



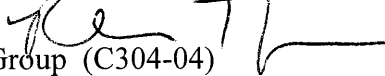
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

November 5, 2008

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Nitrogen Dioxide (NO₂) Descriptive Statistics Tables

FROM: Rhonda Thompson 
Air Quality Analysis Group (C304-04)

TO: NO₂ NAAQS Review Docket

Nitrogen Dioxide (NO₂) monitoring data for 2004-2006 were pulled from the Air Quality System (AQS). Alternative NO₂ design values were calculated for monitors that were at least 75 percent complete for hours in a day and days in a quarter and had all 4 quarters and all 3 years. Table 1 shows the percent of U.S. counties with monitors (and percent of population in counties with monitors) that did exceed alternative NO₂ standards. The alternative forms are the 3-year average of either the 99th or 98th percentiles of the daily 1-hour maximum. The alternative levels for either form are 0.20, 0.15, 0.10, or 0.05. Population is in millions and the number of counties is in the top row and percentages are in the tables.

For the 17 areas in Tables 2 and 3, the monitoring data were aggregated to either the Consolidated Metropolitan Statistical Area (CMSA) or, if no CMSA, the Metropolitan Statistical Area according to the 1999 Office of Management and Budget definitions (January 28, 2002 revision). The monitoring site within an area that had the highest 1-hour design value on a given metric was chosen as the source of that metric value for the area. Table 2 has the 2nd through 9th highest and the 99th and 98th percentiles of the daily maximums for each of the areas. Table 3 shows the ratios of all of the possible metrics (both the 99th and 98th percentiles of the daily maximum and daily average) with each other and the current metric (annual average) for the 17 areas. Each ratio is rounded to the nearest hundredth. For the alternative daily metrics, the statistics were computed for each year and then averaged over 2004-2006; while the form of the current metric, the annual average, is the maximum of the annual averages over 2005-2006. Three of the 17 areas did not meet all completeness requirements above and, therefore, only the complete year data were used in the calculations. Detroit monitors 261630016 and 0019 were complete for 2006 but only monitor 0019 was complete for 2004 and 0016 for 2005; as such,

only the 2 complete years were included in the averages. The Jacksonville monitor was only complete for 2006. The Provo monitor was only complete for 2004 and 2005.

Attachment: Tables 1-3

cc: Phil Lorang

Table 1 Predicted percent of counties with monitors (and percent of population in counties with monitors) exceeding alternative NO₂ standards.

Alternative Standards and Levels (ppm)	Number of counties with monitors (population in 1000s)								
	Total counties (population in millions)	Northeast	Southeast	Industrial Midwest	Upper Midwest	Southwest	Northwest	Southern CA	Outside Regions**
	138 (93.9)	31	32	20	12	9	20	13	1
Percent of counties, total and by region, (and total population) not likely to meet standard and level*									
3 year 99th percentile daily 1 hour max:									
0.20	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0
0.05	59 (79.6)	77	41	80	17	56	55	77	0
3 year 98th percentile daily 1 hour max:									
0.20	0	0	0	0	0	0	0	0	0
0.15	0	0	0	0	0	0	0	0	0
0.10	0	0	0	0	0	0	0	0	0
0.05	46 (63.4)	55	34	60	17	44	45	69	0

* Based on 2004-2006 data for sites that are at least 75% complete for hours in a day and days in a quarter and has all 4 quarters and all 3 years. As such, these estimates are not based on the same air quality data that would be used to determine whether an area would attain a given standard or set of standards. These estimates can only approximate the number counties that are exceeding the given standards and should be used with caution.

** "Outside Resions" include Hawaii.

Table 2. NO₂ Daily Maximums and Percentiles for 2004-2006.

2004-2006	NO ₂ Daily Maximums								Percentiles	
Location	2nd	3rd	4th	5th	6th	7th	8th	9th	99th	98th
Atlanta	0.083	0.079	0.078	0.074	0.073	0.072	0.070	0.070	0.078	0.071
Boston	0.069	0.067	0.064	0.063	0.062	0.060	0.059	0.059	0.064	0.059
Chicago	0.103	0.094	0.093	0.090	0.090	0.088	0.088	0.088	0.093	0.088
Cleveland	0.075	0.074	0.072	0.070	0.069	0.066	0.065	0.064	0.072	0.065
Denver	0.094	0.089	0.086	0.082	0.079	0.077	0.073	0.072	0.086	0.077
El Paso	0.085	0.080	0.075	0.072	0.071	0.068	0.067	0.066	0.075	0.067
Las Vegas	0.042	0.040	0.039	0.039	0.038	0.038	0.037	0.037	0.039	0.037
Los Angeles	0.110	0.095	0.095	0.089	0.088	0.084	0.083	0.081	0.095	0.083
Miami	0.065	0.060	0.059	0.058	0.057	0.056	0.054	0.053	0.059	0.056
New York	0.112	0.099	0.093	0.090	0.086	0.084	0.082	0.081	0.093	0.083
Philadelphia	0.065	0.062	0.060	0.059	0.058	0.057	0.056	0.054	0.060	0.056
Phoenix	0.107	0.097	0.093	0.090	0.089	0.086	0.084	0.083	0.093	0.085
St. Louis	0.066	0.065	0.064	0.064	0.063	0.063	0.063	0.063	0.064	0.063
Washington DC	0.102	0.088	0.079	0.075	0.072	0.066	0.065	0.063	0.079	0.065

These are 14 of the 17 areas in the Draft REA; 3 areas did not meet completeness requirements: Detroit, Jacksonville, and Provo.

Based on 2004-2006 data for sites that are at least 75% complete for hours in a day and days in a quarter and has all 4 quarters and all 3 years. As such, these estimates are not based on the same air quality data that would be used to determine whether an area would attain a given standard or set of standards. These estimates can only approximate the number counties that are exceeding the given standards and should be used with caution.

2004-2006	NO ₂ Daily Maximums								Percentiles	
Location	2nd	3rd	4th	5th	6th	7th	8th	9th	99th	98th
Detroit *	0.062	0.060	0.058	0.057	0.056	0.054	0.054	0.053	0.058	0.054
Detroit **	0.059	0.057	0.054	0.053	0.052	0.052	0.050	0.050	0.054	0.051
Jacksonville ***	0.054	0.05	0.049	0.049	0.049	0.048	0.048	0.048	0.049	0.048

Provo ****	0.071	0.066	0.065	0.065	0.064	0.063	0.063	0.062	0.065	0.063
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- * Detroit monitor 261630016 was complete for 2005 and 2006, 2004 was ignored in the averages.
- ** Detroit monitor 261630019 was complete for 2004 and 2006, 2005 was ignored in the averages.
- *** Jacksonville was only complete for 2006.
- **** Provo was only complete for 2004 and 2005.

Table 3. Ratios of proposed alternatives and the current NO₂ standards.

	2004-2006 Daily			2004-2006 Daily			2004-2006	2005-2006		2004-2006	2005-2006		2004-2006	2005-2006		2004-2006	2005-2006	
	Max	24 hr avg	Rat	Max	24 hr avg	Rat	Daily Max	Ann	Rat	Daily Max	Ann	Rat	24 hr avg	Ann	Rat	24 hr avg	Ann	Rat
Location	99th	99th		98th	98th		99th			98th			99th			98th		
Atlanta	0.078	0.042	1.84	0.071	0.038	1.88	0.078	0.018	4.36	0.071	0.018	4.00	0.042	0.018	2.37	0.038	0.018	2.13
Boston	0.064	0.043	1.50	0.059	0.039	1.50	0.064	0.023	2.73	0.059	0.023	2.50	0.043	0.023	1.81	0.039	0.023	1.66
Chicago	0.093	0.052	1.80	0.088	0.050	1.77	0.093	0.031	3.03	0.088	0.031	2.86	0.052	0.031	1.68	0.050	0.031	1.62
Cleveland	0.072	0.043	1.68	0.065	0.038	1.70	0.072	0.022	3.35	0.065	0.022	3.03	0.043	0.022	1.99	0.038	0.022	1.78
Denver	0.086	0.050	1.73	0.077	0.046	1.68	0.086	0.020	4.22	0.077	0.020	3.78	0.050	0.020	2.44	0.046	0.020	2.25
El Paso	0.075	0.038	1.99	0.067	0.035	1.91	0.075	0.018	4.09	0.067	0.018	3.65	0.038	0.018	2.05	0.035	0.018	1.91
Las Vegas	0.039	0.013	3.04	0.037	0.012	3.10	0.039	0.005	8.65	0.037	0.005	8.21	0.013	0.005	2.84	0.012	0.005	2.65
Los Angeles	0.095	0.061	1.56	0.083	0.055	1.50	0.095	0.031	3.06	0.083	0.031	2.70	0.061	0.031	1.97	0.055	0.031	1.79
Miami	0.059	0.030	1.97	0.056	0.027	2.06	0.059	0.008	7.41	0.056	0.008	7.03	0.030	0.008	3.76	0.027	0.008	3.42
New York	0.093	0.060	1.55	0.083	0.056	1.48	0.093	0.032	2.90	0.083	0.032	2.60	0.060	0.032	1.88	0.056	0.032	1.75
Philadelphia	0.060	0.040	1.51	0.056	0.035	1.61	0.060	0.017	3.62	0.056	0.017	3.34	0.040	0.017	2.40	0.035	0.017	2.07
Phoenix	0.093	0.057	1.63	0.085	0.053	1.60	0.093	0.032	2.95	0.085	0.032	2.70	0.057	0.032	1.81	0.053	0.032	1.69
St. Louis	0.064	0.034	1.91	0.063	0.031	2.03	0.064	0.017	3.82	0.063	0.017	3.74	0.034	0.017	1.99	0.031	0.017	1.84
Washington DC	0.079	0.045	1.76	0.065	0.040	1.61	0.079	0.021	3.70	0.065	0.021	3.02	0.045	0.021	2.10	0.040	0.021	1.88

These are 14 of the 17 areas in the Draft REA; 3 areas did not meet completeness requirements: Detroit, Jacksonville, and Provo.

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2004-2006 Daily	2004-2006 Daily	2004-2006	2005-2006	2004-2006	2005-2006	2004-2006	2005-2006	2004-2006	2005-2006
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	Max	24 hr avg	Rat	Max	24 hr avg	Rat	Daily Max	Ann	Rat	Daily Max	Ann	Rat	24 hr avg	Ann	Rat	24 hr avg	Ann	Rat
Location	99th	99th		98th	98th		99th			98th			99th			98th		
Detroit*	0.058	0.038	1.53	0.054	0.035	1.54	0.058	0.019	2.98	0.054	0.019	2.78	0.038	0.019	1.95	0.035	0.019	1.80
Detroit**	0.054	0.034	1.57	0.051	0.032	1.56	0.054	0.014	3.81	0.051	0.014	3.60	0.034	0.014	2.43	0.032	0.014	2.31
Jacksonville***	0.049	0.027	1.84	0.048	0.024	1.98	0.049	0.012	4.22	0.048	0.012	4.14	0.027	0.012	2.29	0.024	0.012	2.09
Provo****	0.065	0.054	1.20	0.063	0.047	1.34	0.065	0.021	3.13	0.063	0.021	3.04	0.054	0.021	2.60	0.047	0.021	2.27

* Detroit monitor 261630016 was complete for 2005 and 2006, 2004 was ignored in the averages.

** Detroit monitor 261630019 was complete for 2004 and 2006, 2005 was ignored in the averages.

*** Jacksonville was only complete for 2006.

**** Provo was only complete for 2004 and 2005.