



OFFICE OF TRANSPORTATION AND AIR QUALITY

WASHINGTON, D.C. 20460

July 23, 2024

Mr. Chris Northington
Red Leaf RNG, LLC
435 Joe Hall Drive
Ypsilanti, MI 48197

Dear Mr. Northington:

This letter is in response to your alternative measurement protocol (AMP) submission of March 11, 2024, under 40 CFR 80.155(a)(3). In your letter, you requested that EPA approve the use of Coriolis style flow meters that meet the voluntary consensus standard board method AGA Report No. 11 as an alternative to the flow meters specified at 40 CFR 80.155(a)(2).¹

The regulations at 40 CFR 80.155(a) specify that the volume of biogas, renewable natural gas, and renewable compressed natural gas or liquified natural gas must be continuously measured using specified flow meters. The regulations allow for EPA to approve an alternative measurement protocol under 40 CFR 80.155(a)(3) if a party demonstrates that they are unable to continuously measure using the specified methods and the party demonstrates that the alternative measurement protocol is at least as accurate and precise as the specified methods. The regulations at 40 CFR 80.135(c)(3)(iii) and (d)(3)(iii) outline the requirements for biogas production and RNG production facilities, respectively, to request an alternative measurement protocol under 40 CFR 80.155(a)(3).

Your submission included information that described how Coriolis style flow meters that meet AGA Report No. 11 conduct measurement, listed applicable voluntary consensus standards bodies, described routine maintenance and calibration for Coriolis style flow meters, described the measurement frequency of Coriolis style flow meters, and included a comparison with supporting data between the accuracy, precision, and reliability of the alternative measurement protocol and the requirements specified in 40 CFR 80.155(a)(2).

¹ Note that in your submission, you stated that the VCSB method API MPMS Chapter 14.9 is equivalent to AGA Report No. 11. Based on our review of both standards, we agree that the two methods are equivalent and for purposes of this letter, the term "AGA Report No. 11" includes both AGA Report No. 11 and API MPMS Chapter 14.9.

Based on our review of your March 11, 2024, submission and the voluntary consensus standards listed in your AMP submission, the EPA approves your March 11, 2024 AMP submission and a biogas producer or RNG producer may register its facility to use Coriolis style flow meters that meet AGA Report No. 11 under 40 CFR 80.155(a)(3) so long as the producer meets the conditions specified in the attachment and all other applicable regulatory requirements at 40 CFR part 80, subpart E.

We note that your submission and this AMP approval do not address whether a specific facility satisfies the criteria for the approval of an AMP under 40 CFR 80.155(a)(3)(i). A facility that intends to use Coriolis style flow meters covered under this AMP approval must address this criterion in its registration submission as described in the regulations at 40 CFR 80.135(c)(3)(iii)(A) or (d)(3)(iii)(A), as applicable.

If you have any questions related to this general AMP approval, please contact Robert Anderson at anderson.robert@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Byron Bunker", is positioned above the typed name.

Byron Bunker, Director
Implementation, Analysis and Compliance Division
Office of Transportation and Air Quality

EPA Determination that Coriolis style flow meters that meet AGA Report No. 1 meet the requirements for an alternative measurement protocol under 40 CFR 80.155(a)(3)(ii)

Summary

On March 11, 2024, Red Leaf RNG, Inc. submitted an alternative measurement protocol request under 40 CFR 80.155(a)(3)(ii). The regulations at 40 CFR 80.155(a) specify that the volume of biogas, renewable natural gas (RNG), and renewable compressed natural gas (CNG) or liquified natural gas (CNG) must be continuously measured using specified flow meters. The regulations allow for EPA to approve an alternative measurement protocol under 40 CFR 80.155(a)(3) if a party demonstrates that they are unable to continuously measure using the specified methods and the party demonstrates that the alternative measurement protocol is at least as accurate and precise as the specified methods. The regulations at 40 CFR 80.135(c)(3)(iii) and (d)(3)(iii) outline the requirements for biogas production and RNG production facilities, respectively, to request an alternative measurement protocol under 40 CFR 80.155(a)(3).

Based on EPA staff review of the March 11, 2024, and EPA has determined that Coriolis style flow meters are as precise, accurate, and reliable as meters specified at 40 CFR 80.155(a)(1) so long as a facility installs, operates, calibrates, and maintains the meter consistent with AGA Report No. 11.

The following sections describe how the March 11, 2024, submission satisfies the applicable regulatory requirements at 40 CFR 80.135 and 80.155, and how biogas and RNG production facilities using Coriolis style flow meters must submit as part of their registration submissions under 40 CFR 80.135.

Description and VCSB standards

The regulations at 40 CFR 80.135(c)(3)(iii)(B)-(C) and 80.135(d)(3)(iii)(B)-(C) require a description of how measurement would be conducted under the alternative measurement product and a description of any standards or specifications that apply for the measurement of biogas and RNG, respectively. Any Coriolis meter submission under the AGA 11, must include a description of the specific Coriolis style flow meters and data that demonstrate how the meter meets specification in AGA Report No. 11 and any other flow meter standards. A list of standards could include:

- AGA Report No. 11; and
- API MPMS Chapter 14.9 Measurement of Natural Gas by Coriolis Meter;
- ISO 10790 Measurement of fluid flow in closed conduits – Guidance to the selections, installation, and use of Coriolis flowmeters (mass flow, density, and volume flow measurements;
- API – MPMS 5.6 Measurement of Liquid Hydrocarbons by Coriolis Meters;
- ISO /IEC 17025 General requirements for the competence of testing and calibration laboratories
- ASME PTC 19.5-2022 Flow Measurement
- ASME MFC-11-6 Measurement of Fluid Flow by Means of Coriolis Mass Flowmeter
- OIML R-137 Gas meters Part 1 : Metrological and technical requirements and Part 2 : Metrological controls and performance tests

Any facility wishing to utilize this general AMP approval must note in their registration submission under 40 CFR 80.135 that they are using a Coriolis style flow meter as described in this AMP approval letter and must note in their registration submission under 40 CFR 80.135 that they intend to use Coriolis style flow meters that meets at a minimum AGA Report No. 11 installed at their facility.²

Calibration and maintenance

The regulations at 40 CFR 80.135(c)(3)(iii)(D) and 80.135(d)(3)(iii)(D) require a description of all routine maintenance and the frequency that such maintenance will be conducted for an alternative measurement protocol.

AGA 11 Section 5.5.2 Alternative Calibration Fluids states the meter performance dependencies on differing calibration fluids and indicates that calibration adjustment factors may need to be applied to the meter for a fluid not identical to the calibration fluid. If the Coriolis flowmeter is calibrated with water or other fluid not identical to RNG, the equivalency to RNG flow must be demonstrated. Based on our review of the VCSB standards cited in your March 11, 2024, submission, calibration must be performed according to procedures in AGA 11 Section 5.5 or a similar standard such as ASME PTC 19.5-2022, ASME MFC-11-6 or ISO/IEC 10790 at a competent calibration laboratory (e.g., ISO/IEC 17025). Any facility wishing to utilize this general AMP approval must note in their registration submission under 40 CFR 80.135 that the facility intends to meet the calibration specifications in AGA 11, ASME PTC 19.5-2022, ASME MFC-11-6, and ISO/IEC 17025 or describe an alternative maintenance and calibration procedure. If utilizing an alternative calibration procedure, the facility must describe how the alternative will ensure proper operation of the meter in their registration submission.

Based on our review of your submission, the maintenance procedures you specified in AGA 11 Section 9 Field Maintenance and Performance Testing should help ensure reliable operation of Coriolis style flow meters if followed. Any facility wishing to utilize this AMP approval must note that they intend to follow the AGA 11 Section 9 Field Maintenance and Performance Testing specifications. If utilizing an alternative maintenance procedure, the facility must describe how the alternative will ensure proper operation of the meter in their registration submission.

Measurement frequency

The regulations at 40 CFR 80.135(c)(iii)(E) and 80.135(d)(iii)(E) require facilities to submit a description of the frequency of all measurements and how often such measurements will be recorded under the alternative measurement protocol. AGA 11 does not state a frequency of measurement protocol. Producers utilizing AGA 11 for acceptance for use of a Coriolis meter must demonstrate in their registration submissions that their Coriolis meter(s) can measure and record data at a minimum of every one (1) second consistent within the definition of continuous measurement at 40 CFR 80.2.³

² Note, the facility should not submit copies of referenced VCSB standards as part of their registration submission.

³ The regulations at 40 CFR 80.2 define "continuous measurement" as "the automated measurement of specified parameters of biogas, treated biogas, or natural gas as follows: (1) For in-line GC meters, automated measurement must occur and be recorded no less frequent than once every 15 minutes. (2) For flow meters, automated measurement must occur no less frequent than once every 6 seconds, and weighted totals of such measurement must be recorded at no more than 1 minute intervals. (3) For all other meters, automated measurement and recording must occur at a frequency specified at registration."

Any facility wishing to utilize this general AMP approval must include a description of the frequency of measurement and how often such measurements will be recorded as part of their registration submission under 40 CFR 80.135. If the facility intends to meet the frequency specified in the definition of continuous measurement at 40 CFR 80.2, the facility should note that. If the facility wishes to use a less frequent measurement or recording frequency, the facility must specify what that frequency is and include a demonstration over how that frequency will result in measurement equivalent or better than the specified measurement and recording rates for continuous measurement at 40 CFR 80.2.

Accuracy, precision, and reliability comparison

The regulations at 40 CFR 80.135(c)(3)(iii)(F) and 80.135(d)(3)(iii)(F) require a comparison between the accuracy, precision, and reliability of the alternative measurement protocol and the requirements specified in 40 CFR 80.155(a)(1) and (2), as applicable, including any supporting data. In your March 11, 2024, submission, you included information including supporting data that compared the accuracy, precision, and reliability of Coriolis style flow meters and meters specified at 40 CFR 80.155(a)(1).

Based on our review of your March 11, 2024, submission, the listed VCSB standards, and other submissions requesting AMPs for Coriolis style flow meters, we have determined that Coriolis style flow meters that meet AGA Report No. 11 are as accurate, precise, and reliable as flow meters specified at § 80.155(a)(2) as long as producer demonstrates that the Coriolis style flow meters are selected for use, as per the guidelines in AGA 11 Section 6, and are compliant with the minimum accuracy and repeatability specifications in AGA 11 Section 7.

Any facility using Coriolis style flow meters covered under this AMP approval should note in their registration submission under 40 CFR 80.135 that they are relying on EPA's determination in this letter to demonstrate the comparison of accuracy, precision, and reliability of Coriolis style flow meters that meet AGA Report No. 11 and the meters specified at 40 CFR 80.155(a)(2) and describe how their Coriolis style flow meters comport with AGA 11 Sections 6 and 7.