UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 7 2014

THE ADMINISTRATOR

MEMORANDUM

SUBJECT: Voluntary Consensus Standard Results for General Permits and Permits by Rule for the Indian Country Minor New Source Review Program; 40 CFR Part 49, Subparts 156(c) and 162

FROM: Robin Segall, Acting Group Leader
Measurement Technology Group (E143-02)

TO: Laura McKelvey, Group Leader
Community and Tribal Program Group (C304-03)

At your request, the Measurement Technology Group (MTG) of the Office of Air Quality Planning and Standards (OAQPS) conducted searches and reviews to address the National Technology Transfer and Advancement Act (NTTAA) requirements on the use of voluntary consensus standards (VCS). The NTTAA directs EPA to use VCS in regulatory and procurement activities unless doing so would be inconsistent with applicable law or otherwise impracticable. This memorandum documents the results of the MTG searches and reviews to determine if VCS are available and practical for use in lieu of stationary source methods cited in the General Permits and Permits by Rule for the Indian Country Minor New Source Review Program; 40 CFR Part 49, Subparts 156(c) and 162.

In 1998, OAQPS began implementing the requirements of the NTTAA by conducting searches to identify VCS. Searches continue to be performed to meet the requirements of the NTTAA. While we have made a reasonable effort to identify and evaluate potentially practical VCS, our findings do not necessarily represent all potential alternative standards which may exist.

The MTG participates in the American Society for Testing and Materials (ASTM), which is one of the most active VCS organizations on emissions testing, and has been invited to participate in the USA Technical Advisory Group for International Organization for Standardization (ISO) relating to emissions monitoring. We expect these additional efforts will help us to support a periodic review of all EPA reference methods and performance standards for possible incorporation by reference (IBR) of VCS in lieu of or as alternatives to EPA procedures. We anticipate that these activities will provide an opportunity for further review, consideration and possible IBR of VCS overlooked in the National Standards Service Network (NSSN) searches or finalized after Federal agency review in the EPA rulemaking process.

We conducted searches for General Permits and Permits by Rule for the Indian Country Minor New Source Review Program; 40 CFR Part 49, Subparts 156(c) and 162 through the Enhanced NSSN Database managed by the American National Standards Institute (ANSI). We also contacted VCS organizations and accessed and searched their databases. Searches were conducted for EPA Methods 5, 7, 9, 10, 18, 22 and 25A of 40 CFR Part 60, Appendix A. No applicable voluntary standards were identified for method 22.

Three voluntary consensus standards were identified as applicable for the purpose of this rule. The voluntary consensus standard ANSI/ASME PTC 19.10-1981 Part 10 "Flue and Exhaust Gas Analyses" is an acceptable alternative to EPA Method 7.

The voluntary consensus standard ASTM D7520-09 "Standard Test Method for Determining the Opacity of a Plume in the Outdoor Ambient Atmosphere" is an acceptable alternative to Method 9 with the following conditions:

1. During the digital camera opacity technique (DCOT) certification procedure outlined in Section 9.2 of ASTM D7520-09, you or the DCOT vendor must present the plumes in front of various backgrounds of color and contrast representing conditions anticipated during field use such as blue sky, trees, and mixed backgrounds (clouds and/or a sparse tree stand).

2. You must also have standard operating procedures in place including daily or other frequency quality checks to ensure the equipment is within manufacturing specifications as outlined in Section 8.1 of ASTM D7520-09.

3. You must follow the record keeping procedures outlined in §63.10(b)(1) for the DCOT certification, compliance report, data sheets, and all raw unaltered JPEGs used for opacity and certification determination.

4. You or the DCOT vendor must have a minimum of four (4) independent technology users apply the software to determine the visible opacity of the 300 certification plumes. For each set of 25 plumes, the user may not exceed 15% opacity of any one reading and the average error must not exceed 7.5% opacity.

5. This approval does not provide or imply a certification or validation of any vendor's hardware or software. The onus to maintain and verify the certification and/or training of the DCOT camera, software and operator in accordance with ASTM D7520-09 and this letter is on the facility, DCOT operator, and DCOT vendor.

The voluntary consensus standard ASTM D6420-99 (2010) "Test Method for Determination of Gaseous Organic Compounds by Direct Interface Gas Chromatography/Mass Spectrometry" is an acceptable alternative to EPA Method 18.

During the search, if the title or abstract (if provided) of the VCS described technical sampling and analytical procedures that are similar to EPA's reference method, the MTG considered it as a potential equivalent method. All potential standards were reviewed to determine the practicality of the VCS for this rule. This review requires significant method validation data which meets the requirements of EPA Method 301 for accepting alternative methods or scientific, engineering and policy equivalence to procedures in EPA reference methods. The MTG may reconsider determinations of impracticality when additional information is available for particular VCS.

The search identified 19 VCS that were potentially applicable for this rule in lieu of EPA reference methods. After reviewing the available standards, EPA determined that 19 candidate VCS (ASME B133.9-1994 (2001), ISO 9096:1992 (2003), ANSI/ASME PTC-38-1980 (1985), ASTM D3685/D3685M-13, CAN/CSA Z223.1-M1977, ANSI/ASME PTC 19-10-1981 part 10, ISO 10396:1993 (2007), ISO 12039:2001, ASTM D5835-95 (2013), ASTM D6522-11, CAN/CSA Z223.2-M86 (1999), ASTM D1608-98 (2009), ISO 11564:1998, CAN/CSA Z223.24-M1983, CAN/CSA Z223.21-M1978, ASTM D3162-12, ASTM D6060-96 (2009), ISO 14965:2000(E), EN 12619 (1999)) identified for measuring emissions of pollutants or their surrogates subject to emission standards in the rule would not be practical due to lack of equivalency, documentation, validation data and other important technical and policy considerations. These 19 methods are listed in Attachment 1, along with the EPA review comments.

I hope our research into this matter has been useful and timely to your Group's efforts in this rulemaking. Please contact me at (919) 541-7774 with any further questions in this matter.

Attachments

cc: Mark Sendzik, EPA/SPPD (C304-03)
Rima Howell, EPA/AQAD (E143-02)
Michael Toney, EPA/AQAD (E143-02)

Attachment 1. List of Voluntary Consensus Standards Not Applicable for General Permits and Permits by Rule for the Indian Country Minor New Source Review Program; 40 CFR Part 49, Subparts 156(c) and 162

SIMILAR EPA STANDARD REFERENCE METHOD	VOLUNTARY CONSENSUS STANDARD	EPA'S COMMENTS ON VOLUNTARY CONSENSUS STANDARD
EPA Method 5	ASME B133.9-1994 (2001) - Measurement of Exhaust Emissions from Stationary Gas Turbine Engines (Revision of ANSI B133.9-1979)	Not a quantitative method, per se, although a good primer for this source category that includes technical descriptions of manual and instrumental sampling procedures, as well as performance specifications for instrumental methods. This standard has many good references, including the EPA Methods and Performance Specifications. (ECR, >00) ***ONLY USE FOR ENGINES AND TURBINES*** **DO NOT USE AT ALL? NOT A METHOD.**
EPA Method 5	ISO 9096:1992 (2003) - Determination of Concentration and Mass Flow Rate of Particulate Matter in Gas Carrying Ducts Manual Gravimetric Method	Although sections of ISO 9096 incorporate EPA Methods 1, 2, and 5 to some degree, this ISO standard is not equivalent to EPA Method 5 for collection of particulate matter. The standard ISO 9096 does not provide applicable technical guidance for performing many of the integral procedures specified in Methods 1, 2, and 5. Major performance and operational details are lacking or nonexistent, and detailed quality assurance/quality control guidance for the sampling operations required to produce quality, representative particulate data (e.g., guidance for maintaining and monitoring train operating temperatures, specific leak check guidelines and procedures, and sample preparation and recovery procedures) are not provided by

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		the standard, as in EPA Method 5. Also, details of equipment and/or operational requirements, such as those specified in EPA Method 5, are not included in the ISO standard, e.g., stack gas moisture measurements, data reduction guidance, and particulate sample calculations.
EPA Method 5	ANSI/ASME PTC-38-1980 (1985) - Determination of the Concentration of Particulate Matter in Gas Streams	This standard also includes procedures similar to EPA Methods 1 and 2. The difference between this standard and EPA Methods 5 and 17 is, in general, that ASME PTC-38-80 is not specific about equipment requirements, and instead presents the options available and the pro's and con's of each option. The key specific differences between ASME PTC-38-80 and the EPA methods are that the ASME standard: 1) allows in-stack filter placement as compared to the out-of-stack filter placement in EPA Methods 5 and 17; 2) allows many different types of nozzles, pitots, and filtering equipment; 3) does not specify a filter weighing protocol or a minimum allowable filter weight fluctuation as in the EPA methods; and 4) allows filter paper to be only 99 percent efficient, as compared to the 99.95 percent efficiency required by the EPA methods.
EPA Method 5	ASTM D3685/D3685M-13 - Test Methods for Sampling and Determination of Particulate Matter in Stack Gases	This ASTM standard is similar to EPA Methods 5 and 17, but is lacking in the following areas that are needed to produce quality, representative particulate data: 1) requirement that the filter holder temperature should be between 120°C and 134°C, and not just above the acid dew-point; 2) detailed specifications for measuring and monitoring the filter holder temperature during sampling; 3) procedures similar to EPA Methods 1, 2, 3, and 4, that

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		are required by EPA Method 5 and 17; 4) technical guidance for performing the Method 5 and 17 sampling procedures, e.g., maintaining and monitoring sampling train operating temperatures, ***specific leak check guidelines and procedures*** *(delete?)*, and use of reagent blanks for determining and subtracting background contamination; and 5) detailed equipment and/or operational requirements, e.g., component exchange leak checks, use of glass cyclones for heavy particulate loading and/or water droplets, operating under a negative stack pressure, exchanging particulate loaded filters, sampling preparation and implementation guidance, sample recovery guidance, data reduction guidance, and particulate sample calculations input.
EPA Methods 5	CAN/CSA Z223.1-M1977 - Method for the Determination of Particulate Mass Flows in Enclosed Gas Streams	Detailed technical procedures and quality control measures that are required in EPA Methods 1, 2, 3, and 4 are not included in CAN/CSA Z223.1. Secondly, CAN/CSA Z223.1 does not include in its filter weighing procedures the EPA Method 5 requirement to repeat weighing every six hours until a constant weight is achieved. Third, EPA Method 5 requires the weight to be reported to the nearest 0.1 mg, while CAN/CSA Z223.1 requires only weighing to the nearest 0.5 mg. Lastly, CAN/CSA Z223.1 allows the use of a standard pitot for velocity measurement when plugging of the tube opening is not expected to be a problem, whereas EPA Method 5 requires an S-shaped pitot.
EPA Methods	ANSI/ASME PTC 19-10-1981- Part 10 Flue and	This standard includes manual and instrumental methods of

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6C,7E,10,10B	Exhaust Gas Analyses	analyses for carbon dioxide (CO_2), carbon monoxide (CO), hydrogen sulfide (H_2S), nitrogen oxides (NOx), oxygen (O_2), and sulfur dioxide (SO_2). The VCS method analytes that include one or more of the same techniques as the EPA methods are as follows: CO_2 [manual (3B, 6A and 6B) and instrumental (3A and 3C)]; CO [manual (3B) and instrumental (10 and 10B)], H_2S [manual (15A and 16A) and instrumental (15, 16, and 16B)], NOx [manual (7 and 7C) and instrumental (7A, 7B, 7E, 20)], O_2 [manual (3B) and instrumental (3A, 3C, 20)], and SO_2 [manual (6, 6A, 6B, 20) and instrumental (6C)]. ***The manual methods*** are all acceptable alternatives to the corresponding EPA test methods (3B, 6, 6A, 6B, 7, 7C, 15A, 16A, 20 (SO_2 part of 20 only)). [Note that one of the standard's manual SO_2 procedures incorporates EPA Method 6 in its entirety]. For the standard's instrumental procedures, only general descriptions of the procedures are included which are not true methods. Therefore, the ***instrumental procedures*** (3A, 3C, 6C, 7A, 7B, 7E, 10, 10B, 15, 16, 16B, 20 (NOx part of 20 only)) are not acceptable alternatives to the corresponding EPA methods.
EPA Methods 5	ISO 10396:1993 (2007) - Stationary Source Emissions: Sampling for the Automated Determination of Gas Concentrations ASTM D5835-95 (2013) - Standard Practice for Sampling Stationary Source Emissions for Automated Determination of Gas Concentration	This standard is similar to EPA Methods 3A, 6C, 7E, 10, 20 (nitrogen oxides and oxygen parts of 20 only), ALT 004, CTM 022, but lacks in detail and quality assurance/quality control requirements. Specifically, ISO 10396 does not include the following: 1) sensitivity of the method; 2) acceptable levels of analyzer calibration error; 3) acceptable levels of sampling system bias; 4) zero drift

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		and calibration drift limits, time span, and required testing frequency; 5) a method to test the interference response of the analyzer; 6) procedures to determine the minimum sampling time per run and minimum measurement time; 7) specifications for data recorders, in terms of resolution (all types) and recording intervals (digital and analog recorders, only). This standard is also very similar to ASTM D5835.
EPA Methods 10	ASTM D6522-11 - Standard Test Method for the Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Concentrations in Emissions from Natural Gas-Fired Reciprocating Engines, Combustion Turbines, Boilers and Process Heaters Using Portable Analyzers ***(previously ASTM Z7773Z***	ASTM D6522 has been determined to be technically appropriate for identifying nitrogen oxides, carbon monoxide, and oxygen concentrations when the fuel is natural gas
EPA Method 10	ISO 12039:2001 - Stationary Source Emissions Determination of Carbon Monoxide, Carbon Dioxide, and Oxygen Automated Methods	This method is similar to EPA Methods 3A, 10, and 20 (oxygen portion of 20 only). However, ISO 12039 is missing some key features. In terms of sampling, the hardware required by ISO 12039 does not include a 3-way calibration valve assembly or equivalent to block the sample gas flow while calibration gases are introduced. In its calibration procedures, ISO 12039 only specifies a two-point calibration while the EPA methods specify a 3-point calibration. Also, ISO 12039 does not specify performance criteria for calibration error, calibration drift, or sampling system bias tests, although checks of these quality control features are required by the ISO standard. In addition, ISO 12039 does not include procedures for removal of CO_2 when CO is being tested, as in EPA Method 10.

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EPA Method 6C, 7E, 10	CAN/CSA Z223.2-M86 (1999) - Method for the Continuous Measurement of Oxygen, Carbon Dioxide, Carbon Monoxide, Sulphur Dioxide, and Oxides of Nitrogen in Enclosed Combustion Flue Gas Streams	This standard is unacceptable as a substitute for EPA Methods 3A, 6C, 7E, 10, 10A, and 20 (nitrogen oxides and oxygen parts of 20 only), since it does not include quantitative specifications for measurement system performance, most notably the calibration procedures and instrument performance characteristics. The instrument performance characteristics that are provided are nonmandatory and also do not provide the same level of quality assurance as the EPA methods. For example, the zero and span/calibration drift is only checked weekly, whereas the EPA methods requires drift checks after each run.
EPA Method 7	ASTM D1608-98 (2009) - Test Method for Oxides of Nitrogen in Gaseous Combustion Products (Pheno-Disulfonic Acid Procedures)	This standard is very similar to EPA Method 7, however there are some key differences. ASTM D1608 variations are as follows (corresponding EPA Method 7 procedures are in parentheses and *italics*): 405 nm absorbance (*410 nm or optimized*); 3 mL of 3% hydrogen peroxide in the absorbing solution (*6 mL 3% hydrogen peroxide*); no shaking of reaction flask to mix before or after sitting (*shake for at least 5 minutes before and 2 minutes after sitting*); overnight sample sitting step (*at least 16 hours sitting*); no wavelength calibration of spectrophotometer (*calibration every 6 months*); prepare calibration curve at minimum every few days (*prepare calibration curve each day that samples are analyzed*); add NaOH to sample until just basic without any quantitative measurement of basicity (*add NH_4OH until pH = 10 as determined by pH paper*).

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EPA Method 7	ISO 11564:1998 - Stationary Source Emissions - Determination of the Mass Concentration of Nitrogen Oxides - NEDA (naphthylethylenediamine)/ Photometric Method	This ISO standard lacks many quality assurance/quality control items, such as: use of recognized analytical grade reagents, vs. EPA Method 7 which specifies ACS analytical grade reagents; no specific leak checking procedures are in ISO 11564; and no quality control procedures for spectrophotometer, spike sample analysis, or audit sample analysis are in ISO 11564. ISO 11564 also uses an alkaline hydrogen peroxide absorbent whereas EPA Method 7C uses alkaline permanganate. ISO 11564 has two methods of introducing the absorbing solution into the sample flask after the gas is sampled, whereas EPA Method 7 introduces the absorbing solution into the flask prior to sampling the gas.
EPA Method 7	CAN/CSA Z223.24-M1983 - Method for the Measurement of Nitric Oxide and Nitrogen Dioxide in Air	This standard does not cover the range of the EPA method or this regulation. CAN/CSA Z223.24 only applies up to 20 mg/m^3, whereas the EPA Method 7 range is 400 mg/m^3. Also, there are no specific quality assurance/quality control requirements for the spectrophotometer in CAN/CSA Z223.24. Performance specifications for the spectrophotometer are not required but are listed for consideration only and are said to be dependent upon the application of the method. Spectrophotometer wavelength

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		calibration procedures are not included in CAN/CSA Z223.24 and the frequency of other calibration procedures is said to be a function of the instrument quality and required accuracy of measurement vs. the required six-month calibration period of EPA Method 7.
EPA Method 10, 10A	CAN/CSA Z223.21-M1978 - Method for the Measurement of Carbon Monoxide: 3 Method of Analysis by Non-Dispersive Infrared Spectrometry	This standard is not acceptable as an alternative to EPA Methods 10 and 10A because it is lacking in the following areas: 1) sampling procedures; 2) procedures to correct for the carbon dioxide concentration; 3) instructions to correct the gas volume if CO_2 traps are used; 4) specifications to certify the calibration gases are within 2 percent of the target concentration; 5) mandatory instrument performance characteristics (e.g., rise time, fall time, zero drift, span drift, precision); 6) quantitative specification of the span value maximum as compared to the measured value: the standard specifies that the instruments should be Acompatible with the concentration of gases to be measured, whereas EPA Method 10 and 10A specify that the instrument span value should be no more than 1.5 times the source performance standard.
EPA Method 10	ASTM D3162-12 - Standard Test Method for Carbon Monoxide in the Atmosphere (Continuous Measurement by Nondispersive Infrared Spectrometry)	This ASTM standard, which is stated to be applicable in the range of 0.5 - 100 ppm CO, does not cover the range of EPA Method 10 (20 - 1000 ppm CO) at the upper end but claims to have a lower limit of sensitivity. Also, ASTM D3162 does not provide a procedure to remove carbon dioxide interference. Therefore, this ASTM standard is not appropriate for combustion source conditions. In terms of

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		NDIR instrument performance specifications, ASTM D3162 has much higher maximum allowable rise and fall times (5 minutes) than EPA Method 10 (which has 30 seconds).
EPA Method 18	ASTM D6060-96 (2009) - Practice for Sampling of Process Vents with a Portable Gas Chromatography	This ASTM standard lacks key quality control and assurance requirements included in EPA Method 18. For example, ASTM D6060: 1) lacks the requirement of three reference standards in triplicate; 2) lacks the calibration acceptance criteria that the triplicate calibration standards agree within 5 percent of their average; 3) lacks a post-sampling volume flow rate check and requirement to repeat the test if the pre- and post-test flowrates differ by more than 20 percent; 4) lacks triplicate samples for recovery tests and allows a 15 percent difference between the pre-test and recovery test data vs. 10 percent for Method 18; 4) lacks the accuracy performance criteria of 10 percent of the preparation value for audit samples; 5) lacks reporting/documentation requirements. Also, ASTM D6060 does not include procedures for sample collection using other media, such as bags and solid sorbents.
EPA Method 25A	ISO 14965:2000(E) - Air Quality Determination of Total Nonmethane Organic Compounds Cryogenic Preconcentration and Direct Flame Ionization Method	This standard is an impractical alternative to EPA Method 25 or 25A because it does not measure solvent process vapors in concentrations greater than 10 ppm carbon. A method whose upper limit is 10 ppm carbon has a measurement range too limited to be useful in measuring source emissions.
EPA Method 25A	EN 12619 (1999) - Stationary Source Emissions Determination of the Mass Concentration of Total	This standard is an impractical alternative to EPA Method 25 or 25A because it does not measure solvent process

SIMILAR EPA STANDARD REFERENCE METHOD	VOLUNTARY CONSENSUS STANDARD	EPA'S COMMENTS ON VOLUNTARY CONSENSUS STANDARD
	Gaseous Organic Carbon at Low Concentrations in Flue Gases Continuous Flame Ionization Detector Method	vapors in concentrations greater than 40 ppm carbon. A method whose upper limit is 40 ppm carbon has a measurement range too limited to be useful in measuring source emissions.