
OPACITY TEST METHODS No. 9B

October 13, 2005

- ✓ EPA Method 9
- ✓ Time Averaged Method
- ✓ Intermittent Emissions Method

Opacity Test Methods

EPA Method 9 – Visual Determination of the Opacity of Emissions from Stationary Sources (specific to the time specified in AQMD Rule 401, Visible Emissions)

Time Averaged Method

Note: This method can only be conducted by an individual who is a California Air Resources Board (CARB) certified Visible Emission Evaluation (VEE) observer. Qualification and testing requirements for a CARB-certified VEE observer can be obtained from the AQMD.

This procedure is identical to EPA's Method 9 except for the data-reduction procedures, which provide for averaging times other than 3 minutes. This method is applicable to continuous sources of visible emissions for compliance determination with opacity requirements.

Continuous emissions sources for aggregate and related operation include, but are not limited to, conveyor transfer points, and activities that produce emissions continually without interruption such as, conveyORIZED screening and crushing. Emissions from these types of uninterrupted activities are considered continuous even though speed of the activity may vary and emission controls may be in-place for all or a portion of the operation. The qualified observer should do the following:

Position:

Stand at a position at least twenty (20) feet from the fugitive dust source in order to provide a clear view of the emissions with the sun oriented in the 140° sector to the back. While maintaining the above requirements, make opacity observations/readings from a position such that the line of sight is approximately perpendicular to the plume and wind direction. Make opacity observations/readings at the point of greatest opacity in the portion of the plume. Focus observations/readings to one discrete source that generates PM, not the entire operation. Do not include more than one plume in the line of sight at one time.

Field Records:

Record the name of the site, location of dust generating operation, type of operation, type of equipment in-use and activity, method of control used, if any, observer's name, certification data and affiliation, and a sketch of the observer's position relative to the fugitive dust source. Also, record the time, estimated distance to the fugitive dust source location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), observer's position relative to the fugitive dust source, and color of the plume and type of background on the visible emission observation when opacity observations/readings are initiated and completed.

Observations:

Make opacity observations/readings, to the extent possible, using a contrasting background that is perpendicular to the line of sight. Make opacity observations/readings at a point just beyond where material is no longer being deposited out of the plume (normally three (3) feet above the surface from which the plume is generated). The initial observation should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume, but instead observe the plume momentarily at 15-second intervals, first at zero second and then at fifteen seconds.

Recording Observations:

Record the opacity observations/readings to the nearest 5% every fifteen (15) seconds on an observational record sheet. Each momentary observation/reading recorded represents the average opacity of emissions for a fifteen (15) second period. If a multiple plume exists at the time of an observation, do not record an opacity observation/reading. Mark an “x” for that reading. If the equipment generating the plume travels outside of the field of observation, resulting in the inability to maintain the orientation of the sun within the 140° sector or if the equipment ceases operating, mark an “x” for the fifteen (15) second interval reading. Readings identified as “x” shall be considered interrupted observations/readings. If at any time there are five (5) individual, consecutive observations/readings of 50% or greater opacity, stop the opacity observations/readings. Within one hour, no more than one NOV can be issued by the AQMD staff for one emission source.

Data Reduction for Time-Averaged Method:

For each set of twelve (12) or twenty four (24) consecutive observations/readings, calculate the appropriate average opacity. Sets shall consist of consecutive observations/readings, however, observations/readings immediately preceding and following interrupted readings shall be deemed consecutive and in no case shall two sets overlap, resulting in multiple violations.

Intermittent Emissions Method

Note: This method can only be conducted by an individual who is a California Air Resources Board (CARB) certified Visible Emission Evaluation (VEE) observer. Qualification and testing requirements for a CARB-certified VEE observer can be obtained from the AQMD.

This procedure is identical to EPA’s Method 9 except for the data-reduction procedures, which provide for averaging times other than 3 minutes. This method is applicable to intermittent sources of visible emissions for compliance determination with opacity requirements.

Intermittent emissions sources for aggregate and related operations include, but are not limited to, activities that produce emissions randomly such as non-conveyorized screening, loading, unloading, and transferring of materials where random emissions are predominantly produced. This test method shall also be used to determine the opacity of PM emissions from inactive storage piles when disturbed by wind gusts, and visible PM

emissions generated by vehicles while traveling on unpaved roads and unpaved parking lots.

1. For Storage Piles, Screening, and Loading/Unloading/Transferring Activities:

Position:

Stand at a position at least twenty (20) feet from the fugitive dust source in order to provide a clear view of the emissions with the sun oriented in the 140° sector to the back. While maintaining the above requirements, make opacity observations/readings from a position such that the line of sight is approximately perpendicular to the plume and wind direction. Do not include more than one plume in the line of sight at one time.

Field Records:

Record the name of the site, location of dust generating operation, type of operation, type of equipment in-use and activity, method of control used, if any, observer's name, certification data and affiliation, and a sketch of the observer's position relative to the fugitive dust source. Also, record the time, estimated distance to the fugitive dust source location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), observer's position relative to the fugitive dust source, and color of the plume and type of background on the visible emission observation when opacity readings are initiated and completed.

Observations:

Make opacity observations using a contrasting background that is perpendicular to the line of sight. Identify the initial fallout zone within the plume. Make an opacity observation/reading at the maximum point of the entrained fugitive dust plume located just beyond the initial fallout zone, approximately three (3) feet above the surface from which the plume is generated.

- ✓ For the 20% opacity:

Make two observations/readings per plume per activity that occurs within your field of view, beginning with the first observation/reading at zero (0) seconds and the second observation/reading at five (5) seconds. Activities might occur at different sources within your field of view (i.e, loading, unloading activities associated with more than one storage pile). The zero (0) second observation/reading should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume but, instead, observe the plume briefly at zero seconds and then at five seconds.

- ✓ For the 50% opacity:

Make no more than two observations/readings per plume for one discrete activity or source (not the entire operation) that is generating visible PM

emissions (i.e., loading, unloading activities associated with one storage pile), beginning with the first observation/reading at zero (0) seconds and the second observation/reading at five (5) seconds until five (5) observations/readings are completed. The zero (0) second observation/reading should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume but, instead, observe the plume briefly at zero seconds and then at five seconds.

Recording Observations:

Record the opacity observations/readings to the nearest 5% on an observational record sheet. Each momentary observation recorded represents the average opacity of emissions for a five (5) second period.

Repeat the observations/readings and the recording observations/readings listed above in this procedure until you have recorded a total of 12 consecutive opacity readings. This will occur once six intermittent plumes consisting of two readings per plume on which you are able to take proper readings. The 12 consecutive readings must be taken within the same period of observation but must not exceed 1 hour. Observations/readings immediately preceding and following interrupted observations/readings (double plume over, line of sight impeded by traversing traffic) can be considered consecutive.

Average the 12 opacity observations/readings together. If the average opacity observation/reading equals 20% or lower, the source is in compliance. At any time, stop the observations/readings if there are five (5) individual, consecutive observations/readings of 50% or greater opacity. Within one hour, no more than one NOV can be issued by the AQMD staff for one emission source.

2. For Vehicles Traveling on Unpaved Roads and Unpaved Parking Lots:

The purpose of this test method is to estimate the percent opacity of PM emissions caused by vehicle movement on the unpaved roads and unpaved parking lots.

Position:

Stand at least 16.5 feet from the fugitive dust source in order to provide a clear view of the emissions with the sun oriented in the 140° sector to the back. While maintaining the above requirements, make opacity observations/readings from a position such that the line of sight is approximately perpendicular to the plume and wind direction. Focus observations/readings to a discrete portion of the unpaved road or unpaved parking lot where fugitive dust plume is generated. Do not include more than one plume in the line of sight at any one time.

Field Records:

Record the name of the site, dust source type, dust source location, method of control used, if any, observer's name, certification data and affiliation, and a sketch of the observer's position relative to the fugitive dust source. Also, record the time,

estimated distance to the fugitive dust source location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), observer's position relative to the fugitive dust source, and color of the plume and type of background on the visible emission observation when opacity observations/readings are initiated and completed.

Observations:

Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of sight. Make opacity observations/readings approximately 3 feet above the surface from which the plume is generated. Note that the observation/reading is to be made at only one visual point (one discrete location) upon generation of a plume, as opposed to visually tracking the entire length of a dust plume as it is created along the surface. Make two observations/readings per vehicle passing through such discrete location, beginning with the first reading at zero second and the second reading at five (5) seconds. The zero-second observation/reading should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume, but, instead, observe the plume briefly at zero second and then, at five seconds.

Recording Observations:

Record the opacity observations/readings to the nearest 5% on an observational record sheet. Each momentary observation/reading recorded represents the average opacity of emissions for a five (5) second period. Record the vehicle types (mid-size passenger car, heavy-duty truck, etc.) and the approximate speeds the vehicles are traveling when readings are taken.

Repeat the observations/readings and the recording observations/readings listed above in this procedure until a total of 12 consecutive opacity observations/readings are recorded. This will occur once six vehicles have driven on the source in your line of observation for which you are able to take proper readings. The 12 consecutive observations/readings must be taken within the same period of observation but must not exceed 1 hour. Observations/readings immediately preceding and following interrupted observations/readings (vehicle travels in front of the path, plume doubled over, etc) can be considered consecutive. Average the 12 opacity readings together. If the average opacity reading equals 20% or lower, the source is in compliance.

At any time, stop the observations/readings if there are five (5) individual, consecutive readings of 50% or greater opacity. This will occur once three vehicles have driven on the source in your line of observation for which you are able to take proper readings. Within one hour, no more than one NOV can be issued by AQMD staff for one emission source (the unpaved road or unpaved parking lot).