



# Lesson 4: How is Air Pollution Monitored?

Oklahoma Department of Environmental Quality

**Grade Level: 6-12 | PASS Skills: Process Standard 4, 5/ Standard 4.2 (High School)**

Objectives: Students will be able to recognize the criteria pollutants, access and use monitoring site data, and explain how air quality data is used.

Pre-requisite Knowledge: No previous knowledge is necessary for the comprehension of the content.

Activity: Combined with content from lesson plan 5 \*see lesson plan 5 and its accompanying activity\*

Implementation Tips: Using the Air Quality Monitoring Data map from the Air Quality Division web site (<http://www.deq.state.ok.us/AQDnew/monitoring/cpdata.htm>), demonstrate to the students how to access data from one of the actual monitoring sites. Follow the step by step diagram below:

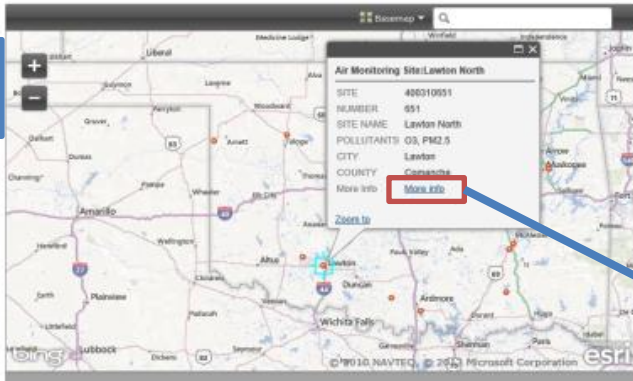
### Air Quality Monitoring Data

\*Data unofficial and subject to change. All Data is considered preliminary until a comprehensive quality review and certification process has been completed.

Get Real-time Data by Pollutant:    
 or   
 Get Real-time Data by clicking on the Site symbol below:

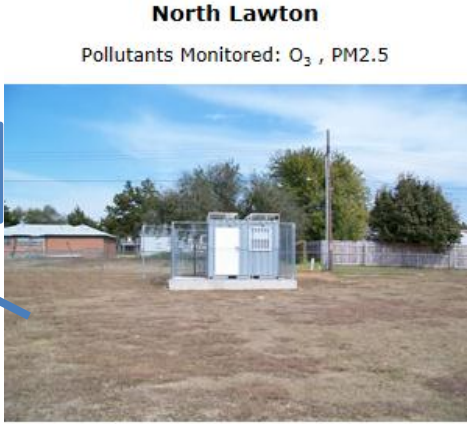
[More information about the Air Quality Data](#)

1



Click on an orange dot to access information about the monitoring site at that specific location. To view the data collected for each pollutant, select the "More info" hyperlink.

2



[Current Monitoring Data \(html\)](#)

The "More info" hyperlink will direct you to an image of the monitoring site and will provide access to the current monitoring data. Select the "Current Monitoring Data" hyperlink in your preferred format and it will display the requested data.

3

The most current air sample measurements can be found by scrolling down towards the bottom of the page. The time of collection is displayed in the first column and the measurement for each pollutant is recorded in the columns to the right.

Site: 0651 - Lawton

Daily Summary Report 02/14/13

Hour	O3 PPM	PM25 UG/M3	wvWDR DEG	wvWSPD MPH	wvRH PERCENT	wvTAIR DEG F
00:00	.001	7.2	23	0	76	35
01:00	.001	6.4	3	0	74	34
02:00	.005	6.1	53	0	79	33
03:00	.002	7.1	89	0	76	33
04:00	.005	9.2	73	0	77	33
05:00	.004	11.7	11	0	80	32
06:00	.001	8.7	50	0	83	32
07:00	.006	10.4	52	1	79	34
08:00	.016	13.8		3	70	37
09:00	.029	10.8	26	3	55	48
10:00	.036	6.5	44	2	41	54
11:00						
12:00						
13:00						

## Monitoring Sites

One of the most critical responsibilities of the Air Quality Division is to monitor Oklahoma's air quality. Currently, there are 27 monitoring sites in 16 different counties that specifically monitor the *criteria pollutants*. The criteria pollutants, as established by the EPA, are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), and sulfur dioxide (SO<sub>2</sub>).

The Air Quality Division's monitoring network routinely measures concentrations of the criteria air pollutants in addition to hydrogen sulfide (H<sub>2</sub>S), mercury (Hg), toxics, visibility, and volatile organic compounds (VOCs).

To view the monitor locations and the types of pollutants monitored at each site, the Air Quality Division web site provides a GFS map of the state that can be used to find air quality data for certain areas. Using the accompanying link, (<http://www.deq.state.ok.us/AQDnew/monitoring/cpdata.htm>), follow the step-by-step diagrams to access site-specific information.

## Monitoring Equipment

The monitoring of air pollutants involves sophisticated equipment and considerable amounts of computing power. There are different types of monitoring equipment and methods of data collection specific to each pollutant; however, most gaseous pollutants are monitored using a light absorption process. Particulate matter is an exception.

Rather than using light absorption techniques, particulate samples are collected on special filter paper located within large vacuum-like machines.

The data collected for continuously monitored particulate matter and other criteria air pollutants are sent directly to a computer located at the DEQ central office. The data stored on this computer are gathered every hour from the monitoring network and are made available to the public on the Air Quality Division web site.

Various pollutants are monitored on different schedules, such as once every three days or once every six days. For each sample, the collection period usually lasts 24 hours. The data from these monitors are also available to the public after analysis is complete.

## Air Quality Data

The air quality data collected from the monitoring network are sent to the Environmental Protection Agency (EPA) and used for many purposes at the regional and state level. Air Quality data are used for the issuance of health advisories, a daily Air Quality Index (AQI), watches; the identification of industrial emission sources; the evaluation of overall air quality trends for the region; the formulation of a state plan designed to meet the National Ambient Air Quality Standards (NAAQS); and many other aspects such as industrial compliance and enforcement.

For example, an inventory of air pollutant emissions is kept by the agency and used to identify the amounts of pollution that certain sources are emitting such as industrial facilities, gas and oil production sites, etc. To ensure these sources are in compliance with the NAAQS, the agency often monitors the air quality in the surrounding areas to identify the levels of human exposure and the potential need for additional controls.

Air quality data are also used to assist the state with determining attainment. If air pollution levels are higher than what is acceptable by the NAAQS, the area could be considered nonattainment. To achieve attainment, a state must develop

a written plan for cleaning the air in any problem areas that may exist. The Air Quality Division of Oklahoma has developed a state implementation plan that outlines the efforts that will be made to achieve or maintain the standards. |