



2018 Air Quality Index

New Jersey Department of Environmental Protection

WHAT IS THE AIR QUALITY INDEX (AQI)?

The Air Quality Index (AQI) is a national air quality rating system based on the National Ambient Air Quality Standards (NAAQS). An index value of 100 is equal to the primary, or health-based, NAAQS for each pollutant. This allows for a comparison of each of the pollutants used in the AQI. These pollutants are ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Although air concentrations of pollutants have been dropping over the past few years, the U.S. Environmental Protection Agency (USEPA) periodically reviews the NAAQS to make sure that they are protective of public health, and adjusts them accordingly in response to new research. The latest NAAQS revision, for ozone, occurred in October 2015.

Every morning an air pollution forecast for the current and following day is prepared by the New Jersey Department of Environmental Protection (NJDEP) using the AQI format. The forecast is provided to USEPA and is disseminated through the Enviroflash system to subscribers who sign up to receive air quality forecast and alert emails or texts (www.enviroflash.info). Anyone can view the forecast and current air quality conditions at USEPA's AirNow website (www.airnow.gov) or at NJDEP's air monitoring webpage (www.njairnow.net/).

In an effort to make the AQI easier to understand, a color code and descriptive interpretation are assigned to the numerical ratings (see Table 3-1). Table 3-2 contains suggested actions to take to protect public health for different AQI levels. For more information on the AQI, visit EPA's web site at www.airnow.gov.

**Table 3-1
Air Quality Index Levels and Associated Health Impacts**

AQI Level of Health Concern	Numerical Value	Meaning	Color Code
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.	Green
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	Yellow
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	Orange
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.	Red
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.	Purple
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects.	Maroon

Table 3-2
AQI Suggested Actions to Protect Health

Air Quality Index Level	AQI Value Actions to Protect Your Health
Good (1-50)	None
Moderate (51-100)	Unusually sensitive individuals should consider limiting prolonged outdoor exertion.
Unhealthy for Sensitive Groups (101-150)	Children, active adults, and people with respiratory disease such as asthma should limit prolonged outdoor exertion.
Unhealthy (151-200)	Children, active adults, and people with respiratory disease such as asthma should avoid prolonged outdoor exertion: Everyone else should limit prolonged outdoor exertion.
Very Unhealthy (201-300)	Children, active adults, and people with respiratory disease such as asthma should avoid outdoor exertion. Everyone else should limit outdoor exertion.
Hazardous (301-500)	Everyone should avoid all physical activity outdoors.

Table 3-3 shows the pollutant-specific ranges for the AQI categories. These are set according to the corresponding NAAQS.

Table 3-3
AQI Pollutant-Specific Ranges

Category	AQI Level	O ₃	PM _{2.5}	CO	SO ₂	NO ₂
		(ppm) 8-hour	(µg/m ³) 24-hour	(ppm) 8-hour	(ppm) 1-hour	(ppm) 1-hour
Good	0-50	0.000-0.054	0.0-12.0	0.0-4.4	0-0.035	0-0.053
Moderate	51-100	0.055-0.070	12.1-35.4	4.5-9.4	0.036-0.075	0.054-0.100
Unhealthy for Sensitive Groups	101-150	0.071-0.085	35.5-55.4	9.5-12.4	0.076-0.185	0.101- 0.360
Unhealthy	151- 200	0.086-0.105	55.5-150.4	12.5-15.4	0.186-0.304	0.361-0.649
Very Unhealthy	201-300	0.106-0.200	150.5-250.4	15.5-30.4	0.305-0.604	0.605-1.249
Hazardous	301-500	>0.200	250.5-500.4	30.5-100.4	0.605-1.004	1.250-2.049

Pollutants:

O₃ – Ozone

PM_{2.5} – Fine particulate matter

CO – Carbon monoxide

SO₂ – Sulfur dioxide

NO₂ – Nitrogen dioxide

On days when the air quality is expected to reach the “Unhealthy for Sensitive Groups” range or above, cautionary statements similar to those in Tables 3-1 and 3-2 are provided as part of the forecast. These air quality alerts are issued through Enviroflash emails, are displayed on the AirNow and NJDEP air monitoring websites, and can also be viewed on the National Weather Service page for the Philadelphia/Mount Holly area (<http://airquality.weather.gov/>). Maps, charts, site photos, and other air quality information are also available on the NJDEP air monitoring web site, as shown in Figure 3-1 below.

Figure 3-1
Examples of Information Available on NJDEP's Air Monitoring Website
www.njaqinow.net

Current Air Quality

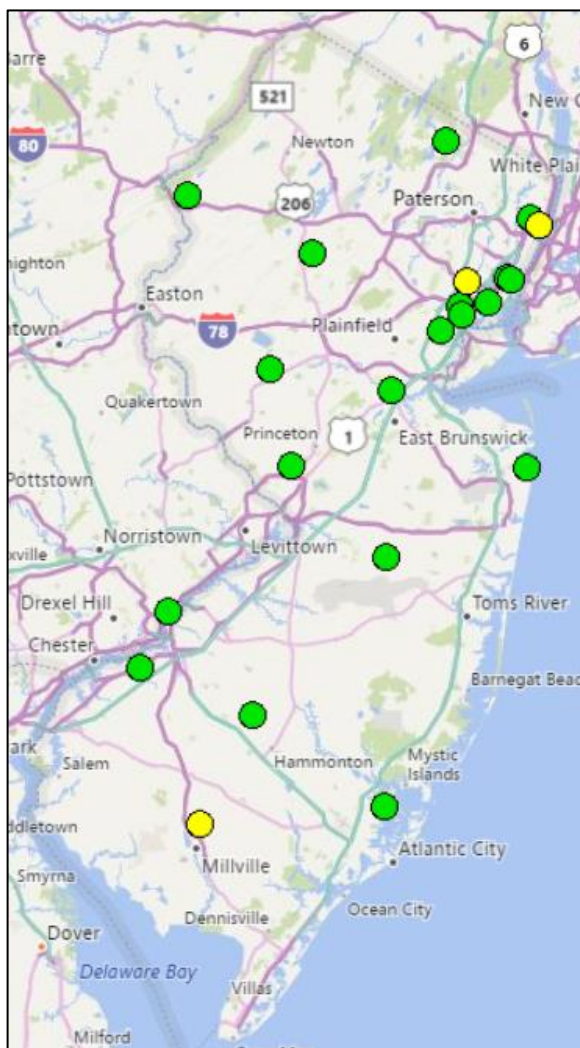


Figure 3-1 (continued)
Examples of Information Available on NJDEP's Air Monitoring Website

Monitors		
<input checked="" type="checkbox"/>	Monitor	Value
<input checked="" type="checkbox"/>	CO[ppm]	0.0
<input checked="" type="checkbox"/>	O3[ppm]	--
<input checked="" type="checkbox"/>	NO[ppm]	0.001
<input checked="" type="checkbox"/>	NO2[ppm]	0.003
<input checked="" type="checkbox"/>	NOX[ppm]	0.005
<input checked="" type="checkbox"/>	SO2[ppm]	0.000
<input checked="" type="checkbox"/>	WSPD[mph]	6.2
<input checked="" type="checkbox"/>	WDIR[Deg]	168
<input checked="" type="checkbox"/>	TEMP[DegF]	72
<input checked="" type="checkbox"/>	RH[%]	48.3
<input checked="" type="checkbox"/>	BP[in Hg]	29.97
<input checked="" type="checkbox"/>	RAIN[in]	0.000
<input checked="" type="checkbox"/>	PM25[ug/m3(L)]	5.6

Real Time Condition:Camden Spruce St Last Received:8/30/2017 12:00 PM Current Monitor:All Monitors

Wind Speed



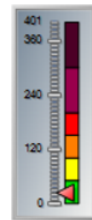
6.2 [mph]

Wind Direction



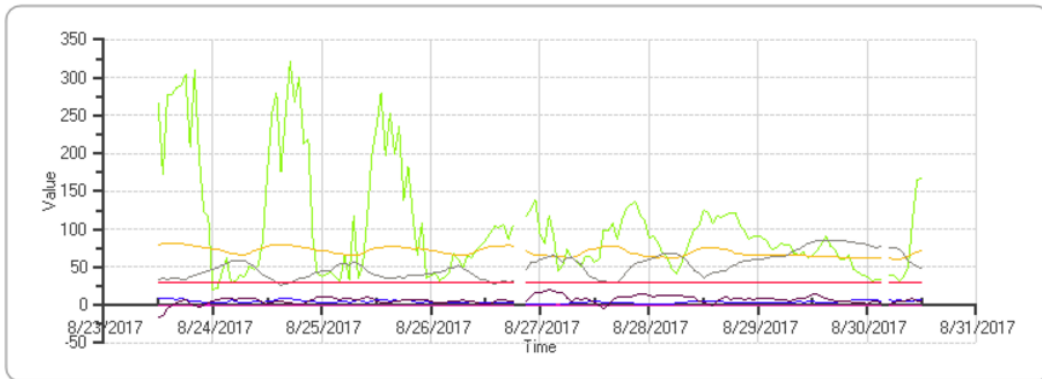
168 [Deg]

Index



24.0

Change Grid / Graph



— CO[ppm] — O3[ppm] — NO[ppm] — NO2[ppm] — NOX[ppm]
— SO2[ppm] — WSPD[mph] — WDIR[Deg] — TEMP[DegF] — RH[%]
— BP[in Hg] — RAIN[in] — PM25[ug/m3(L)]

Temperature



72 [DegF]

2018 AQI SUMMARY

Not all of New Jersey's monitoring sites have 365 days of reported air quality index values. Certain ozone monitors only operate during "ozone season," from March through October. Also, not all monitoring sites measure all pollutants. Table 3-4 shows which pollutants are used to determine the daily AQI at different monitoring stations.

There is also an ozone monitor at Washington Crossing State Park that is managed by USEPA. Although it is not officially part of the NJDEP network, its data is included in determining exceedances in New Jersey.

**Table 3-4
Pollutants Monitored at Each Air Quality Index Monitoring Site
in New Jersey in 2018**

	Monitoring Site	Ozone	Particulate Matter	Carbon Monoxide	Sulfur Dioxide	Nitrogen Dioxide
1	Ancora State Hospital	√ (s)				
2	Bayonne	√			√	√
3	Brigantine	√	√		√	
4	Camden Spruce St.	√	√	√	√	√
5	Chester	√			√	√
6	Clarksboro	√ (s)				
7	Colliers Mills	√ (s)				
8	Columbia WMA	√	√		√	√
9	Elizabeth			√	√	
10	Elizabeth Lab		√	√	√	√
11	Flemington	√	√			
12	Fort Lee Near Road		√	√		√
13	Jersey City			√	√	√
14	Jersey City Firehouse		√			
15	Leonia	√ (s)				
16	Millville	√	√			√
17	Monmouth University	√ (s)				
18	Newark Firehouse	√	√	√	√	√
19	Rahway		√			
20	Ramapo	√ (s)				
21	Rider University	√	√			
22	Rutgers University	√	√			√

(s) – Seasonal operation only (March 1 through October 31).

A summary of the AQI ratings for New Jersey in 2018 is displayed in the pie chart in Figure 3-2 below. In 2018, there were 145 “Good” days, 198 were “Moderate,” 19 were “Unhealthy for Sensitive Groups,” and 3 were “Unhealthy.” This indicates that air quality in New Jersey is mostly good or moderate (40% and 54% of days, respectively), However, air pollution was still bad enough in 2018 to adversely affect sensitive people about 5% of the time, and potentially affect everyone on less than 1% of days.

Figure 3-2
2018 Air Quality Summary by Days

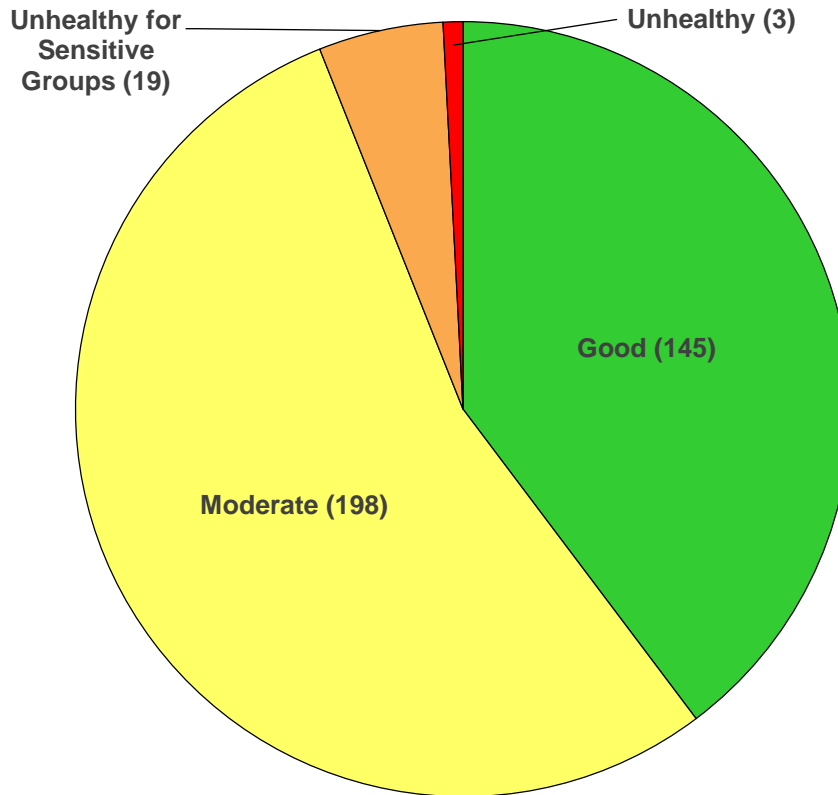


Figure 3-3 shows the distribution of AQI days since 2000. It should be noted that AQI ranges change whenever a NAAQS for a specific pollutant is revised. So even though improvement in AQI days appears to be somewhat erratic, to see how things really have improved, refer to the concentration trend graphs in the individual criteria pollutant reports or in the executive summary.

Of all the criteria pollutants, ozone is predominantly responsible for AQI days above the moderate range in New Jersey.

**Figure 3-3
Number of Days in Each AQI Category Since 2000**

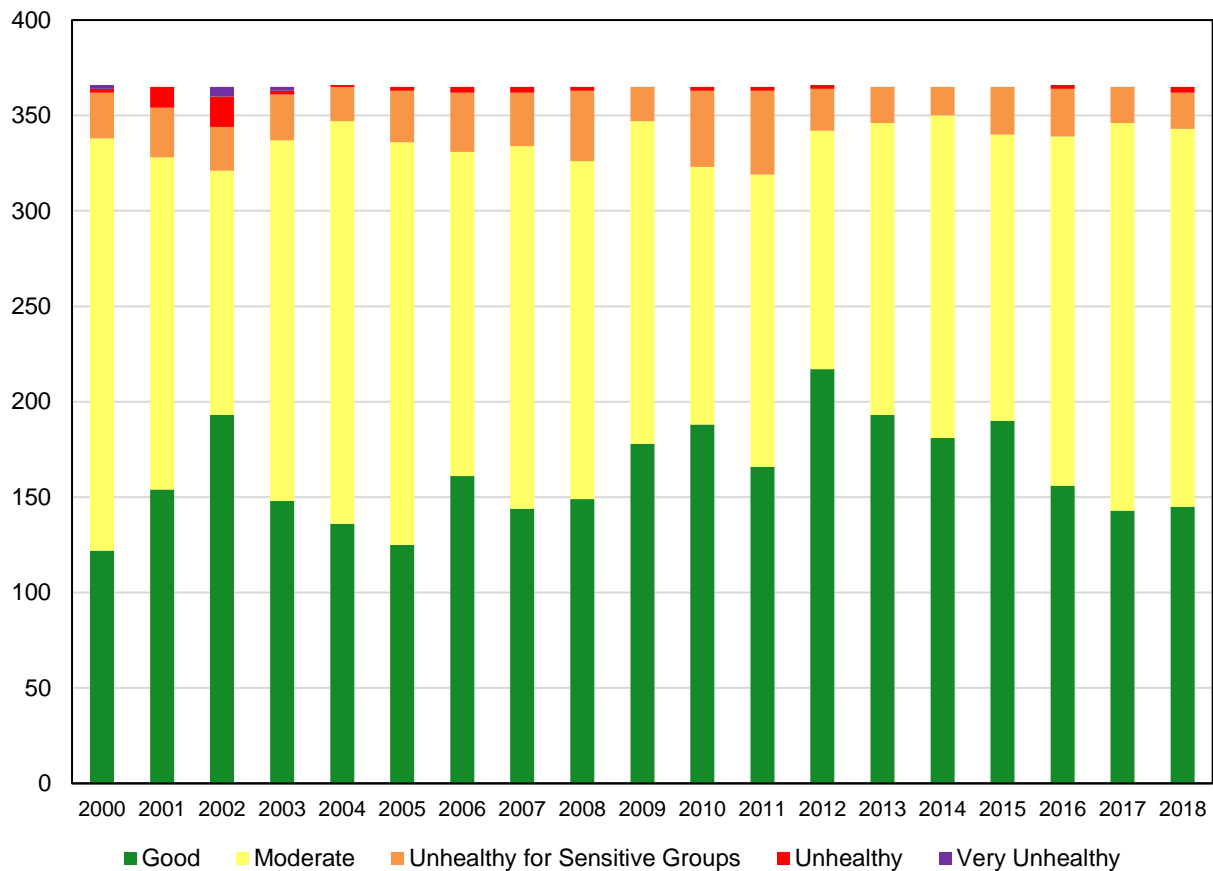


Table 3-5 is a summary of the days when the AQI reached the “Unhealthy” or “Unhealthy for Sensitive Groups” (“USG”) threshold at any monitoring location in New Jersey. Table 3-6 lists the individual exceedance dates and shows the responsible pollutants and their concentrations. The nitrogen dioxide exceedance is attributed to vehicles idling near the Fort Lee Near Road monitoring station.

**Table 3-5
2018 Total Number of NAAQS Exceedance Days in New Jersey**

Pollutant	Exceedances
Nitrogen Dioxide	1
Ozone	21

Table 3-6
AQI “Unhealthy” or “USG” Days in New Jersey During 2018

Day	Date	Monitor Location	Pollutant	Concentration	Units	AQI Rating	AQI Value
1	1/3/18	Fort Lee Near Road	NO ₂	0.131	ppm	USG	107
2	5/1/18	Brigantine	O ₃	0.074	ppm	USG	112
		Chester	O ₃	0.071	ppm	USG	101
		Clarksboro	O ₃	0.072	ppm	USG	105
		Colliers Mills	O ₃	0.074	ppm	USG	112
		Flemington	O ₃	0.072	ppm	USG	105
		Washington Crossing*	O ₃	0.072	ppm	USG	105
3	5/2/18	Chester	O ₃	0.073	ppm	USG	108
		Clarksboro	O ₃	0.074	ppm	USG	112
		Colliers Mills	O ₃	0.076	ppm	USG	119
		Columbia	O ₃	0.074	ppm	USG	112
		Flemington	O ₃	0.072	ppm	USG	105
		Leonia	O ₃	0.071	ppm	USG	101
4	5/25/18	Ramapo	O ₃	0.072	ppm	USG	105
		Rider University	O ₃	0.072	ppm	USG	105
5	5/29/18	Rutgers University	O ₃	0.071	ppm	USG	101
		Bayonne	O ₃	0.072	ppm	USG	105
		Leonia	O ₃	0.074	ppm	USG	112
		Newark Firehouse	O ₃	0.074	ppm	USG	112
6	6/9/18	Ramapo	O ₃	0.075	ppm	USG	115
7	6/17/18	Rutgers University	O ₃	0.076	ppm	USG	119
		Bayonne	O ₃	0.075	ppm	USG	115
8	6/18/18	Leonia	O ₃	0.074	ppm	USG	112
		Bayonne	O ₃	0.079	ppm	USG	129
		Camden Spruce St.	O ₃	0.073	ppm	USG	108
		Flemington	O ₃	0.072	ppm	USG	105
		Leonia	O ₃	0.075	ppm	USG	115
		Rider University	O ₃	0.076	ppm	USG	119
9	6/21/18	Rutgers University	O ₃	0.078	ppm	USG	126
		Colliers Mills	O ₃	0.071	ppm	USG	101
10	6/30/18	Bayonne	O ₃	0.071	ppm	USG	101
		Camden Spruce St.	O ₃	0.075	ppm	USG	115
		Clarksboro	O ₃	0.079	ppm	USG	129
		Colliers Mills	O ₃	0.078	ppm	USG	126
		Leonia	O ₃	0.077	ppm	USG	122
		Newark Firehouse	O ₃	0.071	ppm	USG	101
11	7/1/18	Bayonne	O ₃	0.095	ppm	U	174
		Camden Spruce St.	O ₃	0.075	ppm	USG	115
		Clarksboro	O ₃	0.071	ppm	USG	101
		Leonia	O ₃	0.090	ppm	U	161

Continued on next page.

Table 3-6 (continued)
AQI “Unhealthy” or “USG” Days in New Jersey During 2018

Day	Date	Monitor Location	Pollutant	Concentration	Units	Rating	AQI Value
12	7/2/18	Bayonne	O ₃	0.092	ppm	U	166
		Chester	O ₃	0.081	ppm	USG	136
		Flemington	O ₃	0.097	ppm	U	179
		Leonia	O ₃	0.091	ppm	U	164
		Newark Firehouse	O ₃	0.096	ppm	U	177
		Ramapo	O ₃	0.085	ppm	USG	150
		Rider University	O ₃	0.091	ppm	U	164
		Rutgers University	O ₃	0.075	ppm	USG	115
		Washington Crossing*	O ₃	0.100	ppm	U	187
13	7/3/18	Washington Crossing*	O ₃	0.081	ppm	USG	136
14	7/9/18	Bayonne	O ₃	0.072	ppm	USG	105
		Camden Spruce St.	O ₃	0.076	ppm	USG	119
		Chester	O ₃	0.075	ppm	USG	115
		Clarksboro	O ₃	0.078	ppm	USG	126
		Colliers Mills	O ₃	0.072	ppm	USG	105
		Leonia	O ₃	0.079	ppm	USG	129
15	7/10/18	Ancora	O ₃	0.082	ppm	USG	140
		Bayonne	O ₃	0.078	ppm	USG	126
		Camden Spruce St	O ₃	0.080	ppm	USG	133
		Chester	O ₃	0.077	ppm	USG	122
		Clarksboro	O ₃	0.084	ppm	USG	147
		Colliers Mills	O ₃	0.083	ppm	USG	143
		Flemington	O ₃	0.086	ppm	U	151
		Leonia	O ₃	0.081	ppm	USG	136
		Newark Firehouse	O ₃	0.080	ppm	USG	133
		Rider University	O ₃	0.080	ppm	USG	133
		Rutgers University	O ₃	0.078	ppm	USG	126
Washington Crossing*	O ₃	0.083	ppm	USG	143		
16	7/16/18	Leonia	O ₃	0.078	ppm	USG	126
		Rider University	O ₃	0.077	ppm	USG	122
		Rutgers University	O ₃	0.080	ppm	USG	133
17	7/19/18	Clarksboro	O ₃	0.076	ppm	USG	119
18	7/28/18	Bayonne	O ₃	0.073	ppm	USG	108
		Leonia	O ₃	0.077	ppm	USG	122
19	8/6/18	Leonia	O ₃	0.076	ppm	USG	119
20	8/8/18	Leonia	O ₃	0.074	ppm	USG	112
21	8/28/18	Colliers Mills	O ₃	0.071	ppm	USG	101
22	8/29/18	Colliers Mills	O ₃	0.071	ppm	USG	101

Rating

USG = Unhealthy for sensitive groups

U = Unhealthy

Pollutants

NO₂ –Nitrogen dioxide

O₃ – Ozone

Units

ppm – parts per million

ppm – parts per million

*The Washington Crossing air monitoring station is operated by USEPA. Although it is not part of NJDEP’s network, the site’s data is included in determining exceedances in New Jersey.

REFERENCES

American Lung Association. Air Quality Index: Using Air Quality information to Protect Yourself from Outdoor Air Pollution. <http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/air-quality-index.html>. Accessed 4/15/19.

U.S. Environmental Protection Agency (USEPA) Air Now. *Air Quality Index Basics*. <http://airnow.gov/index.cfm?action=aqibasics.aqi>. Accessed 4/15/19.

USEPA Air Now. *Air Quality Index - A Guide to Air Quality and Your Health*. http://airnow.gov/index.cfm?action=aqi_brochure.index. Accessed 4/15/19.

USEPA Office of Air Quality Planning and Standards. Technical Assistance Document for the Reporting of Daily Air Quality – the Air Quality Index (AQI). September 2018. (EPA-454/B-18-007). <https://www3.epa.gov/airnow/aqi-technical-assistance-document-sept2018.pdf>

“Appendix G to Part 58 - Uniform Air Quality Index (AQI) and Daily Reporting.” Title 40 *Code of Federal Regulations*. https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=3b421c7ca640647158c90279e577c578&mc=true&n=pt40.6.58&r=PART&ty=HTML#ap40.6.58_161.g. Accessed 4/15/19.