could be either visually inspected, or filled with water to detect any liquid leakage.)

5.1.3 Attach the test cap to the end of the vapor recovery hose.

5.1.4 Connect the pressure-vacuum supply hose and the pressure-vacuum relief valve to the shut-off valve. Attach a manometer to the pressure tap.

5.1.5 Connect compartments of the tank internally to each other if possible. If not possible, each compartment must be tested separately, as if it were an individual delivery tank.

5.2 Pressure test.

5.2.1 Connect the pressure source to the pressure-vacuum supply hose.

5.2.2 Open the shut-off valve in the vapor recovery hose cap. Applying air pressure slowly, pressurize the tank to P_i, the initial pressure specified in the regulation.

5.2.3 Close the shut-off valve and allow the pressure in the tank to stabilize, adjusting the pressure if necessary to maintain pressure of P_i. When the pressure stabilizes, record the time and initial pressure.

5.2.4 At the end of t minutes, record the time and final pressure.

5.2.5 Repeat steps 5.2.2 through 5.2.4 until the change in pressure for two consecutive runs agrees within ±12.5 mm H_2O. Calculate the arithmetic average of the two results.

5.2.6 Compare the average measured change in pressure to the allowable pressure change, Δp, as specified in the regulation. If the delivery tank does not satisfy the vapor tightness criterion specified in the regulation, repair the sources of leakage, and repeat the pressure test until the criterion is met.

5.2.7 Disconnect the pressure source from the pressure-vacuum supply hose, and slowly open the shut-off valve to bring the tank to atmospheric pressure.

5.3 Vacuum test.

5.3.1 Connect the vacuum source to the pressure-vacuum supply hose.

5.3.2 Open the shut-off valve in the vapor recovery hose cap. Slowly evacuate the tank to V_i, the initial vacuum specified in the regulation.

5.3.3 Close the shut-off valve and allow the pressure in the tank to stabilize, adjusting the pressure if necessary to maintain a vacuum of V_i. When the pressure stabilizes, record the time and initial vacuum.

5.3.4 At the end of t minutes, record the time and final vacuum.

5.3.5 Repeat steps 5.3.2 through 5.3.4 until the change in vacuum for two consecutive runs agrees within ◊12.5 mm H_2O. Calculate the arithmetic average of the two results.

5.3.6 Compare the average measured change in vacuum to the allowable vacuum change, Δp, as specified in the regulation. If the delivery tank does not satisfy the vapor tightness criterion specified in the regulation, repair the sources of leakage, and repeat the vacuum test until the criterion is met.

5.3.7 Disconnect the vacuum source from the pressure-vacuum supply hose, and slowly open the shut-off valve to bring the tank to atmospheric pressure.

5.4 Post-test clean-up. Disconnect all test equipment and return the delivery tank to its pretest condition.

6. *Alternative Procedures.*

6.1 The pumping of water into the bottom of a delivery tank is an acceptable alternative to the pressure source described above. Likewise, the draining of water out of the bottom of a delivery tank may be substituted for the vacuum source. Note that some of the specific step-by-step procedures in the method must be altered slightly to accommodate these different pressure and vacuum sources.

6.2 Techniques other than specified above may be used for purging and pressurizing a delivery tank, if prior approval is obtained from the Administrator. Such approval will be based upon demonstrated equivalency with the above method.

[FR Doc. 83-22380 Filed 8-17-83; 8:45 am]
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40 CFR Part 60

[AD-FRL-2241-6a]

Addition of Reference Method 21 to Appendix A

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action establishes a new reference method to be added to Appendix A of 40 CFR Part 60, standards of performance for new stationary sources. Reference Method 21 will be used to determine volatile organic compound (VOC) leaks from process equipment such as valves, flanges and other connections, pump and compressor seals, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals. This reference method will be used in several air pollution regulations for the limitation of fugitive VOC emissions which are being developed for proposal and promulgation.

EFFECTIVE DATE: August 18, 1983.

ADDRESSES: *Docket.* A docket, number A-79-32, containing information considered by EPA in development of standards of performance for fugitive emission sources in the synthetic organic chemical manufacturing industry, and which also contains information considered in development of the promulgated reference method, is available for public inspection and copying between 8:00 a.m. and 4:00 p.m., Monday through Friday, at EPA's Central Docket Section (A-130), West Tower Lobby, Gallery 1, 401, M Street, SW., Washington, D.C. 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Mr. Winton Kelly, Emission Measurement Branch, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 541-5543.

SUPPLEMENTARY INFORMATION:

Summary of the Reference Method

Reference Method 21, "Determination of Volatile Organic Compound Leaks" is used to detect VOC leaks from individual sources of fugitive emissions. This procedure is used to identify and classify leaks only, and is not to be used as a direct measure of mass emission rates from individual sources. A portable instrument is used to measure the local organics concentration at the surface of a potential leak source. If a meter reading equal to or greater than a limit specified in an applicable regulation is obtained, a VOC emission (leak) exists. The procedure can also be used to confirm that "no detectable emissions" are present. If the measured difference between the local ambient concentration and the concentration present at the surface of the potential leak source is less than a concentration specified in an applicable regulation, then there are no detectable emissions.

Background

On January 5, 1981, as an appendix to the proposed standards of performance for fugitive emission sources in the synthetic organic chemical manufacturing industry, EPA proposed Reference Method 21. This method would normally be promulgated with those standards. However, the method is being promulgated earlier because several additional regulations are being developed for promulgation in the near future that specify that Reference Method 21 be used. This early promulgation will ensure that the reference procedure will be promulgated prior to being specified in promulgated standards of performance.

Under Executive Order 12291, EPA must judge whether a regulation is "major" and, therefore, subject to the requirement of a regulatory impact analysis. This regulation is not major because it will not have an annual effect on the economy of $100 million or more; it will not result in a major increase in costs or prices; and there will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S.-based enterprise to compete with foreign-based enterprises in domestic or export markets.

Pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that the attached rule will not have a significant economic

impact on a substantial number of small entities.

Public Participation

During the development of the test method, trade and professional associations and individual companies supplied comments on the methods. After proposal on January 5, 1981, comments were received from various sources. A public hearing was held on March 3, 1981, to receive additional formal comments. The formal comment period was extended from April 6, 1981, to July 31, 1981.

Public Comments and Changes Made to the Proposed Reference Method

Numerous comments were received in response to proposal of the standards of performance for fugitive emissions from synthetic organic chemical industry. Most of the comments concerning the test method were specifically related to the selection of the definition of a leak, and not to the procedure alone. These comments have been carefully considered and, where determined to be appropriate, changes have been made in the proposed test method. A detailed discussion of the comments and full responses will be included in Docket No. A-79-32.

The following discussion summarizes the changes made to the reference method based on additional review and in response to public comment.

The promulgated reference method has been reorganized to improve the clarity of the description of the procedures. A "Definitions" section has been added to place all the definitions in one section.

A change in the requirements for instrument performance evaluation was also made to improve the quality control of the procedure. Instead of requiring a calibration precision test consisting of nine repetitions at 6-month intervals, the new requirements specify a test consisting of three repetitions at 3-month intervals. This change will provide a quality control result every quarter and will require less effort.

The definition of "no detectable emissions" has been changed to be consistent with the instrument specification of scale readability. The proposed procedure defined "no detectable emissions" as 2 percent of the leak definition concentration, with a minimum scale readability of 5 percent of the leak definition. The definition of "no detectable emissions" has been changed to correspond to the minimum readability specification and will be specified in applicable regulations.

Several commenters noted that the instruments used during screening studies responded differently for different chemicals. One commenter stated that the actual response factor was poorly related to the theoretical response factor and cited inconsistent responses for nonane and decane, as well as no response for some chemicals, to support his claims. Another commenter suggested that the leak concentration for the standards should vary according to the process unit since a wide variability (0 to 571) in response factors has been determined for the industry. And, another commenter stated that aromatic compounds such as benzene, toluene, and xylene demonstrate a nonlinear response close to 10,000 ppmv. In response to these comments, Reference Method 21 gives specifications for the instrument to be used in monitoring fugitive VOC emission sources. The technique is intended to classify leaks only, not to provide a rigorous analytical concentration or mass emission rate of VOC. A specific statement has been added to Method 21 to clarify the intention to classify leaks only. The variation in response factor due to compound or instrument is not expected to affect significantly the number of leaks determined through screening because screening values are usually much greater than the leak definition for leaks and much less than the leak definition for nonleaks. Two industry commenters concur with EPA in this position. However, to remove some of the wide variability, a definition, specification, and test procedure for response factors have been added to Method 21. This specification will assure that the analyzer used will respond to the compounds to be measured.

Another commenter suggested that the gas specification section be amended to include a turnover of calibration gas standards every 3 months since calibration gases can deteriorate significantly over time. A provision has been added to the promulgated Reference Method 21 to require a shelf-life specification on calibration gases and procedures to follow to ensure that calibration gas concentrations are accurate.

Two comments concerned the instrumentation requirements of Reference Method 21. The commenter stated that only two instruments on the market today could be considered, and neither one would meet the specifications of the reference method entirely: the first instrument fails the calibration accuracy, and the section instrument does not meet the response time requirement. In response, although there are only two instruments which have been used to any great extent, the technical literature and product information suggest that there are others which could be used for detecting leaks. The specifications included in the proposed reference method are achievable based on performance during EPA studies.

One comment letter expressed concern that no provision was made for the use of new instruments or calibration procedures which would provide equivalent or more accurate results. They asked that equivalency provisions be added for test methods and procedures. In response, Reference Method 21 gives specifications for the monitoring instrument that are general enough so as not to preclude new analytical developments. In addition, the General Provisions (40 CFR Part 60, Subpart A) allow for equivalent methods and procedures to be used for performance testing and monitoring when the results of the equivalent method have been demonstrated to be at least as accurate as results obtained by the required methods.

One commenter suggested that use of a windscreen upwind of the component being screened would prevent meteorological effects on the instrument readings. During EPA studies, the selection of a measurement location at the surface of the source was made to minimize meteorological effects. During the data collection efforts, no further provisions were found necessary to obtain repeatable screening values. Therefore, all of the field data were collected without a windscreen. In view of these facts, it seems unnecessary to require that a windscreen be used.

An alternative screening procedure has been added for those sources that can be tested with a soap solution. These sources are restricted to those with non-moving seals, moderate surface temperatures, without large openings to atmosphere, and without evidence of liquid leakage. The soap solution is sprayed on all applicable sources and the potential leak sites are observed to determine if bubbles are formed. If no bubbles are formed, then no detectable emissions or leaks exist. If any bubbles are formed, then the instrument measurement techniques must be used to determine if a leak exists, or if no detectable emissions exist, as applicable.

The alternative soap solution procedure does not apply to pump seals, sources with surface temperatures greater than the boiling point or less than the freezing point of the soap solution, sources such as open-ended lines or valves, pressure relief value

horns, vents with large openings to atmosphere, and any source where liquid leakage is present. The instrument technique in the method must be used for these sources.

The alternative of establishing a soap scoring leak definition equivalent to a concentration-based leak definition is not included in the method and is not recommended for inclusion in an applicable regulation because of the difficulty of calibrating and normalizing a scoring technique based on bubble formation rates. A scoring technique would be based on estimated ranges of volumetric leak rates. These estimates depend on the bubble size and formation rate, which are subjective judgments of an observer. These subjective judgments could only be calibrated or normalized by requiring that the observers correctly identify and score a standard series of test bubbles. It has been reported that trained observers can correctly and repeatably classify ranges of volumetric leak rates. However, because soap scoring requires subjective observations and since an objective concentration measurement procedure is available, a soap scoring equivalent leak definition is not recommended for the applicable regulation. The alternate procedure that has been included will allow more rapid identification of potential leaks for more rigorous instrumental concentration measurement.

Miscellaneous

This final rulemaking is issued under the authority of Sections 111, 114, and 301(a) of the Clean Air Act, as amended [42 U.S.C. 7411, 7414, and 7691(a)].

List of Subjects in 40 CFR Part 60

Air pollution control, Aluminum, Ammonium sulfate plants, Asphalt, Cement industry, Coal copper, Electric power plants, Glass and glass products, Grains, Intergovernmental relations, Iron, Lead, Metals, Metallic minerals, Motor vehicles, Nitric acid plants, Paper and paper products industry, Petroleum, Phosphate, Sewage disposal, Steel, Sulfuric acid plants, Waste treatment and disposal, Zinc, Tires.

Dated: August 4, 1983.

William D. Ruckelshaus,

Administrator.

Appendix A of 40 CFR Part 60 is amended by adding Reference Method 21 as follows:

Appendix A—Reference Methods

* * * * *

Method 21. Determination of Volatile Organic Compounds Leaks

1. Applicability and Principle.

1.1 Applicability. This method applies to the determination of volatile organic compound (VOC) leaks from process equipment. These sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

1.2 Principle. A portable instrument is used to detect VOC leaks from individual sources. The instrument detector type is not specified, but it must meet the specifications and performance criteria contained in Section 3. A leak definition concentration based on a reference compound is specified in each applicable regulation. This procedure is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rates from individual sources.

2. Definitions.

2.1 Leak Definition Concentration. The local VOC concentration at the surface of a leak source that indicates that a VOC emission (leak) is present. The leak definition is an instrument meter reading based on a reference compound.

2.2 Reference Compound. The VOC species selected as an instrument calibration basis for specification of the leak definition concentration. (For example: If a leak definition concentration is 10,000 ppmv as methane, then any source emission that results in a local concentration that yields a meter reading of 10,000 on an instrument calibrated with methane would be classified as a leak. In this example, the leak definition is 10,000 ppmv, and the reference compound is methane.)

2.3 Calibration Gas. The VOC compound used to adjust the instrument meter reading to a known value. The calibration gas is usually the reference compound at a concentration approximately equal to the leak definition concentration.

2.4 No Detectable Emission. The local VOC concentration at the surface of a leak source that indicates that a VOC emission (leak) is not present. Since background VOC concentrations may exist, and to account for instrument drift and imperfect reproducibility, a difference between the source surface concentration and the local ambient concentration is determined. A difference based on meter readings of less than a concentration corresponding to the minimum readability specification indicates that a VOC emission (leak) is not present. (For example, if the leak definition in a regulation is 10,000 ppmv, then the allowable increase in surface concentration versus local ambient concentration would be 500 ppmv based on the instrument meter readings.)

2.5 Response Factor. The ratio of the known concentration of a VOC compound to the observed meter reading when measured using an instrument calibrated with the reference compound specified in the application regulation.

2.6 Calibration Precision. The degree of agreement between measurements of the same known value, expressed as the relative percentage of the average difference between the meter readings and the known concentration to the known concentration.

2.7 Response Time. The time interval from a step change in VOC concentration at the input of the sampling system to the time at which 90 percent of the corresponding final value is reached as displayed on the instrument readout meter.

3. Apparatus.

3.1 Monitoring Instrument.

3.1.1 Specifications.

a. The VOC instrument detector shall respond to the compounds being processed. Detector types which may meet this requirement include, but are not limited to, catalytic oxidation, flame ionization, infrared absorption, and photoionization.

b. The instrument shall be capable of measuring the leak definition concentration specified in the regulation.

c. The scale of the instrument meter shall be readable to ±5 percent of the specified leak definition concentration.

d. The instrument shall be equipped with a pump so that a continuous sample is provided to the detector. The nominal sample flow rate shall be ⅛ to 3 liters per minute.

e. The instrument shall be intrinsically safe for operation in explosive atmospheres as defined by the applicable U.S.A. standards (e.g., National Electrical Code by the National Fire Prevention Association).

3.1.2 Performance Criteria.

a. The instrument response factors for the individual compounds to be measured must be less than 10.

b. The instrument response time must be equal to or less than 30 seconds. The response time must be determined for the instrument configuration to be used during testing.

c. The calibration precision must be equal to or less than 10 percent of the calibration gas value.

d. The evaluation procedure for each parameter is given in Section 4.4.

3.1.3 Performance Evaluation Requirements.

a. A response factor must be determined for each compound that is to be measured, either by testing or from reference sources. The response factor tests are required before placing the analyzer into service, but do not have to be repeated at subsequent intervals.

b. The calibration precision test must be completed prior to placing the analyzer into service, and at subsequent 3-month intervals or at the next use whichever is later.

c. The response time test is required prior to placing the instrument into service. If a modification to the sample pumping system or flow configuration is made that would change the response time, a new test is required prior to further use.

3.2 Calibration Gases. The monitoring instrument is calibrated in terms of parts per million by volume (ppmv) of the reference compound specified in the applicable regulation. The calibration gases required for monitoring and instrument performance evaluation are a zero gas (air, less than 10 ppmv VOC) and a calibration gas in air mixture approximately equal to the leak definition specified in the regulation. If cylinder calibration gas mixture are used, they must be analyzed and certified by the manufacturer to be within ±2 percent

accuracy, and a shelf life must be specified. Cylinder standards must be either reanalyzed or replaced at the end of the specified shelf life. Alternately, calibration gases may be prepared by the user according to any accepted gaseous standards preparation procedure that will yield a mixture accurate to within ±2 percent. Prepared standards must be replaced each day of use unless it can be demonstrated that degradation does not occur during storage.

Calibrations may be performed using a compound other than the reference compound if a conversion factor is determined for that alternative compound so that the resulting meter readings during source surveys can be converted to reference compound results.

4. Procedures.

4.1 Pretest Preparations. Perform the instrument evaluation procedures given in Section 4.4 if the evaluation requirements of Section 3.1.3 have not been met.

4.2 Calibration Procedures. Assemble and start up the VOC analyzer according to the manufacturer's instructions. After the appropriate warmup period and zero internal calibration procedure, introduce the calibration gas into the instrument sample probe. Adjust the instrument meter readout to correspond to the calibration gas value.

Note.—If the meter readout cannot be adjusted to the proper value, a malfunction of the analyzer is indicated and corrective actions are necessary before use.

4.3 Individual Source Surveys.

4.3.1 Type I—Leak Definition Based on Concentration. Place the probe inlet at the surface of the component interface where leakage could occur. Move the probe along the interface periphery while observing the instrument readout. If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time. If the maximum observed meter reading is greater than the leak definition in the applicable regulation, record and report the results as specified in the regulation reporting requirements. Examples of the application of this general technique to specific equipment types are:

a. Valves—The most common source of leaks from valves is at the seal between the stem and housing. Place the probe at the interface where the stem exists the packing gland and sample the stem circumference. Also, place the probe at the interface of the packing gland take-up flange seat and sample the periphery. In addition, survey valve housings of multipart assembly at the surface of all interfaces where leak could occur.

b. Flanges and Other Connections—For welded flanges, place the probe at the outer edge of the flange-gasket interface and sample the circumference of the flange. Sample other types of nonpermanent joints (such as threaded connections) with a similar traverse.

c. Pumps and Compressors—Conduct a circumferential traverse at the outer surface of the pump or compressor shaft and seal interface. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface for the survey. If the housing configuration prevents a complete traverse of the shaft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.

d. Pressure Relief Devices—The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.

e. Process Drains—For open drains, place the probe inlet at approximately the center of the area open to the atmosphere. For covered drains, place the probe at the surface of the cover interface and conduct a peripheral traverse.

f. Open-Ended Lines or Valves—Place the probe inlet at approximately the center of the opening to the atmosphere.

g. Seal System Degassing Vents and Accumulator Vents—Place the probe inlet at approximately the center of the opening to the atmosphere.

h. Access Door Seals—Place the probe inlet at the surface of the door seal interface and conduct a peripheral traverse.

4.3.2 Type II—"No Detectable Emission". Determine the local ambient concentration around the source by moving the probe inlet randomly upwind and downwind at a distance of one to two meters from the source. If an interference exists with this determination due to a nearby emission or leak, the local ambient concentration may be determined at distances closer to the source, but in no case shall the distance be less than 25 centimeters. Then move the probe inlet to the surface of the source and determine the concentration described in 4.3.1. The difference between these concentrations determines whether there are no detectable emissions. Record and report the results as specified by the regulation.

For those cases where the regulation requires a specific device installation, or that specified vents be ducted or piped to a control device, the existence of these conditions shall be visually confirmed. When the regulation also requires that no detectable emissions exist, visual observations and sampling surveys are required. Examples of this technique are:

(a) Pump or Compressor Seals—If applicable, determine the type of shaft seal. Preform a survey of the local area ambient VOC concentration and determine if detectable emissions exist as described above.

(b) Seal System Degassing Vents, Accumulator Vessel Vents, Pressure Relief Devices—If applicable, observe whether or not the applicable ducting or piping exists. Also, determine if any sources exist in the ducting or piping where emissions could occur prior to the control device. If the required ducting or piping exists and there are no sources where the emissions could be vented to the atmosphere prior to the control device, then it is presumed that no detectable emissions are present. If there are sources in the ducting or piping where emissions could be vented or sources where leaks could occur, the sampling surveys described in this paragraph shall be used to determine if detectable emissions exist.

4.3.3 Alternative Screening Procedure. A screening procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used for those sources that do not have continuously moving parts, that do not have surface temperatures greater than the boiling point or less than the freezing point of the soap solution, that do not have open areas to the atmosphere that the soap solution cannot bridge, or that do not exhibit evidence of liquid leakage. Sources that have these conditions present must be surveyed using the instrument techniques of 4.3.1 or 4.3.2.

Spray a soap solution over all potential leak sources. The soap solution may be a commercially available leak detection solution or may be prepared using concentrated detergent and water. A pressure sprayer or a squeeze bottle may be used to dispense the solution. Observe the potential leak sites to determine if any bubbles are formed. If no bubbles are observed, the source is presumed to have no detectable emissions or leaks as applicable. If any bubbles are observed, the instrument techniques of 4.3.1 or 4.3.2 shall be used to determine if a leak exists, or if the source has detectable emissions, as applicable.

4.4 Instrument Evaluation Procedures. At the beginning of the instrument performance evaluation test, assemble and start up the instrument according to the manufacturer's instructions for recommended warmup period and preliminary adjustments.

4.4.1 Response Factor. Calibrate the instrument with the reference compound as specified in the applicable regulation. For each organic species that is to be measured during individual source surveys, obtain or prepare a known standard in air at a concentration of approximately 80 percent of the applicable leak definition unless limited by volatility or explosivity. In these cases, prepare a standard at 90 percent of the saturation concentration, or 70 percent of the lower explosive limit, respectively. Introduce this mixture to the analyzer and record the observed meter reading. Introduce zero air until a stable reading is obtained. Make a total of three measurements by alternating between the known mixture and zero air. Calculate the response factor for each repetition and the average response factor.

Alternatively, if response factors have been published for the compounds of interest for the instrument or detector type, the response factor determination is not required, and existing results may be referenced. Examples of published response factors for flame ionization and catalytic oxidation detectors are included in Section 5.

4.4.2 Calibration Precision. Make a total of three measurements by alternately using zero gas and the specified calibration gas. Record the meter readings. Calculate the average algebraic difference between the meter readings and the known value. Divide this average difference by the known calibration value and mutiply by 100 to express the resulting calibration precision as a percentage.

4.4.3 Response Time. Introduce zero gas into the instrument sample probe. When the meter reading has stabilized, switch quickly to the specified calibration gas. Measure the time from switching to when 90 percent of the final stable reading is attained. Perform this test sequence three times and record the results. Calculate the average response time.

5. Bibliography.

5.1 DuBose, D.A., and G.E. Harris. Response Factors of VOC Analyzers at a Meter Reading of 10,000 ppmv for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, N.C. Publication No. EPA 600/2–81–051. September 1981.

5.2 Brown, G.E., et al. Response Factors of VOC Analyzers Calibrated with Methane for Selected Organic Compounds. U.S. Environmental Protection Agency, Research Triangle Park, N.C. Publication No. EPA 600/2–81–022. May 1981.

5.3 DuBose, D.A., et al. Response of Portable VOC Analyzers to Chemical Mixtures. U.S. Environmental Protection Agency, Research Triangle Park, N.C. Publication No. EPA 600/2–81–110. September 1981.

[FR Doc. 83–22499 Filed 8–17–83; 8:45 am]

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