



**DNREC – Air Quality Management Form
CO₂ Budget Trading Program
Monitoring & Verification Report – Avoided Methane
Emissions from Agricultural Manure Management**

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COVERSHEET

Each of the following Forms must be completed. Check the boxes below to indicate that the submitted *Monitoring & Verification Report* includes each of the required Forms:

PART 1. Preliminary Information Forms

- Form 1.1 – General Information
- Form 1.2 – Project Sponsor Attestations
- Form 1.3 – Project Sponsor Agreement
- Form 1.4 – Disclosure of Greenhouse Gas Emissions Data Reporting

PART 2. Category-Specific Information and Documentation Forms

- Form 2.1 – Demonstration of Conformance with M&V Plan
- Form 2.2 – Determination of Emissions Reduction

PART 3. Independent Verification Form

- Form 3.1 – General Information
- Form 3.2 – Independent Verifier Certification Statement and Report



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Form 1.1 – General Information

| | | | |
|---|-----------------------|----------------------|----------------|
| Project Sponsor (RGGI COATS Authorized Account Representative) | | | |
| Telephone Number | Fax Number | Email Address | |
| Street Address | | | |
| City | State/Province | Postal Code | Country |

| |
|--|
| RGGI COATS General Account Name |
| RGGI COATS General Account Number |

| | | | |
|--|-------------------------|----------------------|----------------------------------|
| Offset Project ID Code | Application Date | | |
| Brief Description of Offset Project | | | |
| Project City | Project County | Project State | Project Commencement Date |

| | | | |
|--|-----------------------|--------------------|----------------|
| Project Sponsor Organization | | | |
| Primary Street Address | | | |
| City | State/Province | Postal Code | Country |
| Brief Description of Project Sponsor Organization | | | |
| Telephone Number | | Website URL | |



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Form 1.2 – Project Sponsor Attestations

The undersigned offset Project Sponsor certifies the truth of the following statements:

1. All offset projects for which the Project Sponsor has received CO₂ offset allowances, under the Project Sponsor’s or project sponsor organization’s ownership or control (or under the ownership or control of any entity which controls, is controlled by, or has common control with the Project Sponsor or project sponsor organization) are in compliance with all applicable requirements of the CO₂ Budget Trading Program in all participating states.
2. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this *M&V Report* and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Project Sponsor signature

date

printed name

title

organization

notary

signature of licensed professional engineer

name of licensed professional engineer

license number(s)

license state(s)



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Form 1.3 – Project Sponsor Agreement

The undersigned Project Sponsor recognizes and accepts that the application for, and the receipt of, CO₂ offset allowances under the CO₂ Budget Trading Program is predicated on the Project Sponsor following all the requirements of 7 DE Reg. 1147. The undersigned Project Sponsor holds the legal rights to the offset project, or has been granted the right to act on behalf of a party that holds the legal rights to the offset project. The Project Sponsor understands that eligibility for the award of CO₂ offset allowances under 7 DE Reg. 1147, is contingent on meeting the requirements of 7 DE Reg. 1147. The Project Sponsor authorizes the Department or its agent to audit this offset project for purposes of verifying that the offset project, including the Monitoring and Verification Plan, has been implemented as described in this application. The Project Sponsor understands that this right to audit shall include the right to enter the physical location of the offset project. The Project Sponsor submits to the legal jurisdiction of the State of Delaware.

Project Sponsor Signature

Printed Name

Title

Organization

Date

Notary



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Form 1.4 – Disclosure of Greenhouse Gas Emissions Data Reporting

Check the box below that applies:

- No greenhouse gas emissions data related to the offset project referenced in this *M&V Report* have been or will be reported to a voluntary or mandatory program other than the CO₂ Budget Trading Program.
- Greenhouse gas emissions data related to the offset project referenced in this *M&V Report* have been or will be reported to a voluntary or mandatory program other than the CO₂ Budget Trading Program. Information for all such programs to which greenhouse gas emissions data have been or will be reported is provided below.

Name of Program to which GHG Emissions Data Reported

Check all that apply:

- Reporting is currently ongoing *Enter Frequency of Reporting*
- Reporting was conducted in the past
- Reporting will be conducted in the future *Enter Reporting Start Date*
- Reporting is mandatory
- Reporting is voluntary

Program Contact Information – Address

Program Website

Categories of Emissions Data Reported

Name of Program to which GHG Emissions Data Reported

Check all that apply:

- Reporting is currently ongoing *Enter Frequency of Reporting*
- Reporting was conducted in the past
- Reporting will be conducted in the future *Enter Reporting Start Date*
- Reporting is mandatory
- Reporting is voluntary

Program Contact Information – Address

Program Website

Categories of Emissions Data Reported

Add extra pages as needed.



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Form 2.1 – Demonstration of Conformance with M&V Plan

Table 1. Quality Assurance/Quality Control (QA/QC) Program

| <p>Attach documentation that procedures and protocols specified in the M&V Plan were performed and records specified in the M&V Plan were generated and retained. Each attachment must include a header that indicates it is an attachment to Form 2.1 and includes the offset project name and offset project ID code.</p> | |
|---|--|
| <p>Procedures and Documentation Required by the M&V Plan</p> | <p>Documentation Provided (check the boxes to indicate attachment of required documentation)</p> |
| <p>1. Procedures for recording names and contact information for the personnel responsible for project monitoring and documentation</p> | <p><input type="checkbox"/> List of the individuals responsible for influent monitoring, digester biogas monitoring, and the third-party laboratory used to verify biogas methane concentration, including contact names by location</p> |
| <p>2. Procedures for recording names and contact information for the personnel responsible for QA/QC of project monitoring and documentation</p> | <p><input type="checkbox"/> List of the individuals responsible for QA/QC of project monitoring, including contact names by location</p> |
| <p>3. Procedures for the compilation of an annual QA/QC report summarizing findings of QA/QC activities conducted and any remedial actions taken</p> | <p><input type="checkbox"/> Annual QA/QC report summarizing all QA/QC activities conducted and remedial actions taken</p> |
| <p>4. Procedures, if applicable, for annual comparison of methane generated by anaerobic digester, as measured by monitoring equipment, with estimated methane used to generate electricity, as derived from electric generation records</p> | <p><input type="checkbox"/> Copy of annual comparison of methane generated by the anaerobic digester with estimated methane used to generate electricity, including calculations and data used</p> |
| <p>5. Procedures for documenting installation and retirement of equipment for monitoring biogas volumetric flow and methane concentration</p> | <p><input type="checkbox"/> Records of biogas monitoring equipment installed or retired</p> |
| <p>6. Procedures for quarterly third-party laboratory analysis of methane concentration of sampled digester biogas using U.S. EPA-approved laboratory testing methods, including specification of the testing method to be used</p> | <p><input type="checkbox"/> List of EPA-approved test procedures used <input type="checkbox"/> Copy of third-party laboratory analysis report of methane concentration of sampled digester biogas and date of analysis</p> |



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Table 1. Quality Assurance/Quality Control (QA/QC) Program (continued)

| Procedures and Documentation Required by the M&V Plan | Documentation Provided (check the boxes to indicate attachment of required documentation) |
|---|---|
| 7. Procedures to ensure that biogas samples will be taken at the same location as the digester biogas flow meter | <input type="checkbox"/> Signed documentation by sampling technician that digester biogas samples were taken at location of digester biogas flow meter |
| 8. Procedures for QA/QC of influent monitoring data for each facility providing manure or organic food waste to the anaerobic digester | <input type="checkbox"/> List of procedures performed during the reporting period |
| 9. For regional-type digesters, procedures for compilation of monthly receipts and records of manure and organic food waste (kg) received for input into the anaerobic digester from each facility providing manure or organic food waste influent | <input type="checkbox"/> Copies of monthly receipts and records of manure and organic food waste (kg) supplied to the anaerobic digester from each off-site facility |
| 10. For regional-type digesters, for each facility providing organic food waste influent, procedures for ensuring that daily food waste input to the on-site storage tank prior to shipment to the anaerobic digester is at least 1/30 of the total storage tank capacity | <input type="checkbox"/> Copy of monthly records of daily monitoring of the timing and quantities of food waste input to the on-site storage tank and the timing and quantity of influent shipped to the anaerobic digester |
| 11. For regional-type digesters, for each facility providing manure influent, procedures for ensuring that daily manure input to the on-site storage tank or pond prior to shipment to the anaerobic digester is at least 1/30 of the total storage tank capacity | <input type="checkbox"/> Copy of monthly records of daily monitoring of the timing and quantities of manure input to the on-site storage tank or pond and the timing and quantity of influent shipped to the anaerobic digester |



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Table 2. Measuring and Monitoring Equipment Maintenance, Operation, and Calibration

| Procedures and Documentation Required by the M&V Plan | Documentation Provided (check the boxes to indicate attachment of required documentation) |
|--|---|
| 1. Monthly records of digester biogas flow rate performance tests to ensure: (1) flow readings are being recorded at least every 15 minutes; (2) the accuracy of digester biogas flow meter readings is within +/- 5 percent of manufacturer specifications; and (3) methane concentration instrument manufacturer specifications for precision and accuracy are met | <input type="checkbox"/> Copy of monthly biogas flow rate performance tests <input type="checkbox"/> Copy of data for one sample day per month of flow meter readings in intervals of at least 15 minutes |
| 2. Records of the type of biogas flow meter installed (differential pressure or hot wire anemometer) | <input type="checkbox"/> Copy of specification sheet for the biogas flow meter installed |
| 3. Records of the date and location of flow meter installation | <input type="checkbox"/> Copy of flow meter installation information, including date and location |
| 4. Records of performance of maintenance schedules for digester biogas flow meter and methane concentration instrument in accordance with manufacturer recommendations and specifications | <input type="checkbox"/> Copies of maintenance schedules and records of maintenance activity conducted <input type="checkbox"/> Copy of manufacturer recommended maintenance schedule and specifications for digester biogas flow meter and methane concentration instrument |
| 5. Daily records of collected digester biogas flow rates | <input type="checkbox"/> Copies of records of daily measured digester biogas flow rates |
| 6. Weekly or daily records of methane concentration (daily records if onsite continuous methane concentration analyzer used) | <input type="checkbox"/> Copies of weekly or daily records of methane concentration (daily records if onsite continuous methane concentration analyzer used) |



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Table 2. Measuring and Monitoring Equipment Maintenance, Operation, and Calibration

| Procedures and Documentation Required by the M&V Plan | Documentation Provided (check the boxes to indicate attachment of required documentation) |
|---|--|
| 7. Monthly records of calculation of digester biogas flow rate standardization (in standard cubic feet) to correct for site-specific pressure and temperature measurements (note, this procedure is not necessary when using flow meters that automatically measure temperature and pressure and express digester biogas flow in standard cubic feet) | <input type="checkbox"/> Monthly calculation records of standardization of daily digester biogas flow from recorded cubic feet per day to standard cubic feet per day |
| 8. Monthly records of field data used for flow measurement standardization, including barometric pressure and biogas temperature and pressure measurements (note, not applicable when using flow meters that automatically measure temperature and pressure and express digester biogas flow in standard cubic feet) | <input type="checkbox"/> Copies of records of field data used for digester biogas flow measurement standardization |
| 9. Monthly records of the number of hours the digester biogas flow meter was inoperable | <input type="checkbox"/> Copies of monthly records of the number of hours the digester biogas flow meter was inoperable (in hours per month) |
| 10. Monthly records of the amount of methane combusted (in standard cubic feet) in the combustion device | <input type="checkbox"/> Copies of monthly records of the amount of methane combusted (in standard cubic feet) in the combustion device |
| 11. Monthly records of electric generation and heat rate (in Btu/kWh) (note, only applicable to offset projects with an electric generation component) | <input type="checkbox"/> Copies of monthly records of electric generation <input type="checkbox"/> Copies of monthly records from source tests showing the measured heat rate, or copies of monthly records used to derive heat rate based on MMBtu of heat input and KWh of electricity generation |



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Table 2. Measuring and Monitoring Equipment Maintenance, Operation, and Calibration

| Procedures and Documentation Required by the M&V Plan | Documentation Provided (check the boxes to indicate attachment of required documentation) |
|--|---|
| 12. Annual records of the calibration procedures conducted for digester biogas flow meter in accordance with manufacturer specifications | <input type="checkbox"/> List of calibration activities conducted and receipts for services rendered if performed by outside contractor <input type="checkbox"/> List of manufacturer recommendations for calibration of digester biogas flow meter |
| 13. Records of the dates and results of digester flow meter calibration, and the portable instrument and procedures used to check installed flow meter accuracy, including field measurements and flow calculations | <input type="checkbox"/> List of dates of digester flow meter calibration <input type="checkbox"/> Copy of calibration field measurement data and flow calculations, and the portable instrument and procedures used to check installed flow meter accuracy |
| 14. Records of calibration procedures conducted for methane concentration monitoring instrument (daily records if applicable to continuous methane concentration monitoring instrument; monthly records if applicable to portable methane concentration monitoring instrument) | <input type="checkbox"/> List of calibration activities conducted and receipts for services rendered if performed by outside contractor <input type="checkbox"/> List of manufacturer recommendations for calibration of methane concentration monitoring instrument |
| 15. Records of the dates and results of methane concentration monitoring instrument calibration (applicable to both continuous methane concentration monitoring instrument and portable methane concentration monitoring instrument) | <input type="checkbox"/> List of dates of methane concentration monitoring instrument calibration <input type="checkbox"/> Copy of calibration field measurement data for methane concentration instrument |



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Form 2.2 – Determination of Emission Reductions

Provide documentation of CO₂-equivalent emissions reductions during the reporting period. Enter information in the fields below and attach documentation, as directed. Each attachment must include a header that indicates it is an attachment to Form 2.2 and includes the offset project name and offset project ID code

Enter the following information:

| | |
|----------------------|--|
| <input type="text"/> | 1. Annual baseline emissions (short tons CO ₂ e) |
| <input type="text"/> | 2. Annual measured volume of methane recovered and destroyed by the anaerobic digester (short tons CO ₂ e) |
| <input type="text"/> | 3. CO ₂ emissions from transportation of manure and organic food waste to the anaerobic digester (short tons CO ₂ e) |
| <input type="text"/> | 4. Annual net emission reductions (short tons CO ₂ e) |

Enter baseline emissions data for each month in the reporting period (if multiple facilities supplied influent to the digester, provide the sum for all facilities):

| Month | VS _p (kg) | VS _{in} (kg) | VS _{out} (kg) | VS _{avail} (kg) | F (unitless) | VS _{deg} (kg) | V _m (scf) | CO ₂ e (short tons) |
|----------------|-------------------------|--------------------------|---------------------------|-----------------------------|----------------------|---------------------------|-------------------------|-----------------------------------|
| January | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| February | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| March | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| April | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| May | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| June | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| July | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| August | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| September | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| October | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| November | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| December | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Total for Year | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | n/a | <input type="text"/> | <input type="text"/> | <input type="text"/> |



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Check the boxes below to indicate that the following required documentation is attached:

- 1. Baseline Emissions. Spreadsheet documenting the data sources and calculations used to quantify baseline CO₂-equivalent emissions for each facility supplying manure and organic food waste influent to the anaerobic digester and the sum of CO₂-equivalent emissions for all such facilities. Monthly records for each facility of influent flow from the facility into the digester, influent total solids concentration (including specified sampling method), and influent volatile solids concentration (including specified sampling method).
- 2. Methane Captured and Destroyed Using Anaerobic Digester. Spreadsheet documenting the procedures, data sources, and calculations used to quantify the annual volume of methane emissions (in standard cubic feet of methane and CO₂-equivalent) captured and destroyed by the anaerobic digester.
- 3. Transport CO₂ Emissions. Spreadsheet documenting the procedures, data sources, and calculations used to quantify CO₂ emissions due to transportation of manure and organic food waste from off-site facilities where manure and organic food waste was generated to the anaerobic digester. Monthly records of transport miles, fuel use, and transport tons, as applicable to the documentation method used.



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Form 3.1 – Independent Verifier General Information

| | | | |
|-------------------------------------|---------------------------|---|----------------|
| Independent Verifier | | States Where Verifier Accredited | |
| Primary Street Address | | Website URL | |
| City | State/Province | Postal Code | Country |
| Point of Contact for Project | | | |
| Contact Telephone Number | Contact Fax Number | Contact Email Address | |
| Contact Street Address | | | |
| City | State/Province | Postal Code | Country |



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Form 3.2 – Independent Verifier Certification Statement and Report

I certify that the accredited independent verifier identified reviewed the *Consistency Application*, including all Forms and attachments, in its entirety, including a review of the following:

1. The verifier has reviewed the entire *M&V Report* and evaluated the contents of the report in relation to the applicable requirements of 7 DE Reg. 1147 and the required information that must be provided in the *M&V Report*.
2. The verifier has evaluated the adequacy and validity of information supplied by the Project Sponsor to determine CO₂-equivalent sequestration in accordance with 7 DE Reg. 1147 and the required documentation that must be provided in the *M&V Report*.
3. The verifier has evaluated the adequacy and consistency of methods used by the Project Sponsor to quantify, monitor, and verify CO₂-equivalent sequestration in accordance with the applicable requirements of 7 DE Reg. 1147 and the Monitoring and Verification Plan submitted as part of the *Consistency Application*.

| | |
|---|---|
| <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <p style="text-align: center;">Verifier Representative Signature</p> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <p style="text-align: center;">Printed Name</p> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <p style="text-align: center;">Title</p> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <p style="text-align: center;">Organization</p> <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <p style="text-align: center;">Date</p> | <hr style="border: 0; border-top: 1px solid black; margin-bottom: 5px;"/> <p style="text-align: center;">Notary</p> |
|---|---|

A verification report is attached that documents the verifier’s review of the entire *M&V Report* in relation to the applicable requirements of 7 DE Reg. 1147 and includes evaluation, conclusions, and findings.