Indiana Department of Environmental Management

The States' View of the Air

State of Indiana

Kentucky Section with Introduction

2014

Keith Baugues
Assistant Commissioner

Indiana Department of Environmental Management
Office of Air Quality
April 8, 2014

EXECUTIVE SUMMARY

Air quality across the nation has improved over the past ten years or more. The publication of misleading reports can unfortunately lead the public to believe otherwise. This analysis demonstrates the progress made from 2000 through 2012 for ozone and fine particles (PM-2.5). The national ambient air quality standards in place in 2012 were applied to all time periods in this analysis to demonstrate the progress made.

Figures 1 through 3 show the progress made for ozone, 24-hour PM-2.5 and annual PM-2.5. The bars represent the population of each period (based on the last year in the period). The portion that is green represents the number of people living in counties that measure air quality better than the standard. The portion of the bar that is red represents the number of people living in counties that measure air quality at levels above the standard. The blue portion of the bar represents the number of people that live in counties where air quality is not measured.

Compliance with standards is determined on a three year basis. In 2000 – 2002 approximately 49 million people lived in counties that measured ozone air quality levels better than the standard. By 2010 – 2012 this had increased to over 128 million people.

The situation for fine particles (PM-2.5) is very similar. In 2000 – 2002, 99 million people lived in counties where 24-hour PM-2.5 levels were measured below the standard. By 2010 – 2012 this had increased to 198 million people. Of note, is that monitoring for PM-2.5 is only conducted in counties with a total of 201 million people.

In the 2000 – 2002 period, 124 million people lived in counties where annual PM-2.5 levels were measured below the standard. By 2010 – 2012 this had increased to 201 million people. Approximately 150,000 people lived in counties where annual PM-2.5 levels were measured above the standard.

Even with the improvements made in air quality, there are still areas of the country that need further improvement. Figure 4 shows states that have 8 hour ozone nonattainment areas based on 2010 – 2012 data using the average air quality method described in this document. Thirty states, including the District of Columbia, would be included. Figure 5 shows the states that would be nonattainment based upon U.S. EPA methods. Only Arizona is added.

Figure 6 shows those states that violate the 24-hour PM-2.5 standard based on 2010 – 2012 data using average air quality data. Only five states are included. The U.S. EPA method adds Oregon. This is shown in Figure 7.

Figure 8 shows those states that violate the annual PM-2.5 standard based on 2010 – 2012 data using average air quality data. Only California is included. Figure 9 shows the results for the same period using U.S. EPA's method and includes only California.

The bottom line is that most areas of the country were meeting the PM-2.5 standard at the 2010 – 2012 review. There are still several areas of the country that violate the current ozone standard. Many areas have made considerable progress in lowering ozone levels, but further work remains to be done. During 2012, U.S. EPA lowered the annual PM-2.5 standard. Future analyses will focus on how areas are dealing with meeting this new standard.

Figure 1

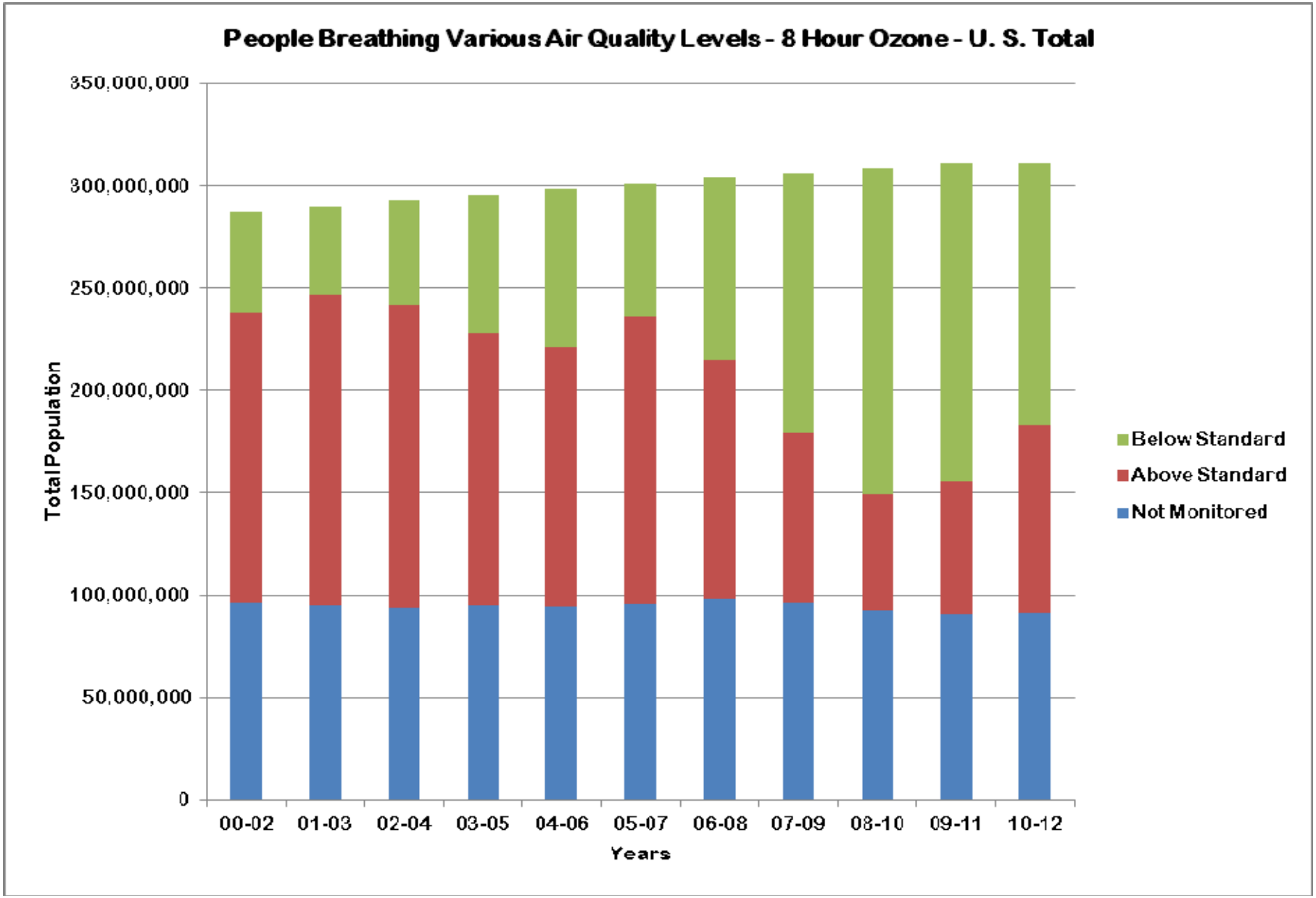
People Breathing Various Air Quality Levels - 8 Hour Ozone - U. S. Total
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Total Population
00-02
01-03
02-04
03-05
04-06
05-07
06-08
07-09
08-10
09-11
10-12
Years
Below Standard
Above Standard
Not Monitored

Figure 2

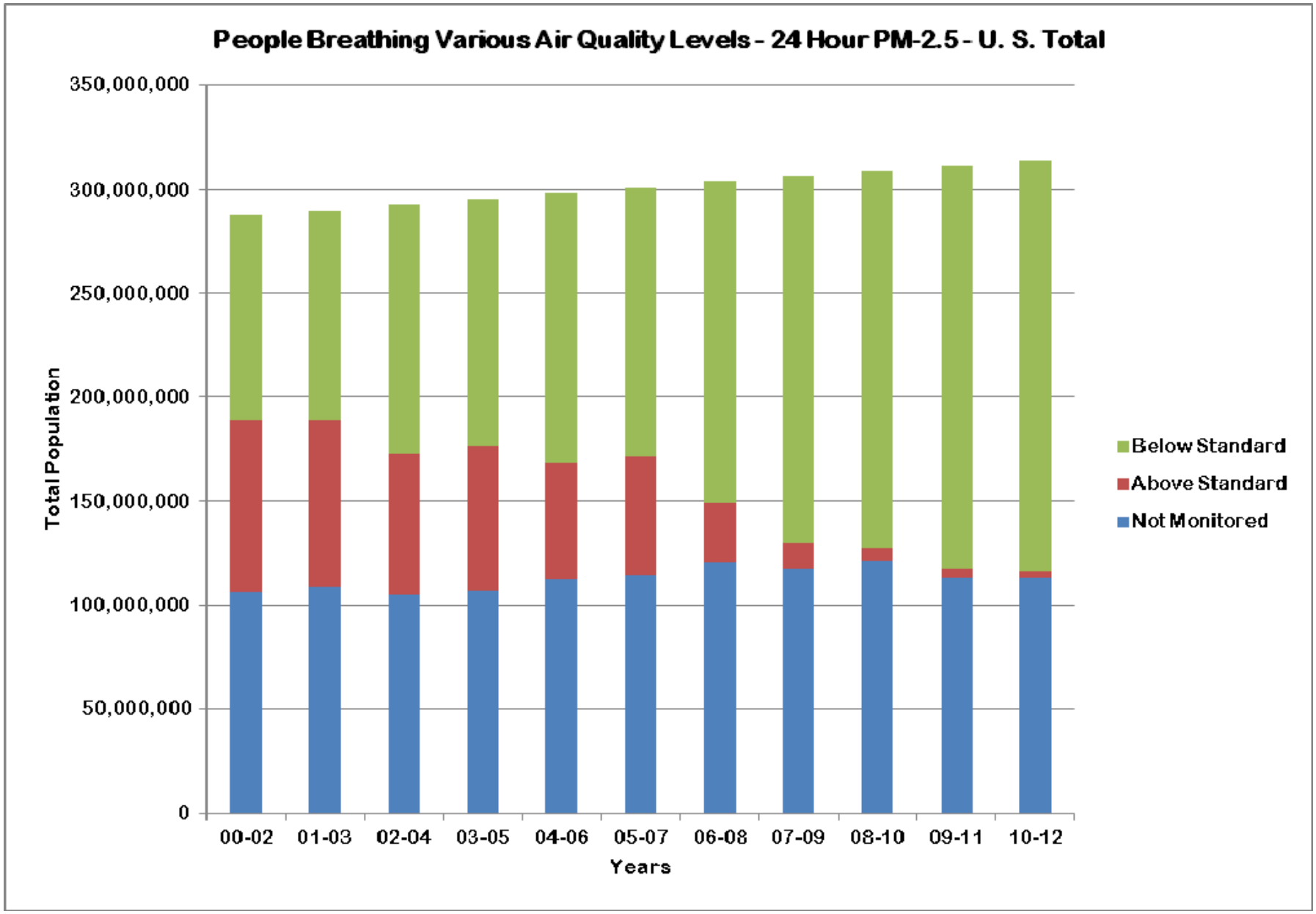
People Breathing Various Air Quality Levels - 24 Hour PM-2.5 - U. S. Total
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Total Population
00-02
01-03
02-04
03-05
04-06
05-07
06-08
07-09
08-10
09-11
10-12
Years
Below Standard
Above Standard
Not Monitored

Figure 3

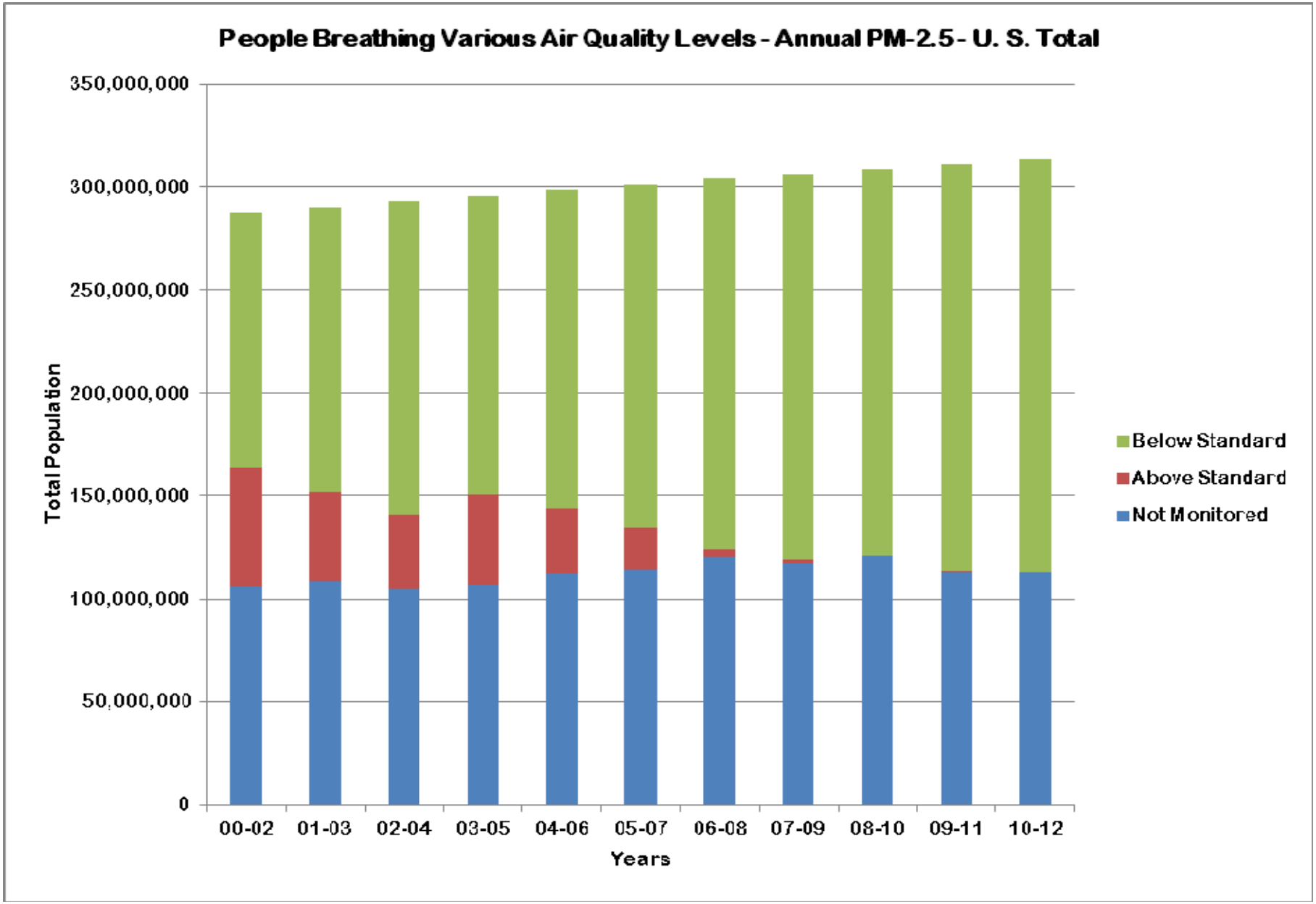
People Breathing Various Air Quality Levels - Annual PM-2.5 - U. S. Total
350,000,000
300,000,000
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
0
Total Population
00-02
01-03
02-04
03-05
04-06
05-07
06-08
07-09
08-10
09-11
10-12
Years
Below Standard
Above Standard
Not Monitored

Figure 4

Non-Attainment States Based on Average Data - 8 Hour Ozone (Map 1)

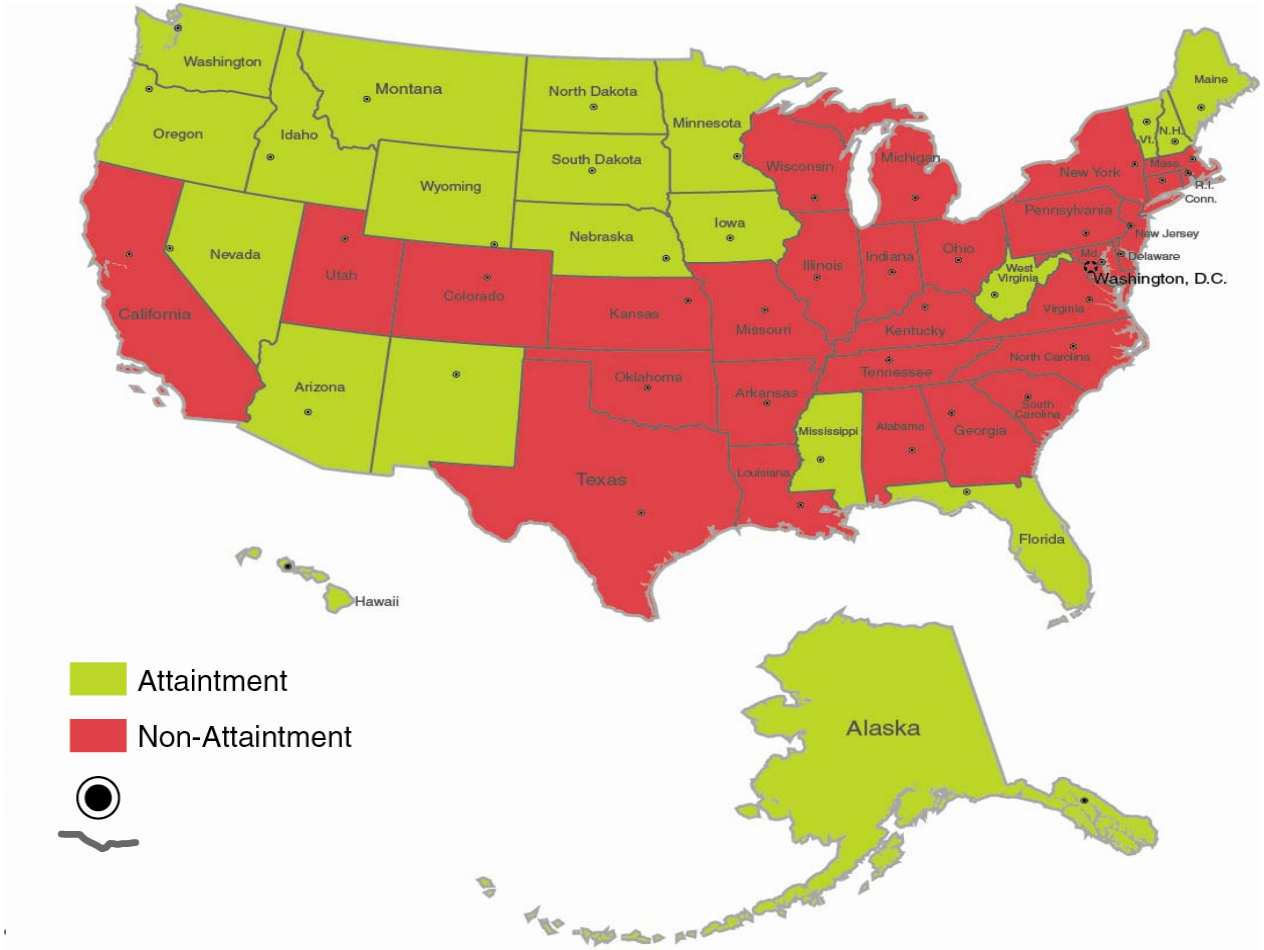

Figure 5

Non-Attainment States Based on U.S. EPA Method - 8 Hour Ozone (Map 2)

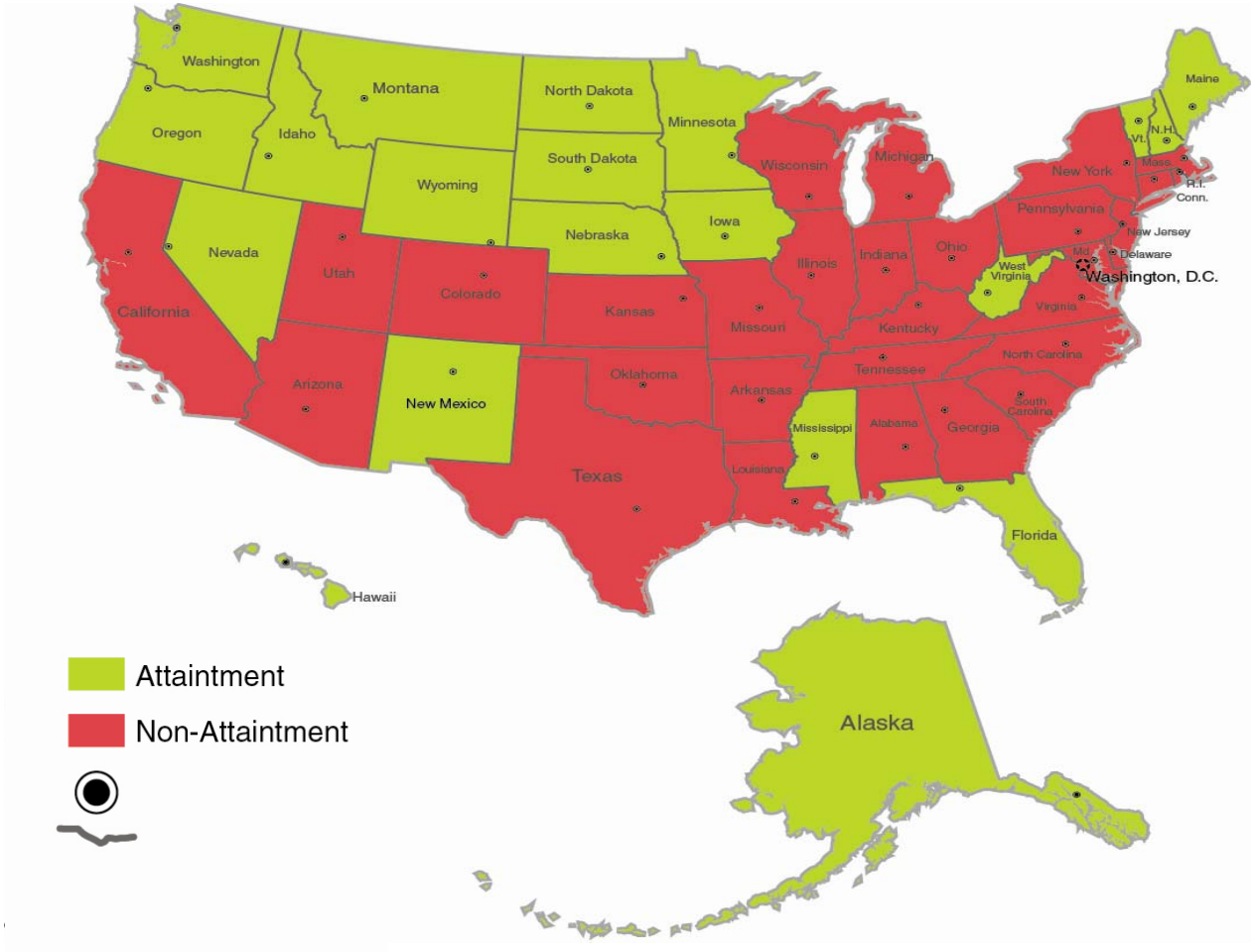

Figure 6

Non-Attainment States Based on Average Data - 24 Hour PM-2.5 (Map 3)

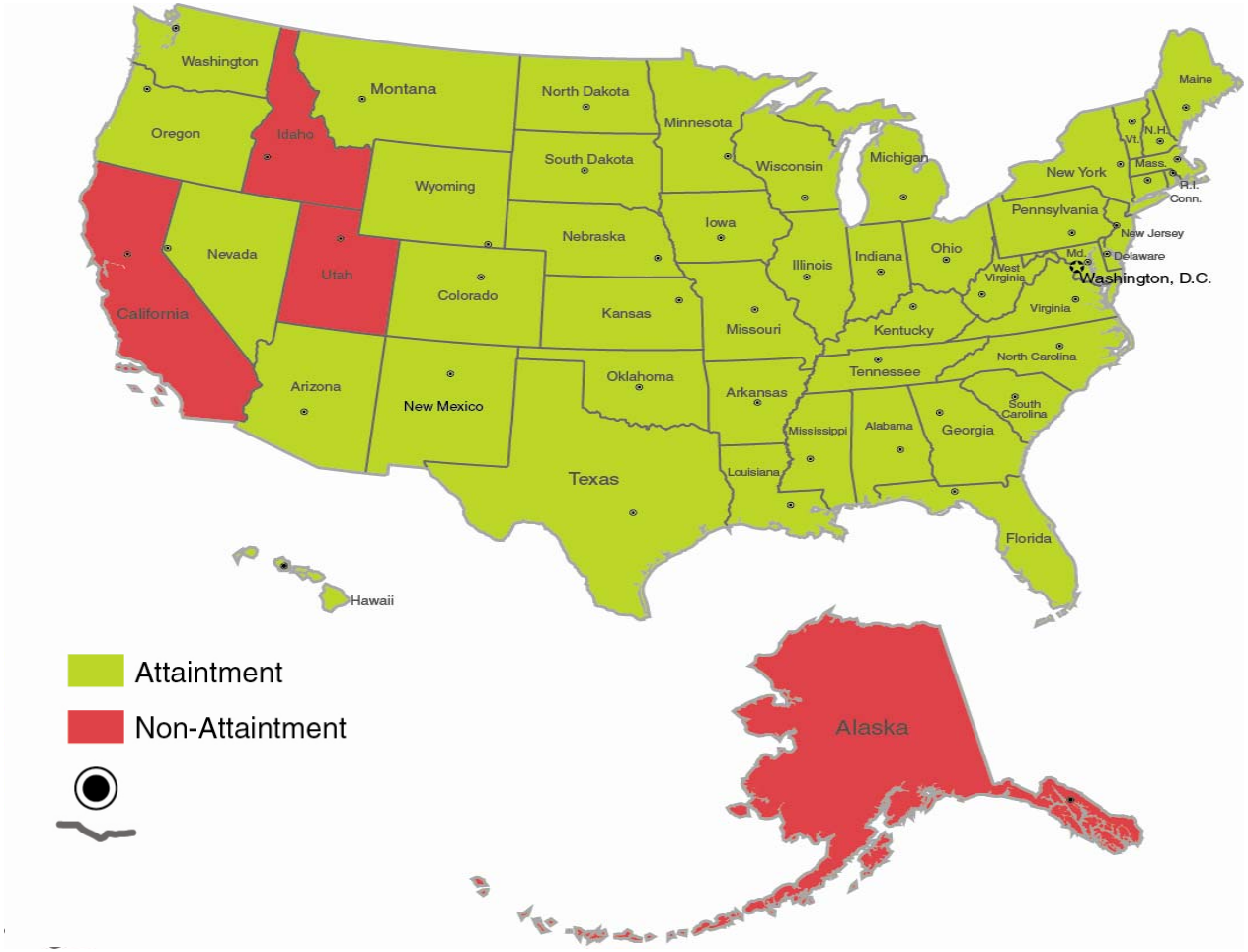

Figure 7

Non-Attainment States Based on U.S. EPA Method - 24 Hour PM-2.5 (Map 5)

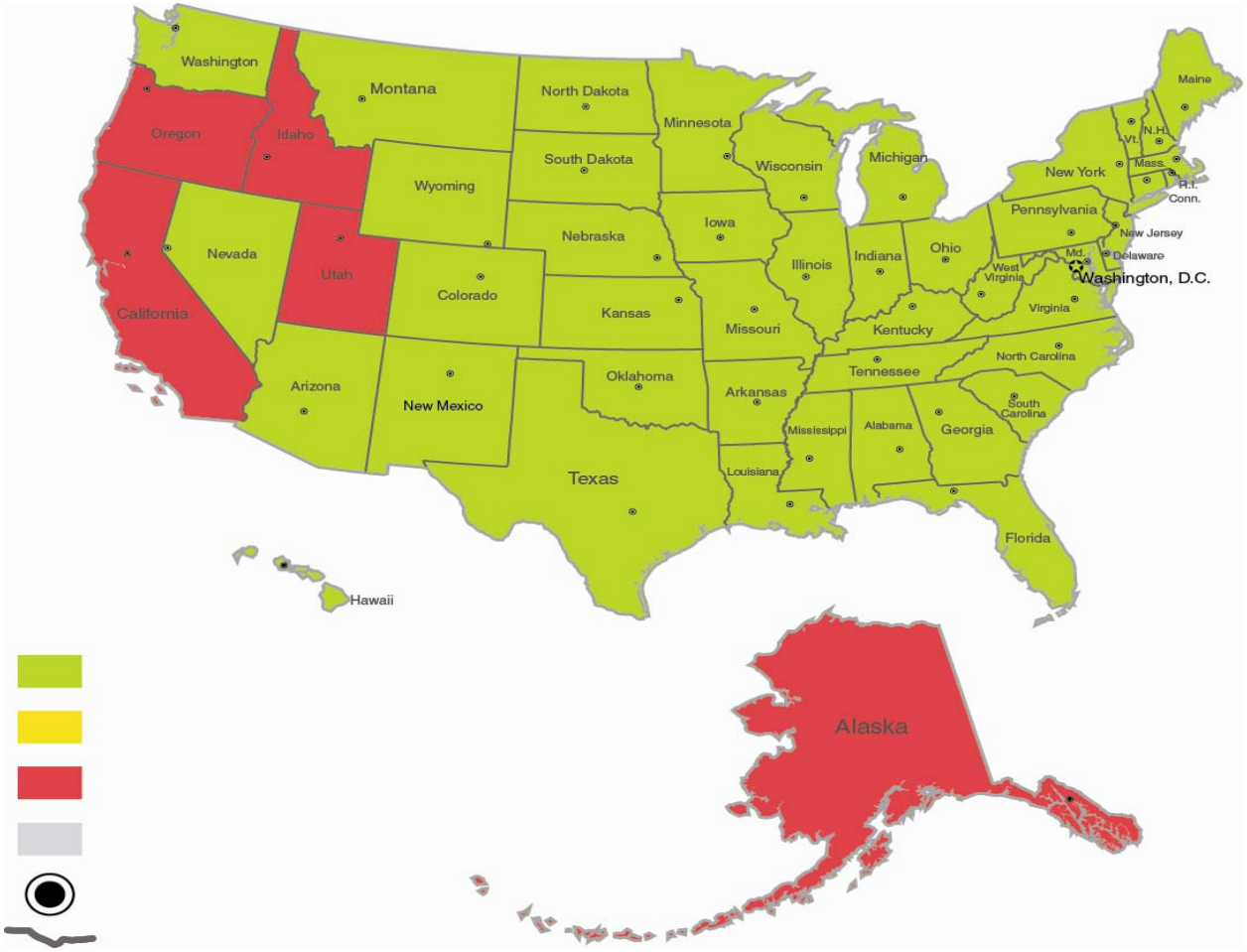

Figure 8

Non-Attainment States Based on Average Data - Annual PM-2.5 (Map 4)

Figure 9

Non-Attainment States Based on U.S. EPA Method - Annual PM-2.5 (Map 6)

The States' View of the Air – 2014

This is the third year for this report. It was originally intended as a complimentary document to the American Lung Association's (ALA) annual report called "The State of the Air."

This report starts with the same air quality data used by the ALA. For this report, it includes data for the period of 2000 – 2012. The review of data in this report differs from the ALA in a few significant ways. First, the design values used for both ozone and PM-2.5 are based on average values for each county. This is an important distinction. While U.S. EPA's guidance for attainment/nonattainment designation purposes focuses on the worst design value for a county, this is not consistent with what people are breathing. For example, if a county has ten monitors and nine have design values below the standard and one is slightly above the standard, U.S. EPA and ALA would assume that everyone in the county were breathing air at levels above the standard. That is obviously not correct. If you combine counties into metropolitan statistical areas (cities) consisting of several counties, the entire area would be assumed to be above the standard based on the one monitor described above. This report averages design values for all monitors in a county to determine the average level that is breathed by the residents of that county. This is not to say that some individuals could be exposed to higher levels. However, not all residents in a county are exposed to levels associated with the highest monitor.

A second difference is that when design values for a number of counties are being grouped to determine the overall value for a metropolitan statistical area, the individual design values for each county are weighted by the population of that county to determine a population weighted average value. This value is more consistent with what the population is being exposed to and is in line with what health research professionals use in their analyses.

A grading system has been established for ozone and PM-2.5 in this report. Any grading system is arbitrary in nature. The key to this grading system is that any area meeting the national ambient air quality standards should not be rated lower than a "C". In essence, we have set the standard as a "C". Any level between 90 and 100% of the standard is rated a "C". Any level between 80 and 90% of the standard is rated as "B". Any level below 80% is set as an "A". Any level between 101 and 110% of the standard is set as a "D". Any level above 110% of the standard is rated as an "F". This translates into the following ranges.

Table 1
Grading Scheme

Grade	Ozone (ppm)	24-hr PM-2.5 (µg/m3)	Annual PM-2.5 (µg/m3)
A	< 0.060	< 28.0	< 12.0
B	0.060 – 0.067	28.0 – 31.4	12.0 – 13.4
C	0.068 – 0.075	31.5 – 35.0	13.5 – 15.0
D	0.076 – 0.082	35.1 – 38.5	15.1 – 16.5
F	➢ 0.082	➢ 38.5	➢ 16.5

This grading scale will need to be revised in the future as the national ambient air quality standards for PM-2.5 and ozone are revised. However, these are the appropriate levels for the standards that were in place during the time period (2010 – 2012).

This report will not report population groups by county or state (those less than 18 or 65 and older, diabetics, etc.). It is very difficult to obtain this data for each state. Also, the methodology which apportions state totals to individual counties is questionable. It is based solely upon a comparison of age distribution of the state versus the county. In many cases other variables, may be important in making these allocations more accurately.

Information on health effects is not included in this report. Instead we provide links to U.S. EPA websites that contain this information.

Ozone: **http://epa.gov/airquality/ozonepollution/health.html**

PM-2.5: **http://epa.gov/airquality/particlepollution/health.html**

The remainder of this report contains tables that are similar to those that are in the ALA report. The ALA report focuses solely on a three year block of data and does not provide any perspective. Our report will look at three year blocks of data from 2000 through 2012 so that the reader can see how the air quality is changing over time.

Ozone

In the 2000 – 2002 period approximately 49 million people (17.2% of the U.S. population) lived in counties that met the ozone standard. During the same time period approximately 96 million people (33.4%) lived in counties where ozone was not monitored. By the 2010 – 2012 period over 128 million people (40.8%) lived in counties that met the ozone standard. During the same time period over 96 million people (29.2%) lived in counties where ozone was not monitored. Figure 1 shows the distribution of people by year.

24 – Hour PM-2.5

In the 2000 – 2002 period approximately 99 million people (34.4% of the U.S. population) lived in counties that met the 24-hour PM-2.5 standard. During this same time period approximately 106 million people (37.0%) lived in counties where PM-2.5 was not monitored. By the 2010 – 2012 period over 198 million people (62.9%) lived in counties that met the 24-hour PM-2.5 standard. During the same time period nearly 113 million people (36.0%) lived in counties where PM-2.5 was not monitored. Figure 2 shows the distribution of people by year.

Annual PM-2.5

In the 2000 – 2002 period approximately 124 million people (43.2% of the U.S. population) lived in counties that met the annual PM-2.5 standard. During the same time period approximately 106 million people (37.0%) lived in counties where PM-2.5 was not monitored. By the 2010 - 2012 period nearly 200 million people (63.9%) lived in counties that met the annual PM-2.5 standard. During the same time period nearly 113 million people (36.0%) lived in counties where PM-2.5 was not monitored. Figure 3 shows the distribution of people by year.

Note:

For the state summaries, the first table shows monitoring totals at the bottom that include county totals for areas that measure either Ozone or PM-2.5. The second set of tables includes totals monitored by pollutant.

Table 2

People Breathing Ozone

Grades	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
A	9,755,126	4,694,728	4,003,383	5,745,195	5,389,555	7,818,727	5,175,867	7,878,534	11,945,133	15,045,046	16,724,008
B	14,260,282	13,717,670	14,239,076	15,907,608	16,103,666	15,411,681	21,792,692	28,041,086	47,031,734	41,619,970	33,864,897
C	25,437,918	24,794,393	32,618,323	45,331,300	55,700,223	41,564,050	61,603,127	91,695,178	100,095,637	99,445,465	77,410,705
D	37,975,358	40,709,552	58,260,198	67,837,033	66,640,317	69,991,995	69,875,747	58,665,292	50,253,319	54,558,315	70,510,160
F	103,587,551	110,959,278	89,650,559	65,470,859	60,114,243	70,673,505	47,217,432	24,029,669	6,771,151	10,136,744	21,083,781
Subtotals	191,016,235	194,875,621	198,771,639	200,291,995	203,948,004	205,357,958	205,664,865	210,109,759	216,096,974	220,805,540	219,693,551
Not Monitored	96,608,958	95,232,312	94,833,659	95,224,604	94,431,908	95,873,249	98,429,101	96,661,870	92,648,564	90,786,377	91,722,257
Totals	287,625,193	290,107,933	292,805,298	295,516,599	298,379,912	301,231,207	304,093,966	306,771,529	308,745,538	311,591,917	314,004,040

Table 3

People Breathing Short-term Particle Pollution (24-hour PM-2.5)

Grades	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
A	35,071,374	42,179,887	47,987,105	38,859,132	51,528,084	56,939,943	68,136,521	102,193,083	129,250,050	151,875,673	163,015,549
B	33,921,410	25,781,038	34,167,227	38,423,718	36,478,624	36,276,741	47,155,529	41,508,829	44,699,084	22,316,651	32,498,178
C	30,006,231	33,645,250	37,783,393	41,572,116	41,820,903	36,628,468	39,248,888	33,240,113	7,321,166	19,930,676	2,074,996
D	35,391,648	31,751,170	31,741,258	26,928,939	27,526,257	30,095,048	21,438,609	6,011,530	2,941,847	36,546	184,186
F	46,872,140	47,775,569	36,918,678	42,898,526	28,657,056	27,274,244	7,577,282	6,510,203	3,738,532	4,300,575	3,042,948
Subtotals	181,262,803	181,112,924	187,597,671	188,682,431	186,010,924	187,214,434	183,557,829	189,463,257	187,950,679	198,785,021	200,815,857
Not Monitored	106,382,390	108,995,009	105,207,827	106,824,168	112,368,988	114,016,773	120,536,137	117,308,272	120,794,859	112,806,896	113,590,425
Totals	287,625,193	290,107,933	292,805,298	295,516,599	298,379,912	301,231,207	304,093,966	306,771,529	308,746,538	311,591,917	314,004,040

Table 4

People Breathing Year Round Particle Pollution (Annual PM-2.5)

Grades	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
A	56,836,194	61,489,443	71,607,095	70,701,800	78,176,385	83,106,618	92,885,878	122,487,530	170,370,433	171,038,744	187,795,282
B	34,560,157	36,925,364	39,692,401	38,788,817	38,827,535	36,294,350	46,112,538	47,329,098	13,296,633	13,927,988	10,897,521
C	32,860,806	39,864,699	40,884,495	35,514,269	37,400,045	47,480,532	40,727,883	17,797,628	3,851,434	12,850,514	1,978,594
D	28,087,112	24,632,741	18,873,078	24,657,312	26,418,093	17,360,943	2,492,617	921,478	442,179	967,775	0
F	28,918,534	18,227,667	16,540,592	19,020,433	5,185,566	2,971,991	1,338,913	948,523	0	0	152,218
Subtotals	181,252,803	181,112,924	187,597,671	188,682,431	186,010,924	187,214,434	183,557,829	189,463,257	187,950,679	198,785,021	200,815,857
Not Monitored	106,382,390	108,995,009	105,207,827	106,824,168	112,368,988	114,016,773	120,536,137	117,308,272	120,794,859	112,806,896	113,590,425
Totals	287,625,193	290,107,933	292,805,298	295,516,599	298,379,912	301,231,207	304,093,966	306,771,529	308,746,538	311,591,917	314,004,040

Table 5
High Cities - Year Round Particle Pollution (Annual PM-2.5)
(2010 -2012)

Rank	MSA	PW DV	Grade	2012 Population
1	**Madera, CA**	**18.9**	**F**	**152,218**
2	Modesto, CA	14.9	C	521,726
3	Bakersfield, CA	14.8	C	656,158
3	Visalia-Porterville, CA	14.8	C	451,977
5	Johnstown, PA	12.9	B	141,584
5	Terre Haute, IN	12.9	B	172,493
7	Hagerstown-Martinsburg, MD-WV	12.6	B	256,278
8	Canton-Massilon, OH	12.4	B	403,455
9	Cincinnati, OH-KY-IN	12.3	B	2,128,603
10	Indianapolis-Carmel-Anderson, IN	12.2	B	1,948,982
11	South Bend-Mishawaka, IN-MI	12.1	B	318,586
11	Lancaster, PA	12.1	B	526,823
11	Louisville-Jefferson County, KY-IN	12.1	B	1,251,351
11	Dayton, OH	12.1	B	800,972
11	Wheeling, WV-OH	12.1	B	146,420
16	Evansville, IN-KY	12.0	B	313,433
17	Springfield, OH	11.9	A	137,206
17	Owensboro, KY	11.9	A	116,030
17	Rome, GA	11.9	A	96,177
17	Riverside-San Bernardino-Ontario, CA	11.9	A	4,350,096
21	Weirton-Steubenville, WV-OH	11.8	A	122,547
21	Macon, GA	11.8	A	232,723
21	Lafayette, LA	11.8	A	474,415
21	Parkersburg-Vienna, WV	11.8	A	92,548

MSA – Metropolitan Statistical Area PW – Population Weighted DV – Design Value

Of the top 24 cities, only one has air quality that exceeds the national ambient air quality standard. Three cities are rated as C. Twelve cities are rated as B and eight are rated as A.

Table 6
Highest Cities – Short Term Particle Pollution (24-hour PM-2.5)
(2010 -2012)

Rank	MSA	PW DV	Grade	2012 Population
1	**Madera, CA**	**51**	**F**	**152,218**
2	**Bakersfield, CA**	**50**	**F**	**656,158**
3	**Modesto, CA**	**49**	**F**	**521,726**
4	**Visalia-Porterville, CA**	**47**	**F**	**451,977**
5	**Fairbanks, AK**	**46**	**F**	**100,272**
6	**Fresno, CA**	**41**	**F**	**947,895**
7	**Logan, UT-ID**	**36**	**D**	**128,306**
8	Ogden-Clearfield, UT	35	C	612,441
9	Salt Lake City, UT	33	C	1,123,712
9	South Bend-Mishawaka, IN-MI	33	C	318,586
11	Yakima, WA	31	B	246,977
11	Lancaster, PA	31	B	526,823
11	Hagerstown-Martinsburg, MD-WV	31	B	256,278
11	Johnstown, PA	31	B	141,584
11	Elkhart-Goshen, IN	31	B	199,619
16	Gettysburg, PA	30	B	101,482
16	Harrisburg-Carlisle, PA	30	B	553,980
16	Terre Haute, IN	30	B	172,493
19	Allentown-Nethlehem-Easton, PA-NJ	29	B	827,171
19	York-Hanover, PA	29	B	437,846
19	State College, PA	29	B	155,171
19	Provo-Orem, UT	29	B	550,845
19	Green Bay, WI	29	B	311,098
19	Riverside-San Bernardino-Ontario, CA	29	B	4,350,096
19	Los Angeles-Long Beach-Anaheim, CA	29	B	13,052,921
19	Indianapolis-Carmel-Anderson, CA	29	B	1,948,982

MSA – Metropolitan Statistical Area PW – Population Weighted DV – Design Value

Of the 26 highest cities, 6 have ratings of F, 1 is a D, 3 are C and 16 are B.

Table 7
Highest 8-Hour Ozone Cities
(2010 -2012)

Rank	MSA	PW DV	Grade	2012 Population
1	Riverside-San Bernardino-Ontario, CA	0.093	F	4,350,096
2	Fresno, CA	0.089	F	947,895
2	Visalia-Porterville, CA	0.089	F	451,977
4	Bakersfield, CA	0.088	F	656,158
5	Sheboygan, WI	0.087	F	115,009
6	Bridgeport-Stamford-Norwalk, CT	0.085	F	933,835
7	Baltimore-Columbia-Towson, MD	0.082	D	2,752,149
7	Dallas-Fort Worth-Arlington, TX	0.082	D	6,700,991
7	Hanford-Corcoran, CA	0.082	D	151,364
7	Merced, CA	0.082	D	262,305
7	Modesto, CA	0.082	D	521,726
7	Muskegon, MI	0.082	D	170,182
7	Niles-Benton Harbor, MI	0.082	D	156,067
7	Louisville-Jefferson County, KY-IN	0.082	D	1,251,351
15	Washington-Arlington-Alexandria, DC	0.081	D	5,860,340
15	Lancaster, PA	0.081	D	526,823
15	Norwich-New London, CT	0.081	D	274,170
15	Racine, WI	0.081	D	194,797
15	Salisbury, MD-DE	0.081	D	381,868
15	Philadelphia-Camden, PA	0.081	D	6,018,800
21	Houston, TX	0.080	D	6,177,035
21	Owensboro, KY	0.080	D	116,030
23	Atlanta-Sandy Springs-Roswell, GA	0.079	D	5,457,831
23	New York-Newark, NY-NJ	0.079	D	19,831,858
23	Dover, DE	0.079	D	167,626
23	Longview, WA	0.079	D	318,675
23	Tulsa, OK	0.079	D	951,880
23	St. Louis, MO-IL	0.079	D	2,795,294
23	Sacramento-Roseville, CA	0.079	D	2,196,482

MSA – Metropolitan Statistical Area PW – Population Weighted DV – Design Value

Of the 29 highest rated cities, six are rated F, while 23 are rated D.

Table 8

Highest Counties - Short Term Particle Pollution (24-hour PM-2.5)
(2010 -2012)

Rank	County/State	DV	Grade	2012 Population
1	**Madera, CA**	**51**	**F**	152,218
2	**Kern, CA**	**50**	**F**	856,158
3	**Stanislaus, CA**	**49**	**F**	521,726
4	**Tulare, CA**	**47**	**F**	451,977
5	**Fairbanks, AK**	**46**	**F**	100,272
6	**Shoshone, ID**	**42**	**F**	12,702
7	**Fresno, CA**	**41**	**F**	947,895
8	**Box Elder, UT**	**37**	**D**	50,171
8	**Lemhi, ID**	**37**	**D**	8,758
10	**Cache, UT**	**36**	**D**	115,520
10	**Inyo, CA**	**36**	**D**	18,495
12	Weber, UT	35	C	236,640
12	Davis, UT	35	C	315,809
14	Salt Lake, UT	34	C	1,063,842
14	Silver Bow, MT	34	C	34,403
16	Lake, OR	33	C	7,771
16	Lewis & Clark, MT	33	C	64,776
16	St. Joseph, IN	33	C	266,344
16	Spencer, IN	33	C	20,837
20	Klamath, OR	32	C	65,912
20	Plumas, CA	32	C	19,399
22	Berkeley, WV	31	B	107,048
22	Yakima, WA	31	B	246,977
22	Northampton, PA	31	B	299,267
22	Lancaster, PA	31	B	526,823
22	Delaware, PA	31	B	561,098
22	Cambria, PA	31	B	141,584
22	Elkhart, IN	31	B	199,619
22	Sacramento, CA	31	B	1,450,121

DV – Design Value

Of the 29 highest counties, seven are rated F, four are D, ten are C and eight are rated B.

Table 9
Highest Counties Year Round Particle Pollution (Annual PM-2.5)
(2010-2012)

Rank	County/State	DV	Grade	2012 Population
1	**Madera, CA**	**18.9**	**F**	**152,218**
2	**Stanislaus, CA**	**14.9**	**C**	**521,726**
3	**Tulare, CA**	**14.8**	**C**	**451,977**
3	**Kern, CA**	**14.8**	**C**	**856,158**
5	**Berkeley, WV**	**13.6**	**C**	**107,098**
6	**St. Bernard, LA**	**13.5**	**C**	**41,635**
7	**Delaware, PA**	**13.2**	**B**	**561,098**
8	**Shoshone, ID**	**13.2**	**B**	**12,702**
9	**Cambria, PA**	**12.9**	**B**	**141,584**
10	**Marshall, WV**	**12.8**	**B**	**32,674**
11	**Madison, WI**	**12.7**	**B**	**267,883**
12	**Brooke, WV**	**12.6**	**B**	**23,353**
13	**Hamilton, OH**	**12.5**	**B**	**802,038**
14	**Stark, OH**	**12.4**	**B**	**374,868**
14	**Butler, OH**	**12.4**	**B**	**370,589**
14	**Porter, IN**	**12.4**	**B**	**165,682**
14	**Marion, IN**	**12.4**	**B**	**919,977**
14	**Riverside, CA**	**12.4**	**B**	**2,267,783**
19	**Beaver, PA**	**12.3**	**B**	**170,245**
19	**Montgomery, OH**	**12.3**	**B**	**534,325**
19	**Dubois, IN**	**12.3**	**B**	**42,07144**
19	**Clayton, GA**	**12.3**	**B**	**265,888**
19	**Russell, AL**	**12.3**	**B**	**57,820**

DV – Design Value

Of the 23 highest counties, only one is rated a F. All others meet the National Ambient Air Quality Standards with five being rated as C, and 17 rated as B.

Table 10
Highest Ozone Counties
(2010 -2012)

Rank	County/State	DV	Grade	2012 Population
1	San Bernardino, CA	0.096	F	2,081,313
2	Riverside, CA	0.090	F	2,268,783
3	Tulare, CA	0.089	F	451,977
3	Fresno, CA	0.089	F	947,895
5	Camden, NJ	0.088	F	513,539
5	Harford, MD	0.088	F	248,622
5	Kern, CA	0.088	F	856,158
8	Sheboygan, WI	0.087	F	115,009
8	Fairfax, VA	0.087	F	1,118,602
8	Gloucester, NJ	0.087	F	289,586
8	Anne Arundel, MD	0.087	F	550,488
8	Oldham, KY	0.087	F	61,412
13	Arlington, VA	0.086	F	221,045
13	Ocean, NJ	0.086	F	580,470
13	Cecil, MD	0.086	F	101,696
16	Kenosha, WI	0.085	F	187,536
16	Middlesex, NJ	0.085	F	823,041
16	Prince Georges, MD	0.085	F	885,138
16	Fairfield, CT	0.085	F	933,835
20	Tarrant, TX	0.084	F	1,880,153
20	Allegan, MI	0.084	F	112,039
20	Charles, MD	0.084	F	150,592
20	Calvert, MD	0.084	F	89,628
20	Fulton, GA	0.084	F	977,773

DV – Design Value

Of the top 24 counties, all are rated as F.

Table 11
Cleanest U.S. Cities for Short-term Particle Pollution (24-hr PM-2.5)
(2010 -2012)

Rank	MSA	PW DV	Grade	2012 Population
1	Prescott, AZ	9	A	212,637
1	Santa Fe, NM	9	A	146,375
3	Tucson, AZ	11	A	992,394
4	Flagstaff, AZ	12	A	132,088
4	Cheyenne, WY	12	A	94,483
6	Sierra Vista-Douglas, AZ	13	A	132,088
6	Santa Cruz-Watsonville, CA	13	A	266,776
6	Urban Honolulu, HI	13	A	976,372
9	Casper, WY	14	A	78,621
9	Kahului-Wailuku-Lahaina, HI	14	A	158,316
9	Farmington, NM	14	A	128,529
9	Redding, CA	14	A	178,586
9	Palm Bay-Melbourne-Titusville, FL	14	A	547,307
9	Cape Coral-Fort Myers, FL	14	A	645,293
9	Salinas, CA	14	A	426,762
16	Miami-Fort Lauderdale, FL	15	A	4,058,826
16	Rapid City, SD	15	A	138,738
16	Pueblo, CO	15	A	160,852
16	Yuma, AZ	15	A	200,022
16	Las Vegas-Henderson, NV	15	A	2,000,759
16	North Port-Sarasota, FL	15	A	720,042
16	Bismarck, ND	15	A	120,060
23	Orlando-Kissimmee, FL	16	A	2,223,674
23	Colorado Springs, CO	16	A	668,353
23	Lakeland-Winter Haven, FL	16	A	616,158
23	Tampa-St. Petersburg, FL	16	A	2,842,878

MSA – Metropolitan Statistical Area PW – Population Weighted DV – Design Value

Of the 26 cleanest cities, all are rated as A.

Table 12
Cleanest U.S. Cities for Year Round Particle Pollution (Annual PM-2.5)
(2010 -2012)

Rank	MSA	PW DV	Grade	2012 Population
1	Prescott, AZ	4.0	A	212,637
2	Santa Fe, NM	4.5	A	146,375
3	Farmington, NM	4.7	A	128,529
4	Casper, WY	4.8	A	78,621
4	Cheyenne, WY	4.8	A	94,483
6	Pocatello, ID	5.1	A	83,800
7	Flagstaff, AZ	5.2	A	132,088
8	Anchorage, AK	5.3	A	392,535
8	Redding, CA	5.3	A	178,586
10	Tucson, AZ	5.4	A	992,394
11	Duluth, MN-WI	5.5	A	279,452
11	Rapid City, SD	5.5	A	138,738
13	Kahului-Wailuku-Lahaina, HI	5.7	A	158,316
14	Las Vegas-Henderson, NV	5.8	A	2,000,759
15	Urban Honolulu, HI	5.9	A	976,372
16	Burlington-South Burlington, VT	6.1	A	213,701
16	Reno, NV	6.1	A	433,843
16	Salinas, CA	6.1	A	426,762
19	Pueblo, CO	6.2	A	160,852
20	Seattle-Tacoma-Bellevue, WA	6.3	A	3,552,157
20	Albuquerque, NM	6.3	A	901,700
20	Colorado Springs, CO	6.3	A	668,353
20	Santa Cruz-Watsonville, CA	6.3	A	266,776
24	Fort Collins, CO	6.5	A	310,487
24	Boulder, CO	6.5	A	305,318
24	Palm Bay-Melbourne-Titusville, FL	6.5	A	547,307

MSA – Metropolitan Statistical Area PW – Population Weighted DV – Design Value

Of the 26 cleanest cities all are rated as A.

Table 13
Cleanest U.S. Cities for Ozone Air Pollution
(2010 - 2012)

Rank	MSA	PW DV	Grade	2012 Population
1	Urban Honolulu, HI	0.045	A	976,372
2	Anchorage, AK	0.046	A	392,535
2	Bellingham, WA	0.046	A	205,262
4	Santa Rosa, CA	0.047	A	491,829
5	Lincoln, NE	0.052	A	310,342
6	Santa Cruz-Watsonville, CA	0.053	A	266,776
7	Seattle-Tacoma-Bellevue, WA	0.056	A	3,552,157
7	Olympia-Turnwater, WA	0.056	A	258,332
9	Duluth, MN-WI	0.057	A	279,452
9	Bangor, ME	0.057	A	153,746
10	Mount Vernon-Anacortes, WA	0.057	A	118,222
10	Salinas, CA	0.057	A	426,762
12	Bismarck, ND	0.058	A	120,060
12	Portland-Vancouver, OR-WA	0.058	A	2,289,800
12	San Francisco-Oakland, CA	0.058	A	4,455,560
15	Bend-Redmond, OR	0.059	A	162,277
15	Eugene, OR	0.059	A	354,542
15	Naples-Marco Island, FL	0.059	A	332,427
15	Salem, OR	0.059	A	396,338
15	Spokane, WA	0.059	A	532,253
15	Tuscaloosa, AL	0.059	A	233,389
15	Omaha-Council Bluffs, NE-IA	0.059	A	885,624
22	Santa Maria-Santa Barbara, CA	0.060	A	431,249
23	Fargo, ND-MN	0.061	B	216,312
23	Lewiston-Auburn, ME	0.061	B	107,609
23	Medford, OR	0.061	B	206,412
23	St. Cloud, MN	0.061	B	190,471
23	Des Moines, IA	0.061	B	588,999
23	Rapid City, SD	0.061	B	138,738

MSA – Metropolitan Statistical Area PW – Population Weighted DV – Design Value

Of the cleanest 28 cities, 22 are rated A, while 6 are rated B.

Table 14
Cleanest Counties – Short Term Particle Pollution (24-hour PM-2.5)
(2010 -2012)

Rank	County/State	DV	Grade	2012 Population
1	Bannock, ID	8	A	83,800
2	Yavapai, AZ	9	A	212,637
2	Lake, CA	9	A	63,983
2	Santa Fe, NM	9	A	146,375
5	La Plata, CO	10	A	52,401
5	Pima, AZ	11	A	992,394
5	Billings, ND	11	A	905
8	Coconino, AZ	12	A	136,011
8	Hawaii, HI	12	A	189,191
8	Rosebud, MT	12	A	9,396
8	Jackson, SD	12	A	3,191
8	Laramie, WY	12	A	94,483
13	Cochise, AZ	13	A	132,088
13	Santa Cruz, AZ	13	A	266,776
13	Montezuma, CO	13	A	25,431
13	Honolulu, HI	13	A	976,372
13	Hancock, ME	13	A	54,558
13	Custer, ND	13	A	8,339
13	Park, WY	13	A	28,702
13	Teton, WY	13	A	21,675
21	Monterey, CA	14	A	426,762
21	Shasta, CA	14	A	178,586
21	Brevard, FL	14	A	547,307
21	Lee, FL	14	A	645,293
21	Miami-Dade, FL	14	A	2,591,035
21	Maui, HI	14	A	158,226
21	San Juan, NM	14	A	128,529
21	Mercer, ND	14	A	8,486
21	King, WA	14	A	2,007,440
21	Campbell, WY	14	A	47,874
21	Natrona, WY	14	A	78,621
21	Sweetwater, WY	14	A	45,267

DV – Design Value

The cleanest 32 counties are all rated as A.

Table 15
Cleanest Counties - Year Round Particle Pollution (Annual PM-2.5)
(2010 -2012)

Rank	County/State	DV	Grade	2012 Population
1	Lake, CA	3.5	A	63,983
2	Jackson, SD	3.8	A	3,191
3	Yavapai, AZ	4.0	A	212,637
4	La Plata, CO	4.2	A	52,401
5	Essex, NY	4.3	A	38,961
5	Custer, SD	4.3	A	8,339
7	Billings, ND	4.4	A	905
8	Santa Fe, NM	4.5	A	146,375
9	Hancock, ME	4.7	A	54,558
9	San Juan, NM	4.7	A	128,529
9	Park, WY	4.7	A	28,702
12	Laramie, WY	4.8	A	94,483
12	Natrona, WY	4.8	A	78,621
14	Rosebud, MT	4.9	A	9,396
15	Campbell, WY	5.0	A	47,874
15	Sublette, WY	5.0	A	10,368
15	Teton, WY	5.0	A	21,675
18	Bannock, ID	5.1	A	83,800
19	Anchorage, AK	5.2	A	298,610
19	Coconino, AZ	5.2	A	136,011
19	Siskiyou, CA	5.2	A	44,154
22	Shasta, CA	5.3	A	78,586
22	Ashland, WI	5.3	A	15,992
24	Pima, AZ	5.4	A	992,394
25	Matanuska, AK	5.5	A	93,925
25	St. Louis, MN	5.5	A	200,319

DV – Design Value

The cleanest 26 counties are all rated as A.

Table 16
Cleanest Counties - Ozone Air Pollution
(2010 -2012)

Rank	County/State	DV	Grade	2012 Population
1	Franklin, NY	0.038	A	51,795
2	Anchorage, AK	0.045	A	298,610
2	Honolulu, HI	0.045	A	976,372
4	Humboldt, CA	0.046	A	134,827
4	Whatcom, CA	0.046	A	205,262
6	San Francisco, CA	0.047	A	825,863
6	Sonoma, CA	0.047	A	491,829
8	Arostook, ME	0.051	A	70,868
8	Columbia, OR	0.051	A	49,286
10	Denali, AK	0.052	A	1,875
10	Marin, CA	0.052	A	256,069
10	Lancaster, NE	0.052	A	293,407
13	San Mateo, CA	0.053	A	739,311
13	Santa Cruz, CA	0.053	A	266,776
15	Oxford, ME	0.055	A	57,481
15	Carlton, MN	0.055	A	35,348
15	Flathead, MT	0.055	A	91,633
15	Powder River, MT	0.055	A	1,763
15	Pierce, WA	0.055	A	811,681
20	Churchill, NV	0.056	A	24,375
20	Clark, WA	0.056	A	438,287
20	King, WA	0.056	A	2,007,440
20	Thurston, WA	0.056	A	258,332
20	Big Horn, WY	0.056	A	11,794
25	Monterey, CA	0.057	A	426,762
25	Penobscot, ME	0.057	A	153,746
25	St. Louis, MN	0.057	A	200,319
25	Rosebud, MT	0.057	A	9,396
25	Multnomah, OR	0.057	A	759,256
25	Skagit, WA	0.057	A	118,222

DV – Design Value

Of the 30 cleanest counties, all are rated A.

KENTUCKY

Ozone

Significant progress has been made in ozone levels in Kentucky. In the 2000 – 2002 time period, approximately 0.3 million people (7.7%) lived in counties that met the ozone standard. By 2010 – 2012 this had increased to approximately 1.1 million people (24.2%). Figure KY-1 shows the distribution of people by year.

24-Hour PM-2.5

Progress has been made in 24-hour PM-2.5 levels in Kentucky. In the 2000 – 2002 time period, approximately 0.7 million people (16.6%) lived in counties where 24-hour PM-2.5 levels met the standard. By 2010 -2012 this was approximately 1.0 million people (23.8%). The remainder of the population lived in counties where PM-2.5 was not measured. Figure KY-2 shows the distribution of people by year.

Annual PM-2.5

Progress has been made in annual PM-2.5 levels in Kentucky. In the 2000 – 2002 time period, approximately 0.6 million people (14.3%) lived in counties where annual PM-2.5 levels met the standard. By 2010 – 2012 this had increased to approximately 1.0 million people (23.8%). The remainder of the population lived in counties where PM-2.5 was not measured. Figure KY-3 shows the distribution of people by year.

KENTUCKY

Table KY-1

2010 – 2012

		OZONE			PARTICLE POLLUTION (PM-2.5)				
County	Population	Avg. DV	Grade	MM	Avg. 24-Hr DV	Grade	Avg. Ann DV	Grade	MM
Bell	28,183	0.065	B	N	25	A	11.3	A	N
Boone	123,316	0.070	B	N	ND	---	ND	---	---
Boyd	49,164	0.072	C	N	24	A	10.6	A	N
Bullitt	75,896	0.075	C	N	ND	---	ND	---	---
Campbell	**90,908**	**0.079**	**D**	N	24	A	10.6	A	N
Carter	27,348	0.069	B	N	19	A	9.9	A	N
Christian	75,427	0.073	C	N	22	A	10.8	A	N
Daviess	**97,847**	**0.080**	**D**	N	26	A	11.9	A	N
Edmonson	**12,071**	**0.076**	**D**	N	ND	---	ND	---	---
Fayette	105,489	0.075	C	N	22	A	10.7	A	N
Greenup	36,707	0.073	C	N	ND	---	ND	---	---
Hancock	**8,677**	**0.076**	**D**	N	ND	---	ND	---	---
Hardin	107,025	0.073	C	N	22	A	11.5	A	N
Henderson	**46,513**	**0.079**	**D**	N	23	A	11.3	A	N
Jefferson	750,828	***	***	***	***	***	***	***	***
Jessamine	49,635	0.073	C	N	ND	---	ND	---	---
Livingston	9,423	0.075	C	N	ND	---	ND	---	---
Madison	84,786	ND	---	---	20	A	9.6	A	N
McCracken	**65,549**	**0.077**	**D**	N	22	A	10.6	A	N
Oldham	**61,412**	**0.087**	**F**	N	ND	---	ND	---	---
Perry	28,241	0.068	C	N	ND	---	ND	---	---
Pike	64,178	0.068	C	N	22	A	9.7	A	N
Pulaski	63,593	0.069	C	N	ND	---	ND	---	---
Simpson	17,538	0.072	C	N	ND	---	ND	---	---
Subtotal	**2,079,754**								
Not Monitored	2,300,661								
Total	**4,380,415**								

DV – Design Value ND - No Data MM – Multiple Monitors

*** - Data for this county has been removed. Problems with sampling have resulted in data that is questionable.

KENTUCKY

Table KY-2

People Breathing Ozone

Grade	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
A	0	0	0	0	0	0	0	0	0	0	0
B	0	0	38,051	65,719	345,603	0	0	28,691	333,876	499,923	178,847
C	314,323	386,490	697,763	1,715,826	1,553,888	612,533	981,850	2,022,641	1,958,725	1,813,924	882,316
D	525,411	1,432,406	1,367,322	472,316	312,288	1,625,283	1,338,252	219,016	0	807,548	1,072,393
F	1,437,999	506,710	290,662	88,047	56,329	57,991	0	0	0	0	61,412
Subtotal	2,277,733	2,325,606	2,393,798	2,341,908	2,267,108	2,295,807	2,320,102	2,270,348	2,292,601	3,121,395	2,194,968
NM	1,812,142	1,791,564	1,752,303	1,840,834	1,951,131	1,960,865	1,969,776	2,046,726	2,046,766	1,247,961	2,185,447
Total	4,089,875	4,117,170	4,146,101	4,182,742	4,219,239	4,256,672	4,289,878	4,317,074	4,339,367	4,369,356	4,380,415

People Breathing Short-term Particle Pollution (24-Hour PM-2.5)

Grade	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
A	0	29,173	112,382	56,465	0	28,794	260,679	1,193,423	1,360,093	2,024,854	1,042,417
B	94,700	432,528	643,805	905,609	908,760	613,169	897,383	802,359	741,096	0	0
C	582,342	657,869	629,976	344,684	310,039	600,609	730,194	0	0	0	0
D	467,177	202,345	706,828	710,018	715,149	723,040	0	0	0	0	0
F	699,810	703,970	0	0	0	0	0	0	0	0	0
Subtotal	1,844,029	2,025,885	2,092,991	2,016,776	1,933,948	1,965,612	1,888,256	1,995,782	2,101,189	2,024,854	1,042,417
NM	2,245,846	2,091,285	2,053,110	2,165,966	2,285,291	2,291,060	2,401,622	2,321,292	2,238,178	2,344,502	3,337,998
Total	4,089,875	4,117,170	4,146,101	4,182,742	4,219,239	4,256,672	4,289,878	4,317,074	4,339,367	4,369,356	4,380,415

People Breathing Year Round Particle Pollution (Annual PM-2.5)

Grade	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010	2009-2011	2010-2012
A	0	0	27,528	0	0	0	109,273	232,794	1,142,868	1,105,605	1,042,417
B	27,262	102,502	606,615	461,396	403,890	178,636	947,215	1,026,283	958,321	919,249	0
C	556,314	949,509	752,020	845,362	1,530,058	1,063,936	831,768	736,705	0	0	0
D	560,643	973,874	706,828	710,018	0	723,040	0	0	0	0	0
F	699,810	0	0	0	0	0	0	0	0	0	0
Subtotal	1,844,029	2,025,885	2,092,991	2,016,776	1,933,948	1,965,612	1,889,256	1,995,782	2,101,189	2,024,854	1,042,417
NM	2,245,846	2,091,285	2,053,110	2,165,966	2,285,291	2,291,060	2,401,622	2,321,292	2,238,178	2,344,502	3,337,998
Total	4,089,875	4,117,170	4,146,101	4,182,742	4,219,239	4,256,672	4,289,878	4,317,074	4,339,367	4,369,356	4,380,415

NM – Not Monitored

Figure KY-1

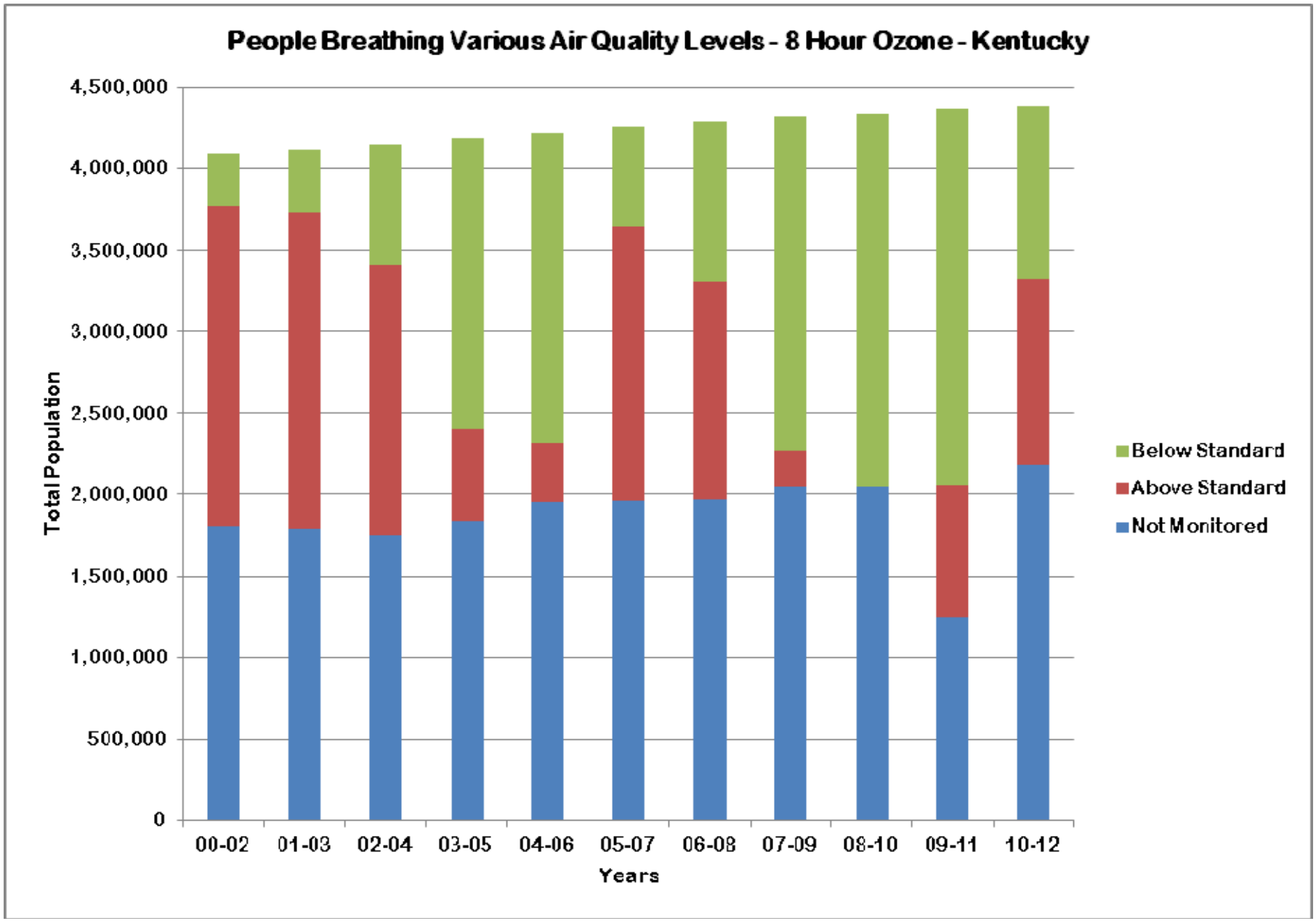
People Breathing Various Air Quality Levels - 8 Hour Ozone - Kentucky
Total Population
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
00-02
01-03
02-04
03-05
04-06
05-07
06-08
07-09
08-10
09-11
10-12
Years
Below Standard
Above Standard
Not Monitored

Figure KY-2

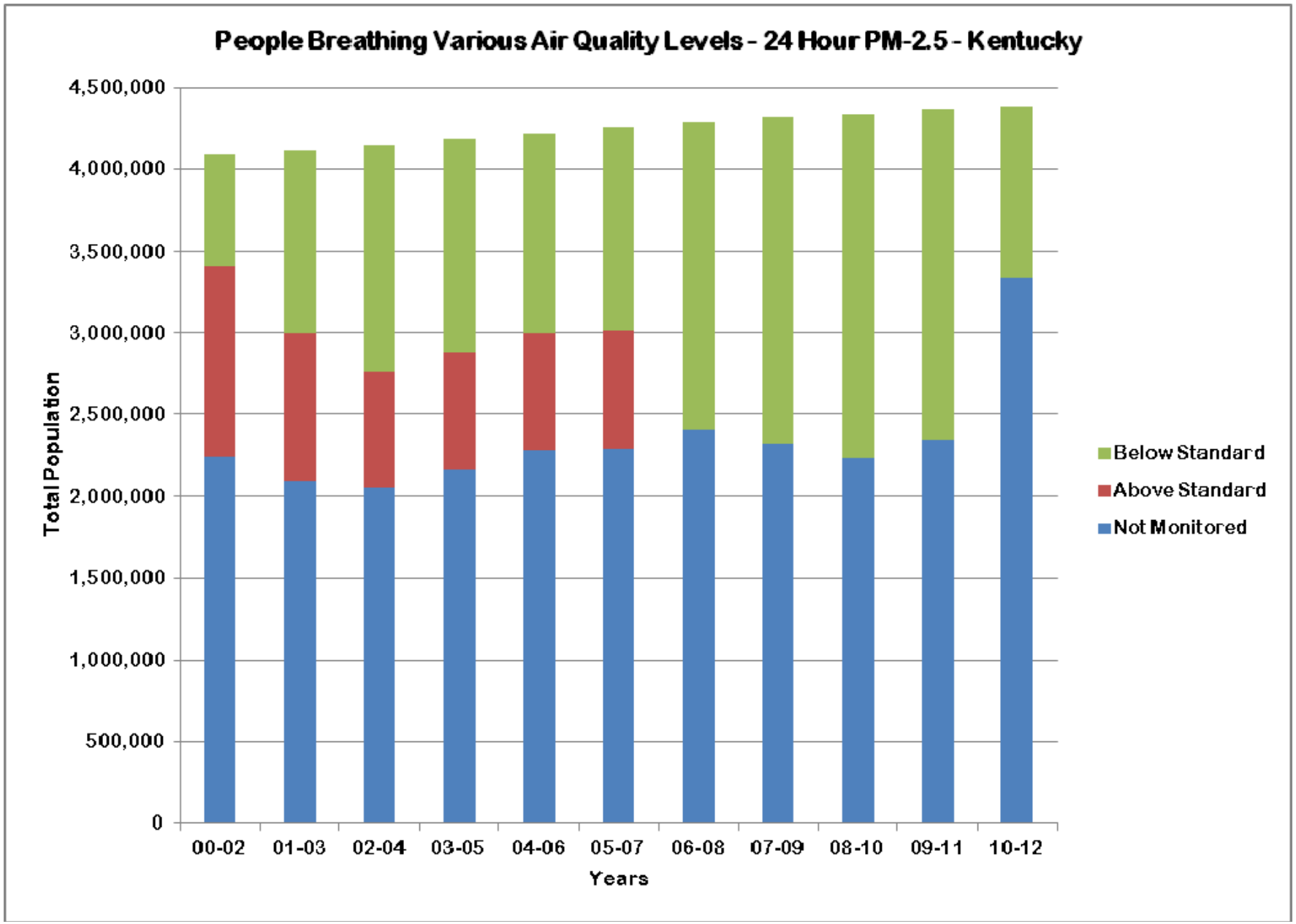
People Breathing Various Air Quality Levels - 24 Hour PM-2.5 - Kentucky
Total Population
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
00-02
01-03
02-04
03-05
04-06
05-07
06-08
07-09
08-10
09-11
10-12
Years
Below Standard
Above Standard
Not Monitored

Figure KY-3

People Breathing Various Air Quality Levels - Annual PM-2.5 - Kentucky
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Total Population
00-02
01-03
02-04
03-05
04-06
05-07
06-08
07-09
08-10
09-11
10-12
Years
Below Standard
Above Standard
Not Monitored