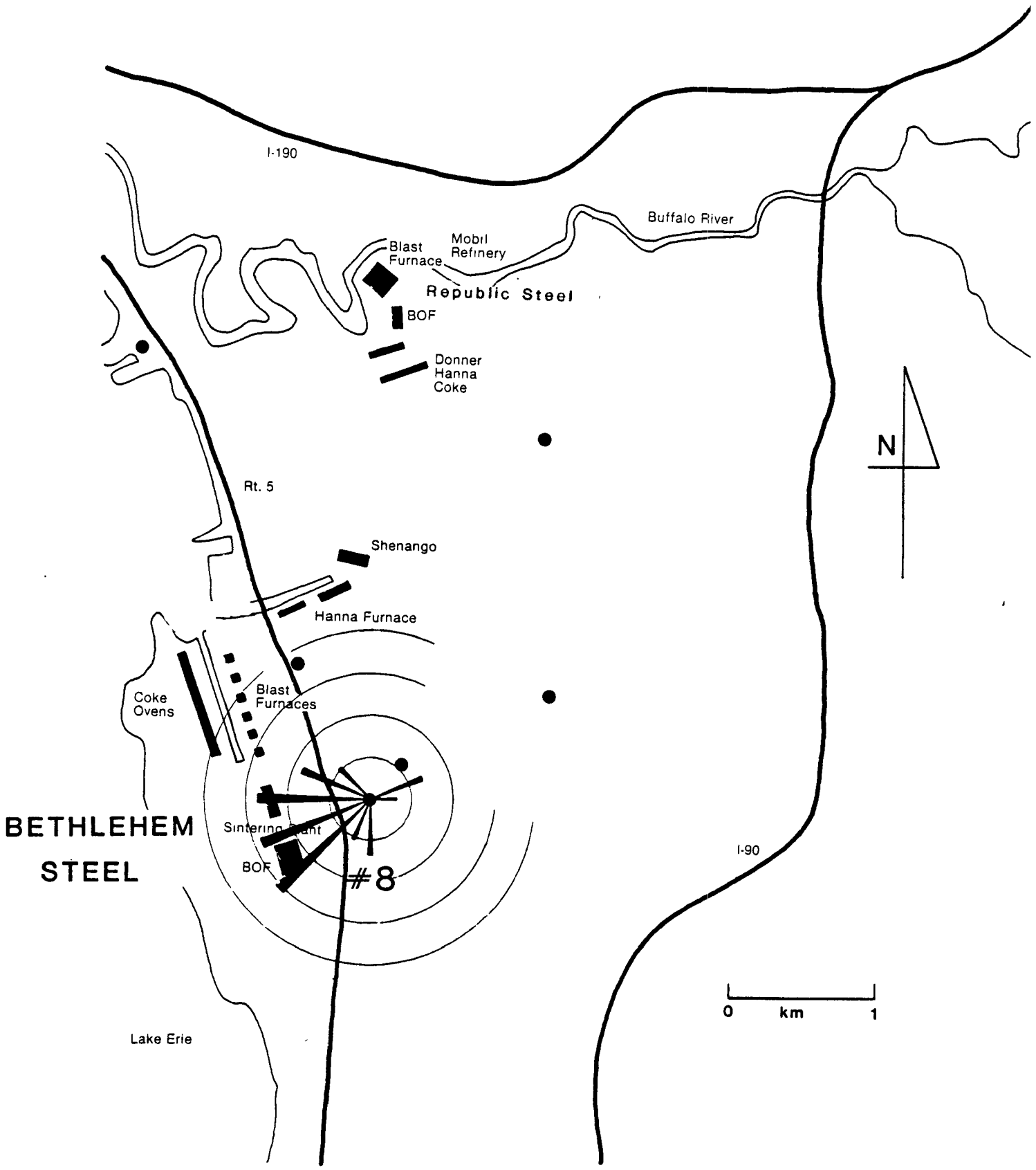
Station #	Terrain	Distance	Rating
1, 2, 5, 7, 8	VII	F	U

Comment: Lake breezes influence these monitor sites more than they influence this meteorological station, so the meteorology may often be unrepresentative.

N.B. See Table 5 in Methodology section.



TSP roses for Bethlehem Steel - Lackawanna, New York, for the period 1978-1980 for cases of $\omega > 0.95$. Each circle represents 50 $\mu g/m^3$.



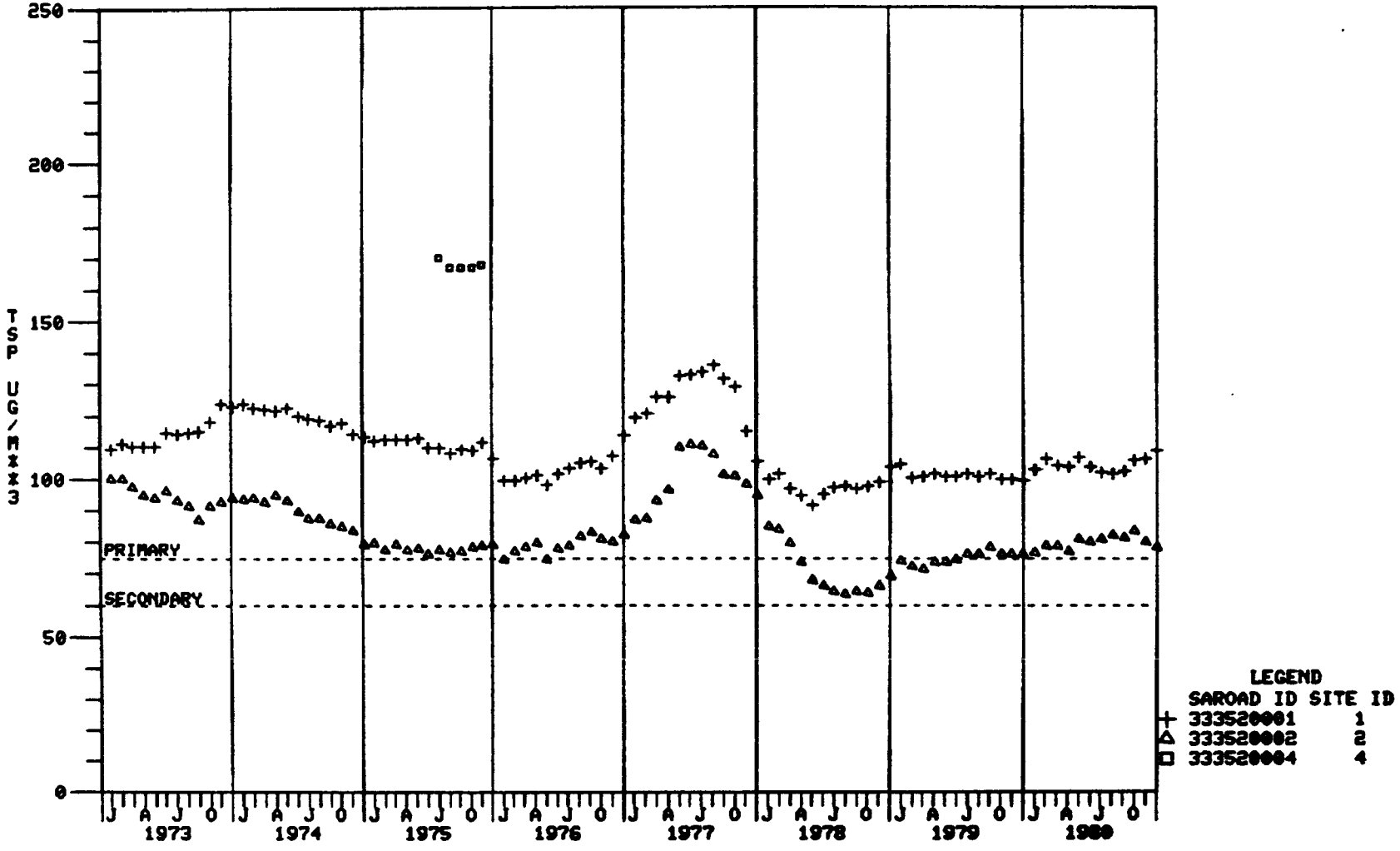
TSP roses for Bethlehem Steel - Lackawanna, New York, for the period 1978-1980 for cases of ω>0.95. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

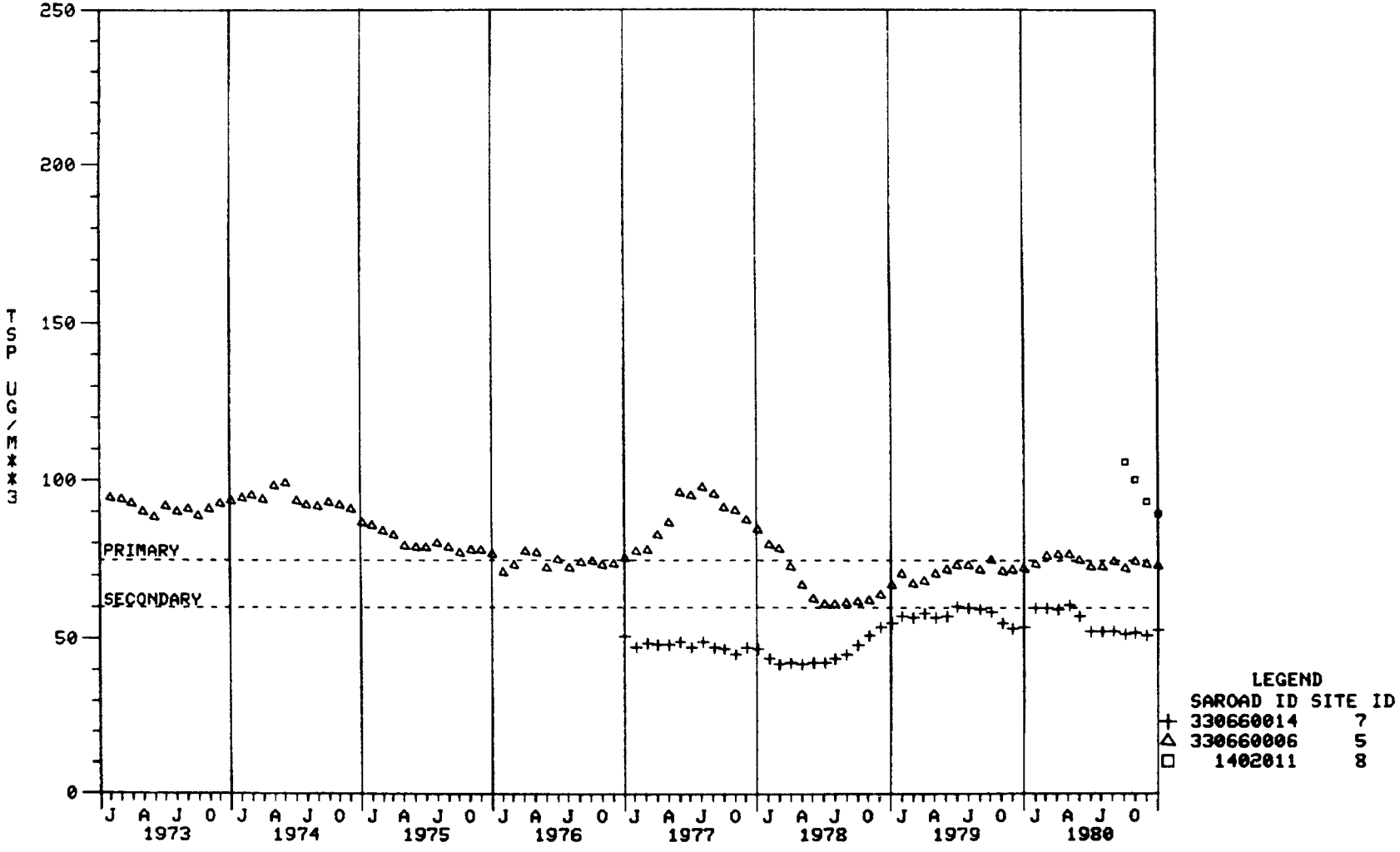
Bethlehem Steel--Lackawanna, NY

Wind Direction	Monitoring Site Numbers #1	#2	#5	#7	#8
N	3	2	2	2	0
NNE	3	1	1	1	0
NE	4	2	2	2	0
ENE	13	3	3	3	5
E	6	0	0	0	1
ESE	1	0	0	0	0
SE	1	0	0	0	0
SSE	6	2	1	2	0
S	17	2	3	2	1
SSW	17	4	3	3	3
SW	39	9	10	8	9
WSW	22	7	7	7	3
W	31	6	6	6	8
WNW	15	3	3	3	7
NW	9	3	3	3	2
NNW	4	0	0	0	0
Total	191	44	44	42	39

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - LACKAWANNA, NY



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - LACKAWANNA, NY



TSP DATA SUMMARY FOR BETHLEHEM - LACKAWANNA, NY
SAROAD STATION # 333520001 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	275	306	301	256	332	213	308	339	255
GEOMETRIC MEAN:	106.8	123.2	113.6	106.5	113.9	105.7	103.8	99.6	109.3
GEOMETRIC S.D.:	1.7	1.8	1.7	1.7	1.7	2.0	1.9	1.7	1.7
HIGHEST BY LARSEN EXTRP:	504.0	708.0	547.1	470.2	549.4	863.4	642.8	454.1	498.5
1ST HIGHEST:	301.0	450.0	522.0	340.0	412.0	414.0	388.0	327.0	450.0
DATE :	720326	730423	740115	750114	761122	770513	780428	790405	800524
2ND HIGHEST:	299.0	385.0	385.0	317.0	383.0	388.0	365.0	320.0	375.0
DATE :	720524	730228	740115	750213	761113	770301	780518	790510	800523
# OF READINGS EXCEEDING 260 :	8	31	16	4	9	20	13	9	8
# OF READINGS EXCEEDING 150 :	80	132	97	68	109	78	102	79	70
RANGE									
0- 65:	61	61	58	41	61	55	71	76	38
66-130:	106	93	112	121	121	66	106	146	116
131-195:	73	68	83	61	97	45	87	85	78
196-260:	27	53	32	29	44	27	31	23	15
261-325:	8	25	11	3	6	15	10	8	5
326-390:	0	5	4	1	2	4	3	1	2
391-455:	0	1	0	0	1	1	0	0	1
>455:	0	0	1	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - LACKAWANNA, NY
SARDAD STATION # 333520002 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	140	83	54	42	57	55	57	60	57
GEOMETRIC MEAN:	100.1	93.7	79.3	79.2	82.0	94.7	69.0	75.3	78.4
GEOMETRIC S.D.:	1.6	1.6	1.6	1.6	1.7	1.9	1.7	1.6	1.7
HIGHEST BY LARSEN EXTRP:	406.0	353.4	317.8	322.2	368.0	630.7	356.7	307.7	360.2
1ST HIGHEST:	249.0	291.0	194.0	206.0	251.0	393.0	294.0	216.0	305.0
DATE :	720521	730609	740411	750524	760611	770517	780526	790415	800527
2ND HIGHEST:	218.0	223.0	188.0	176.0	232.0	352.0	231.0	179.0	248.0
DATE :	720608	730522	740523	750717	760418	770519	780520	790403	800521
# OF READINGS EXCEEDING 260 :	0	1	0	0	0	3	1	0	1
# OF READINGS EXCEEDING 150 :	33	11	7	4	7	15	4	4	7
RANGE									
0- 65:	25	20	20	13	19	15	29	23	24
66-130:	67	43	24	23	27	25	20	30	22
131-195:	40	15	10	5	9	8	6	6	8
196-260:	7	3	0	1	2	4	1	1	2
261-325:	0	1	0	0	0	1	1	0	1
326-390:	1	0	0	0	0	1	0	0	0
391-455:	0	0	0	0	0	1	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - LACKAWANNA, NY
SARDAD STATION # 333520004 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	40	162	0	0	0	0	0
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	440.0	592.0	******	******	******	******	******
DATE :	******	******	741101	750519	******	******	******	******	******
2ND HIGHEST:	******	******	439.0	449.0	******	******	******	******	******
DATE :	******	******	741219	750418	******	******	******	******	******
# OF READINGS EXCEEDING 260 :	0	0	10	26	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	21	106	0	0	0	0	0
RANGE									
0- 65:	0	0	2	4	0	0	0	0	0
66-130:	0	0	15	39	0	0	0	0	0
131-195:	0	0	8	58	0	0	0	0	0
196-260:	0	0	5	35	0	0	0	0	0
261-325:	0	0	6	13	0	0	0	0	0
326-390:	0	0	2	10	0	0	0	0	0
391-455:	0	0	2	2	0	0	0	0	0
>455:	0	0	0	1	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - LACKAWANNA, NY
SARDAD STATION # 330660006 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	139	82	52	40	58	57	56	59	57
GEOMETRIC MEAN:	94.7	93.4	86.3	76.4	75.2	84.5	66.9	72.2	73.0
GEOMETRIC S.D.:	1.5	1.6	1.6	1.6	1.6	1.8	1.8	1.7	1.4
HIGHEST BY LARSEN EXTRP:	309.8	362.4	364.2	325.1	324.4	510.1	370.5	333.6	208.4
1ST HIGHEST:	279.0	351.0	292.0	215.0	414.0	314.0	235.0	220.0	154.0
DATE :	720608	730609	740417	750418	760611	770413	780526	790509	800304
2ND HIGHEST:	195.0	213.0	196.0	214.0	182.0	308.0	200.0	175.0	140.0
DATE :	720917	730608	740411	750623	761015	770302	780911	790602	800421
# OF READINGS EXCEEDING 260 :	1	1	1	0	1	2	0	0	0
# OF READINGS EXCEEDING 150 :	17	13	9	4	4	12	5	5	1
RANGE									
0- 65:	29	20	14	14	25	19	28	24	22
66-130:	78	41	26	20	25	23	21	28	31
131-195:	31	16	10	4	7	9	5	6	4
196-260:	0	4	1	2	0	4	2	1	0
261-325:	1	0	1	0	0	2	0	0	0
326-390:	0	1	0	0	0	0	0	0	0
391-455:	0	0	0	0	1	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - LACKAWANNA, NY
SARDAD STATION # 330660014 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	42	51	52	55	56
GEOMETRIC MEAN:	******	******	******	******	49.4	46.9	55.2	54.0	53.2
GEOMETRIC S.D.:	******	******	******	******	1.8	1.8	2.4	2.0	1.8
HIGHEST BY LARSEN EXTRP:	******	******	******	******	293.3	273.2	757.8	436.3	292.0
1ST HIGHEST:	******	******	******	******	149.0	203.0	232.0	180.0	205.0
DATE :	******	******	******	******	760605	770419	781116	790620	800328
2ND HIGHEST:	******	******	******	******	120.0	128.0	222.0	175.0	154.0
DATE :	******	******	******	******	760418	770922	780426	790322	801205
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	1	3	4	2
RANGE									
0- 65:	0	0	0	0	26	34	28	31	35
66-130:	0	0	0	0	15	16	20	17	17
131-195:	0	0	0	0	1	0	1	7	3
196-260:	0	0	0	0	0	1	3	0	1
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - LACKAWANNA, NY
SAROAD STATION # 1402011 SITE ID # 08
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	206
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	89.1
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	1.7
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	395.1
1ST HIGHEST:	******	******	******	******	******	******	******	******	430.0
DATE :	******	******	******	******	******	******	******	******	800430
2ND HIGHEST:	******	******	******	******	******	******	******	******	351.0
DATE :	******	******	******	******	******	******	******	******	800523
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	2
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	40
RANGE									
0- 65:	0	0	0	0	0	0	0	0	54
66-130:	0	0	0	0	0	0	0	0	103
131-195:	0	0	0	0	0	0	0	0	44
196-260:	0	0	0	0	0	0	0	0	3
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	1
391-455:	0	0	0	0	0	0	0	0	1
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - LACKAWANNA, NY
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.950
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	333520001		333520002		333520004		330660014		330660006		1402011	
SITE ID #	1		2		4		7		5		8	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	1	0	0	0	1	0	0	0	0	0	1
AVE TSP:	0.	358.	0.	0.	0.	345.	0.	0.	0.	0.	0.	430.
NNE COUNT:	0	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	270.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	1	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	268.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	1	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	264.	0.	0.	0.	316.	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	1	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	275.	0.	0.	0.	332.	0.	0.	0.	0.	0.	0.
S COUNT:	0	1	0	0	1	1	0	0	0	0	0	1
AVE TSP:	0.	375.	0.	0.	275.	449.	0.	0.	0.	0.	0.	351.
SSW COUNT:	2	6	1	0	1	5	0	0	0	0	0	0
AVE TSP:	313.	303.	294.	0.	370.	380.	0.	0.	0.	0.	0.	0.
SW COUNT:	17	16	0	1	5	10	0	0	1	1	0	0
AVE TSP:	302.	289.	0.	316.	347.	327.	0.	0.	308.	314.	0.	0.
WSW COUNT:	23	16	1	2	4	3	0	0	2	1	0	0
AVE TSP:	309.	318.	291.	329.	317.	273.	0.	0.	322.	414.	0.	0.
W COUNT:	7	7	0	1	1	2	0	0	0	0	0	0
AVE TSP:	297.	324.	0.	393.	282.	305.	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	4	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	326.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	2	3	0	0	0	0	0	0	0	0	0	0
AVE TSP:	278.	267.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	51	58	2	4	12	24	0	0	3	2	0	2
AVE TSP:	304.	305.	293.	342.	327.	335.	0.	0.	317.	364.	0.	391.

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - LACKAWANNA, NY
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.950
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	333520001		333520002		333520004		330660014		330660006		1402011	
SITE ID #	1		2		4		7		5		8	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	1	7	1	1	0	3	0	0	0	0	0	1
AVE TSP:	171.	206.	164.	176.	0.	222.	0.	0.	0.	0.	0.	430.
NNE COUNT:	0	5	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	200.	0.	0.	0.	181.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	7	0	1	0	3	1	1	0	1	0	1
AVE TSP:	0.	202.	0.	242.	0.	185.	222.	203.	0.	212.	0.	186.
ENE COUNT:	0	4	0	0	2	1	0	2	0	0	0	0
AVE TSP:	0.	182.	0.	0.	157.	157.	0.	180.	0.	0.	0.	0.
E COUNT:	0	7	0	0	0	3	0	2	0	1	0	1
AVE TSP:	0.	193.	0.	0.	0.	235.	0.	204.	0.	155.	0.	159.
ESE COUNT:	0	4	0	0	0	4	0	1	0	0	0	0
AVE TSP:	0.	167.	0.	0.	0.	184.	0.	197.	0.	0.	0.	0.
SE COUNT:	0	4	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	179.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	5	0	1	1	6	1	0	0	1	0	0
AVE TSP:	0.	198.	0.	188.	157.	222.	180.	0.	0.	168.	0.	0.
S COUNT:	3	18	0	2	2	6	0	0	0	2	0	2
AVE TSP:	175.	196.	0.	169.	253.	229.	0.	0.	0.	184.	0.	253.
SSW COUNT:	20	93	1	10	2	22	0	1	1	5	0	6
AVE TSP:	200.	192.	294.	171.	265.	245.	0.	156.	235.	161.	0.	171.
SW COUNT:	80	134	8	9	9	24	0	0	13	9	5	12
AVE TSP:	222.	202.	190.	183.	285.	262.	0.	0.	190.	193.	191.	171.
WSW COUNT:	75	96	7	7	8	17	0	0	9	7	0	6
AVE TSP:	231.	213.	195.	246.	262.	206.	0.	0.	211.	212.	0.	168.
W COUNT:	35	68	1	7	2	4	0	0	0	2	3	1
AVE TSP:	217.	209.	181.	224.	228.	264.	0.	0.	0.	193.	172.	169.
WNW COUNT:	7	32	0	0	0	1	0	0	0	0	0	2
AVE TSP:	195.	215.	0.	0.	0.	161.	0.	0.	0.	0.	0.	159.
NW COUNT:	5	9	0	2	0	4	0	0	0	1	0	0
AVE TSP:	229.	218.	0.	211.	0.	197.	0.	0.	0.	204.	0.	0.
NNW COUNT:	1	2	0	0	0	2	0	0	0	0	0	0
AVE TSP:	202.	207.	0.	0.	0.	222.	0.	0.	0.	0.	0.	0.
ALL COUNT:	227	495	18	40	26	101	2	7	23	29	8	32
AVE TSP:	221.	203.	195.	200.	255.	231.	201.	189.	200.	190.	184.	183.

UPDATED AIR QUALITY EVALUATION - BETHELEHEM STEEL, LACKAWANNA, NEW YORK

Stations used in updated:

Continued operation:	#1, #2, #4, #5, #7
New stations:	#8 (1980)
Discontinued station:	#4 (1975)

Trends in geometric means:

Stations #1, #2, and #5 continued displaying 12-month running geometric means that vary in phase. Long-term trends for these stations (as evidenced by the Spearman correlation coefficient) were moderately negative. The coefficient for station #1 was -0.56; for station #2, -0.49; and for station #5, -0.70. Station #7 continued displaying running 12-month geometric means below the secondary standard; a moderate positive trend is indicated (Spearman correlation coefficient of 0.63). Station #8 generated an annual geometric mean in excess of the primary standard. Its record is too short to assess trends.

The general trend for stations #1, #2, #5, and #7 was upward from mid-1978 to mid-1979 and flat thereafter.

Attainment status:

Stations #1 and #2 remained in nonattainment of the primary annual standard in 1978-1980. In addition, the 24-hour standard was violated at station #1. Station #5 has been borderline attainment/nonattainment of the primary annual standard since mid-1979.

Pollution roses:

Pollution roses for stations #1, #2, #5, and #7 are generally unchanged in pattern. Stations #1, #2, and #5 take advantage of the lake breeze to depict plant impacts. Station #7 continues providing background levels under conditions that force impact at #1, #2, and #5. The addition of station #8 in a plant impact orientation reinforces the pattern.

Standard exceedance roses:

The majority of the 24-hour primary and secondary exceedances at stations #1, #2, and #5 that occur under steady winds involve directions that contain plant activities. Further, the tally of exceedances generally declines with distance from the plant for this array. For station #7, normally a background station, one secondary 24-hour exceedance occurred with steady winds coming from the plant. A second exceedance of the 24-hour secondary standard occurred under northeast winds at this station.

BETHLEHEM STEEL

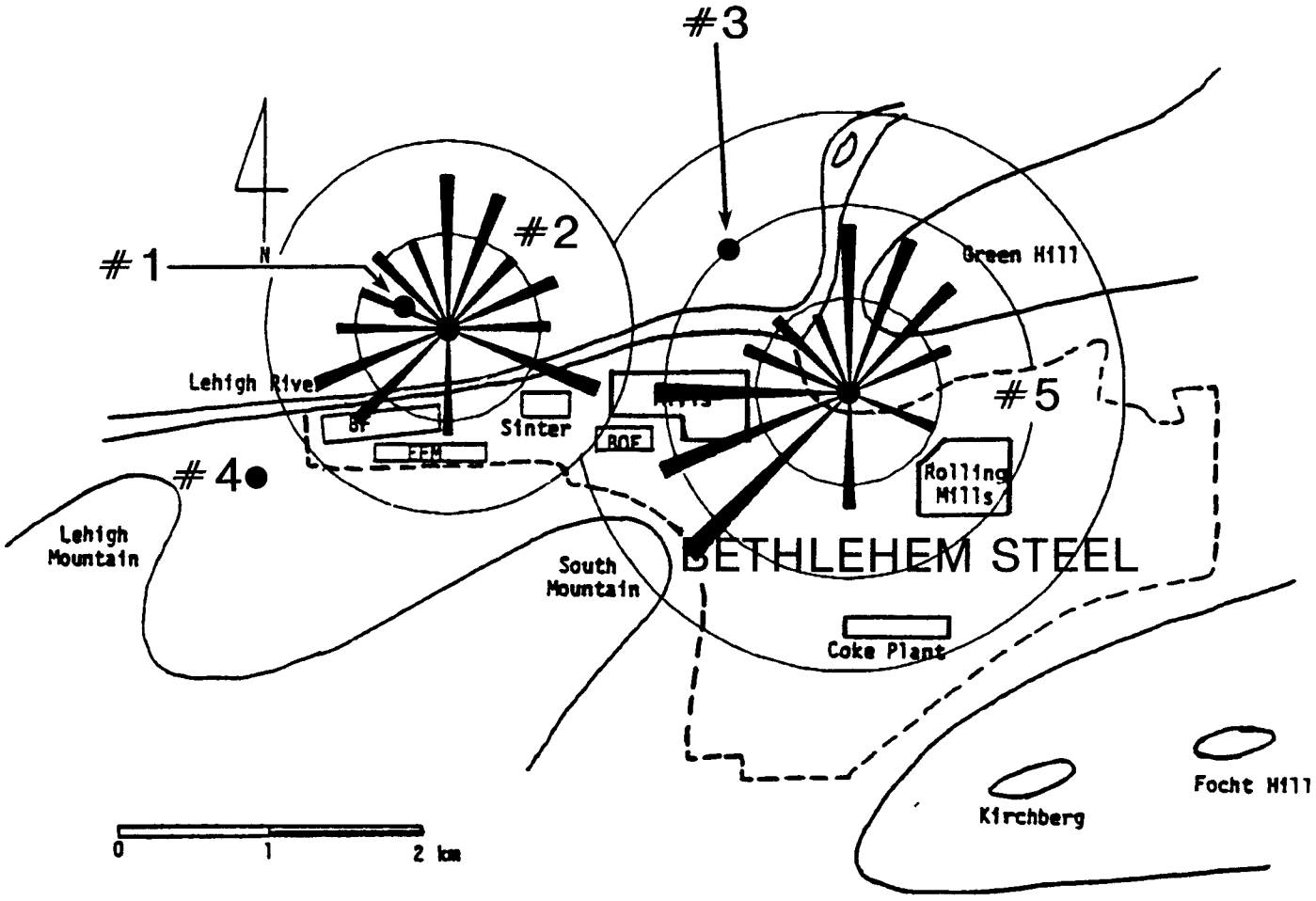
Bethlehem, Pennsylvania

EPA Region III

Hi-Vol Monitoring Sites in the Vicinity of Bethlehem Steel - Bethlehem, PA

	SAROAD #	Site Name and Address	Plant Location from Site Bearing		Distance	Elevation (in meters) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance (m)		Volume
#1	390780703	Bethlehem Central	Blast furnace	196°	0.8 km	12	103	30	Roofmount	F. Broad Street	N	15	Heavy
		520 E. Broad Street	FFM	173°	1.0 km			30					
		(2/72 - 3/76)	Sintering	122°	1.1 km			24					
			BOF	122°	1.5 km			12					
			Mills	107°	2.0 km			15					
			R. Mills	107°	3.8 km			12					
			Coking	122°	3.8 km			12					
#2	390780017	Bethlehem Central	Blast furnace	227°	0.8 km	1	95	22	Ground level	E. Market Street	N	15	Heavy
		E. Market and Wood Streets	FFM	192°	0.9 km			22					
		(3/76 - present)	Sintering	124°	0.7 km			16					
			BOF	124°	1.4 km			4					
			Mills	107°	1.8 km			7					
			R. Mills	107°	3.6 km			4					
			Coking	107°	3.5 km			4					
#3	396560705	Bethlehem East	Blast furnace	243°	2.5 km	1	95	22	Ground level	Cambria	W	15	Moderate
		Freemansburg Municipal	FFM	235°	2.4 km			22					
		Building	Sintering	230°	1.5 km			16					
		(3/73 - 4/76)	BOF	215°	1.4 km			4					
			Mills	215°	1.0 km			7					
			R. Mills	135°	2.1 km			4					
			Coking	167°	2.7 km			4					
X #4	396560705	Bethlehem East	Blast furnace	65°	0.7 km	6	82	9	Roofmount	4th Street	S	12	Moderate
		Victory Firehouse	FFM	80°	1.0 km			9					
		(4/76 - 1/77)	Sintering	75°	2.0 km			3					
			BOF	83°	2.4 km			-9					
			Mills	80°	3.0 km			-6					
			R. Mills	90°	4.5 km			-9					
			Coking	103°	4.2 km			-9					
#5	390780725	Bethlehem East*	Blast furnace	265°	3.2 km	6	67	-6	Roofmount	Apple Butter Rd.	E	20	Heavy
		Water Treatment Plant	FFM	260°	3.0 km			-6					
		(1/77 - present)	Sintering	265°	2.0 km			-12					
			BOF	260°	1.5 km			-14					
			Mills	265°	1.2 km			-21					
			R. Mills	130°	1.0 km			-14					
			Coking	170°	1.5 km			-14					

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.



Wind Data Representativeness

Station #	Terrain	Distance	Rating
2	I	A	E
5	II	C	E

N.B. See Table 5 in Methodology section.

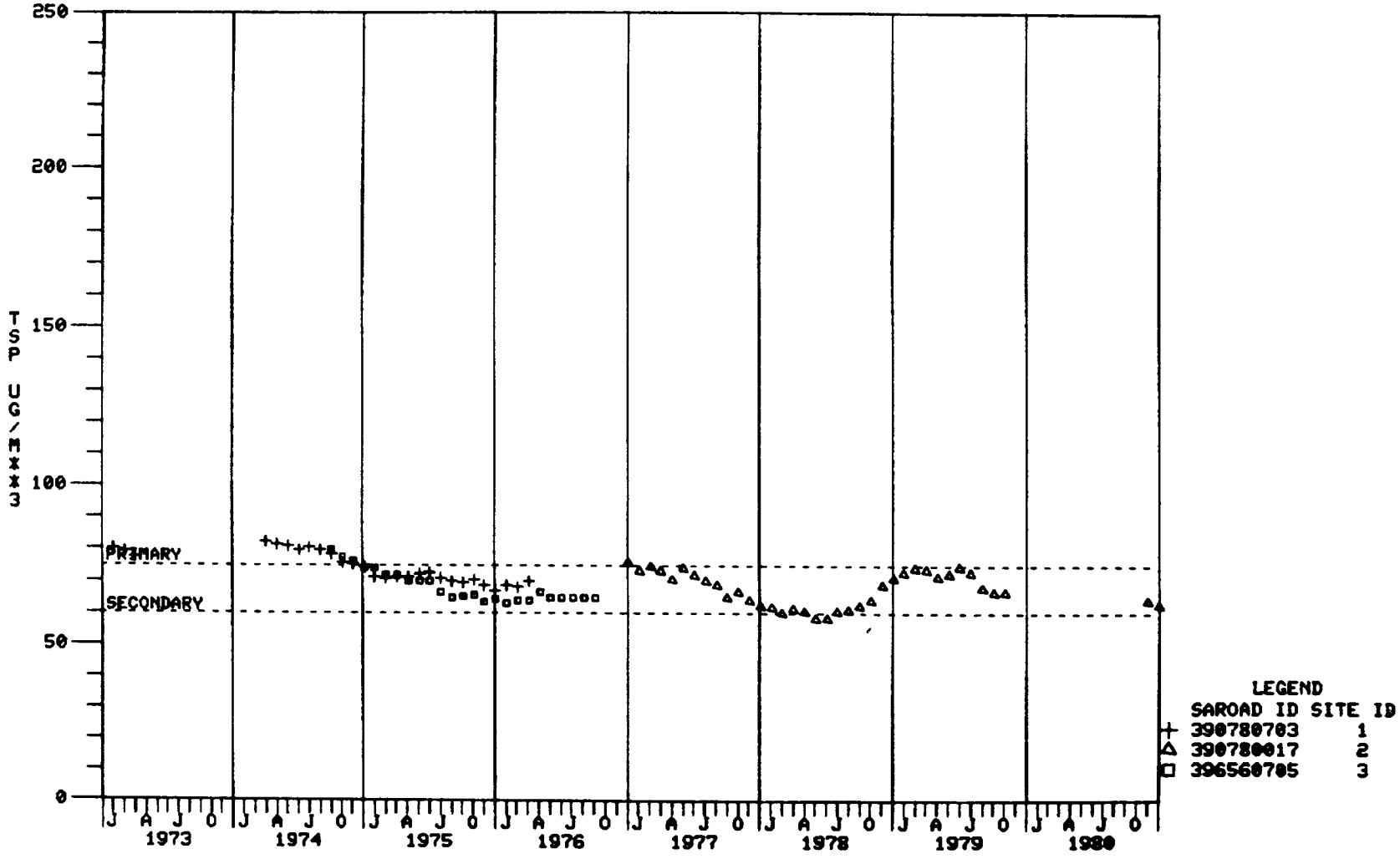
TSP roses for Bethlehem Steel - Bethlehem, Pennsylvania, for the period 1978-1980 for cases of $\omega > 0.90$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

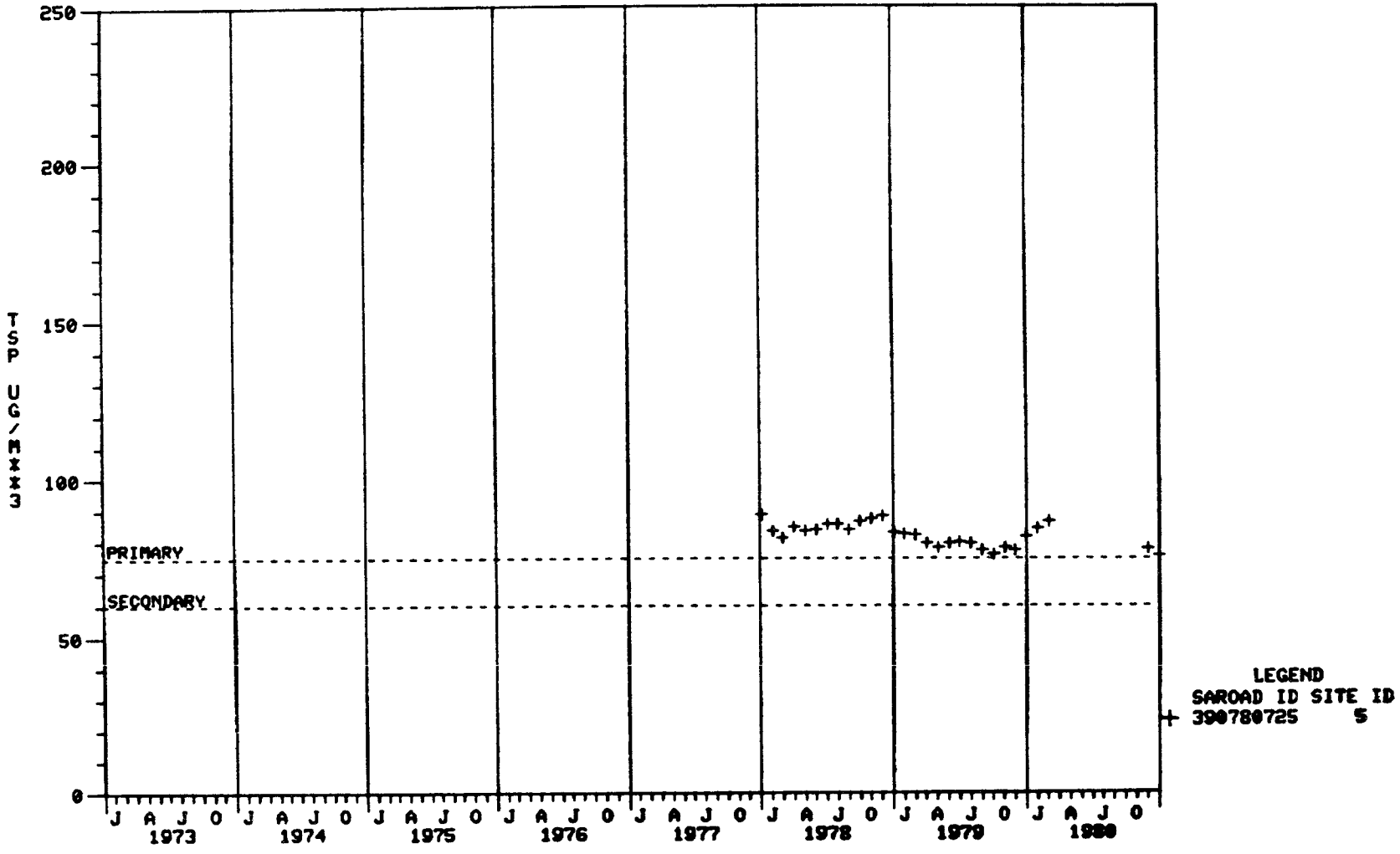
Bethlehem Steel--Bethelehem, PA

Wind Direction	Monitoring Site Numbers #2	#5
N	15	15
NNE	32	43
NE	1	1
ENE	4	4
E	1	0
ESE	1	1
SE	0	0
SSE	0	0
S	1	1
SSW	0	0
SW	1	1
WSW	3	3
W	6	5
WNW	2	1
NW	5	5
NNW	2	2
Total	74	82

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - BETHLEHEM, PA



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - BETHLEHEM, PA



TSP DATA SUMMARY FOR BETHLEHEM - BETHLEHEM, PA
SAROAD STATION # 390780703 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	56	30	59	41	16	0	0	0	0
GEOMETRIC MEAN:	79.8	******	74.5	66.8	******	******	******	******	******
GEOMETRIC S.D.:	1.6	******	1.5	1.5	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	297.9	******	263.7	201.0	******	******	******	******	******
1ST HIGHEST:	190.0	162.0	195.0	165.0	127.0	******	******	******	******
DATE :	720614	730901	740123	750418	760224	******	******	******	******
2ND HIGHEST:	174.0	157.0	172.0	126.0	117.0	******	******	******	******
DATE :	720304	730709	741213	750211	760212	******	******	******	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	5	2	4	1	0	0	0	0	0
RANGE									
0- 65:	16	8	22	19	4	0	0	0	0
66-130:	35	19	32	21	12	0	0	0	0
131-195:	5	3	5	1	0	0	0	0	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BETHLEHEM, PA
SAROAD STATION # 390780017 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	45	60	58	46	50
GEOMETRIC MEAN:	******	******	******	******	75.5	62.1	70.9	******	62.4
GEOMETRIC S.D.:	******	******	******	******	1.8	1.6	1.7	******	1.4
HIGHEST BY LARSEN EXTRP:	******	******	******	******	447.9	252.3	309.4	******	172.3
1ST HIGHEST:	******	******	******	******	275.0	193.0	203.0	157.0	111.0
DATE :	******	******	******	******	760915	770519	781104	791023	800525
2ND HIGHEST:	******	******	******	******	207.0	172.0	179.0	141.0	108.0
DATE :	******	******	******	******	760822	770419	780824	790720	800801
# OF READINGS EXCEEDING 260 :	0	0	0	0	1	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	7	4	5	1	0
RANGE									
0- 65:	0	0	0	0	17	36	28	20	29
66-130:	0	0	0	0	18	19	20	23	21
131-195:	0	0	0	0	7	5	9	3	0
196-260:	0	0	0	0	2	0	1	0	0
261-325:	0	0	0	0	1	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BETHLEHEM, PA
SAROAD STATION # 396560705 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	60	45	31	0	0	0	0
GEOMETRIC MEAN:	******	******	74.4	64.3	******	******	******	******	******
GEOMETRIC S.D.:	******	******	1.6	1.6	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	324.3	257.8	******	******	******	******	******
1ST HIGHEST:	******	******	211.0	167.0	136.0	******	******	******	******
DATE :	******	******	740429	750130	760430	******	******	******	******
2ND HIGHEST:	******	******	179.0	151.0	130.0	******	******	******	******
DATE :	******	******	740517	750124	760418	******	******	******	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	4	2	0	0	0	0	0
RANGE									
0- 65:	0	0	26	23	10	0	0	0	0
66-130:	0	0	26	19	20	0	0	0	0
131-195:	0	0	7	3	1	0	0	0	0
196-260:	0	0	1	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BETHLEHEM, PA
SAROAD STATION # 390780725 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	41	56	55	46
GEOMETRIC MEAN:	******	******	******	******	******	87.5	83.0	81.6	75.5
GEOMETRIC S.D.:	******	******	******	******	******	1.6	1.6	1.7	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	373.4	352.0	399.8	259.3
1ST HIGHEST:	******	******	******	******	******	225.0	223.0	253.0	177.0
DATE :	******	******	******	******	******	770308	780824	790220	800122
2ND HIGHEST:	******	******	******	******	******	209.0	183.0	238.0	150.0
DATE :	******	******	******	******	******	770718	780818	791005	800807
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	6	8	9	1
RANGE									
0- 65:	0	0	0	0	0	17	20	18	18
66-130:	0	0	0	0	0	12	23	27	24
131-195:	0	0	0	0	0	10	12	7	4
196-260:	0	0	0	0	0	2	1	3	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

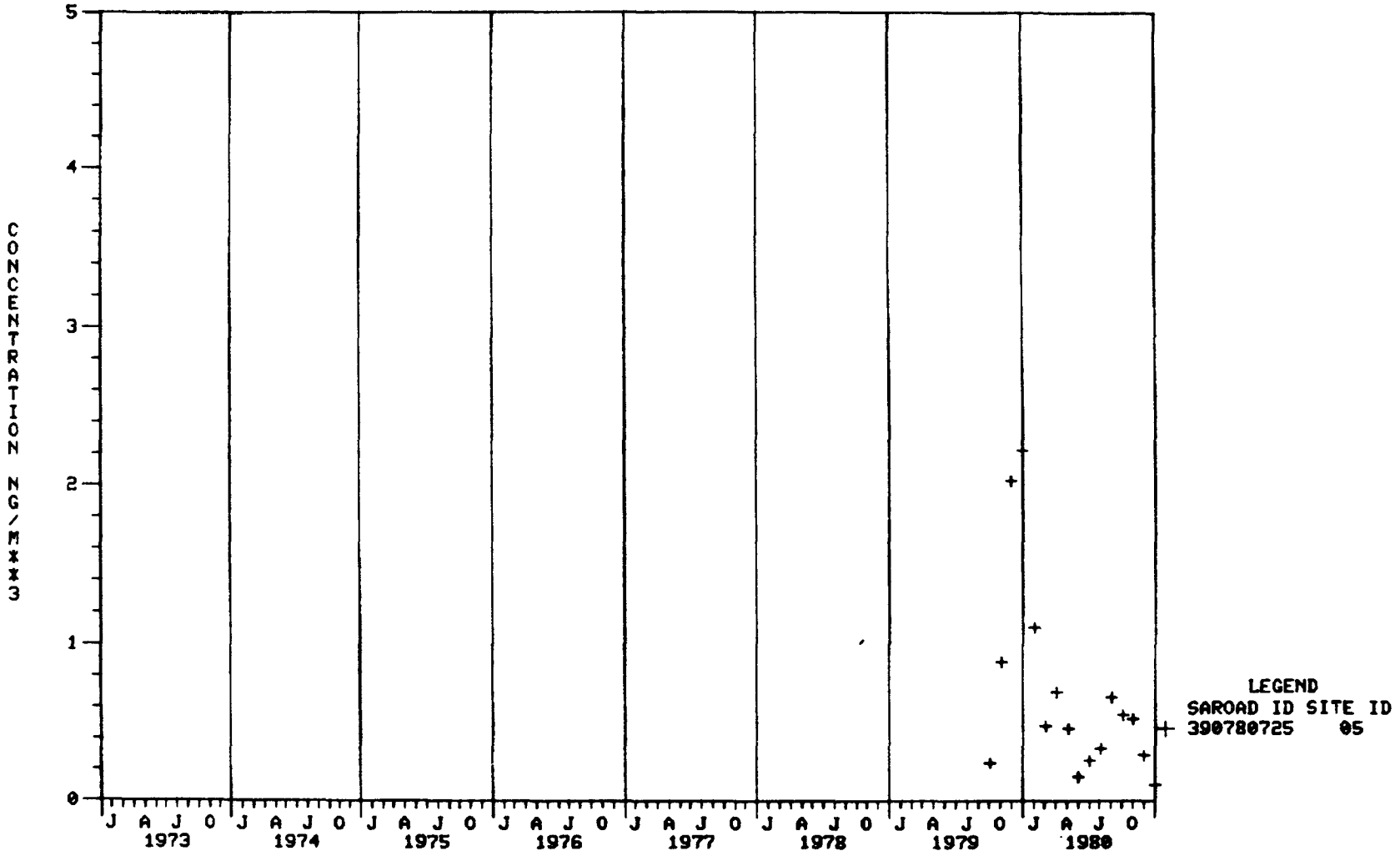
24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - BETHLEHEM, PA
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

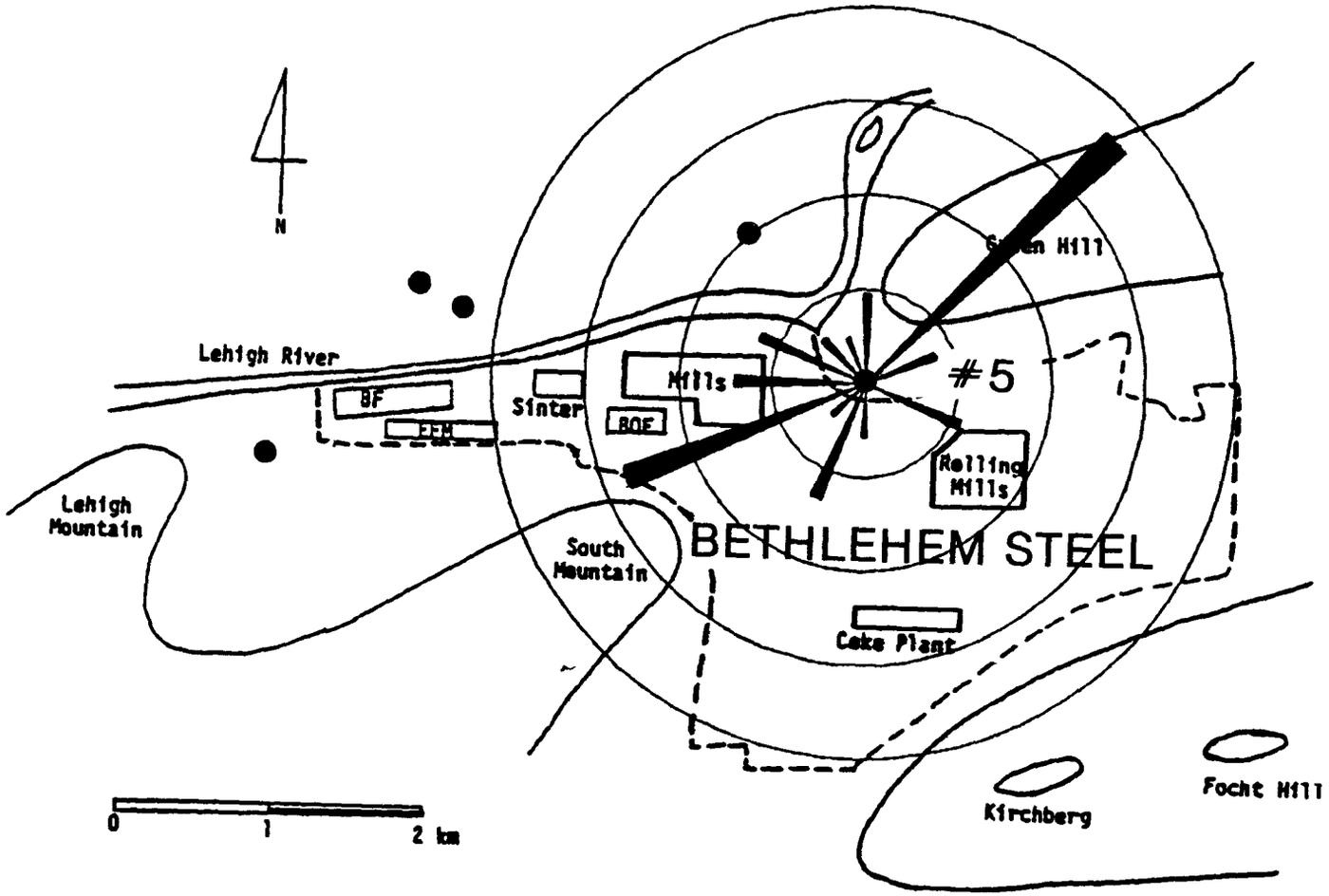
SAROAD #	390780703		390780017		396560705		390780725	
SITE ID #	1		2		3		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	275.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
SE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
SSW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
SW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
WSW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
W COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	275.	0.	0.	0.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - BETHLEHEM, PA
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	390780703		390780017		396560705		390780725	
SITE ID #	1		2		3		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	1	0	0	0	2	0
AVE TSP:	0.	0.	203.	0.	0.	0.	180.	0.
NNE COUNT:	0	0	1	0	0	0	6	0
AVE TSP:	0.	0.	155.	0.	0.	0.	191.	0.
NE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	1	0	1	0	0	0	0
AVE TSP:	0.	172.	0.	151.	0.	0.	0.	0.
E COUNT:	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	275.	0.	0.	0.	0.
ESE COUNT:	0	0	0	3	0	0	0	0
AVE TSP:	0.	0.	0.	176.	0.	0.	0.	0.
SE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	0	1	0	0	0	0	0	1
AVE TSP:	0.	165.	0.	0.	0.	0.	0.	155.
SSW COUNT:	0	0	0	2	0	0	0	3
AVE TSP:	0.	0.	0.	161.	0.	0.	0.	188.
SW COUNT:	0	3	0	0	1	1	0	3
AVE TSP:	0.	162.	0.	0.	151.	179.	0.	181.
WSW COUNT:	1	0	1	2	1	0	4	0
AVE TSP:	157.	0.	171.	190.	211.	0.	174.	0.
W COUNT:	0	1	1	1	0	1	0	1
AVE TSP:	0.	195.	171.	207.	0.	174.	0.	158.
WNW COUNT:	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	225.
NW COUNT:	0	0	0	0	0	2	0	1
AVE TSP:	0.	0.	0.	0.	0.	159.	0.	209.
NNW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	1	6	4	10	2	4	12	10
AVE TSP:	157.	170.	175.	186.	181.	168.	184.	185.

BAP MONTHLY ARITHMETIC MEANS (NG/M**3) FOR BETHLEHEM - BETHLEHEM, PA





BaP roses for Bethlehem Steel - Bethlehem, Pennsylvania, for the period 1978-1980 for cases of $\omega>0.80$. Each circle represents 0.5 ng/m^3.

UPDATED AIR QUALITY EVALUATION - BETHLEHEM STEEL, BETHLEHEM, PENNSYLVANIA

Stations used in update:

Continued operation:	#2, #5
New stations:	None
Discontinued stations:	#1 (1976), #3 (1976)

Trends in geometric means:

Station #2 evidenced a very slight long-term downward trend (Spearman correlation coefficient of -0.13). Station #5 evidenced a significantly larger downward trend (Spearman correlation coefficient of -0.60). Interpretation is hampered by missing data in 1979.

Attainment status:

Stations #5 remained in nonattainment of the primary standards in 1978-1980, while station #2 remained in attainment.

Pollution roses:

The general patterns developed prior to 1978 continue for stations #2 and #5. TSP levels under steady winds that would bring in plant emissions continue to be generally higher than other directions. However, contributions from the north through northeast appear to be larger in 1978-1980 at both stations.

Standard exceedance roses:

The primary 24-hour standard was exceeded only once at station #2; this exceedance occurred under variable winds. Secondary 24-hour standard exceedances under steady winds generally came under conditions that would not involve the plant.

For station #5, the majority of secondary standard excursions came under steady winds opposite the plant. However, four secondary standard exceedances occurred under west-southwest winds that would involve the plant. No primary excursions were recorded. For both stations, excursions beyond the 24-hour secondary standard were most often associated with steady winds from directions not involving the plant or with variable winds.

BaP:

BaP was sampled at station #5 from late 1979 through 1980. Monthly averages were relatively low (< 3 ng/m^3). The BaP pollution rose for station #5 does not demonstrate any substantial contributions from the steel facility.

BETHLEHEM STEEL

Burns Harbor, Indiana

EPA Region V

Hi-Vol Monitoring Sites in the Vicinity of Bethlehem Steel, Burns Harbor, Indiana

	SAROAD #	Name and Address	Bearing	Distance (Km)	Meters Above Ground	MSL (m)	Meters Above Plant	Site Description	Nearest Road: Name	Nearest Road: Direction	Nearest Road: Distance (m)	Nearest Road: Volume
X #1	153420005	Beverly Shores School	245°	13.6	7	190	4	Building roof	Paved road	S	60	2-lane, light
#2	153420006	Dune Acres Pumping Station*	240°	4.6	4	202	16	Building roof	Paved road	W	6	2-lane, light
#3	153420007	Ogden Dunes Maintenance Building*	70°	4.4	5	191	5	Building roof	Paved road	E	45	2-lane, light
#4	153420009	South Haven School	2°	10.0	5	205	19	Building roof	West Road	W	75	2-lane, light
#5	153420901	Station A	BOF 45° 1.6 Coking 135° 0.8		2.3	191	5	Monitoring bench; industrial	Boundary road	E	29	2-lane
#6	153420902	Station B	Coking 45° 0.8		2.3	182	-4	Monitoring bench; industrial	Boundary road	W	49	2-lane
#7	153420903	Station C	0°	1.0	2.3	182	-4	Monitoring bench; residential	US12	S	24	4-lane

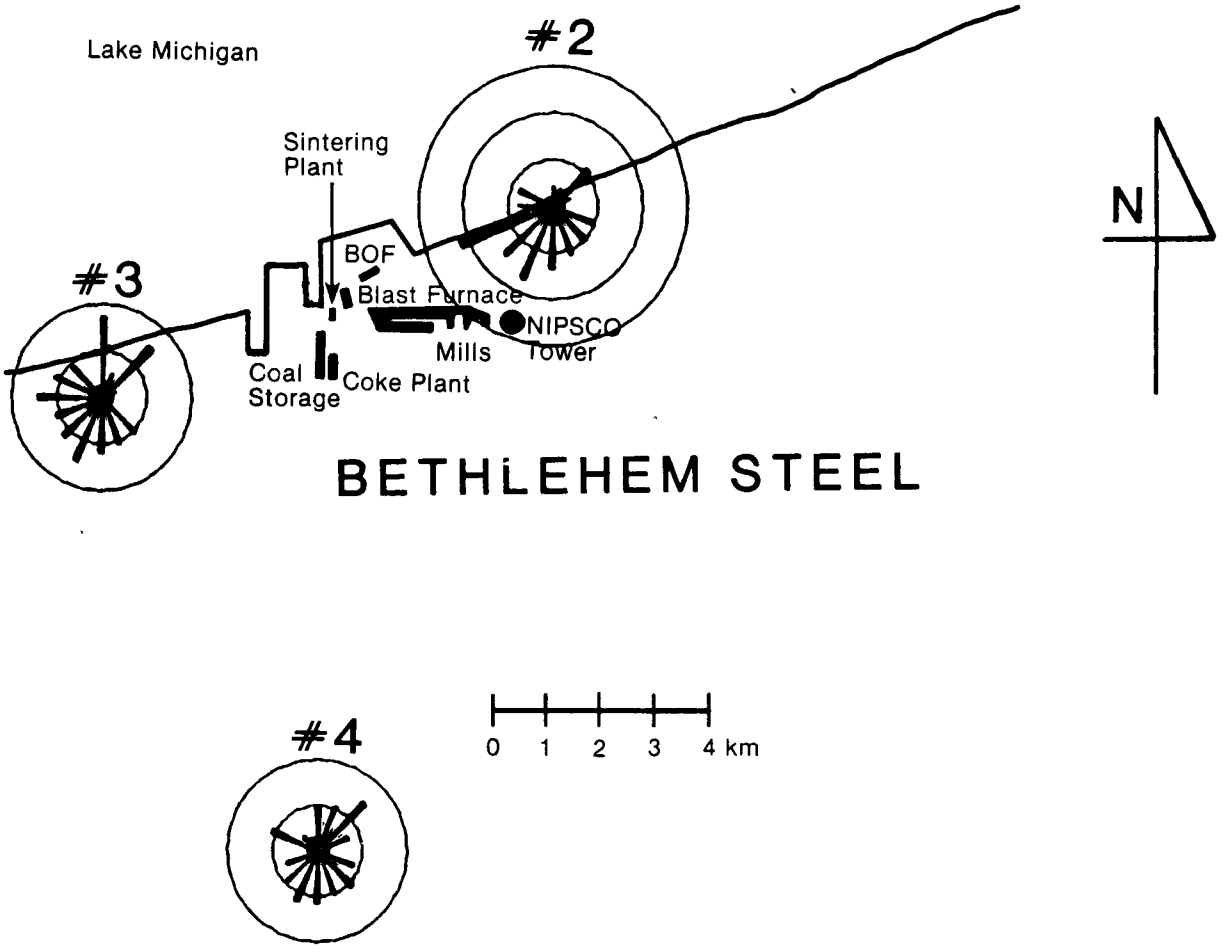
* Critical sites

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

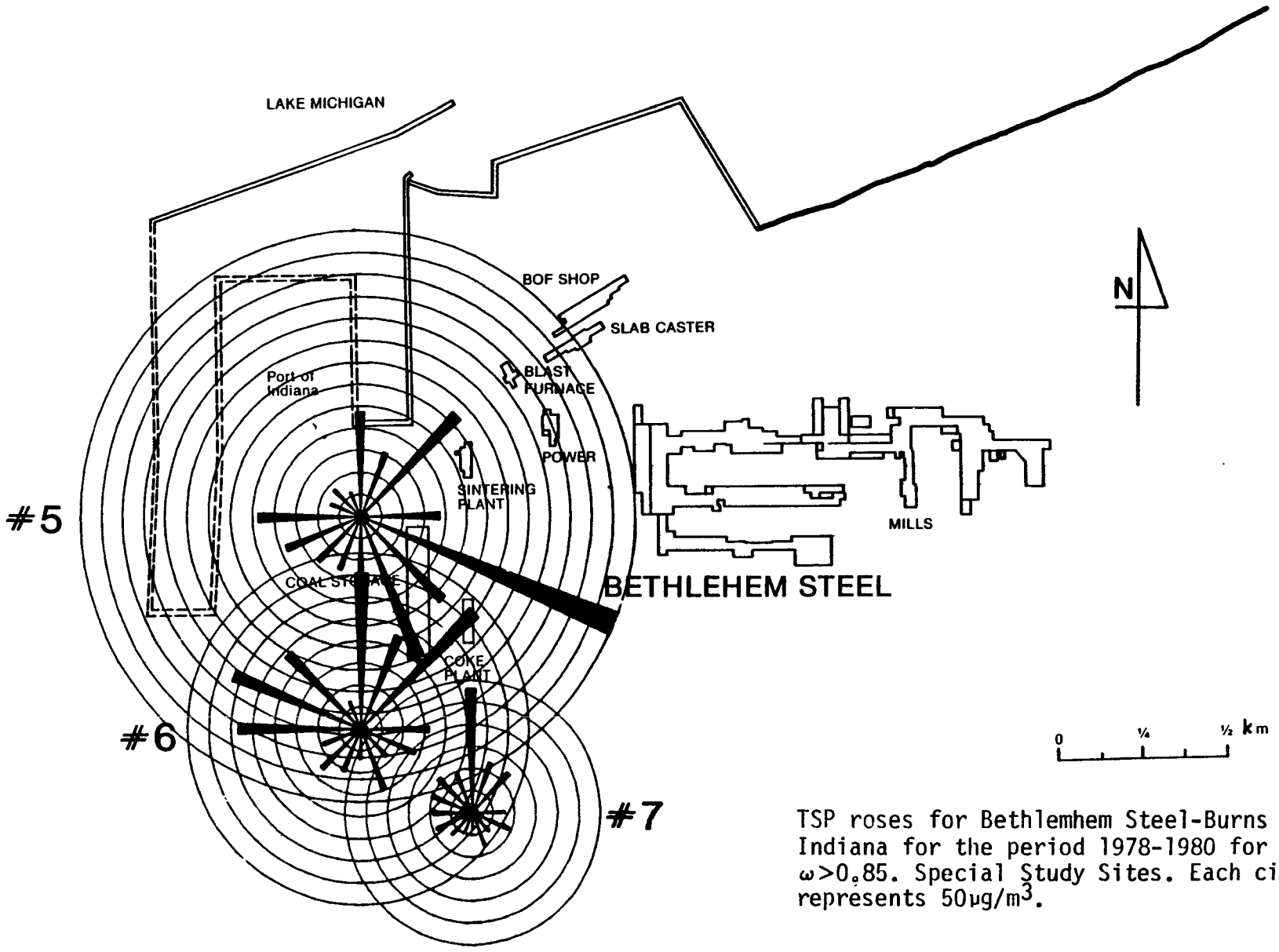
Wind Data Representativeness

Station #	Terrain	Distance	Rating
2	VI	A	E-VG
3, 5, 6, 7	VI	D	G
4	VII	F	U

N.B. See Table 5 in Methodology section.



TSP roses for Bethlehem Steel-Burns Harbor, Indiana for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents $50 \mu g/m^3$.



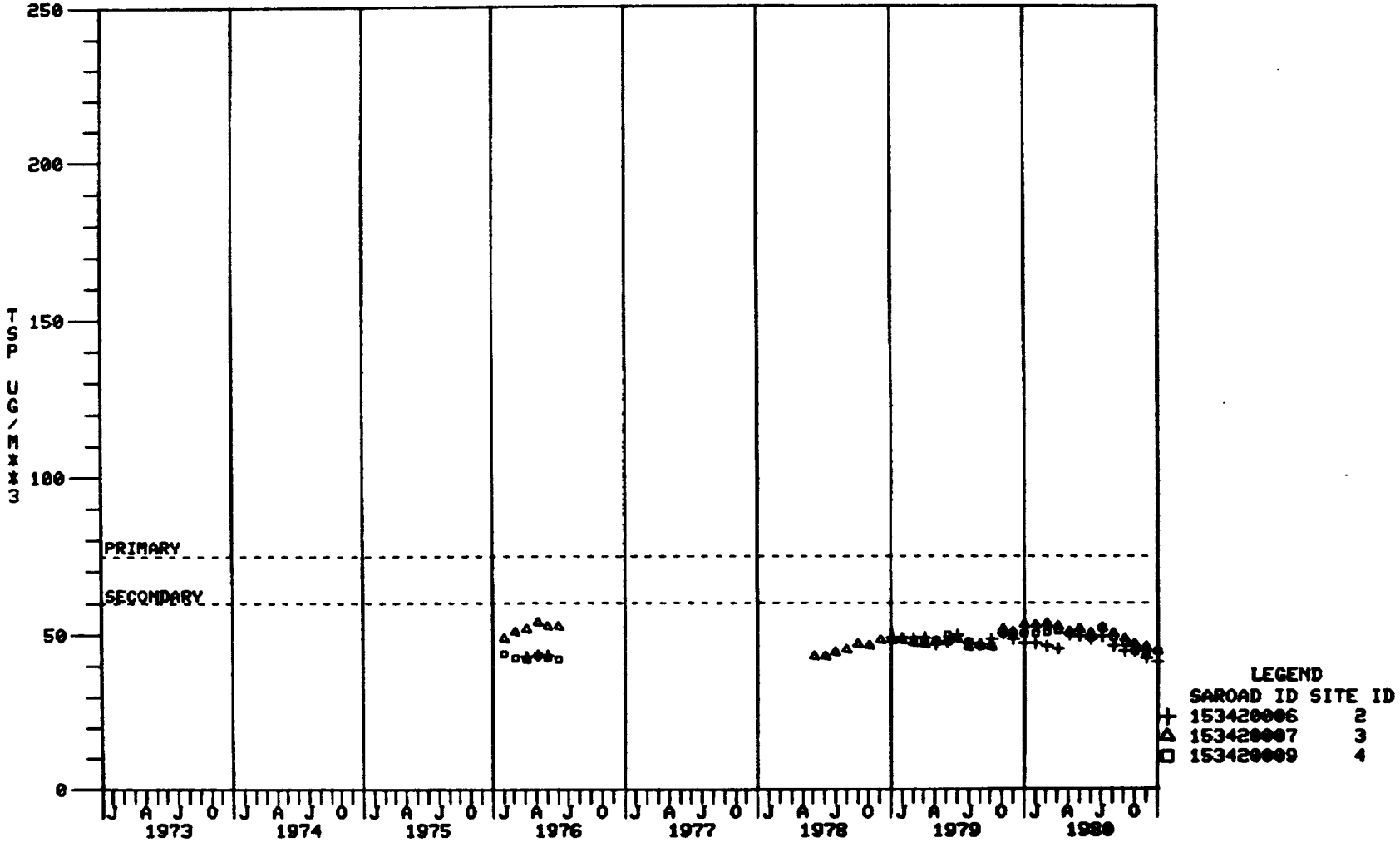
TSP roses for Bethlemhem Steel-Burns Harbor, Indiana for the period 1978-1980 for cases of $\omega > 0.85$. Special Study Sites. Each circle represents $50 \mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

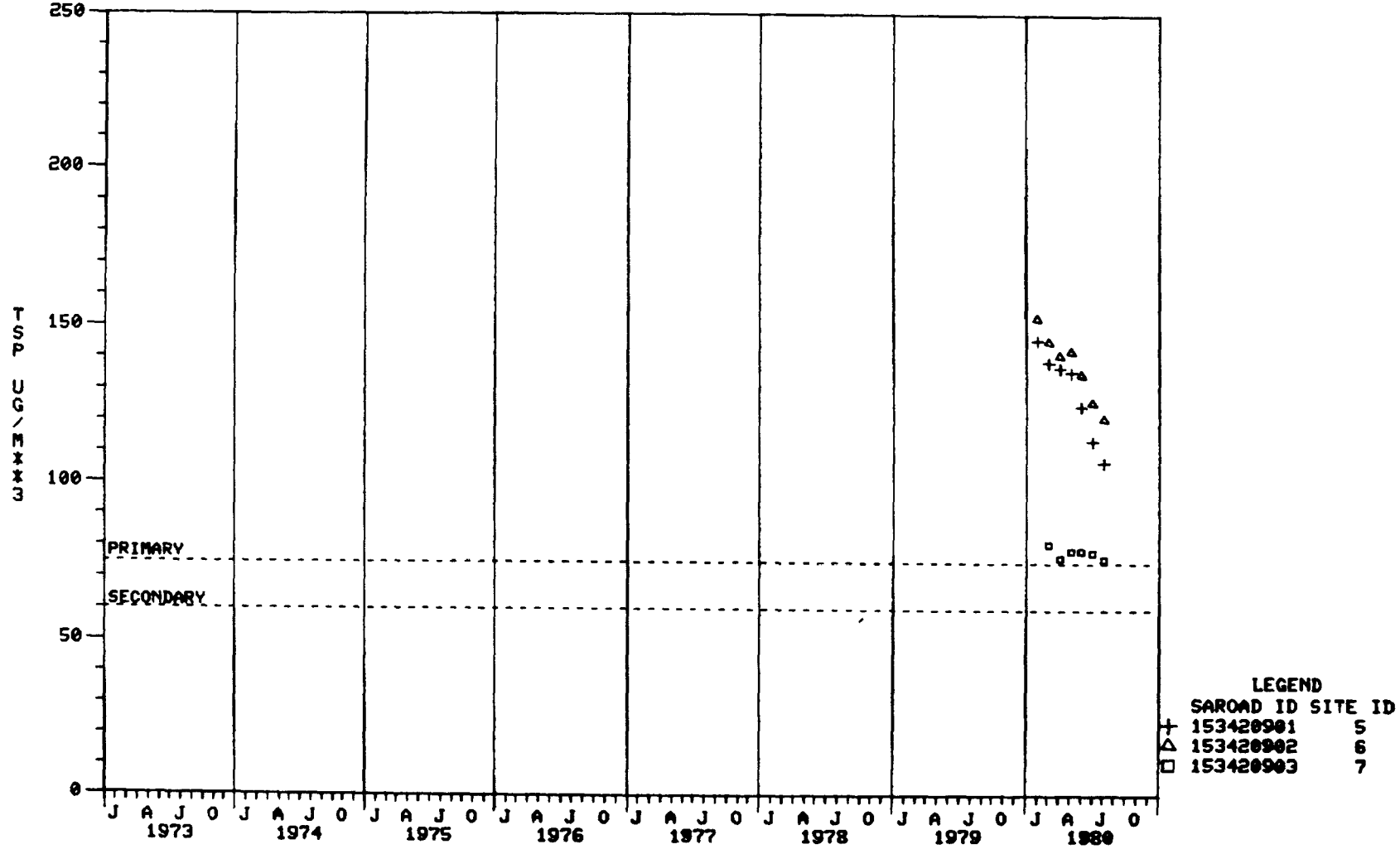
Bethlehem Steel--Burns Harbor, IN

Wind Direction	Monitoring Site Numbers #2	#3	#4	#5	#6	#7
N	3	3	4	2	2	1
NNE	5	3	6	4	4	2
NE	1	1	1	6	6	4
ENE	1	1	1	0	0	0
E	0	0	0	1	1	1
ESE	1	0	2	1	1	1
SE	5	5	3	2	3	1
SSE	2	2	1	3	2	2
S	12	12	10	7	11	8
SSW	8	9	8	18	16	9
SW	7	6	6	6	5	4
WSW	4	4	2	3	3	3
W	1	1	0	1	1	1
WNW	1	3	2	3	3	3
NW	0	1	1	3	3	2
NNW	1	1	1	2	1	2
Total	52	52	48	62	62	44

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - BURNS HARBOR, IN



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR BETHLEHEM - BURNS HARBOR, IN



TSP DATA SUMMARY FOR BETHLEHEM - BURNS HARBOR, IN
SAROAD STATION # 153420006 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	36	13	38	33	20	25	41	49	45
GEOMETRIC MEAN:	******	******	******	******	******	******	49.1	47.5	41.3
GEOMETRIC S.D.:	******	******	******	******	******	******	2.4	2.0	1.9
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	667.6	351.3	232.4
1ST HIGHEST:	155.3	95.1	140.0	141.5	84.0	116.0	193.0	156.0	131.0
DATE :	720602	730727	740423	750518	760418	771127	781222	791229	800626
2ND HIGHEST:	127.5	82.8	140.0	105.0	81.0	107.0	159.0	148.0	114.0
DATE :	720503	731106	740523	750804	760325	770706	780526	790907	800403
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	1	0	0	0	0	0	2	1	0
RANGE									
0- 65:	30	10	29	25	15	22	23	33	37
66-130:	5	3	7	6	4	3	15	14	7
131-195:	1	0	2	1	0	0	3	2	1
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BURNS HARBOR, IN
SAROAD STATION # 153420007 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	26	16	38	38	20	27	45	41	48
GEOMETRIC MEAN:	******	******	******	******	******	******	48.1	53.0	44.8
GEOMETRIC S.D.:	******	******	******	******	******	******	2.1	1.7	1.7
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	401.7	255.4	204.8
1ST HIGHEST:	140.9	82.6	137.3	225.0	120.0	81.0	226.0	127.0	112.0
DATE :	720527	730721	740604	750518	760206	770706	780502	791229	800509
2ND HIGHEST:	135.3	82.4	127.0	105.0	116.0	76.0	139.0	102.0	112.0
DATE :	720521	730709	740228	750810	760418	770624	780526	791018	800625
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	1	0	0	1	0	0
RANGE									
0- 65:	18	10	24	26	11	22	29	24	35
66-130:	5	6	13	11	9	5	13	17	13
131-195:	3	0	1	0	0	0	2	0	0
196-260:	0	0	0	1	0	0	1	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BURNS HARBOR, IN
SARDAD STATION # 153420009 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	38	9	37	37	20	21	40	42	45
GEOMETRIC MEAN:	******	******	******	******	******	******	******	50.3	44.5
GEOMETRIC S.D.:	******	******	******	******	******	******	******	1.6	1.6
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	193.9	179.8
1ST HIGHEST:	147.2	128.7	95.0	132.6	73.0	70.0	121.0	125.0	90.0
DATE :	720527	731106	740216	750518	760418	770922	780911	790912	800421
2ND HIGHEST:	141.5	94.7	89.8	86.0	65.0	66.0	109.0	125.0	90.0
DATE :	720521	730709	740821	750717	760405	770705	780601	790720	800702
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	0
RANGE									
0- 65:	27	7	26	29	19	19	28	31	32
66-130:	9	2	11	7	1	2	12	11	14
131-195:	0	0	0	1	0	0	0	0	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BURNS HARBOR, IN
SARDAD STATION # 153420901 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	105	42
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	745.0	548.0
DATE :	******	******	******	******	******	******	******	790523	800312
2ND HIGHEST:	******	******	******	******	******	******	******	743.0	609.0
DATE :	******	******	******	******	******	******	******	790530	800417
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	23	5
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	54	10
RANGE									
0- 65:	0	0	0	0	0	0	0	11	11
66-130:	0	0	0	0	0	0	0	31	18
131-195:	0	0	0	0	0	0	0	25	6
196-260:	0	0	0	0	0	0	0	15	2
261-325:	0	0	0	0	0	0	0	10	1
326-390:	0	0	0	0	0	0	0	3	0
391-455:	0	0	0	0	0	0	0	4	2
>455:	0	0	0	0	0	0	0	6	2

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BURNS HARBOR, IN
SAROAD STATION # 153420902 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	100	42
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	591.0	566.0
DATE :	******	******	******	******	******	******	******	790712	800123
2ND HIGHEST:	******	******	******	******	******	******	******	588.0	414.0
DATE :	******	******	******	******	******	******	******	790512	800310
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	33	6
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	47	14
RANGE									
0- 65:	0	0	0	0	0	0	0	11	9
66-130:	0	0	0	0	0	0	0	31	16
131-195:	0	0	0	0	0	0	0	16	8
196-260:	0	0	0	0	0	0	0	9	3
261-325:	0	0	0	0	0	0	0	14	1
326-390:	0	0	0	0	0	0	0	7	3
391-455:	0	0	0	0	0	0	0	5	1
>455:	0	0	0	0	0	0	0	7	1

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR BETHLEHEM - BURNS HARBOR, IN
SAROAD STATION # 153420903 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	60	43
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	515.0	473.0
DATE :	******	******	******	******	******	******	******	790913	800423
2ND HIGHEST:	******	******	******	******	******	******	******	282.0	258.0
DATE :	******	******	******	******	******	******	******	790907	800225
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	3	1
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	11	6
RANGE									
0- 65:	0	0	0	0	0	0	0	23	14
66-130:	0	0	0	0	0	0	0	24	19
131-195:	0	0	0	0	0	0	0	7	6
196-260:	0	0	0	0	0	0	0	3	3
261-325:	0	0	0	0	0	0	0	2	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	1	1

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - BURNS HARBOR, IN
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	153420006		153420007		153420009		153420901		153420902		153420903	
SITE ID #	2		3		4		5		6		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	1	2	2	2	1	1
AVE TSP:	0.	0.	0.	0.	0.	0.	328.	303.	355.	345.	282.	515.
NNE COUNT:	0	0	0	0	0	0	1	1	2	3	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	308.	272.	326.	430.	0.	262.
NE COUNT:	0	0	0	0	0	0	5	0	6	2	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	348.	0.	376.	303.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	3	0	3	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	504.	0.	546.	0.	0.
E COUNT:	0	0	0	0	0	0	0	1	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	651.	0.	372.	0.	0.
ESE COUNT:	0	0	0	0	0	0	1	1	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	648.	743.	0.	560.	0.	0.
SE COUNT:	0	0	0	0	0	0	1	1	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	288.	496.	0.	435.	0.	0.
SSE COUNT:	0	0	0	0	0	0	2	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	433.	0.	0.	318.	0.	0.
S COUNT:	0	0	0	0	0	0	1	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	264.	0.	0.	0.	0.	0.
SSW COUNT:	0	0	0	0	0	0	1	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	406.	0.	0.	0.	0.	0.
SW COUNT:	0	0	0	0	0	0	1	0	1	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	305.	0.	310.	0.	0.	0.
WSW COUNT:	0	0	0	0	0	0	1	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	444.	293.	0.	0.	0.	0.
W COUNT:	0	0	0	0	0	0	0	0	1	2	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	281.	394.	0.	0.
WNW COUNT:	0	0	0	0	0	0	0	0	2	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	422.	317.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	1	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	517.	296.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	1	0	3	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	745.	0.	349.	0.	0.
ALL COUNT:	0	0	0	0	0	0	15	11	15	21	1	2
AVE TSP:	0.	0.	0.	0.	0.	0.	373.	483.	371.	398.	282.	389.

24-HR STANDARD EXCEEDANCE ROSE FOR
BETHLEHEM - BURNS HARBOR, IN
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	153420006		153420007		153420009		153420901		153420902		153420903	
SITE ID #	2		3		4		5		6		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	1	0	0	0	1	3	2	3	1	1
AVE TSP:	0.	0.	226.	0.	0.	0.	328.	272.	355.	297.	282.	515.
NNE COUNT:	0	0	0	0	0	0	1	3	2	3	1	2
AVE TSP:	0.	0.	0.	0.	0.	0.	308.	246.	326.	430.	159.	226.
NE COUNT:	0	0	0	0	0	0	6	4	6	4	1	1
AVE TSP:	0.	0.	0.	0.	0.	0.	320.	215.	376.	254.	196.	165.
ENE COUNT:	0	0	0	0	0	0	0	3	0	4	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	504.	0.	453.	0.	159.
E COUNT:	0	0	0	0	0	0	1	1	1	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	185.	651.	161.	372.	0.	0.
ESE COUNT:	0	0	0	0	0	0	1	2	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	648.	483.	0.	560.	0.	0.
SE COUNT:	0	0	0	0	0	0	2	2	0	2	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	268.	341.	0.	337.	0.	0.
SSE COUNT:	0	0	0	0	0	0	3	2	1	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	344.	202.	212.	318.	0.	0.
S COUNT:	1	0	0	0	0	0	2	1	0	0	0	0
AVE TSP:	159.	0.	0.	0.	0.	0.	243.	204.	0.	0.	0.	0.
SSW COUNT:	0	0	0	0	0	0	7	2	2	1	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	216.	186.	186.	180.	0.	158.
SW COUNT:	0	0	1	0	0	0	2	0	1	2	0	0
AVE TSP:	0.	0.	225.	0.	0.	0.	248.	0.	310.	245.	0.	0.
WSW COUNT:	1	0	0	0	0	0	1	1	0	2	1	0
AVE TSP:	193.	0.	0.	0.	0.	0.	444.	293.	0.	231.	201.	0.
W COUNT:	0	0	0	0	0	0	1	0	1	2	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	236.	0.	281.	394.	0.	0.
WNW COUNT:	0	0	0	0	0	0	0	1	2	1	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	156.	422.	317.	0.	175.
NW COUNT:	0	0	0	0	0	0	1	1	2	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	160.	230.	336.	296.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	3	0	5	0	3
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	368.	0.	276.	0.	204.
ALL COUNT:	2	0	2	0	0	0	29	29	20	33	4	10
AVE TSP:	176.	0.	226.	0.	0.	0.	286.	310.	323.	329.	210.	224.

UPDATED AIR QUALITY EVALUATION - BETHLEHEM STEEL, BURNS HARBOR, INDIANA

Stations used in update:

Continued operation:	#2, #3, #4
New stations:	#5* (1979), #6* (1979), #7* (1979)
Discontinued stations:	#5*, #6*, #7* (1980)

Trends in geometric means:

All three regular stations consistently generated 12-month running geometric means below the secondary annual standard. Values were generally less than 50 $\mu g/m^{-3}$. Stations #3 and #4 indicated a moderate upward trend (Spearman correlation coefficients of +0.60 and +0.46, respectively), station #2 indicated a very slight negative trend (Spearman correlation coefficient of -0.14).

Stations #5, #6, and #7 were specially sited during 1979 and 1980. All three of these consistently generated geometric means in excess of the primary annual standard. Because they were part of a special source-oriented study, long term impact trends cannot be assessed. However, these sites do indicate a substantial impact very near the plant.

Attainment status:

All of the long term stations indicate attainment of the primary standards. The special study sites indicate certain 24-hour primary standard nonattainment close to the mill.

Pollution roses:

The patterns established for stations #2, #3, and #4 are generally unchanged. Station #2 displays increased TSP levels under steady winds coming from the plant. The preponderance of southwesterly winds offers little opportunity for impacts at stations #3 and #4.

Pollution roses developed from the special study sites (stations #5, #6, and #7) display a severe local impact, particularly from the coking operations.

Standard exceedance roses:

Stations #2, #3, and #4 registered no excursions beyond the 24-hour primary standard. Additionally, no excursions beyond the 24-hour secondary standard

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* Special study sites.

were recorded at station #4. Secondary standard excursions at station #3 were extremely rare. Both occurred under winds that would not be expected to have involved the plant. Secondary excursions at station #2 were equally rare, but both occurred under steady winds that involved the plant.

For stations #5, #6, and #7, excursions beyond primary and secondary 24-hour standards were a fairly routine event and reinforced the patterns developed through the pollution roses.

BaP:

As part of the special study conducted by EPA Region V, BaP was measured at stations #5 and #6 for 6 days in May 1979. The results were divided into "downwind," "with wind," and "background" categories. Downwind days were defined as having the 24-hour average wind direction within $\pm$ 10° of the station orientation from the plant. With wind days had four or more hours within $\pm$ 10°, while background days had winds away from the station for the entire day. The results are summarized below:

	Downwind Station	With Wind Station	Background Station
Range (ng/m^3)	2.9-981.0	64-196.0	< 1.0-10.3
Geometric Mean	40.9	38.7	1.9

CF & I STEEL

Pueblo, Colorado

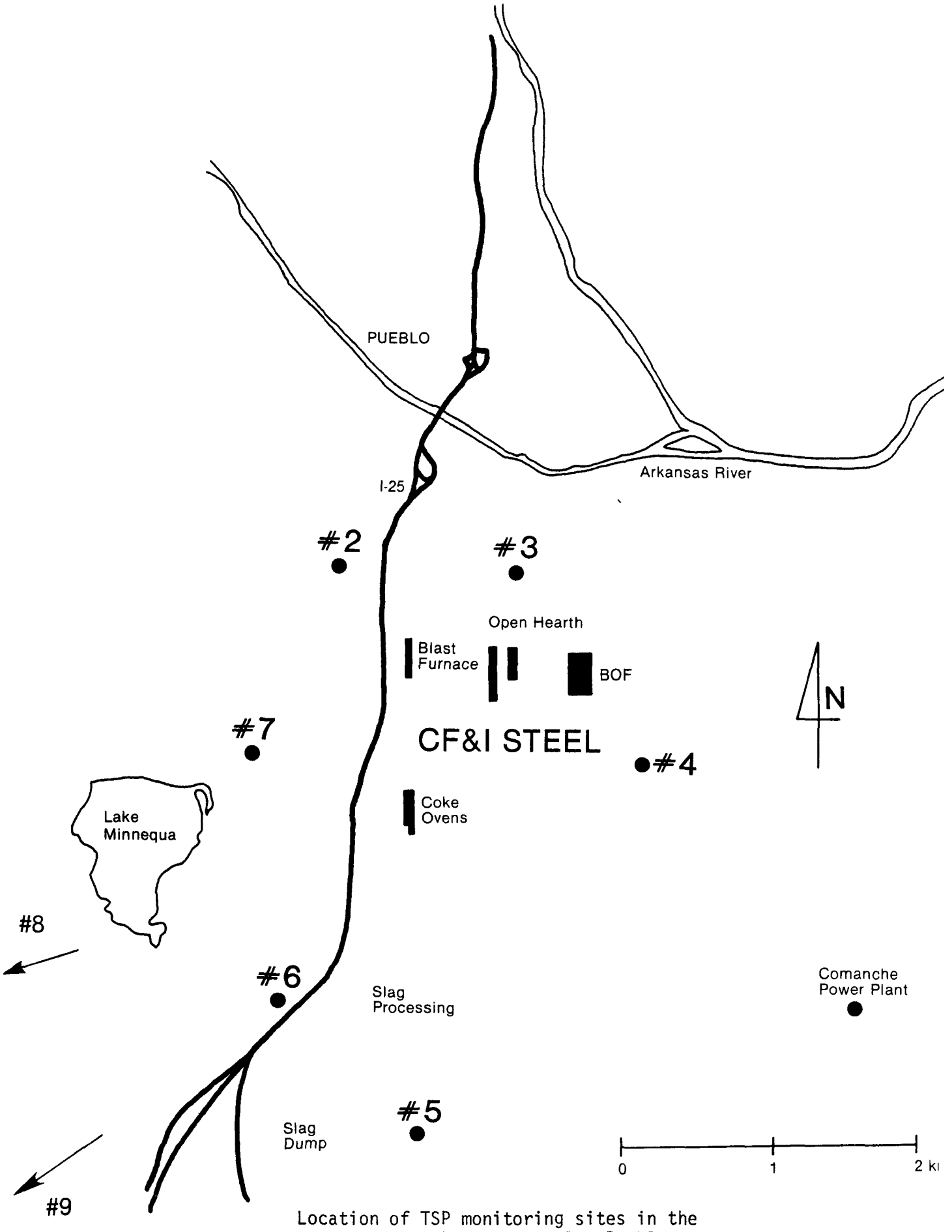
EPA Region VIII

Hi Vol Monitoring Sites in the Vicinity of CF & I Steel - Pueblo, Colorado

	SAROAD #	Site Name and Address	Plant Location from Site: Bearing	Distance (km)	Elevation: Above Ground (m)	MSL (m)	Plant (m)	Site Description	Nearest Roadway: Name	Direction/Distance (m)		Volume
X #1	061820001	Pueblo City-County Health Department	Coking 164° Blast Furn. 143° Open Hearth 126° BOF 113°	3.8 km 2.8 km 3.0 km 3.1 km	5	1421	-34	Building roof	Central Main	SE	30	Moderate
#2	061820003	Mesa & Evans Pueblo	Coking 180° Blast Furn. 180° Open Hearth 168° BOF 158°	1.6 km 0.7 km 1.2 km 1.7 km	9	1452	-2	Building roof	Mesa Evans	N E	15 15	2 lane Moderate 2 lane Moderate
#3	Reference # 500	CF & I - North	Coking 205° Blast Furn. 233° Open Hearth 193° BOF 147°	1.7 km 0.9 km 0.7 km 0.7 km	3	1445	-9	Vacant lot in residential area	unknown (station discontinued)			
#4	Reference # 100	CF & I - East	Coking 260° Blast Furn. 295° Open Hearth 302° BOF 326°	1.5 km 1.7 km 1.2 km 0.8 km	3	1448	-6	Small hilltop	Residential Street	ENE	250	Very light
#5	Reference # 200	CF & I - South *	Coking 358° Blast Furn. 358° Open Hearth 9° BOF 19°	2.2 km 3.1 km 3.1 km 3.2 km	3	1470	15	open land	---	--- (on CF & I property)	---	---
#6	Reference # 300	CF & I - 5 *	Coking 32° Blast Furn. 20° Open Hearth 32° BOF 42°	1.6 km 2.4 km 2.6 km 2.9 km	3	1466	11	open grassy field	I - 25	SE	100	Moderate
#7	Reference # 400	CF & I - West *	Coking 118° Blast Furn. 59° Open Hearth 72° BOF 76°	1.1 km 1.2 km 1.6 km 2.2 km	6	1459	5	Building roof	Lakeview	N	8	Very light
#8	061820 611	South Pumping Station	Coking 78° Blast Furn. 71° Open Hearth 73° BOF 73°	10.13 km 10.5 km 10.88 km 11.39 km	Unknown	1562	118	Rural	Unknown	Unknown		Unknown
#9	Reference # 600	Burnt Mill	Coking 39° Blast Furn 36° Open Hearth 38° BOF 40°	14.76 km 15.68 km 15.86 km 16.32 km	Unknown	1578	134	Rural	Burnt Mill & Little Burnt Mill Road	Unknown		Unknown

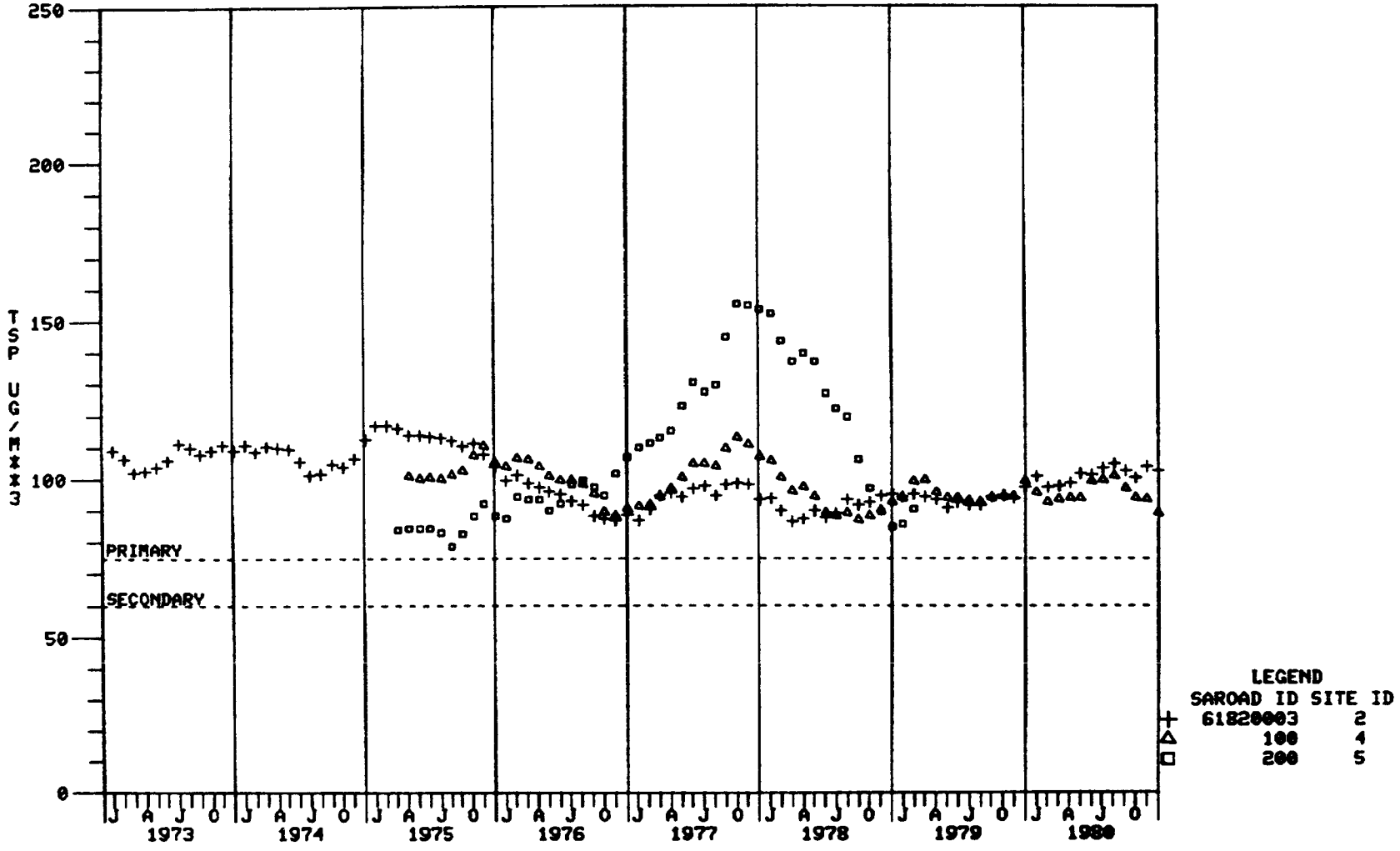
* Critical sites

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

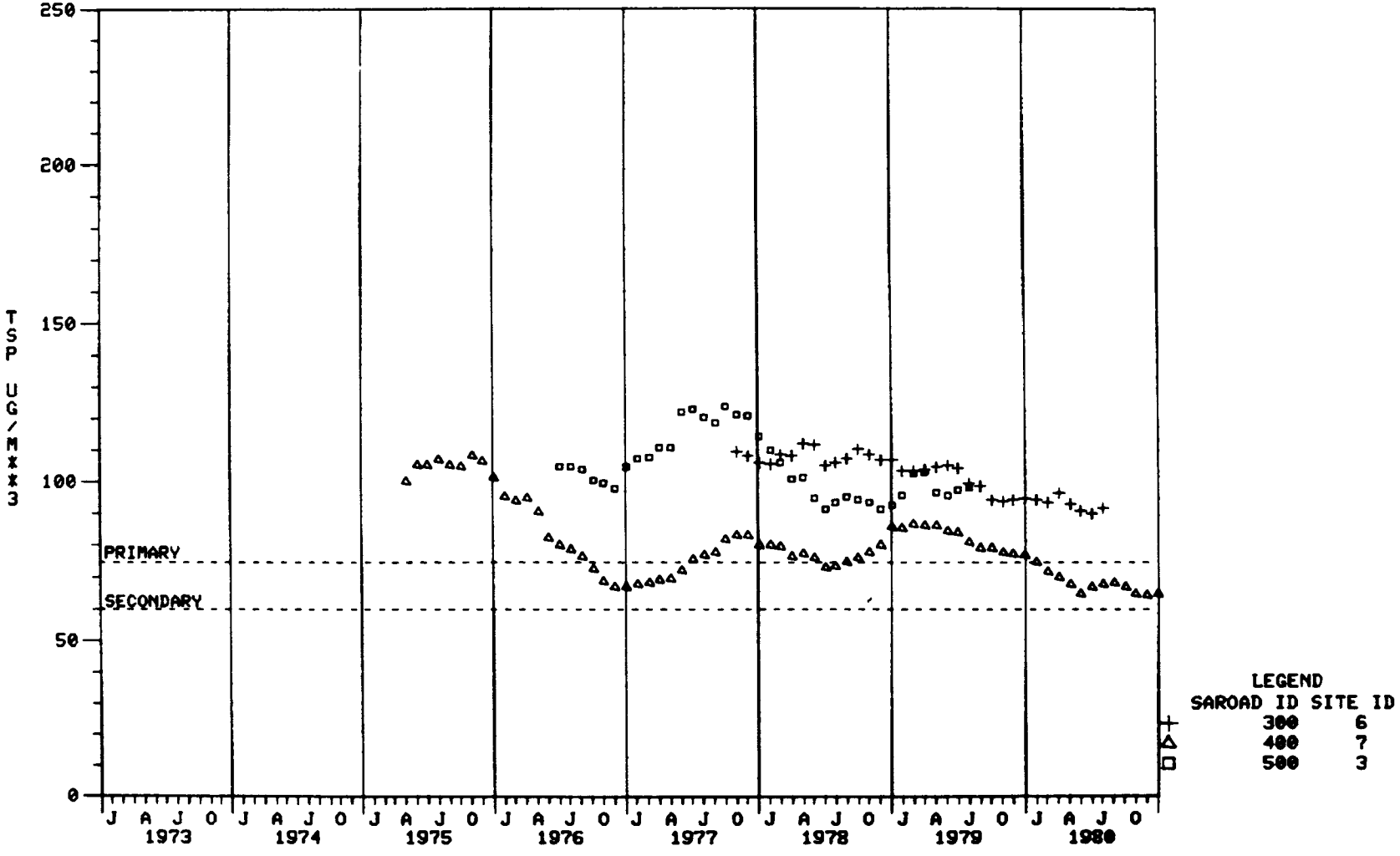


Location of TSP monitoring sites in the vicinity of C.F. & I. Steel - Pueblo, Colorado

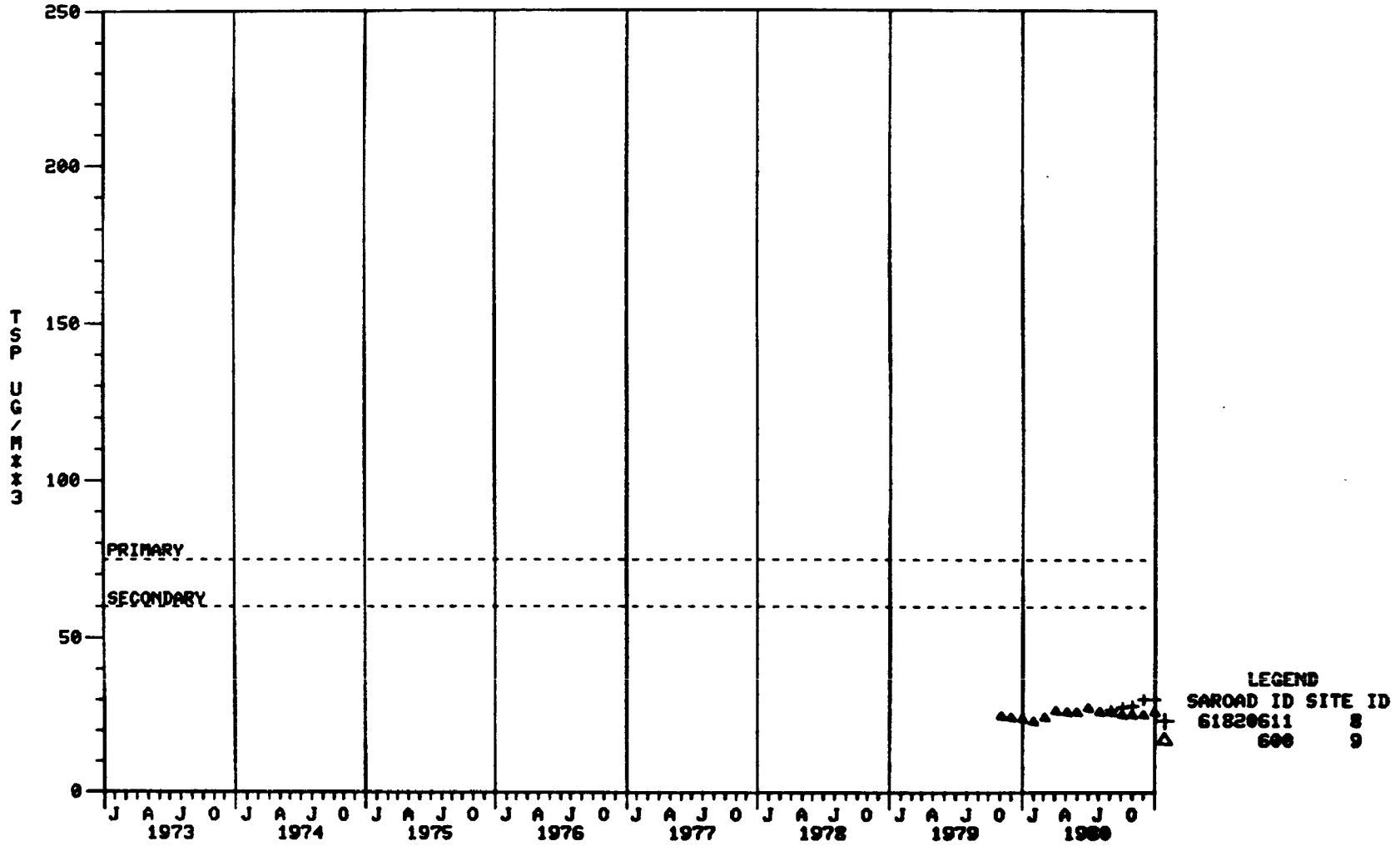
TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR C F & I - PUEBLO, CO



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR C F & I - PUEBLO, CO



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR C F & I - PUEBLO, CO



TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SAROAD STATION # 061820003 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	64	88	86	87	85	87	72	89	67
GEOMETRIC MEAN:	111.8	109.3	112.6	103.8	88.6	93.6	95.1	97.3	102.4
GEOMETRIC S.D.:	1.7	1.5	1.4	1.5	1.5	1.7	1.6	1.6	1.5
HIGHEST BY LARSEN EXTRP:	532.4	391.8	333.0	322.2	301.2	445.1	396.9	368.0	313.6
1ST HIGHEST:	324.0	349.0	454.0	317.0	274.0	358.0	301.0	405.0	262.0
DATE :	720326	730719	740302	750426	760220	770310	780409	790507	800102
2ND HIGHEST:	291.0	246.0	252.0	274.0	250.0	341.0	233.0	332.0	239.0
DATE :	721227	731116	741211	750128	761208	770222	780516	790528	801109
# OF READINGS EXCEEDING 260 :	3	1	1	2	1	6	1	2	1
# OF READINGS EXCEEDING 150 :	18	23	17	16	9	15	11	12	7
RANGE									
0- 65:	8	12	7	8	14	20	12	15	6
66-130:	28	41	51	56	57	45	42	56	46
131-195:	21	30	23	18	12	14	14	13	12
196-260:	4	4	4	3	1	2	3	3	2
261-325:	3	0	0	2	1	4	1	0	1
326-390:	0	1	0	0	0	2	0	1	0
391-455:	0	0	1	0	0	0	0	1	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SARDAD STATION # 500 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	81	147	175	79	23	0
GEOMETRIC MEAN:	******	******	******	******	104.6	114.3	92.6	******	******
GEOMETRIC S.D.:	******	******	******	******	1.9	1.8	2.0	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	676.4	627.0	758.8	******	******
1ST HIGHEST:	******	******	******	607.0	789.0	657.0	649.0	241.0	******
DATE :	******	******	******	751009	760426	770314	780426	790409	******
2ND HIGHEST:	******	******	******	441.0	742.0	542.0	417.0	240.0	******
DATE :	******	******	******	751011	760301	770411	780305	790111	******
# OF READINGS EXCEEDING 260 :	0	0	0	4	8	14	3	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	14	35	46	19	5	0
RANGE									
0- 65:	0	0	0	12	29	26	21	6	0
65-130:	0	0	0	40	68	80	31	10	0
131-195:	0	0	0	23	29	44	19	3	0
196-260:	0	0	0	2	13	11	5	4	0
261-325:	0	0	0	0	4	6	1	0	0
326-390:	0	0	0	1	1	0	0	0	0
391-455:	0	0	0	2	0	3	1	0	0
>455:	0	0	0	1	3	5	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SARDAD STATION # 100 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	73	174	176	165	85	87	87
GEOMETRIC MEAN:	******	******	******	105.1	90.5	106.8	92.8	99.1	89.3
GEOMETRIC S.D.:	******	******	******	1.7	1.9	1.9	1.9	1.9	1.8
HIGHEST BY LARSEN EXTRP:	******	******	******	509.1	587.6	747.2	655.9	608.8	475.3
1ST HIGHEST:	******	******	307.0	378.0	570.0	621.0	452.0	337.0	241.0
DATE :	******	******	741219	750323	760325	770222	780418	790507	801109
2ND HIGHEST:	******	******	250.0	374.0	498.0	586.0	382.0	296.0	237.0
DATE :	******	******	741205	751130	760319	770328	780426	791217	801215
# OF READINGS EXCEEDING 260 :	0	0	1	6	5	10	3	2	0
# OF READINGS EXCEEDING 150 :	0	0	16	43	27	49	18	20	13
RANGE									
0- 65:	0	0	16	32	42	35	24	19	22
66-130:	0	0	31	81	92	61	37	40	39
131-195:	0	0	21	39	29	46	15	17	21
196-260:	0	0	4	16	8	13	6	9	5
261-325:	0	0	1	3	0	5	0	1	0
326-390:	0	0	0	3	2	0	2	1	0
391-455:	0	0	0	0	0	1	1	0	0
>455:	0	0	0	0	3	4	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SARDAD STATION # 200 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	87	114	166	159	79	0	0
GEOMETRIC MEAN:	******	******	******	88.1	107.1	153.5	84.7	******	******
GEOMETRIC S.D.:	******	******	******	2.0	2.1	2.0	2.0	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	667.3	974.0	1231.3	615.6	******	******
1ST HIGHEST:	******	******	377.0	1414.0	1298.0	1657.0	678.0	******	******
DATE :	******	******	740714	750118	760220	770630	780418	******	******
2ND HIGHEST:	******	******	360.0	943.0	1176.0	1098.0	660.0	******	******
DATE :	******	******	740809	750327	760715	770403	780617	******	******
# OF READINGS EXCEEDING 260 :	0	0	8	8	16	31	2	0	0
# OF READINGS EXCEEDING 150 :	0	0	10	18	52	81	13	0	0
RANGE									
0- 65:	0	0	36	41	40	12	27	0	0
66-130:	0	0	36	50	67	55	32	0	0
131-195:	0	0	6	10	31	37	15	0	0
196-260:	0	0	1	5	12	24	3	0	0
261-325:	0	0	6	3	4	13	0	0	0
326-390:	0	0	2	0	3	5	0	0	0
391-455:	0	0	0	0	2	4	0	0	0
>455:	0	0	0	5	7	8	2	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SAROAD STATION # 300 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	155	88	83	30
GEOMETRIC MEAN:	******	******	******	******	******	105.6	107.0	95.0	******
GEOMETRIC S.D.:	******	******	******	******	******	1.8	1.8	1.8	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	590.5	643.3	495.9	******
1ST HIGHEST:	******	******	******	******	******	529.0	567.0	589.0	307.0
DATE :	******	******	******	******	******	771119	780707	790507	800306
2ND HIGHEST:	******	******	******	******	******	498.0	441.0	391.0	221.0
DATE :	******	******	******	******	******	770630	780418	790417	800310
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	13	9	3	1
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	38	27	16	4
RANGE									
0- 65:	0	0	0	0	0	29	20	20	10
66-130:	0	0	0	0	0	79	37	40	14
131-195:	0	0	0	0	0	23	18	15	3
196-260:	0	0	0	0	0	11	4	5	2
261-325:	0	0	0	0	0	6	6	0	1
326-390:	0	0	0	0	0	5	1	1	0
391-455:	0	0	0	0	0	0	1	1	0
>455:	0	0	0	0	0	2	1	1	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SARDAD STATION # 400 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	77	106	182	176	86	89	83
GEOMETRIC MEAN:	******	******	******	101.2	67.0	80.1	85.8	77.0	64.7
GEOMETRIC S.D.:	******	******	******	1.6	1.6	1.6	1.6	1.6	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	410.8	281.4	319.4	329.3	316.1	275.4
1ST HIGHEST:	******	******	239.0	397.0	579.0	416.0	291.0	407.0	248.0
DATE :	******	******	740920	750118	760301	770310	780426	790507	801109
2ND HIGHEST:	******	******	201.0	278.0	432.0	313.0	264.0	300.0	198.0
DATE :	******	******	741219	750424	760325	771119	780418	790528	800322
# OF READINGS EXCEEDING 260 :	0	0	0	4	5	5	2	2	1
# OF READINGS EXCEEDING 150 :	0	0	14	20	6	15	9	5	3
RANGE									
0- 65:	0	0	9	15	100	55	24	35	43
66-130:	0	0	51	62	72	98	46	45	42
131-195:	0	0	15	18	5	14	12	6	2
196-260:	0	0	2	7	0	4	2	1	2
261-325:	0	0	0	3	1	4	2	1	0
326-390:	0	0	0	0	2	0	0	0	0
391-455:	0	0	0	1	1	1	0	1	0
>455:	0	0	0	0	1	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SAROAD STATION # 061820611 SITE ID # 08
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	8	68
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	30.6
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	1.8
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	166.0
1ST HIGHEST:	******	******	******	******	******	******	******	36.0	192.0
DATE :	******	******	******	******	******	******	******	791229	801109
2ND HIGHEST:	******	******	******	******	******	******	******	32.0	155.0
DATE :	******	******	******	******	******	******	******	791205	800521
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	2
RANGE									
0- 65:	0	0	0	0	0	0	0	8	63
66-130:	0	0	0	0	0	0	0	0	3
131-195:	0	0	0	0	0	0	0	0	2
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

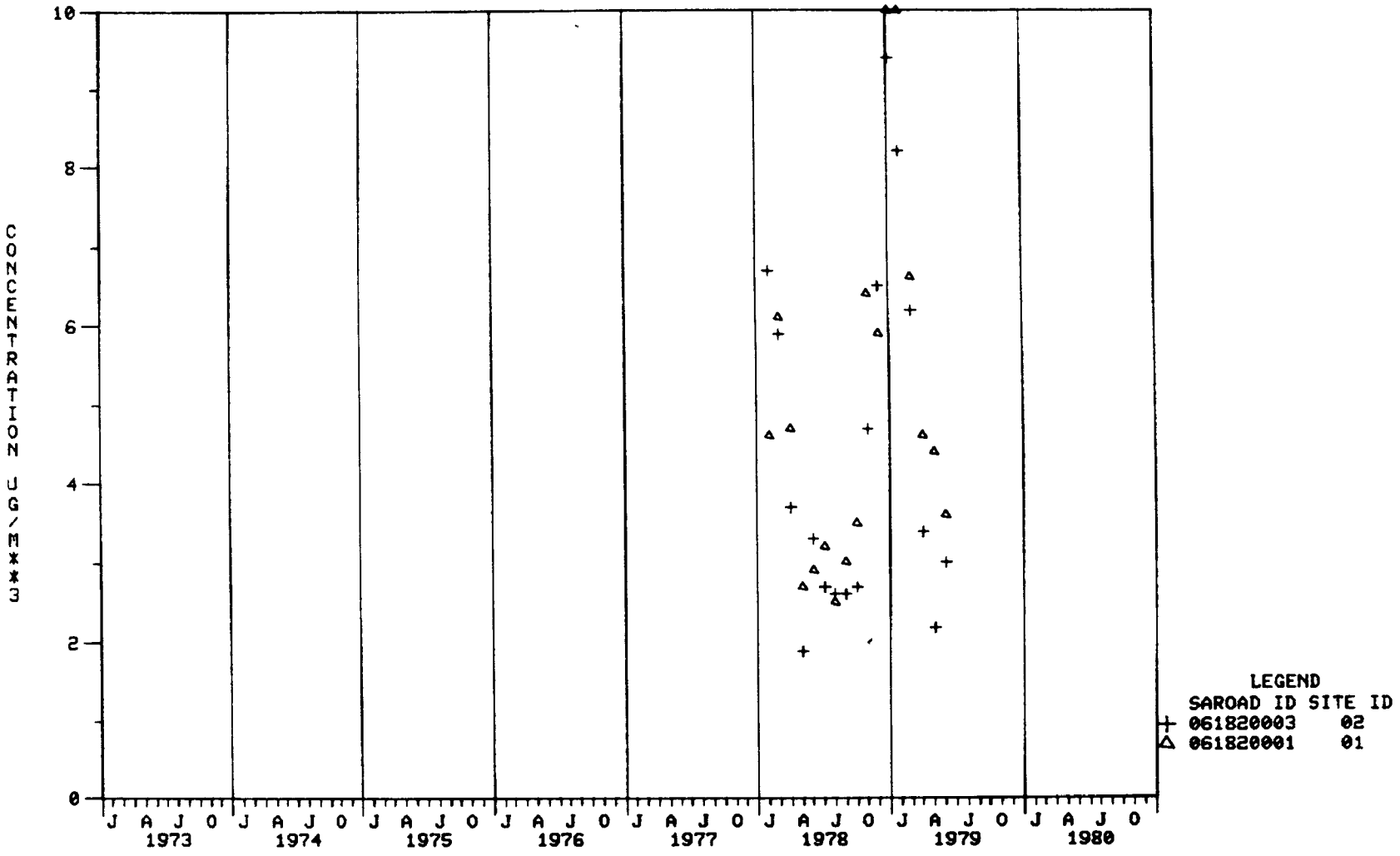
****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR C F & I - PUEBLO, CO
SARDAD STATION # 600 SITE ID # 09
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	117	82
GEOMETRIC MEAN:	******	******	******	******	******	******	******	23.6	25.0
GEOMETRIC S.D.:	******	******	******	******	******	******	******	2.7	2.0
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	418.0	204.7
1ST HIGHEST:	******	******	******	******	******	******	******	366.0	153.0
DATE :	******	******	******	******	******	******	******	790507	800521
2ND HIGHEST:	******	******	******	******	******	******	******	203.0	83.0
DATE :	******	******	******	******	******	******	******	790528	800720
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	1	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	3	1
RANGE									
0- 65:	0	0	0	0	0	0	0	106	77
66-130:	0	0	0	0	0	0	0	8	4
131-195:	0	0	0	0	0	0	0	1	1
196-260:	0	0	0	0	0	0	0	1	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	1	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

BSO MONTHLY ARITHMETIC MEANS (UG/M**3) FOR C F & I - PUEBLO, CO



UPDATED AIR QUALITY EVALUATION - CF & I STEEL, PUEBLO, COLORADO

Stations used in update:

Continued operation:	#2, #4, #7
New stations:	#8, #9 (both 1979)
Discontinued stations:	#3 (1979), #5 (1978), #6 (1979)

Trends in geometric means:

Those stations with multiyear records displayed moderate negative trends (Spearman correlation coefficients near -0.5), and the graphs of running 12-month geometric means showed general coherence. For instance, stations #2, #3, #4, #5, and #7 all indicate increasing values through 1977 and a decreasing trend through 1978. Since most stations show this pattern, it may be regional in nature, perhaps related to open dust source emissions. Station #5, which is located near a potential open dust source, the slag dump, displays this pattern more strongly than other stations.

Attainment status:

Station #8 (record sufficiently long only for 1980) and station #9 (1979, 1980) were the only two stations in attainment of primary TSP standards from 1978-1979. These are both background sites.

Pollution and standard exceedance roses:

New wind roses were not constructed because computer-compatible wind data were not available for 1978-1980.

Sampling days with three or more stations in operation, and at least one recording a value in excess of the primary 24-hour TSP standard, were inspected for multiple excursions. Results are tabulated below.

BSO:

Benzene-soluble organics were sampled at stations #1 and #2 from early 1978 to mid-1979. Monthly average values generally ranged between 2 and 10 $\mu g/m^3$.

Pollution and standard exceedance roses (continued):

Episode	# Stations Reporting	# Stations >Primary	# Stations >Secondary
78/03/05	6	1	5
78/04/06	1	1	1
78/04/14	6	1	5
78/04/18	6	4	6
78/04/26	6	3	6
78/05/16	6	1	4
78/06/17	5	2	2
78/06/21	3	1	1
78/07/07	4	1	2
78/07/27	5	1	3
78/09/09	5	1	2
78/12/18	5	1	6
78/04/17	4	1	3
79/05/07	5	5	5
79/06/28	5	3	5
80/03/06	5	1	2

In 25 percent of the cases, more than half of the operating network was above the 24-hour standard. In nearly 70 percent of the cases, more than half of the operating network was above the secondary standard. Both of these factors point to a regional scale effect.

CRUCIBLE STEEL

Midland, Pennsylvania

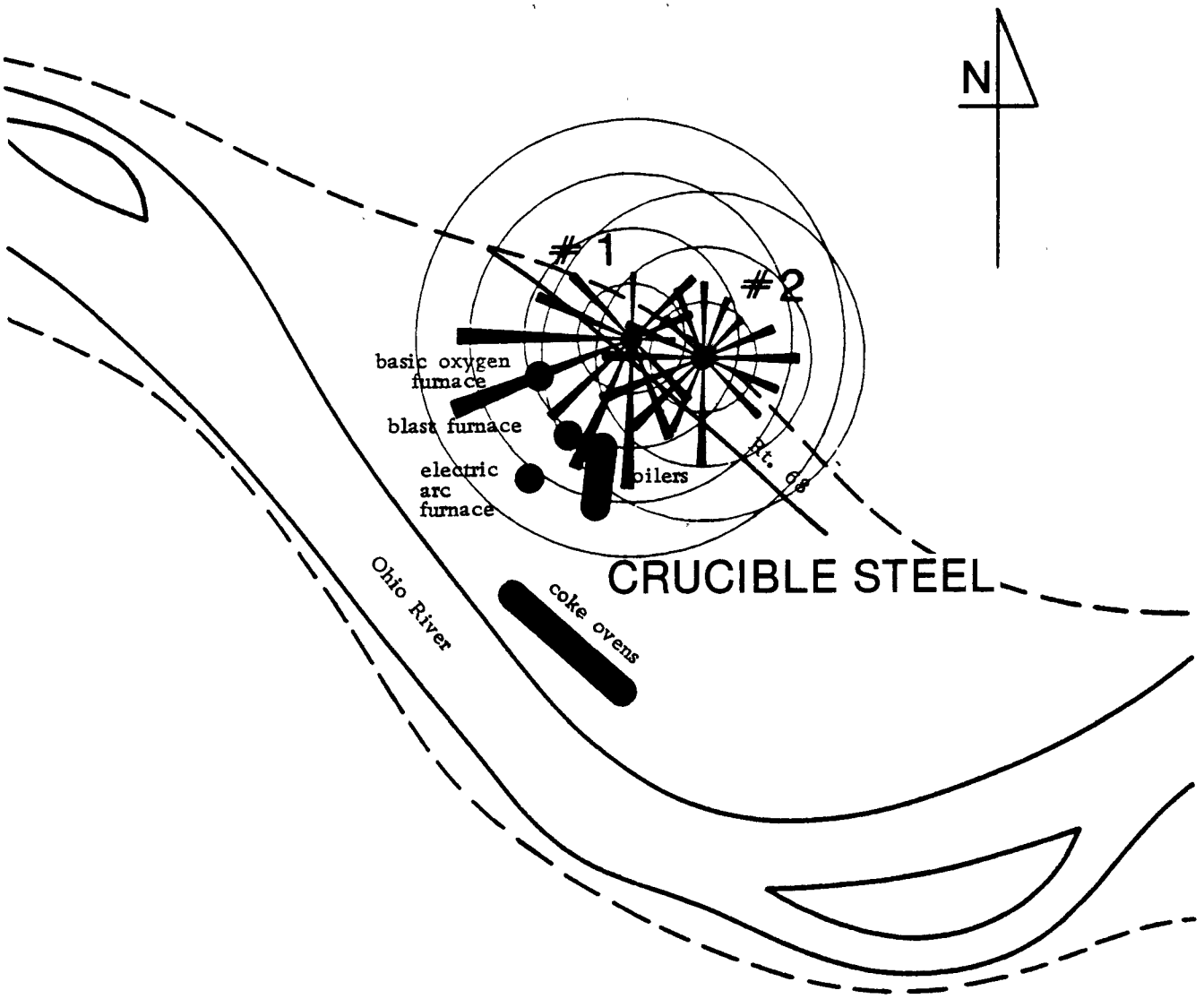
EPA Region III

Hi-Vol Monitoring Sites - Crucible Steel, Midland, PA

	SAROAD #	Site Name	Plant Location from Site: Bearing (clockwise)	Plant Location from Site: Distance (km)	Elevation: Height of Hi-Vol Inlet Above Ground (m)	Elevation: Elevation Diff. Site-Plant (m)	Site Description	Nearest Roadway: Name	Nearest Roadway: Direction/Distance (m)	Nearest Roadway: Volume
#1	395740509F02	Midland Post Office*	From 254° To 182°	0.4 1.2	5	3	Building roof (asphalt)		NW/6	Paved road, light traffic
									NE/12	Paved road, light traffic
								Rt. 68	SW/9	Paved road, moderate traffic
#2	395740501F01	Midland Swimming Pool	161° - 289°	.47 km - 2.5 km	2	55	Unknown	Virginia Avenue	NW/	Unknown

* Denotes critical site.

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.



Wind Data Representativeness

Station #	Terrain	Distance	Rating
1, 2	III	H	U

Comment: At this distance the representativeness of the meteorology is questionable.

N.B. See Table 5 in Methodology section.

— — — Defines river valley

0 610 m

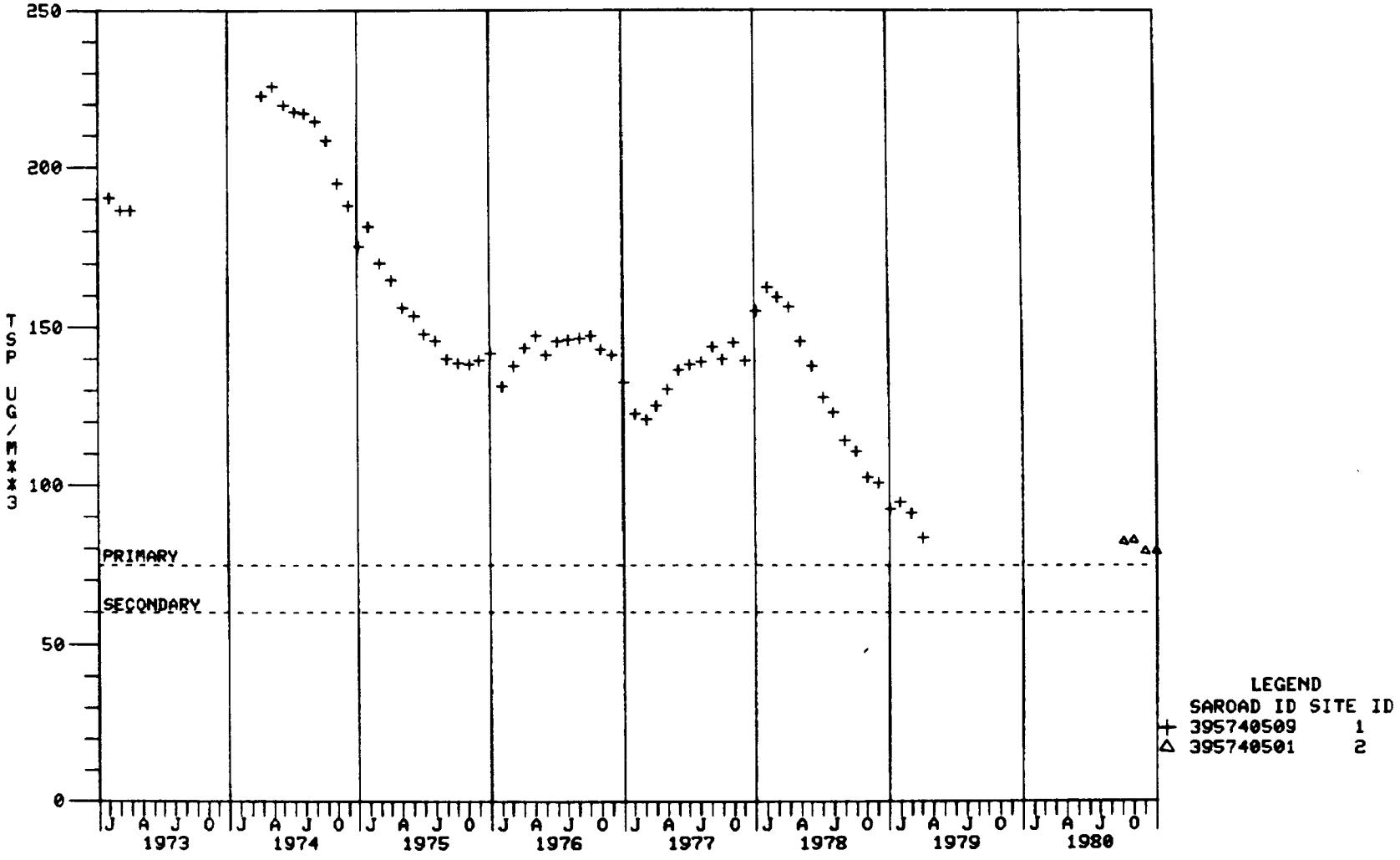
TSP roses for Crucible Steel-Midland, Pennsylvania for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents $50 \mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Crucible Steel--Midland, PA

Wind Direction	Monitoring Site Numbers #1	#2
N	4	1
NNE	0	1
NE	5	1
ENE	1	2
E	1	1
ESE	0	3
SE	2	1
SSE	1	0
S	2	1
SSW	2	1
SW	4	5
WSW	4	3
W	7	1
WNW	1	3
NW	2	4
NNW	0	1
Total	36	29

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR CRUCIBLE - MIDLAND, PA



TSP DATA SUMMARY FOR CRUCIBLE - MIDLAND, PA
SAROAD STATION # 395740509 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	60	31	59	44	60	55	60	0	0
GEOMETRIC MEAN:	190.7	******	175.4	141.8	132.6	155.2	92.7	******	******
GEOMETRIC S.D.:	1.6	******	1.7	1.7	1.8	2.0	1.8	******	******
HIGHEST BY LARSEN EXTRP:	786.9	******	884.3	653.0	742.7	1199.3	487.2	******	******
1ST HIGHEST:	484.0	621.0	454.0	364.0	353.0	1123.0	373.0	******	******
DATE :	720807	731013	740827	750124	760611	770624	780321	******	******
2ND HIGHEST:	418.0	427.0	442.0	344.0	341.0	589.0	302.0	******	******
DATE :	720608	731112	741101	750106	760909	770308	780225	******	******
# OF READINGS EXCEEDING 260 :	17	12	18	4	7	10	2	0	0
# OF READINGS EXCEEDING 150 :	42	28	37	24	30	28	14	0	0
RANGE									
0- 65:	1	0	2	5	6	3	14	0	0
66-130:	13	3	15	14	21	18	31	0	0
131-195:	12	5	11	13	17	13	9	0	0
196-260:	17	11	12	8	9	11	4	0	0
261-325:	10	7	13	1	5	3	1	0	0
326-390:	3	2	3	3	2	5	1	0	0
391-455:	3	2	2	0	0	0	0	0	0
>455:	1	1	0	0	0	2	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR CRUCIBLE - MIDLAND, PA
SAROAD STATION # 395740501 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	60
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	78.4
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	1.4
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	205.7
1ST HIGHEST:	******	******	******	******	******	******	******	******	154.0
DATE :	******	******	******	******	******	******	******	******	800626
2ND HIGHEST:	******	******	******	******	******	******	******	******	143.0
DATE :	******	******	******	******	******	******	******	******	801030
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	1
RANGE									
0- 65:	0	0	0	0	0	0	0	0	15
66-130:	0	0	0	0	0	0	0	0	41
131-195:	0	0	0	0	0	0	0	0	3
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
CRUCIBLE - MIDLAND, PA
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	395740509		395740501	
SITE ID #	1		2	
DIRECTION	W>=X	W<X	W>=X	W<X
N COUNT:	1	0	0	0
AVE TSP:	279.	0.	0.	0.
NNE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ENE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
E COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ESE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
SE COUNT:	1	0	0	0
AVE TSP:	269.	0.	0.	0.
SSE COUNT:	0	2	0	0
AVE TSP:	0.	318.	0.	0.
S COUNT:	1	3	0	0
AVE TSP:	292.	280.	0.	0.
SSW COUNT:	3	5	0	0
AVE TSP:	638.	329.	0.	0.
SW COUNT:	11	11	0	0
AVE TSP:	346.	345.	0.	0.
WSW COUNT:	5	2	0	0
AVE TSP:	351.	328.	0.	0.
W COUNT:	4	1	0	0
AVE TSP:	329.	272.	0.	0.
WNW COUNT:	0	2	0	0
AVE TSP:	0.	277.	0.	0.
NW COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NNW COUNT:	1	0	0	0
AVE TSP:	286.	0.	0.	0.
ALL COUNT:	27	26	0	0
AVE TSP:	368.	323.	0.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
CRUCIBLE - MIDLAND, PA
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	395740509		395740501	
SITE ID #	1		2	
DIRECTION	W>=X	W<X	W>=X	W<X
N COUNT:	1	2	0	0
AVE TSP:	279.	170.	0.	0.
NNE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ENE COUNT:	0	1	0	0
AVE TSP:	0.	193.	0.	0.
E COUNT:	1	2	0	0
AVE TSP:	164.	226.	0.	0.
ESE COUNT:	1	2	0	0
AVE TSP:	170.	198.	0.	0.
SE COUNT:	4	2	0	0
AVE TSP:	218.	171.	0.	0.
SSE COUNT:	1	4	0	0
AVE TSP:	255.	258.	0.	0.
S COUNT:	2	5	0	0
AVE TSP:	223.	269.	0.	0.
SSW COUNT:	11	11	0	0
AVE TSP:	314.	255.	0.	0.
SW COUNT:	21	17	0	1
AVE TSP:	286.	293.	0.	154.
WSW COUNT:	13	12	0	0
AVE TSP:	254.	225.	0.	0.
W COUNT:	13	11	0	0
AVE TSP:	239.	228.	0.	0.
WNW COUNT:	11	5	0	0
AVE TSP:	195.	210.	0.	0.
NW COUNT:	2	3	0	0
AVE TSP:	218.	206.	0.	0.
NNW COUNT:	2	1	0	0
AVE TSP:	245.	169.	0.	0.
ALL COUNT:	83	78	0	1
AVE TSP:	255.	243.	0.	154.

UPDATED AIR QUALITY EVALUATION - CRUCIBLE STEEL, MIDLAND, PENNSYLVANIA

Stations used in update:

Continued operation:	None
New stations:	#2 (1980)
Discontinued stations:	#1 (1978)

Trends in geometric means:

Station #1 continued generating 12-month running geometric means in excess of the primary annual standard. These values went into a sharp decline in 1978. Nonetheless, 12-month running geometric means at the end of station #1's service life continued above the primary annual standard. The Spearman correlation coefficient for station #1 over the period 1974-1978 was -0.78, indicating a strong negative trend.

Station #2 did not come into service until 1980; the annual geometric mean for that year was in excess of the primary annual standard.

Attainment status:

Station #1 followed by station #2 indicates nonattainment of the primary TSP standards.

Pollution roses:

Pollution roses generated for both stations show a continuation of the pattern evolved prior to 1978, largest average TSP levels generally came from directions containing plant activity. Station #1's rose contained information for 1978 only; station #2's rose contained information for 1980 only. Even though the pattern remains essentially the same, 1978 values (station #1) are substantially smaller than those of 1974-1977, and 1980 (station #2) are smaller still.

Standard exceedance roses:

In 1978 (station #1), the great majority of excursions beyond the 24-hour primary standard that involved steady winds involved transport from directions containing plant activities. There was an equally large incidence of primary excursions involving variable winds. A similar pattern is evident regarding excursions beyond 24-hour secondary standards through the contributions from nonplant directions. Out of 83 secondary excursions under steady winds, 65 occurred under conditions that would involve plant emissions.

In 1980 (station #2), there was only one excursion beyond the 24-hour secondary standard (but still below primary); this occurred under variable winds.

FORD MOTOR COMPANY

Dearborn, Michigan

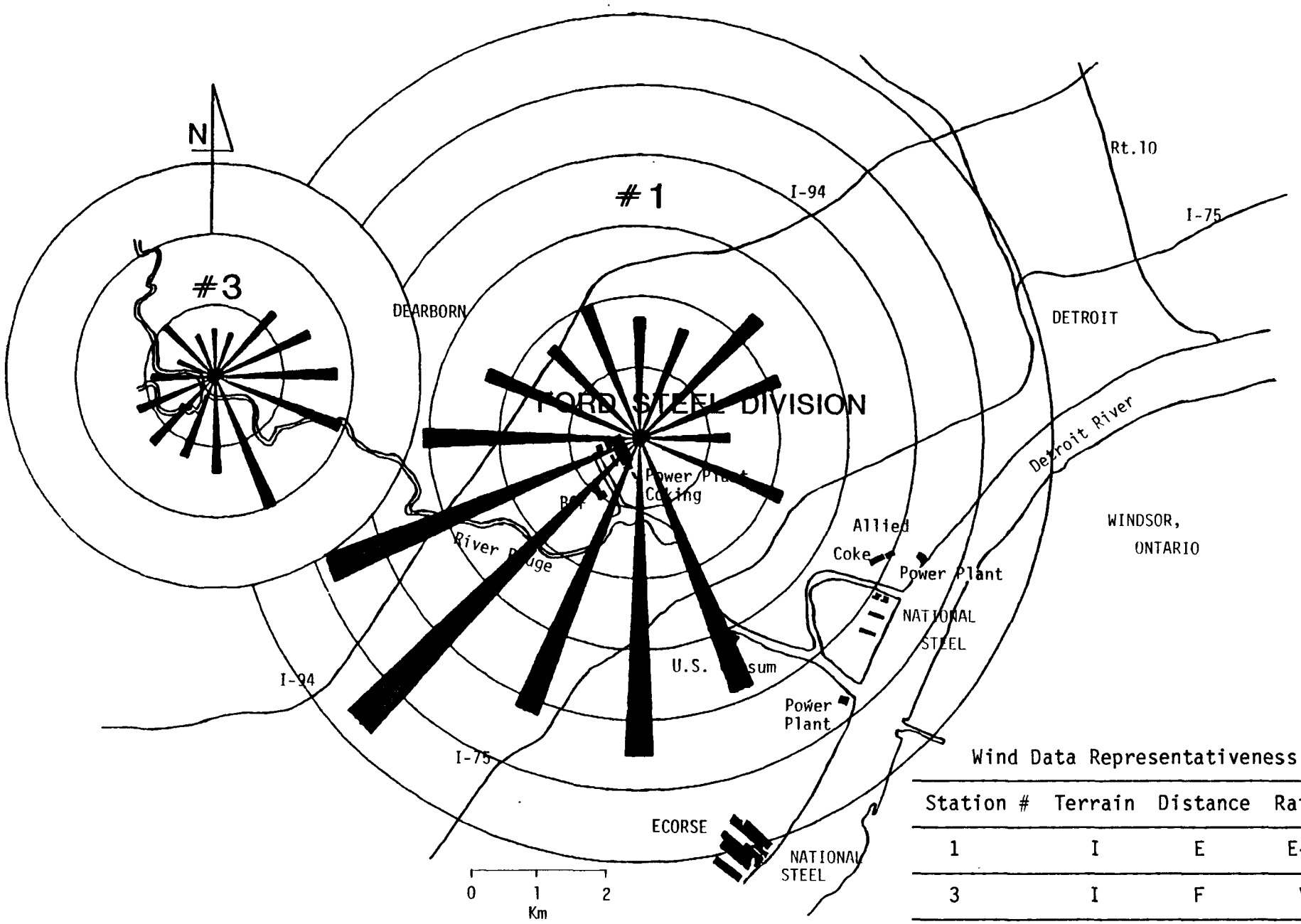
EPA Region V

Hi Vol Monitoring Sites in the Vicinity of Ford Motor Company - Detroit, Michigan

	SAROAD #	Site Name and Address	Plant Location from Site: Bearing	Distance (km)	Elevation: Above Ground (m)	MSL (m)	Plant (m)	Site Description	Nearest Roadway: Name	Direction/Distance (m)		Volume
#1	231140002	Salina School * 2683 Salina Dearborn	Sinter Plant 261° Blast Furn. 256° BOF 228° Coking 203° Power Plant 223°	0.8 km 0.6 km 1.1 km 0.6 km 0.5 km	4	177	0	Trailer top (across railroad tracks from plant)	Lowery	SSE	9	2 lane light
X #2	231140001	City Hall Annex* Michigan & Maple Dearborn	Sinter Plant 140° Blast Furn. 137° BOF 148° Coking 137° Power Plant 137°	2.4 km 2.5 km 2.9 km 3.0 km 2.9 km	12	180	3	Building roof (commercial)	Maple	WSW	20	2 lane moderate
#3	231140003	4901 Evergreen Dearborn	Sinter Plant 99° Blast Furn. 99° BOF 105° Coking 102° Power Plant 101°	6.1 km 6.3 km 6.2 km 6.7 km 6.6 km	4	180	3	Trailer top (in River Rouge Park)	small gravel parking lot	---	10	Very light
X #4	231180015	6601 W. Fort Detroit	Sinter Plant 270° Blast Furn. 270° BOF 263° Coking 265° Power Plant 267°	4.2 km 4.1 km 4.3 km 3.7 km 3.8 km	4	179	2	Trailer top (residential)	Rademacher W. Fort	ENE NNW	9 30	2 lane light 4 lane moderate

* Critical sites

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.



Wind Data Representativeness

Station #	Terrain	Distance	Rating
1	I	E	E-VG
3	I	F	VG

N.B. See Table 5 in Methodology section.

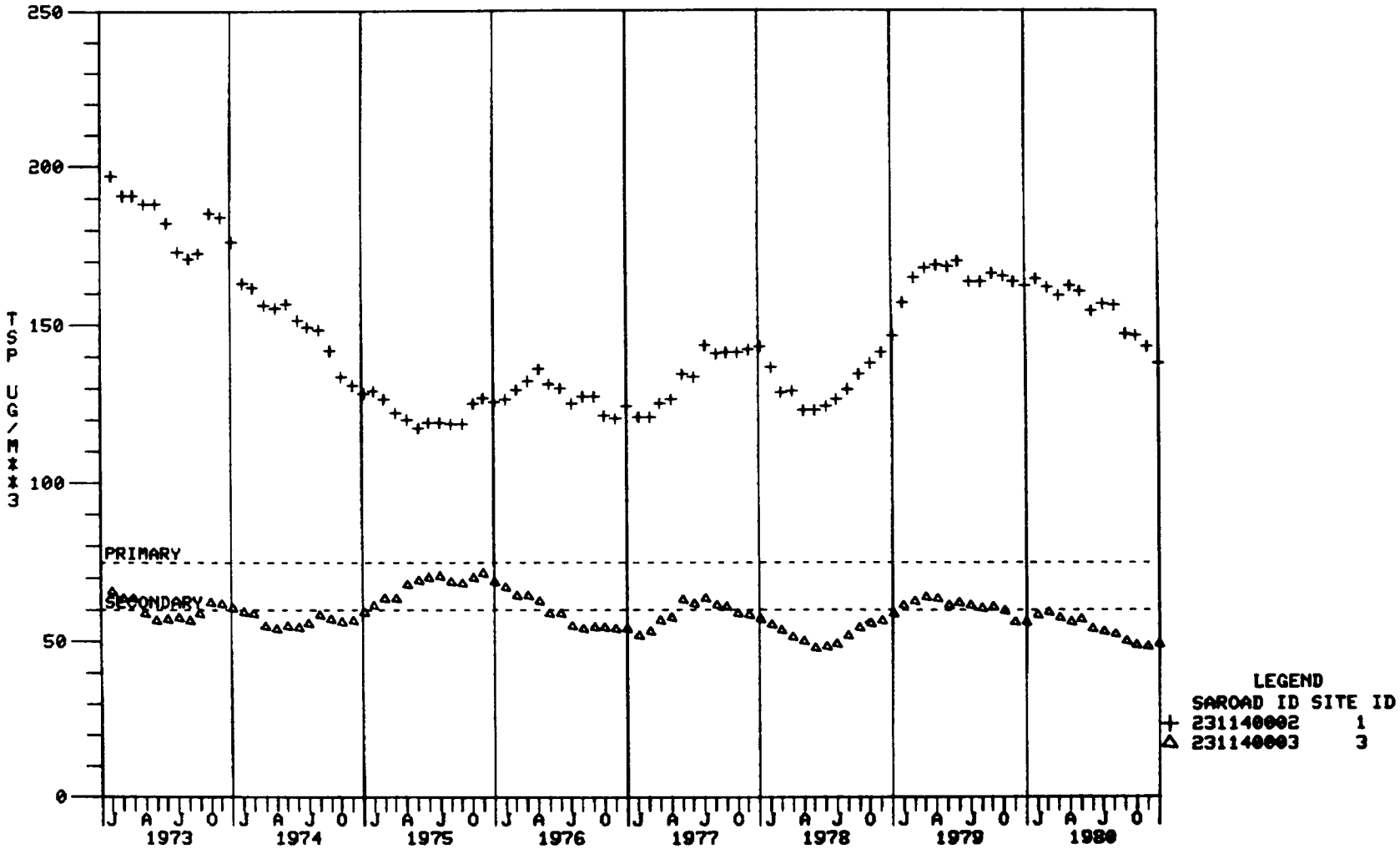
TSP roses for Ford Steel - Dearborn, Michigan, for the period 1978-1980 for cases of $\omega>0.90$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Ford Steel--Dearborn, MI

Wind Direction	Monitoring Site Numbers #1	#3
N	3	3
NNE	5	4
NE	4	4
ENE	1	1
E	2	3
ESE	2	2
SE	0	0
SSE	2	2
S	9	8
SSW	6	6
SW	14	14
WSW	10	11
W	10	11
WNW	6	6
NW	4	4
NNW	1	2
Total	79	81

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR FORD MOTOR CO. - DEARBORN, MI



TSP DATA SUMMARY FOR FORD MOTOR CO. - DEARBORN, MI
SARDAD STATION # 231140002 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	58	51	61	56	60	54	60	55	61
GEOMETRIC MEAN:	188.8	176.0	128.1	125.7	124.2	142.9	146.5	162.2	137.8
GEOMETRIC S.D.:	1.6	1.6	1.6	1.6	1.6	1.6	1.9	1.7	1.6
HIGHEST BY LARSEN EXTRP:	789.7	699.1	473.5	532.7	535.4	594.3	977.2	750.1	523.7
1ST HIGHEST:	1085.0	492.0	321.0	306.0	345.0	323.0	449.0	417.0	279.0
DATE :	720720	730110	740926	751003	760319	770419	780911	791211	801217
2ND HIGHEST:	513.0	400.0	304.0	260.0	325.0	302.0	389.0	407.0	255.0
DATE :	720608	730808	740610	750623	761214	770630	781104	790813	800122
# OF READINGS EXCEEDING 260 :	17	11	2	1	5	4	12	10	1
# OF READINGS EXCEEDING 150 :	40	30	26	22	21	26	32	33	30

RANGE									
0- 65:	0	0	4	6	6	4	9	2	5
66-130:	14	14	24	20	28	18	14	19	20
131-195:	17	14	25	21	10	17	17	12	21
196-260:	14	12	6	8	11	11	8	12	14
261-325:	9	6	2	1	4	4	5	3	1
326-390:	1	3	0	0	1	0	6	5	0
391-455:	1	1	0	0	0	0	1	2	0
>455:	0	1	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR FORD MOTOR CO. - DEARBORN, MI
SAROAD STATION # 231140003 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	52	53	58	48	57	60	58	59	59
GEOMETRIC MEAN:	67.0	60.3	59.2	68.9	53.9	56.9	58.6	55.9	49.2
GEOMETRIC S.D.:	1.6	1.7	1.8	1.7	1.6	1.8	1.7	1.8	1.6
HIGHEST BY LARSEN EXTRP:	261.6	265.6	328.9	319.4	211.6	332.8	275.9	293.7	206.0
1ST HIGHEST:	157.0	178.0	307.0	260.0	165.0	208.0	217.0	174.0	113.0
DATE :	720527	730709	740809	750816	761015	770419	780911	790322	801205
2ND HIGHEST:	155.0	152.0	212.0	179.0	142.0	175.0	156.0	134.0	98.0
DATE :	720912	730925	740815	750430	760605	770531	780526	791018	800110
# OF READINGS EXCEEDING 260 :	0	0	1	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	2	2	3	3	1	4	2	1	0
RANGE									
0- 65:	21	31	33	20	38	35	32	34	40
66-130:	27	18	20	24	16	20	24	22	19
131-195:	4	4	3	3	3	4	1	3	0
196-260:	0	0	1	1	0	1	1	0	0
261-325:	0	0	1	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

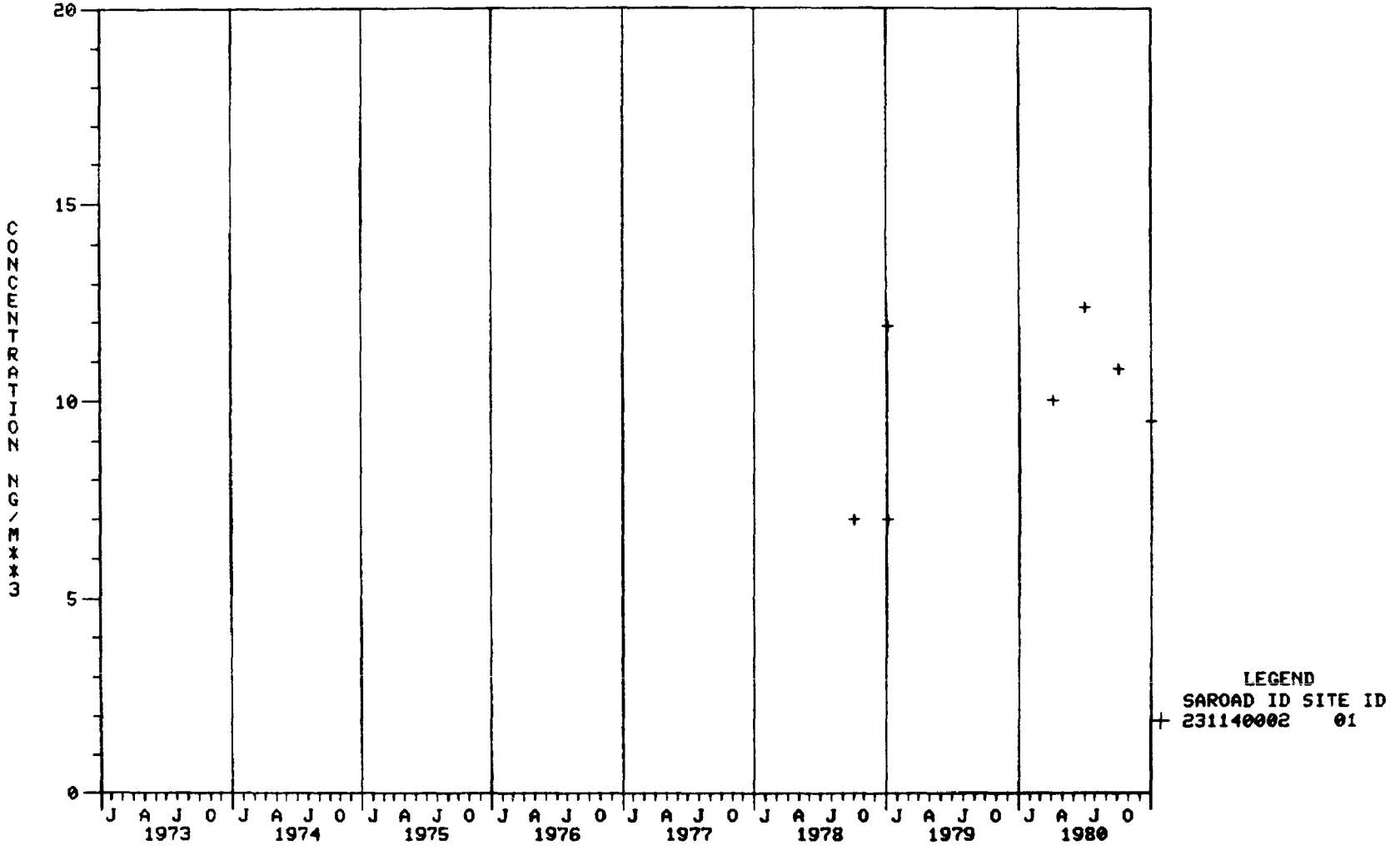
24-HR STANDARD EXCEEDANCE ROSE FOR
FORD MOTOR CO. - DEARBORN, MI
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	231140002		231140003	
SITE ID #	1		3	
DIRECTION	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NNE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ENE COUNT:	0	0	0	1
AVE TSP:	0.	0.	0.	307.
E COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ESE COUNT:	1	0	0	0
AVE TSP:	262.	0.	0.	0.
SE COUNT:	0	1	0	0
AVE TSP:	0.	277.	0.	0.
SSE COUNT:	0	1	0	0
AVE TSP:	0.	351.	0.	0.
S COUNT:	4	3	0	0
AVE TSP:	300.	286.	0.	0.
SSW COUNT:	6	2	0	0
AVE TSP:	355.	291.	0.	0.
SW COUNT:	13	8	0	0
AVE TSP:	422.	308.	0.	0.
WSW COUNT:	9	2	0	0
AVE TSP:	342.	294.	0.	0.
W COUNT:	4	4	0	0
AVE TSP:	309.	330.	0.	0.
WNW COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NW COUNT:	0	1	0	0
AVE TSP:	0.	283.	0.	0.
NNW COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ALL COUNT:	37	22	0	1
AVE TSP:	362.	306.	0.	307.

24-HR STANDARD EXCEEDANCE ROSE FOR
FORD MOTOR CO. - DEARBORN, MI
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	231140002		231140003	
SITE ID #	1		3	
DIRECTION	W>=X	W<X	W>=X	W<X
N COUNT:	1	2	0	0
AVE TSP:	229.	196.	0.	0.
NNE COUNT:	1	0	0	0
AVE TSP:	161.	0.	0.	0.
NE COUNT:	2	2	0	1
AVE TSP:	197.	213.	0.	178.
ENE COUNT:	1	1	0	2
AVE TSP:	218.	190.	0.	284.
E COUNT:	0	6	0	3
AVE TSP:	0.	163.	0.	164.
ESE COUNT:	4	1	2	1
AVE TSP:	200.	215.	166.	166.
SE COUNT:	0	7	0	3
AVE TSP:	0.	198.	0.	162.
SSE COUNT:	2	13	0	2
AVE TSP:	192.	195.	0.	184.
S COUNT:	23	21	0	1
AVE TSP:	225.	204.	0.	176.
SSW COUNT:	18	20	0	0
AVE TSP:	252.	213.	0.	0.
SW COUNT:	30	23	0	1
AVE TSP:	305.	239.	0.	208.
WSW COUNT:	23	16	1	1
AVE TSP:	258.	208.	217.	165.
W COUNT:	11	17	0	0
AVE TSP:	235.	228.	0.	0.
WNW COUNT:	4	6	0	0
AVE TSP:	196.	205.	0.	0.
NW COUNT:	1	4	0	0
AVE TSP:	205.	209.	0.	0.
NNW COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ALL COUNT:	121	139	3	15
AVE TSP:	253.	212.	183.	187.

BAP QUARTERLY COMPOSITE (NG/M**3) FOR FORD MOTOR CO. - DEARBORN, MI



UPDATED AIR QUALITY EVALUATION - FORD MOTOR COMPANY, DEARBORN, MICHIGAN

Stations used in update:

Continued operation:	#1, #3
New stations:	None
Discontinued stations:	None

Trends in geometric means:

Recent graphs of the running 12-month geometric means for stations #1 and #3 are in phase to remarkable detail, with values for station #1 substantially above those for station #3. A brief decline in early 1978 is followed by an uptrend that peaks in early 1979. Values decline from this peak through the end of 1980. There is no overall trend (1978-1980) for station #1 (Spearman correlation coefficient of -0.02). The overall trend for station #2 (Spearman correlation coefficient of -0.34) is more apparent and negative.

Attainment status:

Station #1 was not in attainment of primary standards for the period 1978-1980. Station #3 was not in attainment of primary standards for 1978 and 1979; this station was in attainment in 1980.

Pollution roses:

Recent pollution roses developed for stations #1 and #3 continue the earlier pattern showing impact of plant emissions. Large contributions from the north are no longer evident.

Standard exceedance roses:

All excursions beyond primary 24-hour standards under persistent winds at station #1 occurred under conditions that would transport plant emissions to the hi-vol. The only excursion beyond the 24-hour primary standard at station #3 occurred under variable winds.

BaP:

BaP was sampled at station #1 from 1978 through 1980. No values were reported for 1979. Quarterly composite concentrations were moderately high, ranging between 5 and 12 ng/m^3.

INLAND STEEL

East Chicago, Indiana

EPA Region V

Hi-Vol Monitoring Sites in the Vicinity of Inland Steel, East Chicago, IN

		SAROAD #	Name and Address	Bearing	Distance (Km)	Meters Above Ground	MSL (M)	Meters Above Plant	Site Description	Nearest Road Name	Nearest Road Direction	Nearest Road Distance (Meters)	Volume
	#1	151180001	Central Fire Station 400 E. Columbus Dr.	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant, and BOF #2		10	180	0	Building roof	E. Columbus Dr.	S	30	2-lane, heavy
				44°	3.4								
				C Battery and A and B Blast Furnace									
				42°	2.5								
				Coke Oven 11 and BOF #4									
				42°	5.5								
X	#2	151180003	Marktown Broad and Pine, Marktown	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant, and BOF #2		4	180	0	Building roof	Broad St. Pine Ave.	E SE	12 12	2-lane, moderate 2-lane, moderate
				84°	2.4								
				C Battery and A and B Blast Furnace									
				102°	1.7								
				Coke Over 11 and BOF #4									
				62°	4.0								
	#3	151180004	Field School * Block and James	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant, and BOF #2		9	180	0	Building roof	Block Ave.	SW	76	2-lane, moderate
				0°	1.5								
				C Battery and A and B Blast Furnace									
				310°	1.2								
				Coke Oven 11 and BOF #4									
				18°	3.0								

* Critical Site

(Continued)

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi-Vol Monitoring Sites in the Vicinity of Inland Steel, East Chicago, IN (Continued)

	SAROAD #	Name and Address	Bearing	Distance (Km)	Meters Above Ground	MSL (M)	Meters Above Plant	Site Description	Nearest Road Name	Nearest Road Direction	Nearest Road Distance (M)	Nearest Road Volume
#4	151180006	Franklin School * Alder and 142nd	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		9	180	0	Building roof	Franklin St.	W	24	2-lane, moderate
			355°	2.9								
			C Battery and A and B Blast Furnace									
			340°	2.5								
			Coke Oven 11 and BOF #4									
			13°	4.5								
X #5	151180007	Roxanna Roxanna and Walsh	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		4	180	0	Building roof	Roxanna Dr.	S	15	2-lane, moderate
			38°	6.5								
			C Battery and A and B Blast Furnace									
			38°	5.5								
			Coke Oven 11 and BOF #4									
			38°	8.5								
X #6	151780001	Goldblotts 5206 Hohman	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		15	180	0	Building roof	Hohman Ave.	E	15	2-lane, heavy
			56°	7.0								
			C Battery and A and B Blast Furnace									
			56°	8.0								
			Coke Oven 11 and BOF #4									
			54°	10.0								

* Critical Site

(Continued)

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi-Vol Monitoring Sites in the Vicinity of Inland Steel, East Chicago, IN (Continued)

	SAROAD #	Name and Address	Bearing	Distance (Km)	Meters Above Ground	MSL (M)	Meters Above Plant	Site Description	Nearest Road Name	Nearest Road Direction	Nearest Road Distance (M)	Nearest Road Volume
X #7	151780002	City Hall 5935 Calumet Ave.	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		11	181	2	Building roof	Calumet Ave.	W	24	4-lane, heavy
			44°	8.3								
			C Battery and A and B Blast Furnace									
			40°	7.4								
			Coke Oven 11 and BOF #4									
			40°	10.5								
X #8	151780004	Purdue 2233 171st St.	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		9	184	5	Building roof	Woodmar Ave. 171st St.	W S	76 46	2-lane, moderate 2-lane, moderate
			18°	8.9								
			C Battery and A and B Blast Furnace									
			16°	8.1								
			Coke Oven 11 and BOF #4									
			22°	10.6								
X #9	151780005	Police and Fire Station 2211 Calumet Ave.	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		5	180	0	Building roof	Calumet Ave.	W	15	4-lane, heavy
			109°	5.7								
			C Battery and A and B Blast Furnace									
			116°	5.4								
			Coke Oven 11 and BOF #4									
			90°	6.7								

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi-Vol Monitoring Sites in the Vicinity of Inland Steel, East Chicago, IN (Concluded)

	SAROAD #	Name and Address	Bearing	Distance (Km)	Meters Above Ground	MSL (M)	Meters Above Plant	Site Description	Nearest Road Name	Nearest Road Direction	Nearest Road Distance (M)	Nearest Road Volume
X #10	151780006	Hessville Fire Station 3323 165th	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		5	181	2	Building roof	165th St.	S	30	2-lane, moderate
			3°	7.2								
			C Battery and A and B Blast Furnace									
			358°	6.7								
			Coke Oven 11 and BOF #4									
			10°	9.0								
X #11	151780007	GSA Building 3200 Sheffield	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		3	180	0	Building roof	Paved road	E	12	2-lane, light
			80°	6.0								
			C Battery and A and B Blast Furnace									
			86°	5.4								
			Coke Oven 11 and BOF #4									
			70°	7.8								
X #12	151780008	1300 141st St. 1300 141st St.	Coke Ovens 6-10, Blast Furnaces 1-6, Sintering Plant and BOF #2		5	178	-2	Building roof	141st St.	N	15	2-lane, moderate
			65°	5.5								
			C Battery and A and B Blast Furnace									
			68°	4.6								
			Coke Oven 11 and BOF #4									
			58°	7.4								

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi-Vol Monitoring Sites - Inland Steel, East Chicago, IN

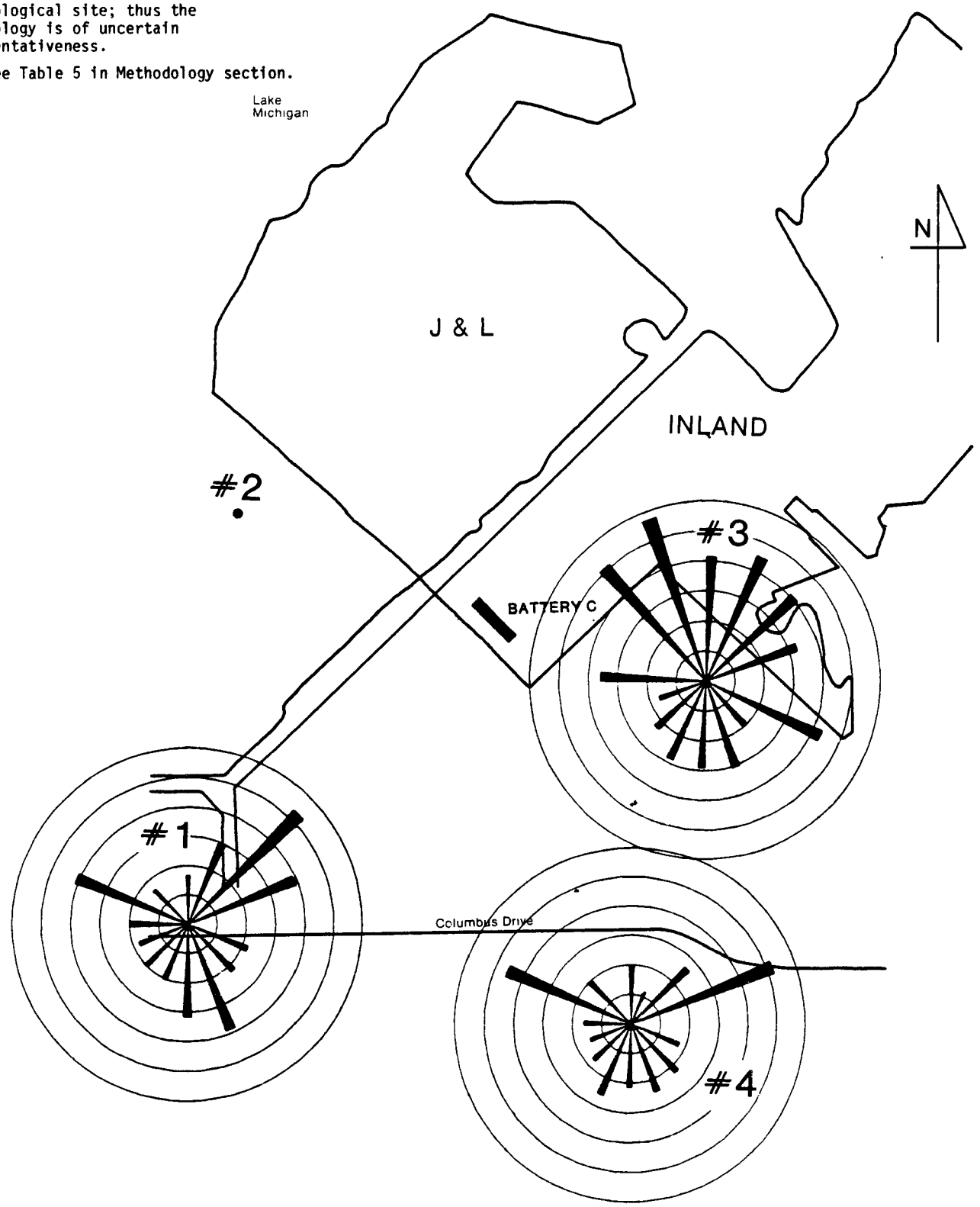
	SAROAD #	Name and Address	Bearing	Distance (Km)	Meters Above Ground	MSL (M)	Meters Above Plant	Site Description	Nearest Road Name	Nearest Road Direction	Nearest Road Distance (Meters)	Volume
#13	13000	Park Maintenance Building Markstown	64°	1.8	4.5	180	0	Rooftop Residential	Pine Ave.	E	17	
#14	14000	Mill Gate Inn	Coking Plant #2 255°	.92	4.3	179	-1	Scaffold	Dickey Rd.	NE	14	
#15	15000	Wayne Adams Buick Dealer Car Wash	Battery C 145°	.3	5.2	Unknown	Unknown	Rooftop	Watling St.	SE	65	
#16	16000	Field Elementary School	Plant #2 355°	1.18	9.0	180	0	Rooftop	Block James	SW Unknown	76 Unknown	

Wind Data Representativeness

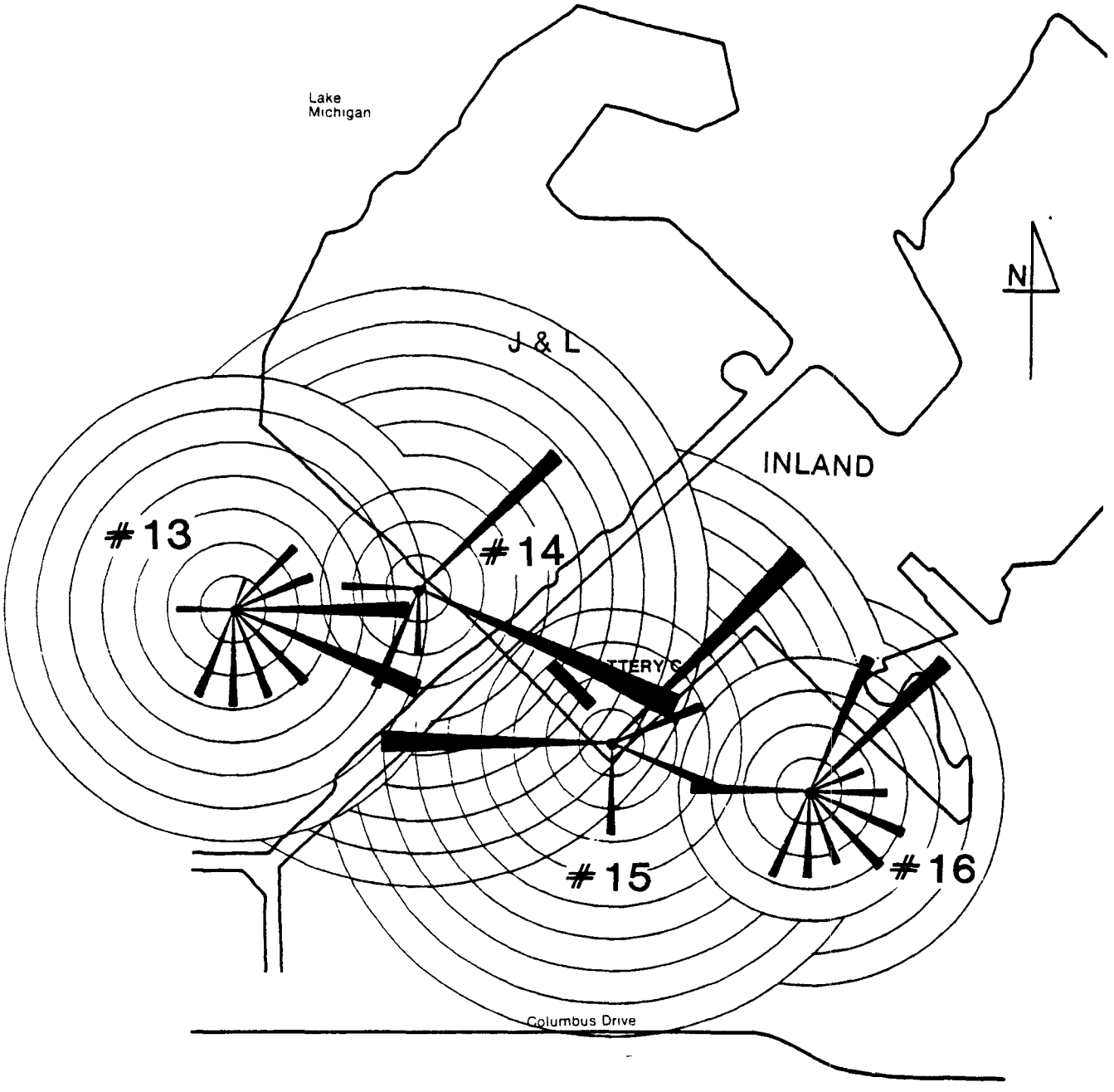
Station #	Terrain	Distance	Rating
1, 3, 4, 13 14, 15, 16	VI	G	U

Comment: Monitor sites are less subject to lake breeze than the meteorological site; thus the meteorology is of uncertain representativeness.

N.B. See Table 5 in Methodology section.



TSP roses for Inland Steel - East Chicago, Indiana, for the period 1978-1980 for cases of $\omega>0.90$. Each circle represents 50 $\mu g/m^3$.



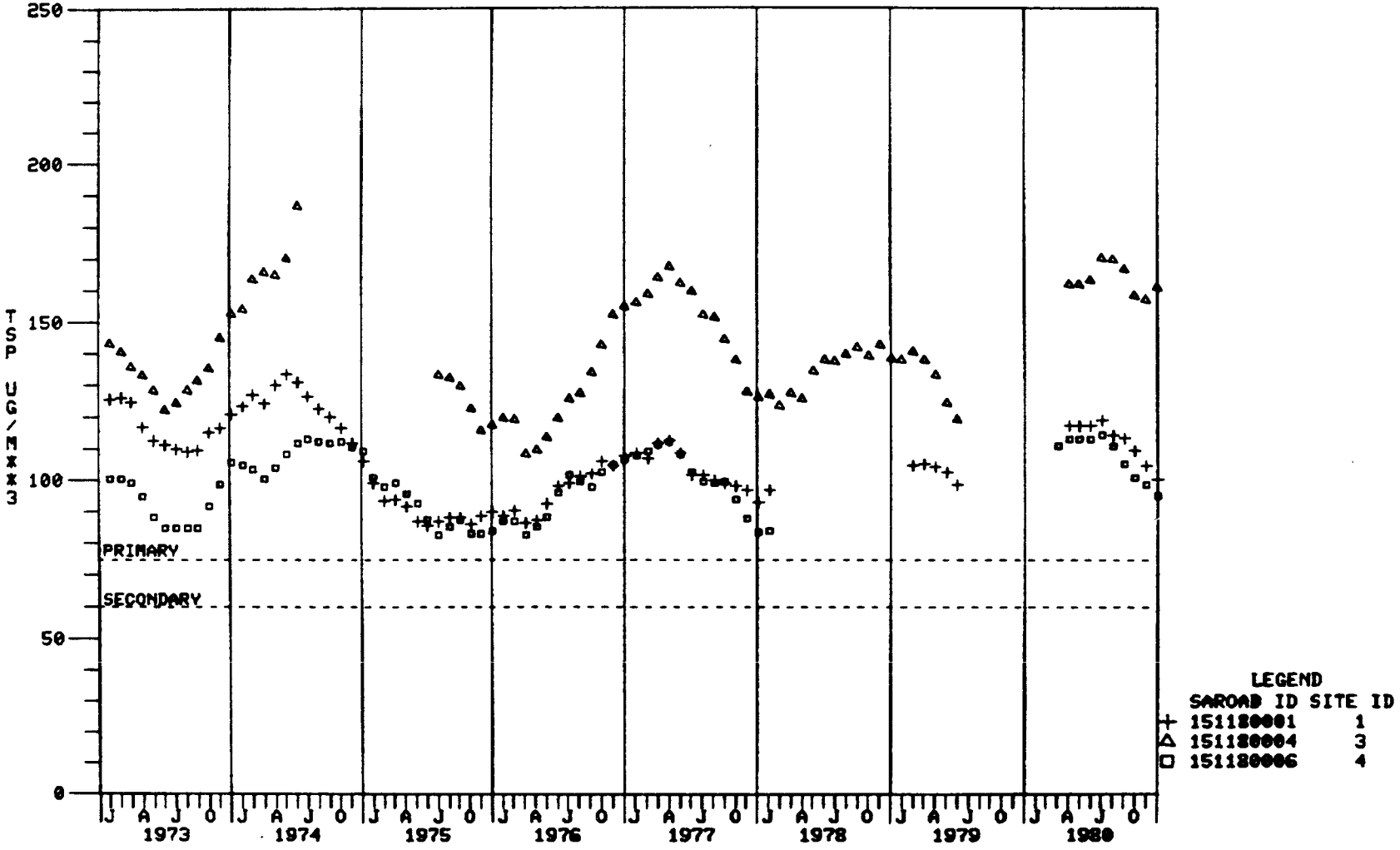
TSP roses for Inland Steel - East Chicago, Indiana, for the period 1978-1980 for cases of $\omega > 0.85$. Special Study Sites. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Inland Steel--East Chicago

Wind Direction	Monitoring Site Numbers #1	#3	#4	#13	#14	#15	#16
N	6	5	4	0	0	0	0
NNE	1	3	1	1	0	0	0
NE	1	6	1	4	3	4	4
ENE	2	3	1	1	0	1	1
E	0	0	0	1	0	0	1
ESE	2	3	2	1	1	1	1
SE	2	1	1	2	0	0	2
SSE	2	3	3	2	0	0	2
S	16	14	16	2	1	2	2
SSW	6	8	7	1	1	0	1
SW	6	7	7	0	0	0	0
WSW	3	2	1	0	0	0	0
W	4	8	4	1	1	1	1
WNW	1	0	1	0	0	0	0
NW	2	4	2	0	0	0	0
NNW	0	1	0	0	0	0	0
Total	54	68	51	16	7	9	16

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR INLAND STEEL CO, - EAST CHICAGO, IN



TSP DATA SUMMARY FOR INLAND STEEL CO, - EAST CHICAGO, IN
SAROAD STATION # 151180001 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	61	53	61	52	55	47	33	37	46
GEOMETRIC MEAN:	119.6	120.9	106.0	90.2	107.7	93.2	******	******	100.4
GEOMETRIC S.D.:	1.7	1.4	1.6	1.5	1.6	1.5	******	******	1.8
HIGHEST BY LARSEN EXTRP:	525.8	353.9	424.5	271.8	395.2	289.7	******	******	540.3
1ST HIGHEST:	415.0	313.0	313.0	210.0	240.0	191.0	223.0	290.0	376.0
DATE :	720521	731212	740529	750506	761015	771028	780619	791223	800110
2ND HIGHEST:	344.0	231.0	269.0	194.0	220.0	172.0	212.0	229.0	265.0
DATE :	720831	731019	740228	750319	760605	770419	780830	790912	800328
# OF READINGS EXCEEDING 260 :	6	1	2	0	0	0	0	1	2
# OF READINGS EXCEEDING 150 :	18	16	12	4	14	3	6	11	12
RANGE									
0- 65:	7	3	11	11	9	10	1	5	10
66-130:	27	26	27	34	28	29	22	17	20
131-195:	14	19	18	6	14	8	7	8	11
196-260:	7	4	3	1	4	0	3	5	3
261-325:	4	1	2	0	0	0	0	1	1
326-390:	1	0	0	0	0	0	0	0	1
391-455:	1	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INLAND STEEL CO, - EAST CHICAGO, IN
SAROAD STATION # 151180004 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	60	58	29	58	54	48	56	36	80
GEOMETRIC MEAN:	142.2	152.7	******	117.4	155.0	126.0	138.1	******	160.7
GEOMETRIC S.D.:	1.8	1.6	******	1.8	1.6	1.5	1.7	******	1.5
HIGHEST BY LARSEN EXTRP:	805.2	564.9	******	612.1	589.8	407.0	628.8	******	626.0
1ST HIGHEST:	478.0	430.0	463.0	701.0	432.0	301.0	372.0	335.0	398.0
DATE :	720515	730128	740628	750319	761015	770425	780520	790318	800421
2ND HIGHEST:	411.0	354.0	451.0	330.0	420.0	275.0	286.0	287.0	374.0
DATE :	720509	730814	740517	750307	760524	770413	780426	790310	800110
# OF READINGS EXCEEDING 260 :	8	5	10	4	7	2	7	3	11
# OF READINGS EXCEEDING 150 :	27	29	21	17	28	16	26	18	45
RANGE									
0- 65:	7	2	0	9	2	3	3	4	4
66-130:	15	19	8	25	16	22	22	10	15
131-195:	20	19	8	14	22	17	17	11	34
196-260:	10	13	3	6	7	4	7	8	15
261-325:	3	3	5	2	4	2	6	2	5
326-390:	3	1	3	1	1	0	1	1	4
391-455:	1	1	1	0	2	0	0	0	1
>455:	1	0	1	1	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INLAND STEEL CO. - EAST CHICAGO, IN
SAROAD STATION # 151180006 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	59	57	59	53	57	45	37	33	44
GEOMETRIC MEAN:	98.2	105.5	109.2	83.9	106.5	83.3	******	******	95.4
GEOMETRIC S.D.:	1.9	1.5	1.6	1.6	1.6	1.5	******	******	1.6
HIGHEST BY LARSEN EXTRP:	698.9	368.5	408.6	321.8	416.7	256.3	******	******	354.6
1ST HIGHEST:	365.0	386.0	254.0	195.0	295.0	214.0	236.0	240.0	260.0
DATE :	720427	730110	740517	750512	760611	770413	780619	791229	800221
2ND HIGHEST:	353.0	308.0	250.0	173.0	271.0	153.0	215.0	235.0	180.0
DATE :	720521	730609	740628	750822	760406	770425	780905	790825	800720
# OF READINGS EXCEEDING 260 :	6	3	0	0	3	0	0	0	0
# OF READINGS EXCEEDING 150 :	17	7	14	5	11	2	7	9	5
RANGE									
0- 65:	18	7	7	17	9	11	8	4	8
66-130:	19	38	30	27	31	30	18	16	25
131-195:	13	8	18	9	9	3	7	9	10
196-260:	3	1	4	0	5	1	4	4	1
261-325:	4	2	0	0	3	0	0	0	0
326-390:	2	1	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INLAND STEEL CO. - EAST CHICAGO, IN
SAROAD STATION # 13000 SITE ID # 13
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	43
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	384.0
DATE :	******	******	******	******	******	******	******	******	800709
2ND HIGHEST:	******	******	******	******	******	******	******	******	309.0
DATE :	******	******	******	******	******	******	******	******	800524
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	6
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	23
RANGE									
0- 65:	0	0	0	0	0	0	0	0	2
66-130:	0	0	0	0	0	0	0	0	9
131-195:	0	0	0	0	0	0	0	0	23
196-260:	0	0	0	0	0	0	0	0	3
261-325:	0	0	0	0	0	0	0	0	5
326-390:	0	0	0	0	0	0	0	0	1
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INLAND STEEL CO. - EAST CHICAGO, IN
SAROAD STATION # 14000 SITE ID # 14
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	23
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	577.0
DATE :	******	******	******	******	******	******	******	******	800625
2ND HIGHEST:	******	******	******	******	******	******	******	******	436.0
DATE :	******	******	******	******	******	******	******	******	800624
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	5
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	18
RANGE									
0- 65:	0	0	0	0	0	0	0	0	0
66-130:	0	0	0	0	0	0	0	0	2
131-195:	0	0	0	0	0	0	0	0	5
196-260:	0	0	0	0	0	0	0	0	9
261-325:	0	0	0	0	0	0	0	0	1
326-390:	0	0	0	0	0	0	0	0	3
391-455:	0	0	0	0	0	0	0	0	1
>455:	0	0	0	0	0	0	0	0	1

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INLAND STEEL CO. - EAST CHICAGO, IN
SAROAD STATION # 15000 SITE ID # 15
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	34
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	733.0
DATE :	******	******	******	******	******	******	******	******	800715
2ND HIGHEST:	******	******	******	******	******	******	******	******	512.0
DATE :	******	******	******	******	******	******	******	******	800702
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	17
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	28
RANGE									
0- 65:	0	0	0	0	0	0	0	0	0
66-130:	0	0	0	0	0	0	0	0	3
131-195:	0	0	0	0	0	0	0	0	8
196-260:	0	0	0	0	0	0	0	0	6
261-325:	0	0	0	0	0	0	0	0	7
326-390:	0	0	0	0	0	0	0	0	4
391-455:	0	0	0	0	0	0	0	0	1
>455:	0	0	0	0	0	0	0	0	5

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INLAND STEEL CO. - EAST CHICAGO, IN
SARDAD STATION # 16000 SITE ID # 16
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	44
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	371.0
DATE :	******	******	******	******	******	******	******	******	800716
2ND HIGHEST:	******	******	******	******	******	******	******	******	346.0
DATE :	******	******	******	******	******	******	******	******	800627
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	5
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	25
RANGE									
0- 65:	0	0	0	0	0	0	0	0	0
66-130:	0	0	0	0	0	0	0	0	8
131-195:	0	0	0	0	0	0	0	0	20
196-260:	0	0	0	0	0	0	0	0	11
261-325:	0	0	0	0	0	0	0	0	2
326-390:	0	0	0	0	0	0	0	0	3
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
INLAND STEEL CO. - EAST CHICAGO, IN
(All Cases > 260 μg/m^3 for 1972-1980)
x=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	151180001		151180004		151180006		13000		14000		15000	
SITE ID #	1		3		4		13		14		15	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	5	1	1	0	0	0	0	0	0	0
AVE TSP:	0.	0.	341.	330.	269.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	4	5	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	342.	287.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	1	1	3	5	1	1	0	0	1	1	2	2
AVE TSP:	265.	313.	311.	290.	300.	271.	0.	0.	309.	337.	589.	392.
ENE COUNT:	0	0	1	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	264.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	1	0	0	0	2	0	1	0	0
AVE TSP:	0.	0.	0.	463.	0.	0.	0.	327.	0.	384.	0.	0.
ESE COUNT:	0	1	0	1	0	1	1	1	1	1	0	1
AVE TSP:	0.	313.	0.	314.	0.	308.	309.	298.	436.	577.	0.	284.
SE COUNT:	0	0	0	1	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	271.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	312.
S COUNT:	2	0	1	2	0	0	0	0	0	0	0	2
AVE TSP:	333.	0.	374.	385.	0.	0.	0.	0.	0.	0.	0.	569.
SSW COUNT:	0	0	0	0	0	0	0	1	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	279.	0.	0.	0.	301.
SW COUNT:	0	0	0	0	1	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	386.	0.	0.	0.	0.	0.	0.	283.
WSW COUNT:	0	1	1	3	0	1	0	0	0	0	0	3
AVE TSP:	0.	269.	305.	301.	0.	295.	0.	0.	0.	0.	0.	318.
W COUNT:	0	0	1	4	0	0	0	0	0	0	0	2
AVE TSP:	0.	0.	287.	328.	0.	0.	0.	0.	0.	0.	0.	316.
WNW COUNT:	0	0	0	1	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	432.	0.	0.	0.	0.	0.	0.	0.	598.
NW COUNT:	0	0	3	4	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	277.	409.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	1	1	0	0	0	1	0	1	0	1
AVE TSP:	0.	0.	286.	342.	0.	0.	0.	265.	0.	352.	0.	341.
ALL COUNT:	3	3	20	29	3	3	1	5	2	4	2	15
AVE TSP:	310.	298.	318.	333.	318.	291.	309.	299.	373.	413.	589.	375.

24-HR STANDARD EXCEEDANCE ROSE FOR
INLAND STEEL CO. - EAST CHICAGO, IN
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD # 16000
SITE ID # 16

DIRECTION		W>=X	W<X
N	COUNT:	0	0
	AVE TSP:	0.	0.
NNE	COUNT:	0	1
	AVE TSP:	0.	281.
NE	COUNT:	2	1
	AVE TSP:	328.	335.
ENE	COUNT:	0	0
	AVE TSP:	0.	0.
E	COUNT:	0	0
	AVE TSP:	0.	0.
ESE	COUNT:	0	0
	AVE TSP:	0.	0.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	0	0
	AVE TSP:	0.	0.
S	COUNT:	0	1
	AVE TSP:	0.	371.
SSW	COUNT:	0	0
	AVE TSP:	0.	0.
SW	COUNT:	0	0
	AVE TSP:	0.	0.
WSW	COUNT:	0	0
	AVE TSP:	0.	0.
W	COUNT:	0	0
	AVE TSP:	0.	0.
WNW	COUNT:	0	0
	AVE TSP:	0.	0.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	2	3
	AVE TSP:	328.	329.

24-HR STANDARD EXCEEDANCE ROSE FOR
INLAND STEEL CO. - EAST CHICAGO, IN
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	151180001		151180004		151180006		13000		14000		15000	
SITE ID #	1		3		4		13		14		15	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	2	1	9	5	4	2	0	0	0	0	0	1
AVE TSP:	170.	193.	274.	220.	215.	199.	0.	0.	0.	0.	0.	254.
NNE COUNT:	4	1	10	9	2	3	0	0	0	1	0	0
AVE TSP:	193.	164.	251.	245.	211.	164.	0.	0.	0.	210.	0.	0.
NE COUNT:	2	7	6	9	1	6	1	0	2	2	3	3
AVE TSP:	228.	192.	256.	258.	300.	207.	193.	0.	266.	268.	443.	324.
ENE COUNT:	4	3	2	6	3	3	0	1	0	0	0	1
AVE TSP:	191.	170.	230.	190.	217.	157.	0.	174.	0.	0.	0.	206.
E COUNT:	0	2	0	6	0	4	0	3	0	2	0	0
AVE TSP:	0.	179.	0.	258.	0.	210.	0.	276.	0.	298.	0.	0.
ESE COUNT:	0	1	4	3	0	2	1	1	1	1	1	1
AVE TSP:	0.	313.	205.	268.	0.	272.	309.	298.	436.	577.	176.	284.
SE COUNT:	1	2	2	2	0	1	0	1	0	0	0	0
AVE TSP:	183.	200.	240.	234.	0.	166.	0.	168.	0.	0.	0.	0.
SSE COUNT:	4	1	1	1	2	2	1	2	0	2	0	2
AVE TSP:	196.	152.	233.	202.	197.	189.	154.	207.	0.	252.	0.	270.
S COUNT:	9	3	7	8	3	2	1	4	0	2	1	3
AVE TSP:	220.	193.	224.	247.	176.	208.	192.	187.	0.	223.	163.	451.
SSW COUNT:	4	1	9	6	2	2	0	1	0	1	0	2
AVE TSP:	180.	194.	174.	174.	213.	203.	0.	279.	0.	161.	0.	238.
SW COUNT:	1	5	5	6	2	0	0	2	0	1	0	2
AVE TSP:	158.	186.	171.	197.	275.	0.	0.	171.	0.	170.	0.	253.
WSW COUNT:	3	5	5	10	2	2	0	1	0	1	0	3
AVE TSP:	185.	196.	211.	233.	183.	225.	0.	164.	0.	174.	0.	318.
W COUNT:	1	3	9	12	0	2	0	1	0	1	0	2
AVE TSP:	159.	162.	212.	239.	0.	191.	0.	180.	0.	230.	0.	316.
WNW COUNT:	1	1	5	8	1	2	0	0	0	0	0	1
AVE TSP:	204.	240.	203.	222.	228.	232.	0.	0.	0.	0.	0.	598.
NW COUNT:	0	4	6	13	0	3	0	0	0	0	0	0
AVE TSP:	0.	181.	248.	254.	0.	158.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	2	2	15	1	1	0	2	0	1	0	2
AVE TSP:	0.	209.	220.	202.	177.	177.	0.	249.	0.	352.	0.	278.
ALL COUNT:	36	42	82	119	23	37	4	19	3	15	5	23
AVE TSP:	196.	190.	224.	229.	213.	197.	212.	215.	323.	264.	334.	319.

24-HR STANDARD EXCEEDANCE ROSE FOR
INLAND STEEL CO. - EAST CHICAGO, IN
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD # 16000
SITE ID # 16

DIRECTION		W>=X	W<X
N	COUNT:	0	1
	AVE TSP:	0.	175.
NNE	COUNT:	1	1
	AVE TSP:	218.	281.
NE	COUNT:	2	3
	AVE TSP:	328.	261.
ENE	COUNT:	0	1
	AVE TSP:	0.	184.
E	COUNT:	0	2
	AVE TSP:	0.	209.
ESE	COUNT:	1	1
	AVE TSP:	156.	256.
SE	COUNT:	0	1
	AVE TSP:	0.	197.
SSE	COUNT:	0	1
	AVE TSP:	0.	202.
S	COUNT:	1	1
	AVE TSP:	163.	371.
SSW	COUNT:	0	2
	AVE TSP:	0.	184.
SW	COUNT:	0	1
	AVE TSP:	0.	176.
WSW	COUNT:	0	2
	AVE TSP:	0.	208.
W	COUNT:	0	2
	AVE TSP:	0.	212.
WNW	COUNT:	0	1
	AVE TSP:	0.	248.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	5	20
	AVE TSP:	239.	225.

UPDATED AIR QUALITY EVALUATION - INLAND STEEL, EAST CHICAGO, INDIANA

Stations used in update:

Continued operation:	#1, #3, #4
New stations:	#13,* #14,* #15,* #16* (all 1980)
Discontinued stations:	#13, #14, #15, #16 (all 1980)

Trends in geometric means:

Where concurrent records are available, the recent graphs of the running 12-month geometric means for stations #1, #3, and #4 continue to exhibit similar long-term fluctuations. Stations #1 and #4 (where concurrent) display nearly identical values; station #3 consistently displays much higher values. The Spearman correlation coefficients for these three records range from slightly negative to slightly positive (-0.31 to +0.24).

Station #13, #14, #15, and #16 were special study sites that were not in service sufficiently long to generate suitable graphs.

Attainment status:

Stations #1, #3, and #4 were not in attainment of primary TSP standards for the period. All four special study sites indicated nonattainment of the 24-hour primary standard.

Pollution roses:

Pollution roses for stations #1 and #3 offer recognizable impacts from plant emissions. The pollution rose for station #4 does not indicate as strong an impact. All three of these stations must rely upon relatively infrequent wind sectors to differentiate impacts.

Pollution roses for stations #13, #14, #15, and #16 were constructed from less than a year's worth of data, but indicate substantial impacts. The roses for these four stations allow more reasonable separation between Inland and J&L impacts.

Standard exceedance roses:

For station #3, 17 of the 20 excursions beyond the 24-hour primary standard that occurred under steady winds involved wind directions that contained the Inland facility alone or the Inland facility plus the J&L facility. Stations #1 and #4 rarely suffered primary excursions that would involve steady transport of emissions from either or both of these facilities.

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* Special study sites.

Stations #13, #14, 15, and #16 were in operation only a short time, but all 24-hour primary excursions under steady winds involved directions that contained at least one of the facilities.

BaP:

As part of the special study conducted by EPA Region V, BaP was measured at stations #13, #14, #15, and #16 for 5 days in July 1979. The results were divided into "downwind," "with wind," and "background" categories. Downwind days were defined as having the 24-hour average wind direction within ± 10° of the station orientation from the plant. With wind days had four or more hours within ± 10°, while background days had winds away from the station for the entire day. The results are summarized below:

	Downwind Station	With Wind Station	Background Station
Range (ng/m^3)	1.0-13.1	0.4-2.7	0.1-1.6
Geometric mean	4.4	1.4	0.3

INTERLAKE STEEL

Chicago, Illinois

EPA Region V

Hi-Vol Sites in the Vicinity of InterLake Steel - Chicago, Illinois

	SAROAD #	Site Name and Address	Plant Location from Site: Bearing	Distance (km)	Elevation (m): Above Ground	MSL	Plant	Site Description	Nearest Roadway: Name	Direction/Distance (m)		Volume
#1	141220010	Fenger High School *	Blast Furn	091° 7.5	15	187	9	Roof mount	112th Street	N	60	Moderate
		11220 S. Wallace Avenue	Coke	091° 6.5					113th Street	S	60	Moderate
			BOF	163° 3.8					Wallace Street	E	30	Moderate
#2	141220018	Carver High School *	Blast Furn	042° 5.7	15	179	1	Roof mount	paved road	W	60	Light
		801 E 133rd Street	Coke	035° 5.3								
			BOF	269° 3.1								
#3	141220022	Washington High School *	Blast Furn	320° 1.5	9	178	0	Roof mount	114th Street	N	60	Moderate
		3500 E. 114th Street	Coke	275° 2.0					S. Avenue O	W	60	Heavy
			BOF	243° 8.2								
#4	141220031	Addams Elementary	Blast Furn	263° 1.5	10	178	0	Roof mount	108th Street	N	45	Heavy
		10810 S. Avenue H	Coke	242° 2.5					S. Avenue H	W	30	Moderate
			BOF	238° 9.1								
X #5	151780005	Police & Fire Station	Blast Furn	303° 4.0	5	178	0	Roof mount	Calumet Avenue	W	15	Heavy
		2211 Calumet Avenue	Coke	288° 4.6								
			BOF	255° 10.2								
X #6	141220016	Calumet High School	Blast Furn	123° 10.3	15	183	5	Roof mount	May Avenue	W	30	Moderate
		8131 S. May Avenue	Coke	130° 10.0								
			BOF	163° 10.2								
X #7	151780001	Goldblotts	Blast Furn	345° 8.7	18	180	2	Roof mount	Hohman Avenue	E	15	Heavy
		5206 Hohman Avenue	Coke	338° 8.5								
			BOF	295° 9.7								

* Critical Monitors

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Hi-Vol Sites in the Vicinity of Wisconsin Steel, Chicago, Illinois

	SAROAD #	Site Name and Address	Plant Location from Site		Elevation (m)			Site Description	Nearest Roadway			
			Bearing	Distance	Above Ground	MSL	Plant		Name	Direction/Distance (m)		Volume
#10	141220030	Anthony Elementary* 9800 Torrence Avenue	170°	1.8 km	5	178	-1	Roof mount	Torrence Avenue	E	15	Heavy
#4	141220031	Addams Elementary 10810 S. Avenue H	276°	2.0 km	10	178	-1	Roof mount	108th Street S. Avenue H	N W	45 30	Heavy Moderate

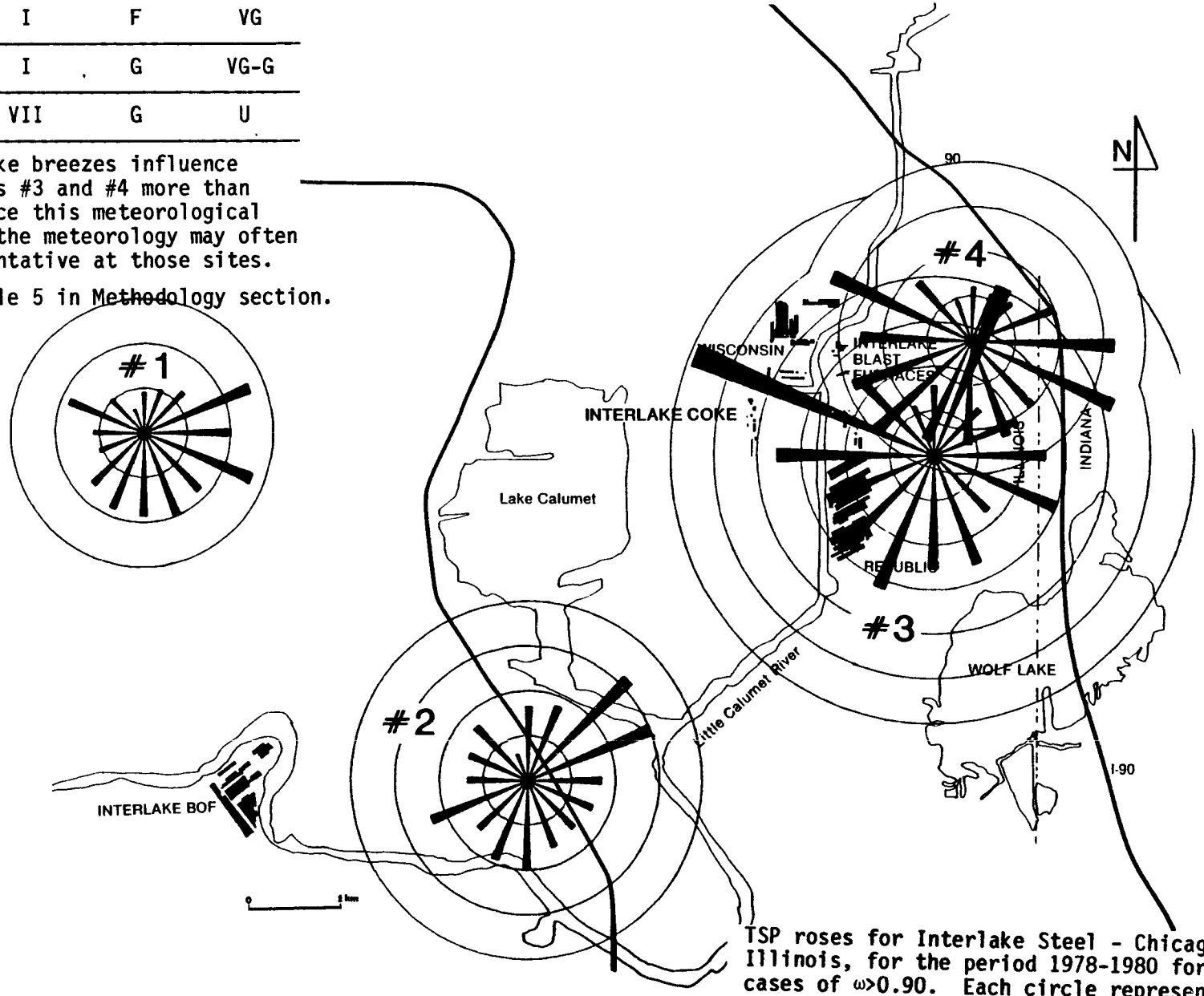
*** Critical Sites**

Wind Data Representativeness

Station #	Terrain	Distance	Rating
1	I	F	VG
2	I	G	VG-G
3, 4	VII	G	U

Comment: Lake breezes influence monitor sites #3 and #4 more than they influence this meteorological station, so the meteorology may often be unrepresentative at those sites.

N.B. See Table 5 in Methodology section.



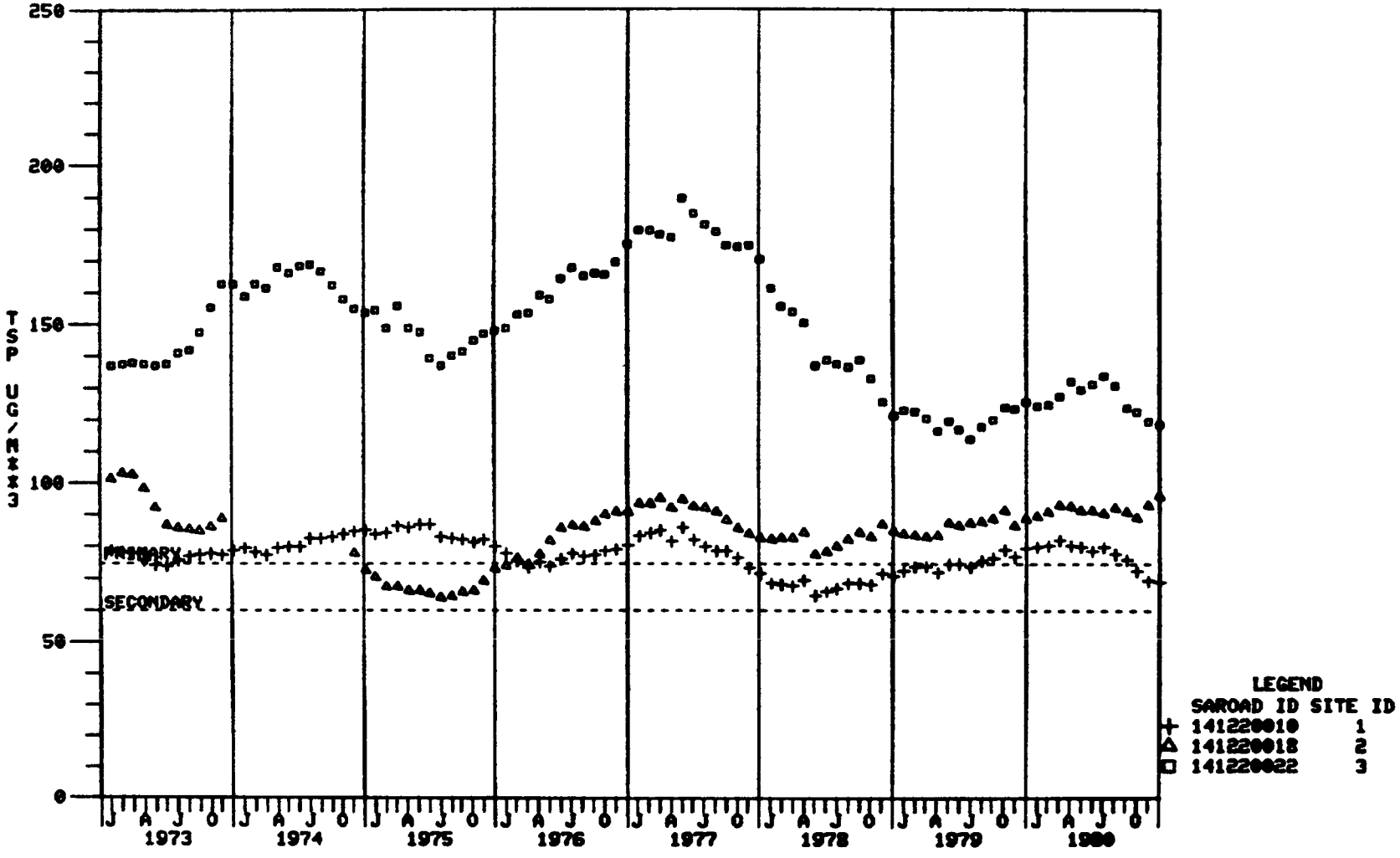
TSP roses for Interlake Steel - Chicago, Illinois, for the period 1978-1980 for cases of $\omega > 0.90$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

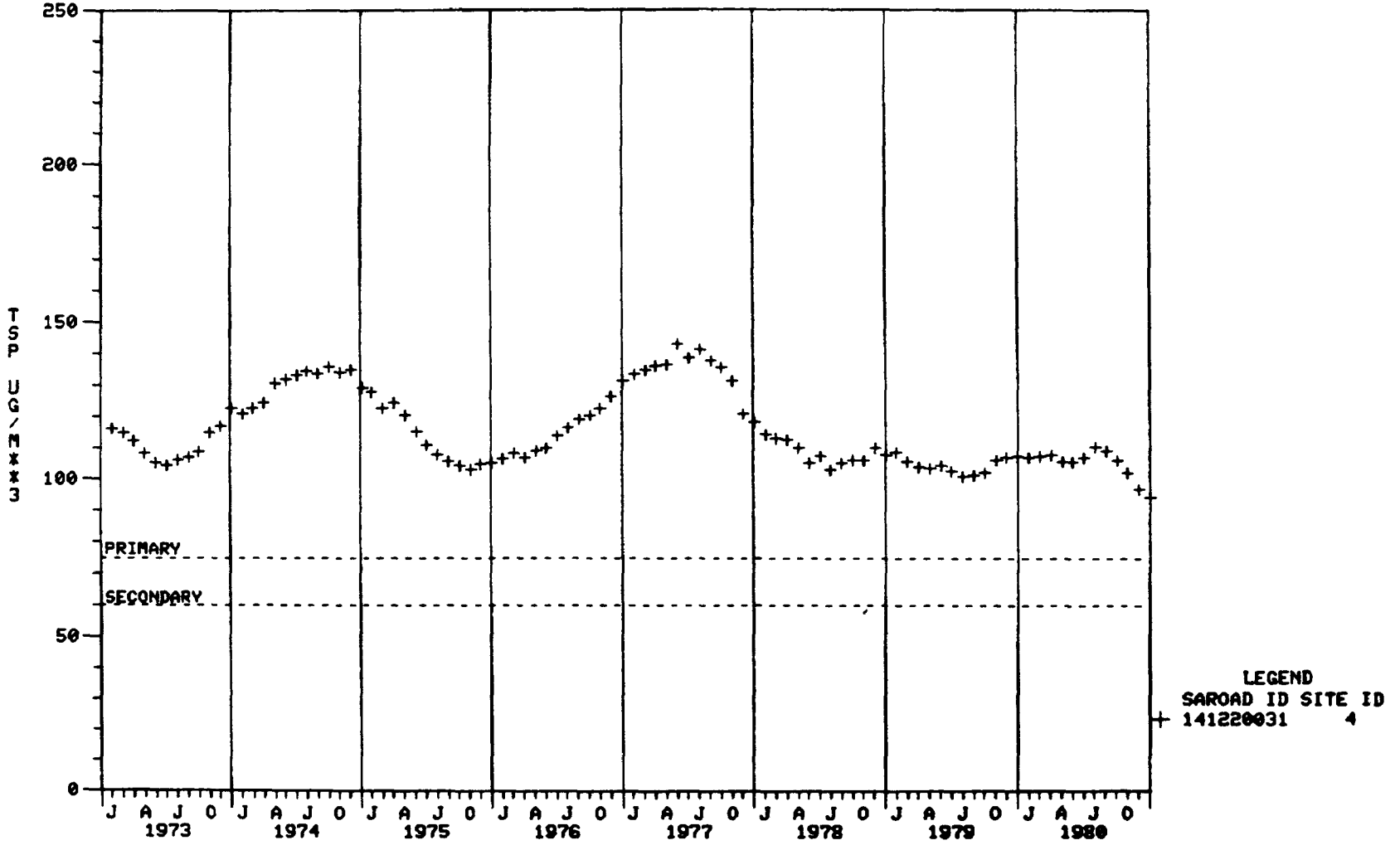
Interlake Steel--Chicago, IL

Wind Direction	Monitoring Site Numbers #1	#2	#3	#4
N	9	8	10	9
NNE	2	5	4	3
NE	5	4	5	5
ENE	6	7	3	6
E	1	1	1	1
ESE	1	2	2	2
SE	3	3	2	3
SSE	3	2	3	3
S	32	31	23	27
SSW	15	15	12	15
SW	11	11	8	10
WSW	6	5	6	6
W	14	13	14	13
WNW	2	1	1	1
NW	7	7	6	5
NNW	1	1	1	1
Total	118	116	101	110

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR INTERLAKE INC. - CHICAGO, IL



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR INTERLAKE INC. - CHICAGO, IL



TSP DATA SUMMARY FOR INTERLAKE INC. - CHICAGO, IL
SAROAD STATION # 141220010 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	137	113	116	103	113	106	102	108	53
GEOMETRIC MEAN:	79.0	78.9	85.1	80.0	80.5	71.7	70.9	73.4	69.3
GEOMETRIC S.D.:	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.6	1.7
HIGHEST BY LARSEN EXTRP:	323.3	292.2	335.3	307.6	343.7	314.9	284.9	295.5	335.3
1ST HIGHEST:	270.0	234.0	350.0	284.0	310.0	291.0	209.0	240.0	180.0
DATE :	720427	730224	740426	750518	761015	770128	780405	790608	800527
2ND HIGHEST:	246.0	196.0	297.0	272.0	236.0	277.0	191.0	200.0	149.0
DATE :	720519	730715	741213	750214	760512	770522	780417	790720	800310
# OF READINGS EXCEEDING 260 :	1	0	2	2	1	2	0	0	0
# OF READINGS EXCEEDING 150 :	17	8	12	8	11	12	4	6	1
RANGE									
0- 65:	54	38	41	27	36	51	50	35	21
66-130:	63	58	51	65	57	41	40	60	27
131-195:	14	15	20	9	13	9	11	11	5
196-260:	5	2	2	0	6	3	1	2	0
261-325:	1	0	1	2	1	2	0	0	0
326-390:	0	0	1	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIFNT DATA

TSP DATA SUMMARY FOR INTERLAKE INC. - CHICAGO, IL
SAROAD STATION # 141220018 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	136	54	82	86	103	108	104	110	53
GEOMETRIC MEAN:	100.9	******	72.5	73.0	90.7	82.8	84.7	88.7	95.9
GEOMETRIC S.D.:	1.7	******	1.7	1.6	1.6	1.6	1.6	1.6	1.8
HIGHEST BY LARSEN EXTRP:	457.8	******	334.1	290.8	390.6	341.4	308.3	362.9	552.2
1ST HIGHEST:	454.0	254.0	257.0	170.0	360.0	292.0	250.0	272.0	377.0
DATE :	720523	730206	740601	750518	761015	770522	780628	790530	800801
2ND HIGHEST:	366.0	245.0	211.0	167.0	317.0	285.0	199.0	248.0	373.0
DATE :	720521	730227	740628	750319	760512	770519	780417	790322	800906
# OF READINGS EXCEEDING 260 :	8	0	0	0	4	2	0	1	3
# OF READINGS EXCEEDING 150 :	25	10	6	5	14	13	12	13	10
RANGE									
0- 65:	26	15	34	37	26	40	29	31	14
66-130:	73	27	38	38	57	51	57	56	24
131-195:	20	9	8	11	12	9	15	15	9
196-260:	9	3	2	0	4	6	3	7	3
261-325:	5	0	0	0	3	2	0	1	1
326-390:	2	0	0	0	1	0	0	0	2
391-455:	1	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INTERLAKE INC. - CHICAGO, IL
SAROAD STATION # 141220022 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	136	87	84	98	115	113	88	84	52
GEOMETRIC MEAN:	134.0	162.8	153.4	148.0	175.1	170.4	121.2	125.6	118.5
GEOMETRIC S.D.:	1.6	1.6	1.7	1.6	1.6	1.7	1.7	1.6	1.5
HIGHEST BY LARSEN EXTRP:	562.4	700.6	750.0	562.0	710.5	837.8	540.9	480.1	419.2
1ST HIGHEST:	397.0	463.0	540.0	381.0	474.0	1106.0	517.0	325.0	231.0
DATE :	720601	730510	740613	751105	760714	771118	780613	790310	801006
2ND HIGHEST:	320.0	422.0	506.0	367.0	452.0	688.0	278.0	234.0	226.0
DATE :	720817	730718	740228	750226	761223	771031	780601	790906	800310
# OF READINGS EXCEEDING 260 :	9	19	9	10	21	19	2	5	0
# OF READINGS EXCEEDING 150 :	59	44	47	50	79	68	33	36	20
RANGE									
0- 65:	11	2	7	4	5	4	12	7	6
66-130:	47	27	21	37	19	27	33	33	23
131-195:	50	28	27	27	45	47	31	34	16
196-260:	19	11	20	20	25	16	10	5	7
261-325:	8	10	2	8	13	6	1	5	0
326-390:	0	5	3	2	4	3	0	0	0
391-455:	1	3	2	0	3	3	0	0	0
>455:	0	1	2	0	1	7	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR INTERLAKE INC. - CHICAGO, IL
SAROAD STATION # 141220031 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	136	98	97	97	117	114	92	104	55
GEOMETRIC MEAN:	115.5	122.4	129.1	105.4	131.2	118.2	107.9	107.3	94.4
GEOMETRIC S.D.:	1.6	1.7	1.5	1.5	1.7	1.7	1.5	1.5	1.6
HIGHEST BY LARSEN EXTRP:	490.8	556.5	411.8	379.1	575.4	546.0	345.6	369.2	362.3
1ST HIGHEST:	332.0	342.0	357.0	282.0	681.0	385.0	249.0	230.0	212.0
DATE :	720525	731209	740228	751105	760912	770715	780908	790310	800626
2ND HIGHEST:	309.0	299.0	318.0	229.0	494.0	351.0	244.0	220.0	188.0
DATE :	720222	731025	741026	750304	761129	770531	780309	790927	800930
# OF READINGS EXCEEDING 260 :	7	7	2	1	4	8	0	0	0
# OF READINGS EXCEEDING 150 :	40	34	35	17	51	34	19	21	9
RANGE									
0- 65:	16	9	5	10	10	10	10	10	9
66-130:	61	42	41	54	42	58	50	60	32
131-195:	43	26	39	29	44	28	28	29	13
196-260:	9	14	10	3	17	10	4	5	1
261-325:	6	6	1	1	1	4	0	0	0
326-390:	1	1	1	0	1	4	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	2	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
INTERLAKE INC. - CHICAGO, IL
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	141220010		141220018		141220022		141220031	
SITE ID #	1		2		3		4	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	342.
NNE COUNT:	0	0	0	0	2	0	0	1
AVE TSP:	0.	0.	0.	0.	482.	0.	0.	297.
NE COUNT:	0	0	1	1	1	3	0	0
AVE TSP:	0.	0.	304.	373.	342.	387.	0.	0.
ENE COUNT:	0	0	0	1	0	1	0	0
AVE TSP:	0.	0.	0.	272.	0.	275.	0.	0.
E COUNT:	0	1	0	1	0	0	0	0
AVE TSP:	0.	272.	0.	317.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	293.	0.	0.
SE COUNT:	0	1	0	0	0	2	0	1
AVE TSP:	0.	350.	0.	0.	0.	320.	0.	279.
SSE COUNT:	0	1	0	0	1	2	0	0
AVE TSP:	0.	297.	0.	0.	688.	329.	0.	0.
S COUNT:	0	0	0	0	3	0	1	0
AVE TSP:	0.	0.	0.	0.	285.	0.	681.	0.
SSW COUNT:	1	0	1	1	8	6	2	1
AVE TSP:	277.	0.	292.	285.	324.	362.	289.	282.
SW COUNT:	1	0	0	0	9	2	2	1
AVE TSP:	284.	0.	0.	0.	320.	357.	284.	299.
WSW COUNT:	0	0	1	2	14	6	3	4
AVE TSP:	0.	0.	377.	275.	345.	376.	286.	341.
W COUNT:	2	0	1	0	9	5	4	1
AVE TSP:	301.	0.	360.	0.	377.	363.	359.	351.
WNW COUNT:	0	0	0	0	6	2	0	0
AVE TSP:	0.	0.	0.	0.	435.	299.	0.	0.
NW COUNT:	0	0	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	269.	0.	0.
NNW COUNT:	0	0	0	0	1	0	0	0
AVE TSP:	0.	0.	0.	0.	601.	0.	0.	0.
ALL COUNT:	4	3	4	6	54	31	12	10
AVE TSP:	291.	306.	333.	299.	366.	350.	343.	321.

24-HR STANDARD EXCEEDANCE ROSE FOR
INTERLAKE INC. - CHICAGO, IL
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	141220010		141220018		141220022		141220031	
SITE ID #	1		2		3		4	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	1	2	2	4	0	3
AVE TSP:	0.	0.	221.	252.	171.	212.	0.	239.
NNE COUNT:	0	1	1	2	4	4	2	2
AVE TSP:	0.	196.	162.	184.	324.	193.	162.	225.
NE COUNT:	0	2	3	8	2	9	1	6
AVE TSP:	0.	172.	210.	206.	287.	257.	158.	175.
ENE COUNT:	4	4	7	8	1	7	1	6
AVE TSP:	187.	188.	200.	217.	201.	201.	159.	186.
E COUNT:	0	10	0	8	0	11	2	10
AVE TSP:	0.	190.	0.	218.	0.	202.	194.	184.
ESE COUNT:	0	4	0	2	1	9	1	6
AVE TSP:	0.	199.	0.	190.	195.	182.	205.	177.
SE COUNT:	0	4	2	1	2	6	3	3
AVE TSP:	0.	223.	157.	151.	200.	235.	163.	241.
SSE COUNT:	0	3	1	2	4	6	2	4
AVE TSP:	0.	217.	164.	177.	311.	230.	163.	173.
S COUNT:	2	3	4	1	23	15	11	6
AVE TSP:	165.	192.	172.	160.	197.	175.	226.	163.
SSW COUNT:	5	2	6	2	39	29	28	7
AVE TSP:	188.	162.	203.	246.	215.	218.	192.	203.
SW COUNT:	2	1	3	0	21	23	21	16
AVE TSP:	233.	168.	162.	0.	256.	217.	214.	200.
WSW COUNT:	2	3	3	3	19	27	18	16
AVE TSP:	169.	210.	262.	247.	310.	243.	219.	226.
W COUNT:	3	3	2	5	25	19	12	12
AVE TSP:	252.	185.	288.	177.	263.	247.	248.	206.
WNW COUNT:	0	2	0	3	13	19	5	9
AVE TSP:	0.	207.	0.	175.	304.	196.	182.	176.
NW COUNT:	0	2	1	2	7	13	2	3
AVE TSP:	0.	180.	246.	182.	212.	193.	185.	184.
NNW COUNT:	0	0	0	0	5	8	0	1
AVE TSP:	0.	0.	0.	0.	267.	183.	0.	166.
ALL COUNT:	18	44	34	49	168	209	109	110
AVE TSP:	199.	194.	203.	205.	249.	215.	207.	197.

UPDATED AIR QUALITY EVALUATION - INTERLAKE STEEL, CHICAGO, ILLINOIS

Stations used in update:

Continued operation:	#1, #2, #3, #4
New stations:	None
Discontinued stations:	None

Trends in geometric means:

Recent trend graphs of 12-month running geometric means for stations #1, #2, #3, and #4 continue the general pattern established earlier. Stations #3 and #4 are in phase to substantial detail, following roughly a 3-year peak-to-peak cycling; values at station #3 are consistently larger than those at station #4. The Spearman correlation coefficients for these records (-0.40 for #3, -0.44 for #4) indicate a slight negative trend for the long term. Peak values as well as minimum values are in general decline.

The recent trend graphs for stations #1 and #2 are everywhere much lower than those of stations #3 and #4, and are generally in phase. The Spearman correlation coefficients for these stations (-0.35 for #1, 0.30 for #2) indicate a divergence in trend, but both trends are slight.

Attainment status:

None of the stations discussed here are in attainment of primary TSP standards.

Pollution roses:

Recent pollution roses for stations #1, #2, #3, and #4 continue the general pattern established earlier in that largest average TSP values under steady winds come from directions containing the facility. Little impact of the Interlake BOF shop can be detected since there are no stations within close proximity.

Standard exceedance roses:

Stations #3 and #4 received the largest number of excursions past the 24-hour primary standard under steady winds during 1973-1980. Roughly half of the exceedance cases at stations #3 and #4 occurred with wind directions that would have transported Interlake emissions to these stations; the other half occurred with wind directions from the Republic mill. Stations #1 and #2 suffered a much lower frequency of primary excursions under steady winds (4 each), and station #2 recorded only one such excursion that may have involved plant emissions; station #1 recorded none out of its four. Both of these stations are much farther from the Interlake facilities than #3 or #4.

JONES & LAUGHLIN STEEL

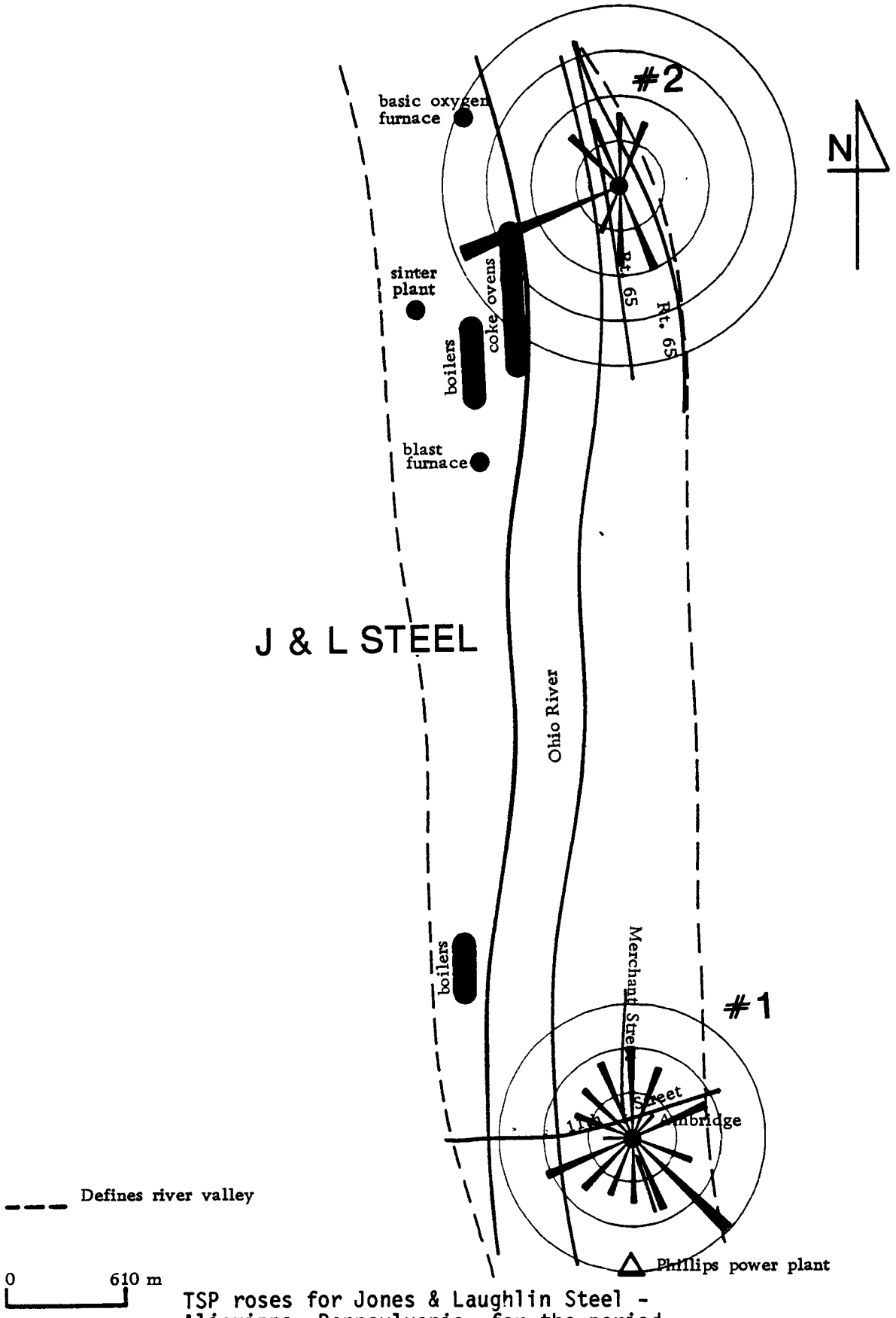
Aliquippa, Pennsylvania

EPA Region III

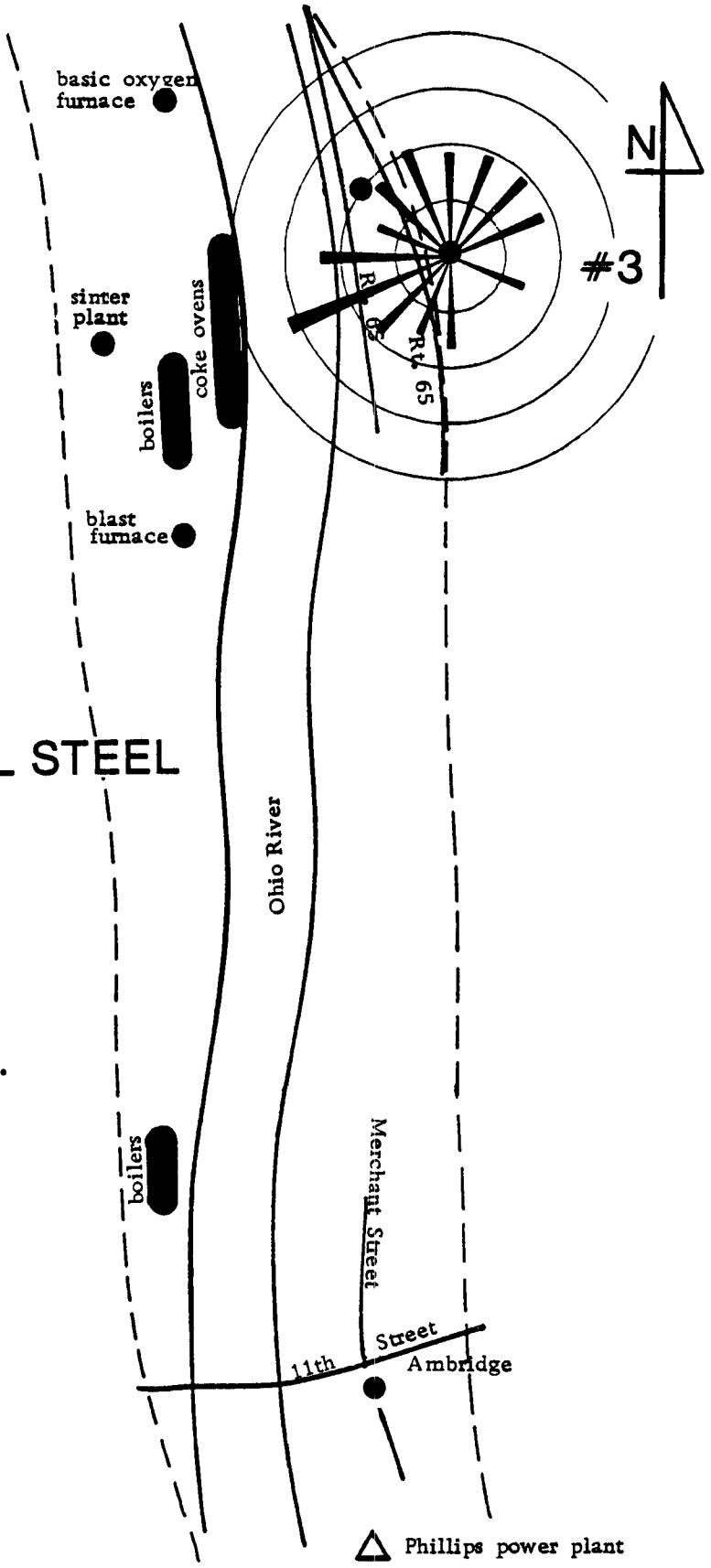
Hi-Vol Monitoring Sites - J & L Steel, Aliquippa, PA

	SAROAD #	Site Name	Plant Location from Site: Bearing (clockwise)	Plant Location from Site: Distance (km)	Elevation: Height of Hi-Vol Inlet Above Ground (m)	Elevation: Elevation Diff. Site-Plant (m)	Site Description	Nearest Roadway: Name	Nearest Roadway: Direction/Distance (m)	Nearest Roadway: Volume
#1	390180507F01	Ambridge Post Office*	Boilers		5	12	Building roof (gravel)	Merchant Street	WSW/9	Paved road, moderate traffic
			Rest of Plant		5	0			SE/6	Paved road, light traffic
			From 348°	3.4					NE/55	Paved road, light traffic
			To 353°	5.1				11th Street	NNW/122	Paved road, moderate traffic
#2	390440004F01	Baden (Copams)*	Boilers		1	15	Small gravel plot		SSE/9	Paved road, light traffic
			Rest of Plant		1	3		Rt. 65	W/8	Paved road, Heavy traffic
			From 298°	1.0				Rt. 65	ENE/122	Paved road, heavy traffic
			To 207°	1.5						
#3	390440509F01	State Street School Harmony & State Streets	Boilers 203°	3.6	5	55	Roof top	Harmony Street	N/84	
			Rest of Plant from 230°	1.6				State St.	E/152	
			to 310°	1.5						

* Denotes critical site.



TSP roses for Jones & Laughlin Steel - Aliquippa, Pennsylvania, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.



Wind Data Representativeness

Station #	Terrain	Distance	Rating
2, 3	II	B	E
1	II	D	VG

N.B. See Table 5 in Methodology section.

Defines river valley

0 610 m

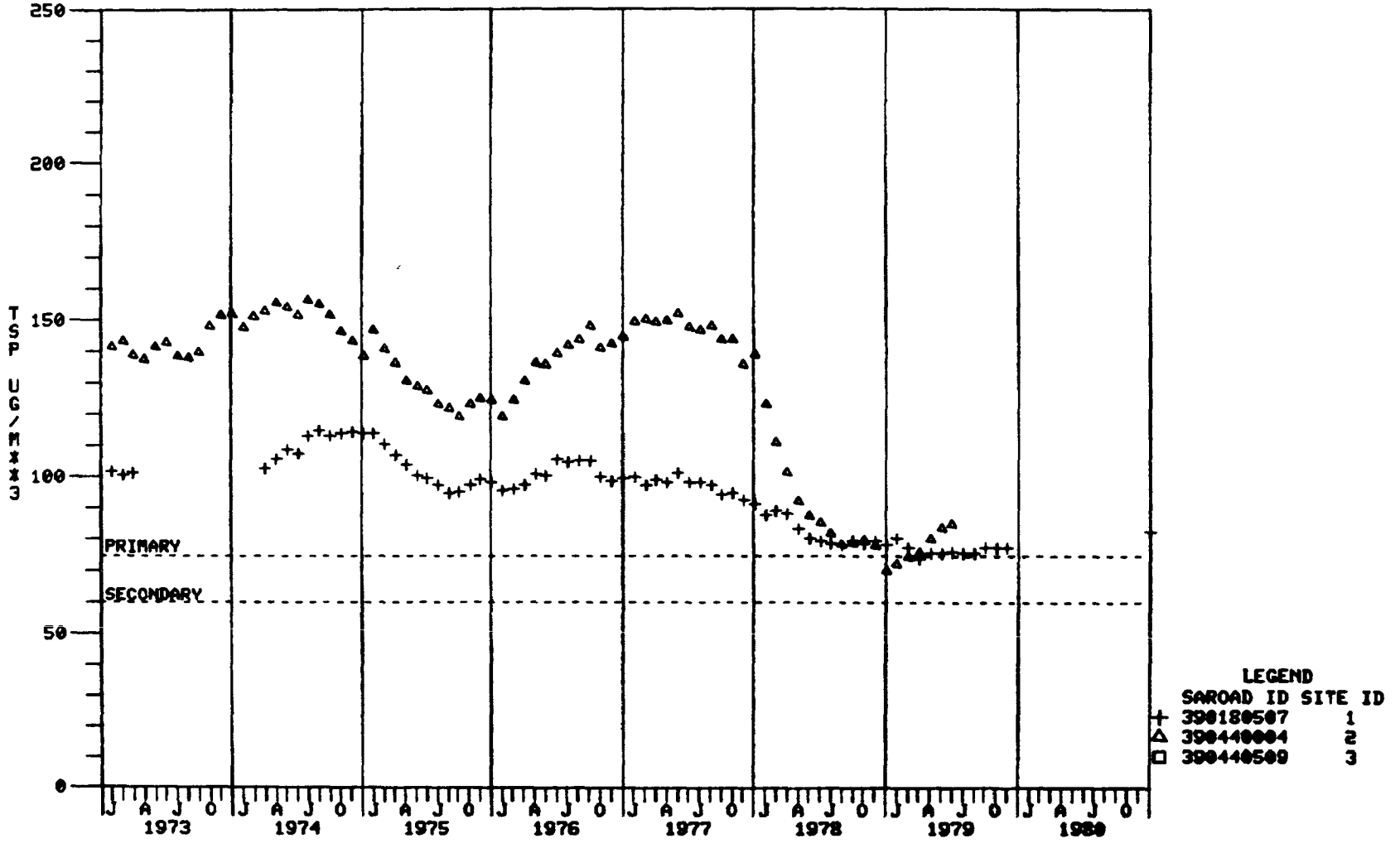
TSP roses for Jones & Laughlin Steel - Aliquippa, Pennsylvania, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Jones & Laughlin Steel--Aliquippa, PA

Wind Direction	Monitoring Site Numbers #1	#2	#3
N	11	7	3
NNE	49	41	8
NE	2	0	2
ENE	2	0	2
E	0	0	0
ESE	1	0	1
SE	1	0	0
SSE	3	2	0
S	4	1	3
SSW	2	1	1
SW	3	0	2
WSW	4	1	3
W	1	0	1
WNW	3	0	1
NW	5	2	3
NNW	3	3	1
Total	94	58	31

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J & L STEEL - ALIQUIPPA, PA



TSP DATA SUMMARY FOR J & L STEEL - ALIQUIPPA, PA
SAROAD STATION # 390180507 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	59	29	59	42	59	61	60	45	46
GEOMETRIC MEAN:	104.2	******	114.0	98.4	99.7	91.3	78.2	******	82.5
GEOMETRIC S.D.:	1.5	******	1.5	1.5	1.5	1.5	1.5	******	1.4
HIGHEST BY LARSEN EXTRP:	336.1	******	365.0	310.8	324.7	278.9	268.0	******	233.4
1ST HIGHEST:	206.0	184.0	245.0	290.0	234.0	256.0	208.0	185.0	159.0
DATE :	720104	730808	740228	750205	760623	770119	781104	790930	801030
2ND HIGHEST:	182.0	175.0	201.0	226.0	222.0	232.0	184.0	151.0	147.0
DATE :	720110	731025	740105	751003	760418	770419	780526	790509	801123
# OF READINGS EXCEEDING 260 :	0	0	0	1	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	10	2	18	7	11	6	2	2	1
RANGE									
0- 65:	8	4	4	5	10	14	18	12	12
66-130:	31	21	32	26	34	39	36	29	32
131-195:	19	4	19	9	12	6	5	4	2
196-260:	1	0	4	1	3	2	1	0	0
261-325:	0	0	0	1	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - ALIQUIPPA, PA
SAROAD STATION # 390440004 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	58	56	58	55	59	61	60	15	0
GEOMETRIC MEAN:	146.2	151.8	138.2	124.5	144.4	138.6	69.9	******	******
GEOMETRIC S.D.:	1.6	1.4	1.6	1.5	1.6	1.6	1.7	******	******
HIGHEST BY LARSEN EXTRP:	556.2	450.0	585.7	427.1	612.9	517.6	304.9	******	******
1ST HIGHEST:	393.0	289.0	285.0	328.0	440.0	359.0	192.0	182.0	******
DATE :	720116	730110	740429	750106	760611	770218	780824	790421	******
2ND HIGHEST:	358.0	267.0	270.0	279.0	422.0	316.0	154.0	157.0	******
DATE :	720310	730227	740610	750118	760319	770131	780520	790509	******
# OF READINGS EXCEEDING 260 :	5	2	3	2	4	7	0	0	0
# OF READINGS EXCEEDING 150 :	28	33	27	20	32	26	2	2	0
RANGE									
0- 65:	3	3	3	6	3	4	27	1	0
66-130:	21	12	20	21	19	22	25	12	0
131-195:	16	26	19	22	23	24	8	2	0
196-260:	13	13	13	4	10	4	0	0	0
261-325:	1	2	3	1	0	5	0	0	0
326-390:	3	0	0	1	2	1	0	0	0
391-455:	1	0	0	0	2	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - ALIQUIPPA, PA
SAROAD STATION # 390440509 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	14	39
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	147.0	305.0
DATE :	******	******	******	******	******	******	******	790212	801030
2ND HIGHEST:	******	******	******	******	******	******	******	145.0	171.0
DATE :	******	******	******	******	******	******	******	790224	800801
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	1
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	4
RANGE									
0- 65:	0	0	0	0	0	0	0	4	8
66-130:	0	0	0	0	0	0	0	7	27
131-195:	0	0	0	0	0	0	0	3	3
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	0	0	1
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

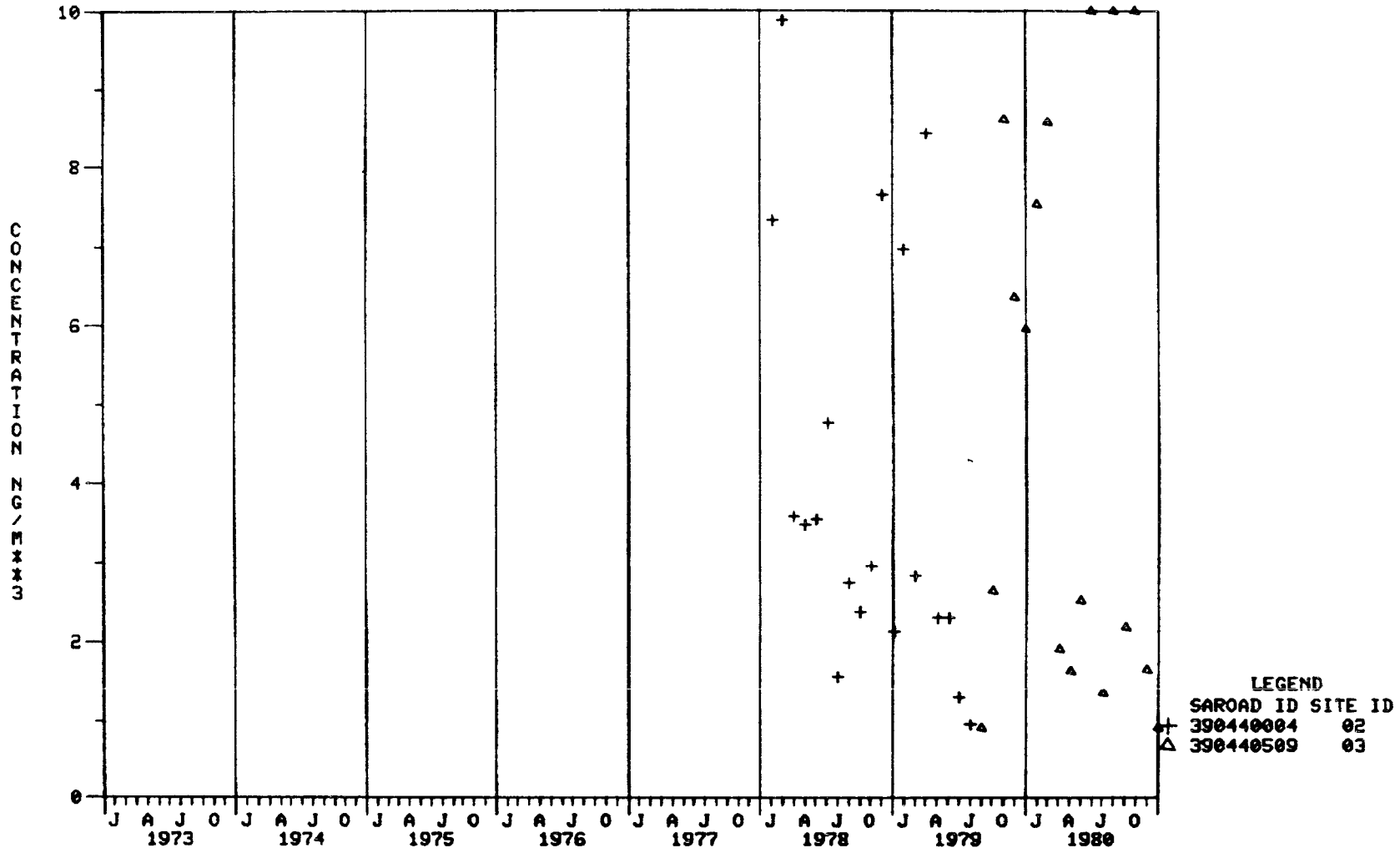
24-HR STANDARD EXCEEDANCE ROSE FOR
J & L STEEL - ALIQUIPPA, PA
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

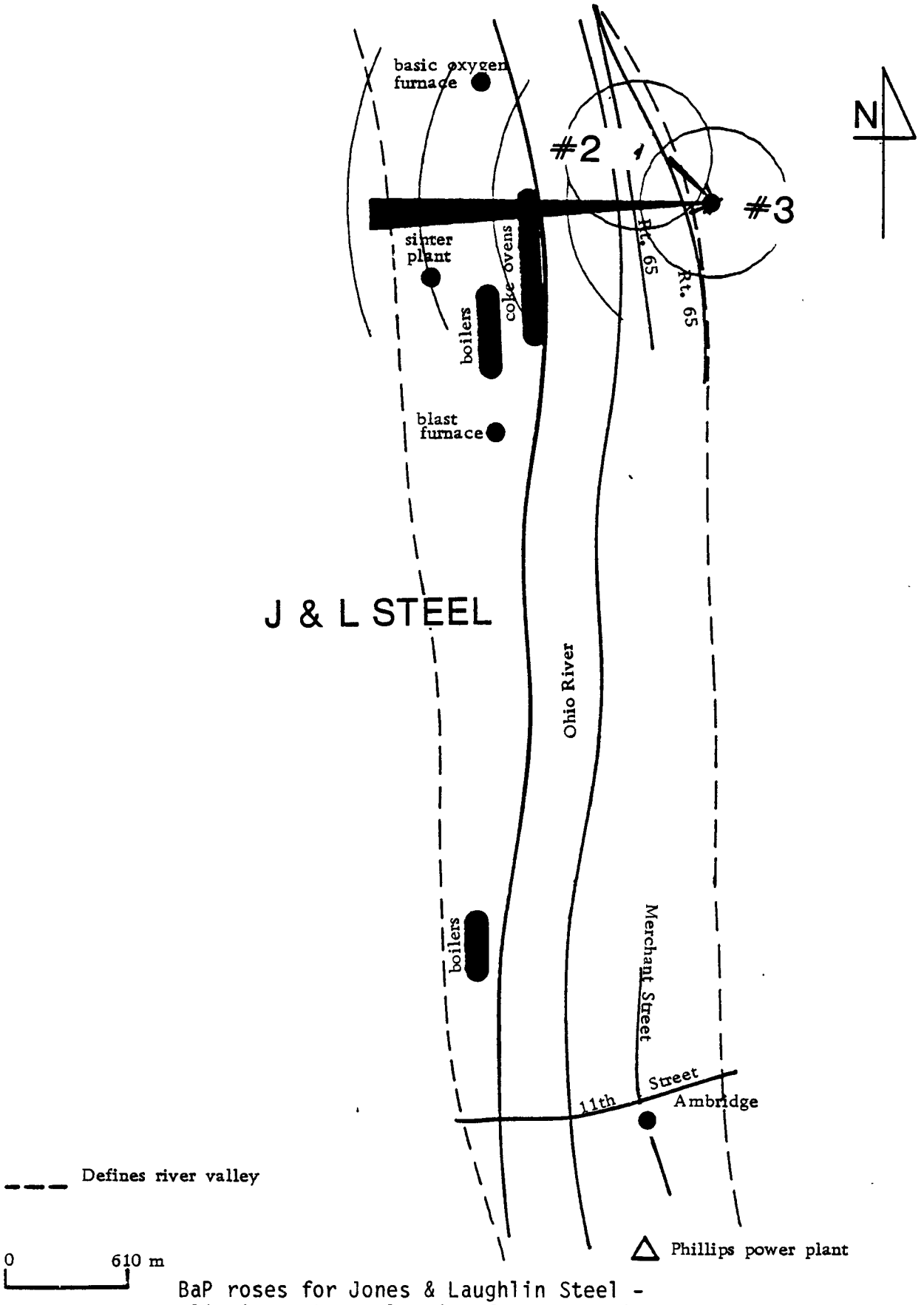
SAROAD #	390180507		390440004		390440509	
SITE ID #	1		2		3	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	1	0	0	0
AVE TSP:	0.	0.	267.	0.	0.	0.
E COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
SE COUNT:	0	1	0	0	0	0
AVE TSP:	0.	290.	0.	0.	0.	0.
SSE COUNT:	0	0	1	1	0	0
AVE TSP:	0.	0.	267.	328.	0.	0.
S COUNT:	0	0	3	0	0	0
AVE TSP:	0.	0.	375.	0.	0.	0.
SSW COUNT:	0	0	1	3	0	0
AVE TSP:	0.	0.	270.	287.	0.	0.
SW COUNT:	0	0	2	2	0	0
AVE TSP:	0.	0.	298.	307.	0.	0.
WSW COUNT:	0	0	2	0	1	0
AVE TSP:	0.	0.	278.	0.	306.	0.
W COUNT:	0	0	2	0	0	0
AVE TSP:	0.	0.	372.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
ALL COUNT:	0	1	12	6	1	0
AVE TSP:	0.	290.	319.	301.	306.	0.

24-HR STANDARD EXCEEDANCE ROSE FOR
J & L STEEL - ALIQUIPPA, PA
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	390180507		390440004		390440509	
SITE ID #	1		2		3	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	2	1	0	0	0	0
AVE TSP:	185.	160.	0.	0.	0.	0.
NNE COUNT:	1	0	1	0	0	0
AVE TSP:	208.	0.	154.	0.	0.	0.
NE COUNT:	1	0	1	1	0	0
AVE TSP:	189.	0.	186.	156.	0.	0.
ENE COUNT:	0	0	1	1	0	0
AVE TSP:	0.	0.	267.	151.	0.	0.
E COUNT:	0	1	0	1	0	0
AVE TSP:	0.	159.	0.	216.	0.	0.
ESE COUNT:	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.
SE COUNT:	1	1	2	0	0	0
AVE TSP:	182.	290.	207.	0.	0.	0.
SSE COUNT:	2	3	3	4	0	0
AVE TSP:	192.	163.	214.	218.	0.	0.
S COUNT:	4	3	8	8	0	0
AVE TSP:	185.	182.	282.	180.	0.	0.
SSW COUNT:	0	5	7	14	0	1
AVE TSP:	0.	183.	200.	207.	0.	160.
SW COUNT:	6	8	16	22	0	0
AVE TSP:	194.	175.	208.	199.	0.	0.
WSW COUNT:	2	1	13	7	1	0
AVE TSP:	193.	201.	218.	193.	306.	0.
W COUNT:	2	1	8	9	0	1
AVE TSP:	185.	176.	226.	176.	0.	171.
WNW COUNT:	1	0	7	3	0	0
AVE TSP:	155.	0.	185.	183.	0.	0.
NW COUNT:	0	1	1	2	1	0
AVE TSP:	0.	188.	154.	165.	157.	0.
NNW COUNT:	1	1	0	2	0	0
AVE TSP:	172.	168.	0.	224.	0.	0.
ALL COUNT:	23	26	68	74	2	2
AVE TSP:	188.	180.	217.	194.	232.	166.

BAP MONTHLY ARITHMETIC MEANS (NG/M**3) FOR J & L STEEL - ALIQUIPPA, PA





BaP roses for Jones & Laughlin Steel - Aliquippa, Pennsylvania, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 35 ng/m^3.

UPDATED AIR QUALITY EVALUATION - J&L STEEL, ALIQUIPPA, PENNSYLVANIA

Stations used in update:

Continued operation:	#1
New stations:	#3 (1979)
Discontinued stations:	#2 (1979)

Trends in geometric means:

The cyclic pattern in running 12-month geometric means established earlier changed abruptly in early 1978. Values at site #2 declined rapidly throughout 1978 to meet those recorded at site #1.

The Spearman correlation coefficient for station #1 was -0.88, indicating a strong long-term negative trend. Station #2 indicated a moderate negative trend. Its Spearman correlation coefficient was -0.57.

Attainment status:

Station #1 was not in attainment of primary TSP standards in 1978 and 1980; insufficient data was collected in 1979 to make any estimates. Station #2 was not in attainment of primary TSP standards in 1978; insufficient data was collected in 1979 to make any estimate. Station #3 provided insufficient data in 1979 and 1980 to estimate attainment status.

Pollution roses:

Recent pollution roses for stations #1 and #2 continue the general pattern developed earlier. Impacts from plant emissions are most readily discerned from station #2. The average TSP levels associated with such impacts are less than the pre-1978 levels, but still substantially above nonplant directions. TSP levels from nonplant directions are relatively unchanged from pre-1978 and are not very different from those for any direction at site #1.

Although the record from site #3 is incomplete, its pollution rose compares favorably with that of station #2.

Standard exceedance roses:

Two-thirds of the primary 24-hour standard exceedance cases at station #2 occurred with winds carrying mill emissions toward the station. The sole cases of primary standard exceedance at station #3 occurred with persistent winds blowing from the direction of the coke ovens.

BaP:

BaP was sampled at station #2 (1978-1979) and station #3 (1979-1980). Monthly averages were relatively high, especially during the operation of station #3 when values in excess of 20 ng/m^3 were not uncommon. The BaP pollution rose for station #3 indicates largest contributions (the westerly case was inflated by one episode in excess of 250 ng/m^3) from the J&L coking facility. The BaP pollution rose for station #2 does not indicate a substantial impact.

JONES & LAUGHLIN STEEL

East Chicago, Indiana

EPA Region V

Hi Vol Monitoring Sites - Jones and Laughlin, East Chicago, Indiana

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Plant Location from Site Distance	Elevation Above Ground	Elevation MSL	Elevation Plant	Site Description	Nearest Roadway Name	Nearest Roadway Direction/Distance		Nearest Roadway Volume
#1	151180001 *	Central Fire Station * 405 E. Columbus Drive	29°	3.4 km	10	180	0	Building Roof	E. Columbus Dr.	S	30 m	2-lane heavy
#2	151180003 *	Marktown* Broad and Pine Marktown	64°	1.8 km	4	180	0	Building Roof	Broad St.	E	12 m	2-lane moderate
									Pine Street	SE	12 m	2-lane moderate
#3	151180004 *	Field School * Block and James	330°	2.0 km	9	180	0	Building Roof	Block Ave.	SW	75 m	2-lane moderate
#4	151180006 *	Franklin School * Alder and 142nd	345°	5.5 km	9	180	0	Building Roof	Franklin	W	25 m	2-lane moderate
X #5	151180007	Roxanna Roxanna and Walsh	30°	6.4 km	4	180	0	Building Roof	Roxanna Dr.	S	15 m	2-lane moderate
X #6	151780001	Goldblotts 5206 Hohman	51°	7.5 km	15	180	0	Building Roof	Hohman Ave.	E	15 m	2-lane heavy
X #7	151780002	City Hall 5935 Calumet Ave.	35°	8.2 km	11	181	2	Building Roof	Calumet Ave.	W	25 m	2-lane heavy
X #8	151780004	Purdue 2233 171st St.	12°	9.2 km	10	184	3	Building Roof	Woodmar Ave.	W	75 m	2-lane moderate
									171st St.	S	45 m	2-lane moderate
X #9	151780005	Police and Fire Station 2211 Calumet Ave.	105°	6.8 km	5	180	0	Building Roof	Calumet Ave.	W	15 m	2-lane heavy
X #10	151780006	Hessville Fire Station 3323 165th Street	358°	7.8 km	5	181	2	Building Roof	165th St.	S	30 m	2-lane moderate
X #11	151780007	GSA Building 3200 Sheffield	73°	5.5 km	3	180	0	Building Roof	Paved Road	E	12 m	2-lane light
X #12	151780008	1300 141st Street	55°	5.2 km	5	178	-2	Building Roof	141st Street	N	15 m	2-lane moderate

* Critical Site

(Continued)

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

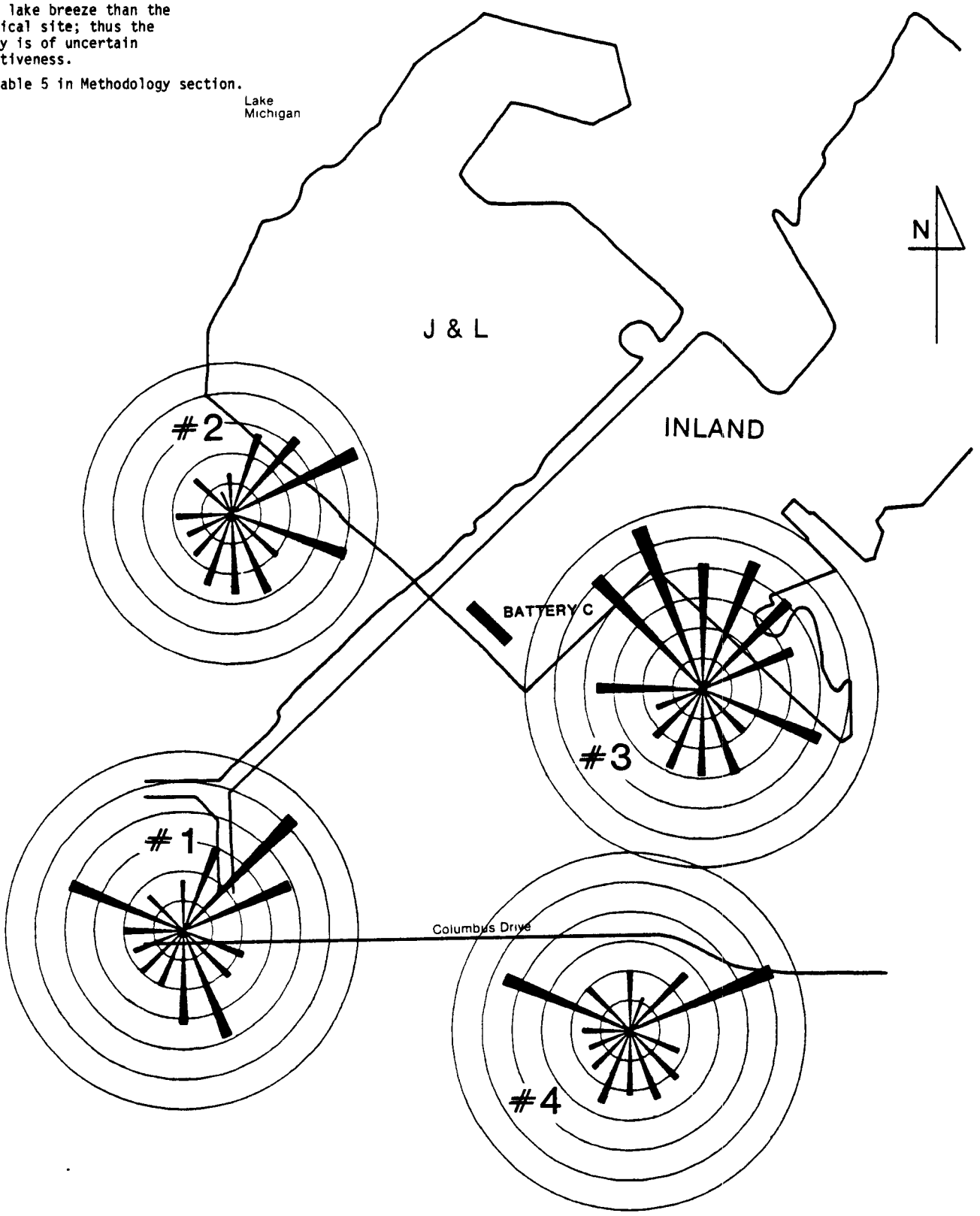
Hi Vol Monitoring Sites - Jones and Laughlin, East Chicago, Indiana

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance		Volume
#13	13000	Park Maintenance Building	Coking 75°	1.5 km	4.5	55	0	Rooftop Residential	Pine Ave.	E	17m	
#14	14000	Mill Gate Inn	Coking 235°	1.6 km	4.3	179	1.5	Scaffold	Dickey Rd.	NE	14m	
#15	15000	Wayne Adams Buick Dealer Car Wash	Unknown		5.2	Unknown	Unknown	Rooftop	Wetling St.	SE	65m	
#16	16000	Field Elementary School	Coking 137°	1.5 km	9	180	0	Rooftop	Block Ave.	SW	76m	

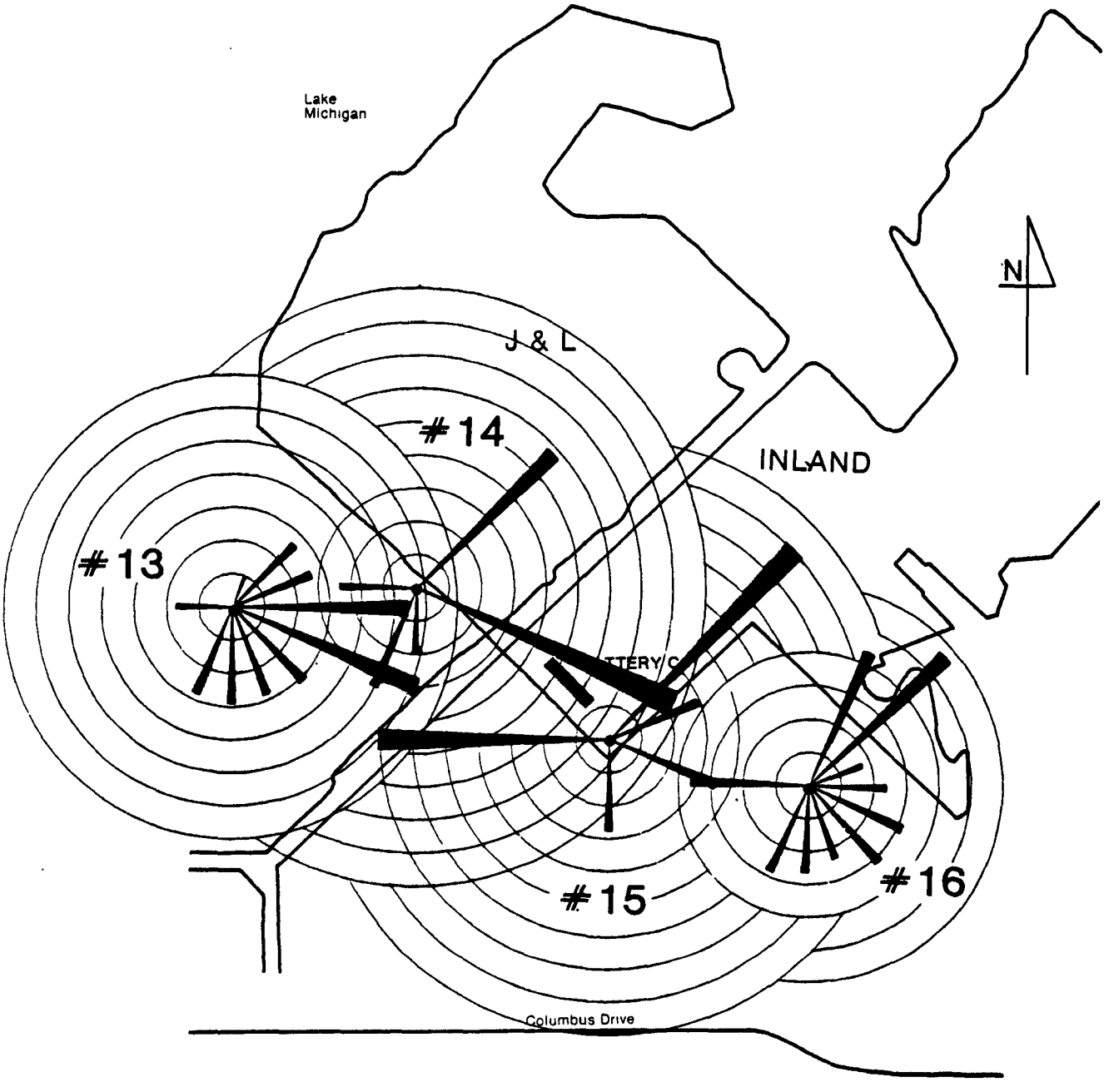
1, 2, 3, 4, 13, 14, 15, 16	VI	G	U

Comment: Monitor sites are less subject to lake breeze than the meteorological site; thus the meteorology is of uncertain representativeness.

N.B. See Table 5 in Methodology section.



TSP roses for Jones & Laughlin Steel - East Chicago, Indiana, for the period 1978-1980 for cases of $\omega > 0.90$. Each circle represents 50 $\mu g/m^3$.



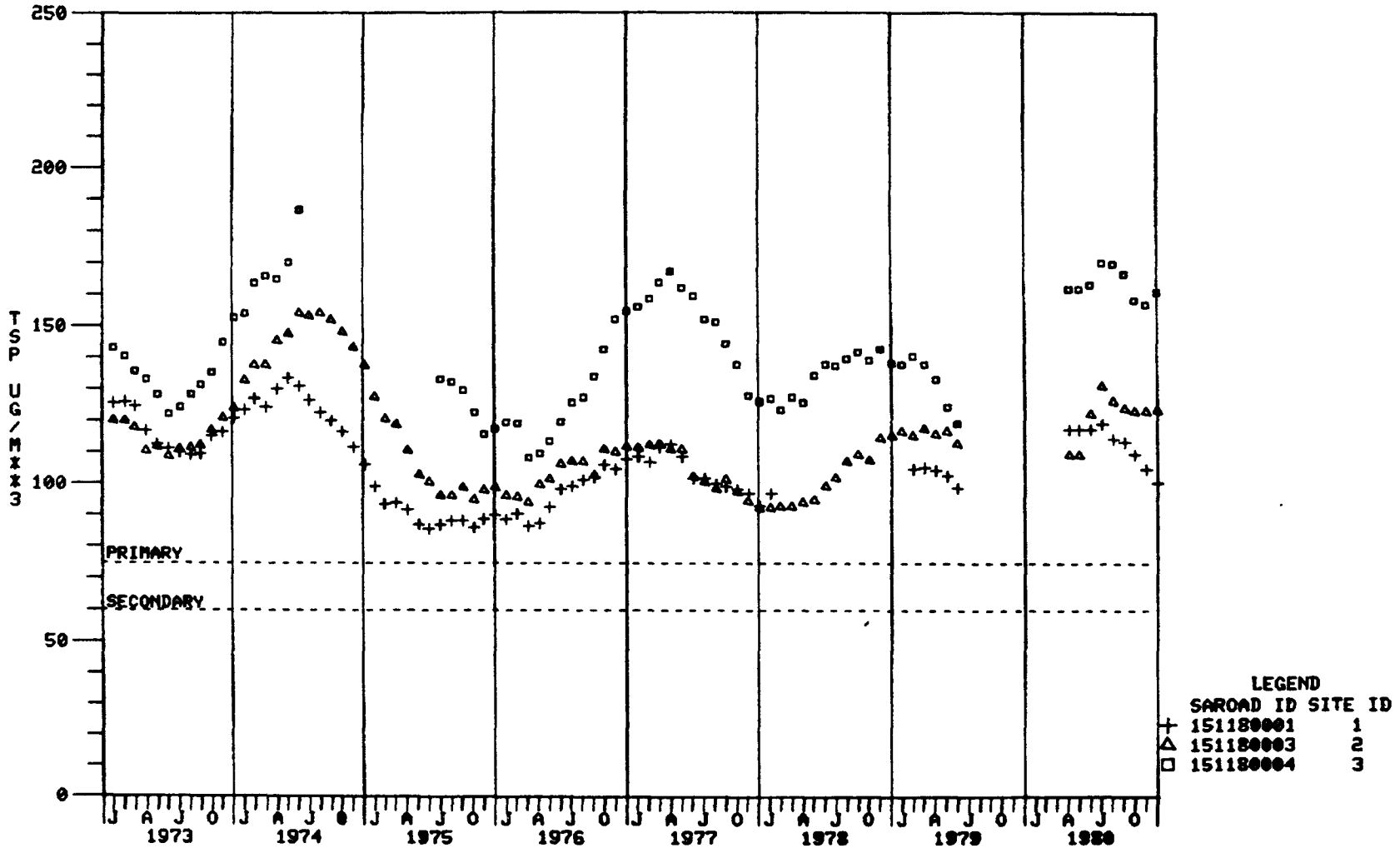
TSP roses for Jones & Laughlin Steel - East Chicago, Indiana, for the period 1978-1980 for cases of $\omega>0.85$. Special Study Sites. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

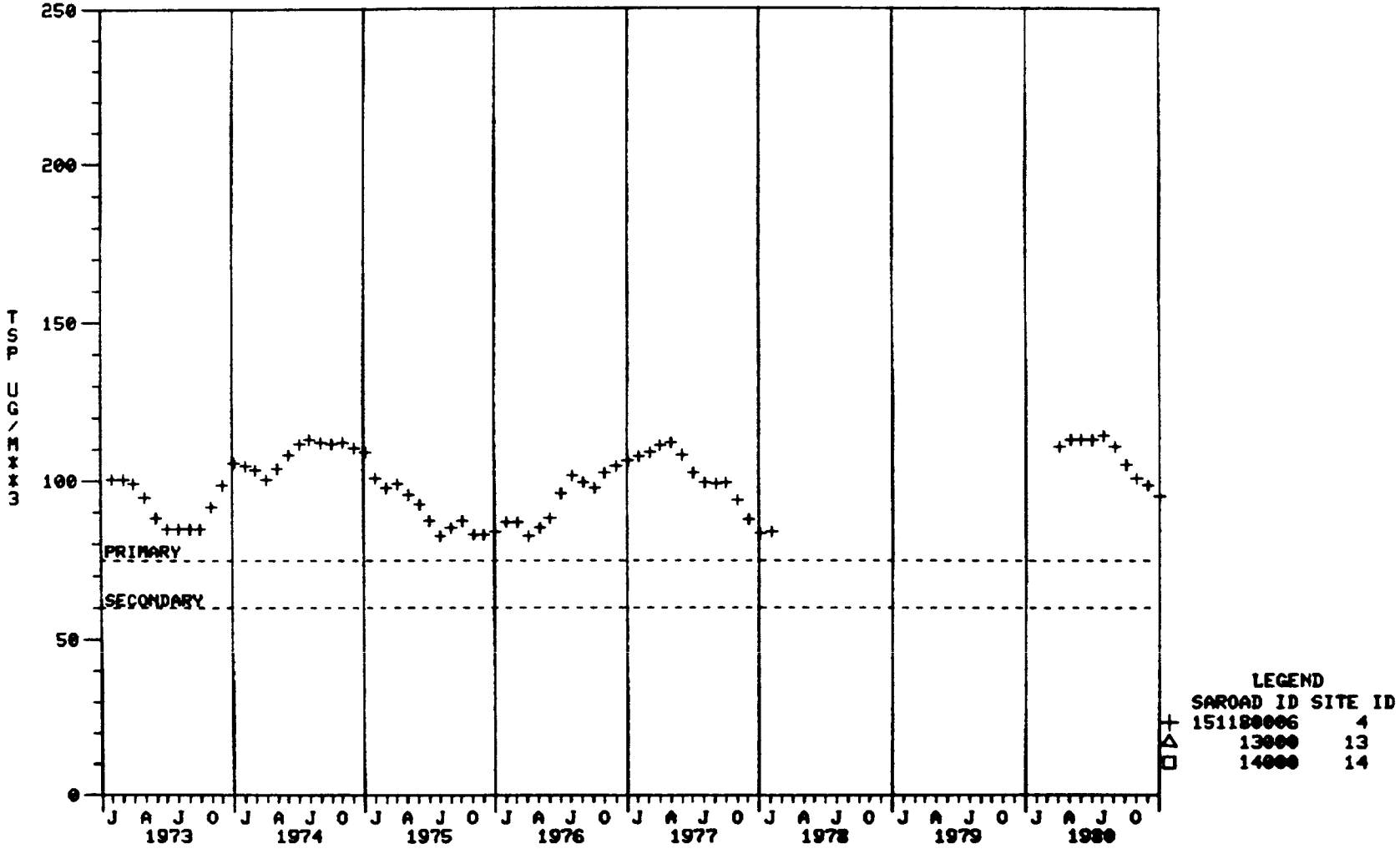
Jones & Laughlin Steel--East Chicago, IN

Wind Direction	Monitoring Site Numbers							
	#1	#2	#3	#4	#13	#14	#15	#16
N	6	6	5	4	0	0	0	0
NNE	1	3	3	1	1	0	0	1
NE	1	6	6	1	4	3	4	4
ENE	2	3	3	1	1	0	1	1
E	0	0	0	0	1	0	0	1
ESE	2	3	3	2	1	1	1	1
SE	2	2	1	1	2	0	0	2
SSE	2	4	3	3	2	0	0	2
S	16	17	14	16	2	1	2	2
SSW	6	8	8	7	1	1	0	1
SW	6	8	7	7	0	0	0	0
WSW	3	4	2	1	0	0	0	0
W	4	9	8	4	1	1	1	1
WNW	1	0	0	1	0	0	0	0
NW	2	4	4	2	0	0	0	0
NNW	0	1	1	0	0	0	0	0
Total	54	78	68	51	16	7	9	16

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J + L STEEL - EAST CHICAGO, IL



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J + L STEEL - EAST CHICAGO, IL



TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SAROAD STATION # 151180001 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	61	53	61	52	55	47	33	37	46
GEOMETRIC MEAN:	119.6	120.9	106.0	90.2	107.7	93.2	******	******	100.4
GEOMETRIC S.D.:	1.7	1.4	1.6	1.5	1.6	1.5	******	******	1.8
HIGHEST BY LARSEN EXTRP:	525.8	353.9	424.5	271.8	395.2	289.7	******	******	540.3
1ST HIGHEST:	415.0	313.0	313.0	210.0	240.0	191.0	223.0	290.0	376.0
DATE :	720521	731212	740529	750506	761015	771028	780619	791223	800110
2ND HIGHEST:	344.0	231.0	269.0	194.0	220.0	172.0	212.0	229.0	265.0
DATE :	720831	731019	740228	750319	760605	770419	780830	790912	800328
# OF READINGS EXCEEDING 260 :	6	1	2	0	0	0	0	1	2
# OF READINGS EXCEEDING 150 :	18	16	12	4	14	3	6	11	12
RANGE									
0- 65:	7	3	11	11	9	10	1	6	10
66-130:	27	26	27	34	28	29	22	17	20
131-195:	14	19	18	6	14	8	7	8	11
196-260:	7	4	3	1	4	0	3	5	3
261-325:	4	1	2	0	0	0	0	1	1
326-390:	1	0	0	0	0	0	0	0	1
391-455:	1	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SAROAD STATION # 151180003 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	60	57	52	53	56	50	61	39	84
GEOMETRIC MEAN:	119.3	123.8	137.4	98.8	111.9	92.0	115.3	******	123.4
GEOMETRIC S.D.:	1.7	1.6	1.9	1.7	1.7	1.5	1.7	******	1.7
HIGHEST BY LARSEN EXTRP:	524.9	498.2	860.1	437.6	530.1	301.6	517.0	******	539.3
1ST HIGHEST:	488.0	388.0	412.0	258.0	445.0	206.0	393.0	375.0	329.0
DATE :	720427	731212	740710	750729	760611	770419	780619	790322	800624
2ND HIGHEST:	342.0	383.0	358.0	257.0	376.0	193.0	296.0	298.0	301.0
DATE :	720328	730913	740716	750909	760605	770401	780408	790825	800221
# OF READINGS EXCEEDING 260 :	5	2	9	0	3	0	2	3	5
# OF READINGS EXCEEDING 150 :	21	18	23	10	14	5	19	9	29
RANGE									
0- 65:	4	4	6	12	7	10	11	8	10
66-130:	33	30	16	30	30	29	23	18	28
131-195:	16	13	12	4	11	10	19	8	35
196-260:	2	8	9	7	5	1	6	2	5
261-325:	3	0	5	0	0	0	1	2	5
326-390:	1	2	3	0	2	0	0	1	1
391-455:	0	0	1	0	1	0	1	0	0
>455:	1	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SAROAD STATION # 151180004 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	60	58	29	58	54	48	56	36	80
GEOMETRIC MEAN:	142.2	152.7	******	117.4	155.0	126.0	138.1	******	160.7
GEOMETRIC S.D.:	1.8	1.6	******	1.9	1.6	1.5	1.7	******	1.5
HIGHEST BY LARSEN EXTRP:	805.2	564.9	******	612.1	589.8	407.0	628.8	******	626.0
1ST HIGHEST:	478.0	430.0	463.0	701.0	432.0	301.0	372.0	335.0	398.0
DATE :	720515	730128	740628	750319	761015	770425	780520	790918	800421
2ND HIGHEST:	411.0	354.0	451.0	330.0	420.0	275.0	286.0	287.0	374.0
DATE :	720509	730814	740517	750307	760524	770413	780426	790310	800110
# OF READINGS EXCEEDING 260 :	8	5	10	4	7	2	7	3	11
# OF READINGS EXCEEDING 150 :	27	29	21	17	28	16	26	18	46
RANGE									
0- 65:	7	2	0	9	2	3	3	4	4
66-130:	15	19	8	25	16	22	22	10	16
131-195:	20	19	8	14	22	17	17	11	34
196-260:	10	13	3	6	7	4	7	8	15
261-325:	3	3	5	2	4	2	6	2	5
326-390:	3	1	3	1	1	0	1	1	4
391-455:	1	1	1	0	2	0	0	0	1
>455:	1	0	1	1	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SAROAD STATION # 151180006 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	59	57	59	53	57	45	37	33	44
GEOMETRIC MEAN:	98.2	105.5	109.2	83.9	106.5	83.3	******	******	95.4
GEOMETRIC S.D.:	1.9	1.5	1.6	1.6	1.6	1.5	******	******	1.6
HIGHEST BY LARSEN EXTRP:	698.9	368.5	408.6	321.8	416.7	256.3	******	******	354.6
1ST HIGHEST:	365.0	386.0	254.0	195.0	295.0	214.0	236.0	240.0	260.0
DATE :	720427	730110	740517	750512	760611	770413	780619	791229	800221
2ND HIGHEST:	353.0	308.0	250.0	173.0	271.0	153.0	215.0	236.0	180.0
DATE :	720521	730609	740628	750822	760406	770425	780905	790825	800720
# OF READINGS EXCEEDING 260 :	6	3	0	0	3	0	0	0	0
# OF READINGS EXCEEDING 150 :	17	7	14	5	11	2	7	9	5
RANGE									
0- 65:	19	7	7	17	9	11	8	4	8
66-130:	19	38	30	27	31	30	18	16	25
131-195:	13	8	18	9	9	3	7	9	10
196-260:	3	1	4	0	5	1	4	4	1
261-325:	4	2	0	0	3	0	0	0	0
326-390:	2	1	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SAROAD STATION # 13000 SITE ID # 13
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	43
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	384.0
DATE :	******	******	******	******	******	******	******	******	800709
2ND HIGHEST:	******	******	******	******	******	******	******	******	309.0
DATE :	******	******	******	******	******	******	******	******	800624
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	5
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	23
RANGE									
0- 65:	0	0	0	0	0	0	0	0	2
66-130:	0	0	0	0	0	0	0	0	9
131-195:	0	0	0	0	0	0	0	0	23
196-260:	0	0	0	0	0	0	0	0	3
261-325:	0	0	0	0	0	0	0	0	5
326-390:	0	0	0	0	0	0	0	0	1
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SARDAD STATION # 14000 SITE ID # 14
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	23
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	577.0
DATE :	******	******	******	******	******	******	******	******	800625
2ND HIGHEST:	******	******	******	******	******	******	******	******	436.0
DATE :	******	******	******	******	******	******	******	******	800524
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	5
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	18
RANGE									
0- 65:	0	0	0	0	0	0	0	0	0
66-130:	0	0	0	0	0	0	0	0	2
131-195:	0	0	0	0	0	0	0	0	6
196-260:	0	0	0	0	0	0	0	0	9
261-325:	0	0	0	0	0	0	0	0	1
326-390:	0	0	0	0	0	0	0	0	3
391-455:	0	0	0	0	0	0	0	0	1
>455:	0	0	0	0	0	0	0	0	1

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SARDAD STATION # 15000 SITE ID # 15
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	34
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	733.0
DATE :	******	******	******	******	******	******	******	******	800716
2ND HIGHEST:	******	******	******	******	******	******	******	******	612.0
DATE :	******	******	******	******	******	******	******	******	800702
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	17
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	28
RANGE									
0- 65:	0	0	0	0	0	0	0	0	0
66-130:	0	0	0	0	0	0	0	0	3
131-195:	0	0	0	0	0	0	0	0	8
196-260:	0	0	0	0	0	0	0	0	6
261-325:	0	0	0	0	0	0	0	0	7
326-390:	0	0	0	0	0	0	0	0	4
391-455:	0	0	0	0	0	0	0	0	1
>455:	0	0	0	0	0	0	0	0	5

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - EAST CHICAGO, IL
SAROAD STATION # 16000 SITE ID # 16
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	0	0	44
GEOMETRIC MEAN:	******	******	******	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	******	******
1ST HIGHEST:	******	******	******	******	******	******	******	******	371.0
DATE :	******	******	******	******	******	******	******	******	800716
2ND HIGHEST:	******	******	******	******	******	******	******	******	346.0
DATE :	******	******	******	******	******	******	******	******	800627
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	5
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	0	0	25
RANGE									
0- 65:	0	0	0	0	0	0	0	0	0
66-130:	0	0	0	0	0	0	0	0	8
131-195:	0	0	0	0	0	0	0	0	20
196-260:	0	0	0	0	0	0	0	0	11
261-325:	0	0	0	0	0	0	0	0	2
326-390:	0	0	0	0	0	0	0	0	3
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
J + L STEEL - EAST CHICAGO, IL
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	151180001		151180003		151180004		151180006		13000		14000	
SITE ID #	1		2		3		4		13		14	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	5	1	1	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	341.	330.	269.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	4	5	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	342.	287.	0.	0.	0.	0.	0.	0.
NE COUNT:	1	1	2	2	3	5	1	1	0	0	1	1
AVE TSP:	265.	313.	302.	346.	311.	290.	300.	271.	0.	0.	309.	337.
ENE COUNT:	0	0	3	1	1	0	0	0	0	0	0	0
AVE TSP:	0.	0.	316.	375.	264.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	5	0	1	0	0	0	2	0	1
AVE TSP:	0.	0.	0.	344.	0.	463.	0.	0.	0.	327.	0.	384.
ESE COUNT:	0	1	1	3	0	1	0	1	1	1	1	1
AVE TSP:	0.	313.	329.	328.	0.	314.	0.	308.	309.	298.	436.	577.
SE COUNT:	0	0	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	271.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	1	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	349.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	2	0	0	1	1	2	0	0	0	0	0	0
AVE TSP:	333.	0.	0.	393.	374.	385.	0.	0.	0.	0.	0.	0.
SSW COUNT:	0	0	0	1	0	0	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	279.	0.	0.	0.	0.	0.	279.	0.	0.
SW COUNT:	0	0	0	0	0	0	1	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	386.	0.	0.	0.	0.	0.
WSW COUNT:	0	1	0	1	1	3	0	1	0	0	0	0
AVE TSP:	0.	269.	0.	445.	305.	301.	0.	295.	0.	0.	0.	0.
W COUNT:	0	0	0	0	1	4	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	287.	328.	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	0	1	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	295.	0.	0.	432.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	1	1	3	4	0	0	0	0	0	0
AVE TSP:	0.	0.	276.	266.	277.	409.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	1	1	1	0	0	0	1	0	1
AVE TSP:	0.	0.	0.	265.	286.	342.	0.	0.	0.	265.	0.	352.
ALL COUNT:	3	3	9	16	20	29	3	3	1	5	2	4
AVE TSP:	310.	298.	311.	339.	318.	333.	318.	291.	309.	299.	373.	413.

24-HR STANDARD EXCEEDANCE ROSE FOR
J + L STEEL - EAST CHICAGO, IL
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	15000		16000	
SITE ID #	15		16	
DIRECTION	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NNE COUNT:	0	0	0	1
AVE TSP:	0.	0.	0.	281.
NE COUNT:	2	2	2	1
AVE TSP:	589.	392.	328.	335.
ENE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
E COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
ESE COUNT:	0	1	0	0
AVE TSP:	0.	284.	0.	0.
SE COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
SSE COUNT:	0	1	0	0
AVE TSP:	0.	312.	0.	0.
S COUNT:	0	2	0	1
AVE TSP:	0.	569.	0.	371.
SSW COUNT:	0	1	0	0
AVE TSP:	0.	391.	0.	0.
SW COUNT:	0	1	0	0
AVE TSP:	0.	283.	0.	0.
WSW COUNT:	0	3	0	0
AVE TSP:	0.	318.	0.	0.
W COUNT:	0	2	0	0
AVE TSP:	0.	316.	0.	0.
WNW COUNT:	0	1	0	0
AVE TSP:	0.	598.	0.	0.
NW COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NNW COUNT:	0	1	0	0
AVE TSP:	0.	341.	0.	0.
ALL COUNT:	2	15	2	3
AVE TSP:	589.	375.	328.	329.

24-HR STANDARD EXCEEDANCE ROSE FOR
J + L STEEL - EAST CHICAGO, IL
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	151180001		151180003		151180004		151180006		13000		14000	
SITE ID #	1		2		3		4		13		14	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	2	1	0	4	9	5	4	2	0	0	0	0
AVE TSP:	170.	193.	0.	185.	274.	220.	215.	199.	0.	0.	0.	0.
NNE COUNT:	4	1	2	0	10	9	2	3	0	0	0	1
AVE TSP:	193.	164.	195.	0.	251.	245.	211.	164.	0.	0.	0.	210.
NE COUNT:	2	7	6	8	6	9	1	6	1	0	2	2
AVE TSP:	228.	192.	223.	238.	256.	258.	300.	207.	193.	0.	266.	268.
ENE COUNT:	4	3	5	6	2	6	3	3	0	1	0	0
AVE TSP:	191.	170.	285.	235.	230.	190.	217.	157.	0.	174.	0.	0.
E COUNT:	0	2	0	11	0	6	0	4	0	3	0	2
AVE TSP:	0.	179.	0.	273.	0.	258.	0.	210.	0.	276.	0.	298.
ESE COUNT:	0	1	1	4	4	3	0	2	1	1	1	1
AVE TSP:	0.	313.	329.	285.	205.	268.	0.	272.	309.	298.	436.	577.
SE COUNT:	1	2	4	4	2	2	0	1	0	1	0	0
AVE TSP:	183.	200.	186.	209.	240.	234.	0.	166.	0.	168.	0.	0.
SSE COUNT:	4	1	4	4	1	1	2	2	1	2	0	2
AVE TSP:	196.	152.	220.	199.	233.	202.	197.	189.	154.	207.	0.	252.
S COUNT:	9	3	9	11	7	8	3	2	1	4	0	2
AVE TSP:	220.	193.	204.	203.	224.	247.	176.	208.	192.	187.	0.	223.
SSW COUNT:	4	1	8	4	5	6	2	2	0	1	0	1
AVE TSP:	180.	194.	195.	235.	174.	174.	213.	203.	0.	279.	0.	161.
SW COUNT:	1	5	3	5	5	6	2	0	0	2	0	1
AVE TSP:	158.	186.	172.	179.	171.	197.	275.	0.	0.	171.	0.	170.
WSW COUNT:	3	5	2	4	5	10	2	2	0	1	0	1
AVE TSP:	185.	196.	196.	249.	211.	233.	183.	225.	0.	164.	0.	174.
W COUNT:	1	3	2	3	9	12	0	2	0	1	0	1
AVE TSP:	159.	162.	179.	188.	212.	239.	0.	191.	0.	180.	0.	230.
WNW COUNT:	1	1	1	3	5	8	1	2	0	0	0	0
AVE TSP:	204.	240.	295.	204.	203.	222.	228.	232.	0.	0.	0.	0.
NW COUNT:	0	4	1	2	6	13	0	3	0	0	0	0
AVE TSP:	0.	181.	276.	244.	248.	254.	0.	158.	0.	0.	0.	0.
NNW COUNT:	0	2	1	5	2	15	1	1	0	2	0	1
AVE TSP:	0.	209.	232.	213.	220.	202.	177.	177.	0.	249.	0.	352.
ALL COUNT:	36	42	49	78	82	119	23	37	4	19	3	15
AVE TSP:	196.	190.	216.	226.	224.	229.	213.	197.	212.	215.	323.	264.

24-HR STANDARD EXCEEDANCE ROSE FOR
J + L STEEL - EAST CHICAGO, IL
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	15000		16000	
SITE ID #	15		16	
DIRECTION	W>=X	W<X	W>=X	W<X
N COUNT:	0	1	0	1
AVE TSP:	0.	254.	0.	175.
NNE COUNT:	0	0	1	1
AVE TSP:	0.	0.	218.	281.
NE COUNT:	3	3	2	3
AVE TSP:	443.	324.	328.	261.
ENE COUNT:	0	1	0	1
AVE TSP:	0.	206.	0.	184.
E COUNT:	0	0	0	2
AVE TSP:	0.	0.	0.	209.
ESE COUNT:	1	1	1	1
AVE TSP:	176.	284.	156.	256.
SE COUNT:	0	0	0	1
AVE TSP:	0.	0.	0.	197.
SSE COUNT:	0	2	0	1
AVE TSP:	0.	270.	0.	202.
S COUNT:	1	3	1	1
AVE TSP:	163.	451.	163.	371.
SSW COUNT:	0	2	0	2
AVE TSP:	0.	238.	0.	184.
SW COUNT:	0	2	0	1
AVE TSP:	0.	253.	0.	176.
WSW COUNT:	0	3	0	2
AVE TSP:	0.	318.	0.	208.
W COUNT:	0	2	0	2
AVE TSP:	0.	316.	0.	212.
WNW COUNT:	0	1	0	1
AVE TSP:	0.	558.	0.	248.
NW COUNT:	0	0	0	0
AVE TSP:	0.	0.	0.	0.
NNW COUNT:	0	2	0	0
AVE TSP:	0.	278.	0.	0.
ALL COUNT:	5	23	5	20
AVE TSP:	334.	319.	239.	225.

UPDATED AIR QUALITY EVALUATION - J&L STEEL, EAST CHICAGO, INDIANA

Stations used in update:

Continued operation:	#1, #2, #3, #4
New stations:	#13,* #14,* #15,* #16* (all 1979)
Discontinued stations:	#13, #14, #15, #16 (all 1979)

Trends in geometric means:

The cyclic pattern in running 12-month geometric means established earlier continues. The curves for stations #1, #2, #3, and #4 are essentially in phase with a general tendency for station #3 to have highest values, and stations #1, #2, and #4 much closer to each other and substantially below values for station #3.

Stations #1 and #2 evidenced a slight negative overall trend (Spearman correlation coefficients of -0.31 and -0.22, respectively). Stations #3 and #4 evidenced a slight positive trend (Spearman correlation coefficients of 0.24 and 0.18, respectively). However, visual inspection argues for essentially no trends. Insufficient information is available to determine the reason for the values at stations #1, #2, and #3 being higher in 1980 than in the early part of 1979.

Stations #13, #14, #15, and #16 had not been in service sufficiently long to generate suitable data to evaluate trends.

Attainment status:

Where adequate data exists, stations #1, #2, #3, and #4 are not in attainment of primary TSP standards. Stations #13, #14, #15, and #16, despite their short period of record, also indicate nonattainment of the primary 24-hour standard.

Pollution roses:

Among the continuing monitors, station #2 appears to be best situated to isolate contributions from the J&L facility. Stations #13 and #14 are also well placed to depict this impact. However, strict isolation depends upon relatively infrequent wind directions.

Patterns established in pre-1978 data essentially remain except that substantial TSP levels no longer seem to occur with northwesterly winds.

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* Special study sites.

Standard exceedance roses:

Of 120 recorded excursions beyond primary 24-hour TSP standards at the stations discussed above, only 42 occurred under wind conditions deemed to be steady. At station #2, nine primary excursions occurred under steady winds. Five of these were associated with wind directions that largely involved the J & L facility; an additional excursion occurred under conditions that would involve the Inland Steel facility.

Of the special study sites, station #14 best differentiates the impacts of the two mills. One excursion at this site largely involved the J & L facility; the other excursion under steady winds largely involved the Inland Steel facility.

BaP:

As part of the special study conducted by EPA Region V, BaP was measured at stations #13, #14, #15, and #16 for 5 days in July 1979. The results were divided into "downwind," "with wind," and "background" categories. Downwind days were defined as having the 24-hour average wind direction within $\pm$ 10° of the station orientation from the plant. With wind days had four or more hours within $\pm$ 10°, while background days had winds away from the station for the entire day. The results are summarized below:

	Downwind Station	With Wind Station	Background Station
Range (ng/m^3)	1.0-13.1	0.4-2.7	0.1-1.6
Geometric Mean	4.4	1.4	0.3

JONES & LAUGHLIN STEEL

Pittsburgh, Pennsylvania

EPA Region III

Hi-Vol Monitoring Sites - J & L Steel, Pittsburgh, PA

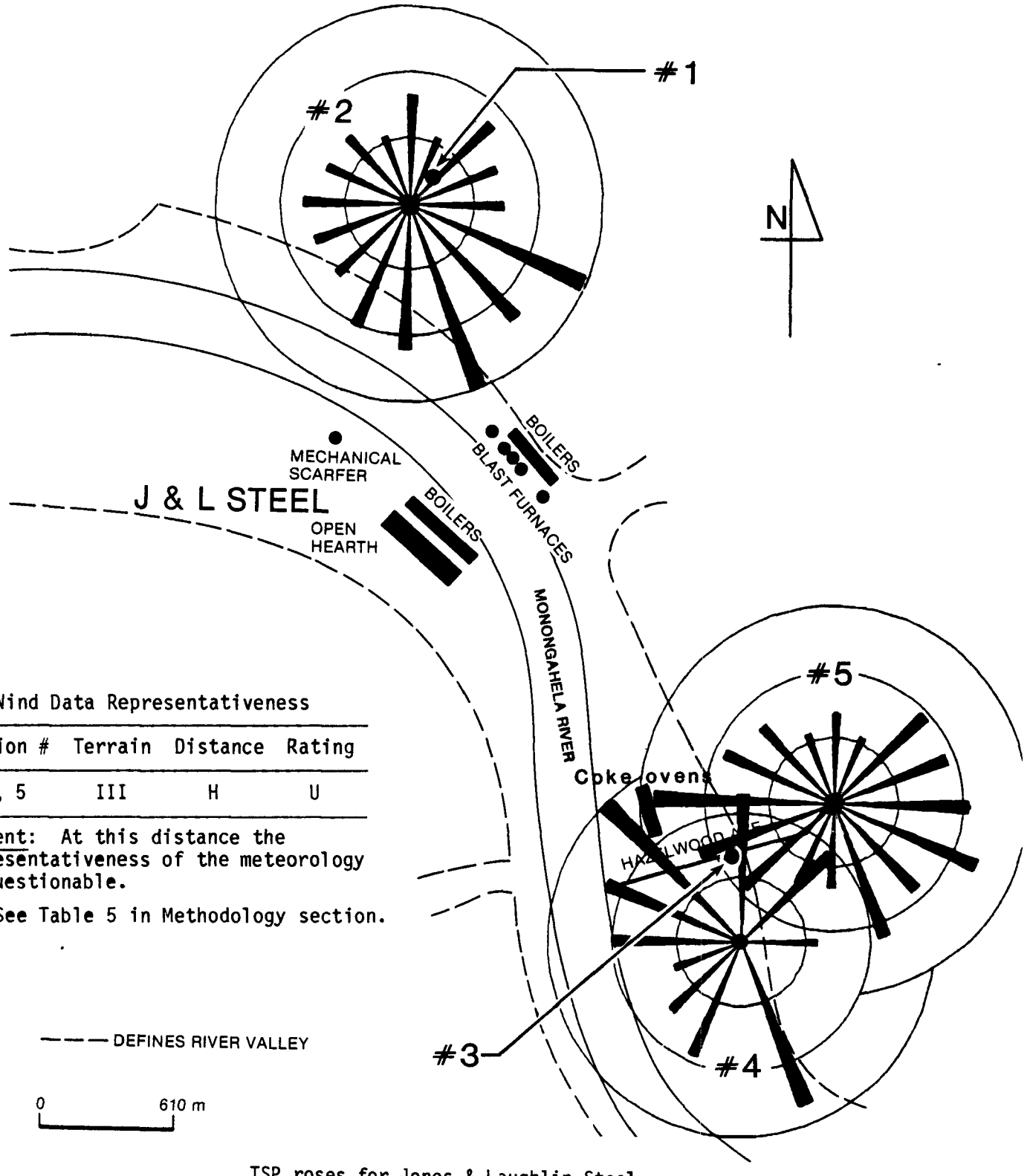
	SAROAD #	Site Name	Plant Location from Site: Bearing (clockwise)	Plant Location from Site: Distance (km)	Elevation: Height of Hi-Vol Inlet Above Ground (m)	Elevation: Elevation Diff. Site-Plant (m)	Site Description	Nearest Roadway: Name	Nearest Roadway: Direction/Distance (m)	Nearest Roadway: Volume
								All traffic flow data are simulated counts.		
#1	397260006G01	Oakland (old site)	Rest of Plant From 198° To 160° Blast Furnaces 160°	 1.2 3.0 1.4	13	49 coke ovens 52 rest of mill	building roof (gravel)	McKee Pl. Forbes Ave. 5th Ave. Blvd. of the Allies Parkway East	NNE/153 ESE/6 NW/116 S/366 SSW/610	paved road, moderate traffic paved road, moderate traffic paved road, moderate traffic 11,606 vehicles/day paved road, heavy traffic 20,780 vehicles/day paved road, heavy traffic 42,462 vehicles/day
#2	397260027G01	Oakland (new site) 3333 Forbes Ave.	Rest of Plant From 197° To 159° Blast Furnaces 159°	 1.1 2.9 1.3	16	49 coke ovens 52 rest of mill	building roof (gravel)	 Forbes Ave 5th Ave Blvd. of the Allies Parkway East	NE/5 SE/9 NW/11 NW/92 S/275 SSW/488	paved drive light traffic paved road, moderate traffic paved drive, light traffic paved road, mod. traffic, 11,606 vehicles/day paved road, heavy traffic, 20,780 vehicles/day paved road, heavy traffic, 42,462 vehicles/day

(continued)

Hi-Vol Monitoring Sites - J & L Steel, Pittsburgh, PA (continued)

	SAROAD #	Site Name	Plant Location from Site: Bearing (clockwise)	Distance (km)	Elevation: Height of Hi-Vol Inlet Above Ground (m)	Elevation Diff. Site-Plant (m)	Site Description	Nearest Roadway: Name	Direction/Distance (m)	Volume
#3	397260012G01	Hazelwood (old site)* Hazelwood and Second Ave.	Coke Ovens 292°	0.5	10	6 coke ovens 9 rest of mill	building roof (asphalt paper)	Hazelwood Ave Second Ave	N/8 W/3	paved road, light traffic paved road, mod. traffic
			Open Hearth 315°	2.0						
			Mechanical Scarfer 317°	2.7						
			Blast Furnace 332°	2.1						
#4	397260004G01	Hazelwood (new site) 5001 Second Ave.	Coke Ovens 320°	0.7	4	3 coke ovens 6 rest of mill	trailer roof (asphalt roof with raised metal grate)	Second Ave	SW/15 ENE/31	paved road, light traffic paved road, mod. traffic
			Open Hearth 320°	2.3						
			Mechanical Scarfer 320°	3.0						
			Blast Furnace 334°	2.4						
#5	397260022G01	Hazelwood 2 327 Hazelwood Ave. (Gladstone High School)	Coke Ovens 265°	.87	4.5	291	61	Trailer roof	Hazelwood Ave.	91
			Open Hearth 300°	1.85						
			Mechanical Scarfer 316°	2.35						
			Blast Furnace 317°	1.83						

* Denotes critical site



Wind Data Representativeness

Station #	Terrain	Distance	Rating
1, 4, 5	III	H	U

Comment: At this distance the representativeness of the meteorology is questionable.

N.B. See Table 5 in Methodology section.

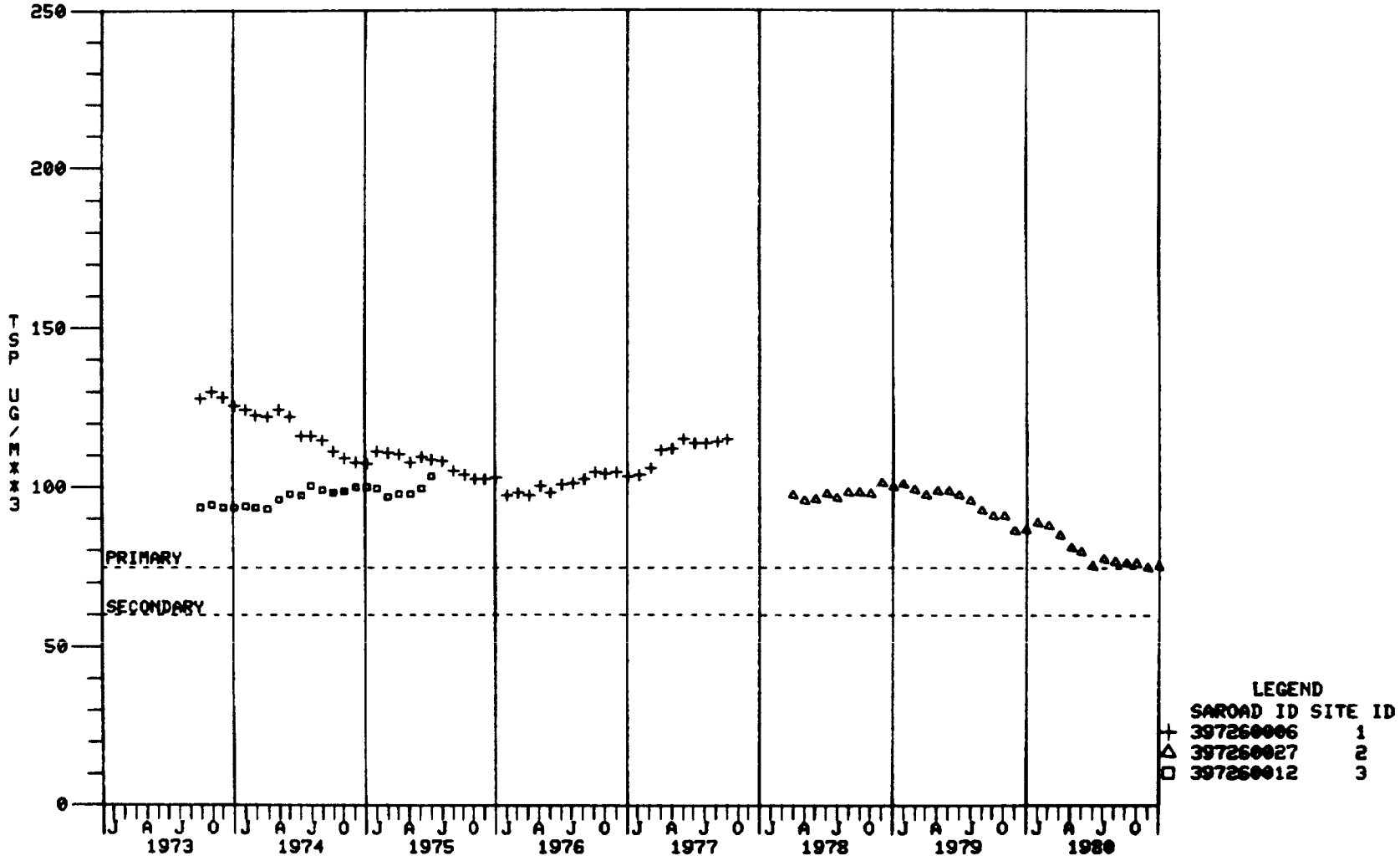
TSP roses for Jones & Laughlin Steel - Pittsburgh, Pennsylvania, for the period 1978-1980 for cases of $\omega>0.90$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

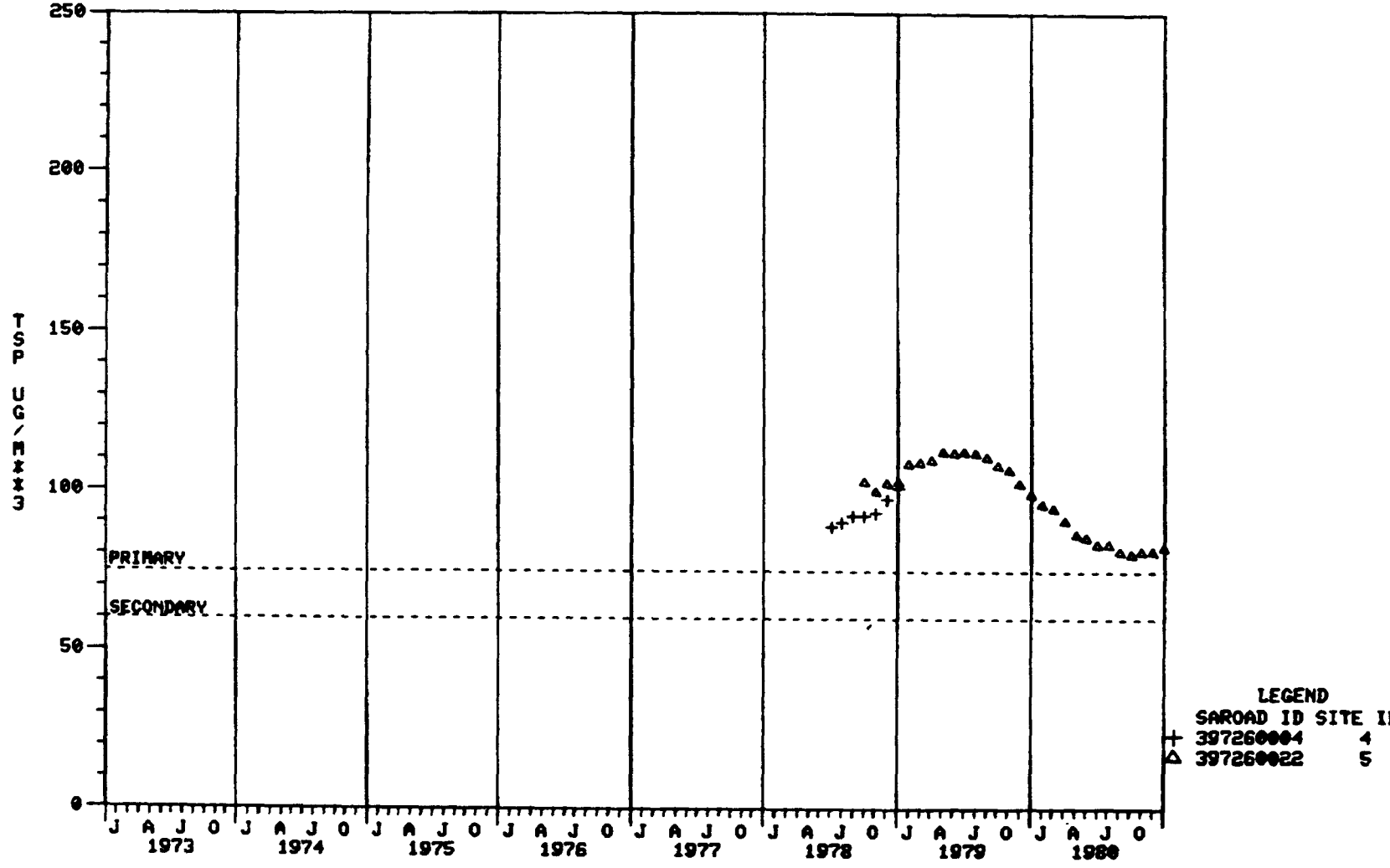
Jones & Laughlin Steel--Pittsburgh, PA

Wind Direction	Monitoring Site Numbers		
	#2	#4	#5
N	6	2	11
NNE	1	0	2
NE	6	3	5
ENE	2	0	1
E	2	1	4
ESE	2	0	6
SE	6	0	6
SSE	6	1	6
S	2	0	3
SSW	7	2	8
SW	10	1	9
WSW	8	3	9
W	16	5	27
WNW	6	2	11
NW	7	2	9
NNW	2	0	4
Total	89	22	121

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J & L STEEL - PITTSBURGH, PA



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J & L STEEL - PITTSBURGH, PA



TSP DATA SUMMARY FOR J & L STEEL - PITTSBURGH, PA
SARDAD STATION # 397260006 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	57	77	113	116	48	0	0	0
GEOMETRIC MEAN:	******	125.7	107.3	102.9	103.6	******	******	******	******
GEOMETRIC S.D.:	******	1.5	1.5	1.5	1.5	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	386.5	373.1	325.9	358.4	******	******	******	******
1ST HIGHEST:	******	249.0	327.0	386.0	263.0	347.0	******	******	******
DATE :	******	731025	740411	750109	760415	770418	******	******	******
2ND HIGHEST:	******	225.0	279.0	229.0	250.0	326.0	******	******	******
DATE :	******	730719	741011	750801	760418	770212	******	******	******
# OF READINGS EXCEEDING 260 :	0	0	2	1	1	5	0	0	0
# OF READINGS EXCEEDING 150 :	0	18	19	23	29	15	0	0	0
RANGE									
0- 65:	0	4	11	13	17	4	0	0	0
66-130:	0	24	43	73	61	21	0	0	0
131-195:	0	23	19	20	33	14	0	0	0
196-260:	0	5	2	5	4	4	0	0	0
261-325:	0	0	1	0	1	3	0	0	0
326-390:	0	0	1	1	0	2	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - PITTSBURGH, PA
SAROAD STATION # 397260027 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	62	115	57	61
GEOMETRIC MEAN:	******	******	******	******	******	******	100.0	85.4	75.1
GEOMETRIC S.D.:	******	******	******	******	******	******	1.6	1.5	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	405.0	298.7	267.7
1ST HIGHEST:	******	******	******	******	******	242.0	267.0	249.0	168.0
DATE :	******	******	******	******	******	770715	780228	790220	801123
2ND HIGHEST:	******	******	******	******	******	199.0	259.0	213.0	162.0
DATE :	******	******	******	******	******	771025	781104	790322	800725
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	1	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	8	23	5	2
RANGE									
0- 65:	0	0	0	0	0	11	23	14	22
66-130:	0	0	0	0	0	35	61	34	33
131-195:	0	0	0	0	0	14	23	6	6
196-260:	0	0	0	0	0	2	7	3	0
261-325:	0	0	0	0	0	0	1	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - PITTSBURGH, PA
SAROAD STATION # 397260012 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	244	98	18	0	0	0	0	0
GEOMETRIC MEAN:	******	93.7	100.1	******	******	******	******	******	******
GEOMETRIC S.D.:	******	1.5	1.5	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	322.6	336.5	******	******	******	******	******	******
1ST HIGHEST:	******	331.0	402.0	211.0	******	******	******	******	******
DATE :	******	731023	740216	750307	******	******	******	******	******
2ND HIGHEST:	******	305.0	278.0	183.0	******	******	******	******	******
DATE :	******	730904	741110	750124	******	******	******	******	******
# OF READINGS EXCEEDING 260 :	0	4	4	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	29	15	2	0	0	0	0	0
RANGE									
0- 65:	0	48	14	1	0	0	0	0	0
66-130:	0	147	59	13	0	0	0	0	0
131-195:	0	36	21	3	0	0	0	0	0
196-260:	0	9	0	1	0	0	0	0	0
261-325:	0	3	3	0	0	0	0	0	0
326-390:	0	1	0	0	0	0	0	0	0
391-455:	0	0	1	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - PITTSBURGH, PA
SAROAD STATION # 397260004 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	12	0	0	29	54	0	0
GEOMETRIC MEAN:	******	******	******	******	******	******	100.8	******	******
GEOMETRIC S.D.:	******	******	******	******	******	******	1.5	******	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	360.8	******	******
1ST HIGHEST:	******	******	196.0	******	******	116.0	215.0	******	******
DATE :	******	******	740403	******	******	771230	780228	******	******
2ND HIGHEST:	******	******	188.0	******	******	114.0	210.0	******	******
DATE :	******	******	740410	******	******	771025	780429	******	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	4	0	0	0	12	0	0
RANGE									
0- 65:	0	0	1	0	0	7	10	0	0
66-130:	0	0	5	0	0	22	26	0	0
131-195:	0	0	5	0	0	0	16	0	0
196-260:	0	0	1	0	0	0	2	0	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - PITTSBURGH, PA
SAROAD STATION # 397260022 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	96	116	111
GEOMETRIC MEAN:	******	******	******	******	******	******	102.4	98.7	82.2
GEOMETRIC S.D.:	******	******	******	******	******	******	1.6	1.5	1.4
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	385.0	346.5	226.6
1ST HIGHEST:	******	******	******	******	******	******	343.0	285.0	182.0
DATE :	******	******	******	******	******	******	781104	790322	800726
2ND HIGHEST:	******	******	******	******	******	******	315.0	220.0	165.0
DATE :	******	******	******	******	******	******	780908	790421	800623
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	4	1	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	21	21	4
RANGE									
0- 65:	0	0	0	0	0	0	15	20	30
66-130:	0	0	0	0	0	0	56	69	71
131-195:	0	0	0	0	0	0	20	23	10
196-260:	0	0	0	0	0	0	1	3	0
261-325:	0	0	0	0	0	0	3	1	0
326-390:	0	0	0	0	0	0	1	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

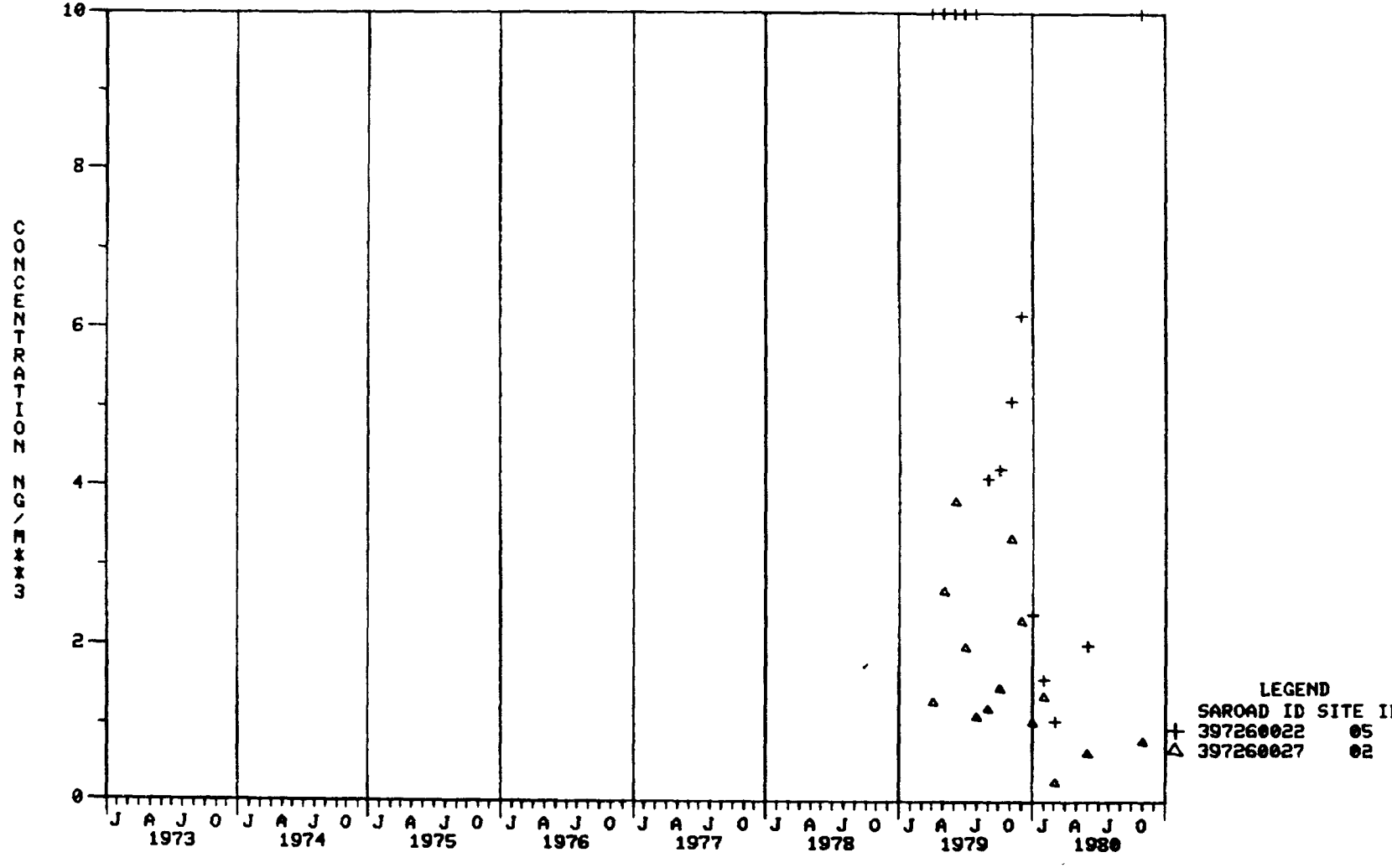
24-HR STANDARD EXCEEDANCE RCSE FOR
J & L STEEL - PITTSBURGH, PA
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

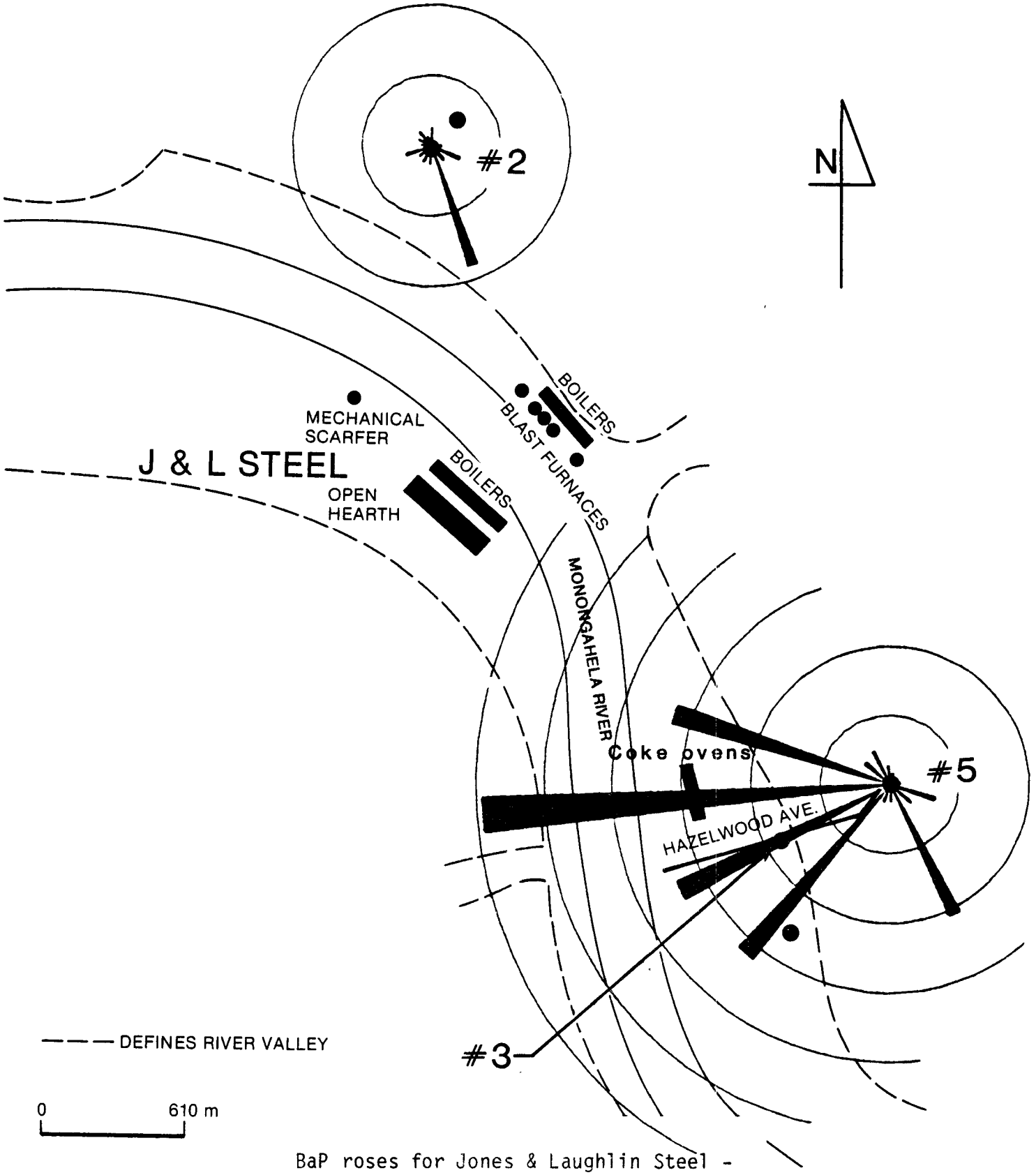
SAROAD #	397260006		397260027		397260012		397260004		397260022	
SITE ID #	1		2		3		4		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	292.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	402.	0.	0.	0.	0.
ESE COUNT:	0	2	0	0	0	3	0	0	0	1
AVE TSP:	0.	334.	0.	0.	0.	285.	0.	0.	0.	285.
SE COUNT:	0	1	0	0	0	1	0	0	0	1
AVE TSP:	0.	327.	0.	0.	0.	331.	0.	0.	0.	291.
SSE COUNT:	0	0	0	1	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	267.	0.	0.	0.	0.	0.	0.
S COUNT:	0	2	0	0	0	0	0	0	0	1
AVE TSP:	0.	314.	0.	0.	0.	0.	0.	0.	0.	290.
SSW COUNT:	0	1	0	0	0	1	0	0	0	0
AVE TSP:	0.	279.	0.	0.	0.	270.	0.	0.	0.	0.
SW COUNT:	1	1	0	0	0	0	0	0	0	0
AVE TSP:	273.	263.	0.	0.	0.	0.	0.	0.	0.	0.
WSW COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
W COUNT:	0	1	0	0	0	0	0	0	1	0
AVE TSP:	0.	386.	0.	0.	0.	0.	0.	0.	315.	0.
WNW COUNT:	0	0	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	267.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	343.
NNW COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	1	8	0	1	0	8	0	0	1	4
AVE TSP:	273.	319.	0.	267.	0.	302.	0.	0.	315.	302.

24-HR STANDARD EXCEEDANCE ROSE FOR
J & L STEEL - PITTSBURGH, PA
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SARDAD #	397260006		397260027		397260012		397260004		397260022	
SITE ID #	1		2		3		4		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	2	1	1	0	0	0	1	0	1
AVE TSP:	0.	191.	192.	199.	0.	0.	0.	169.	0.	161.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	2	0	0	1	0
AVE TSP:	0.	0.	0.	0.	0.	161.	0.	0.	178.	0.
ENE COUNT:	0	3	0	1	0	3	0	1	0	1
AVE TSP:	0.	178.	0.	197.	0.	203.	0.	164.	0.	163.
E COUNT:	0	4	0	1	0	4	0	0	1	3
AVE TSP:	0.	166.	0.	156.	0.	241.	0.	0.	179.	175.
ESE COUNT:	1	7	0	2	1	4	0	0	1	3
AVE TSP:	190.	231.	0.	211.	235.	258.	0.	0.	161.	198.
SE COUNT:	2	5	2	2	0	2	0	1	0	3
AVE TSP:	202.	204.	164.	191.	0.	249.	0.	196.	0.	208.
SSE COUNT:	1	3	3	4	0	1	0	1	2	2
AVE TSP:	217.	196.	210.	158.	0.	179.	0.	215.	169.	189.
S COUNT:	1	13	3	4	0	3	0	1	0	4
AVE TSP:	163.	192.	188.	198.	0.	177.	0.	180.	0.	206.
SSW COUNT:	2	15	0	5	0	3	0	1	0	3
AVE TSP:	161.	193.	0.	175.	0.	209.	0.	185.	0.	174.
SW COUNT:	7	8	1	2	0	3	1	0	1	4
AVE TSP:	191.	206.	158.	163.	0.	231.	177.	0.	173.	159.
WSW COUNT:	4	10	0	2	1	3	0	2	0	5
AVE TSP:	174.	175.	0.	162.	248.	187.	0.	173.	0.	180.
W COUNT:	3	3	2	1	0	1	2	0	8	0
AVE TSP:	203.	242.	174.	178.	0.	186.	164.	0.	201.	0.
WNW COUNT:	1	4	0	0	1	4	1	1	1	0
AVE TSP:	153.	171.	0.	0.	192.	191.	155.	167.	152.	0.
NW COUNT:	1	3	0	1	5	1	0	3	0	2
AVE TSP:	163.	182.	0.	259.	175.	174.	0.	188.	0.	263.
NNW COUNT:	1	0	0	0	4	0	0	0	0	0
AVE TSP:	170.	0.	0.	0.	191.	0.	0.	0.	0.	0.
ALL COUNT:	24	80	12	26	12	34	4	12	15	31
AVE TSP:	184.	194.	185.	188.	193.	210.	165.	182.	186.	189.

BAP MONTHLY ARITHMETIC MEANS (NG/M**3) FOR J & L STEEL - PITTSBURGH, PA





BaP roses for Jones & Laughlin Steel - Pittsburgh, Pennsylvania, for the period 1978-1980 for cases of $\omega > 0.80$. Each circle represents 4 ng/m^3.

UPDATED AIR QUALITY EVALUATION - J&L STEEL, PITTSBURGH, PENNSYLVANIA

Stations used in update:

Continued operation:	None
New stations:	#2 (1977), #4 (1977), #5 (1978)
Discontinued stations:	#1 (1977), #3 (1975)

Trends in geometric means:

Strong downward trends are noted at stations #2 and #5 that have Spearman rank correlation coefficients of -0.83 and -0.79, respectively.

Attainment status:

Stations #2, #4, and #5 indicate primary standard nonattainment for the years 1978-1980.

Pollution roses:

Stations #2 and #4 indicate the best defined impact of the mill.

Standard exceedance roses:

At station #2, the one excursion over the primary 24-hour standard occurred with a south-southeast wind that blows from the mill toward the station. However, the wind on this day was not highly persistent from this direction. Only one of the five excursions over the primary standard at station #5 occurred with a northwest wind blowing from the mill to the station.

BaP:

BaP was sampled at stations #2 and #5. Monthly values for station #2 were generally lower than those for station #5. The BaP pollution rose for station #5 indicates that the highest contributions came from the direction of the J&L coking operation. Station #2 also indicates impact from the plant, but at substantially reduced values.

JONES & LAUGHLIN STEEL

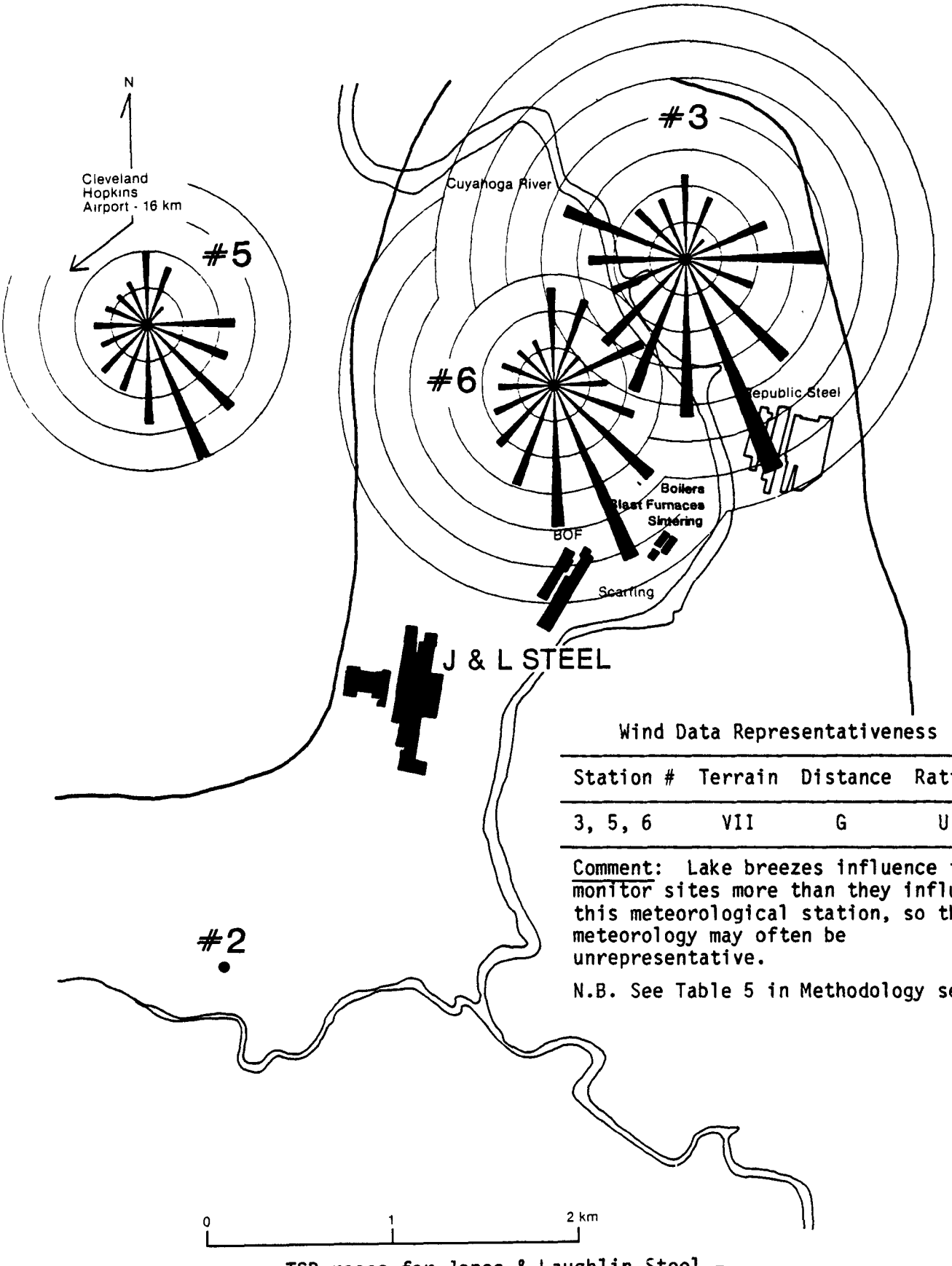
Cleveland, Ohio

EPA Region V

Hi-Vol Monitoring Sites in the Vicinity of Jones and Laughlin Corporation - Cleveland, Ohio

	SAROAD #	Site Name and Address	Plant Location from Site: Bearing	Distance (km)	Elevation in Meters: Above Ground	MSL	Plant	Site Description	Nearest Roadway: Name	Direction/Distance		Volume
X #1	36-1300-008-H01	Fire Station #13 4749 Broadway Avenue Cleveland, Ohio	BOF 251° Scarfing 242° Blast furnaces 248° Sintering 248° Boilers 248°	2.1 2.2 1.4 1.4 1.4	12	221	38	Rooftop Urban Commercial Industrial	Broadway Ave	SW	9 m	2 lane moderate to heavy
#2	36-1300-009-H01	Brooklyn YMCA 3881 West 25th Street Cleveland, Ohio	BOF 40° Scarfing 48° Blast furnaces 48° Sintering 48° Boilers 48°	2.6 2.4 3.2 3.2 3.2	15 before 1/11/75 4.5 after 4/11/75	222 212	40 29	Rooftop Urban Commercial Industrial	W 25th Street	W	30 m	4 lane moderate to heavy
#3	36-1300-013-H01	Air Pollution Control Laboratory 2785 Broadway Avenue Cleveland, Ohio	BOF 203° Scarfing 198° Blast furnaces 182° Sintering 182° Boilers 182°	1.9 2.2 1.6 1.6 1.6	6	186	3	Rooftop Industrial	Broadway Ave Railroad	SSW N	30 m 152 m	2 lane moderate to heavy. Local truck traffic 2 tracks
X #4	36-1300-026-H01	Harvard Yards 4150 East 49th Street Cleveland, Ohio	BOF 326° Scarfing 322° Blast furnaces 340° Sintering 340° Boilers 340°	2.9 2.6 2.7 2.7 2.7	4.5	218	35	Elevated Platform Parking lot Commercial	Railroad	S	122 m	2 tracks
#5	36-1300-027-H01	Paul L Dunbar Elementary School 2200 West 28th Street Cleveland, Ohio	BOF 123° Scarfing 129° Blast furnaces 113° Sintering 113° Boilers 113°	2.5 2.8 3.0 3.0 3.0	7.5	215	32.5	Rooftop Urban Residential	Railroad	SE	0.35km	multiple tracks in line between steel mills and monitoring location.
#6	36-1300-038-H01	St Theodosius Church 2547 St. Tikhon Avenue Cleveland, Ohio	BOF 180° Scarfing 177° Blast furnaces 143° Sintering 143° Boilers 143°	1.1 1.5 1.2 1.2 1.2	4.5	210	27	Rooftop Urban Residential	No major nearby roadways. Site overlooks steel facilities to the South and East.			
X #7	36-1300-041-H01	Washington Park Horticultural School 3875 Washington Park Cleveland, Ohio	BOF 311° Scarfing 303° Blast furnaces 328° Sintering 328° Boilers 328°	2.3 2.0 2.0 2.0 2.0	7.5	216	33.5	Rooftop Residential	Willow Freeway	E	0.3km	4 lane moderate to heavy

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.



Wind Data Representativeness

Station #	Terrain	Distance	Rating
3, 5, 6	VII	G	U

Comment: Lake breezes influence these monitor sites more than they influence this meteorological station, so the meteorology may often be unrepresentative.

N.B. See Table 5 in Methodology sectio

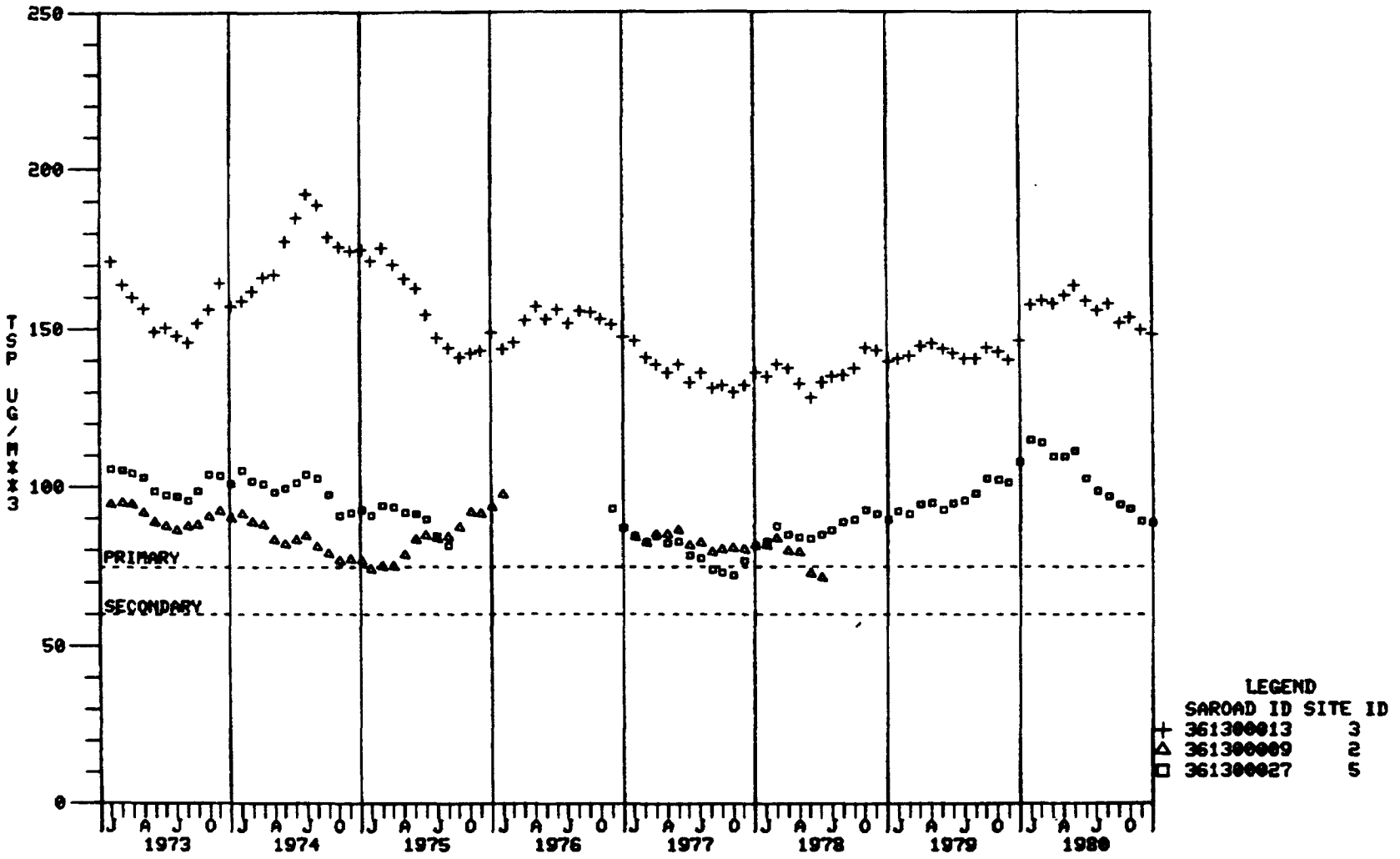
TSP roses for Jones & Laughlin Steel - Cleveland, Ohio, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

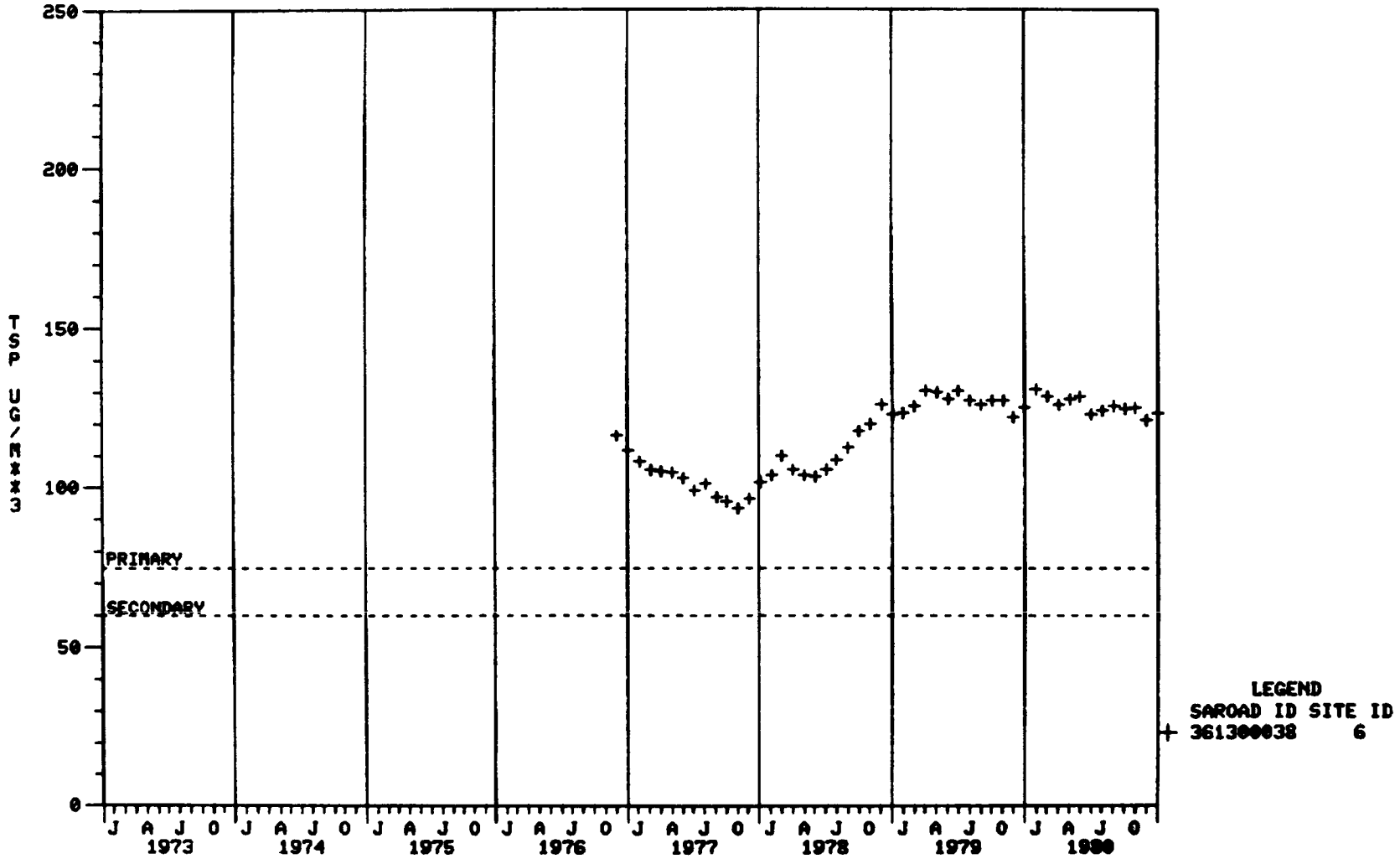
Jones & Laughlin Steel--Cleveland, OH

Wind Direction	Monitoring Site Numbers #3	#5	#6
N	4	3	3
NNE	4	5	5
NE	1	1	1
ENE	2	0	2
E	1	1	1
ESE	1	1	1
SE	2	2	2
SSE	9	8	9
S	18	14	17
SSW	15	12	14
SW	21	19	21
WSW	9	8	9
W	5	4	5
WNW	3	4	4
NW	3	3	3
NNW	5	4	5
Total	103	89	102

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J & L STEEL - CLEVELAND, OH



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J & L STEEL - CLEVELAND, OH



TSP DATA SUMMARY FOR J & L STEEL - CLEVELAND, OH
SAROAD STATION # 361300009 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	93	85	68	51	115	89	13	0	0
GEOMETRIC MEAN:	94.7	90.2	76.4	93.4	******	81.2	******	******	******
GEOMETRIC S.D.:	1.6	1.6	1.5	1.6	******	1.6	******	******	******
HIGHEST BY LARSEN EXTRP:	406.2	369.3	276.1	389.6	******	310.1	******	******	******
1ST HIGHEST:	309.0	359.0	159.0	284.0	406.0	276.0	227.0	******	******
DATE :	720524	730227	740517	750524	760602	770531	780309	******	******
2ND HIGHEST:	238.0	292.0	155.0	194.0	269.0	212.0	159.0	******	******
DATE :	720412	730416	740105	750512	760622	770326	780219	******	******
# OF READINGS EXCEEDING 260 :	1	2	0	1	2	1	0	0	0
# OF READINGS EXCEEDING 150 :	15	11	2	7	14	7	2	0	0
RANGE									
0- 65:	26	21	21	9	34	31	7	0	0
66-130:	43	47	38	30	60	44	4	0	0
131-195:	18	12	9	11	17	10	1	0	0
196-260:	5	3	0	0	2	3	1	0	0
261-325:	1	1	0	1	1	1	0	0	0
326-390:	0	1	0	0	0	0	0	0	0
391-455:	0	0	0	0	1	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - CLEVELAND, OH
SAROAD STATION # 361300013 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	75	76	72	67	179	85	64	64	61
GEOMETRIC MEAN:	169.9	157.1	174.9	148.8	147.2	135.9	139.6	145.0	148.3
GEOMETRIC S.D.:	1.7	1.8	1.8	1.7	1.7	1.7	1.9	1.7	1.6
HIGHEST BY LARSEN EXTRP:	854.0	900.7	943.7	690.3	668.4	677.5	964.1	653.1	617.9
1ST HIGHEST:	407.0	592.0	534.0	383.0	618.0	660.0	473.0	368.0	694.0
DATE :	720506	730416	740529	751208	760322	770531	780526	790918	801024
2ND HIGHEST:	353.0	353.0	509.0	340.0	379.0	350.0	384.0	352.0	347.0
DATE :	720527	730925	740606	750517	760608	770823	781011	790620	800110
# OF READINGS EXCEEDING 260 :	19	18	19	11	23	8	11	9	5
# OF READINGS EXCEEDING 150 :	50	44	46	34	90	35	34	33	31
RANGE									
0- 65:	6	5	4	5	11	9	7	3	4
66-130:	12	21	18	22	62	34	19	25	19
131-195:	22	19	10	17	49	15	13	16	22
196-260:	16	13	21	12	34	19	14	11	11
261-325:	15	15	11	7	16	3	6	4	3
326-390:	3	2	5	4	6	4	4	5	1
391-455:	1	0	1	0	0	0	0	0	0
>455:	0	1	2	0	1	1	1	0	1

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - CLEVELAND, OH
SAROAD STATION # 361300027 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	62	84	69	29	147	89	55	51	53
GEOMETRIC MEAN:	108.8	101.0	92.4	******	87.1	81.5	89.6	107.8	88.8
GEOMETRIC S.D.:	1.7	1.8	1.9	******	1.9	1.8	1.7	1.7	1.7
HIGHEST BY LARSEN EXTRP:	544.9	587.4	633.6	******	539.3	443.3	421.2	483.2	424.5
1ST HIGHEST:	279.0	284.0	321.0	374.0	344.0	307.0	311.0	272.0	235.0
DATE :	720822	730407	740821	750128	760622	771109	780526	790322	800110
2ND HIGHEST:	276.0	253.0	300.0	236.0	333.0	262.0	275.0	267.0	230.0
DATE :	720831	730913	740411	750524	760420	770218	781104	790912	800328
# OF READINGS EXCEEDING 250 :	3	1	4	1	5	2	2	2	0
# OF READINGS EXCEEDING 150 :	19	21	17	8	27	14	9	17	9
RANGE									
0- 65:	13	21	24	11	48	31	16	9	19
66-130:	25	31	24	9	57	39	25	23	28
131-195:	14	18	11	7	30	10	12	12	13
196-260:	7	13	6	1	7	7	0	5	3
261-325:	3	1	4	0	3	2	2	2	0
326-390:	0	0	0	1	2	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J & L STEEL - CLEVELAND, OH
SAROAD STATION # 361300038 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	3	28	145	74	66	65	61
GEOMETRIC MEAN:	******	******	******	******	111.8	101.7	122.9	125.2	123.3
GEOMETRIC S.D.:	******	******	******	******	1.9	1.8	1.7	1.7	1.7
HIGHEST BY LARSEN EXTRP:	******	******	******	******	687.5	577.0	544.5	637.9	614.5
1ST HIGHEST:	******	******	207.0	402.0	392.0	378.0	444.0	403.0	357.0
DATE :	******	******	741231	750617	760513	770531	780526	790322	801024
2ND HIGHEST:	******	******	140.0	337.0	369.0	303.0	369.0	335.0	302.0
DATE :	******	******	741219	750524	760820	770330	781104	790620	800110
# OF READINGS EXCEEDING 260 :	0	0	0	4	15	3	3	7	4
# OF READINGS EXCEEDING 150 :	0	0	1	11	49	19	23	25	25
RANGE									
0- 65:	0	0	1	2	27	18	8	9	9
66-130:	0	0	0	11	55	31	32	28	19
131-195:	0	0	1	9	39	13	12	11	20
196-260:	0	0	1	2	9	9	11	10	9
261-325:	0	0	0	2	10	2	1	5	3
326-390:	0	0	0	1	4	1	1	1	1
391-455:	0	0	0	1	1	0	1	1	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
J & L STEEL - CLEVELAND, OH
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	361300013		361300009		361300027		361300038	
SITE ID #	3		2		5		6	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	4	0	0	0	0	0	1
AVE TSP:	0.	295.	0.	0.	0.	0.	0.	269.
NNE COUNT:	1	3	1	0	0	3	0	2
AVE TSP:	305.	316.	359.	0.	0.	282.	0.	370.
NE COUNT:	1	0	1	0	2	1	0	2
AVE TSP:	277.	0.	406.	0.	311.	270.	0.	323.
ENE COUNT:	0	3	0	1	0	0	0	2
AVE TSP:	0.	280.	0.	284.	0.	0.	0.	310.
E COUNT:	0	1	0	0	0	1	0	1
AVE TSP:	0.	473.	0.	0.	0.	311.	0.	444.
ESE COUNT:	2	2	0	0	0	1	0	0
AVE TSP:	301.	332.	0.	0.	0.	374.	0.	0.
SE COUNT:	1	1	0	0	0	0	1	0
AVE TSP:	303.	281.	0.	0.	0.	0.	321.	0.
SSE COUNT:	14	3	0	1	4	1	4	2
AVE TSP:	340.	273.	0.	269.	253.	344.	329.	322.
S COUNT:	15	2	1	1	2	0	7	2
AVE TSP:	335.	488.	292.	276.	292.	0.	321.	346.
SSW COUNT:	16	4	0	0	0	1	3	3
AVE TSP:	304.	306.	0.	0.	0.	275.	295.	333.
SW COUNT:	8	5	0	0	0	1	0	3
AVE TSP:	315.	321.	0.	0.	0.	262.	0.	289.
WSW COUNT:	0	10	0	0	0	0	0	2
AVE TSP:	0.	308.	0.	0.	0.	0.	0.	289.
W COUNT:	1	4	0	0	0	0	0	0
AVE TSP:	271.	391.	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	1	0	0	0	0	0	0
AVE TSP:	0.	349.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	2	0	0	0	0	0	1
AVE TSP:	0.	500.	0.	0.	0.	0.	0.	292.
ALL COUNT:	59	45	3	3	8	9	15	21
AVE TSP:	321.	333.	352.	276.	297.	298.	318.	323.

24-HR STANDARD EXCEEDANCE ROSE FOR
J & L STEEL - CLEVELAND, OH
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	361300013		361300009		361300027		361300038	
SITE ID #	3		2		5		6	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	2	10	1	1	1	4	2	4
AVE TSP:	173.	236.	183.	191.	180.	218.	197.	228.
NNE COUNT:	4	11	4	7	2	9	3	7
AVE TSP:	212.	234.	219.	200.	199.	228.	184.	244.
NE COUNT:	2	3	2	2	3	1	1	3
AVE TSP:	218.	227.	322.	170.	279.	270.	153.	266.
ENE COUNT:	1	7	0	3	0	7	1	9
AVE TSP:	155.	220.	0.	202.	0.	209.	195.	214.
E COUNT:	1	4	0	0	0	4	0	4
AVE TSP:	191.	268.	0.	0.	0.	215.	0.	252.
ESE COUNT:	2	5	0	0	2	7	1	3
AVE TSP:	301.	263.	0.	0.	223.	220.	187.	223.
SE COUNT:	3	3	0	0	3	3	2	0
AVE TSP:	250.	231.	0.	0.	199.	209.	285.	0.
SSE COUNT:	22	9	0	1	18	10	10	6
AVE TSP:	293.	243.	0.	269.	228.	212.	258.	255.
S COUNT:	37	15	2	3	12	5	22	9
AVE TSP:	261.	236.	222.	221.	200.	203.	240.	241.
SSW COUNT:	46	19	4	0	4	4	21	9
AVE TSP:	246.	207.	182.	0.	177.	196.	210.	244.
SW COUNT:	35	20	0	3	3	6	9	8
AVE TSP:	226.	234.	0.	169.	178.	202.	186.	228.
WSW COUNT:	13	26	0	4	0	5	3	6
AVE TSP:	195.	241.	0.	174.	0.	183.	170.	221.
W COUNT:	4	13	0	2	0	4	1	3
AVE TSP:	228.	247.	0.	160.	0.	195.	183.	160.
WNW COUNT:	5	10	0	2	0	3	0	3
AVE TSP:	172.	204.	0.	194.	0.	160.	0.	168.
NW COUNT:	0	9	0	0	0	0	0	1
AVE TSP:	0.	194.	0.	0.	0.	0.	0.	187.
NNW COUNT:	1	5	0	2	0	2	0	2
AVE TSP:	168.	334.	0.	191.	0.	183.	0.	251.
ALL COUNT:	178	169	13	30	48	74	76	77
AVE TSP:	242.	234.	221.	192.	212.	208.	220.	230.

UPDATED AIR QUALITY EVALUATION - J&L STEEL, CLEVELAND, OHIO

Stations used in update:

Continued operation:	#3, #5, #6
New stations:	None
Discontinued stations:	#2 (1978)

Trends in geometric means:

No strong trends in TSP levels were observed at any of the stations. The long-term Spearman rank correlation coefficient for station #3 indicates a slight downward trend (-0.45). At station #6, which most clearly displays mill impact, the coefficient is +0.74, indicating an upward trend since the station started in 1976. Stations #3 and #6 have very similar shapes for 1977-1980. The difference in coefficient is due solely to data prior to 1976 which are available for #3, but not available for #6. Only a very slight downturn is seen in 1980 at station #6, whereas station #3, which is more greatly impacted by the Republic mill, and station #5, a background site, both show more pronounced downtrends in 1980.

Attainment status:

Stations #3, #5, and #6 show primary standard nonattainment during the period from 1978-1980.

Pollution roses:

Well-defined impact of the mill is indicated by stations #3, #5, and #6. The roses have approximately the same configuration as the previous analysis period. Station #3 indicates a stronger influence of the Republic plant than of the J&L mill.

Standard exceedance roses:

At station #3; the cases of primary 24-hour standard exceedances occurred most frequently from the directions south-southeast, south, and south-southwest, which includes all of the J&L mill as well as the Republic plant. Exceedances occur most frequently at station #6 when the wind blows from the south, the direction of the BOF shop and scarfer.

JONES & LAUGHLIN STEEL

Youngstown, Ohio

EPA Region V

HiVol Monitoring Sites - Jones and Laughlin's Youngstown Sheet and Tube Campbell Works, Ohio

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance (km)	Elevation (meters) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance	Volume
#1	36-7760-005-I09-I01	Fire Station #7 145 Madison Youngstown, Ohio	Open hearths 139° Boilers 135° Coke ovens 137°	6.0 6.5 7.0	10.5	300	44	Rooftop Residential	Elm Street Ohio Edison Power	W 9 m SW 1km	2 lane Moderate
#2	36-7760-004-I01	Fire Station #9 1900 Midlothian Blvd. Youngstown, Ohio	Open hearths 73° Boilers 80° Coke ovens 90°	1.8 2.3 2.4	7.5	326	70	Rooftop Residential Commercial	Midlothian Blvd	S 15 m	2 lane Moderate
X #3	36-7760-003-I01	Fire Station #13 641 Sherwood Avenue Youngstown, Ohio	Open hearths 98° Boilers 98° Coke ovens 101°	6.2 6.8 7.0	9	329	73	Rooftop Residential	Glenwood Ave Sherwood Ave	W 30 m N 20 m	2 lane Light 2 lane Light
#4	36-6480-001-I01-F05	Struthers City Hall 6 Elm Street Struthers, Ohio	Open hearths 326° Boilers 352° Coke ovens 2°	1.2 0.9 0.5	6	274	18	Rooftop Residential	No major roadways Youngstown Sheet & Tube Coking Operations	N 0.5 km	
#5	36-0960-001-F05 I01	Campbell City Hall 351 Tenny Street Campbell, Ohio	Open hearths 203° Boilers 176° Coke ovens 172°	1.2 1.3 1.7	9	326	70	Rooftop Residential	No major roadways Republic Steel J & L's Campbell Works	W 2 km S & SW 1.0 km	

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

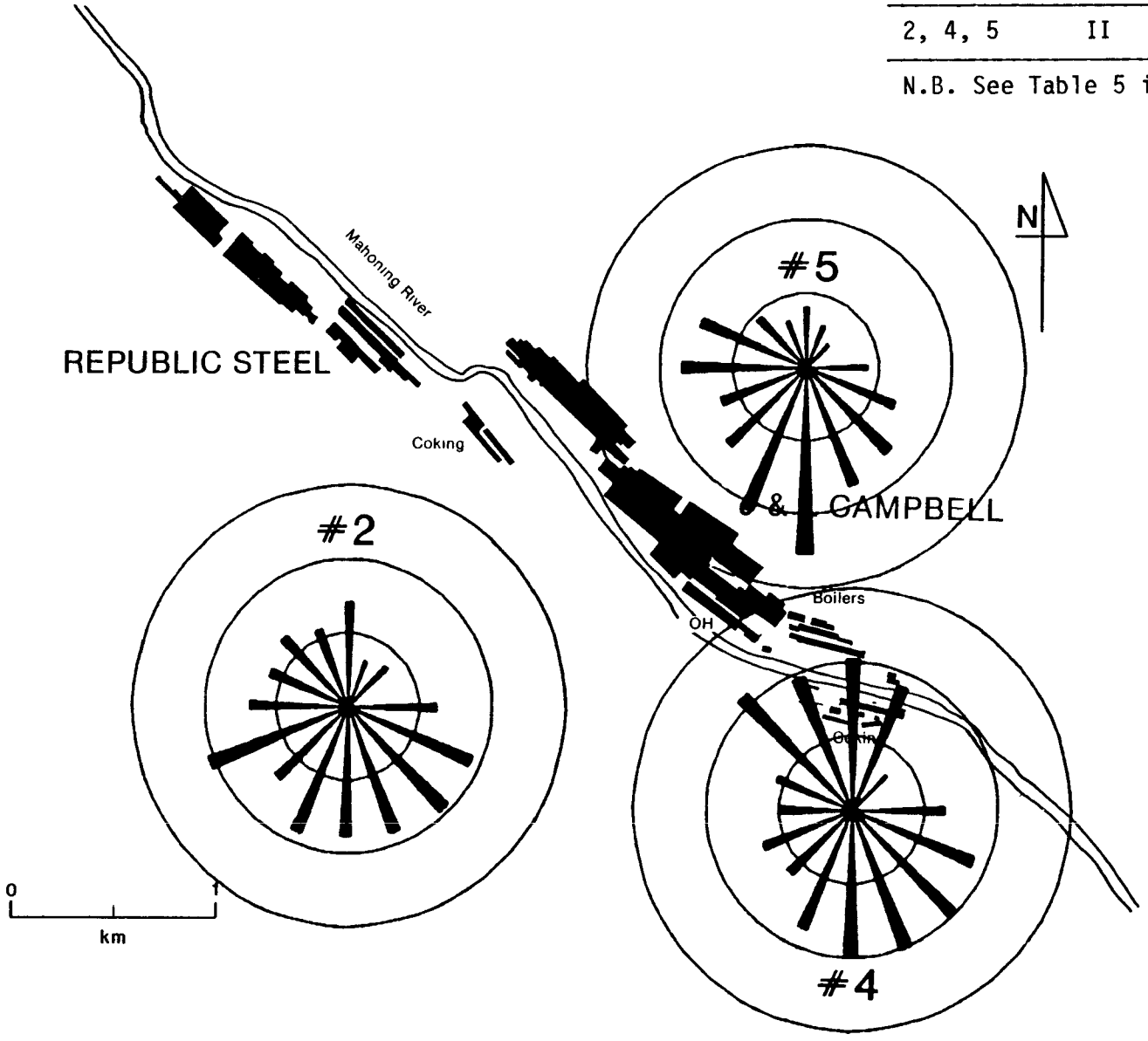
HiVol Monitoring Sites - Jones and Laughlin's Youngstown Sheet and Tube Brier Hill Works - Youngstown, Ohio

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance (km)	Elevation (meters) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance		Volume
#6	36-7760-006-I02-F05	Fire Station #5 1524 Oakland Avenue Youngstown, Ohio	315°	1.6	4.5	294	23	Rooftop Residential Industrial	W. Federal St Oakland Ave U.S. Steel	SW SW SW	100m 30m 0.8 km	2 lane Moderate 4 lane Heavy
#1	36-7760-005-I09-I01	Fire Station #7 145 Madison Youngstown, Ohio	305°	3.7	10.5	300	29	Rooftop Residential	Elm Street Ohio Edison Power	W SW	9m 1 km	2 lane Moderate
#3	36-7760-003-I01	Fire Station #13 641 Sherwood Avenue Youngstown, Ohio	352°	5.9	9	329	58	Rooftop Residential	Glenwood Ave Sherwood Ave	W N	30 m 20 m	2 lane Light 2 lane Light
#7	36-2480-001-I01	Girard City Hall 100 W. Main Street Girard, Ohio	153°	3.5	8	277	6	Rooftop Urban Commercial	W. Main State St. Railroad	S E W	20 m 150 m 100 m	2 lane Moderate 4 lane heavy multiple tracks

Wind Data Representativeness

Station #	Terrain	Distance	Rating
2, 4, 5	II	G	G

N.B. See Table 5 in Methodology section



TSP roses for Jones & Laughlin Steel (Campbell Works)-Youngstown,Ohio for the period 1978-1980 for cases of $\omega>0.90$. Each circle represents $50\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

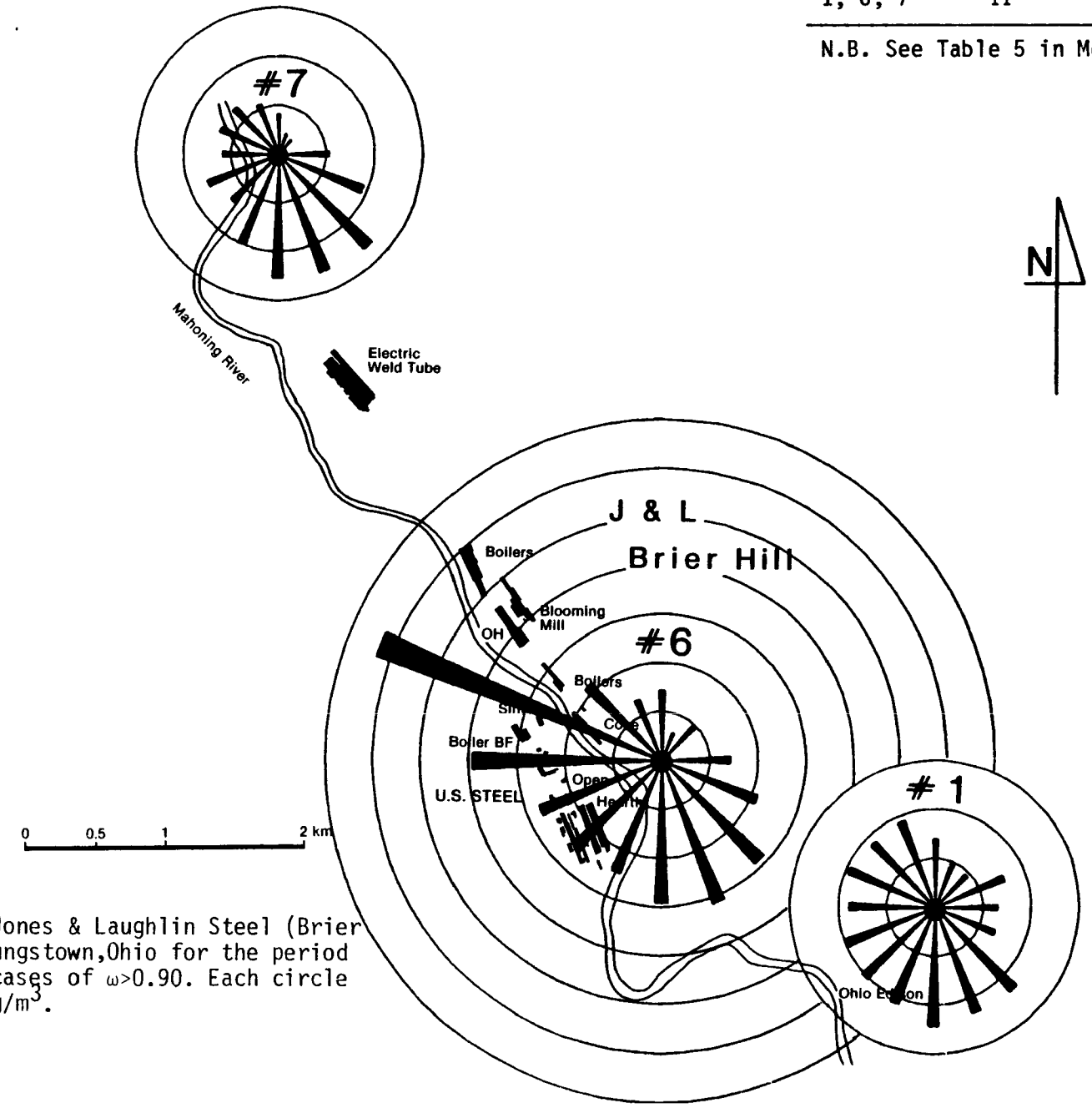
Jones & Laughlin Steel (Campbell Works)--Youngstown, OH

Wind Direction	Monitoring Site Numbers #2	#4	#5
N	1	1	1
NNE	1	1	1
NE	1	1	1
ENE	0	0	0
E	2	3	3
ESE	2	2	2
SE	9	8	8
SSE	3	3	3
S	5	5	6
SSW	7	7	7
SW	10	10	10
WSW	4	5	5
W	8	9	9
WNW	4	5	5
NW	4	4	4
NNW	2	2	2
Total	63	66	67

Wind Data Representativeness

Station #	Terrain	Distance	Rating
1, 6, 7	II	F	VG-G

N.B. See Table 5 in Methodology section



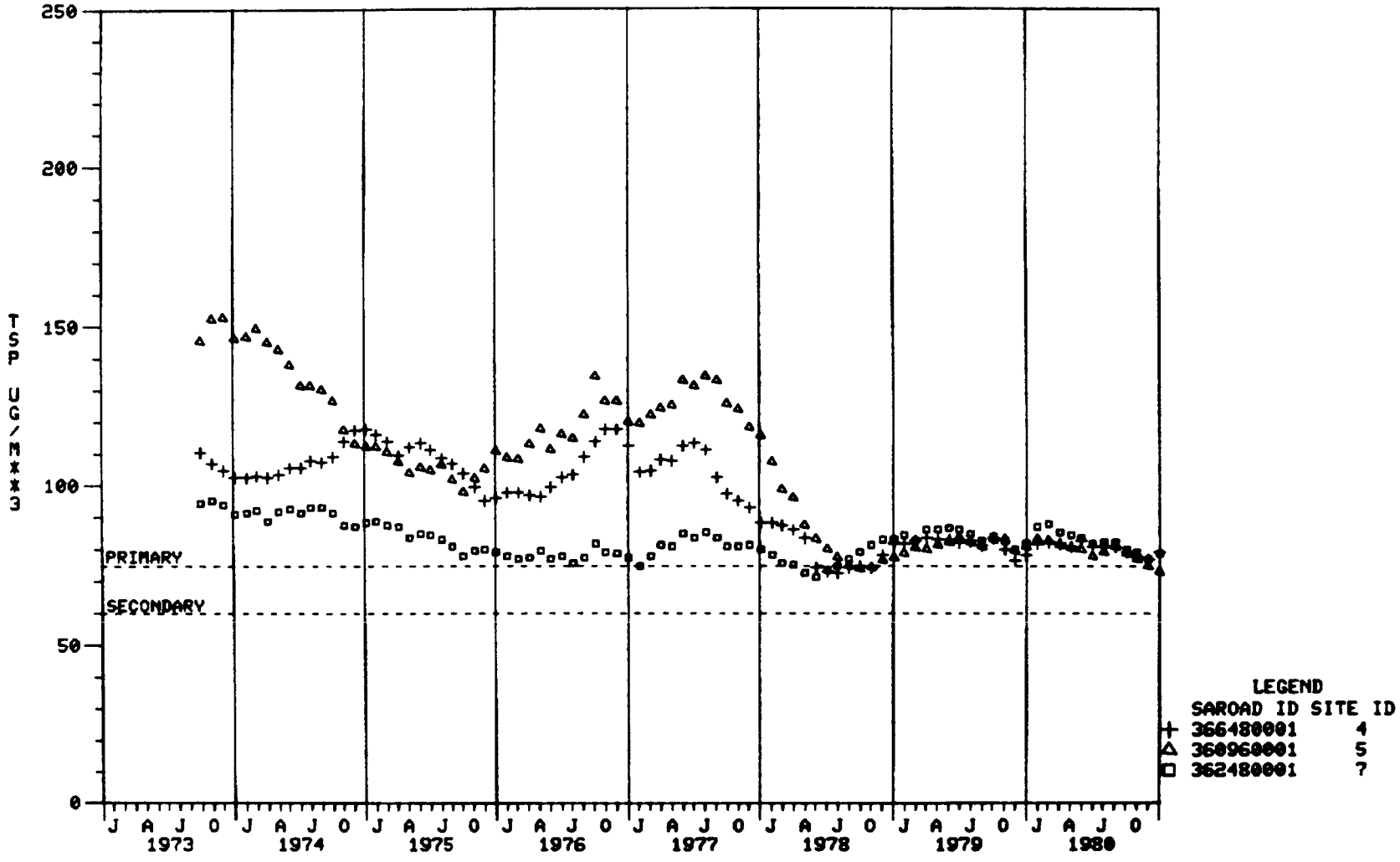
TSP roses for Jones & Laughlin Steel (Brier Hill Works)-Youngstown,Ohio for the period 1978-1980 for cases of ω>0.90. Each circle represents 50$\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

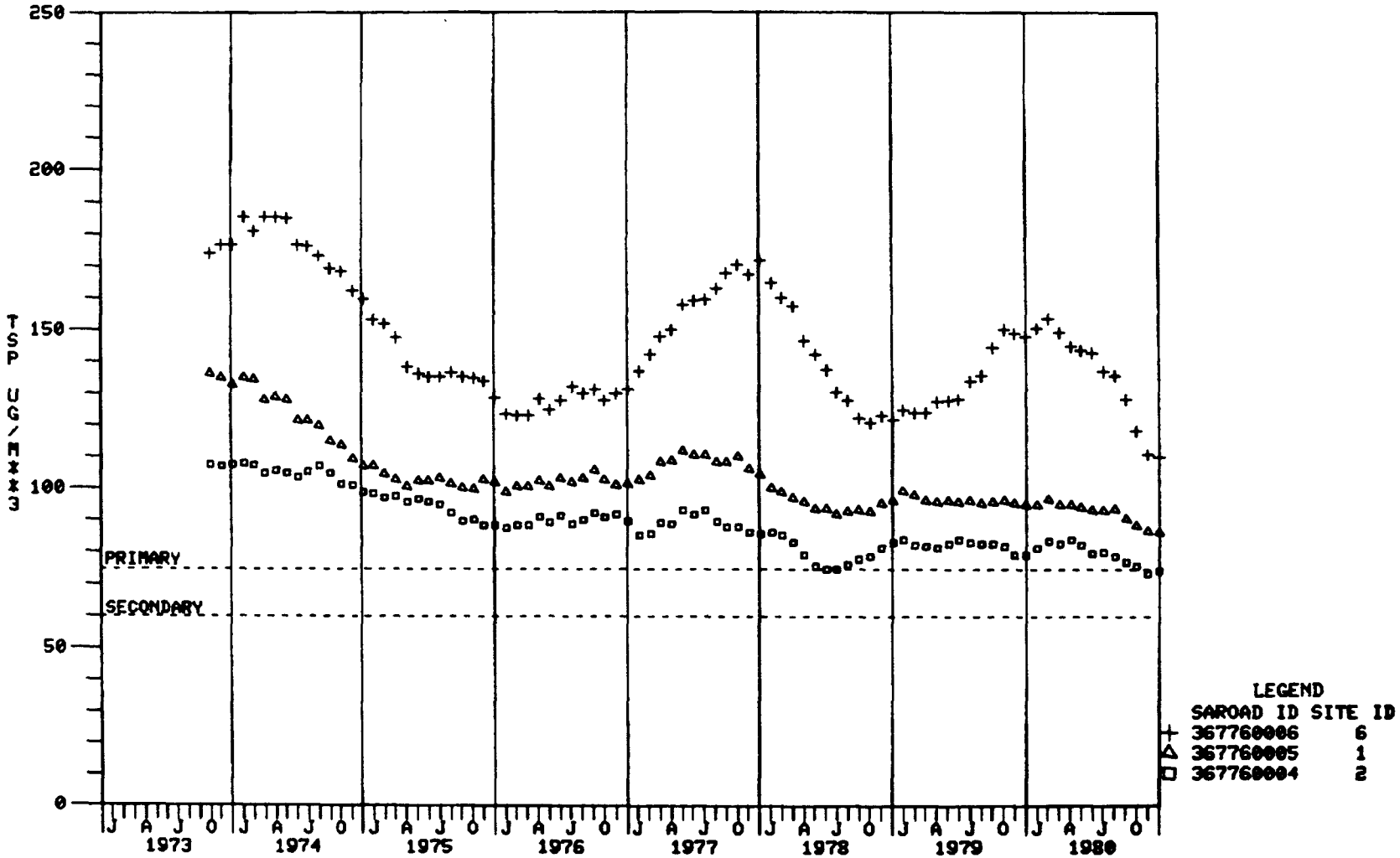
Jones & Laughlin Steel (Brier Hill Works)--Youngstown, OH

Wind Direction	Monitoring Site Numbers #1	#6	#7
N	13	1	1
NNE	6	1	1
NE	7	1	1
ENE	4	0	0
E	10	3	2
ESE	10	2	2
SE	14	9	8
SSE	8	3	3
S	20	6	6
SSW	30	7	7
SW	34	8	9
WSW	20	4	5
W	28	9	9
WNW	18	5	5
NW	17	4	4
NNW	15	2	1
Total	254	65	64

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J + L STEEL - YOUNGSTOWN, OH



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR J + L STEEL - YOUNGSTOWN, OH



TSP DATA SUMMARY FOR J + L STEEL - YOUNGSTOWN, OH
SAROAD STATION # 367760005 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	58	153	244	240	247	244	242	233
GEOMETRIC MEAN:	******	132.1	106.9	101.6	101.1	104.3	96.3	94.6	86.3
GEOMETRIC S.D.:	******	1.5	1.6	1.5	1.6	1.6	1.6	1.5	1.5
HIGHEST BY LARSEN EXTRP:	******	426.2	449.5	376.5	378.4	396.8	395.9	315.5	268.2
1ST HIGHEST:	******	335.0	365.0	383.0	281.0	320.0	257.0	228.0	228.0
DATE :	******	730301	741028	751119	760509	771024	780309	790930	800203
2ND HIGHEST:	******	287.0	241.0	295.0	244.0	319.0	241.0	225.0	205.0
DATE :	******	730302	740105	750514	760513	770329	781102	790306	801120
# OF READINGS EXCEEDING 260 :	0	3	1	8	1	6	0	0	0
# OF READINGS EXCEEDING 150 :	0	20	38	45	46	53	48	28	11
RANGE									
0- 65:	0	3	23	45	42	34	48	44	45
66-130:	0	23	70	136	124	135	126	147	157
131-195:	0	22	48	47	59	60	58	44	29
196-260:	0	7	11	8	14	12	12	7	2
261-325:	0	2	0	7	1	6	0	0	0
326-390:	0	1	1	1	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - YOUNGSTOWN, OH
SAROAD STATION # 367760004 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	54	60	58	59	60	60	55	57
GEOMETRIC MEAN:	******	107.5	98.7	88.2	89.4	85.6	83.0	79.1	74.4
GEOMETRIC S.D.:	******	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.4
HIGHEST BY LARSEN EXTRP:	******	292.1	270.5	215.9	292.2	300.7	261.1	250.2	204.8
1ST HIGHEST:	******	229.0	223.0	159.0	246.0	212.0	209.0	229.0	138.0
DATE :	******	730227	740105	751027	760822	770302	780526	790315	800116
2ND HIGHEST:	******	185.0	187.0	150.0	211.0	194.0	202.0	211.0	130.0
DATE :	******	731212	740821	750124	760418	770531	781104	790509	800403
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	10	4	1	6	6	3	2	0
RANGE									
0- 65:	0	4	6	7	13	18	17	16	17
66-130:	0	33	40	44	37	30	36	34	39
131-195:	0	16	13	7	7	11	5	3	1
196-260:	0	1	1	0	2	1	2	2	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - YOUNGSTOWN, OH
SAROAD STATION # 366480001 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	59	61	54	57	60	60	58	58
GEOMETRIC MEAN:	******	102.3	117.9	95.9	112.8	88.4	81.8	78.3	79.0
GEOMETRIC S.D.:	******	1.6	1.6	1.5	1.8	2.0	1.6	1.6	1.5
HIGHEST BY LARSEN EXTRP:	******	439.7	505.6	347.7	680.5	727.7	349.7	294.5	283.6
1ST HIGHEST:	******	611.0	448.0	287.0	511.0	419.0	234.0	219.0	196.0
DATE :	******	730323	740312	750512	760524	770507	781104	790322	800421
2ND HIGHEST:	******	334.0	306.0	245.0	484.0	419.0	200.0	166.0	173.0
DATE :	******	730227	740204	750313	760518	770525	780526	790720	800527
# OF READINGS EXCEEDING 260 :	0	2	2	1	6	5	0	0	0
# OF READINGS EXCEEDING 150 :	0	12	18	6	16	15	7	5	4
RANGE									
0- 65:	0	11	8	10	10	21	17	21	17
66-130:	0	33	29	32	24	22	33	29	35
131-195:	0	11	13	9	13	8	7	7	5
196-260:	0	2	9	2	4	4	3	1	1
261-325:	0	0	1	1	3	2	0	0	0
326-390:	0	1	0	0	1	0	0	0	0
391-455:	0	0	1	0	0	0	0	0	0
>455:	0	1	0	0	2	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - YOUNGSTOWN, OH
SARDAD STATION # 360960001 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	61	60	58	59	59	61	59	60
GEOMETRIC MEAN:	******	146.3	112.0	110.7	119.8	115.6	77.2	80.7	73.2
GEOMETRIC S.D.:	******	1.8	1.8	1.8	1.9	1.7	1.8	1.5	1.5
HIGHEST BY LARSEN EXTRP:	******	825.8	619.1	587.8	740.7	578.1	430.0	243.5	223.2
1ST HIGHEST:	******	668.0	485.0	367.0	494.0	366.0	294.0	182.0	130.0
DATE :	******	731019	740306	751214	760909	770419	781104	790220	800801
2ND HIGHEST:	******	469.0	376.0	314.0	398.0	302.0	214.0	150.0	127.0
DATE :	******	730416	741119	750418	760903	770531	780414	790322	800726
# OF READINGS EXCEEDING 260 :	0	10	5	4	6	3	1	0	0
# OF READINGS EXCEEDING 150 :	0	27	17	19	20	19	8	1	0
RANGE									
0- 65:	0	4	8	10	10	7	23	18	22
66-130:	0	21	29	27	24	25	26	34	38
131-195:	0	14	13	10	9	15	9	7	0
196-260:	0	12	5	7	10	9	2	0	0
261-325:	0	6	2	3	1	2	1	0	0
326-390:	0	1	2	1	3	1	0	0	0
391-455:	0	1	0	0	1	0	0	0	0
>455:	0	2	1	0	1	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - YOUNGSTOWN, OH
SAROAD STATION # 367760006 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	58	61	59	56	62	59	60	59
GEOMETRIC MEAN:	******	176.3	159.7	128.6	131.2	171.8	121.8	148.0	110.0
GEOMETRIC S.D.:	******	1.6	1.6	1.5	1.7	1.6	1.6	1.5	1.7
HIGHEST BY LARSEN EXTRP:	******	655.8	615.8	395.1	589.7	702.1	486.2	567.0	490.6
1ST HIGHEST:	******	409.0	390.0	368.0	309.0	602.0	354.0	497.0	387.0
DATE :	******	730428	741207	750301	760418	770513	781104	790702	800203
2ND HIGHEST:	******	365.0	387.0	279.0	297.0	460.0	251.0	428.0	302.0
DATE :	******	731106	740318	750512	761120	770302	780327	790906	800128
# OF READINGS EXCEEDING 260 :	0	11	8	3	4	8	1	5	4
# OF READINGS EXCEEDING 150 :	0	38	35	22	25	38	22	28	15
RANGE									
0- 65:	0	2	2	2	8	1	6	2	8
66-130:	0	9	16	29	16	15	24	21	31
131-195:	0	22	24	22	21	20	20	21	14
196-260:	0	14	11	3	7	18	8	11	2
261-325:	0	6	2	2	4	1	0	2	3
326-390:	0	4	6	1	0	3	1	1	1
391-455:	0	1	0	0	0	2	0	1	0
>455:	0	0	0	0	0	2	0	1	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR J + L STEEL - YOUNGSTOWN, OH
SARDAD STATION # 362480001 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	60	60	59	60	61	53	60	59
GEOMETRIC MEAN:	******	90.4	88.4	79.0	77.4	80.0	82.9	81.8	78.5
GEOMETRIC S.D.:	******	1.5	1.6	1.5	1.6	1.6	1.7	1.7	1.6
HIGHEST BY LARSEN EXTRP:	******	319.2	376.9	255.7	297.7	333.5	424.3	398.4	289.3
1ST HIGHEST:	******	233.0	274.0	227.0	203.0	242.0	289.0	272.0	170.0
DATE :	******	731025	741207	751120	760915	770212	781104	790322	800110
2ND HIGHEST:	******	197.0	263.0	182.0	176.0	225.0	173.0	209.0	167.0
DATE :	******	730416	740411	750512	760418	770419	780309	790316	800116
# OF READINGS EXCEEDING 260 :	0	0	2	0	0	0	1	1	0
# OF READINGS EXCEEDING 150 :	0	5	9	2	5	6	7	9	3
RANGE									
0- 65:	0	15	13	22	25	23	19	22	18
66-130:	0	30	34	30	24	29	21	25	33
131-195:	0	13	10	6	10	6	12	9	7
196-260:	0	2	1	1	1	3	0	3	0
261-325:	0	0	2	0	0	0	1	1	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
J + L STEEL - YOUNGSTOWN, OH
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	367760006		367760005		367760004		366480001		360960001		362480001	
SITE ID #	6		1		2		4		5		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	2	2	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	515.	290.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	2	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	397.	419.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	2	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	397.	334.	0.	0.	0.	0.
ENE COUNT:	0	0	0	1	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	267.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	2	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	281.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	1	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	312.	0.	0.	0.	0.	0.	0.	0.	0.	272.
SE COUNT:	1	0	1	1	0	0	0	0	0	0	1	0
AVE TSP:	390.	0.	263.	267.	0.	0.	0.	0.	0.	0.	274.	0.
SSE COUNT:	2	0	0	3	0	0	0	0	3	3	1	0
AVE TSP:	270.	0.	0.	324.	0.	0.	0.	0.	314.	346.	263.	0.
S COUNT:	0	3	2	1	0	0	0	0	2	4	0	1
AVE TSP:	0.	310.	278.	383.	0.	0.	0.	0.	408.	311.	0.	289.
SSW COUNT:	1	2	2	1	0	0	0	1	7	2	0	0
AVE TSP:	287.	326.	327.	261.	0.	0.	0.	287.	383.	387.	0.	0.
SW COUNT:	0	2	3	0	0	0	0	0	5	2	0	0
AVE TSP:	0.	301.	280.	0.	0.	0.	0.	0.	335.	274.	0.	0.
WSW COUNT:	5	2	0	1	0	0	0	0	0	0	0	0
AVE TSP:	353.	298.	0.	281.	0.	0.	0.	0.	0.	0.	0.	0.
W COUNT:	6	5	0	0	0	0	0	0	0	0	0	0
AVE TSP:	332.	361.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	7	8	0	0	0	0	0	0	0	0	0	0
AVE TSP:	353.	381.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	1	4	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	484.	304.	0.	338.	0.	0.
ALL COUNT:	22	22	9	10	0	0	7	9	17	12	2	2
AVE TSP:	338.	347.	292.	299.	0.	0.	443.	315.	360.	328.	269.	281.

24-HR STANDARD EXCEEDANCE ROSE FOR
J + L STEEL - YOUNGSTOWN, OH
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	367760006		367760005		367760004		366480001		360960001		362480001	
SITE ID #	6		1		2		4		5		7	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	3	0	1	0	0	2	7	0	0	0	0
AVE TSP:	0.	182.	0.	187.	0.	0.	515.	226.	0.	0.	0.	0.
NNE COUNT:	1	3	0	1	0	1	3	6	0	0	0	1
AVE TSP:	205.	212.	0.	248.	0.	209.	325.	233.	0.	0.	0.	171.
NE COUNT:	0	1	0	3	0	1	2	3	0	0	0	1
AVE TSP:	0.	166.	0.	167.	0.	229.	397.	229.	0.	0.	0.	173.
ENE COUNT:	0	1	0	5	0	1	0	2	0	0	0	0
AVE TSP:	0.	227.	0.	187.	0.	173.	0.	179.	0.	0.	0.	0.
E COUNT:	0	1	2	4	0	1	0	1	0	0	0	1
AVE TSP:	0.	217.	156.	246.	0.	186.	0.	188.	0.	0.	0.	173.
ESE COUNT:	2	2	4	6	0	1	0	1	0	0	0	1
AVE TSP:	176.	192.	228.	188.	0.	173.	0.	219.	0.	0.	0.	272.
SE COUNT:	6	5	10	14	0	1	0	3	0	0	4	4
AVE TSP:	223.	199.	193.	180.	0.	187.	0.	159.	0.	0.	194.	184.
SSE COUNT:	9	12	9	25	2	3	3	2	6	9	4	5
AVE TSP:	202.	191.	190.	203.	171.	172.	183.	190.	254.	240.	200.	187.
S COUNT:	5	17	11	28	2	4	4	7	5	16	3	9
AVE TSP:	217.	203.	196.	192.	178.	188.	174.	182.	276.	222.	213.	189.
SSW COUNT:	10	11	18	25	1	2	2	2	14	10	2	4
AVE TSP:	195.	219.	201.	187.	178.	190.	174.	244.	302.	246.	195.	175.
SW COUNT:	7	18	23	17	1	1	0	3	14	13	1	1
AVE TSP:	181.	205.	192.	183.	155.	211.	0.	178.	252.	210.	170.	176.
WSW COUNT:	17	16	13	10	5	1	1	0	5	9	2	1
AVE TSP:	241.	201.	190.	192.	181.	153.	166.	0.	207.	192.	183.	171.
W COUNT:	16	16	4	21	1	0	0	2	2	3	0	1
AVE TSP:	252.	254.	189.	170.	162.	0.	0.	189.	194.	205.	0.	163.
WNW COUNT:	9	17	6	10	0	1	0	6	0	2	0	0
AVE TSP:	319.	283.	162.	182.	0.	162.	0.	215.	0.	165.	0.	0.
NW COUNT:	1	12	4	8	0	1	1	5	0	2	0	1
AVE TSP:	186.	188.	163.	199.	0.	152.	171.	190.	0.	180.	0.	180.
NNW COUNT:	0	5	2	5	0	1	6	9	0	1	0	0
AVE TSP:	0.	177.	172.	182.	0.	246.	248.	240.	0.	338.	0.	0.
ALL COUNT:	83	140	106	183	12	20	24	59	46	65	16	30
AVE TSP:	231.	216.	191.	189.	175.	186.	259.	209.	263.	220.	196.	185.

UPDATED AIR QUALITY EVALUATION - J&L STEEL, YOUNGSTOWN, OHIO

Stations used in update:

Continued operation:	#1, #2, #4, #5, #6, #7
New stations:	None
Discontinued stations:	None

Trends in geometric means:

Stations #2, #4, and #5, in the vicinity of the J&L Campbell Works, all had Spearman rank correlation coefficients (-0.91, -0.77, and -0.78, respectively) that indicated strong downward trends in TSP levels. In the vicinity of the Brier Hill Works, station #1 has a Spearman rank correlation coefficient of -0.84, indicating a long-term downtrend. Station #6 has had a series of downward and upward trends.

Attainment status:

All stations showed primary standard nonattainment in 1978 and 1979. However, stations #2 and #5 did not exhibit primary standard violations in 1980.

Pollution roses:

Roses for all stations have configurations similar to those in the previous study; however, the magnitudes of the average concentrations associated with many of the high impact direction sectors are generally lower.

Standard exceedance roses:

Primary standard exceedances associated with persistent winds most frequently occur with winds from the west and west-northwest at station #6; these directions include the Brier Hill coke ovens and the U.S. Steel boilers, sinter, and blast furnaces. The vast majority of the primary exceedance cases at stations #4 and #5 occurred with wind directions from the Campbell Works; in fact, 17 out of the 29 cases occurred with persistent winds (ω>0.90) from these directions (south-southeast through southwest) at station #5.

KAISER STEEL

Fontana, California

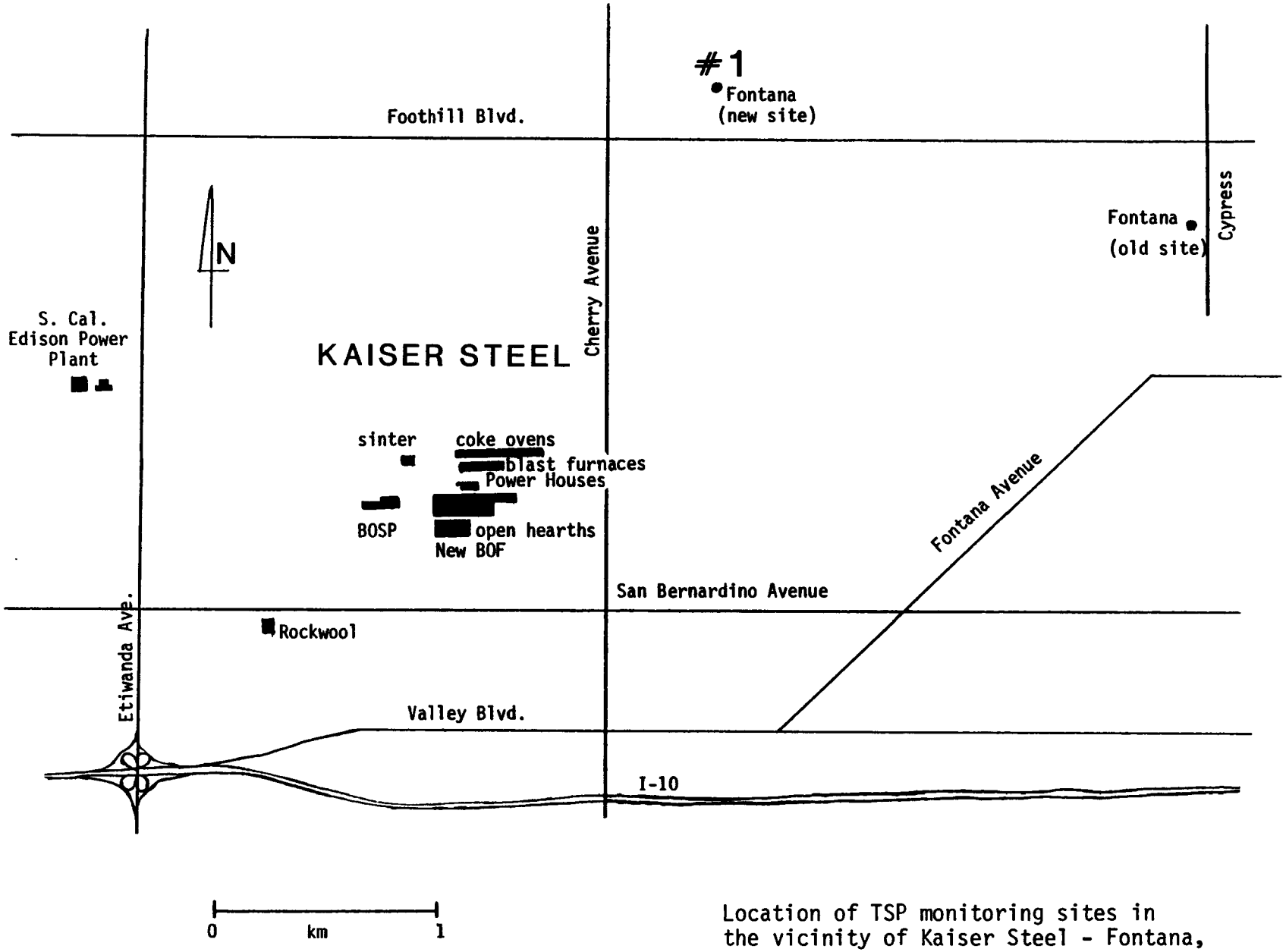
EPA Region IX

HiVol Monitoring Sites in the Vicinity of Kaiser Steel - Fontana, California

		SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance (km)	Elevation (m) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction	Distance (m)	Volume
	#1	052680001	14838 Foothill Blvd. Fontana	210°-221°	2.9-3.6	3	446	111	Trailer roof	Foothill Blvd.	S	350	4 lane Moderate
			8384 Cypress Fontana (before 6/73	249°-255°	5.0-5.9	4	448	113	Building roof	Cypress	E	60	2 lane light
X	#2	055380001	Ontario International Airport, Ontario	74°-77°	10.2-11.1	unknown	291	-44	unknown	unknown			
X	#3	0565350001	Riverside Co. Bldg. 5888 Mission Blvd. Rubidoux	317°-321°	12.2	4	244	-91	Building roof	Mission Blvd.	NE	38	6 lane Heavy
X	#4	056680001	City Hall 172 W. 3rd Street San Bernardino	263°	19.9	28	316	-19	Building roof	3rd 4th Arrowhead Mountain View	S N W E	75 75 75 75	All 4 Lane Moderate
X	#5	058440003	Civic Center 155. D Street Upland	95°	13.8	4	380	45	Building roof	D Street	S	22	2 lane light
X	#6	058440004	Post Office 3rd Street & Arrow Hwy Upland	95°	13.5	6	383	48	Building roof	Arrow Hwy 3rd Street	S W	45 15	4 lane Moderate 2 lane Moderate
X	#7	State site 36-166	Municipal Airport Rialto	241°-245°	9.9	1	433	98	ground-level at edge of airplane parking area	Miro Way	S	12	2 lane Very light

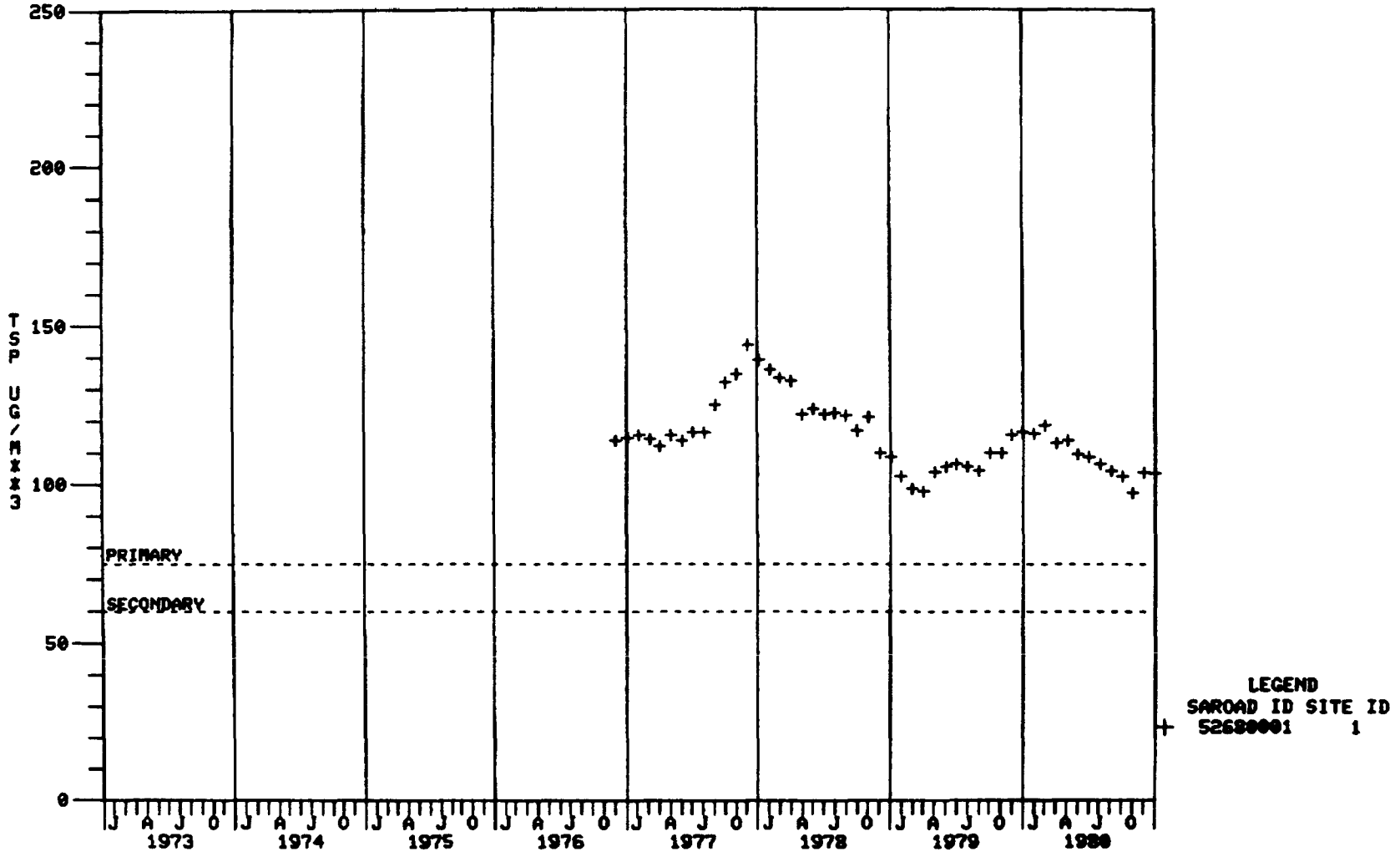
* Critical Site.

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.



Location of TSP monitoring sites in the vicinity of Kaiser Steel - Fontana, California.

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR KAISER STEEL - FONTANA, CA



TSP DATA SUMMARY FOR KAISER STEEL - FONTANA, CA
SAROAD STATION # 052680001 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	47	54	58	60	51
GEOMETRIC MEAN:	******	******	******	******	115.0	139.2	108.7	116.4	103.3
GEOMETRIC S.D.:	******	******	******	******	1.7	1.8	2.0	2.0	2.0
HIGHEST BY LARSEN EXTRP:	******	******	******	******	580.7	844.6	868.3	885.0	800.9
1ST HIGHEST:	******	******	******	******	338.0	288.6	379.0	320.0	417.0
DATE :	******	******	******	******	761003	770218	781005	790912	801006
2ND HIGHEST:	******	******	******	******	319.0	276.0	325.0	279.0	385.0
DATE :	******	******	******	******	760717	771103	780201	790626	801105
# OF READINGS EXCEEDING 260 :	0	0	0	0	3	4	4	4	3
# OF READINGS EXCEEDING 150 :	0	0	0	0	18	31	19	23	17
RANGE									
0- 65:	0	0	0	0	6	5	12	9	13
66-130:	0	0	0	0	20	14	19	21	17
131-195:	0	0	0	0	16	19	13	14	11
196-260:	0	0	0	0	2	12	10	12	7
261-325:	0	0	0	0	2	4	3	4	0
326-390:	0	0	0	0	1	0	1	0	2
391-455:	0	0	0	0	0	0	0	0	1
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

UPDATED AIR QUALITY EVALUATION - KAISER STEEL, FONTANA, CALIFORNIA

Stations used in update:

Continued operation:	#1
New stations:	None
Discontinued stations:	None

Trends in geometric means:

Station #1, with a Spearman rank correlation coefficient of -0.58, displays an overall downtrend.

Attainment status:

Station #1 remained in nonattainment throughout the period 1978-1980.

Pollution roses:

None were generated due to lack of appropriate wind data.

Standard exceedance roses:

None were generated due to lack of appropriate wind data.

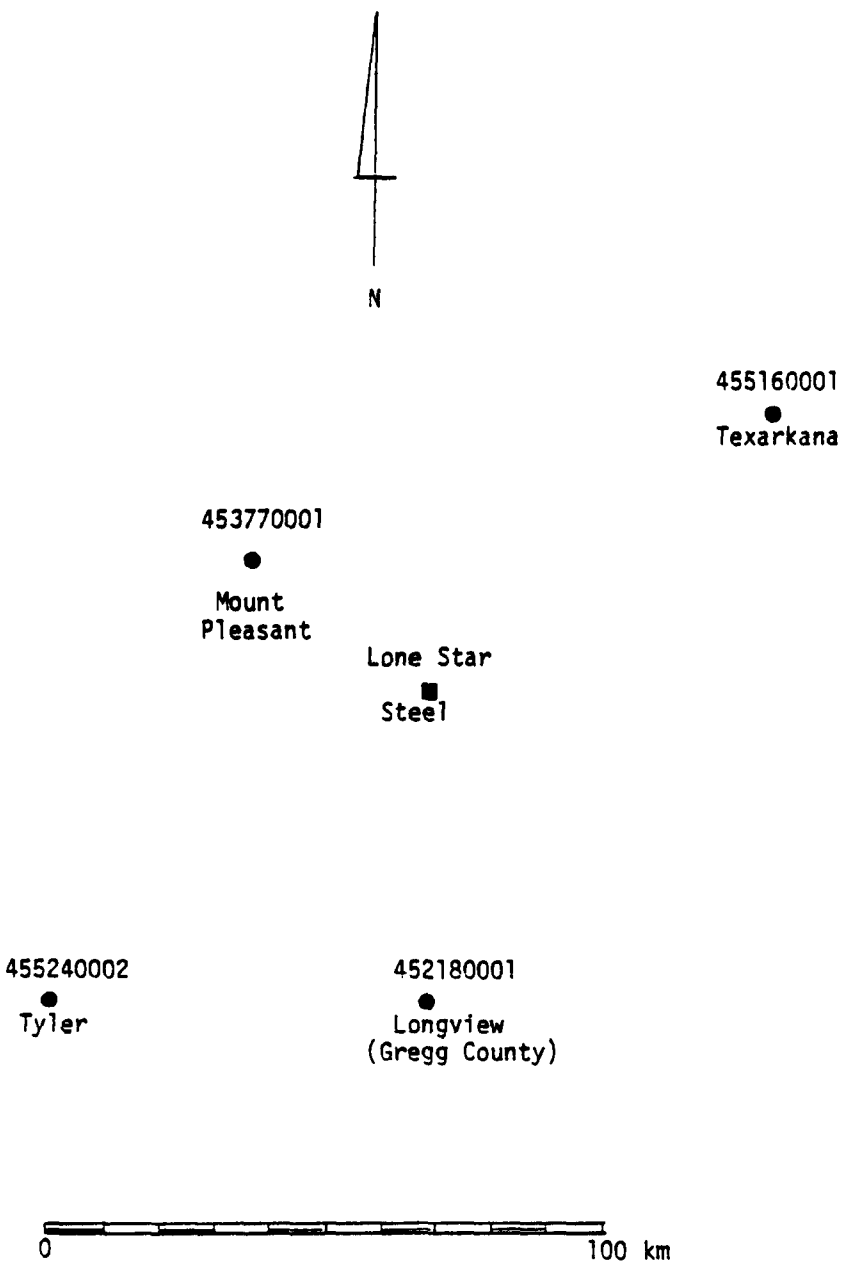
LONE STAR STEEL

Lone Star, Texas

EPA Region VI

PLANT HISTORY UPDATE - LONE STAR STEEL - LONE STAR, TEXAS

No analysis of TSP data is possible due to the lack of relevant monitoring data. The nearest TSP station is approximately 40 km from the Lone Star mill.



TSP Monitors in Relation to Lone Star Steel - Lone Star, Texas

NATIONAL STEEL

Weirton, West Virginia

EPA Region III

Hi-Vol Monitoring Sites in the Vicinity of National Steel Corporation - Weirton, West Virginia

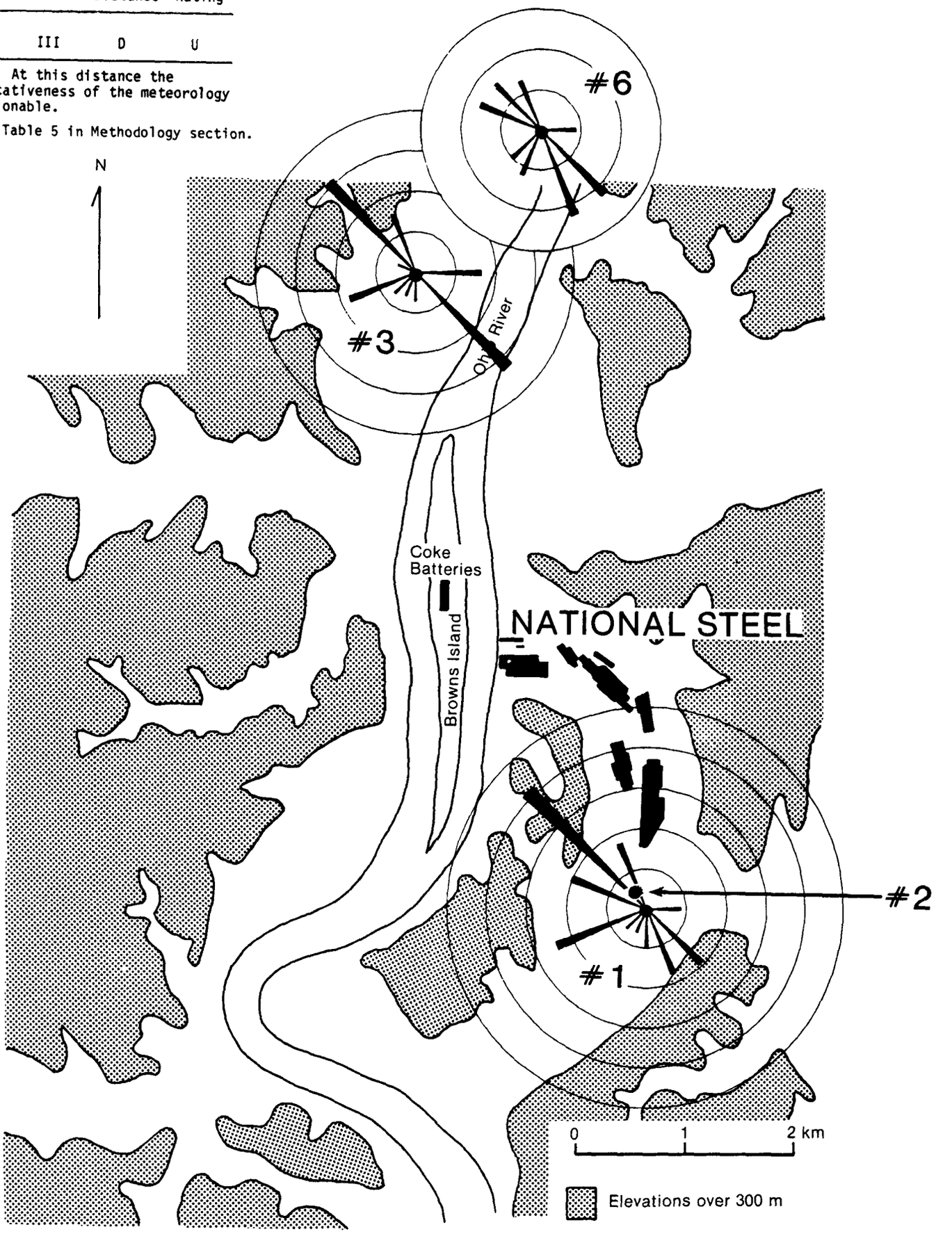
	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance	Elevation (meters) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance (m)		Volume
#1	50-2000-003-F02	Weirton Fire Station Weirton, West Virginia	Browns Island Coke Battery 325°	3.0 km	9	218	-4.5	Rooftop Urban Commercial	Main Street Cove Road Railroad	W N S & E	150 120 120	4-lane heavy 2-lane moderate 2-3 tracks RR Yard to S
			Mainland Coke Battery 333° Blast Furnaces 345° BOF 4° Sintering 342°	 2.75 km 2.4 km 1.4 km 2.1 km								
#2	50-2000-002-F02	Weirton Library 3442 Main Street Weirton, West Virginia	NOTE: Library site is approximately 100 meters west of Weirton Fire Station. Library site discontinued and moved to Fire Station July 1975. No significant location change relative to plant point sources.		10.5	221	-1.5	Rooftop Urban Commercial	Main Street Cove Road Railroad	W N E	45 90 230	4-lane heavy 2-lane moderate 2-3 tracks
#3	36-6620-003-101	SC Dennis School Toronto, Ohio	Browns Island Coke Battery 173°	3.4 km	7.5	245	23	Rooftop Residential	Route 7 Titanium Metals	W SE	250 700	4-lane moderate to heavy
			Mainland Coke Battery 165° Blast Furnaces 156° BOF 152° Sintering 158°	 3.5 km 3.9 km 5.0 km 4.1 km								
X #4	36-6420-004-102	Garfield School 936 North 5th Street Steubenville, Ohio	Browns Island Coke Battery 1.5°	5.6 km	9	218	-4.5	Rooftop Urban Residential	Route 7 Railroad Ohio River Federal Paper Board Paper Incinerator	E E E S	30 45 90 400	4-lane heavy 2-tracks moderate barge traffic
			Mainland Coke Battery 6° Blast Furnaces 13° BOF 23° Sintering 17°	 5.6 km 5.6 km 5.0 km 5.5 km								
#6	36-6620-001	Fire Department 6025 4th Street Toronto, Ohio	Browns Island Coke Battery 190° Blast Furnaces 190° BOF 168° Sintering 171°	 3.65 4.59 5.6 4.68	8.2	220	-2	Rooftop	4th Street	W		

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Station #	Terrain	Distance	Rating
1, 3, 6	III	D	U

Comment: At this distance the representativeness of the meteorology is questionable.

N.B. See Table 5 in Methodology section.



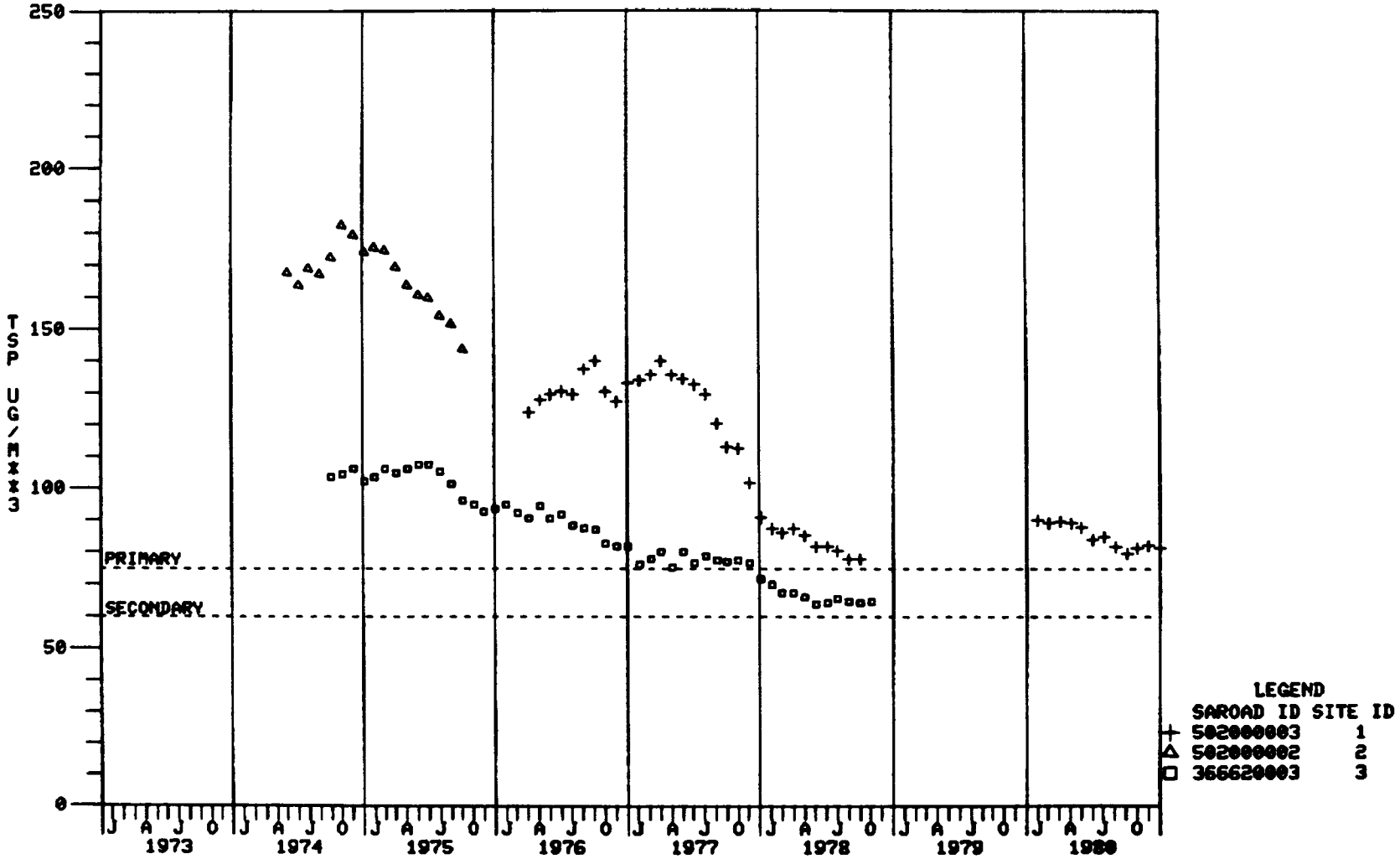
TSP roses for National Steel - Weirton, West, Virginia, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

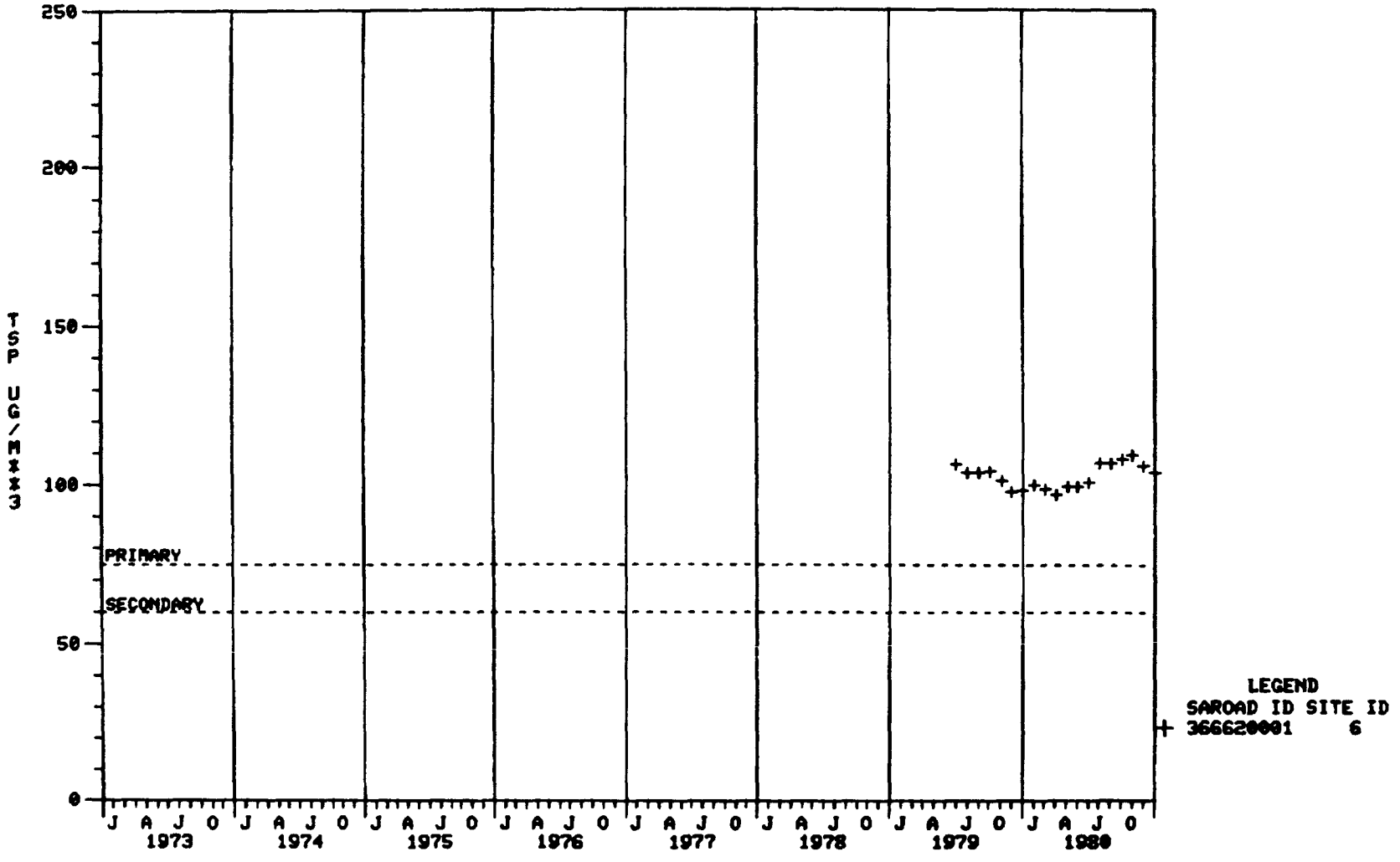
National Steel--Weirton, WV

Wind Direction	Monitoring Site Numbers #1	#3	#6
N	0	0	0
NNE	0	0	0
NE	0	0	0
ENE	0	0	0
E	1	1	1
ESE	0	0	0
SE	8	2	13
SSE	5	0	5
S	2	2	0
SSW	1	1	1
SW	2	1	1
WSW	1	1	0
W	0	0	0
WNW	2	1	2
NW	1	1	1
NNW	3	2	3
Total	26	12	27

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - WEIRTON, WV



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - WEIRTON, WV



TSP DATA SUMMARY FOR NATIONAL STEEL - WEIRTON, WV
SARDAD STATION # 502000003 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	36	65	37	27	38	43
GEOMETRIC MEAN:	******	******	******	******	133.0	90.7	******	******	81.1
GEOMETRIC S.D.:	******	******	******	******	1.7	1.6	******	******	1.3
HIGHEST BY LARSEN EXTRP:	******	******	******	******	587.6	349.3	******	******	194.1
1ST HIGHEST:	******	******	******	377.0	366.0	237.0	208.0	202.0	135.0
DATE :	******	******	******	751119	760907	770413	780408	790509	800515
2ND HIGHEST:	******	******	******	344.0	361.0	194.0	185.0	167.0	133.0
DATE :	******	******	******	751118	760413	770531	780601	791018	800526
# OF READINGS EXCEEDING 260 :	0	0	0	6	7	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	12	25	5	5	7	0
RANGE									
0- 65:	0	0	0	4	7	12	7	8	12
66-130:	0	0	0	14	25	17	12	20	29
131-195:	0	0	0	10	19	7	7	9	2
196-260:	0	0	0	2	8	1	1	1	0
261-325:	0	0	0	4	5	0	0	0	0
326-390:	0	0	0	2	2	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - WEIRTON, WV
SAROAD STATION # 502000002 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	38	20	57	28	0	0	0	0	0
GEOMETRIC MEAN:	******	******	174.0	******	******	******	******	******	******
GEOMETRIC S.D.:	******	******	1.5	******	******	******	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	554.9	******	******	******	******	******	******
1ST HIGHEST:	307.0	278.0	370.0	450.0	******	******	******	******	******
DATE :	720607	730910	740909	750220	******	******	******	******	******
2ND HIGHEST:	295.0	234.0	345.0	351.0	******	******	******	******	******
DATE :	720824	730827	740708	750123	******	******	******	******	******
# OF READINGS EXCEEDING 260 :	4	1	6	2	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	18	11	40	15	0	0	0	0	0
RANGE									
0- 65:	3	1	2	3	0	0	0	0	0
66-130:	12	5	13	8	0	0	0	0	0
131-195:	15	5	16	9	0	0	0	0	0
196-260:	4	8	20	6	0	0	0	0	0
261-325:	4	1	4	0	0	0	0	0	0
326-390:	0	0	2	1	0	0	0	0	0
391-455:	0	0	0	1	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - WEIRTON, WV
SARDAD STATION # 366620003 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	60	52	56	61	33	0	0
GEOMETRIC MEAN:	******	******	101.3	93.6	81.9	71.6	******	******	******
GEOMETRIC S.D.:	******	******	1.7	1.7	1.8	1.7	******	******	******
HIGHEST BY LARSEN EXTRP:	******	******	521.7	429.5	439.0	364.0	******	******	******
1ST HIGHEST:	******	******	440.0	289.0	263.0	227.0	211.0	******	******
DATE :	******	******	740803	750723	760418	770419	780520	******	******
2ND HIGHEST:	******	******	266.0	266.0	252.0	205.0	203.0	******	******
DATE :	******	******	740920	750717	760406	770212	780713	******	******
# OF READINGS EXCEEDING 260 :	0	0	2	2	1	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	18	9	9	6	6	0	0
RANGE									
0- 65:	0	0	11	13	20	25	17	0	0
66-130:	0	0	26	28	22	28	9	0	0
131-195:	0	0	16	6	10	5	4	0	0
196-260:	0	0	5	3	3	3	3	0	0
261-325:	0	0	1	2	1	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	1	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - WEIRTON, WV
SARDAD STATION # 366620001 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	0	15	61	61
GEOMETRIC MEAN:	******	******	******	******	******	******	******	98.3	103.7
GEOMETRIC S.D.:	******	******	******	******	******	******	******	1.7	1.6
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	******	451.3	392.0
1ST HIGHEST:	******	******	******	******	******	******	464.0	329.0	299.0
DATE :	******	******	******	******	******	******	781104	790220	800620
2ND HIGHEST:	******	******	******	******	******	******	180.0	285.0	258.0
DATE :	******	******	******	******	******	******	781023	790309	800912
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	1	2	1
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	0	6	12	13
RANGE									
0- 65:	0	0	0	0	0	0	1	13	10
66-130:	0	0	0	0	0	0	8	29	33
131-195:	0	0	0	0	0	0	5	13	11
196-260:	0	0	0	0	0	0	0	4	6
261-325:	0	0	0	0	0	0	0	1	1
326-390:	0	0	0	0	0	0	0	1	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	1	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - WEIRTON, WV
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	502000003		502000002		366620003		502000005		366620001	
SITE ID #	1		2		3		5		6	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	464.
E COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SE COUNT:	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	329.
SSE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSW COUNT:	0	0	0	0	1	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	440.	0.	0.	0.	0.	0.
SW COUNT:	0	0	1	1	0	0	0	0	0	0
AVE TSP:	0.	0.	320.	370.	0.	0.	0.	0.	0.	0.
WSW COUNT:	0	0	1	0	0	1	0	0	0	0
AVE TSP:	0.	0.	300.	0.	0.	266.	0.	0.	0.	0.
W COUNT:	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	299.
WNW COUNT:	0	0	0	2	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	304.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	1	0	0	0	0	0	0	0
AVE TSP:	0.	0.	281.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	0	0	3	3	1	1	0	0	0	3
AVE TSP:	0.	0.	300.	326.	440.	266.	0.	0.	0.	364.

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - WEIRTON, WV
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	502000003		502000002		366620003		502000005		366620001	
SITE ID #	1		2		3		5		6	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	2	0	1	0	1	0	0	0	1
AVE TSP:	0.	174.	0.	184.	0.	160.	0.	0.	0.	173.
NNE COUNT:	0	0	0	1	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	249.	0.	0.	0.	0.	0.	232.
NE COUNT:	0	0	0	1	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	180.	0.	0.	0.	0.	0.	156.
ENE COUNT:	0	0	0	0	0	1	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	160.	0.	0.	0.	464.
E COUNT:	0	0	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	156.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0	0	0	0	5
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	203.
SE COUNT:	3	3	1	0	4	4	0	0	3	5
AVE TSP:	168.	172.	211.	0.	185.	191.	0.	0.	183.	211.
SSE COUNT:	0	2	0	0	1	2	0	0	1	1
AVE TSP:	0.	174.	0.	0.	227.	191.	0.	0.	192.	201.
S COUNT:	0	0	0	0	1	1	0	0	0	2
AVE TSP:	0.	0.	0.	0.	168.	176.	0.	0.	0.	158.
SSW COUNT:	0	1	3	7	1	2	0	0	0	0
AVE TSP:	0.	237.	201.	207.	440.	176.	0.	0.	0.	0.
SW COUNT:	0	0	4	3	1	0	0	0	0	0
AVE TSP:	0.	0.	234.	262.	155.	0.	0.	0.	0.	0.
WSW COUNT:	0	0	4	2	1	1	0	0	0	0
AVE TSP:	0.	0.	237.	183.	217.	266.	0.	0.	0.	0.
W COUNT:	1	0	0	2	0	2	0	0	0	1
AVE TSP:	151.	0.	0.	211.	0.	190.	0.	0.	0.	298.
WNW COUNT:	1	0	0	2	0	2	0	0	0	1
AVE TSP:	152.	0.	0.	304.	0.	165.	0.	0.	0.	180.
NW COUNT:	1	1	4	1	3	0	0	0	0	1
AVE TSP:	208.	164.	216.	247.	178.	0.	0.	0.	0.	152.
NNW COUNT:	0	0	1	1	0	0	0	0	0	2
AVE TSP:	0.	0.	168.	170.	0.	0.	0.	0.	0.	176.
ALL COUNT:	6	9	17	21	12	17	0	0	4	22
AVE TSP:	169.	179.	219.	222.	208.	184.	0.	0.	186.	209.

UPDATED AIR QUALITY EVALUATION - NATIONAL STEEL, WEIRTON, WEST VIRGINIA

Stations used in update:

Continued operation:	#1
New station:	#6 (1978)
Discontinued stations:	#2 (1975), #3 (1978)

Trends in geometric means:

Strong downward trends in TSP levels were detected particularly at stations #1 and #3, as indicated by the Spearman rank correlation coefficients of -0.82 and -0.96. However, these downtrends ended in 1978. At station #1, geometric means for periods ending in early 1980 were higher than those of the latter half of 1978.

Attainment status:

Station #1 remained in nonattainment for the primary TSP standard through 1978-1980. Station #3 indicated attainment of the primary annual standard in 1977, but the station was shut down in 1978. However, station #6, which replaced #3, indicated nonattainment in 1979 and 1980.

Pollution roses:

The only station indicating mill impact is station #1. It is uncertain whether the mill actually has little impact on other stations or whether the roses show this result due to complex wind flow in the valley regime in which the mill and stations are located.

Standard exceedance roses:

None of the primary 24-hour standard exceedances can be directly related to the mill based on wind direction.

NATIONAL STEEL

Granite City, Illinois

EPA Region V

National Steel - Granite City

	SAROAD #	Site Name and Address	Plant Location from Site Bearing		Distance	Elevation Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance		Volume
#1	142960006	City Hall *	Coke	106°	2.3 km	8	130	3	Roof mount	Edison Avenue	SE	15	Heavy
		2000 Edison Avenue	Blast Furn	115°	2.0 km			3					
			Sinter	125°	1.9 km			3					
			BOF	140°	1.2 km			3					
#2	142960007	Fire Station #1	Coke	120°	1.7 km	8	126	2	Roof mount	23rd Street	SW	15	Moderate
		23rd & Madison	Blast Furn	140°	1.5 km			2		Madison Ave	NW	15	Heavy
			Sinter	152°	1.5 km			2					
			BOF	186°	1.2 km			2					
X #3	142960008	Lake School	Coke	230°	1.0 km	4	126	0	Roof mount	23rd Street	SW	30	Heavy
		2301 E. 23rd Street	Blast Furn	230°	1.5 km			0					
			Sinter	230°	2.0 km			0					
			BOF	248°	2.5 km			0					
#4	142960009	Dallas Residence	Coke	85°	1.6 km	5	126	0	Roof mount	20th Street	NW	9	Moderate
		2001 E. 20th Street	Blast Furn	95°	1.3 km			0					
			Sinter	115°	0.8 km			0					
			BOF	180°-270°	0.1 km			0					
#5	142960010	Air Products	Coke	85°	2.7 km	8	126	0	Roof mount	15th Street	SW	30	Light
		15th & Madison	Blast Furn	90°	2.3 km			0		Madison Ave	SE	30	Heavy
			Sinter	98°	2.0 km			0					
			BOF	90°	1.2 km			0					
X #6	142960011	Fire Station #2	Coke	118°	3.6 km	3	126	0	Roof mount	Roosevelt Ave			
		Roosevelt Ave & Rock Rd	Blast Furn	123°	3.5 km			0		Rock Road			
			Sinter	130°	3.4 km			0					
			BOF	90°	1.2 km			0					
#7	142960014	Norfolk & Western	Coke	20°	0.6 km	3	126	0		dirt road	W	15	Light
		N & W railroad	Blast Furn	330°	0.3 km			0					
			Sinter	270°	0.4 km			0					
			BOF	285°	2.5 km			0					
X #8	142960015	Frohardt School	Coke	196°	2.9 km	5	128	5	Roof mount	Johnson Ave.	N	25	Light
		Johnson Avenue	Blast Furn	200°	3.3 km			5					
			Sinter	202°	3.6 km			5					
			BOF	214°	3.8 km			5					
#9	142960016	Lincoln & Nameoki*	Coke	190°	0.5 km	5	126	0	Roof mount	23rd Street	N	120	Moderate
		(Farmers Market)	Blast Furn	215°	1.0 km			0		Nameoki Rd	W	120	Moderate
		23rd & Nameoki	Sinter	215°	1.5 km			0					
			BOF	245°	1.8 km			0					

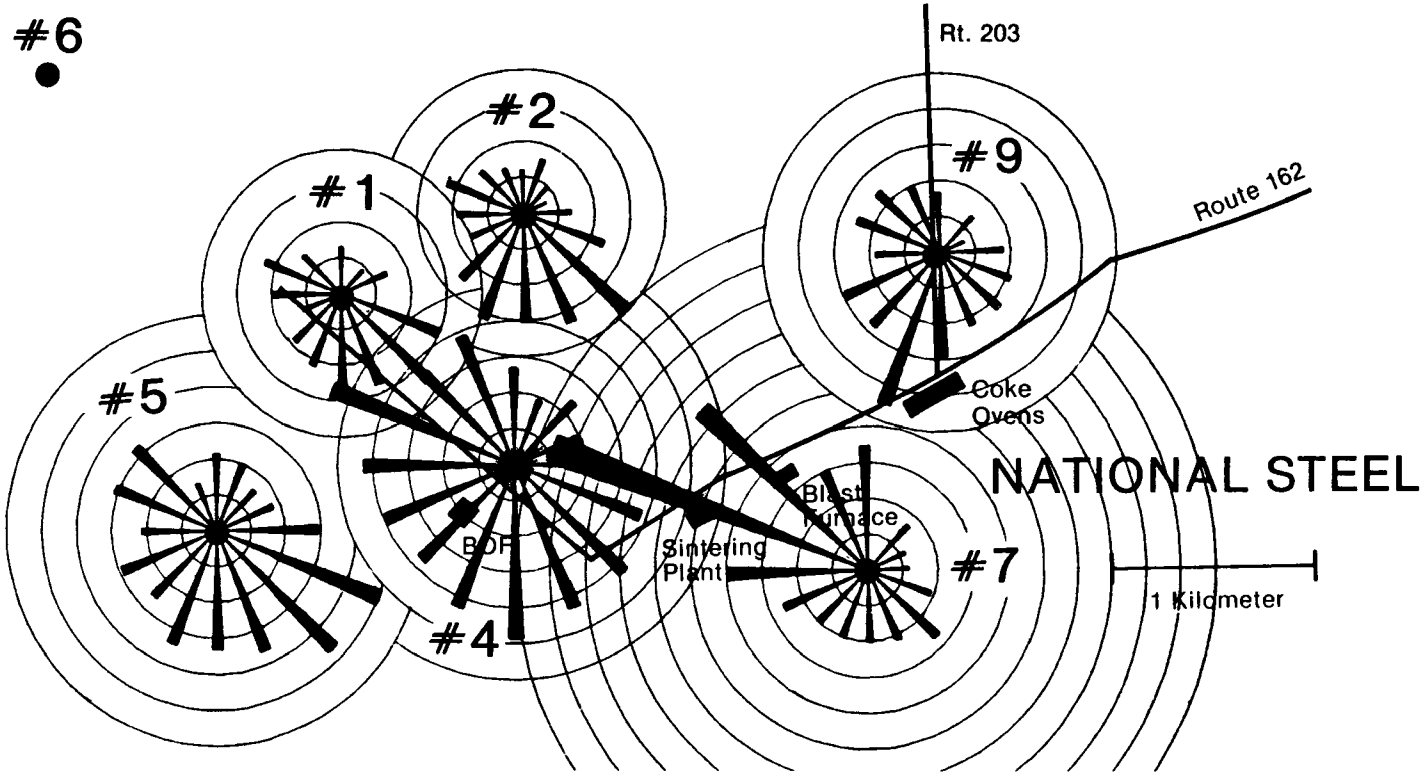
* Critical Sites

X-- Indicates that data from this station were included in the original 1973-1977 analysis; however, no strong mill impact on TSP was noted at this site. Based on the likelihood that this situation has not changed, data from this site were not employed in the 1978-1980 update.

Wind Data Representativeness

Station #	Terrain	Distance	Rating
1, 2, 4 5, 7, 9	I	G	VG-G

N.B. See Table 5 in Methodology section.



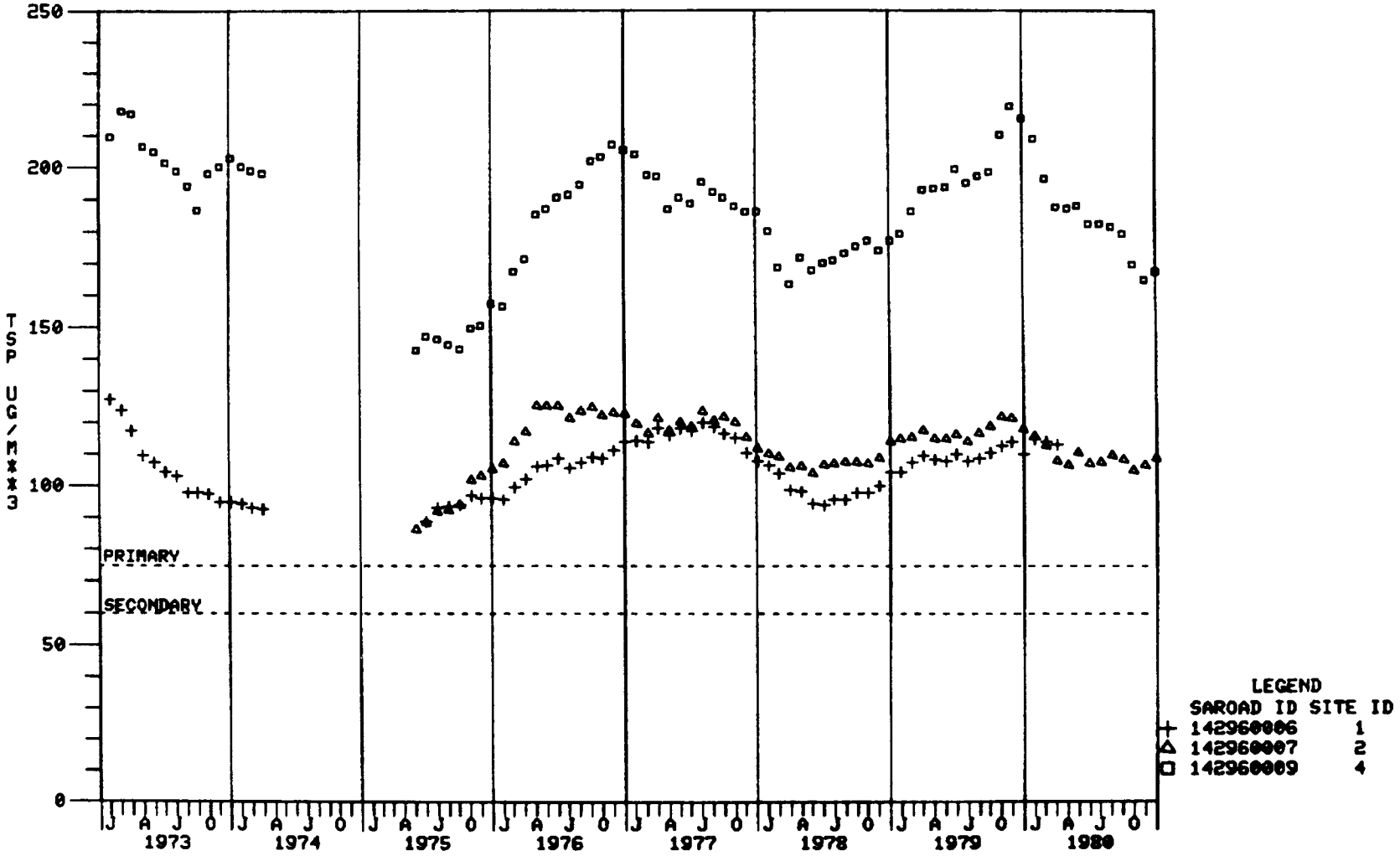
TSP roses for National Steel - Granite City, Illinois, for the period 1978-1980 for cases of $\omega > 0.90$. Each circle represents 50 g/m^3.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

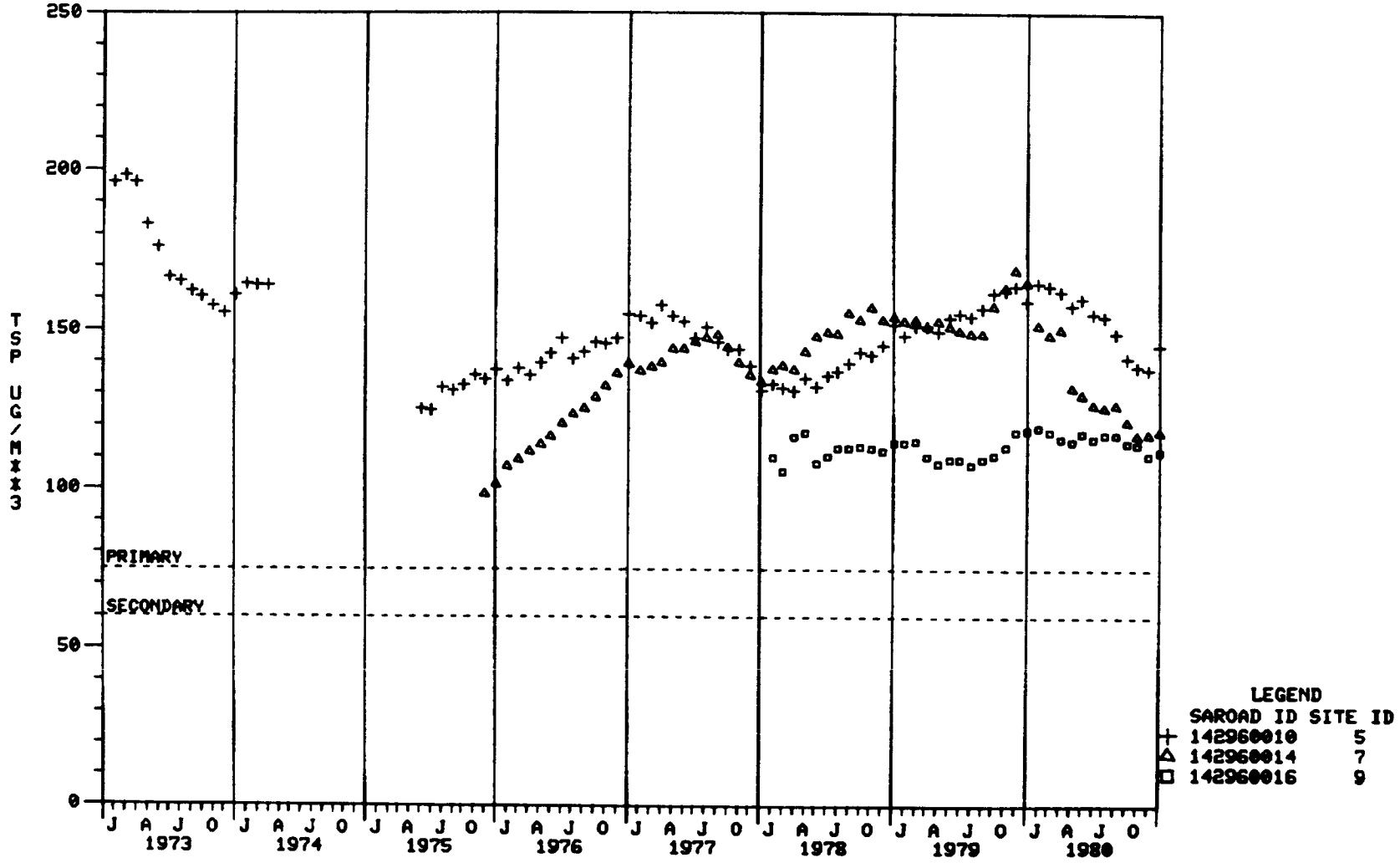
National Steel--Granite City, IL

Wind Direction	Monitoring Site Numbers #1	#2	#4	#5	#7	#9
N	2	5	7	6	6	6
NNE	0	1	3	1	0	0
NE	2	2	3	2	2	2
ENE	2	1	1	1	1	1
E	0	2	2	1	2	2
ESE	4	4	10	6	6	6
SE	6	7	8	6	7	8
SSE	4	9	16	10	10	7
S	5	11	14	11	11	11
SSW	1	2	3	2	2	2
SW	1	2	2	2	2	2
WSW	1	2	2	2	3	3
W	3	6	10	6	6	6
WNW	6	10	14	10	10	11
NW	5	6	10	5	4	6
NNW	0	1	2	1	1	2
Total	42	71	107	72	73	75

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - GRANITE CITY, IL



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - GRANITE CITY, IL



TSP DATA SUMMARY FOR NATIONAL STEEL - GRANITE CITY, IL
SAROAD STATION # 142960006 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	58	59	17	56	59	59	55	56	0
GEOMETRIC MEAN:	127.9	95.0	******	96.1	113.9	107.8	104.5	109.8	******
GEOMETRIC S.D.:	1.5	1.4	******	1.5	1.5	1.5	1.6	1.5	******
HIGHEST BY LARSEN EXTRP:	391.3	241.1	******	307.8	341.6	337.0	380.6	341.1	******
1ST HIGHEST:	282.0	196.0	219.0	199.0	225.0	238.0	197.0	239.0	******
DATE :	720427	730709	741008	751003	760430	770308	780408	790912	******
2ND HIGHEST:	257.0	184.0	168.0	177.0	221.0	231.0	192.0	222.0	******
DATE :	720831	730116	741107	751009	761015	770314	780526	790316	******
# OF READINGS EXCEEDING 260 :	1	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	20	5	2	4	17	13	13	10	0
RANGE									
0- 65:	4	9	5	10	5	5	8	5	0
66-130:	25	42	6	34	30	35	29	33	0
131-195:	23	7	4	11	20	16	17	12	0
196-260:	5	1	1	1	4	3	1	5	0
261-325:	1	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - GRANITE CITY, IL
SARDAD STATION # 142960007 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	20	53	59	54	61	61	50
GEOMETRIC MEAN:	******	******	******	105.4	122.8	111.6	114.1	117.9	108.7
GEOMETRIC S.D.:	******	******	******	1.6	1.6	1.7	1.5	1.6	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	405.0	454.7	539.1	393.4	445.4	378.1
1ST HIGHEST:	******	******	182.0	306.0	322.0	385.0	229.0	282.0	242.0
DATE :	******	******	741107	751003	760224	770302	781228	790322	800527
2ND HIGHEST:	******	******	154.0	241.0	271.0	276.0	219.0	270.0	219.0
DATE :	******	******	740821	751021	760406	770308	780719	790316	800825
# OF READINGS EXCEEDING 250 :	0	0	0	1	2	3	0	2	0
# OF READINGS EXCEEDING 150 :	0	0	2	12	23	17	18	23	11
RANGE									
0- 65:	0	0	4	9	5	9	8	8	8
66-130:	0	0	12	23	27	24	28	23	22
131-195:	0	0	4	18	16	11	19	24	15
196-260:	0	0	0	2	9	7	6	4	5
261-325:	0	0	0	1	2	2	0	2	0
326-390:	0	0	0	0	0	1	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - GRANITE CITY, IL
SARCAD STATION # 142960009 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	50	60	17	59	60	55	61	93	122
GEOMETRIC MEAN:	205.2	202.3	******	157.5	205.3	186.0	177.0	215.4	167.6
GEOMETRIC S.D.:	1.7	1.5	******	1.4	1.5	1.7	1.6	1.7	1.6
HIGHEST BY LARSEN EXTRP:	945.9	716.5	******	441.7	675.5	881.3	760.1	1020.2	524.3
1ST HIGHEST:	754.0	577.0	233.0	353.0	753.0	592.0	430.0	936.0	375.0
DATE :	720614	731019	740827	751021	760224	771221	781222	791205	801108
2ND HIGHEST:	551.0	547.0	222.0	307.0	527.0	485.0	398.0	661.0	362.0
DATE :	720712	730516	740920	750325	760319	770308	780414	790620	800310
# OF READINGS EXCEEDING 260 :	17	17	0	3	14	16	13	32	18
# OF READINGS EXCEEDING 150 :	36	47	8	33	47	34	42	70	78
RANGE									
0- 65:	0	1	0	1	0	0	1	2	3
66-130:	10	7	7	12	9	15	14	11	28
131-195:	12	17	5	29	22	15	17	18	42
196-260:	11	18	5	14	15	9	16	30	33
261-325:	9	10	0	2	7	8	10	13	14
326-390:	3	5	0	1	2	2	0	11	4
391-455:	2	0	0	0	3	2	3	3	0
>455:	3	2	0	0	2	4	0	5	1

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - GRANITE CITY, IL
SARDAD STATION # 142960010 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	39	55	19	61	61	54	56	59	59
GEOMETRIC MEAN:	199.5	160.9	******	137.6	154.7	130.9	151.8	159.0	145.1
GEOMETRIC S.D.:	1.6	1.5	******	1.5	1.5	1.5	1.6	1.6	1.5
HIGHEST BY LARSEN EXTRP:	741.7	498.4	******	436.0	522.8	456.8	594.4	660.2	479.5
1ST HIGHEST:	522.0	344.0	276.0	326.0	314.0	323.0	416.0	448.0	323.0
DATE :	720830	731218	741107	750729	760430	770308	780905	790912	800421
2ND HIGHEST:	500.0	308.0	257.0	312.0	310.0	265.0	341.0	410.0	301.0
DATE :	720426	731212	740821	751003	760512	770218	780824	790831	801223
# OF READINGS EXCEEDING 260 :	9	6	1	2	7	2	5	5	3
# OF READINGS EXCEEDING 150 :	29	35	5	28	32	22	25	36	25
RANGE									
0- 65:	0	1	3	4	2	2	1	3	3
66-130:	8	14	9	17	16	27	22	17	22
131-195:	8	25	5	31	24	14	12	18	18
196-260:	14	9	2	7	12	9	16	16	12
261-325:	5	5	1	1	7	2	3	1	3
326-390:	1	1	0	1	0	0	1	0	0
391-455:	0	0	0	0	0	0	1	4	0
>455:	3	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - GRANITE CITY, IL
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SARCAD #	142960006		142960007		142960009		142960010		142960014		142960016	
SITE ID #	1		2		4		5		7		9	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	1	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	455.	363.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	1	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	269.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	359.	0.	0.
ENE COUNT:	0	0	0	0	0	0	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	300.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	1	0	1	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	398.	0.	319.	0.	0.	0.	0.
ESE COUNT:	0	0	1	0	0	0	2	2	0	0	0	0
AVE TSP:	0.	0.	385.	0.	0.	0.	380.	315.	0.	0.	0.	0.
SE COUNT:	0	0	3	0	1	2	3	4	0	0	0	0
AVE TSP:	0.	0.	274.	0.	358.	308.	338.	358.	0.	0.	0.	0.
SSE COUNT:	0	0	2	1	10	1	2	1	2	0	0	1
AVE TSP:	0.	0.	314.	271.	366.	291.	290.	278.	407.	0.	0.	341.
S COUNT:	0	0	1	0	12	12	1	3	0	0	0	2
AVE TSP:	0.	0.	276.	0.	339.	306.	323.	360.	0.	0.	0.	301.
SSW COUNT:	0	0	0	0	2	6	0	1	0	3	1	1
AVE TSP:	0.	0.	0.	0.	277.	370.	0.	301.	0.	455.	302.	351.
SW COUNT:	0	0	0	0	0	14	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	347.	0.	0.	0.	274.	0.	0.
WSW COUNT:	0	0	0	0	3	11	0	2	0	0	0	1
AVE TSP:	0.	0.	0.	0.	401.	388.	0.	278.	0.	0.	0.	272.
W COUNT:	0	0	0	0	7	10	0	2	3	7	1	0
AVE TSP:	0.	0.	0.	0.	349.	379.	0.	275.	351.	349.	417.	0.
WNW COUNT:	0	0	0	0	11	4	0	3	11	7	0	1
AVE TSP:	0.	0.	0.	0.	363.	310.	0.	285.	492.	353.	0.	288.
NW COUNT:	0	0	0	0	2	3	0	2	8	3	0	0
AVE TSP:	0.	0.	0.	0.	335.	322.	0.	289.	307.	404.	0.	0.
NNW COUNT:	0	0	0	0	0	1	0	1	0	2	0	0
AVE TSP:	0.	0.	0.	0.	0.	287.	0.	281.	0.	309.	0.	0.
ALL COUNT:	0	0	7	1	48	65	8	23	26	25	2	6
AVE TSP:	0.	0.	302.	271.	353.	348.	335.	311.	402.	364.	360.	309.

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - GRANITE CITY, IL
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	142960006		142960007		142960009		142960010		142960014		142960016	
SITE ID #	1		2		4		5		7		9	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	1	0	0	5	7	1	4	6	5	0	2
AVE TSP:	0.	156.	0.	0.	205.	200.	184.	205.	222.	215.	0.	182.
NNE COUNT:	0	0	0	1	1	2	1	1	2	1	0	0
AVE TSP:	0.	0.	0.	170.	151.	211.	172.	192.	225.	155.	0.	0.
NE COUNT:	0	0	0	0	0	5	1	3	0	3	0	1
AVE TSP:	0.	0.	0.	0.	0.	202.	153.	187.	0.	251.	0.	171.
ENE COUNT:	0	0	0	0	3	3	4	2	0	3	0	0
AVE TSP:	0.	0.	0.	0.	179.	168.	189.	261.	0.	175.	0.	0.
E COUNT:	1	0	0	0	1	3	2	3	0	0	0	0
AVE TSP:	153.	0.	0.	0.	205.	248.	174.	252.	0.	0.	0.	0.
ESE COUNT:	4	1	2	2	11	6	8	5	2	2	0	1
AVE TSP:	169.	176.	270.	170.	202.	195.	263.	235.	203.	171.	0.	167.
SE COUNT:	12	2	13	5	14	15	12	9	3	1	2	1
AVE TSP:	179.	214.	205.	187.	221.	216.	239.	287.	227.	170.	182.	217.
SSE COUNT:	6	3	11	10	20	13	16	11	4	3	2	3
AVE TSP:	187.	187.	226.	182.	287.	213.	216.	201.	286.	172.	208.	232.
S COUNT:	3	8	11	12	23	34	15	18	4	9	6	10
AVE TSP:	188.	186.	195.	200.	273.	246.	159.	232.	159.	183.	188.	218.
SSW COUNT:	1	0	3	9	6	16	3	12	0	8	2	7
AVE TSP:	161.	0.	175.	178.	226.	270.	207.	197.	0.	290.	273.	213.
SW COUNT:	2	1	0	5	3	26	1	9	1	7	1	1
AVE TSP:	185.	170.	0.	192.	193.	280.	176.	189.	175.	197.	163.	230.
WSW COUNT:	0	5	1	9	7	29	1	12	1	12	2	5
AVE TSP:	0.	174.	159.	167.	306.	271.	228.	201.	248.	204.	174.	211.
W COUNT:	2	1	1	0	13	28	4	9	11	17	2	5
AVE TSP:	188.	161.	237.	0.	286.	261.	211.	198.	254.	263.	296.	196.
WNW COUNT:	2	6	3	4	20	17	7	12	13	19	3	4
AVE TSP:	170.	180.	182.	190.	288.	218.	213.	215.	451.	262.	192.	221.
NW COUNT:	0	3	0	2	8	11	3	11	12	17	1	1
AVE TSP:	0.	185.	0.	186.	244.	218.	227.	200.	277.	235.	221.	229.
NNW COUNT:	0	0	1	1	2	7	1	7	2	11	1	0
AVE TSP:	0.	0.	175.	152.	225.	215.	236.	219.	225.	225.	157.	0.
ALL COUNT:	33	31	46	60	137	222	80	128	61	118	22	41
AVE TSP:	179.	182.	206.	183.	257.	243.	216.	215.	287.	231.	205.	211.

UPDATED AIR QUALITY EVALUATION - NATIONAL STEEL, GRANITE CITY, ILLINOIS

Stations used in update:

Continued operation:	#1, #2, #4, #5, #7, #9
New stations:	None
Discontinued stations:	None

Trends in geometric means:

None of the stations exhibits major long-term positive or negative trends as the Spearman rank correlation coefficients range from +0.39 to -0.17. Trends in TSP at all of the stations indicate gradual increases in 1978 and 1979 and a rather sharp decline in 1980.

Attainment status:

All stations continued to show nonattainment of the primary standards throughout 1978-1980.

Pollution roses:

Roses for all stations were quite similar to ones in the previous analysis with the exception of station #7, which indicated more well-defined impact of the blast furnace and sinter plant in the newer data.

Standard exceedance roses:

The greatest number of primary standard exceedances occurred at stations #4 and #7. Many of the exceedances at station #4 are likely due to emissions from the BOF and from the nearby roadway running between the station and the BOF. At station #7, the exceedances are concentrated in the directions from the sinter and blast furnaces.

NATIONAL STEEL

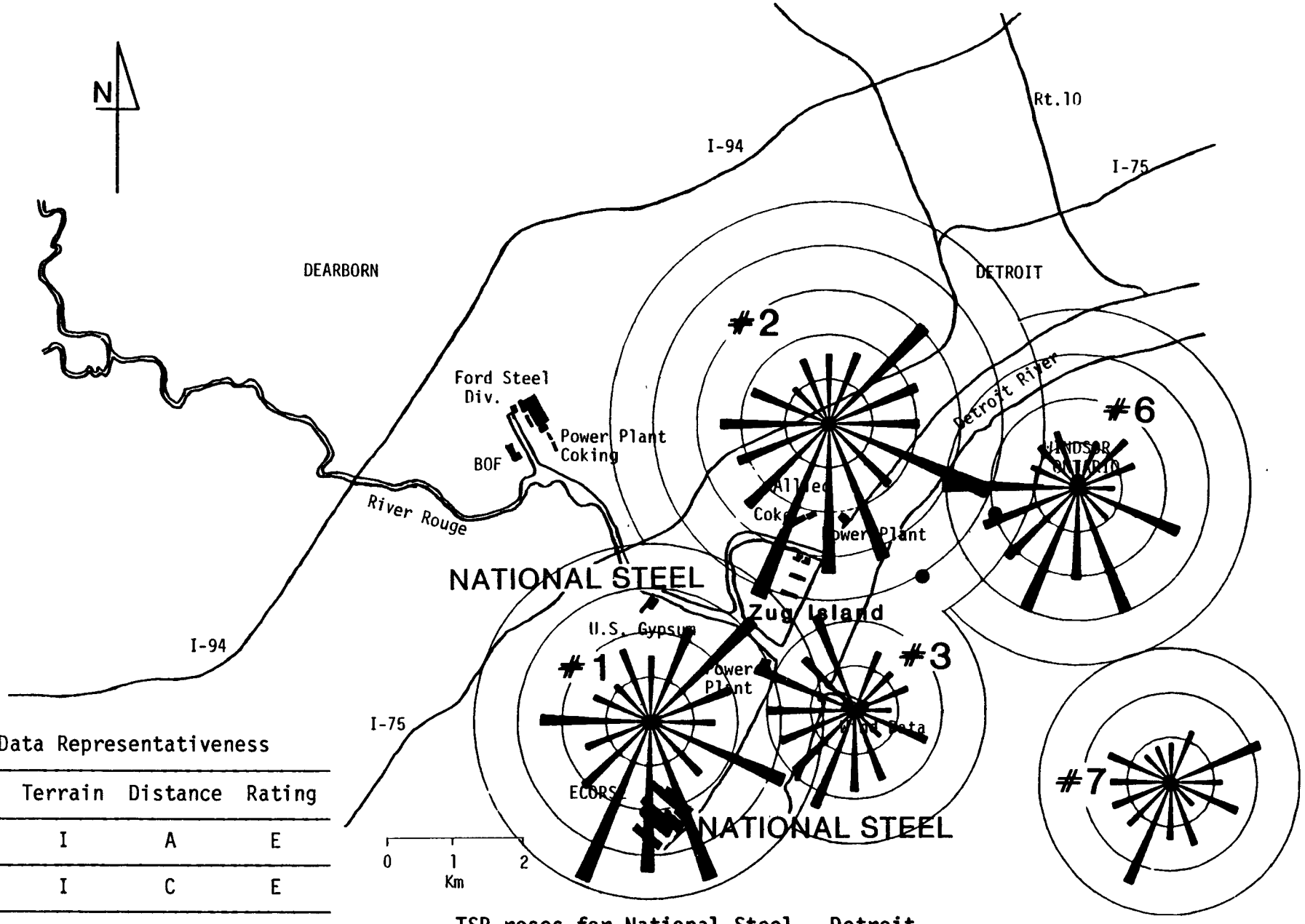
Detroit, Michigan

EPA Region V

Hi-Vol Monitoring Sites in the Vicinity of National Steel - Detroit, Michigan

	SAROAD #	Site Name and Address	Plant Location from Site: Bearing	Distance (km)	Elevation (m): Above Ground	MSL	Plant	Site Description	Nearest Roadway: Name	Direction/Distance (m)		Volume
#1	234420005	315 Genesee River Rouge	Blast Furn, Boilers Coking BOF #1 BOF #2 Open Hearth EAF	42° 45° 180° 158° 163° 176°	3.0 km 2.7 km 1.9 km 1.6 km 1.4 km 2.0 km	4	178	1	Trailer top (residential)	Genesee	NW	6	2 lane light
#2	231180015	6601 W. Fort * Detroit	Blast Furn, Boilers Coking BOF #1, BOF #2, Open Hearth, EAF	179° 184° 195-200°	1.9 km 2.2 km 6.0 km	4	179	2	Trailer top (residential)	Rademacher W. Fort	ENE NNW	9 30	2 lane light 4 lane Moderate
#3	12032	Morton Dock * Windsor, Ontario	Blast Furn, Boilers Coking BOF #1, BOF #2, EAF Open Hearth	338° 330° 237° 233° 241°	2.3 km 2.0 km 3.2 km 3.5 km 2.9 km	4	177	0	Trailer top	Morton	S	300	---
#4	12015	Hwy 18 & Prospect * Windsor, Ontario	Blast Furn, Boilers Coking BOF #1, BOF #2, EAF, O. H.	281° 270° 223-227°	1.7 km 1.9 km 5.0 km	6	178	1	Building roof	---	---	11	---
#5	12016	College & South Streets Windsor, Ontario	Blast Furn, Boilers Coking BOF #1, BOF #2, EAF, O. H. ,	258° 252° 224-227°	2.8 km 3.1 km 6.5 km	4	180	3	Trailer top (residential)	---	---	12	Light
#6	12014	College & California Streets Windsor, Ontario	Blast Furn, Boilers Coking BOF #1, BOF #2, EAF, O. H.	253° 249° 228-231°	4.5 km 4.8 km 8.1 km	1	181	4	Ground level on grassy field	---	---	9	Light
#7	12037	St. Hubert's School Windsor, Ontario	Blast Furn, Boilers, Coking BOF #1, BOF #2, EAF, O. H.	294-297° 261-266°	6.6 km 7.7 km	4	182	5	Building roof	---	---	30	Heavy

* Critical sites

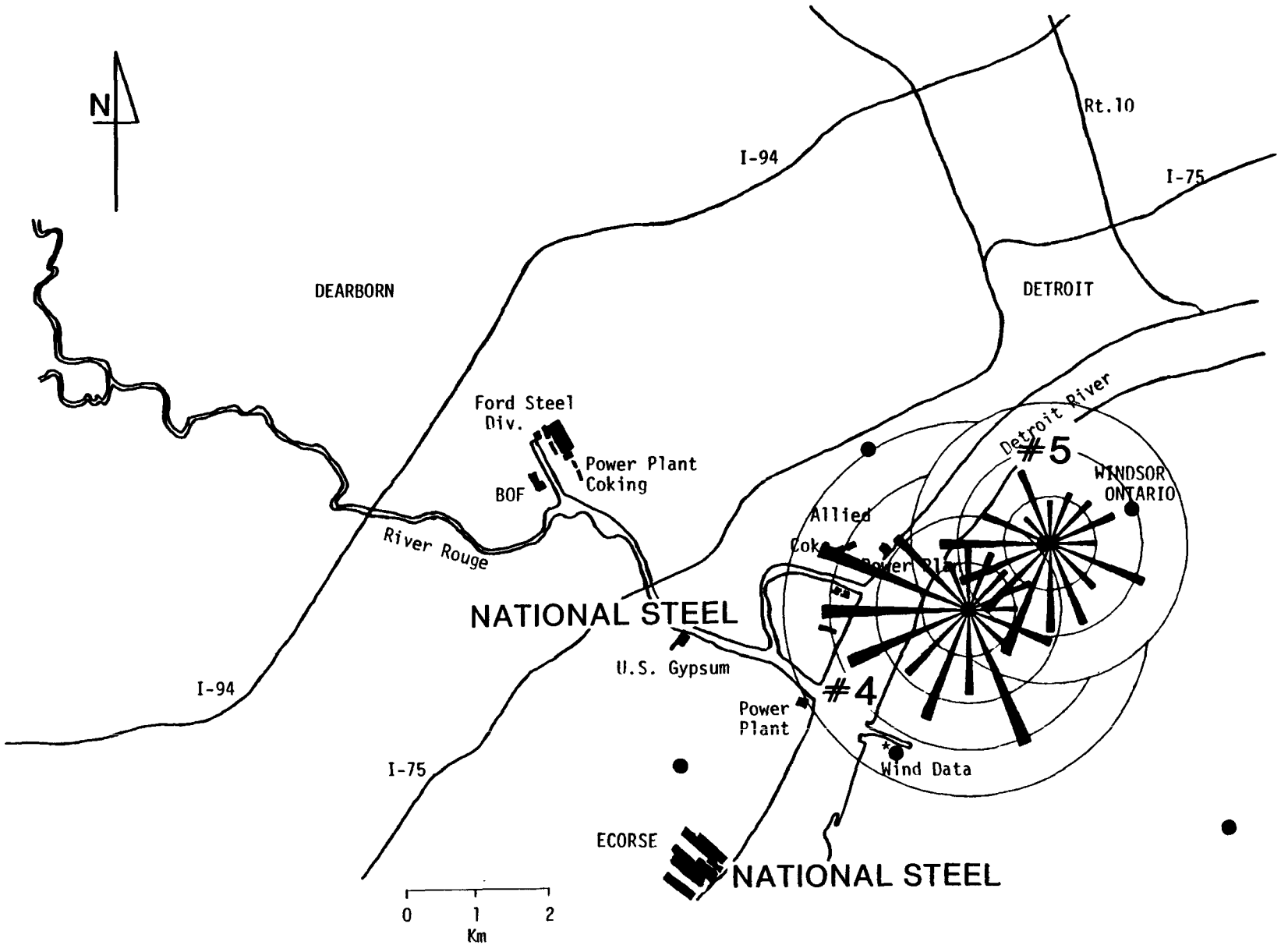


TSP roses for National Steel - Detroit, Michigan, for the period 1978-1980 for cases of $\omega>0.85$. Each circle represents 50 $\mu g/m^3$.

Wind Data Representativeness

Station #	Terrain	Distance	Rating
3	I	A	E
1, 4	I	C	E
2, 5, 6, 7	I	D	E

N.B. See Table 5 in Methodology section.



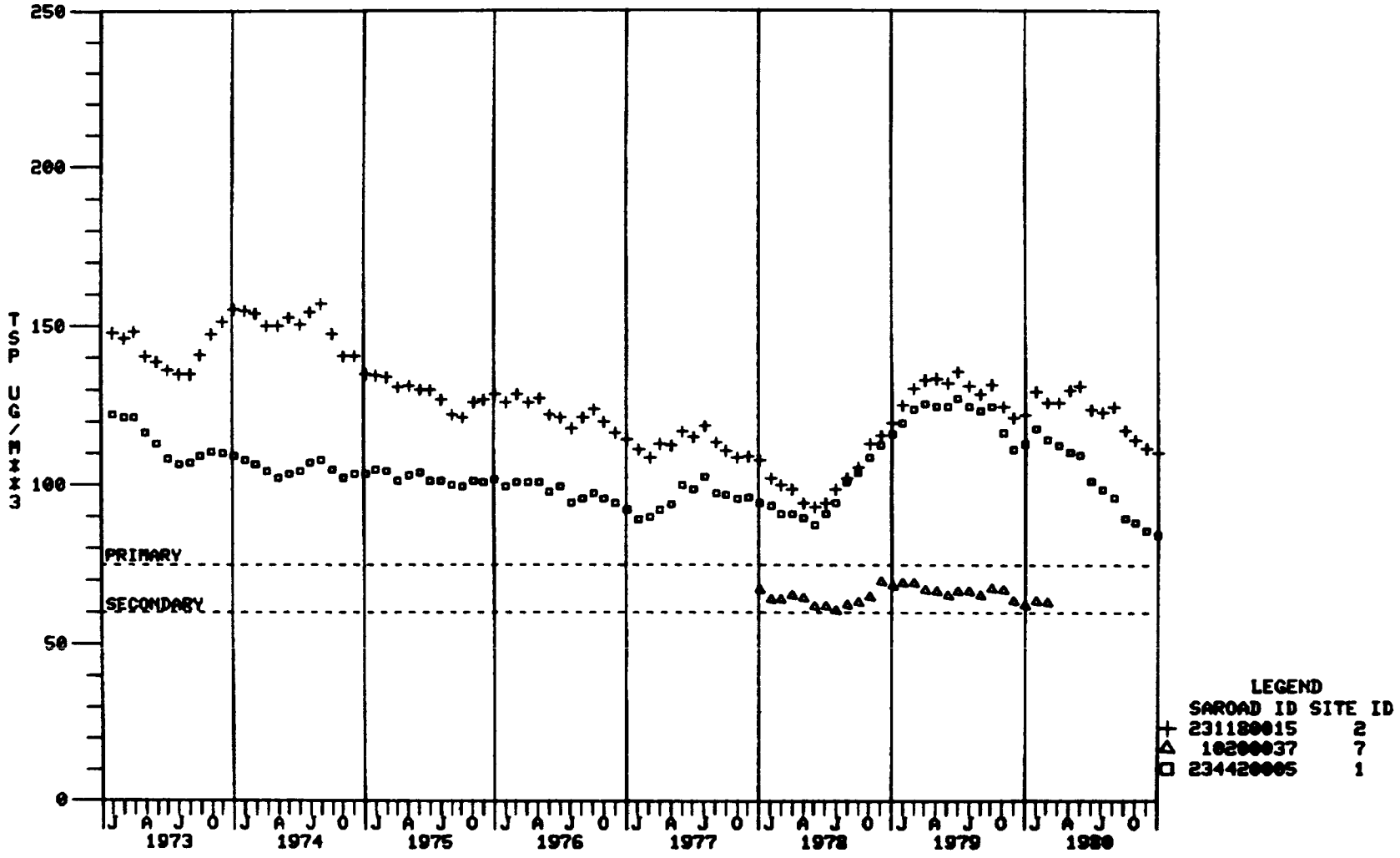
TSP roses for National Steel - Detroit, Michigan, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

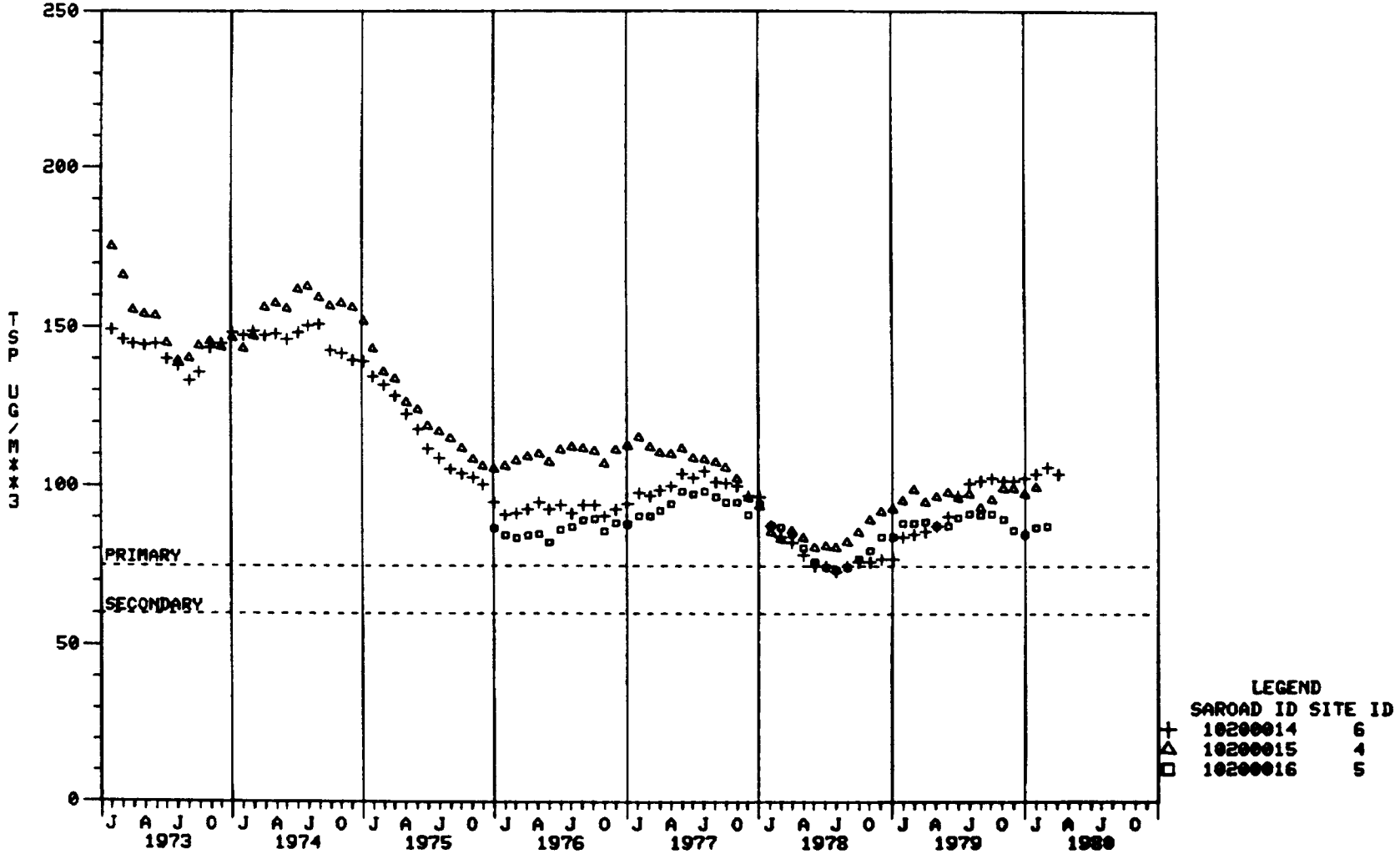
National Steel--Detroit, MI

Wind Direction	Monitoring Site Numbers #1	#2	#3	#4	#5	#6	#7
N	3	3	0	1	1	1	1
NNE	7	7	4	5	5	4	3
NE	3	3	1	1	1	1	0
ENE	5	4	3	4	4	4	2
E	6	6	3	3	3	3	2
ESE	1	1	1	1	1	1	1
SE	4	4	2	2	2	1	2
SSE	3	3	2	2	3	3	3
S	15	15	11	10	12	12	11
SSW	11	11	8	8	9	8	9
SW	13	12	8	6	8	8	5
WSW	15	16	12	10	12	13	12
W	6	7	5	5	5	3	4
WNW	6	6	3	3	3	3	3
NW	4	4	2	2	1	1	2
NNW	4	4	3	2	2	3	3
Total	106	106	68	65	72	69	63

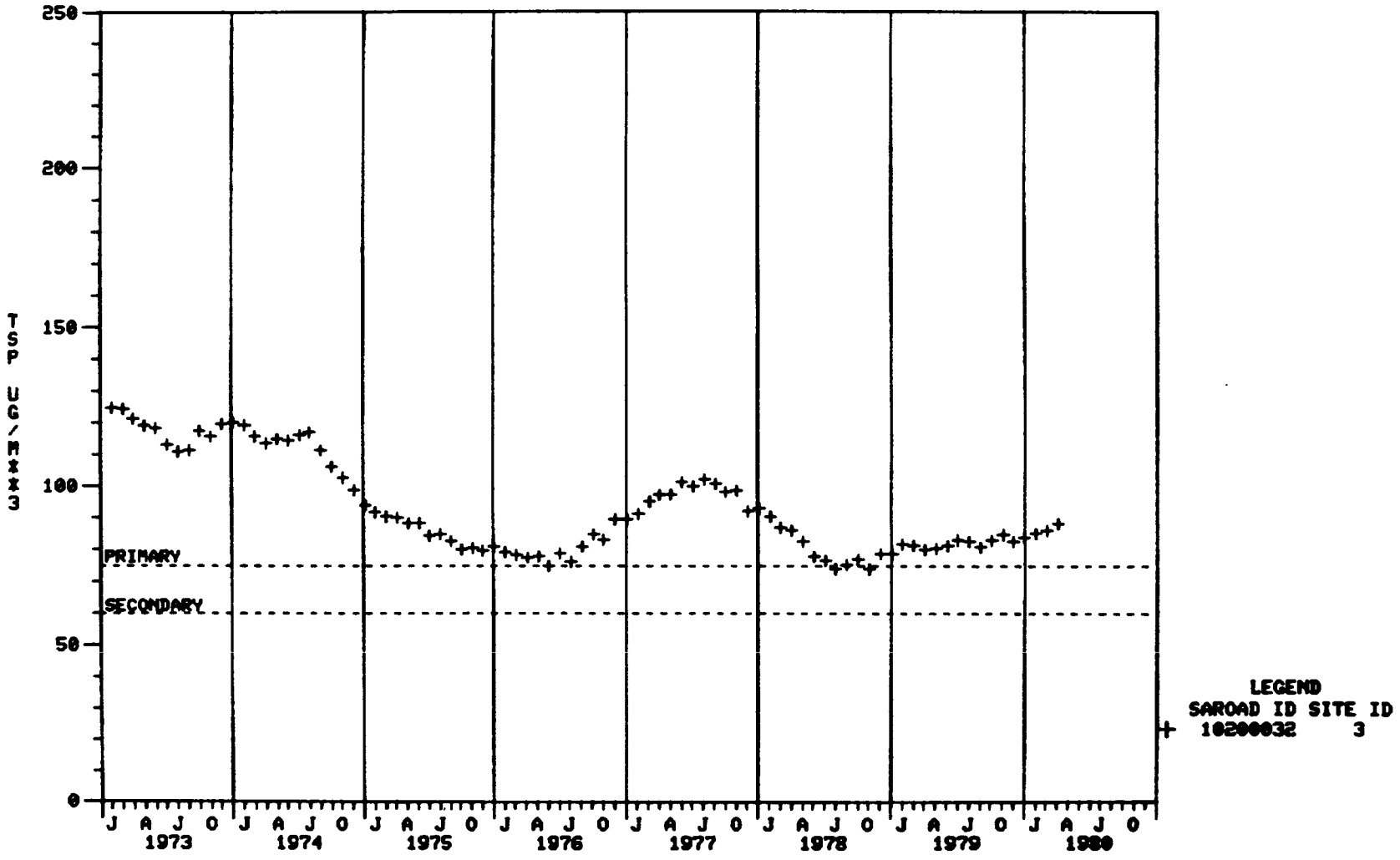
TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - DETROIT, MI



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - DETROIT, MI



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR NATIONAL STEEL - DETROIT, MI



TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 234420005 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	58	53	60	57	60	61	61	59	60
GEOMETRIC MEAN:	124.7	109.0	103.5	101.6	92.2	94.4	115.9	113.1	84.3
GEOMETRIC S.D.:	1.5	1.6	1.6	1.5	1.5	1.7	1.7	1.8	1.6
HIGHEST BY LARSEN EXTRP:	439.5	441.2	376.4	310.9	306.9	448.1	575.7	605.3	321.2
1ST HIGHEST:	420.0	356.0	253.0	217.0	250.0	323.0	316.0	403.0	197.0
DATE :	720620	730416	740306	750729	760418	770419	780526	790509	800521
2ND HIGHEST:	293.0	347.0	230.0	214.0	184.0	243.0	280.0	310.0	173.0
DATE :	720521	731025	740610	750518	761003	770525	781104	790813	800328
# OF READINGS EXCEEDING 260 :	2	3	0	0	0	1	4	4	0
# OF READINGS EXCEEDING 150 :	19	13	15	9	11	12	24	22	5
RANGE									
0- 65:	5	6	12	7	15	12	11	12	17
66-130:	26	32	27	35	30	34	22	22	31
131-195:	19	8	18	13	14	8	20	15	11
196-260:	6	4	3	2	1	6	4	6	1
261-325:	1	1	0	0	0	1	4	3	0
326-390:	0	2	0	0	0	0	0	0	0
391-455:	1	0	0	0	0	0	0	1	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 231180015 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	56	54	61	50	60	59	59	58	61
GEOMETRIC MEAN:	152.8	155.3	134.9	128.6	114.3	107.9	119.6	122.3	110.6
GEOMETRIC S.D.:	1.5	1.5	1.6	1.5	1.5	1.6	1.8	1.6	1.6
HIGHEST BY LARSEN EXTRP:	554.2	547.8	587.2	462.1	406.0	434.4	663.5	495.0	408.7
1ST HIGHEST:	554.0	373.0	423.0	307.0	385.0	303.0	386.0	327.0	272.0
DATE :	720421	730925	740523	751027	760903	770419	780707	790509	800421
2ND HIGHEST:	460.0	357.0	357.0	304.0	298.0	244.0	354.0	288.0	262.0
DATE :	720122	731025	740411	750517	760418	770624	781104	790220	800813
# OF READINGS EXCEEDING 260 :	3	8	7	4	3	1	5	2	2
# OF READINGS EXCEEDING 150 :	27	28	24	16	13	15	18	20	15

RANGE									
0- 65:	3	0	7	4	3	7	7	5	5
66-130:	15	21	20	23	39	34	26	28	34
131-195:	24	17	19	15	11	11	14	13	15
196-260:	11	8	8	4	4	6	7	10	4
261-325:	0	5	3	4	2	1	3	1	2
326-390:	1	3	3	0	1	0	2	1	0
391-455:	0	0	1	0	0	0	0	0	0
>455:	2	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 10200032 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	53	61	56	58	71	63	54	58	0
GEOMETRIC MEAN:	126.2	120.1	94.0	80.9	89.5	92.9	78.6	84.0	******
GEOMETRIC S.D.:	1.6	1.5	1.6	1.6	1.7	1.6	1.7	1.4	******
HIGHEST BY LARSEN EXTRP:	479.4	376.6	340.9	303.9	397.9	398.3	395.9	246.6	******
1ST HIGHEST:	287.0	319.0	210.0	266.0	284.0	412.0	279.0	206.0	******
DATE :	720521	730907	740920	750518	761112	770513	780905	790906	******
2ND HIGHEST:	263.0	272.0	207.0	205.0	228.0	287.0	245.0	164.0	******
DATE :	721016	730828	740523	750319	760915	770413	780824	790918	******
# OF READINGS EXCEEDING 260 :	2	3	0	1	1	3	1	0	0
# OF READINGS EXCEEDING 150 :	20	16	10	6	10	10	8	2	0
RANGE									
0- 65:	5	5	11	18	16	15	18	14	0
66-130:	24	30	32	30	41	33	28	37	0
131-195:	15	23	10	8	12	10	5	6	0
196-260:	7	0	3	1	1	2	2	1	0
261-325:	2	3	0	1	1	2	1	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	1	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 10200015 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	56	56	55	55	76	65	55	49	0
GEOMETRIC MEAN:	182.9	146.6	151.7	105.1	112.7	93.4	92.8	97.6	******
GEOMETRIC S.D.:	1.7	1.7	1.4	1.4	1.5	1.8	1.7	1.5	******
HIGHEST BY LARSEN EXTRP:	854.5	656.5	429.3	288.0	372.7	492.7	406.8	333.3	******
1ST HIGHEST:	644.0	759.0	324.0	267.0	385.0	322.0	295.0	239.0	******
DATE :	720204	730110	740228	750301	760307	770513	780321	790906	******
2ND HIGHEST:	550.0	417.0	323.0	199.0	313.0	283.0	237.0	238.0	******
DATE :	720119	731206	740123	750112	760711	770115	780526	790720	******
# OF READINGS EXCEEDING 250 :	13	5	5	1	2	3	1	0	0
# OF READINGS EXCEEDING 150 :	28	27	27	9	15	12	9	5	0
RANGE									
0- 65:	0	3	1	4	6	15	13	10	0
66-130:	16	19	13	35	44	35	28	26	0
131-195:	19	22	31	13	20	8	10	10	0
196-260:	8	7	5	2	4	4	3	3	0
261-325:	4	3	5	1	1	3	1	0	0
326-390:	2	0	0	0	1	0	0	0	0
391-455:	2	1	0	0	0	0	0	0	0
>455:	5	1	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 10200016 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	41	79	64	57	55	0
GEOMETRIC MEAN:	******	******	******	87.6	87.9	94.5	83.8	84.9	******
GEOMETRIC S.D.:	******	******	******	1.4	1.5	1.6	1.6	1.4	******
HIGHEST BY LARSEN EXTRP:	******	******	******	261.1	299.5	397.1	333.8	245.3	******
1ST HIGHEST:	******	******	******	218.0	240.0	288.0	245.0	141.0	******
DATE :	******	******	******	750810	761116	770706	781104	790316	******
2ND HIGHEST:	******	******	******	153.0	210.0	285.0	222.0	141.0	******
DATE :	******	******	******	750623	761015	770419	780526	790714	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	4	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	3	4	9	4	0	0
RANGE									
0- 65:	0	0	0	9	17	13	15	14	0
66-130:	0	0	0	26	47	39	34	35	0
131-195:	0	0	0	5	13	5	5	6	0
196-260:	0	0	0	1	2	3	3	0	0
261-325:	0	0	0	0	0	4	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 10200014 SITE ID # 06
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	53	54	58	57	80	66	54	56	0
GEOMETRIC MEAN:	152.3	148.2	139.1	94.6	94.4	96.5	77.1	102.6	******
GEOMETRIC S.D.:	1.5	1.6	1.7	1.5	1.5	1.6	1.7	1.6	******
HIGHEST BY LARSEN EXTRP:	505.2	577.9	629.7	294.3	330.5	367.2	350.6	373.2	******
1ST HIGHEST:	321.0	604.0	462.0	202.0	264.0	263.0	210.0	273.0	******
DATE :	720127	730110	741225	750206	761015	770413	780321	790514	******
2ND HIGHEST:	313.0	279.0	366.0	192.0	211.0	257.0	185.0	241.0	******
DATE :	720111	730209	741026	751015	761116	770302	781104	790626	******
# OF READINGS EXCEEDING 250 :	5	3	6	0	1	1	0	1	0
# OF READINGS EXCEEDING 150 :	25	32	26	7	10	11	4	10	0
RANGE									
0- 65:	1	2	4	10	18	12	19	10	0
66-130:	18	14	19	35	47	39	26	30	0
131-195:	18	23	22	11	13	10	8	11	0
196-260:	11	12	7	1	1	4	1	4	0
261-325:	5	2	4	0	1	1	0	1	0
326-390:	0	0	1	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	1	1	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR NATIONAL STEEL - DETROIT, MI
SAROAD STATION # 10200037 SITE ID # 07
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	40	52	52	0
GEOMETRIC MEAN:	******	******	******	******	******	66.7	68.2	62.0	******
GEOMETRIC S.D.:	******	******	******	******	******	1.6	1.7	1.5	******
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	266.4	301.8	190.8	******
1ST HIGHEST:	******	******	******	******	******	186.0	281.0	131.0	******
DATE :	******	******	******	******	******	770513	780201	790906	******
2ND HIGHEST:	******	******	******	******	******	173.0	150.0	113.0	******
DATE :	******	******	******	******	******	770419	781116	790509	******
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	1	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	2	1	0	0
RANGE									
0- 65:	0	0	0	0	0	20	24	30	0
66-130:	0	0	0	0	0	16	21	21	0
131-195:	0	0	0	0	0	4	6	1	0
196-260:	0	0	0	0	0	0	0	0	0
261-325:	0	0	0	0	0	0	1	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - DETROIT, MI
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	231180015		10200037		234420005		10200014		10200015		10200016	
SITE ID #	2		7		1		6		4		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	1	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	302.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ENE COUNT:	1	0	0	0	0	1	0	0	1	0	0	0
AVE TSP:	295.	0.	0.	0.	0.	293.	0.	0.	447.	0.	0.	0.
E COUNT:	1	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	554.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	1	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	266.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SE COUNT:	2	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	365.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	0	0	0	0	1	0	0	0	1	0	0	0
AVE TSP:	0.	0.	0.	0.	280.	0.	0.	0.	340.	0.	0.	0.
S COUNT:	7	2	0	0	2	0	0	0	0	0	0	0
AVE TSP:	308.	286.	0.	0.	290.	0.	0.	0.	0.	0.	0.	0.
SSW COUNT:	8	3	1	0	7	0	1	0	0	0	0	0
AVE TSP:	326.	289.	281.	0.	313.	0.	273.	0.	0.	0.	0.	0.
SW COUNT:	4	4	0	0	1	2	3	1	4	2	1	1
AVE TSP:	319.	360.	0.	0.	403.	335.	387.	275.	452.	315.	264.	285.
WSW COUNT:	2	0	0	0	0	0	4	2	4	3	1	1
AVE TSP:	347.	0.	0.	0.	0.	0.	304.	288.	353.	387.	288.	273.
W COUNT:	0	0	0	0	0	0	3	1	6	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	339.	279.	359.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0	1	1	5	2	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	306.	321.	347.	388.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	1	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	385.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	26	9	1	0	11	3	12	5	22	8	2	2
AVE TSP:	330.	320.	281.	0.	314.	321.	331.	290.	376.	359.	276.	279.

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - DETROIT, MI
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD # 10200032
SITE ID # 3

DIRECTION		W>=X	W<X
N	COUNT:	0	0
	AVE TSP:	0.	0.
NNE	COUNT:	0	0
	AVE TSP:	0.	0.
NE	COUNT:	0	0
	AVE TSP:	0.	0.
ENE	COUNT:	0	1
	AVE TSP:	0.	287.
E	COUNT:	0	0
	AVE TSP:	0.	0.
ESE	COUNT:	0	0
	AVE TSP:	0.	0.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	0	0
	AVE TSP:	0.	0.
S	COUNT:	0	0
	AVE TSP:	0.	0.
SSW	COUNT:	0	1
	AVE TSP:	0.	266.
SW	COUNT:	1	0
	AVE TSP:	263.	0.
WSW	COUNT:	1	3
	AVE TSP:	283.	277.
W	COUNT:	1	0
	AVE TSP:	284.	0.
WNW	COUNT:	2	1
	AVE TSP:	296.	412.
NW	COUNT:	0	0
	AVE TSP:	0.	0.
NNW	COUNT:	0	0
	AVE TSP:	0.	0.
ALL	COUNT:	5	6
	AVE TSP:	284.	300.

24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - DETROIT, MI
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

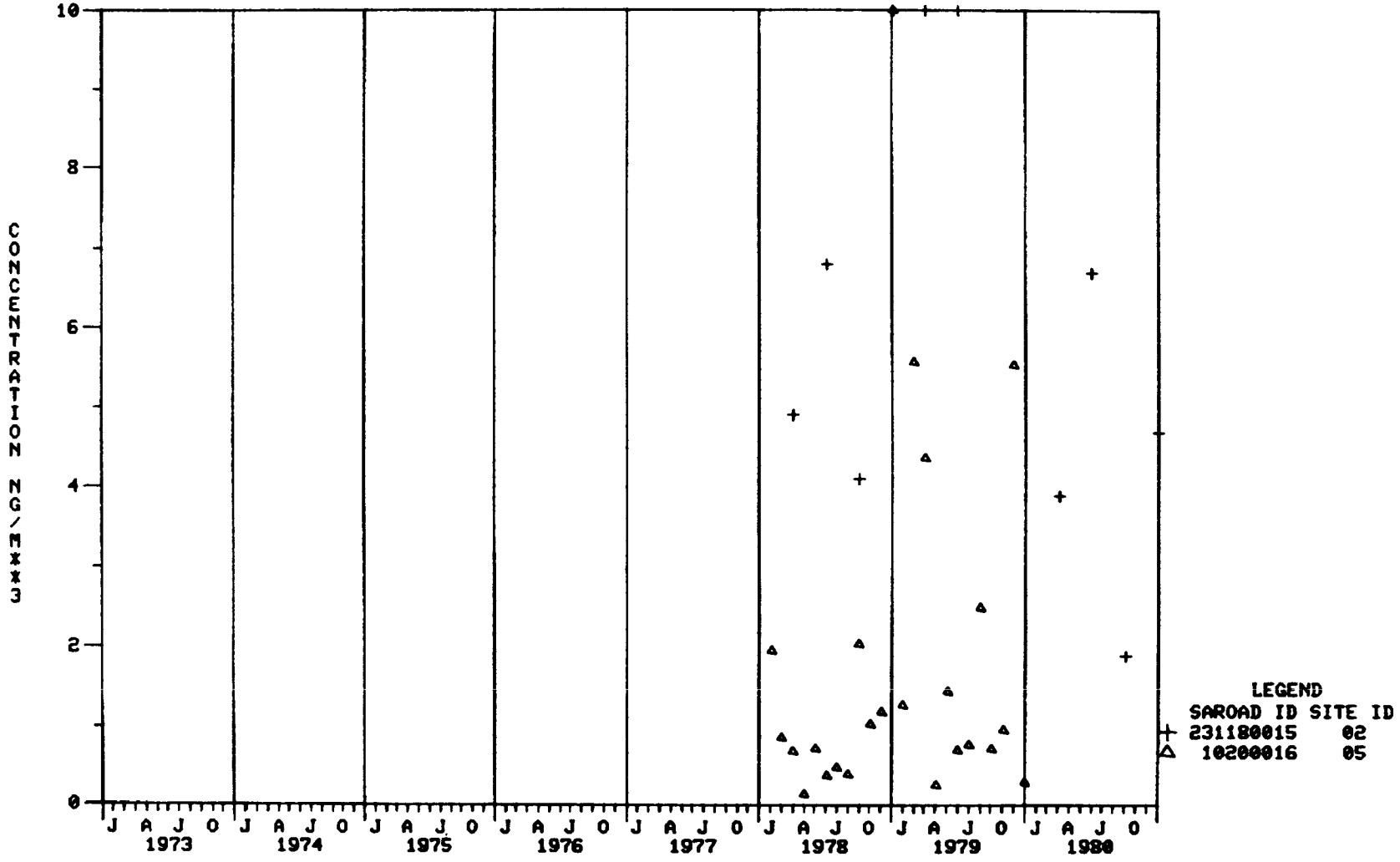
SAROAD #	231180015		10200037		234420005		10200014		10200015		10200016	
SITE ID #	2		7		1		6		4		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	2	2	0	0	2	3	1	0	2	1	0	0
AVE TSP:	219.	208.	0.	0.	159.	162.	186.	0.	169.	159.	0.	0.
NNE COUNT:	0	2	0	0	2	3	0	1	1	3	0	0
AVE TSP:	0.	180.	0.	0.	176.	194.	0.	171.	169.	230.	0.	0.
NE COUNT:	3	3	0	0	6	2	1	1	1	1	0	1
AVE TSP:	192.	187.	0.	0.	180.	218.	214.	165.	153.	172.	0.	235.
ENE COUNT:	5	3	0	0	5	2	0	1	2	1	0	0
AVE TSP:	207.	184.	0.	0.	187.	236.	0.	190.	306.	222.	0.	0.
E COUNT:	5	2	0	0	1	5	2	1	0	0	0	0
AVE TSP:	278.	192.	0.	0.	159.	182.	181.	245.	0.	0.	0.	0.
ESE COUNT:	4	0	0	0	4	0	0	1	2	0	0	0
AVE TSP:	206.	0.	0.	0.	169.	0.	0.	164.	184.	0.	0.	0.
SE COUNT:	4	2	0	0	1	4	1	0	0	0	0	0
AVE TSP:	286.	193.	0.	0.	154.	172.	156.	0.	0.	0.	0.	0.
SSE COUNT:	3	7	0	0	1	4	3	3	3	5	0	1
AVE TSP:	180.	204.	0.	0.	280.	179.	221.	190.	248.	179.	0.	174.
S COUNT:	25	10	0	0	22	8	12	5	4	2	1	0
AVE TSP:	232.	218.	0.	0.	206.	192.	177.	183.	186.	208.	222.	0.
SSW COUNT:	16	13	1	0	16	7	10	3	10	1	1	0
AVE TSP:	265.	213.	281.	0.	249.	193.	187.	207.	195.	154.	245.	0.
SW COUNT:	17	11	0	1	7	7	16	12	12	11	5	1
AVE TSP:	228.	248.	0.	173.	222.	219.	228.	196.	273.	206.	197.	285.
WSW COUNT:	10	8	0	0	3	7	20	5	16	8	5	2
AVE TSP:	213.	199.	0.	0.	171.	167.	223.	213.	244.	280.	216.	220.
W COUNT:	5	5	0	0	3	2	11	3	18	3	0	0
AVE TSP:	177.	183.	0.	0.	182.	160.	243.	248.	244.	207.	0.	0.
WNW COUNT:	6	2	0	1	0	2	8	4	13	6	1	2
AVE TSP:	160.	154.	0.	186.	0.	187.	212.	212.	256.	246.	156.	230.
NW COUNT:	0	1	0	0	0	0	0	0	1	4	0	0
AVE TSP:	0.	177.	0.	0.	0.	0.	0.	0.	385.	183.	0.	0.
NNW COUNT:	0	1	0	0	0	1	0	0	1	0	0	0
AVE TSP:	0.	199.	0.	0.	0.	161.	0.	0.	191.	0.	0.	0.
ALL COUNT:	105	72	1	2	73	57	85	40	86	46	13	7
AVE TSP:	227.	209.	281.	180.	207.	188.	212.	201.	239.	218.	207.	228.

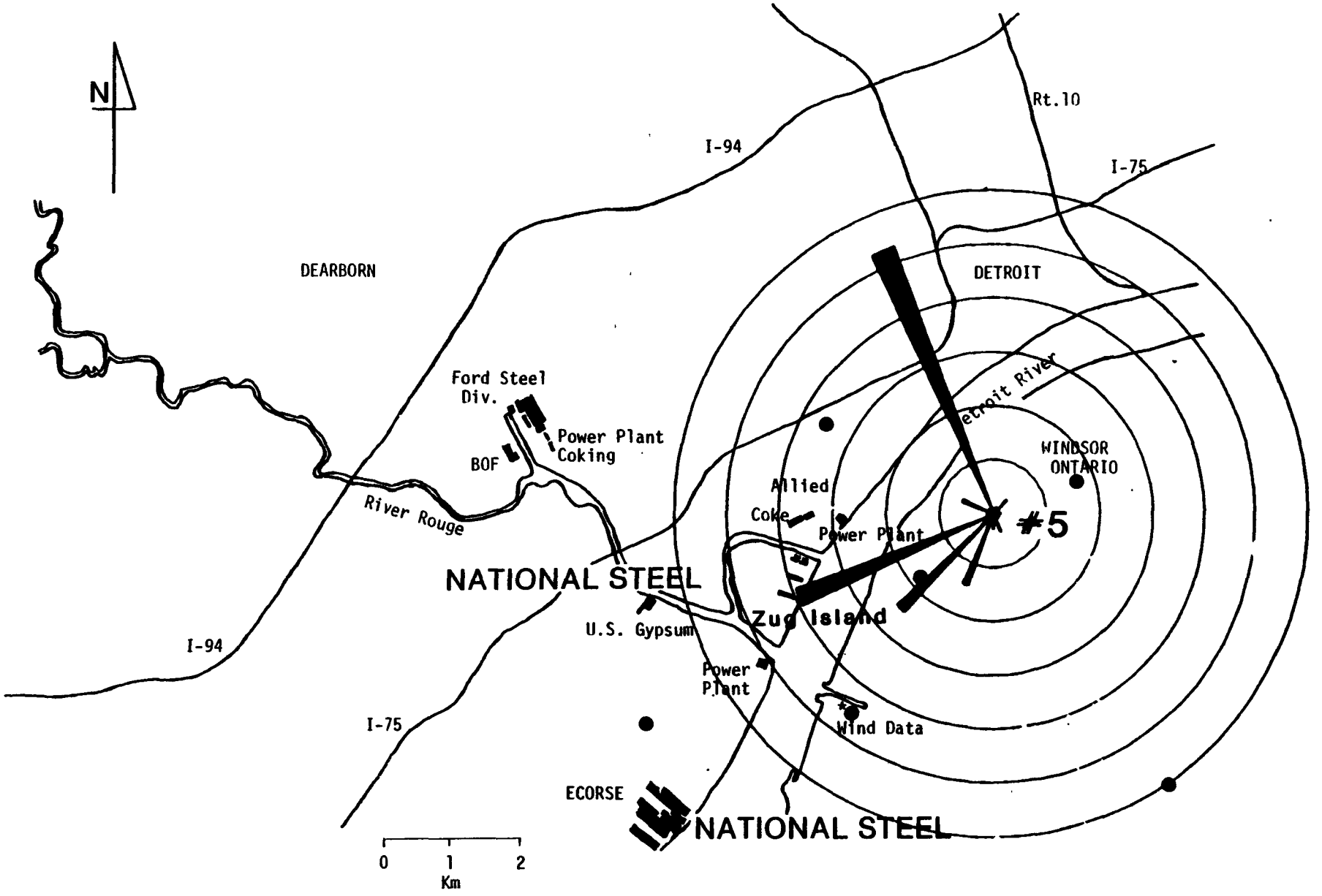
24-HR STANDARD EXCEEDANCE ROSE FOR
NATIONAL STEEL - DETROIT, MI
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD # 10200032
SITE ID # 3

DIRECTION		W>=X	W<X
N	COUNT:	1	1
	AVE TSP:	180.	205.
NNE	COUNT:	1	5
	AVE TSP:	210.	191.
NE	COUNT:	2	2
	AVE TSP:	191.	158.
ENE	COUNT:	2	1
	AVE TSP:	166.	287.
E	COUNT:	0	1
	AVE TSP:	0.	157.
ESE	COUNT:	2	1
	AVE TSP:	174.	164.
SE	COUNT:	0	0
	AVE TSP:	0.	0.
SSE	COUNT:	2	1
	AVE TSP:	214.	210.
S	COUNT:	6	2
	AVE TSP:	177.	172.
SSW	COUNT:	6	1
	AVE TSP:	174.	266.
SW	COUNT:	9	2
	AVE TSP:	184.	177.
WSW	COUNT:	6	7
	AVE TSP:	195.	216.
W	COUNT:	3	2
	AVE TSP:	216.	200.
WNW	COUNT:	6	2
	AVE TSP:	226.	333.
NW	COUNT:	1	1
	AVE TSP:	213.	176.
NNW	COUNT:	3	3
	AVE TSP:	174.	188.
ALL	COUNT:	50	32
	AVE TSP:	191.	205.

BAP MONTHLY AND QUARTERLY ARITHMETIC MEANS (NG/M**3) FOR NATIONAL STEEL - DETROIT, MI





BaP roses for National Steel - Detroit, Michigan, for the period 1978-1980 for cases of $\omega > 0.80$. Each circle represents 2 ng/m^3.

UPDATED AIR QUALITY EVALUATION - NATIONAL STEEL, DETROIT, MICHIGAN

Stations used in update:

Continued operation:	#1, #2, #3, #4, #5, #6, #7
New stations:	None
Discontinued stations:	None

Trends in geometric means:

All stations except #7 indicated an upward trend beginning in mid-1978 through mid-1979. This was followed by a downtrend from mid-1979 through 1980. Unfortunately, the Canadian data were not available for 1980.

Long-term trends were the strongest at station #4 with a Spearman correlation coefficient of -0.89 and moderately negative at stations #6, #3, and #2 (-0.72, -0.64, and -0.60, respectively).

Attainment status:

All stations except #7, the station farthest from the mill, were in nonattainment of the primary TSP standards from 1978 through 1980.

Pollution roses:

Roses for stations #1 and #2 show more definitive impact of the mill than in the previous analysis. Station #1 indicates impact from both the Zug Island and Ecorse plants. Canadian stations #3 and #4 continue to show strong mill impact, particularly from the Zug Island coke batteries.

Standard exceedance roses:

Approximately two-thirds of the primary standard exceedances at stations #1 and #2 were associated with wind directions coming from sectors in which mill sources are located. The majority of exceedances at the three closest Canadian stations (#3, #4, #5) also occurred with winds directed from the mill.

BaP:

BaP was sampled at stations #2 and #5. Monthly values were moderately high (up to 10 ng/m^3). The BaP pollution rose for station #5 tends to indicate that some of the observed ambient BaP originates from National Steel coking operations on Zug Island.

REPUBLIC STEEL

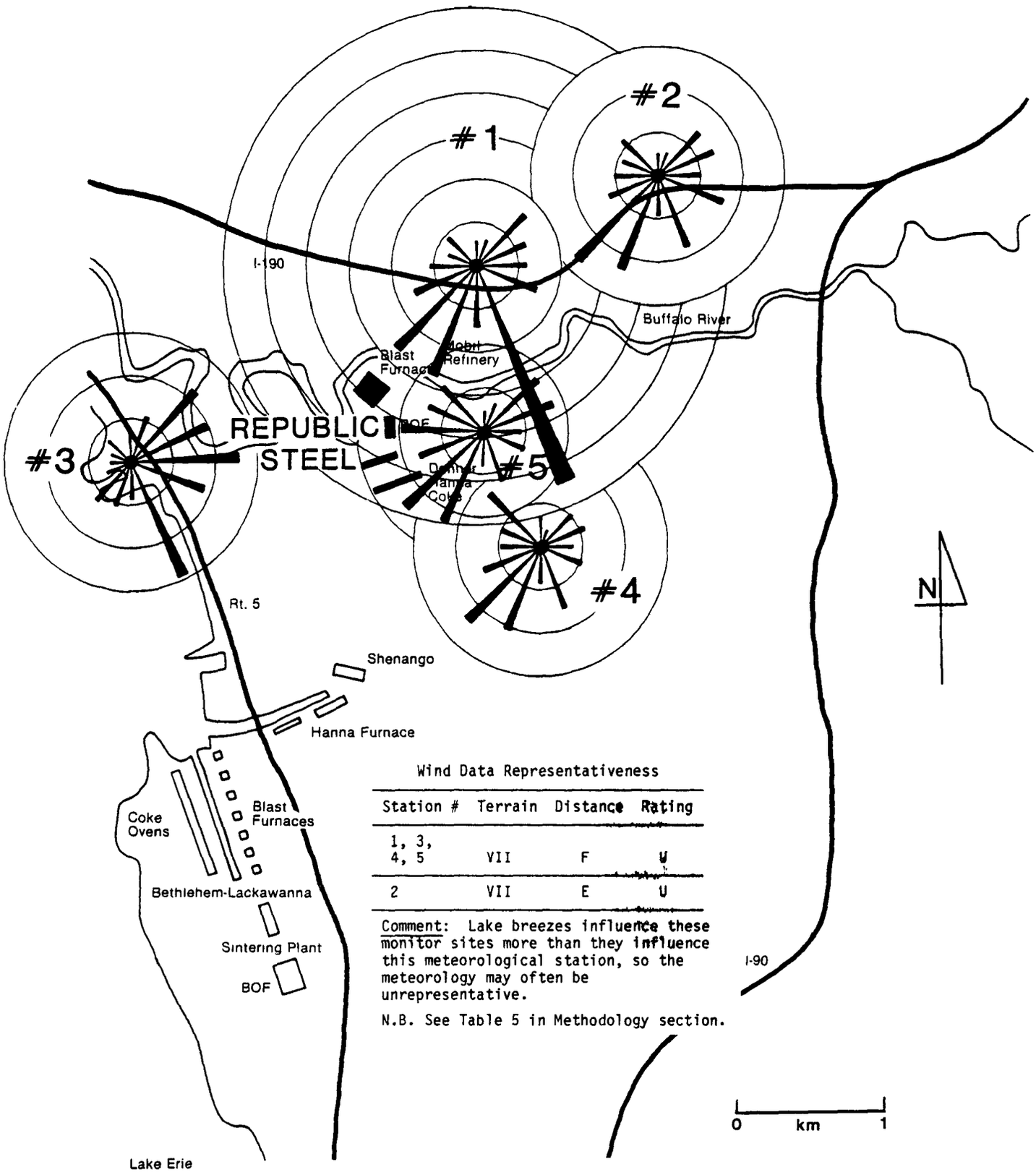
Buffalo, New York

EPA Region II

HiVol Monitoring Sites in the Vicinity of - Republic Steel, Buffalo, New York

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance (km)	Elevation (m) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction	Distance (m)	Volume
#1	330660003	Public School #26*	Blast furnaces 225°	1.3km	9	180	2	Building roof	Harrison St.	ESE	23	very light
			BOF 213°	1.6km								
			Donner Hanna Coke 205°	2.0km								
#2	330660005	Dingens & Weiss	Blast furnaces 236°	3.2km	3	183	5	Top of trailer	Access Road to state bridge Maintainence yard	E	3	light
			BOF 229°	3.3km								
			Donner Hanna Coke 224°	3.6km					Dingens Street	N	60	2 lanes-moderate
#3	330660014	Buffalo Port Terminal	Blast furnaces 73°	2.4km	9	178	0	Building roof	Rt. 5	NE	90	4 lane expressway moderate - heavy
			BOF 82°	2.4km								
			Donner Hanna Coke 92°	2.4km								
#4	330660006	Holy Family School	Blast furnaces 318°	2.0km	15	180	2	Building roof	Tifft Street	S	15	2 lane-moderate
			BOF 312°	1.7km								
			Donner Hanna Coke 300°	1.4km								
#5	None Reference # 1401013	Public School #28	Blast furnaces 296°	1.1km	9	178	0	Building roof	Bailey	ENE	45	2 lane moderate
			BOF 276°	0.9km								
			Donner Hanna Coke 242°	0.9km					South Park	NNE	45	2 lane moderate

*Critical Site



Wind Data Representativeness

Station #	Terrain	Distance	Rating
1, 3, 4, 5	VII	F	U
2	VII	E	U

Comment: Lake breezes influence these monitor sites more than they influence this meteorological station, so the meteorology may often be unrepresentative.

N.B. See Table 5 in Methodology section.

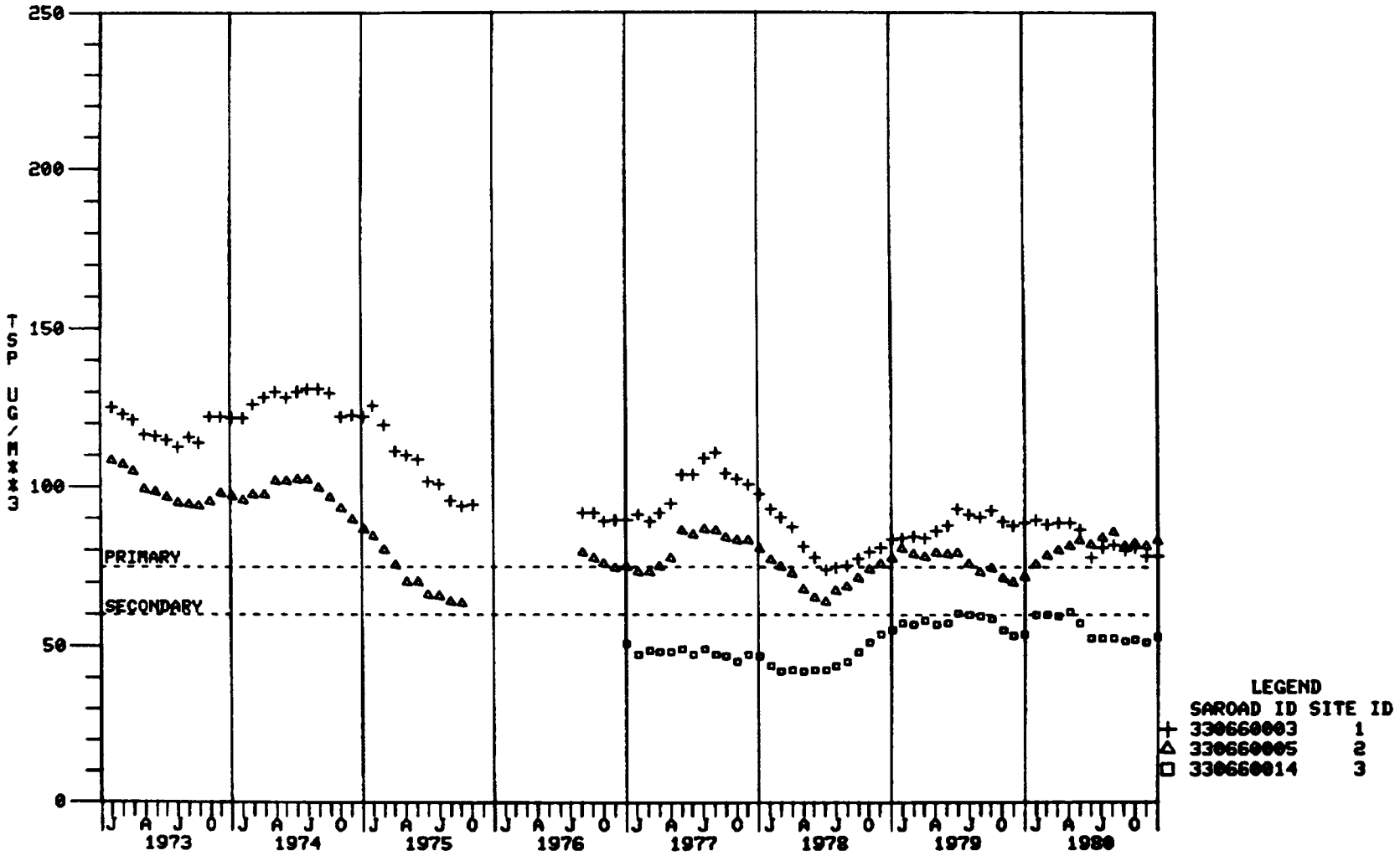
TSP roses for Republic Steel - Buffalo, New York, for the period 1978-1980 for cases of $\omega > 0.90$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

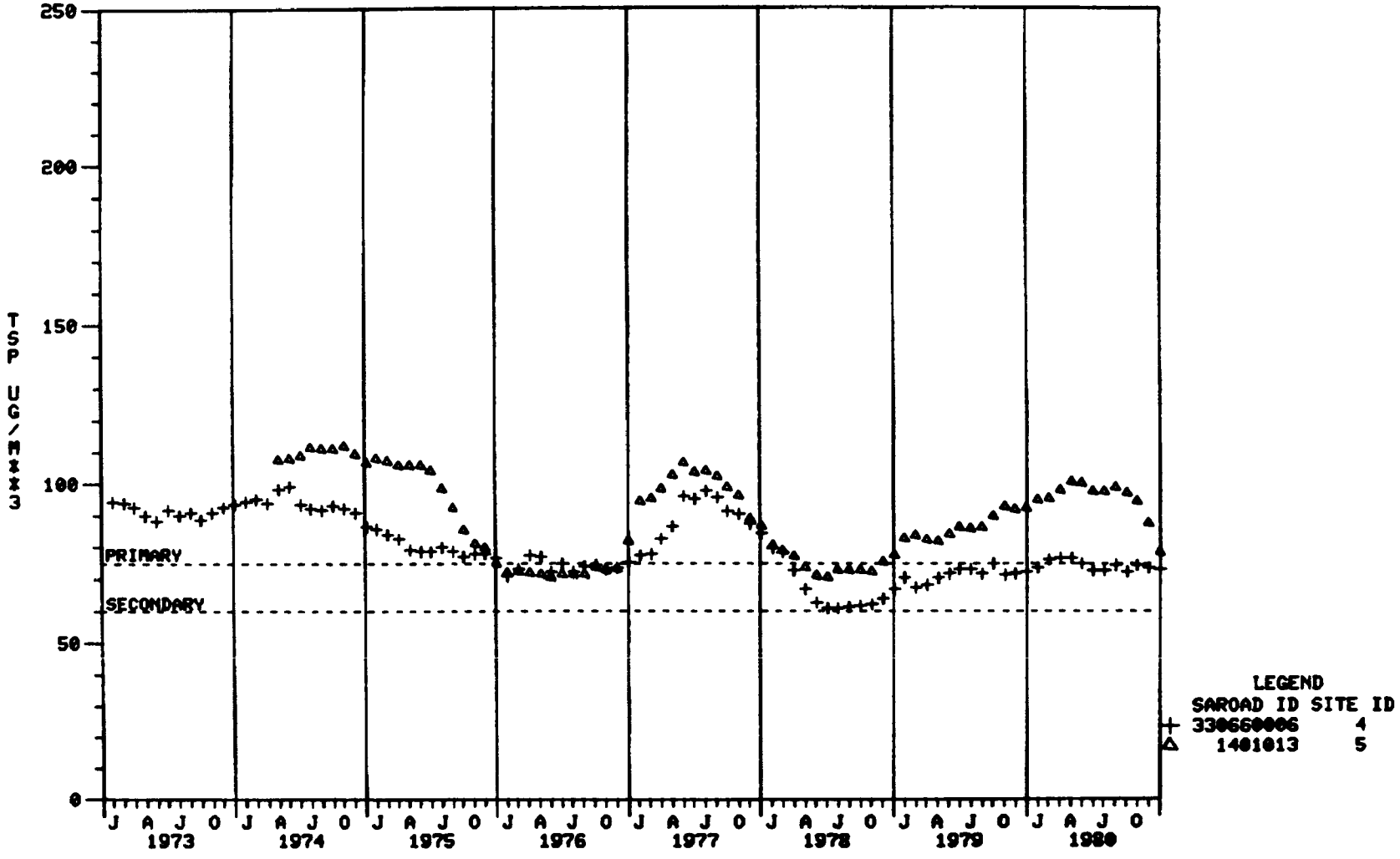
Republic Steel--Buffalo, NY

Wind Direction	Monitoring Site Numbers #1	#2	#3	#4	#5
N	2	2	2	2	1
NNE	1	1	1	1	2
NE	4	4	3	4	5
ENE	3	4	4	4	4
E	3	3	3	3	4
ESE	1	1	1	1	1
SE	0	0	0	0	0
SSE	2	2	2	1	3
S	3	4	3	4	3
SSW	12	12	10	11	13
SW	15	15	14	16	15
WSW	8	9	8	9	8
W	7	8	7	7	11
WNW	3	4	4	4	6
NW	3	2	3	3	4
NNW	0	0	0	0	0
Total	67	71	65	70	80

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR REPUBLIC STEEL - BUFFALO, NY



TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR REPUBLIC STEEL - BUFFALO, NY



TSP DATA SUMMARY FOR REPUBLIC STEEL - BUFFALO, NY
SAROAD STATION # 330660003 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	137	58	53	39	56	44	54	49	56
GEOMETRIC MEAN:	125.7	121.6	122.2	******	89.7	98.0	83.3	88.6	78.4
GEOMETRIC S.D.:	1.5	1.6	1.6	******	1.7	1.7	1.8	1.7	1.5
HIGHEST BY LARSEN EXTRP:	430.8	500.2	478.6	******	447.4	478.1	440.3	421.5	267.3
1ST HIGHEST:	363.0	309.0	312.0	243.0	253.0	231.0	254.0	438.0	166.0
DATE :	720612	731112	740306	750418	760611	770419	780526	790520	800304
2ND HIGHEST:	290.0	303.0	289.0	183.0	248.0	224.0	230.0	251.0	159.0
DATE :	720427	730416	740228	750124	761214	770513	780911	790509	800720
# OF READINGS EXCEEDING 260 :	4	3	2	0	0	0	0	1	0
# OF READINGS EXCEEDING 150 :	49	21	19	7	12	14	8	7	2
RANGE									
0- 65:	8	6	7	8	19	13	17	10	15
66-130:	58	25	25	21	17	16	24	30	37
131-195:	55	18	11	9	15	10	10	7	4
196-260:	12	6	8	1	5	5	3	1	0
261-325:	3	3	2	0	0	0	0	0	0
326-390:	1	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	1	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR REPUBLIC STEEL - BUFFALO, NY
SAROAD STATION # 330660005 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	60	61	54	38	56	53	60	60	56
GEOMETRIC MEAN:	105.0	97.1	86.7	******	74.7	80.6	77.6	71.7	82.9
GEOMETRIC S.D.:	1.6	1.7	1.7	******	1.8	1.8	1.9	1.7	1.6
HIGHEST BY LARSEN EXTRP:	408.8	486.0	402.1	******	388.1	449.5	518.5	316.1	360.8
1ST HIGHEST:	292.0	279.0	259.0	201.0	281.0	222.0	290.0	227.0	186.0
DATE :	720409	731124	740411	751120	760611	770419	780526	790509	800304
2ND HIGHEST:	290.0	270.0	208.0	189.0	242.0	206.0	209.0	180.0	171.0
DATE :	720608	730116	740417	750524	760629	770413	780911	790220	800421
# OF READINGS EXCEEDING 260 :	2	2	0	0	1	0	1	0	0
# OF READINGS EXCEEDING 150 :	12	12	10	3	7	9	10	5	4
RANGE									
0- 65:	8	14	15	19	26	19	21	23	16
66-130:	33	28	23	14	20	20	26	31	31
131-195:	13	13	14	4	6	11	9	5	9
196-260:	4	4	2	1	3	3	3	1	0
261-325:	2	2	0	0	1	0	1	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR REPUBLIC STEEL - BUFFALO, NY
SAROAD STATION # 330660014 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	42	51	52	55	56
GEOMETRIC MEAN:	******	******	******	******	49.4	46.9	55.2	54.0	53.2
GEOMETRIC S.D.:	******	******	******	******	1.8	1.8	2.4	2.0	1.8
HIGHEST BY LARSEN EXTRP:	******	******	******	******	293.3	273.2	757.8	436.3	292.0
1ST HIGHEST:	******	******	******	******	149.0	203.0	232.0	180.0	205.0
DATE :	******	******	******	******	760605	770419	781116	790620	800328
2ND HIGHEST:	******	******	******	******	120.0	128.0	222.0	175.0	154.0
DATE :	******	******	******	******	760418	770922	780426	790322	801205
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	1	3	4	2
RANGE									
0- 65:	0	0	0	0	26	34	28	31	35
66-130:	0	0	0	0	15	16	20	17	17
131-195:	0	0	0	0	1	0	1	7	3
196-260:	0	0	0	0	0	1	3	0	1
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR REPUBLIC STEEL - BUFFALO, NY
SAROAD STATION # 330660006 SITE ID # 04
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	139	82	52	40	58	57	56	59	57
GEOMETRIC MEAN:	94.7	93.4	86.3	76.4	75.2	84.5	66.9	72.2	73.0
GEOMETRIC S.D.:	1.5	1.6	1.6	1.6	1.6	1.8	1.8	1.7	1.4
HIGHEST BY LARSEN EXTRP:	309.8	362.4	364.2	325.1	324.4	510.1	370.5	333.5	208.4
1ST HIGHEST:	279.0	351.0	292.0	215.0	414.0	314.0	235.0	220.0	154.0
DATE :	720608	730609	740417	750418	760611	770413	780526	790509	800304
2ND HIGHEST:	195.0	213.0	196.0	214.0	182.0	308.0	200.0	175.0	140.0
DATE :	720917	730608	740411	750623	761015	770302	780911	790502	800421
# OF READINGS EXCEEDING 260 :	1	1	1	0	1	2	0	0	0
# OF READINGS EXCEEDING 150 :	17	13	9	4	4	12	5	5	1
RANGE									
0- 65:	29	20	14	14	25	19	28	24	22
66-130:	78	41	26	20	25	23	21	28	31
131-195:	31	15	10	4	7	9	5	6	4
196-260:	0	4	1	2	0	4	2	1	0
261-325:	1	0	1	0	0	2	0	0	0
326-390:	0	1	0	0	0	0	0	0	0
391-455:	0	0	0	0	1	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR REPUBLIC STEEL - BUFFALO, NY
SARDAD STATION # 1401013 SITE ID # 05
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	102	284	176	78	55	53	59	89
GEOMETRIC MEAN:	******	******	106.6	74.7	81.6	86.7	77.6	92.2	78.1
GEOMETRIC S.D.:	******	******	1.5	1.6	1.6	1.5	1.7	1.6	1.5
HIGHEST BY LARSEN EXTRP:	******	******	386.4	281.7	324.9	302.7	384.8	334.8	267.3
1ST HIGHEST:	******	291.0	352.0	262.0	286.0	277.0	257.0	264.0	175.0
DATE :	******	731108	741022	750418	760611	770419	780526	790509	800328
2ND HIGHEST:	******	246.0	270.0	236.0	254.0	223.0	187.0	185.0	172.0
DATE :	******	730830	740514	750112	761114	770413	780707	791018	800526
# OF READINGS EXCEEDING 260 :	0	1	2	1	1	1	0	1	0
# OF READINGS EXCEEDING 150 :	0	27	72	13	9	4	8	5	5
RANGE									
0- 65:	0	14	43	64	26	12	18	11	31
66-130:	0	54	143	92	38	36	26	35	48
131-195:	0	22	77	17	10	5	8	12	9
196-260:	0	11	19	2	3	1	1	0	0
261-325:	0	1	1	1	1	1	0	1	0
326-390:	0	0	1	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
REPUBLIC STEEL - BUFFALO, NY
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	330660003		330660005		330660014		330660006		1401013	
SITE ID #	1		2		3		4		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	277.
ENE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
E COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ESE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
SSE COUNT:	1	0	0	0	0	0	0	0	0	0
AVE TSP:	438.	0.	0.	0.	0.	0.	0.	0.	0.	0.
S COUNT:	0	0	0	1	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	279.	0.	0.	0.	0.	0.	262.
SSW COUNT:	1	0	1	0	0	0	0	0	0	0
AVE TSP:	309.	0.	290.	0.	0.	0.	0.	0.	0.	0.
SW COUNT:	3	1	0	0	0	0	1	1	1	1
AVE TSP:	300.	303.	0.	0.	0.	0.	308.	314.	352.	270.
WSW COUNT:	0	0	2	0	0	0	3	0	1	1
AVE TSP:	0.	0.	276.	0.	0.	0.	352.	0.	286.	291.
W COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
WNW COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NW COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NNW COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
ALL COUNT:	5	1	3	1	0	0	4	1	2	4
AVE TSP:	330.	303.	280.	279.	0.	0.	341.	314.	319.	275.

24-HR STANDARD EXCEEDANCE ROSE FOR
REPUBLIC STEEL - BUFFALO, NY
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.900
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	330660003		330660005		330660014		330660006		1401013	
SITE ID #	1		2		3		4		5	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	0	0	0	0	0	0	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	164.
NNE COUNT:	0	0	0	0	0	0	0	0	0	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
NE COUNT:	0	2	0	1	1	1	0	1	1	1
AVE TSP:	0.	193.	0.	222.	222.	203.	0.	212.	185.	277.
ENE COUNT:	0	0	0	0	0	2	0	0	0	2
AVE TSP:	0.	0.	0.	0.	0.	180.	0.	0.	0.	179.
E COUNT:	0	0	1	1	1	1	0	1	0	0
AVE TSP:	0.	0.	227.	159.	232.	175.	0.	155.	0.	0.
ESE COUNT:	0	0	0	0	0	1	0	0	0	1
AVE TSP:	0.	0.	0.	0.	0.	197.	0.	0.	0.	159.
SE COUNT:	0	1	0	0	0	0	0	0	0	1
AVE TSP:	0.	160.	0.	0.	0.	0.	0.	0.	0.	172.
SSE COUNT:	1	1	0	0	1	0	0	1	0	1
AVE TSP:	438.	178.	0.	0.	180.	0.	0.	168.	0.	166.
S COUNT:	2	1	0	4	0	0	1	1	1	6
AVE TSP:	196.	243.	0.	209.	0.	0.	153.	215.	157.	196.
SSW COUNT:	14	12	5	6	0	1	2	4	12	17
AVE TSP:	194.	180.	201.	181.	0.	156.	194.	163.	187.	168.
SW COUNT:	24	11	15	8	0	0	17	5	39	10
AVE TSP:	199.	192.	176.	195.	0.	0.	188.	202.	187.	196.
WSW COUNT:	8	7	7	5	0	0	11	5	11	13
AVE TSP:	190.	203.	224.	187.	0.	0.	229.	172.	195.	187.
W COUNT:	0	3	0	4	0	0	0	2	7	7
AVE TSP:	0.	221.	0.	167.	0.	0.	0.	193.	192.	184.
WNW COUNT:	0	1	0	0	0	0	0	0	4	5
AVE TSP:	0.	162.	0.	0.	0.	0.	0.	0.	210.	193.
NW COUNT:	0	1	0	2	0	0	0	1	0	1
AVE TSP:	0.	168.	0.	176.	0.	0.	0.	204.	0.	163.
NNW COUNT:	0	0	0	0	0	0	0	0	1	0
AVE TSP:	0.	0.	0.	0.	0.	0.	0.	0.	154.	0.
ALL COUNT:	49	40	28	31	3	6	31	21	76	66
AVE TSP:	201.	191.	194.	188.	211.	182.	202.	184.	189.	184.

UPDATED AIR QUALITY EVALUATION - REPUBLIC STEEL, BUFFALO, NEW YORK

Stations used in update:

Continued operation:	#1, #2, #3, #4, #5
New stations:	None
Discontinued stations:	None

Trends in geometric means:

A rather pronounced downturn in TSP levels occurred from mid-1977 through mid-1978 at all stations except the background site #3. However, all stations, including #3, indicated rising TSP levels from mid-1978 through mid-1980.

Over the long term (1972-1980), stations #1 and #4 demonstrate the most pronounced downtrends (Spearman rank correlation coefficient of -0.84 and -0.70, respectively).

Attainment status:

All stations except the background site, station #3, are in non-attainment of the primary annual TSP standards.

Pollution roses:

The roses differ from the previous analysis in the following ways: (1) more well-defined impact of the steel complex is indicated at station #2 than previously; (2) the large impact from the south-southeast that did not appear previously at station #1 consists of only two events (one of which was 438 $\mu g/m^3$ on June 20, 1979); and (3) impact at station #3 is more pronounced than it was previously.

Standard exceedance roses:

Four out of the six cases of primary 24-hour standard exceedances at station #1 occur with persistent winds and indicate impact of Republic and Donner Hanna. All of the station #4 exceedances occur under south-west and west-southwest winds, possibly implicating Bethlehem Steel and Hanna Furnace rather than Republic. Two-thirds of the exceedances at station #5 were from the directions of Republic and Donner Hanna Coke.

REPUBLIC STEEL

Birmingham, Alabama

Region IV

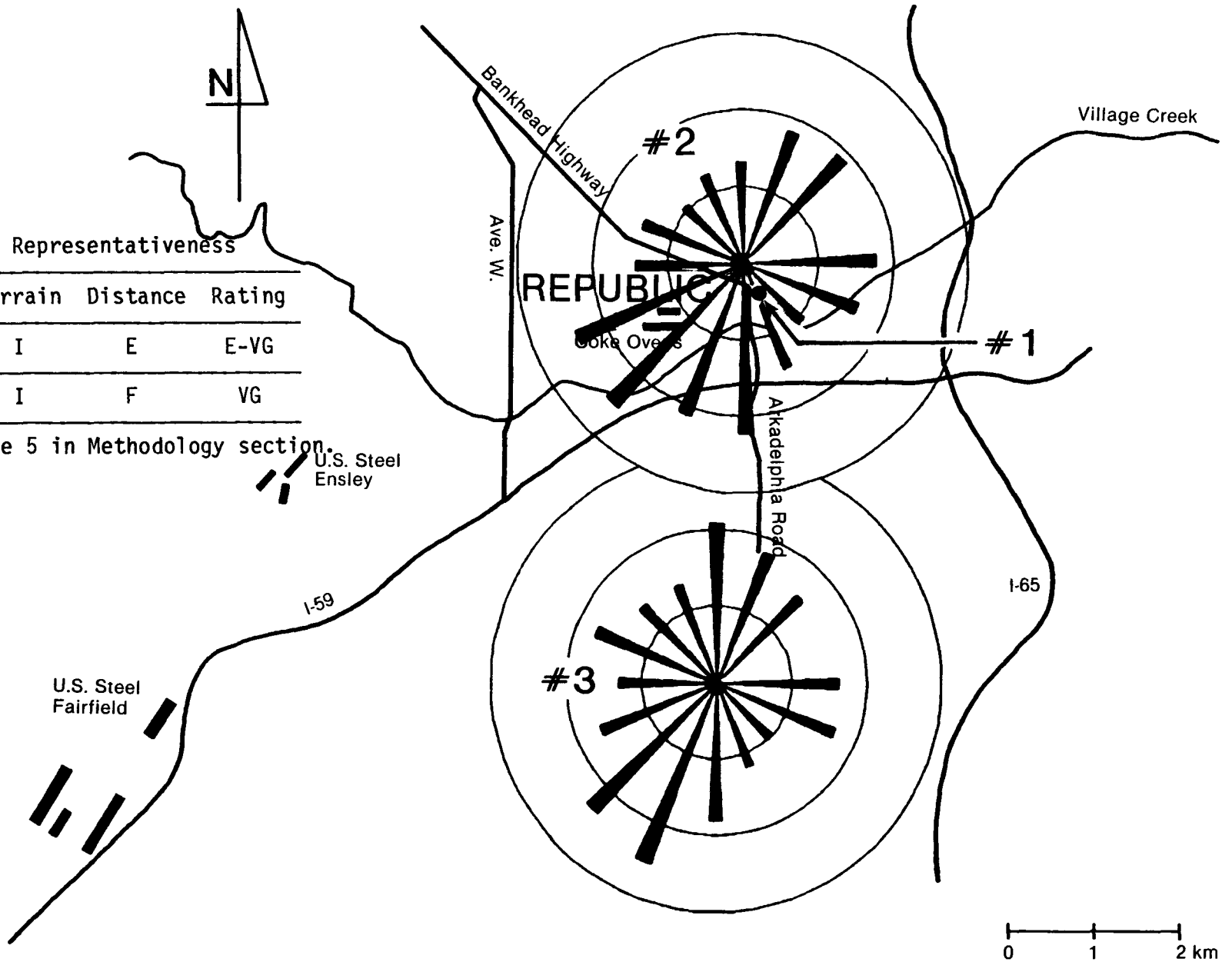
HiVol Monitoring Sites in the Vicinity of Republic Steel, Birmingham, Alabama

	SAROAD #	Site Name and Address	Plant Location from Site Bearing	Distance (km)	Elevation (m) Above Ground	MSL	Plant	Site Description	Nearest Roadway Name	Direction/Distance (m)		Volume
#1	010380019	East Thomas (old site)	250°	1.0	3	165	0	platform between high-way and service road	Finley Service Rd.	NW SE	8 4	Moderate Light
#2	010380022	East Thomas (new site)	228°	1.2	1	171	6	ground level near radio trans-mitter building	Dead end St.	E	23	Very light
#3	010380011	West End	350°	4.0	3	174	9	platform between traffic lanes	Steiner	NW & SE	2	Moderate

Wind Data Representativeness

Station #	Terrain	Distance	Rating
2	I	E	E-VG
3	I	F	VG

N.B. See Table 5 in Methodology section.



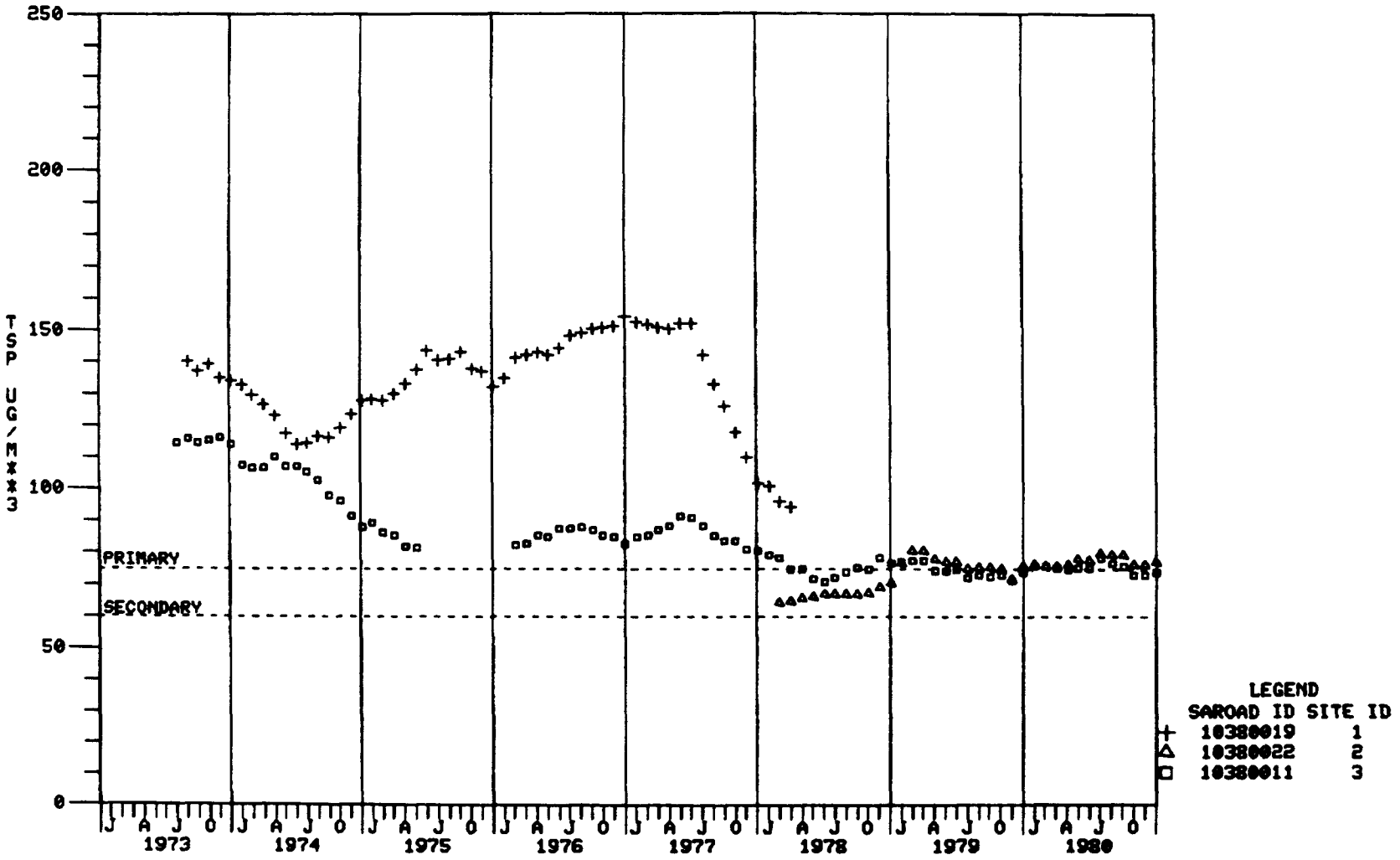
TSP roses for Republic Steel - Birmingham, Alabama, for the period 1978-1980 for cases of $\omega > 0.85$. Each circle represents 50 $\mu g/m^3$.

NUMBER OF TSP OBSERVATIONS USED IN POLLUTION ROSES

Republic Steel--Birmingham, AL

Wind Direction	Monitoring Site Numbers #2	#3
N	21	11
NNE	7	5
NE	2	2
ENE	0	0
E	8	7
ESE	5	4
SE	4	4
SSE	6	6
S	7	4
SSW	2	3
SW	1	1
WSW	2	1
W	9	9
WNW	7	4
NW	6	7
NNW	6	7
Total	93	75

TSP 12 MONTH RUNNING GEOMETRIC MEANS (UG/M**3) FOR REPUBLIC STEEL - BIRMINGHAM, AL



TSP DATA SUMMARY FOR REPUBLIC STEEL - BIRMINGHAM, AL
SAROAD STATION # 010380019 SITE ID # 01
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	15	257	284	229	272	240	0	0	0
GEOMETRIC MEAN:	******	133.9	128.0	132.1	154.4	101.8	******	******	******
GEOMETRIC S.D.:	******	1.7	1.7	1.8	1.6	1.9	******	******	******
HIGHEST BY LARSEN EXTRP:	******	632.3	623.9	717.3	643.4	648.8	******	******	******
1ST HIGHEST:	321.0	447.0	441.0	486.0	621.0	514.0	******	******	******
DATE :	721229	730205	741026	751118	760123	770210	******	******	******
2ND HIGHEST:	276.0	384.0	425.0	454.0	399.0	464.0	******	******	******
DATE :	721228	730413	741025	751119	760722	770211	******	******	******
# OF READINGS EXCEEDING 260 :	3	33	25	25	38	20	0	0	0
# OF READINGS EXCEEDING 150 :	4	107	114	98	147	71	0	0	0
RANGE									
0- 65:	4	22	32	26	15	60	0	0	0
66-130:	4	99	109	82	79	92	0	0	0
131-195:	4	77	83	64	93	51	0	0	0
196-260:	0	26	35	32	47	17	0	0	0
261-325:	3	24	15	17	22	14	0	0	0
326-390:	0	8	5	4	13	3	0	0	0
391-455:	0	1	5	3	2	1	0	0	0
>455:	0	0	0	1	1	2	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR REPUBLIC STEEL - BIRMINGHAM, AL
SARDAD STATION # 010380022 SITE ID # 02
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	0	0	0	0	0	119	84	55	59
GEOMETRIC MEAN:	******	******	******	******	******	******	70.4	75.7	76.8
GEOMETRIC S.D.:	******	******	******	******	******	******	1.8	1.7	1.5
HIGHEST BY LARSEN EXTRP:	******	******	******	******	******	******	391.2	340.7	275.5
1ST HIGHEST:	******	******	******	******	******	193.0	244.0	208.0	188.0
DATE :	******	******	******	******	******	770708	780104	791205	801205
2ND HIGHEST:	******	******	******	******	******	189.0	225.0	135.0	155.0
DATE :	******	******	******	******	******	771021	780331	791117	800215
# OF READINGS EXCEEDING 260 :	0	0	0	0	0	0	0	0	0
# OF READINGS EXCEEDING 150 :	0	0	0	0	0	6	9	4	2
RANGE									
0- 65:	0	0	0	0	0	51	36	21	21
66-130:	0	0	0	0	0	54	35	25	32
131-195:	0	0	0	0	0	14	9	8	6
196-260:	0	0	0	0	0	0	4	1	0
261-325:	0	0	0	0	0	0	0	0	0
326-390:	0	0	0	0	0	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	0	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

TSP DATA SUMMARY FOR REPUBLIC STEEL - BIRMINGHAM, AL
SAROAD STATION # 010380011 SITE ID # 03
UNITS : MICROGRAMS/M**3

YEAR	1972	1973	1974	1975	1976	1977	1978	1979	1980
# OF READINGS :	121	56	55	43	49	58	50	56	53
GEOMETRIC MEAN:	******	114.0	87.7	******	82.5	80.6	76.5	73.7	74.0
GEOMETRIC S.D.:	******	1.6	1.5	******	1.7	1.6	1.6	1.5	1.5
HIGHEST BY LARSEN EXTRP:	******	490.5	311.3	******	377.8	304.5	297.1	244.8	230.7
1ST HIGHEST:	275.0	776.0	230.0	215.0	341.0	262.0	246.0	151.0	176.0
DATE :	720201	730116	740628	750112	760611	770413	780408	790421	800421
2ND HIGHEST:	224.0	293.0	199.0	181.0	270.0	245.0	181.0	149.0	154.0
DATE :	720209	731019	741026	751202	760406	770513	780402	790202	800714
# OF READINGS EXCEEDING 260 :	1	2	0	0	2	1	0	0	0
# OF READINGS EXCEEDING 150 :	31	13	5	4	3	5	4	1	2
RANGE									
0- 65:	12	6	12	10	15	21	20	21	17
66-130:	65	33	35	26	26	30	24	31	32
131-195:	38	10	6	6	6	4	5	4	4
196-260:	5	5	2	1	0	2	1	0	0
261-325:	1	1	0	0	1	1	0	0	0
326-390:	0	0	0	0	1	0	0	0	0
391-455:	0	0	0	0	0	0	0	0	0
>455:	0	1	0	0	0	0	0	0	0

****** INDICATES MISSING OR INSUFFICIENT DATA

24-HR STANDARD EXCEEDANCE ROSE FOR
REPUBLIC STEEL - BIRMINGHAM, AL
(All Cases > 260 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF PRIMARY EXCEEDANCES

SAROAD #	10380019		10380022		10380011	
SITE ID #	1		2		3	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	3	6	0	0	0	0
AVE TSP:	282.	353.	0.	0.	0.	0.
NNE COUNT:	4	6	0	0	2	1
AVE TSP:	339.	323.	0.	0.	306.	293.
NE COUNT:	5	2	0	0	0	0
AVE TSP:	310.	298.	0.	0.	0.	0.
ENE COUNT:	2	7	0	0	0	0
AVE TSP:	355.	288.	0.	0.	0.	0.
E COUNT:	1	6	0	0	0	1
AVE TSP:	306.	326.	0.	0.	0.	776.
ESE COUNT:	2	8	0	0	0	0
AVE TSP:	351.	323.	0.	0.	0.	0.
SE COUNT:	8	16	0	0	1	0
AVE TSP:	338.	304.	0.	0.	262.	0.
SSE COUNT:	1	8	0	0	0	0
AVE TSP:	426.	315.	0.	0.	0.	0.
S COUNT:	3	4	0	0	0	0
AVE TSP:	312.	313.	0.	0.	0.	0.
SSW COUNT:	2	13	0	0	0	0
AVE TSP:	515.	326.	0.	0.	0.	0.
SW COUNT:	1	2	0	0	0	0
AVE TSP:	447.	314.	0.	0.	0.	0.
WSW COUNT:	0	6	0	0	0	0
AVE TSP:	0.	287.	0.	0.	0.	0.
W COUNT:	2	0	0	0	0	0
AVE TSP:	318.	0.	0.	0.	0.	0.
WNW COUNT:	2	8	0	0	0	0
AVE TSP:	295.	316.	0.	0.	0.	0.
NW COUNT:	1	2	0	0	0	0
AVE TSP:	341.	282.	0.	0.	0.	0.
NNW COUNT:	4	6	0	0	0	0
AVE TSP:	283.	341.	0.	0.	0.	0.
ALL COUNT:	41	100	0	0	3	2
AVE TSP:	334.	316.	0.	0.	291.	535.

24-HR STANDARD EXCEEDANCE ROSE FOR
REPUBLIC STEEL - BIRMINGHAM, AL
(All Cases > 150 μg/m^3 for 1972-1980)
X=0.850
COUNT/AVERAGE TSP OF SECONDARY EXCEEDANCES

SAROAD #	10380019		10380022		10380011	
SITE ID #	1		2		3	
DIRECTION	W>=X	W<X	W>=X	W<X	W>=X	W<X
N COUNT:	24	23	2	0	6	3
AVE TSP:	199.	242.	173.	0.	197.	157.
NNE COUNT:	10	31	1	0	4	4
AVE TSP:	251.	234.	183.	0.	235.	225.
NE COUNT:	14	12	1	1	0	0
AVE TSP:	234.	197.	162.	167.	0.	0.
ENE COUNT:	13	24	0	1	0	0
AVE TSP:	218.	221.	0.	189.	0.	0.
E COUNT:	11	21	0	3	0	2
AVE TSP:	204.	232.	0.	183.	0.	471.
ESE COUNT:	5	34	0	2	0	1
AVE TSP:	256.	220.	0.	170.	0.	153.
SE COUNT:	16	31	0	3	1	0
AVE TSP:	259.	254.	0.	209.	262.	0.
SSE COUNT:	8	20	1	0	0	1
AVE TSP:	214.	243.	175.	0.	0.	163.
S COUNT:	6	19	2	1	0	1
AVE TSP:	248.	219.	182.	188.	0.	156.
SSW COUNT:	17	27	0	0	2	1
AVE TSP:	223.	264.	0.	0.	166.	253.
SW COUNT:	7	14	0	1	1	0
AVE TSP:	225.	204.	0.	163.	189.	0.
WSW COUNT:	5	22	0	0	0	0
AVE TSP:	179.	220.	0.	0.	0.	0.
W COUNT:	5	15	0	1	0	1
AVE TSP:	249.	193.	0.	225.	0.	229.
WNW COUNT:	11	29	0	1	2	1
AVE TSP:	216.	221.	0.	166.	173.	256.
NW COUNT:	8	20	0	0	2	0
AVE TSP:	201.	203.	0.	0.	213.	0.
NNW COUNT:	9	26	0	0	1	3
AVE TSP:	236.	223.	0.	0.	152.	200.
ALL COUNT:	169	368	7	14	19	18
AVE TSP:	224.	228.	176.	187.	201.	229.

UPDATED AIR QUALITY EVALUATION - REPUBLIC STEEL, BIRMINGHAM, ALABAMA

Stations used in update:

Continued operation:	#2, #3
New stations:	None
Discontinued stations:	#1 (1977)

Trends in geometric means:

An upward trend (Spearman correlation coefficient of +0.69) was detected at station #2, which is the station most clearly impacted by emissions from the Republic coking operations.

Over the long-term, station #1 shows very little overall trend despite a large decline in 1977 and early 1978. The most well-defined long-term downward trend is at station #3 with a Spearman rank correlation coefficient of -0.88; however, this station is only marginally affected by the coke plant emissions.

Attainment status:

Station #2 remained in nonattainment of the primary TSP standards throughout 1978-1980, while station #3 came into attainment in 1979.

Pollution roses:

The Republic contribution to the TSP values for the peak directions (southwest and west-southwest) on the station #2 rose cannot be determined since these directions also encompass the U.S. Steel Ensley and Fairfield Works.

Standard exceedance roses:

No measured 24-hour primary standard exceedance occurred at station #2. During the years of operation of station #1, exceedances occurred from all 16 directions; this phenomenon probably occurred due to the poor siting of the sampler near a roadway.

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

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		6. PERFORMING ORGANIZATION CODE 80-01-148-6
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15. SUPPLEMENTARY NOTES

Volume 1 of 2

16. ABSTRACT

Ambient air quality statistics have been updated to include 1978-1980 data for TSP, BaP, and BSO for the vicinities of the 50 major integrated steel facilities in the United States. For each mill, conclusions have been drawn concerning the impact of the mill as discerned through pollution roses and analyses of the conditions occurring on days on which the National Ambient Air Quality Standards have been exceeded. Trends in the 12-month running geometric means of TSP have been examined. Statistical summaries of the data are presented such that the attainment status of the vicinity of each mill could be easily determined. Data included in the analyses were composed of those available from the National Aerometric Data Bank as well as special study data obtained from EPA and state and local agencies.

Seventy percent of the stations used in the analyses demonstrate long-term downward trends in TSP levels. During 1980, there were seven steel mills for which the nearby monitoring stations indicated no violations of the TSP standards.

The methodology for the analysis is described and the results are presented in a separate section for each steel mill.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group

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