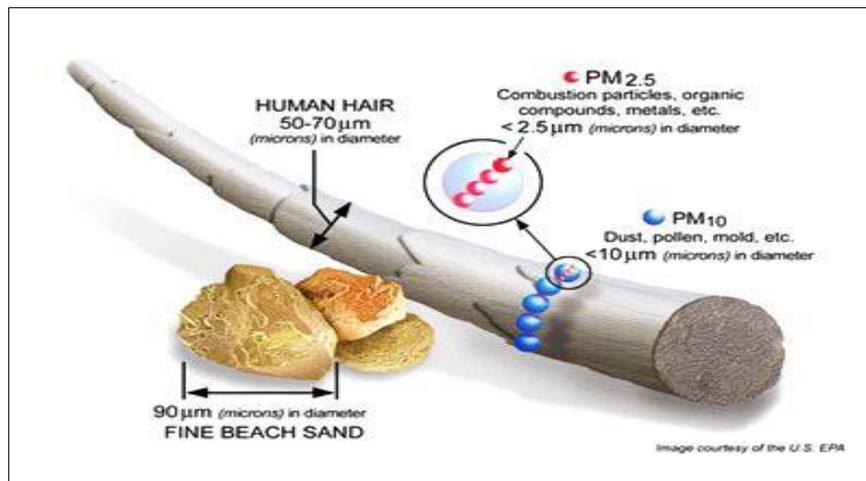


Air-Quality Analysis of PM₁₀

PM₁₀ refers to airborne particles smaller than 10 micrometers in diameter. People may inhale these particles, but no one can see them with the naked eye. Examples include microscopic mold, dust, and pollen. The general public may encounter particulate matter (PM) in this size range near roads and industries, among other areas. These particles are so tiny that the average human hair is seven times larger than the widest ones.



Due to their small size, these particles can entrench themselves in one's lungs and bloodstream. Studies have shown that particle pollution can impact people in all age groups. However, children, the elderly, and those with a heart condition and/or lung disease are highest at risk. Particle pollution also impairs the environment and damages buildings. For more information, go to <http://www.epa.gov/airquality/particlepollution/index.html>.

Monitoring sites use filters to trap these particles. Some sites operated by the Missouri Department of Natural Resources require a chemist to weigh the filters and calculate the concentration of airborne PM₁₀. The U.S. Environmental Protection Agency (EPA) classifies this process as a federal reference method, the gold standard of air monitoring.

Other sites use newer methods that the EPA recently approved as federal equivalent methods. They also use filters, but the equipment does not require chemists to weigh the filters to determine the concentration of airborne PM₁₀. These methods continuously measure PM₁₀. Some sites monitor PM₁₀ using a combination of methods.

The EPA has set a standard for PM₁₀ at 150 micrograms per cubic meter of ambient air (150 $\mu\text{g}/\text{m}^3$), averaged over a 24-hour day. A site does not meet this standard if it exceeds the level more than once per year, averaged over a three-year period. The PM₁₀ standard is expressed as "expected number of days exceeding the standard." The word *expected* is used because PM₁₀ is not always measured every day at a specific monitoring site. Consequently, determining the

number of days of exceedance requires adjustment by the ratio of the number of days in the year (365 or 366) to the number of days on which PM₁₀ is measured.



A chemist in the department's Environmental Services Program prepares to weigh a PM₁₀ filter.

The following pages show a map with PM₁₀ monitoring sites operated by the department and a table of PM₁₀ design values. A value greater than one indicates exceedance of the PM₁₀ standard; a value less than or equal to one indicates that a site is meeting the standard. These values come from quality-assured data gathered through December 2014 and preliminary estimates from the first half of 2015. As shown on the map and table, half of the sites use a PM₁₀ instrument that EPA only recently designated and approved as a federal equivalent method. The department currently does not publish all of this data.

All but one of the department's sites has met the PM₁₀ standard in recent years. That site is located in an area near an industrial facility whose operations may release PM₁₀ into the air. Staff members from the department's Air Pollution Control Program are working with this facility to reduce PM₁₀ emissions so that this location can meet the standard in the future.



Expected Numbers of Days That Air-Monitoring Sites in Missouri Indicate an Exceedance of the PM10 Standard

(150 micrograms per cubic meter)

Updated 10/19/2015

Site numbers correspond to map legend.

Expected exceedance days through December 2014 are based on quality-assured data reported to U.S. EPA.

Yellow highlighting indicates expected exceedance days greater than one. The standard is exceeded at these sites.

Air-Monitoring Sites	Monitoring Periods (Three years in length)						
	2007-2009	2008-2010	2009-2011	2010-2012	2011-2013	2012-2014	2013-2015**
Nos. 01 - 07 in St. Louis area							
01 Margareta	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02 Blair St.*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03 Branch St.*	0.7	0.7	0.7	1.8	2.1	2.1	1.0
04 Forest Park*							
05 South Broadway*							
06 Ladue*							
07 Arnold West*							
Nos. 08 -12 in Kansas City area							
08 Liberty*							
09 Front St.			0.0	0.0	0.0	0.0	0.0
10 Troost*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 Blue Ridge I-70*							
12 Richards Gebaur South*							
No. 13 in Springfield area							
13 Hillcrest High School*							
Nos. 14 - 17 in outstate areas							
14 Carthage in southwest Missouri	0.3	0.0	1.3	1.9	1.9	0.9	0.3
15 El Dorado Springs* in southwest Missouri							
16 Mark Twain State Park in northeast Missouri	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17 St. Joseph Pump Station* in northwest Missouri	0.0	0.0	0.0	0.0	0.0	0.0	0.0

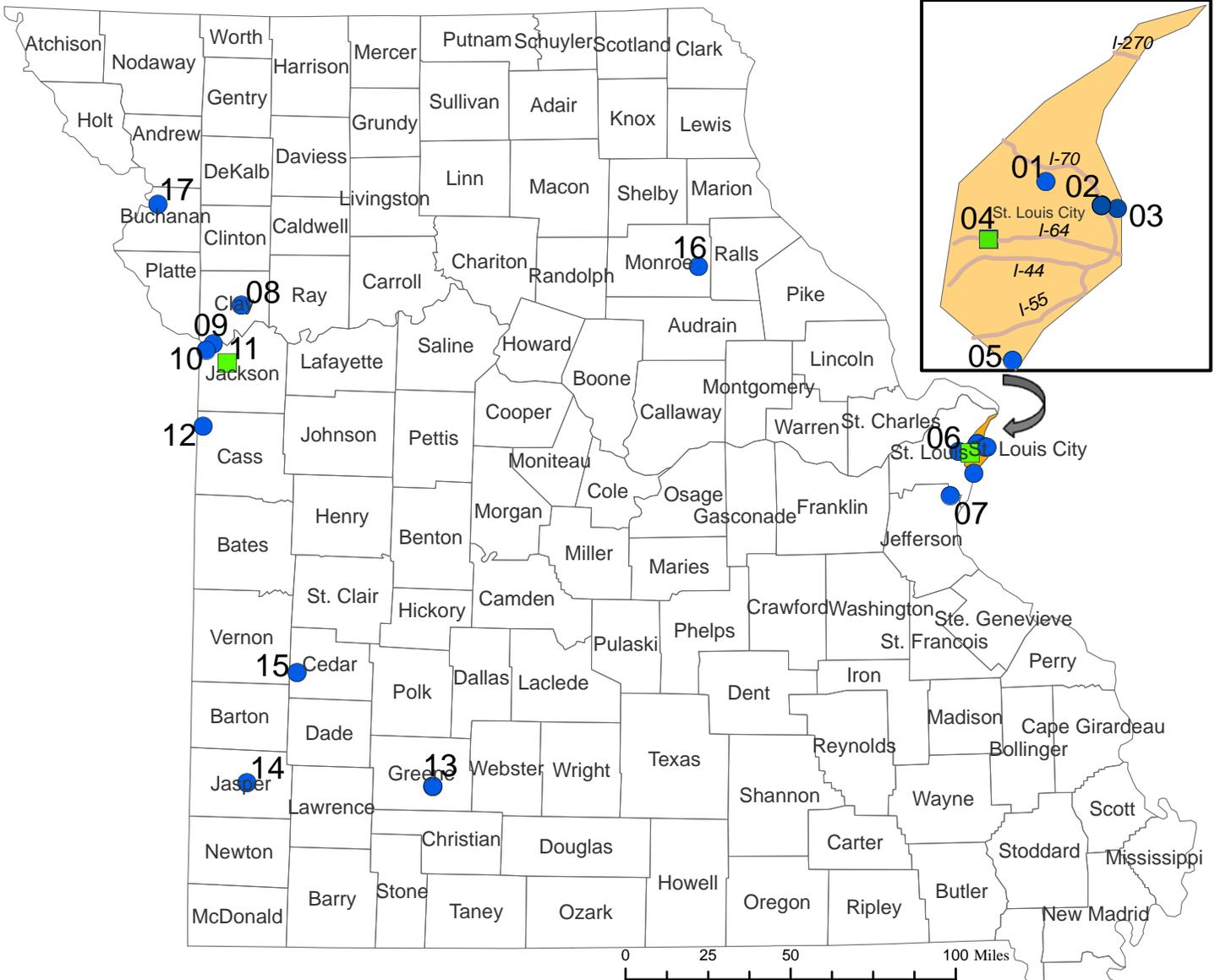
*The U.S. Environmental Protection Agency (EPA) approved the monitoring processes at these sites as federal equivalent methods in July 2014.

Some of these sites also have samplers using a federal reference method, and those results appear in the table.

The Missouri Department of Natural Resources is comparing data from the recently approved instruments to data derived from samplers using a federal reference method, which air-monitoring agencies consider the gold standard. The department anticipates publishing data from the newer instruments in the near future.

**Data from 2015 come from first and second quarters only (January - June).

2015 Missouri PM10 Ambient Monitoring Network



Legend

- Monitor in Compliance with the PM10 Standard
- Near Roadway Monitor in Compliance with the PM10 Standard

St. Louis Area

Site#	Site Name
01	Margaretta**
02	Blair Street^~
03	Branch Street**^
04	Forest Park^
05	South Broadway^
06	Ladue^
07	Arnold West***^

Kansas City Area

Site#	Site Name
08	Liberty^
09	Front Street**
10	Troost^~
11	Blue Ridge, I-70^
12	Richards Gebaur-South^

Springfield Area

Site#	Site Name
13	Hillcrest High School**^

Outstate Area

Site#	Site Name
14	Carthage**
15	El Dorado Springs^
16	Mark Twain State Park**
17	St. Joseph Pump Station^~

**Measure PM10 continuously. Data reported to EPA.

^Measure PM10 continuously. Data not reported to EPA as Federal Equivalent Method.

~PM10 Filter-based, noncontinuous. Data reported to EPA.