

Lesson 4 & 5: How is Ground-Level Ozone Monitored and How Are Air Quality Data Communicated to the Public?



Name: _____

Period: _____

Oklahoma Department of Environmental Quality

Date: _____

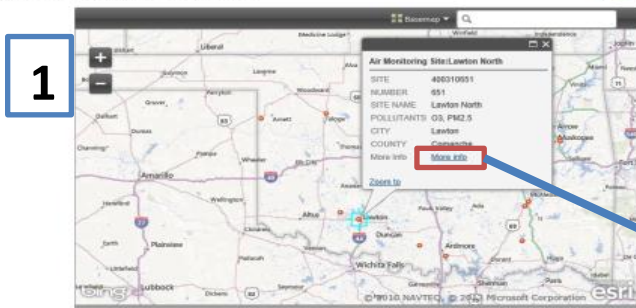
The Air Quality Division’s monitoring network routinely measures concentrations of the criteria pollutants which are carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), and sulfur dioxide (SO₂).

The electronic data recorded by the monitoring equipment is analyzed and used to calculate a score that is represented by a special index or scale. Together, this score and the Air Quality index (AQI) are used to describe the air quality for a given area.

Using the *Air Quality Monitoring Data* map, <http://www.deq.state.ok.us/AQDnew/monitoring/cpdata.htm>, select a monitoring site of your choice by following the picture diagrams below. Answer the questions below about the monitoring site you have selected.

Air Quality Index	Numerical Value	Meaning
Good	0 to 50	Air Quality is considered satisfactory, and air pollution poses little or no risk
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
Unhealthy for sensitive groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects

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



2

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

The most current air sample measurements can be found by scrolling 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.



3

Daily Summary Report
02/14/13

Hour	O3 PPM	PM2.5 UG/M3	wwDIR DEG	wwWSPD MPH	wwRH PERCENT	wwTARR DEG/F
00:00	.001	7.2	23	0	75	35
01:00	.001	6.4	3	0	74	34
02:00	.005	6.1	53	0	76	33
03:00	.002	7.1	99	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	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						

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.

1. What is the site number and where is the monitoring station located? _____
 2. What types of pollutants are monitored at this site? _____
-
3. Use the table below to calculate and record the average concentrations for the pollutants monitored at the site you selected (*ONLY calculate averages for the pollutants provided in answer 2):

Type of Pollutant	How to Calculate the Average Used for NAAQS Averaging Period	Avg. Concentration of Pollutant
CO – Carbon Monoxide (8-hr avg.) Units: parts per million (ppm)	Add up the last 8 values reported for CO (do not include the summary data in the gray columns). Find the concentration average by dividing the total by 8.	
NO ₂ – Nitrogen Dioxide (1-hr avg.) Units: parts per billion (ppb)	The most recent concentration value recorded by the monitoring equipment is the 1-hr avg.	
O ₃ – Ozone (8-hr avg.) Units: parts per million (ppm) *Note: 1,000 ppb = 1 ppm	Add up the last 8 values reported for O ₃ (do not include the summary data in the gray columns). Find the concentration average by dividing the total by 8. If some hours are absent, use a 6- or 7-hr average.	
PM _{2.5} – Particulate Matter (24-hr avg.) *very fine particles* Units: µg/m³	The 24-hr avg. concentration value for PM is found in the gray summary column at the bottom of the FIRST page of the Daily Summary Report. 	
PM ₁₀ – Particulate Matter (24-hr avg.) *small particles* Units: µg/m³	The 24-hr avg. concentration value for PM is found in the gray summary column at the bottom of the FIRST page of the Daily Summary Report. 	
SO ₂ – Sulfur Dioxide (1-hr avg.) Units: parts per billion (ppb)	The most recent concentration value recorded by the monitoring equipment is the 1hr avg.	

4. Once the average concentrations have been found or calculated, use AIRNow's AQI Calculator (http://www.airnow.gov/index.cfm?action=resources.conc_aqi_calc) to convert the pollutant concentrations into AQI scores.
 - To make conversions, select a pollutant from the pull-down menu—be sure to select the proper time average as listed in the data table shown above, i.e., 24-hr avg., 8-hr avg., 1-hr avg., etc.
 - Check to make sure the units match with what is listed in the data table shown above. If the units do not match, change them.
 - Type in the average concentration for the corresponding pollutant you calculated and recorded in the previous data table.
 - Record the monitored pollutant in the following table and the corresponding AQI score as well as a description of what that score means in terms of the air quality.

Ex: $PM_{2.5} = 6.6 \mu\text{g}/\text{m}^3 \rightarrow$ AQI score for $PM_{2.5}$ is 21 which means the air quality is good and there are no associated health concerns.

Pollutant (units)	AQI Score	Air Quality Description