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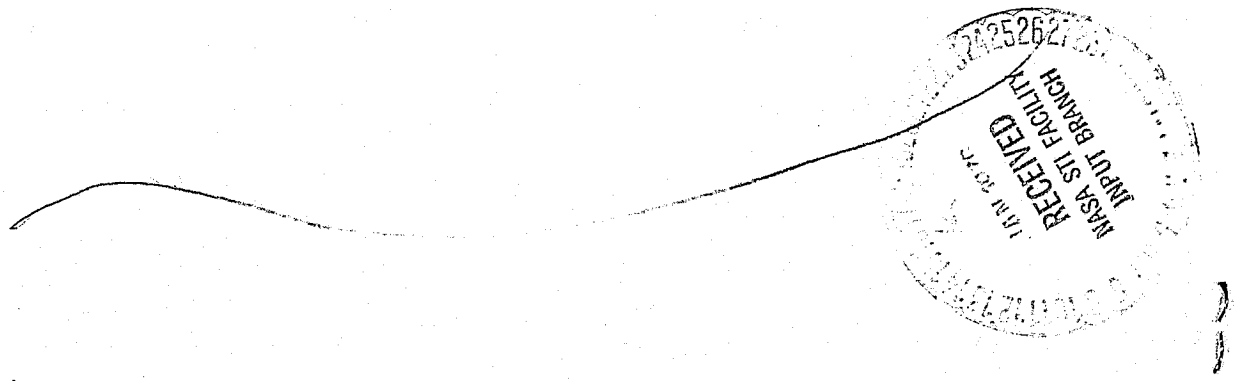

ELEMENTAL COMPOSITION AND SIZE DISTRIBUTION OF PARTICULATES IN CLEVELAND, OHIO

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ABSTRACT

Measurements have been made of the elemental particle size distribution at five contrasting urban environments with different source-type distributions in Cleveland, Ohio. Air quality conditions ranged from normal to air pollution alert levels. A parallel network of high-volume cascade impactors (5-stage) were used for simultaneous sampling on glass fiber surfaces for mass determinations and on Whatman-41 surfaces for elemental analysis by neutron activation for 25 elements. The elemental data are assessed in terms of distribution functions and interrelationships and are compared between locations as a function of resultant wind direction in an attempt to relate the findings to sources.

SUMMARY

As part of a cooperative program being carried out by the City of Cleveland Division of Air Pollution Control and NASA Lewis Research Center to study the chemical and physical characteristics of the airborne total suspended particulate (TSP) matter in Cleveland, Ohio, measurements have been made of the ambient particle size distributions for 25 elements.

This information is essential for estimating the potential burden of these pollutants on human health and is useful in identifying the sources responsible for them.[1]

TSP was sampled for 24-hour periods from September through December 1973. Thirty-five of 74 runs were selected for elemental analysis. Of the 10 days for which samples were analyzed, two coincided with air pollution alerts; the others provided several stable wind directions to aid in associating the results with sources.

Two cascade impactors were run simultaneously at each site. One using glass filter media for TSP size distribution, the other used Whatman-41 filter media (which was not weighed) for elemental analysis.

The elements could be grouped by mass median diameter (M.M.D.) into three ranges <2μm As, Br, Pb, Sb, Se, V, Zn, 2-4μm Co, Cr, Hf, Mn, Tb, Ti, Cl, and >4μm Al, Fe, Hg, La, Mg, Na, Sc, Si, Sm, Th, Ta. Studies of mass distribution by size; elemental ratios by wind direction; bromine-lead ratios; enrichment factors and pollution alert days for the elements were done to assist in identifying sources. Al and Fe have their mass concentrated in the large size range while Br and Zn have their mass concentrated in the small size range. The ratios of element-to-aluminum show a relationship to wind direction for several of the sites. The Br/Pb ratios indicate that these elements are primarily associated with automotive sources. Sb, Br, Cl, Pb and Zn showed the largest enrichment above earth crustal values. No difference, other than TSP was observed for the air pollution alert days.

EXPERIMENTAL

Sample Collection

Commercial high-volume cascade impactors were operated at 9.44×10^{-3} m^3 per second (20 ft^3/sec) on conventional high-volume samplers. The impactors collected particles in five aerodynamic size ranges >7μm, 3.3 to 7μm, 2.0 to 3.3 μm, 1.1 to 2.0μm and from 1.1μm to the backup filter limit of about 0.01μm. The operation has been described by Leibecki, et al.[2] Two impactors were installed at each site about 2.5 meters apart. One impactor was equipped with acid washed fiber glass filter media for mass loading determination, the other with Whatman-41 filter media for chemical analysis.

Site Selection

The City of Cleveland Division of Air Polution Control maintains a network of 21 stations for the purpose of monitoring the air quality in the City of Cleveland, Ohio. NASA Lewis Research Center in cooperation with the city augmented 16 of these stations to study the chemical and physical characteristics of the suspended particulate matter. Five of these stations were selected for size distribution measurements as follows. These are identical to the locations used in reference 2.

Site 1. - 2785 Broadway, an industrial location, 4 kilometers southeast of the city center, on the roof of a building 6 meters above the ground having a total elevation of 186 meters above sea level.

Site 2. - 3701 East 71st Street, a light industrial-residential location, 8½ kilometers southeast of the center of the city, on the roof of a building 18 meters above ground having a total elevation of 241

meters above sea level.

Site 3. - 16210 Lorain Avenue, a residential-commercial location, 10 kilometers west of the city center, on the roof of a building 10 meters above ground having a total elevation of 243 meters above sea level.

Site 4. - East 105th and Superior, a residential-commercial location, 6½ kilometers east of the city center, on the roof of a building 9 meters above ground having a total elevation of 202 meters above sea level.

Site 5. - 1365 East 12th Street, a commercial location 1½ kilometers east of the center of the city, on the roof of a building 20 meters above ground having a total elevation of 193 meters above sea level.

A more detailed description of each site as a function of the wind vectors encountered is given in the appendix.

Data Selection

The hi-vol impactors operated from about Noon to Noon Monday through Firday from September 6, 1973 to December 31, 1973. For a number of reasons (e.g., power failure) not all sites provided suitable samples from both impactors on every sampling day. The cost of analysis placed a further constraint on the number of samples analyzed. In order to have maximum wind resolution, it was decided to select particular days for which:

(1) the maximum number of sites operated successfully,

(2) the days on which there was an air pollution alert, and

(3) the days in which the wind blew from a direction comparable to those used in reference 2.

The actual number of filters analyzed was 175 (35 sets of 5 filters). Table I lists the days and sites selected, the wind direction, the

wind stability (ratio of the vector wind velocity to the scalar wind speed) and the meteorological conditions. Table II lists values, by element, for each site, the date, the resultant wind direction (in degrees), the number of less-than values, total concentration (in ng/M^3), the mass median diameter (in μm), the standard geometric deviation, and the percent of the element found on each stage. The sites are designated by a three-diget number for computer purposes and are related to sites used in this report as follows: 105 is site 1; 125 is site 2; 160 is site 3; 185 is site 4; and 205 is site 5. The meteorological data was obtained from listings provided by the National Weather Service for the station at Cleveland Hopkins International Airport.[3]

Elemental Analysis

Except for five elements, all analyses were made by Instrumental Neutron Activation Analysis with an accuracy of ±25% and precision of ±12%.[4] Be, Si, Cd, Bi, and Pb were determined by emission spectroscopy and the accuracy was estimated at ±25% while the precision is of the order of ±10%.[4] The analytical methods are described in reference 5.

The TSP sampling characteristics of these cascade impactors have the same order of precision and accuracy on the standard high volume air samplers. The correlation between impactors is excellent with a correlation coefficient of 0.96;[6] however, no correlation was run between impactors equipped with fiber glass and Whatman-41 filter media because of the large mass of hygroscopic Whatman-41 material on each stage of the impactor relative to the mass of particulate collected.

RESULTS AND DISCUSSION

Cumulative Size Distribution

All 35 data sets listed in Table I and the 25 elements listed in Table II were used in evaluating the fit of the data to a lognormal distribution and estimating the effective mass median diameters. The data were reduced by plotting the logarithm of the effective cut-off diameter, in μm, for each stage as a function of the cumulative percent mass of each element for each stage using a normal probability scale. A least squarer linear regression was used to obtain the mass median diameter (MMD) and standard geometric deviation. Since the samples obtained were often quite small, the sensitivity of the analytical method provided only "less than values" for some of the analysis. Where only one such value per set was encountered a concentration of one-half the sensitivity limit was used in determining the distribution. By visual inspection, about 80 percent of the elemental size distributions can be represented by a lognormal plot. The resolution of particle sizes measured was not sufficient to determine if the distribution was bimodal.[7,8]

A summary of the average MMD's and concentration for 25 elements for all data sets containing no more than one "less than value" per set is shown in Table III.

Using the average MMD's, the 25 elements can be classified into three categories:

(1) small MMD <2μ

As, Br, Pb, Sb, Se, V, and Zn

(2) intermediate MMD, 2-4μm

Co, Cr, Hf, Mn, Tb, Ti, and Cl

(3) large MMD >4μm

Al, Fe, Hg, La, Mg, Na, Sc, Si, Sm, Th, and Ta

The small MMD categories are those usually associated with combustion processes and have been found in coal burning processes.[9] The large MMD category are of a size usually produced by mechanical size reduction (e.g., wind action and grinding). Mercury, however, is an anomaly since it has a high vapor pressure it would be expected to be found in the small MMD group as shown by Kaakinen, et al.[9] No source is known for the intermediate (2-4μm) category and are likely to be produced by a mixture of processes.

For statistical reasons those days when the maximum number of stations ran on the same day, sites 2, 3, 4, and 5 on 10/9, 10/29, 11/26, 12/10, 10/15 and 11/19 were used to determine any difference between sites and days. Application of the analysis of variance[10] showed no significant difference of MMD's for the elements between stations; however, there is an indication that there may be a significant variation with the sampling days and therefore wind direction, but the data was insufficient to yield reliable statistical information. The alert level day was not significantly different from the other days. These findings are in contrast to TSP MMD's reported in reference 2 where wind direction showed a significant difference; however, more data permitted a reliable statistical analysis in the TSP case.

Mass Distribution by Impactor Stage

Six days (10/9, 10/29, 11/26, 1210, 10/15, and 11/19) at sites 2, 3, 4, and 5 plus five days (9/24, 11/12, 12/10, 10/15, and 11/5) at site 1 for the elements Fe, Pb, Br, Co, Zn, Sb, Cr, Al, were evaluated for mass distribution by stage. This was done by plotting the percent mass of the element on each stage as a ratio to that on the backup filter (stage 5) versus stage number. Ninety-four percent of the size-mass distribution can be described by three modes. Those elements in the large size mode are produced by mechanical processes and include soil derived elements. An example of this mode is shown in figure 1 for Fe. Those elements in the small size mode are produced by combustion processes. An example of this mode is shown in figure 2 for Br. The third type or mixed mode are produced by a combination of the two processes. An example of this mode is shown in figure 3 for Pb. The remaining 6% of the samples are of a diverse distribution. Table IV lists the eight elements and the percentage found in each mode. As would be expected, Al and Fe are found in the large mode. Br and Zn are found in the small mode. Pb, Sb, and Cr constitute a mixture of small and mixed modes. Co contains mixtures of all modes with an appreciable number (20%) in the diverse distribution. The mass distributions are reasonable and generally agree with what would be expected from diversified industry found in an urban area such as Cleveland. Pb seems to be an anomaly since its major contribution is usually reported as automotive but it appears that there are other sources in the area.

Elemental Ratios

Br/Pb. - All 35 sets listed in Table I were run for Br-Pb ratios. A computer program was run to determine the ratio and accuracy based on the analytical accuracy. If internal combustion engines are the primary source of Br and Pb in the form of PbBrCl, then the ratio of Br/Pb should be consistent with values obtained by gross (TSP) sampling which is approximately 0.39 for fresh samples and approximately 0.14 for aged samples.[11] Most of the samples fall in this range but 12% were outside the range. Site 2 on 11/12 showed low values of 0.03 ± 0.01; 0.08 ± 0.02; 0.13 ± 0.03; 0.06 ± 0.01 and 0.08 ± 0.02 for stages 1-5. Low Br/Pb values can be expected in an urban area with a large iron industry.[12] High Br/Pb values were observed in a number of instances. Site 12, for example, had values of 0.19 ± 0.05; 0.75 ± 0.25; 0.44 ± 0.15; 0.31 ± 0.09 and 2.74 ± 0.50 on stages 1-5. Whether this is a redistribution of Br from PbBrCl[13] or an indication of a Br source is unknown at this time. Present work on source emissions has indicated an increase of Br from some industrial effluents.

X/Al. - The elemental concentrations (ng/M^3) of Cl, Pb, Br. Co, Fe, Zn, Sb and Cr were normalized to the concentration of Al (ng/M^3) for each stage for five days (10/9, 10/29, 11/26, 12/10, 11/19) at sites 2, 3, 4, and 5 plus five days (9/24, 11/12, 12/10, 10/15, and 11/5) at site 1. Concentrations of elements normalized to Al are shown for each site according to the resultant wind direction in figures 4 to 11. The wind is depicted as the direction from which it originated.

The values chosen for plotting are those in which there was a marked difference according to size. Only those values - large (>3.3μm) or small (<3.3μm) particles - that were several times larger than the average were used. In most cases the small size range had a marked difference in element-aluminum ratio. These cases are shown as solid lines and when the increased ratio was in the larger size range they are shown as dashed lines. The value of Sb at site 2 points in the direction of a known source in the city.

The values observed for the four east side sites are not unusual for the area which is heavily industrialized. The values observed for the west side site from 280^{o} and 330^{o} were unexpected. Apartment incinerators may account for this west side observation, but this area will require further investigation.

Enrichment Factors

The samples and elements normalized to Al were used to calculate an enrichment factor by ratioing the normalized value to the ratio of element to aluminum found in the earth's crust.[14] Previous studies[4] for this area have shown that the Al/Si value is one. Rare earths such as La or Sm could not be used because there were too many filters where the concentrations were below the detection limit of the analytical method. A general observation of the enrichment of the elements shows that Fe, Co, and Cr have very little enrichment being only several times the earths composition. Pb, Br, Cl, Zn, and Sb are enriched by factors of 10^{2} to 10^{4}. The small sizes had greater enrichment than the larger sizes. This was true for all the elements studied. This can be explained by small size sources and extended settling time of the small particles.

residence times vary from about 10 hours for 10μm particles to 100 hours for 1μm particles (ref. 12, pg. 16).

CONCLUSIONS

As part of a cooperative program being carried out by the City of Cleveland Division of Air Pollution Control and NASA Lewis Research Center to study the chemical and physical characteristics of the suspended particulate matter in Cleveland, measurements have been made of the elemental size distributions at five different locations. The results of this study have shown the following:

(1) The elements are adequately represented by lognormal distribution better than 80% of the time.

(2) The elements can be classified into three groups by MMD small (less than 2μm), intermediate (2-4μm) and large (greater than 4μm).

(3) The elemental mass distribution by size can be adequately represented by three configurations.

Large - those consisting of a high concentration of large particles with decreasing amounts of smaller particles

small - those consisting of a high concentration of small particles with decreasing amounts of larger particles

mixed - those with the majority of mass concentrated in the large (stage 1) and small (stage 5) size range with lesser amounts in the intermediate (stages 2, 3, and 4) size range.

(4) The majority of the lead and bromine is of automotive origin as shown by Br/Pb values from 0.39 to 0.14. However, higher and lower

ratios show there may also be other sources of lead and bromine.

(5) Of the elements studied, all but Fe, Co and Cr showed marked enrichment compared to the earth's crust. The enrichment of elements was greater in the small size range, but several experiments showed greater enrichment in the large size range.

(6) Generally the concentrations of the eight elements normalized to the concentration of aluminum showed a relationship to wind direction relative to source types.

(7) No significant difference was observed on air pollution alert days for any of the characteristics studied.

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APPENDIX - DETAILED DESCRIPTION OF EACH SITE

Site	Compass direction	Description of Environment
1	30° to 50°	Area contains an interstate highway with an interchange, some truck terminals, light manufacturing plants, and large open spaces.
1	180 to 190°	A hill is adjacent to the site; heavy industry is about 3/4 kilometer away.
1	230 to 250°	The industrial valley of Cleveland is located here with steel mills, coke ovens, and assorted industry; a large pile of iron ore is within 0.1 kilometer.
1	340 to 360°	Area contains an asphalt plant and petroleum related industry.
2	30 to 50°	Area contains residential neighborhood and a mixture of light manufacturing plants.
2	180 to 190°	Area contains residential neighborhood and a mixture of light manufacturing plants.
2	230 to 250°	The industrial valley of Cleveland is 3/4 to 1½ kilometers away.
2	340 to 360°	Area contains a high school, heavily travelled street, steel fabrication, light industry, and manufacturing plants.
3	30 to 50°	A school and residential neighborhood are located here.
3	180 to 190°	Area contains commercial and residential neighborhood; a foundry is 3½ kilometers away.

Site	Compass direction	Description of Environment
3	230 to 250°	Area contains a hospital, a residential neighborhood, and a park comprised of open spaces and vegetation.
3	340 to 360°	Area is a residential neighborhood.
4	30 to 50°	Area is residential and commercial with an industrial complex 4½ to 8 kilometers away.
4	180 to 190°	Area is residential and commercial.
4	230 to 250°	Area is residential and commercial.
4	340 to 360°	Area is residential and commercial.
5	30 to 50°	Area contains light industry and small commercial buildings.
5	180 to 190°	Highly commercial area; industrial valley 1½ to 2½ kilometers away.
5	230 to 250°	Commercial and office buildings of commercial center in Cleveland.
5	340 to 360°	Area contains office buildings, a railroad yard, lake shipping area; and an interstate highway with interchanges.

TABLE I. - SITES ANALYZED BY DAY AND METEOROLOGICAL CONDITIONS

Day 1973	Site 1	2	3	4	5	Wind Direction Degrees	Wind Stability Velocity/Scalar Speed	Remarks
9/6						290	7.1/8.3	Haze; trace of rain
9/24	X	X	X	X		60	6.7/7.8	Haze
10/9		X	X	X	X	30	1.7/2.6	Fog; haze, air pollution alert
10/15	X	X		X	X	280	10.2/11.9	Trace of rain
10/23			X	X	X	240	1.1/3.6	Haze; air pollution alert
10/29		X	X	X	X	60	7.9/9.1	0.1" rain
11/5	X					310	10.6/11.7	Trace of snow
11/12	X					200	11.8/11.9	
11/19		X	X	X	X	330	4.3/6.3	Fog; haze
11/20		X	X	X	X	140	5.9/6.9	0.02" rain; haze
12/03			X			200	13.5/14.2	
12/10	X	X	X	X	X	230	14.3/15.2	0.3" snow

TABLE II. - ELEMENTAL CONCENTRATION, MASS MEDIAN DIAMETER (M.M.D.), STANDARD GEOMETRIC DEVIATION (SGD)

AL

AND PERCENT BY MASS ON EACH STAGE BY SITE AND DAY

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	4160.00	4.67	3.80	35.79	29.29	8.89	10.29	15.59
105	11123	200	0	3950.00	5.61	2.92	42.00	25.29	18.50	6.80	7.29
105	12103	230	0	2250.00	5.48	3.27	41.79	24.00	16.00	8.89	9.29
105	10153	280	0	3110.00	4.01	4.74	35.00	21.19	12.50	9.59	21.50
105	11053	310	0	2340.00	4.68	2.81	37.19	22.59	19.69	12.80	7.69
125	10093	30	0	7540.00	10.28	3.23	61.69	22.39	8.59	4.00	3.29
125	9243	60	0	2980.00	5.29	3.60	41.59	21.79	15.39	9.69	11.39
125	10293	60	0	980.00	6.42	3.68	48.00	19.39	17.29	5.09	10.19
125	11263	140	0	2370.00	8.65	3.52	54.00	27.39	8.39	3.00	7.19
125	12103	230	0	1380.00	8.20	3.01	55.79	23.19	11.59	5.80	3.59
125	10153	280	0	2210.00	5.56	4.77	43.39	19.89	13.09	7.19	16.29
125	11193	330	0	2490.00	10.59	2.84	62.69	26.89	5.19	3.19	2.00
160	10093	30	0	3210.00	7.43	3.50	49.79	26.50	11.19	4.39	8.09
160	9243	60	0	1930.00	5.35	3.01	40.39	25.39	17.59	8.29	8.29
160	10293	60	0	2630.00	9.78	3.41	58.89	24.00	8.39	4.19	4.59
160	11263	140	0	1860.00	7.37	2.34	52.19	29.59	14.50	1.59	2.19
160	12033	200	0	1070.00	7.26	4.15	48.59	26.19	8.39	5.59	11.19
160	12103	230	0	145.00	5.47	2.84	48.29	10.29	27.59	6.89	6.89
160	10233	240	0	13270.00	94.36	9.26	87.79	5.59	2.50	1.80	2.29
160	11193	330	0	1160.00	8.80	2.22	62.09	25.00	11.19	0.90	0.90
185	10093	30	0	5850.00	8.74	4.55	53.79	22.89	8.00	5.09	10.09
185	10293	60	0	720.00	5.45	3.92	43.09	19.39	18.09	5.59	13.89
185	9243	60	0	2770.00	6.96	3.50	48.39	25.29	12.29	5.80	8.29
185	11263	140	0	2270.00	7.89	2.81	52.89	28.19	11.89	3.09	4.00
185	12103	230	0	1200.00	6.12	6.72	47.50	14.19	15.00	1.69	21.69
185	10233	240	0	3470.00	7.30	3.32	49.89	25.89	12.09	5.19	6.89
185	10153	280	0	3290.00	5.29	3.62	39.19	28.29	12.50	6.69	13.39
185	9063	290	0	1840.00	8.55	3.76	53.79	25.50	9.80	2.19	8.69
185	11193	330	0	895.00	9.27	2.69	63.69	17.89	14.50	1.69	2.19
205	10093	30	0	6000.00	8.33	3.62	53.00	26.50	8.29	5.00	7.19
205	10293	60	0	2210.00	8.75	3.03	57.89	22.19	12.19	4.09	3.59
205	11263	140	0	3860.00	3.20	1.43	0.80	80.29	12.39	4.39	2.09
205	12103	230	0	1230.00	5.71	5.24	48.79	8.89	7.89	8.09	16.29
205	10233	240	0	4990.00	7.61	3.88	51.09	23.39	10.39	6.39	8.59
205	11193	330	0	1410.00	8.09	3.12	54.59	23.39	14.19	2.09	5.69

AS

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	1	44.50	0.05	361.76	20.19	4.50	1.09	4.50	69.69
105	11123	200	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11053	310	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	1	39.00	2.51	4.19	25.59	12.80	25.59	2.59	33.29
125	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10293	60	1	13.00	3.98	3.40	30.79	30.79	7.69	15.39	15.39
125	11263	140	0	10.00	1.88	5.22	20.00	20.00	10.00	10.00	40.00
125	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	1	34.00	1.64	3.04	11.80	17.59	2.89	35.29	32.39
160	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10293	60	1	8.00	2.39	3.80	25.00	12.50	12.50	25.00	25.00
160	11263	140	0	33.00	0.51	9.00	12.09	6.09	12.09	3.00	66.69
160	12033	200	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	0	13.00	1.67	4.02	15.39	15.39	15.39	15.39	38.50
160	11193	330	0	38.00	0.04	13.73	2.59	2.59	2.59	2.59	89.50
185	10093	30	0	46.00	1.82	2.91	13.00	13.00	15.19	30.39	28.29
185	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	0	23.00	0.31	6.36	4.29	8.69	4.29	4.29	78.29
185	12103	230	1	8.50	1.08	4.00	11.80	5.89	11.80	23.50	47.09
185	10233	240	1	46.00	1.59	6.00	28.29	4.29	2.19	26.09	39.09
185	10153	280	0	24.00	2.19	2.46	8.29	41.69	4.19	12.50	33.29
185	9063	290	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	0	15.00	0.33	7.80	6.69	6.69	6.69	6.69	73.29
205	10093	30	0	52.00	1.48	3.62	11.50	15.39	13.50	19.19	40.39
205	10293	60	0	8.00	2.66	7.34	12.50	12.50	50.00	12.50	12.50
205	11263	140	0	96.00	0.35	7.50	6.29	10.39	3.09	5.19	75.00
205	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	0	58.00	2.93	4.21	32.79	8.59	15.50	20.69	22.39
205	11193	330	0	13.00	3.54	1.27	23.09	23.09	15.39	38.50	0.00

BR

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	143.00	1.08	4.98	11.89	13.29	11.19	11.89	51.69
105	11123	200	0	101.00	1.18	3.77	8.89	13.89	12.89	15.80	48.50
105	12103	230	0	82.00	1.29	4.71	14.59	11.00	13.39	15.89	45.09
105	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11053	310	0	47.00	1.19	3.74	8.50	14.89	14.89	10.59	51.09
125	10093	30	0	461.00	0.93	4.80	9.29	13.00	10.19	11.09	56.39
125	9243	60	0	115.00	0.67	6.97	12.19	8.69	4.29	16.50	58.29
125	10293	60	0	86.00	1.26	4.08	11.59	11.59	17.39	11.59	47.69
125	11263	140	0	131.00	1.62	4.01	14.50	16.79	12.19	17.59	38.89
125	12103	230	0	63.00	1.96	4.19	19.00	17.50	11.09	19.00	33.29
125	10153	280	0	81.00	1.00	4.33	9.89	11.09	7.39	21.00	50.59
125	11193	330	0	380.00	0.28	7.20	5.00	6.09	5.29	7.39	76.29
160	10093	30	0	691.00	0.62	4.50	4.89	10.59	5.89	12.00	66.59
160	9243	60	0	118.00	0.98	3.64	5.89	12.69	14.39	8.50	58.50
160	10293	60	0	138.00	0.73	4.40	5.80	11.59	10.09	7.19	65.19
160	11263	140	0	266.00	0.65	5.82	8.29	12.00	9.80	2.29	67.69
160	12033	200	0	146.00	1.37	3.55	9.59	16.39	12.29	17.79	43.79
160	12103	230	0	372.00	0.05	10.12	1.59	2.39	2.19	2.39	91.39
160	10233	240	0	555.00	0.82	3.41	3.59	11.00	10.59	11.69	63.09
160	11193	330	0	397.00	0.23	7.39	4.50	5.00	5.00	7.29	78.09
185	10093	30	0	811.00	0.75	5.75	9.89	10.69	8.09	12.09	59.19
185	9243	60	0	186.00	1.22	4.93	13.39	14.00	11.80	12.39	48.39
185	10293	60	0	197.00	0.83	5.43	10.19	11.19	10.19	10.69	57.89
185	11263	140	0	255.00	0.83	5.09	9.00	11.80	9.80	10.59	58.79
185	12103	230	0	116.00	1.23	5.22	14.69	12.89	11.19	13.80	47.39
185	10233	240	0	1420.00	0.69	5.51	8.50	11.29	6.29	12.69	61.29
185	10153	280	0	216.00	0.25	7.50	4.59	6.89	4.59	5.09	78.69
185	9063	290	0	104.00	2.00	3.76	15.39	27.89	10.59	4.80	41.29
185	11193	330	0	323.00	0.77	4.97	8.00	11.50	9.00	11.09	60.39
205	10093	30	0	513.00	0.47	6.75	7.59	8.59	6.80	8.80	68.19
205	10293	60	0	165.00	0.88	3.80	5.50	13.29	9.09	12.69	59.39
205	11263	140	0	785.00	0.15	9.19	4.29	4.69	4.50	5.00	81.50
205	12103	230	0	510.00	0.10	9.65	2.89	3.29	3.50	3.89	86.29
205	10233	240	0	680.00	0.85	3.67	5.89	8.09	9.59	20.59	55.89
205	11193	330	0	128.00	3.52	0.92	21.89	24.19	26.59	27.29	0.00

CL

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	6290.00	3.25	4.29	28.09	25.89	9.39	11.80	24.79
105	11123	200	0	3980.00	2.64	4.63	26.09	18.59	12.59	14.29	28.39
105	12103	230	0	7930.00	7.12	2.43	56.69	20.69	12.39	8.80	1.39
105	10153	280	0	1690.00	2.66	4.24	23.09	27.79	10.69	4.69	33.69
105	11053	310	0	1590.00	4.12	2.84	32.69	23.89	17.00	17.00	9.39
125	10093	30	0	4600.00	1.87	6.10	24.59	11.69	10.69	16.09	37.00
125	9243	60	0	2160.00	2.50	4.02	25.50	11.59	21.29	13.89	27.79
125	10293	60	0	2760.00	0.64	15.69	19.89	5.80	9.39	6.50	58.29
125	11263	140	0	1680.00	3.94	2.61	34.50	22.59	7.69	28.00	7.09
125	12103	230	0	4580.00	6.09	3.63	45.39	22.89	13.09	9.00	9.59
125	10153	280	0	2470.00	2.50	6.55	27.50	20.19	8.89	6.89	36.39
125	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	0	2490.00	1.84	9.90	26.89	15.29	8.00	6.39	43.39
160	9243	60	0	1770.00	1.58	9.10	23.69	16.89	7.29	4.50	47.50
160	10293	60	0	2550.00	0.71	14.00	18.39	11.39	5.50	6.29	58.39
160	11263	140	0	4400.00	2.62	1.88	11.39	9.09	58.19	8.59	12.69
160	12033	200	0	1440.00	3.59	2.83	28.50	27.09	8.29	25.00	11.09
160	12103	230	0	2860.00	7.73	3.30	52.39	24.50	10.80	6.59	5.59
160	10233	240	0	5440.00	1704.78	102.76	87.89	3.69	1.69	0.60	6.29
160	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	0	2940.00	2.72	6.37	29.59	18.00	9.89	10.19	32.29
185	9243	60	0	1720.00	2.51	4.12	22.09	22.69	15.69	7.59	32.00
185	10293	60	0	1000.00	1.02	7.81	17.00	12.00	11.00	6.00	54.00
185	11263	140	0	2020.00	1.98	6.11	24.79	12.89	13.89	10.89	37.59
185	12103	230	0	5310.00	8.14	3.07	55.69	21.79	13.19	5.09	4.09
185	10233	240	0	2280.00	1.46	5.57	20.19	8.80	12.69	16.69	41.69
185	10153	280	0	980.00	2.41	3.35	17.29	26.50	15.29	11.19	29.59
185	9063	290	0	2490.00	3.41	3.94	29.29	22.50	15.29	11.19	21.69
185	11193	330	0	1330.00	3.16	2.65	25.59	15.00	27.09	19.50	12.80
205	10093	30	0	7390.00	1.91	8.87	28.00	11.39	10.29	10.59	39.79
205	10293	60	0	1950.00	0.67	18.22	22.59	3.59	11.29	4.59	57.89
205	11263	140	0	3740.00	2.04	2.86	11.50	25.89	10.19	24.29	28.09
205	12103	230	0	7690.00	8.30	4.54	55.00	16.89	11.39	7.39	9.19
205	10233	240	0	9700.00	0.69	6.94	11.09	11.00	7.19	10.00	60.59
205	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

CO

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	2.91	3.38	3.89	27.69	26.69	13.00	9.19	23.29
105	11123	200	0	8.42	4.44	3.80	36.09	23.00	15.09	10.19	15.69
105	12103	230	0	0.64	3.76	5.00	37.50	10.89	20.29	7.80	23.39
105	10153	280	0	1.45	2.13	5.28	21.89	24.00	6.80	8.19	39.00
105	11053	310	0	1.84	4.34	3.21	33.50	25.89	17.29	10.29	13.00
125	10093	30	0	2.74	6.20	5.94	45.50	24.00	2.89	9.50	18.19
125	9243	60	0	0.72	3.93	3.51	37.50	12.50	18.09	18.09	13.89
125	10293	60	0	2.09	6.26	6.95	46.69	18.59	6.69	9.00	19.00
125	11263	140	1	1.21	6.80	4.04	60.39	0.40	18.00	12.19	9.00
125	12103	230	0	4.32	2.70	1.93	7.39	29.79	34.89	18.00	9.89
125	10153	280	0	1.16	2.89	7.02	31.59	17.89	7.69	11.09	31.59
125	11193	330	0	2.64	3.97	2.71	32.50	20.79	19.59	18.50	8.69
160	10093	30	0	4.30	0.08	31.87	9.29	5.80	2.59	3.50	78.89
160	9243	60	0	0.97	3.21	9.20	35.09	16.50	9.29	5.19	34.00
160	10293	60	0	2.47	0.55	14.32	16.09	10.89	6.00	3.59	63.29
160	11263	140	0	1.62	7.05	4.56	47.89	25.19	9.19	3.69	14.09
160	12033	200	0	0.61	3.51	2.98	26.19	26.19	18.00	14.80	14.80
160	12103	230	1	2.00	5.54	1.71	57.39	3.00	37.89	1.50	0.20
160	10233	240	0	2.12	3.15	2.56	21.09	22.50	31.00	9.89	15.50
160	11193	330	0	3.06	2.85	2.44	23.09	13.00	21.19	31.29	11.39
185	10093	30	0	2.53	3.67	8.20	36.59	18.09	7.50	7.89	29.89
185	9243	60	0	0.92	5.22	5.11	42.39	18.50	15.19	4.29	19.59
185	10293	60	0	0.68	1.17	8.32	20.59	8.80	14.69	4.39	51.50
185	11263	140	0	1.43	5.92	4.12	44.39	25.00	6.29	12.50	11.80
185	12103	230	0	0.76	4.48	5.58	39.50	17.09	15.80	3.89	23.69
185	10233	240	0	1.67	3.98	4.93	34.50	23.79	8.89	10.09	22.59
185	10153	280	0	0.82	3.03	4.50	28.00	20.69	14.59	9.80	26.79
185	9063	290	0	1.95	3.17	1.72	18.89	13.29	35.69	30.59	1.50
185	11193	330	0	1.43	3.01	3.78	29.19	14.59	16.69	18.79	20.79
205	10093	30	0	5.02	5.42	5.42	41.59	25.79	6.00	6.00	20.69
205	10293	60	0	1.95	4.56	2.16	32.69	33.69	13.80	17.29	2.59
205	11263	140	0	5.53	6.20	3.61	44.79	25.59	12.29	7.19	10.09
205	12103	230	0	0.62	5.93	5.01	45.19	19.39	14.50	3.19	17.69
205	10233	240	0	19.29	3.58	2.42	25.89	24.39	20.69	21.19	7.80
205	11193	330	0	2.31	3.20	0.83	40.09	22.79	18.50	18.50	0.00

CR

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	36.59	2.02	14.21	31.09	12.80	7.39	6.29	42.29
105	11123	200	0	10.19	3.48	2.85	26.50	24.50	17.59	18.59	12.69
105	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	0	20.89	3.52	3.05	23.89	38.79	8.59	8.09	20.59
105	11053	310	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	0	46.79	1.23	16.18	25.59	12.59	6.80	3.59	51.29
125	9243	60	0	15.19	2.08	5.33	28.89	4.59	14.50	19.09	32.89
125	10293	60	0	13.89	1.52	7.21	23.00	13.69	2.89	18.69	41.69
125	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	1	10.54	5.55	3.53	54.00	0.50	25.59	9.50	10.39
125	10153	280	0	18.29	0.89	13.15	20.19	14.80	4.89	1.09	59.00
125	11193	330	1	7.84	0.91	15.18	22.89	11.50	0.60	12.69	52.19
160	10093	30	0	68.59	0.46	5.33	4.69	9.89	5.00	7.59	72.89
160	9243	60	0	122.19	0.00	57.36	1.50	0.90	0.70	1.09	95.69
160	10293	60	0	14.69	0.90	6.16	15.00	4.80	17.69	5.39	57.09
160	11263	140	0	13.80	0.61	7.32	10.89	9.39	8.00	9.39	62.29
160	12033	200	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	1	18.14	0.33	3.86	1.09	6.59	3.89	0.30	88.19
160	11193	330	0	5.80	0.86	5.46	10.29	15.50	1.69	15.50	56.89
185	10093	30	0	35.19	1.84	4.06	17.89	15.59	11.89	20.50	34.09
185	9243	60	0	13.39	0.43	9.88	12.69	3.69	8.19	10.39	64.89
185	10293	60	1	8.04	0.02	947.26	18.59	5.00	1.19	0.60	74.50
185	11263	140	0	13.19	0.41	57.10	24.19	6.09	6.80	1.50	61.39
185	12103	230	0	3.69	3.60	3.27	32.39	13.50	29.69	5.39	18.89
185	10233	240	0	53.09	2.20	3.95	18.79	24.50	8.09	16.59	32.00
185	10153	280	0	14.09	1.31	6.72	20.59	7.80	14.19	11.29	46.09
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	0	24.09	1.62	8.28	24.89	13.29	5.00	15.39	41.50
205	10293	60	1	7.54	0.67	3.90	4.00	13.19	0.70	15.89	66.19
205	11263	140	0	14.29	1.68	4.63	16.79	18.19	16.09	4.19	44.79
205	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	0	35.09	2.02	5.28	21.69	21.09	6.59	13.69	37.00
205	11193	330	0	4.09	4.38	1.33	51.19	22.00	12.19	14.59	0.00

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11123	200	1	0.07	3.06	2.63	19.29	27.59	29.00	3.39	20.69
105	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11053	310	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	1	0.15	6.44	2.39	55.39	18.50	12.29	12.29	1.50
125	9243	60	0	0.05	2.72	2.31	21.69	10.89	21.69	34.79	10.89
125	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	9243	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	1	0.03	9.61	5.20	55.89	20.59	8.80	2.89	11.80
160	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	1	0.15	4.27	1.98	43.09	18.50	6.19	30.79	1.50
185	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	1	0.02	3.11	3.61	24.00	36.00	4.00	8.00	28.00
185	10233	240	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10153	280	1	0.06	4.50	2.31	32.00	32.00	16.00	16.00	4.00
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	1	0.18	6.48	2.26	47.19	36.69	4.19	10.50	1.29
205	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11263	140	1	0.08	4.98	26.69	44.79	12.59	5.69	1.09	35.59
205	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	16530.00	3.38	4.14	28.59	26.39	10.69	10.59	23.79
105	11123	200	0	12450.00	4.39	4.00	35.79	24.09	12.00	11.59	16.50
105	12103	230	0	2290.00	6.13	5.84	47.19	15.69	12.19	7.89	17.00
105	10153	280	0	8750.00	4.66	5.50	38.89	22.39	8.69	8.50	21.59
105	11053	310	0	13850.00	5.25	2.90	39.39	26.29	18.00	8.50	7.80
125	10093	30	0	6340.00	5.65	5.08	42.89	23.29	8.50	7.89	17.39
125	9243	60	0	2320.00	4.16	3.59	34.50	22.79	13.80	14.19	14.69
125	10293	60	0	750.00	6.73	4.21	48.00	21.29	13.29	5.29	12.00
125	11263	140	0	2170.00	6.80	3.75	48.39	23.50	10.59	8.80	8.80
125	12103	230	0	1700.00	7.76	3.39	60.00	8.80	18.19	7.59	5.29
125	10153	280	0	12040.00	2.95	4.47	27.19	21.19	15.09	8.50	28.09
125	11193	330	0	2200.00	5.09	3.51	40.00	23.19	14.50	10.89	11.39
160	10093	30	0	4020.00	2.96	5.04	28.59	21.39	10.00	11.89	28.09
160	9243	60	0	1840.00	4.58	3.90	35.89	26.59	12.50	8.19	16.79
160	10293	60	0	1630.00	6.01	4.20	44.19	24.50	9.80	8.59	12.89
160	11263	140	0	1730.00	6.86	4.87	47.39	23.69	8.69	5.80	14.50
160	12033	200	0	4990.00	3.96	1.60	8.80	81.79	2.80	3.39	3.19
160	12103	230	0	255.00	4.63	3.39	35.29	27.50	17.59	3.89	15.69
160	10233	240	0	3470.00	5.14	3.07	36.00	35.19	11.00	6.59	11.19
160	11193	330	0	2030.00	4.51	3.58	38.89	18.69	14.29	15.80	12.29
185	10093	30	0	6930.00	6.24	5.05	46.19	21.39	7.80	10.09	14.59
185	9243	60	0	2480.00	6.12	4.08	44.39	25.00	11.29	6.50	12.89
185	10293	60	0	780.00	3.97	3.42	35.89	19.19	10.29	21.79	12.80
185	11263	140	0	1780.00	7.11	4.12	48.29	25.79	7.89	7.29	10.69
185	12103	230	0	1760.00	5.51	4.64	43.79	18.79	13.59	8.50	15.29
185	10233	240	0	4080.00	6.19	4.25	44.89	25.00	8.80	8.59	12.69
185	10153	280	0	3240.00	4.57	4.02	36.39	25.00	13.29	8.00	17.29
185	9063	290	0	2360.00	5.83	3.39	42.39	27.50	15.29	3.00	11.89
185	11193	330	0	1400.00	4.21	3.61	35.00	21.39	16.39	12.09	15.00
205	10093	30	0	12490.00	7.12	4.87	48.79	22.69	7.39	8.19	12.80
205	10293	60	0	1970.00	5.52	2.78	39.09	35.00	8.09	11.69	6.09
205	11263	140	0	5180.00	6.88	4.00	49.00	21.59	11.39	8.29	9.69
205	12103	230	0	1180.00	5.43	4.00	42.39	21.19	15.29	7.59	13.59
205	10233	240	0	16560.00	5.33	3.33	42.19	23.69	10.80	14.59	8.80
205	11193	330	0	1950.00	3.96	1.31	41.50	19.00	14.89	24.59	0.00

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11123	200	0	0.52	2.95	1.90	7.69	51.89	5.80	26.89	7.69
105	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11053	310	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	1	1.00	5.23	2.01	39.00	32.00	18.00	10.00	1.00
125	9243	60	0	0.30	4.48	2.63	33.29	30.00	13.29	16.69	6.69
125	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	0	3.02	4.08	2.22	30.00	24.09	25.39	16.19	4.29
125	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	1	0.20	6.67	5.03	46.50	27.89	4.69	2.29	18.59
160	10093	30	1	0.31	3.40	3.33	25.00	34.39	12.50	3.09	25.00
160	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	1	0.71	7.78	3.05	50.69	32.39	8.50	1.39	7.00
185	9243	60	1	0.33	5.27	3.38	38.19	35.29	2.89	11.80	11.80
185	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10153	280	0	0.15	3.26	3.19	25.00	25.00	18.79	12.50	18.79
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	0	1.19	5.94	2.32	40.00	37.50	15.00	4.19	3.29
205	10293	60	0	0.41	4.45	2.42	26.79	51.19	2.39	9.80	9.80
205	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	0	2.88	3.70	2.31	23.89	31.09	18.69	19.69	6.59
205	11193	330	1	0.20	5.90	1.43	73.19	14.59	9.80	2.39	0.00

HG

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	11.59	2.23	3.62	18.09	20.69	17.19	12.89	31.00
105	11123	200	1	1.44	1.83	1.76	6.89	3.39	6.89	69.00	13.80
105	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	1	6.64	10.76	24.72	58.59	6.00	0.80	12.00	22.59
105	11053	310	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	0	17.69	2.83	4.24	27.69	15.29	18.59	12.39	26.00
125	9243	60	0	13.80	7.66	5.00	54.29	12.29	14.50	7.19	11.59
125	10293	60	1	4.14	3.53	4.41	36.09	9.59	26.50	1.19	26.50
125	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	0	8.69	16.16	4.95	74.69	4.59	11.50	4.59	4.59
125	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	0	16.09	1.50	5.73	23.59	6.80	5.59	24.19	39.79
160	9243	60	0	4.69	2.93	3.23	31.89	8.50	12.80	29.79	17.00
160	10293	60	0	12.89	4.27	2.93	36.39	16.29	31.00	1.59	14.69
160	11263	140	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	0	17.69	3.22	3.53	35.00	3.39	30.50	9.59	21.50
185	9243	60	0	10.80	5.50	4.06	43.50	19.39	14.80	9.29	13.00
185	10293	60	0	8.80	3.64	2.20	35.19	1.09	50.00	2.29	11.39
185	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	0	14.80	7.78	4.48	55.39	12.19	16.19	6.09	10.09
185	10153	280	0	8.50	4.33	3.95	40.00	11.80	22.39	9.39	16.50
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	1	0.45	3.16	2.50	22.19	22.19	22.19	22.19	11.09
205	10093	30	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	0	9.80	1.81	26.04	33.69	9.19	9.19	1.00	46.89
205	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

LA

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11123	200	0	2.96	4.21	4.18	36.69	19.19	14.09	12.80	17.19
105	12103	230	0	1.04	5.35	2.61	40.00	28.59	15.19	11.39	4.80
105	10153	280	1	2.00	4.69	6.61	40.00	20.00	10.00	5.00	25.00
105	11053	310	0	1.65	3.94	2.74	31.89	21.69	18.69	18.69	9.00
125	10093	30	0	4.29	5.90	5.13	44.19	23.29	7.00	9.29	16.29
125	9243	60	0	1.59	3.26	3.19	25.00	25.00	18.79	12.50	18.79
125	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	0	2.00	5.55	4.46	45.29	18.39	9.00	14.39	12.89
125	12103	230	0	2.21	3.44	2.53	23.89	27.00	18.50	20.69	9.89
125	10153	280	1	1.30	9.45	5.70	55.00	20.59	7.59	3.80	13.00
125	11193	330	0	2.37	3.24	4.82	30.29	20.19	15.09	7.09	27.29
160	10093	30	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	9243	60	0	1.50	3.35	3.52	26.69	26.69	13.29	13.29	20.00
160	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	0	1.00	6.46	3.71	46.50	23.79	12.89	6.89	9.89
160	12033	200	1	0.97	5.59	3.82	41.00	30.79	10.29	0.50	17.39
160	12103	230	1	1.59	0.00	689.85	11.19	0.30	1.89	3.09	83.50
160	10233	240	0	3.34	3.60	2.77	22.69	44.19	6.29	8.09	18.79
160	11193	330	0	1.75	3.56	3.84	30.69	20.50	21.00	5.09	22.69
185	10093	30	0	6.09	7.91	6.68	54.09	11.50	11.50	8.19	14.80
185	9243	60	1	1.89	7.19	3.29	52.59	21.09	10.50	10.50	5.29
185	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	0	1.43	4.08	5.25	36.09	21.50	9.00	11.09	22.19
185	12103	230	0	1.23	8.38	4.04	55.59	18.50	10.50	8.09	7.29
185	10233	240	1	2.64	5.07	2.17	37.69	34.00	11.29	15.09	1.89
185	10153	280	0	2.14	3.78	3.03	27.39	29.29	18.59	8.80	15.80
185	9063	290	0	1.43	5.01	2.78	34.69	35.39	12.50	9.00	8.29
185	11193	330	0	1.39	2.16	4.40	20.69	20.69	10.00	15.69	32.89
205	10093	30	0	5.39	5.33	4.47	46.29	14.80	9.29	16.69	13.00
205	10293	60	1	2.00	4.69	6.61	40.00	20.00	10.00	5.00	25.00
205	11263	140	0	4.59	0.95	19.70	24.29	10.39	7.19	3.69	54.29
205	12103	230	0	2.23	0.15	27.34	12.09	5.39	6.29	1.29	75.00
205	10233	240	0	2.91	6.41	3.00	47.89	24.00	13.00	9.89	5.09
205	11193	330	0	1.05	3.81	1.31	29.19	22.59	25.50	22.59	0.00

MG

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	11123	200	1	3150.00	5.24	2.11	39.39	29.19	20.29	9.50	1.59
105	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	0	1210.00	22.48	104.23	62.00	3.29	2.50	7.39	24.79
105	11053	310	1	1970.00	5.13	2.23	39.59	25.39	22.79	9.59	2.50
125	10093	30	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	9243	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	9243	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	1	1555.00	3.76	3.93	47.59	1.00	7.09	27.69	16.69
185	10153	280	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	9063	290	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MN

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	481.00	2.92	7.60	32.19	17.69	7.89	9.59	32.59
105	11123	200	0	304.19	1.81	2.07	2.69	23.29	21.39	23.69	28.89
105	12103	230	0	75.00	4.55	2.01	41.29	20.00	16.00	21.29	1.29
105	10153	280	0	317.00	3.64	7.67	36.29	17.39	9.80	6.89	29.69
105	11053	310	0	271.00	4.37	3.72	36.19	21.39	16.19	11.09	15.09
125	10093	30	0	372.00	3.46	6.09	34.89	16.09	10.80	12.09	26.09
125	9243	60	0	144.00	3.10	3.87	28.50	18.09	16.00	16.00	21.50
125	10293	60	0	194.00	6.41	5.69	46.39	20.59	9.80	5.69	17.50
125	11263	140	0	169.00	2.95	2.43	17.79	24.89	24.89	19.50	13.00
125	12103	230	0	35.00	2.23	4.35	22.89	14.29	17.09	14.29	31.39
125	10153	280	0	269.00	2.89	6.73	31.19	17.79	9.29	10.00	31.59
125	11193	330	0	122.00	4.19	4.01	36.09	20.50	13.09	13.89	16.39
160	10093	30	0	367.00	0.82	6.12	12.00	10.39	7.59	14.19	55.89
160	9243	60	0	71.00	1.27	8.09	21.09	11.29	8.50	12.69	46.50
160	10293	60	0	119.00	1.10	9.52	20.19	12.59	6.69	10.09	50.39
160	11263	140	0	346.00	2.31	1.85	7.50	7.50	58.69	9.00	17.29
160	12033	200	0	92.00	1.63	3.45	13.00	14.09	15.19	21.69	35.89
160	12103	230	0	10.00	1.72	4.74	20.00	10.00	20.00	10.00	40.00
160	10233	240	0	275.00	20.56	5.03	80.00	5.50	4.00	7.59	2.89
160	11193	330	0	61.29	3.00	3.44	26.09	19.59	15.19	19.59	19.59
185	10093	30	0	368.00	1.67	4.12	15.80	16.00	13.00	17.09	38.00
185	9243	60	0	77.00	2.43	5.14	26.00	16.89	11.69	14.29	31.19
185	10293	60	0	44.00	1.53	4.46	15.89	13.59	13.59	15.89	40.89
185	11263	140	0	179.00	3.03	2.78	20.69	26.29	19.00	17.89	16.19
185	12103	230	0	60.00	2.85	4.62	28.29	16.69	15.00	13.29	26.69
185	10233	240	0	195.00	1.51	4.09	14.39	14.39	12.29	19.00	40.00
185	10153	280	0	83.00	1.33	6.69	18.09	16.89	7.19	9.59	48.19
185	9063	290	0	87.09	2.22	6.50	25.29	23.00	6.19	4.19	41.29
185	11193	330	0	80.00	2.40	3.00	17.50	20.00	17.50	22.50	22.50
205	10093	30	0	511.00	1.50	9.16	24.29	12.69	6.80	12.09	44.00
205	10293	60	0	68.00	1.92	6.06	23.50	14.69	11.80	11.80	38.19
205	11263	140	0	256.00	2.40	2.35	9.00	34.39	18.00	16.00	22.69
205	12103	230	0	211.00	0.04	44.90	9.00	3.29	3.29	3.80	80.59
205	10233	240	0	625.00	2.50	10.93	32.79	14.09	6.59	9.80	36.79
205	11193	330	0	143.00	4.01	4.97	37.79	15.39	13.29	13.29	20.29

NA

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	G.G.D.	PCT ON EACH STAGE: LARGE---->SMALL				
105	9243	60	0	1510.00	2.05	6.67	25.79	16.59	5.29	15.89	36.39
105	11123	200	0	1135.00	3.61	4.77	33.50	18.50	14.09	11.00	22.89
105	12103	230	0	5310.00	9.68	3.98	60.79	14.89	12.80	5.50	6.00
105	10153	280	0	1460.00	5.87	7.91	45.89	15.80	9.59	6.80	21.89
105	11053	310	0	950.00	4.36	2.64	31.59	27.39	24.19	7.39	9.50
125	10093	30	0	930.00	1.87	8.51	26.89	11.80	12.89	6.50	41.89
125	9243	60	0	270.00	1.60	3.88	14.80	14.80	11.09	22.19	37.00
125	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	0	405.00	3.68	7.38	37.00	14.80	13.59	4.89	29.59
125	12103	230	0	2830.00	4.31	3.81	37.09	19.09	15.19	13.80	14.80
125	10153	280	0	785.00	2.50	7.46	33.09	10.19	7.00	17.79	31.79
125	11193	330	0	425.00	0.58	11.42	15.29	8.19	8.19	7.09	61.19
160	10093	30	0	1780.00	0.25	13.35	10.09	5.59	5.09	7.89	71.29
160	9243	60	0	450.00	1.08	22.24	26.69	11.09	4.39	6.69	51.09
160	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	0	355.00	0.89	11.38	19.69	9.89	7.00	9.89	53.50
160	12033	200	0	595.00	3.51	2.89	28.59	20.19	20.19	18.50	12.59
160	12103	230	0	2010.00	6.68	6.20	47.29	20.39	9.50	4.00	18.89
160	10233	240	0	2130.00	45.70	16.67	76.50	4.19	5.59	4.69	8.89
160	11193	330	0	580.00	0.51	20.84	19.79	6.00	7.80	6.00	60.29
185	10093	30	0	1600.00	0.16	99.97	20.59	6.29	3.80	2.50	66.89
185	9243	60	0	480.00	1.14	10.23	20.79	14.59	8.29	2.09	54.19
185	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	0	265.00	0.62	10.16	15.09	7.50	9.39	7.50	60.39
185	12103	230	0	2450.00	10.39	4.74	59.19	18.39	9.00	5.29	8.19
185	10233	240	0	450.00	1.01	8.08	16.69	16.69	6.69	2.19	57.79
185	10153	280	1	232.50	1.14	14.28	25.79	6.50	12.89	3.19	51.59
185	9063	290	1	225.00	3.80	2.71	28.89	22.19	31.09	2.19	15.59
185	11193	330	0	295.00	2.45	10.44	32.19	13.59	8.50	8.50	37.29
205	10093	30	0	2030.00	4.25	29.39	43.79	9.89	4.89	6.89	34.50
205	10293	60	0	700.00	3.65	4.97	38.59	7.09	22.89	7.09	24.29
205	11263	140	0	1460.00	0.08	30.34	9.59	4.09	4.09	4.09	78.09
205	12103	230	0	4160.00	8.57	8.52	52.89	15.09	9.09	4.29	18.50
205	10233	240	0	1280.00	0.92	9.14	19.50	5.50	13.29	7.80	53.89
205	11193	330	0	200.00	3.29	0.92	70.00	10.00	10.00	10.00	0.00

PB

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	677.09	0.96	8.86	17.00	14.89	6.09	6.19	55.79
105	11123	200	0	1119.00	1.74	9.71	27.29	11.80	7.29	12.29	41.19
105	12103	230	0	492.00	0.78	5.09	9.59	7.00	12.89	11.69	58.69
105	10153	280	0	274.89	0.99	5.03	12.29	8.00	15.89	10.00	53.79
105	11053	310	0	225.88	1.44	2.31	2.39	20.00	17.39	14.19	46.00
125	10093	30	0	964.00	1.88	3.39	16.29	12.39	18.50	21.69	31.09
125	9243	60	0	411.00	1.12	5.11	12.59	14.19	11.29	10.29	51.59
125	10293	60	0	928.79	2.27	1465.83	44.00	4.09	2.00	4.29	45.69
125	11263	140	0	527.79	0.76	7.18	13.00	9.19	11.39	7.19	59.29
125	12103	230	0	324.39	0.01	542367.00	31.09	1.89	1.59	1.59	63.79
125	10153	280	0	363.79	2.32	4.61	24.89	14.59	12.69	18.00	29.69
125	11193	330	0	593.50	0.99	4.26	10.50	6.69	13.89	17.39	51.59
160	10093	30	0	1765.00	1.21	2.90	6.00	9.19	15.80	24.89	44.19
160	9243	60	0	322.50	1.03	5.53	12.59	13.89	9.59	10.80	53.09
160	10293	60	0	346.29	1.10	4.84	13.19	9.39	11.39	17.59	48.29
160	11263	140	0	427.29	1.77	5.00	20.19	15.09	10.19	17.39	37.19
160	12033	200	0	434.29	1.38	8.39	21.69	13.69	8.50	9.29	46.69
160	12103	230	0	16.90	2.15	6.21	24.89	18.00	9.80	10.00	37.29
160	10233	240	0	4981.29	0.00	46.33	0.60	0.30	0.50	0.70	98.00
160	11193	330	0	258.29	2.44	2.73	22.09	13.39	8.89	38.19	17.39
185	10093	30	0	2365.00	0.48	6.75	8.80	5.39	9.50	9.80	66.59
185	9243	60	0	498.50	1.08	4.65	11.89	10.09	14.09	13.29	50.59
185	10293	60	0	267.69	2.46	2.92	16.79	22.89	17.09	21.09	22.09
185	11263	140	0	528.79	1.71	5.82	20.19	17.50	10.09	10.19	42.00
185	12103	230	0	65.94	0.85	5.98	13.29	8.19	7.59	17.39	53.50
185	10233	240	0	2325.50	0.56	3.08	1.09	5.50	8.00	10.09	75.19
185	10153	280	0	505.00	0.47	12.13	13.59	9.00	6.39	6.50	64.59
185	9063	290	0	444.89	1.07	10.62	19.69	14.69	6.89	4.69	53.89
185	11193	330	0	854.50	1.07	4.40	10.09	12.89	13.29	11.19	52.50
205	10093	30	0	1345.00	2.00	5.96	24.79	12.89	12.19	13.80	36.29
205	10293	60	0	202.39	2.80	4.91	27.79	19.09	11.80	13.09	28.29
205	11263	140	0	855.50	2.19	7.54	27.09	17.19	8.69	8.59	38.50
205	12103	230	0	472.39	0.97	6.87	14.89	11.69	10.69	8.29	54.39
205	10233	240	0	2653.00	0.31	8.22	7.29	5.29	6.09	9.19	72.09
205	11193	330	0	602.79	1.61	5.05	18.59	14.00	11.80	15.39	40.09

SB

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	16.19	0.18	36.28	15.39	7.39	4.89	0.60	71.59
105	11123	200	0	198.39	2.40	2.66	12.80	28.19	17.00	19.19	22.79
105	12103	230	0	4.59	1.00	10.00	21.69	6.50	8.69	13.00	50.00
105	10153	280	0	4.00	1.75	6.57	22.50	15.00	12.50	7.50	42.50
105	11053	310	1	2.44	2.98	3.63	24.50	24.50	20.39	2.00	28.59
125	10093	30	0	76.29	2.16	2.92	11.89	30.09	14.39	10.69	32.79
125	9243	60	0	15.89	0.65	7.17	11.89	6.89	12.59	6.29	62.29
125	10293	60	0	15.69	2.06	4.44	19.09	23.59	8.29	12.69	36.29
125	11263	140	0	7.29	1.32	4.85	16.39	11.00	8.19	21.89	42.50
125	12103	230	0	5260.00	3.67	1.89	12.69	55.09	16.19	11.19	4.80
125	10153	280	0	23.29	4.54	2.47	30.89	32.59	23.59	4.29	8.59
125	11193	330	0	12.29	0.58	8.18	12.19	8.09	5.69	13.00	61.00
160	10093	30	0	46.19	2.00	2.97	11.00	28.09	10.19	18.19	32.50
160	9243	60	0	24.69	3.24	2.45	18.19	34.79	18.19	16.19	12.59
160	10293	60	0	11.00	1.00	5.04	10.89	14.50	8.19	12.69	53.59
160	11263	140	0	110.89	2.31	2.46	10.59	25.50	21.79	20.59	21.59
160	12033	200	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	0	12.00	0.79	17.85	21.69	10.80	5.00	6.69	55.79
160	11193	330	0	39.50	0.28	7.02	4.80	7.09	5.29	5.59	77.19
185	10093	30	0	61.09	1.23	5.37	14.09	17.69	7.69	10.59	49.89
185	9243	60	0	6.89	0.26	13.78	10.09	7.19	5.80	4.29	72.50
185	10293	60	0	17.09	0.20	3.92	0.60	1.80	1.19	8.80	87.69
185	11263	140	0	55.59	2.61	2.75	14.59	33.29	14.39	14.39	23.39
185	12103	230	0	7.50	3.15	4.93	30.69	17.29	17.29	6.69	28.00
185	10233	240	0	55.19	0.25	8.31	5.59	6.69	3.39	8.19	76.09
185	10153	280	0	35.39	0.07	8.23	1.39	2.29	1.09	4.80	90.39
185	9063	290	1	11.64	0.31	62.43	22.29	10.29	0.40	0.90	66.09
185	11193	330	0	77.50	1.08	6.71	16.09	12.29	9.69	11.00	51.00
205	10093	30	0	267.00	2.41	3.73	19.50	25.09	12.39	13.09	30.00
205	10293	60	0	10.50	0.44	7.56	9.50	5.69	5.69	13.29	65.69
205	11263	140	0	122.39	2.11	2.87	12.39	22.09	19.89	17.39	28.29
205	12103	230	1	14.44	0.53	2.68	0.30	6.19	4.19	3.50	85.79
205	10233	240	0	958.00	3.02	2.31	15.09	34.39	17.69	20.89	11.80
205	11193	330	0	18.29	3.34	0.92	50.79	23.50	13.09	12.59	0.00

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	0.61	4.51	3.75	34.39	31.09	11.50	3.29	19.69
105	11123	200	0	1.00	5.59	3.27	41.09	28.00	12.59	9.00	9.39
105	12103	230	0	0.18	7.96	5.66	51.89	18.59	11.50	2.69	15.29
105	10153	280	0	0.51	3.18	7.77	33.29	19.59	7.80	5.89	33.29
105	11053	310	0	0.45	4.47	2.63	31.69	29.89	21.00	8.89	8.50
125	10093	30	0	1.17	8.50	3.50	53.39	28.00	7.59	4.19	6.80
125	9243	60	0	0.41	4.04	2.90	31.69	22.00	24.39	9.80	12.19
125	10293	60	0	0.10	6.88	8.81	54.50	3.00	15.19	7.09	20.19
125	11263	140	1	0.58	6.77	1.91	53.39	32.09	9.50	4.80	0.20
125	12103	230	0	0.46	8.67	2.59	63.19	18.19	11.50	5.80	1.29
125	10153	280	0	0.30	6.53	2.72	50.00	23.29	13.29	10.00	3.29
125	11193	330	0	0.64	7.64	2.34	55.59	26.89	11.59	4.80	1.09
160	10093	30	0	0.45	7.58	6.94	53.29	11.09	11.09	8.89	15.59
160	9243	60	0	0.37	4.29	3.45	32.39	29.69	13.50	8.09	16.19
160	10293	60	0	0.38	7.05	3.80	47.39	28.89	7.89	5.29	10.50
160	11263	140	1	0.43	7.96	2.00	58.09	30.89	8.69	2.09	0.20
160	12033	200	0	0.23	6.55	2.65	45.29	34.69	7.80	8.59	3.69
160	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	0	1.15	3.10	1.97	22.39	23.29	6.00	44.00	4.29
160	11193	330	0	0.33	7.46	2.21	59.09	22.39	12.09	5.80	0.60
185	10093	30	0	1.19	8.53	4.88	53.29	21.69	7.50	6.69	10.80
185	9243	60	0	0.51	6.40	3.52	45.09	27.50	11.80	5.89	9.80
185	10293	60	0	0.15	2.89	5.74	33.29	13.29	6.69	20.00	26.69
185	11263	140	0	0.49	8.50	2.44	55.59	33.09	6.19	3.69	1.39
185	12103	230	1	0.20	10.69	3.95	62.19	17.59	12.39	0.70	7.09
185	10233	240	0	0.73	7.13	4.00	47.89	27.39	8.19	5.50	11.00
185	10153	280	0	0.63	4.60	4.06	36.50	25.39	12.69	7.89	17.50
185	9063	290	0	0.48	6.91	2.84	47.19	31.39	12.89	2.29	6.19
185	11193	330	0	0.18	8.00	2.36	56.50	28.50	9.29	4.69	1.00
205	10093	30	0	1.20	7.83	3.45	51.19	28.09	7.39	6.59	6.59
205	10293	60	0	0.63	7.23	2.82	47.39	36.29	6.29	4.69	5.19
205	11263	140	0	1.03	8.89	2.50	61.00	24.29	9.80	3.80	1.09
205	12103	230	0	0.18	7.84	2.82	53.79	25.29	13.69	3.29	3.80
205	10233	240	0	0.91	5.93	3.37	46.19	22.00	11.00	13.19	7.59
205	11193	330	0	0.27	5.72	1.44	61.79	24.69	11.29	2.19	0.00

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	24.79	0.63	5.94	9.29	7.69	8.89	12.50	61.69
105	11123	200	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	12103	230	1	1.94	0.93	2.68	2.59	5.09	15.39	20.50	56.39
105	10153	280	1	18.50	0.84	2.35	0.50	13.50	2.69	5.39	77.79
105	11053	310	1	3.74	0.74	6.14	10.69	13.29	1.29	16.00	58.69
125	10093	30	0	29.79	1.01	3.04	5.00	7.39	13.39	23.50	50.69
125	9243	60	0	17.50	0.85	6.50	12.59	14.29	2.89	14.29	56.00
125	10293	60	0	8.69	1.97	2.82	10.29	23.00	18.39	17.19	31.00
125	11263	140	0	5.89	1.15	4.23	11.89	11.89	6.80	23.69	45.79
125	12103	230	0	16.69	3.38	2.81	24.59	25.69	19.19	16.79	13.80
125	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	0	3.00	1.95	2.64	13.29	13.29	13.29	36.69	23.29
160	10093	30	0	52.59	0.92	2.62	4.00	3.39	5.09	36.09	51.29
160	9243	60	0	18.39	0.65	5.28	7.59	10.29	4.89	15.19	62.00
160	10293	60	0	7.39	0.92	5.46	13.50	5.39	14.89	12.19	54.09
160	11263	140	0	4.29	2.00	2.55	9.29	20.89	18.59	25.59	25.59
160	12033	200	1	2.84	1.18	2.41	1.80	21.09	3.50	17.50	56.09
160	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	0	27.19	0.04	10.87	1.50	1.50	1.09	4.00	91.89
160	11193	330	0	3.19	1.54	2.66	12.50	6.19	6.19	43.79	31.29
185	10093	30	0	66.69	1.30	2.96	12.09	4.59	5.19	39.00	39.00
185	9243	60	0	20.89	1.46	3.36	8.59	26.29	4.80	12.39	47.79
185	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	1	2.74	1.54	3.72	21.79	1.80	7.29	32.69	36.39
185	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	0	40.00	1.44	3.88	11.00	25.00	3.50	13.00	47.50
185	10153	280	0	16.29	0.45	6.54	6.69	9.19	7.39	5.50	71.19
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	0	2.29	1.78	3.12	13.00	17.39	8.69	30.39	30.39
205	10093	30	0	62.09	0.53	4.24	5.19	3.69	5.80	19.29	66.00
205	10293	60	1	3.80	0.16	9.95	5.29	5.29	2.59	7.89	78.89
205	11263	140	0	5.39	1.43	2.86	11.09	5.59	13.00	35.19	35.19
205	12103	230	0	2.00	2.32	2.80	20.00	10.00	20.00	30.00	20.00
205	10233	240	0	84.19	0.28	5.98	3.19	8.19	1.80	6.09	80.79
205	11193	330	0	1.89	3.37	1.27	15.80	26.29	10.50	47.39	0.00

SI

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	9531.00	6.70	5.37	47.09	22.00	8.89	5.89	16.09
105	11123	200	0	14317.00	6.85	4.63	48.29	21.00	11.80	5.69	13.19
105	12103	230	0	4664.00	4.19	8.63	39.89	15.09	10.59	6.09	28.29
105	10153	280	0	10970.00	3.82	3.62	30.69	25.29	15.59	9.89	18.39
105	11053	310	0	8557.00	2.54	2.04	6.09	42.89	19.59	11.19	20.19
125	10093	30	0	14328.00	6.36	4.67	45.19	25.39	8.00	6.39	14.89
125	9243	60	0	6629.00	5.40	2.89	39.69	29.00	14.50	9.69	7.09
125	10293	60	0	1907.39	6.44	2.55	53.50	20.19	10.89	13.19	2.19
125	11263	140	0	5880.00	5.22	5.00	41.79	20.59	11.00	9.00	17.50
125	12103	230	0	5851.00	6.90	3.44	49.39	23.79	10.50	9.39	6.89
125	10153	280	0	6274.00	5.69	3.88	44.00	20.69	14.80	8.59	11.89
125	11193	330	0	5764.00	11.96	4.61	63.29	17.09	7.80	5.69	6.19
160	10093	30	0	12087.00	6.93	4.34	46.89	29.00	4.80	5.80	13.50
160	9243	60	0	5193.39	9.94	3.06	60.50	25.39	9.09	0.70	4.39
160	10293	60	0	5454.00	9.52	4.44	56.29	22.39	7.39	5.39	8.50
160	11263	140	0	4638.00	5.85	5.54	45.29	18.19	11.00	8.29	17.09
160	12033	200	0	4486.00	5.00	5.53	40.79	20.59	11.09	6.59	20.79
160	12103	230	0	1680.00	7.47	3.39	50.89	24.89	11.39	6.09	6.69
160	10233	240	0	1686.69	1.50	3.27	14.89	2.09	25.59	17.19	40.19
160	11193	330	0	3786.00	8.83	4.41	55.50	19.89	9.59	6.39	8.59
185	10093	30	0	13795.00	6.44	6.47	47.19	17.89	10.00	6.29	18.59
185	9243	60	0	5271.00	7.60	3.89	52.39	20.89	10.50	8.50	7.80
185	10293	60	0	1691.19	5.80	2.55	43.89	28.69	12.09	12.00	3.39
185	11263	140	0	4659.00	6.17	5.58	45.29	21.89	8.50	6.69	17.59
185	12103	230	0	6661.00	5.80	5.16	43.50	22.79	9.29	6.69	17.59
185	10233	240	0	7265.00	4.31	3.65	33.39	27.69	14.59	6.59	17.59
185	10153	280	0	6869.00	4.98	3.45	37.59	27.50	14.00	8.09	12.80
185	9063	290	0	5740.00	6.23	4.31	46.89	20.39	10.29	10.80	11.59
185	11193	330	0	2518.00	7.52	4.41	51.19	20.89	9.29	8.39	10.09
205	10093	30	0	15403.00	13.68	5.53	64.69	15.80	6.80	5.50	7.29
205	10293	60	0	6754.19	7.73	2.35	53.19	33.50	6.80	5.39	1.19
205	11263	140	0	9286.00	8.55	5.74	53.39	19.00	7.89	6.89	12.80
205	12103	230	0	6140.00	7.03	4.73	49.19	20.00	12.19	5.50	13.19
205	10233	240	0	12862.00	7.31	4.86	49.39	22.19	8.69	6.80	12.80
205	11193	330	0	5123.00	8.91	4.64	56.00	18.19	9.69	7.09	8.89

SM

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	0.46	4.78	3.60	37.00	28.29	8.69	13.00	13.00
105	11123	200	0	0.44	4.40	2.80	31.69	29.39	21.09	6.89	11.00
105	12103	230	1	0.06	3.59	1.77	17.89	25.00	42.89	12.50	1.80
105	10153	280	0	0.36	4.90	5.35	41.69	16.69	13.89	8.29	19.39
105	11053	310	0	0.31	4.39	2.32	31.19	27.09	26.19	10.09	5.39
125	10093	30	0	0.90	7.69	4.63	52.19	21.09	5.59	11.09	10.00
125	9243	60	0	0.28	3.13	2.53	17.89	35.69	14.29	17.89	14.29
125	10293	60	0	0.08	3.53	2.66	25.00	25.00	25.00	12.50	12.50
125	11263	140	0	0.33	5.46	3.45	39.89	32.00	5.59	11.69	10.89
125	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	0	0.23	4.71	6.26	41.69	16.69	8.29	12.50	20.79
125	11193	330	0	0.31	4.52	7.05	39.89	18.39	9.80	6.59	25.29
160	10093	30	0	0.53	4.01	4.76	37.69	17.00	9.39	17.00	18.89
160	9243	60	0	0.25	4.25	4.72	36.00	24.00	8.00	12.00	20.00
160	10293	60	0	0.23	5.80	2.94	41.69	29.19	16.69	4.19	8.29
160	11263	140	0	0.18	7.05	3.16	48.19	29.00	9.80	6.69	6.19
160	12033	200	1	0.15	4.38	1.83	42.59	16.79	16.79	23.19	0.60
160	12103	230	1	0.18	0.27	5.97	3.09	9.39	0.50	3.09	83.79
160	10233	240	0	0.35	5.01	5.00	40.09	22.89	11.39	5.69	20.00
160	11193	330	0	0.54	3.87	1.86	14.29	68.50	4.59	4.09	8.50
185	10093	30	0	1.11	8.38	8.58	55.39	10.69	6.29	11.59	16.09
185	9243	60	0	0.52	7.23	3.70	50.00	25.00	7.69	9.59	7.69
185	10293	60	0	0.44	0.00	1383.20	15.89	2.29	2.29	2.29	77.29
185	11263	140	0	0.20	6.21	7.19	45.50	22.50	5.59	2.80	23.50
185	12103	230	1	0.15	5.82	2.73	43.29	26.79	21.00	0.60	8.29
185	10233	240	0	0.75	8.67	4.27	53.29	26.69	4.00	6.69	9.29
185	10153	280	0	0.39	4.38	2.42	28.19	35.89	20.50	7.69	7.69
185	9063	290	0	0.26	7.89	3.36	51.29	28.50	9.89	2.69	7.59
185	11193	330	0	0.37	2.64	2.06	14.69	9.59	48.50	13.89	13.29
205	10093	30	0	1.01	8.22	5.74	54.89	14.69	7.80	10.80	11.80
205	10293	60	0	0.33	7.04	5.38	48.50	21.19	9.09	6.09	15.19
205	11263	140	0	0.69	2.34	26.66	35.79	12.59	4.00	4.89	42.59
205	12103	230	1	0.27	0.13	23.72	12.59	0.40	6.69	5.39	74.79
205	10233	240	0	0.85	4.80	5.44	38.79	27.09	5.89	3.50	24.69
205	11193	330	0	0.16	3.10	0.84	49.09	19.89	18.09	12.89	0.00

TA

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	1	0.30	281.35	14.24	92.29	2.29	2.59	0.80	2.00
105	11123	200	1	1.00	5.28	7.21	42.79	20.89	9.00	0.50	26.89
105	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	0	1.10	2.09	1.41	2.89	0.60	9.00	85.69	1.80
105	11053	310	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	0	0.27	4.92	3.42	40.69	18.50	18.50	11.09	11.09
125	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10293	60	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	1	0.15	3.65	1.87	28.59	23.29	13.29	33.19	1.69
185	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10293	60	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	9063	290	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TB

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	1	0.07	1.96	2.40	6.69	26.69	13.29	26.69	26.69
105	11123	200	1	0.23	3.16	1.78	20.39	24.50	8.19	44.89	2.00
105	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	0	0.08	2.17	2.80	12.50	25.00	12.50	25.00	25.00
105	11053	310	1	0.20	1.83	1.91	2.29	18.59	14.00	46.50	18.59
125	10093	30	1	0.13	4.08	4.56	34.50	27.59	3.39	13.80	20.69
125	9243	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	1	0.15	3.63	2.00	30.29	12.09	30.29	24.19	3.00
125	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	0	0.16	6.66	4.11	47.09	23.50	11.80	5.89	11.80
185	9243	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10293	60	1	0.05	2.01	4.05	18.19	18.19	18.19	9.09	36.39
185	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	9063	290	1	0.13	2.21	1.97	3.39	34.50	20.69	20.69	20.69
185	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	1	0.18	2.58	1.74	2.59	51.29	10.29	25.59	10.29
205	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TH

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	0.49	3.41	2.11	18.39	30.59	26.50	18.39	6.09
105	11123	200	0	1.47	3.89	2.16	28.39	23.00	25.69	18.89	4.09
105	12103	230	1	0.26	27.13	19.18	67.89	7.50	7.50	1.89	15.09
105	10153	280	0	0.33	2.85	3.88	23.50	29.39	5.89	14.69	26.50
105	11053	310	0	0.33	4.31	2.43	36.39	15.19	30.29	12.09	6.09
125	10093	30	0	1.03	8.19	3.42	52.89	26.89	10.59	1.89	7.69
125	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10293	60	1	0.31	4.29	1.98	30.79	33.79	12.29	21.50	1.50
125	11263	140	1	0.57	4.29	1.87	38.29	24.29	10.39	26.09	0.90
125	12103	230	0	1.53	1.88	2.13	8.39	16.19	1.89	54.50	18.79
125	10153	280	1	0.23	4.91	2.20	40.79	28.59	8.19	20.39	2.00
125	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	0	0.48	5.92	5.04	43.69	25.00	6.29	8.29	16.69
160	9243	60	0	0.41	3.23	4.94	29.29	29.29	4.89	4.89	31.69
160	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	1	0.16	4.30	2.07	34.29	17.09	34.29	11.39	2.89
160	12033	200	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	1	0.75	8.09	2.72	58.29	19.89	17.19	0.70	4.00
160	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	0	1.33	5.37	2.72	39.59	27.59	19.39	6.69	6.69
185	9243	60	0	0.35	4.98	2.97	37.09	28.59	14.29	11.39	8.59
185	10293	60	1	0.13	3.58	3.57	27.59	34.50	3.39	13.80	20.69
185	11263	140	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	0	0.64	4.41	2.94	39.09	12.50	31.19	4.69	12.50
185	10233	240	0	0.64	5.80	3.03	43.69	28.09	7.80	14.09	6.29
185	10153	280	0	0.62	3.45	2.09	16.09	40.29	19.39	17.69	6.50
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	0	1.46	5.96	2.46	40.09	37.39	12.89	5.39	4.09
205	10293	60	0	0.78	6.81	2.98	53.79	14.09	23.09	2.59	6.39
205	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11193	330	1	0.21	5.46	1.39	71.09	8.89	17.79	2.19	0.00

TI

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	283.00	2.70	2.24	10.19	37.09	19.29	16.59	16.59
105	11123	200	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	10153	280	1	245.00	2.11	2.26	6.09	43.29	7.29	4.09	39.19
105	11053	310	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10093	30	0	461.00	10.00	3.42	62.89	20.79	3.29	9.80	3.29
125	9243	60	0	128.00	8.34	7.46	60.19	5.50	4.69	15.59	14.09
125	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	1	197.00	4.61	3.20	46.69	5.09	21.29	17.29	9.59
125	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	9243	60	0	242.00	5.56	4.83	45.50	16.50	11.19	12.39	14.50
160	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12033	200	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	1	888.00	20.93	3.76	83.29	6.09	6.09	3.39	1.09
160	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	1	420.00	5.33	5.51	42.89	19.00	14.29	2.39	21.39
185	9243	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10293	60	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	1	295.00	5.17	3.31	50.79	3.39	23.09	13.59	9.19
185	10153	280	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	9063	290	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10093	30	1	350.00	5.19	2.40	46.59	17.09	16.59	16.89	2.89
205	10293	60	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11263	140	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	10233	240	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
205	11193	330	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	27.00	1.80	4.98	18.09	23.29	8.50	5.59	44.39
105	11123	200	0	30.09	0.47	10.02	11.59	9.29	7.29	5.29	66.39
105	12103	230	0	4.69	4.00	3.59	31.89	25.50	14.89	10.59	17.00
105	10153	280	0	17.69	1.36	9.47	23.69	9.59	12.39	6.80	47.50
105	11053	310	0	12.50	2.15	5.14	23.19	17.59	11.19	13.59	34.39
125	10093	30	0	25.09	2.76	13.60	35.50	13.09	6.39	8.39	36.69
125	9243	60	1	7.94	1.39	8.38	27.69	0.60	15.09	11.29	45.29
125	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	11263	140	1	5.34	5.80	4.88	43.00	29.89	0.90	7.50	18.69
125	12103	230	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	10153	280	0	29.39	0.62	9.67	13.89	9.19	8.19	7.50	61.19
125	11193	330	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10093	30	0	22.59	0.99	11.03	19.89	13.69	4.39	8.80	53.09
160	9243	60	0	13.39	2.88	4.47	26.09	23.89	11.19	10.39	28.39
160	10293	60	1	12.00	1.44	6.77	19.19	20.00	3.29	10.00	47.50
160	11263	140	0	8.89	3.52	3.62	29.19	22.50	21.29	4.50	22.50
160	12033	200	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	12103	230	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	10233	240	1	31.34	310.25	90.07	79.69	5.09	3.19	0.20	11.80
160	11193	330	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10093	30	0	27.39	1.47	7.86	21.19	19.00	3.59	8.80	47.39
185	9243	60	1	9.14	5.14	16.20	44.79	13.09	8.69	0.50	32.79
185	10293	60	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11263	140	0	12.29	4.03	5.03	35.00	22.79	11.39	7.29	23.59
185	12103	230	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	10233	240	0	12.50	2.27	6.51	26.39	18.39	8.00	11.19	36.00
185	10153	280	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	9063	290	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
185	11193	330	1	5.34	1.52	5.31	24.29	0.90	16.79	16.79	41.09
205	10093	30	0	66.50	0.46	17.75	16.50	9.80	4.19	6.29	63.19
205	10293	60	1	12.00	1.33	8.09	20.79	15.80	3.29	13.29	46.69
205	11263	140	1	15.94	1.51	5.45	26.29	0.30	10.69	22.59	40.09
205	12103	230	0	10.29	1.80	6.36	22.29	16.50	9.69	10.69	40.79
205	10233	240	0	104.50	1.28	9.67	22.00	13.39	8.00	7.80	48.79
205	11193	330	3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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SITE	DATE	DEG WIND	NUMBER OF LESS-THANS	NG/CU.M CONCEN	MICROM. M.M.D.	S.G.D.	PCT ON EACH STAGE: LARGE--->				SMALL
105	9243	60	0	1340.00	2.82	4.61	26.09	23.09	11.19	10.39	29.09
105	11123	200	0	2580.00	1.36	3.11	10.09	9.69	10.09	32.19	38.00
105	12103	230	0	655.00	1.58	6.34	24.39	6.89	10.69	18.29	39.69
105	10153	280	0	110.00	1.71	4.63	18.19	13.59	18.19	9.09	40.89
105	11053	310	0	270.00	2.56	3.62	22.19	18.50	18.50	14.80	25.89
125	10093	30	0	1410.00	0.92	3.56	5.69	10.59	9.19	19.89	54.59
125	9243	60	0	670.00	0.78	4.74	9.00	7.50	9.00	17.89	56.69
125	10293	60	0	280.00	1.12	5.62	16.09	7.09	16.09	10.69	50.00
125	11263	140	0	570.00	1.64	2.02	1.80	19.29	15.80	33.29	29.79
125	12103	230	0	440.00	1.88	5.07	25.00	8.00	11.39	21.59	34.09
125	10153	280	0	255.00	1.60	6.16	21.59	11.80	11.80	13.69	41.19
125	11193	330	0	640.00	2.17	2.43	12.50	15.59	18.79	34.39	18.79
160	10093	30	0	860.00	0.89	3.90	7.00	9.29	9.29	19.79	54.69
160	9243	60	0	260.00	2.18	3.94	19.19	19.19	19.19	7.69	34.59
160	10293	60	0	245.00	0.49	4.50	4.09	6.09	6.09	14.29	69.39
160	11263	140	0	540.00	1.52	3.47	13.00	11.09	14.80	24.09	37.00
160	12033	200	0	395.00	1.94	2.28	8.89	11.39	25.29	32.89	21.50
160	12103	230	1	55.00	4.18	4.09	36.39	18.19	18.19	9.09	18.19
160	10233	240	1	370.00	0.58	3.94	5.39	1.39	12.19	13.50	67.59
160	11193	330	0	1470.00	3.40	2.41	25.19	19.00	27.19	19.69	8.80
185	10093	30	0	1570.00	1.15	5.34	15.29	11.50	6.39	20.39	46.50
185	9243	60	0	330.00	1.14	4.03	9.09	15.19	12.09	12.09	51.50
185	10293	60	0	315.00	0.13	10.86	6.29	1.59	3.19	9.50	79.39
185	11263	140	0	350.00	2.20	4.08	22.89	14.29	11.39	22.89	28.59
185	12103	230	0	500.00	1.50	4.20	16.00	10.00	16.00	18.00	40.00
185	10233	240	0	710.00	0.63	5.25	8.50	7.00	5.59	18.29	60.59
185	10153	280	0	140.00	3.09	3.35	25.00	21.39	21.39	10.69	21.39
185	9063	290	0	530.00	1.62	5.61	18.89	17.00	13.19	5.69	45.29
185	11193	330	0	2220.00	4.00	2.34	27.89	28.39	21.19	16.69	5.89
205	10093	30	0	1750.00	0.81	4.53	8.59	8.00	8.59	18.89	56.00
205	10293	60	0	160.00	1.46	2.68	6.29	12.50	18.79	25.00	37.50
205	11263	140	0	780.00	2.34	2.72	17.89	14.09	17.89	30.79	19.19
205	12103	230	0	220.00	2.00	3.25	18.19	11.39	15.89	27.29	27.29
205	10233	240	0	1800.00	1.30	3.04	11.69	6.69	4.39	38.29	38.89
205	11193	330	0	580.00	3.62	1.29	24.09	20.69	25.89	29.29	0.00

TABLE III. - ELEMENTAL MASS MEDIAN DIAMETERS, MMD (μm), AND CONCENTRATION (ng/m^3) BY SITE

Site	1		2		3		4		5	
	MMD	ng/m^3	MMD	ng/m^3	MMD	ng/m^3	MMD	ng/m^3	MMD	ng/m^3
Al	4.9	3060	7.9	2350	7.4	1710	7.3	2040	7.0	2760
As	---	--	2.8	17	1.3	21	1.2	23	2.2	31
Br	1.2	86	1.1	142	0.7	278	1.0	275	1.0	379
Cl	4.0	3510	2.9	2840	3.0	2720	3.0	1950	2.7	5260
Co	3.6	2.1	4.7	1.8	3.3	1.8	3.7	1.2	4.8	3.4
Cr	3.0	20	2.0	16	0.6	24	1.4	15	2.1	13
Fe	4.8	8940	5.6	2710	4.8	1920	5.5	2310	5.7	4120
Hf	3.0	0.52	5.1	0.66	3.4	0.32	5.4	0.34	5.0	0.73
Hg	5.0	4.82	7.6	9.69	2.9	9.92	4.6	6.76	1.8	9.8
La	4.6	1.79	5.2	2.14	4.5	1.55	5.5	1.98	3.6	2.65
Mg	11.0	1960	---	--	---	--	3.8	1560	---	--
Mn	3.5	248	3.6	154	4.1	107	2.1	105	2.1	235
Na	5.1	1660	2.4	677	8.4	884	2.6	493	3.5	1140
Pb	1.2	471	1.3	541	1.6	410	1.1	554	1.7	749
Sb	1.7	11	2.1	41	1.6	30	1.0	26	2.0	67
Sc	5.2	0.48	7.0	0.42	6.3	0.42	7.1	0.42	7.3	0.57
Se	0.8	7.6	1.7	11	1.0	9.6	1.3	13	1.4	8.6
Si	4.8	9020	6.9	5820	6.9	4080	6.1	5190	8.9	8550
Sm	4.4	0.26	4.9	0.28	4.3	0.27	6.4	0.40	4.3	0.46
Ta	3.7	0.69	4.9	0.27	---	--	3.7	0.15	---	--
Tb	2.3	0.13	3.9	0.15	---	--	3.6	0.11	2.6	0.19
Th	8.3	0.46	4.7	0.59	5.4	0.40	4.6	0.51	6.1	0.63
Ti	2.4	263	7.7	227	13	464	5.3	352	5.2	350
V	2.0	15	2.7	13	2.2	16	2.9	12	1.3	27
Zn	2.0	583	1.5	524	1.9	370	1.7	531	1.9	607
TSP	4.1	195*	2.7	109*	2.7	92*	3.2	99*	4.1	164*

*in $\mu g/m^3$

TABLE IV. - ELEMENTAL MASS DISTRIBUTION

Element	% Large Mode	% Mixed Mode	% Small Mode
Al	100		
Sb	10	42	47
Br		5	95
Co	35	30	15
Cr	6	28	56
Fe	100		
Pb		55	40
Zn	5	10	73

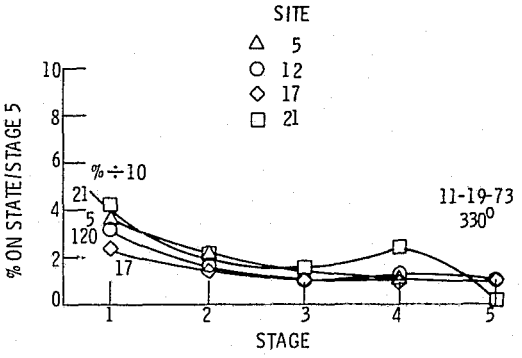

Figure 1. - Percent concentration of Fe.

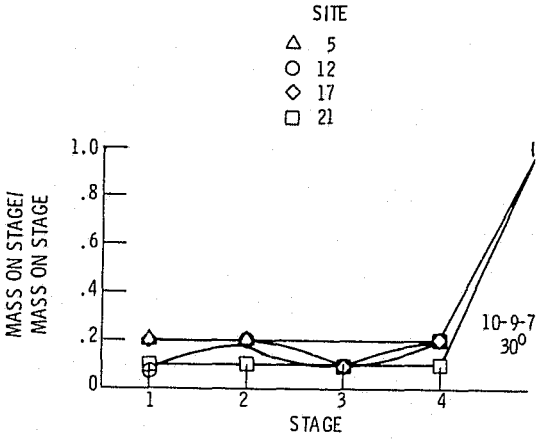

Figure 2. - Percent concentration of Br.

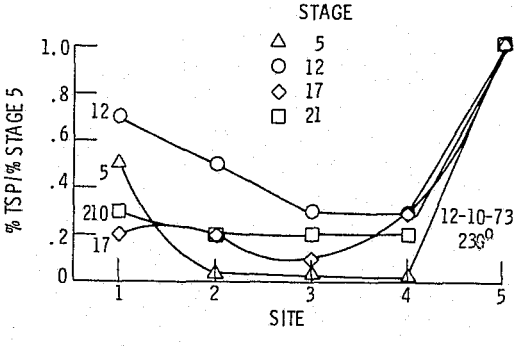

Figure 3. - Percent concentration of Pb.

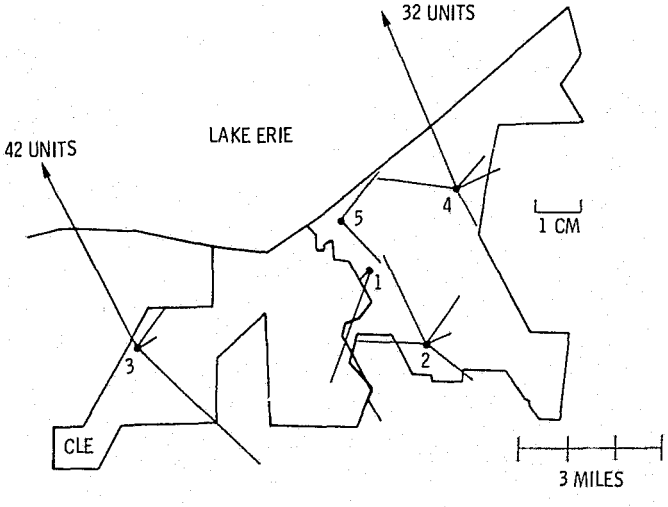

Figure 4. - Zinc-aluminum ratios as a function of prevailing resultant wind direction, 1 cm = 2 units. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

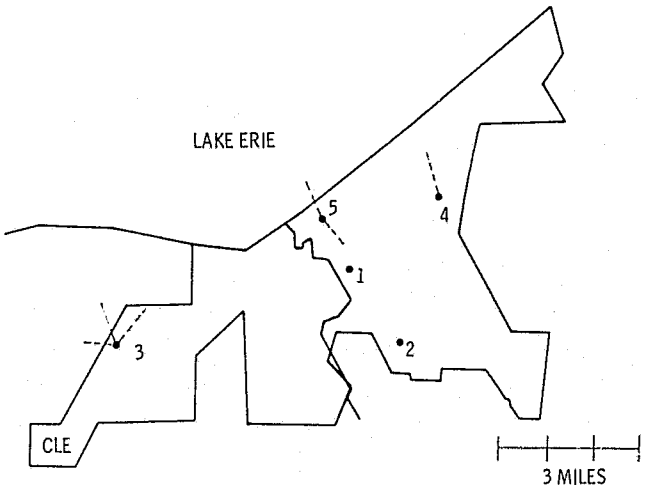

Figure 5. - Cobalt-aluminum ratios as a function of prevailing resultant wind direction. Values not to scale but listed values are 10^2 larger than average. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

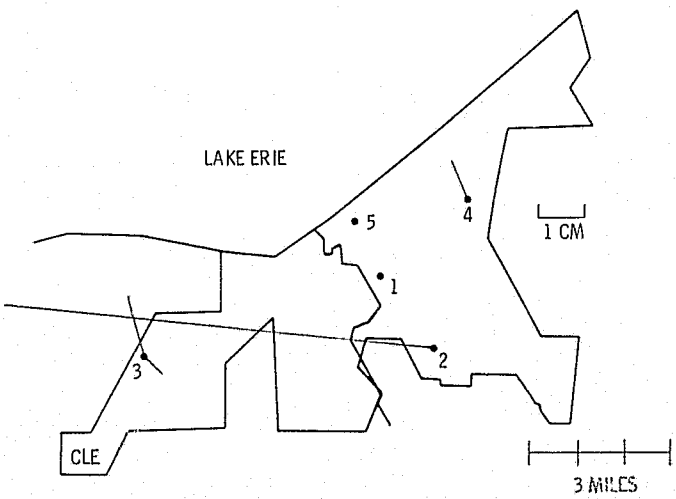

Figure 6. - Antimony-aluminum ratios as a function of prevailing resultant wind direction, 1 cm = 2 units. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

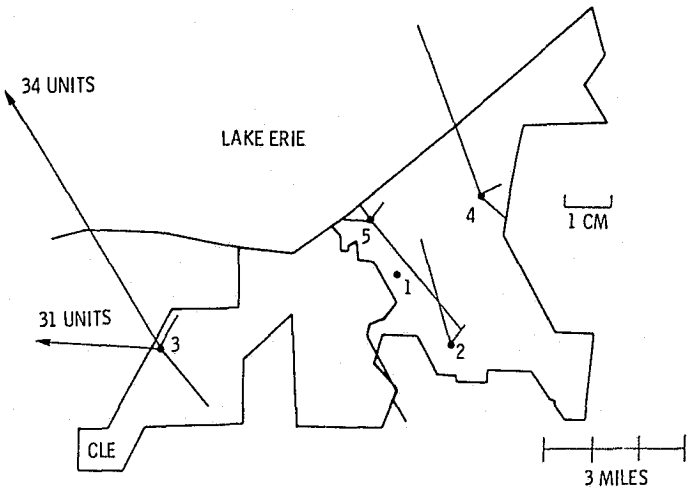

Figure 7. - Bromine-aluminum ratios as a function prevailing resultant wind direction, 1 cm = 2 units. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

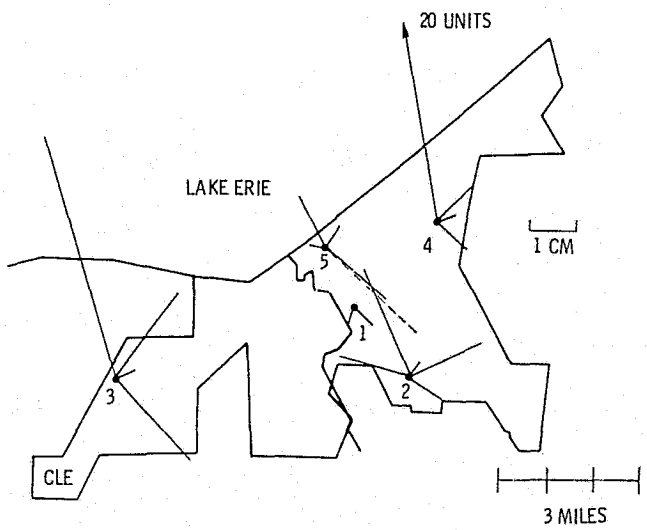

Figure 8. - Lead-aluminum ratios as a function of prevailing resultant wind direction, 1 cm = 2 units. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

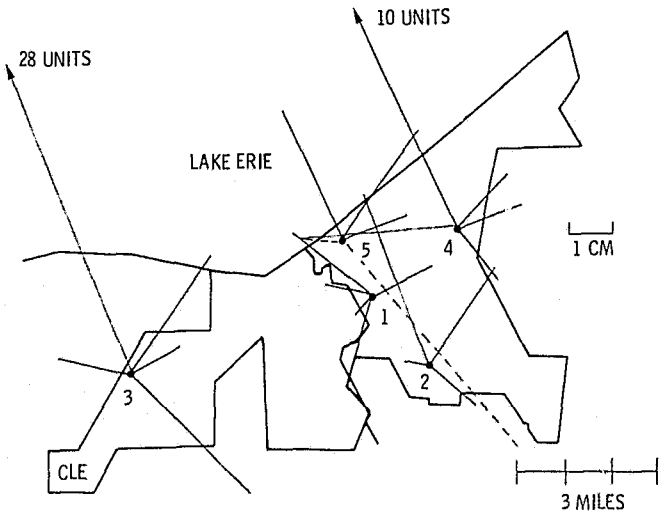

Figure 9. - Iron-aluminum ratios as a function of prevailing resultant wind direction, 1 cm = 2 units except site 1 where 1 cm = 10 units. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

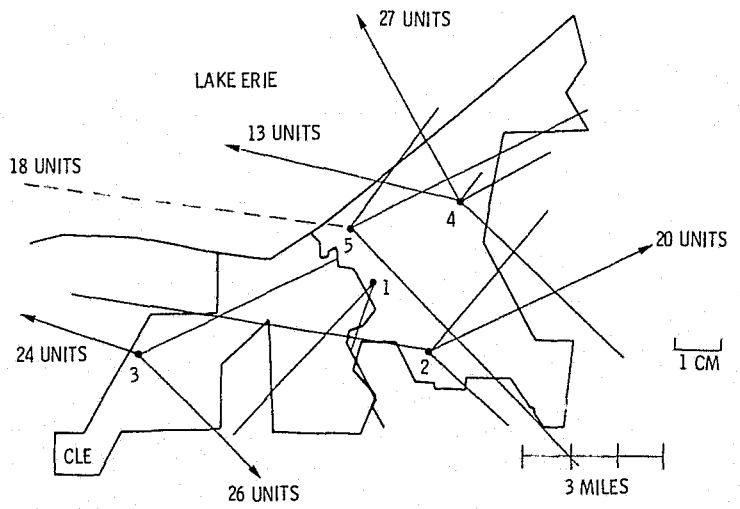

Figure 10. - Chlorine-aluminum ratios as a function of prevailing resultant wind direction, 1 cm = 2 units. The heavy line down the center is the Cuyahoga River. The municipal boundaries have been straightened somewhat but are accurate in their essential features.

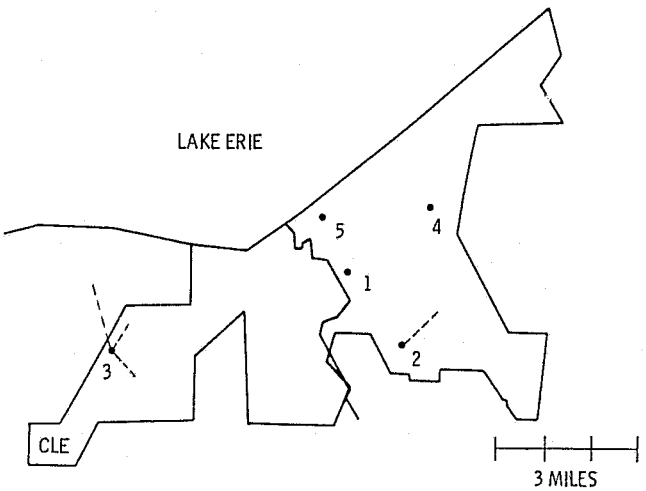

Figure 11. - Chromium-aluminum ratios as a function of prevailing resultant wind direction. Values not to scale but listed values are 10^2 larger than average. The heavy line down the center is the Cuyahoga River. The municpal boundaries have been straightened somewhat but are accurate in their essential features.