



VERIFICATION REPORT FOR SPARTANBURG COUNTY LANDFILL GAS COMBUSTION PROJECT



Document Prepared By TÜV SÜD America, Inc. -Ruby Canyon

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Prepared By	TÜV SÜD America, Inc., Ruby Canyon Environmental Services
Contact	743 Horizon Court, Suite 385 Grand Junction, CO 81506 970-241-9298 www.rubycanyonenv.com zach.eyler@tuvsud.com
Approved By	Nina Pinette
Work Carried Out By	Bonny Crews and Masury Lynch

Summary:

Ruby Canyon Environmental, Inc. (“RCE”) provided third party greenhouse gas (GHG) emissions verification services to Anew Environmental, LLC (“Anew”) (Project Developer or PD) for its Spartanburg County Landfill Gas Combustion Project (“Project”). RCE was acquired by TÜV SÜD America, Inc. in 2023 (“RCE” will be used throughout the report). This report is provided to Anew as a product of the VCS project verification process for the Spartanburg County Landfill Gas Combustion Project. The Project is located in Spartanburg County, South Carolina, United States (Facility or Site). The project consists of three phase implemented at the Wellford Landfill (“Landfill”). Phase I involves the installation of 103 wells and flaring of the collected biogas. Phase II involves the transport of landfill gas via pipeline to the Milliken Dewey Chemical Plant where the biogas is combusted in two steam boilers and a hot oil boiler. Phase II of the Project involves the destruction of biogas via a Caterpillar 3520 engine-generator unit to produce electricity. All three phases are currently active, and each contributes to the Project reduction of CO₂ equivalents through the avoidance of methane emissions and the displacement of fossil fuel that would otherwise be combusted in the boilers. The project activity is methane destruction only and does not include the generation of renewable energy nor the sale of renewable energy credits (RECs).

The Project’s 2022 Monitoring Report v1.0, dated 29 February, 2024, as well as the validated VCS Project Description v1.9, dated 21 June 2021, served as the basis for the verification scope. The verification was conducted to a reasonable level of assurance, with a 5% materiality threshold. The goal of the verification was to ensure that the claimed GHG emission reductions were real, measurable, permanent, transparent, and conservative, and that the Project conforms to the

requirement of the verification criteria as defined in Section 1.2. Furthermore, the verification activities ensure that the data provided to RCE is well documented and free of any material errors or omissions.

During the verification process, RCE issued one corrective action request, two non-material findings, three additional documentation requests, seven clarifications, and no recommendations for improvement, all of which were promptly and sufficiently addressed by Anew. The Project reported 65,494 metric tons CO₂e for the verification reporting period of January 1, 2022 through December 31, 2022. Ruby Canyon Environmental concludes the Project meets all the relevant VCS requirements, is without material discrepancy, and is verified to a reasonable level of assurance.

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1 INTRODUCTION

1.1 Objective

The goal of the verification was to ensure that the claimed GHG emission reductions were real, measurable, permanent, transparent, and conservative, and that the Project conforms to the requirement of the verification criteria as defined in Section 1.2. Furthermore, the verification activities ensure that the data provided to RCE is well documented and free of any material errors or omissions.

1.2 Scope and Criteria

The scope of the verification consisted of the following independent and objective activities:

- Review the Project Monitoring Report;
- Review the Project data acquisition and quality control procedures;
- Review the Project evidence of environmental and regulatory requirements to ensure the project is additional;
- Review evidence of the emission reductions ownership;
- Review the Project baseline emissions and check that the baseline and Project boundaries have not changed;
- Review the Project emission reduction calculations;
- Review the Project documents and data against the verification criteria in Table 1;
- Conduct a virtual site visit to the Project location;
- Issue requests for additional data, clarifications and corrective actions as necessary; and
- Issue a verification report, list of findings and verification representation to Anew.

Table 1 – Verification Criteria

Criteria	Details
Standard of Verification	• VCS Standard: VCS Version 4.5, 11 December 2023 • Validated VCS Project Description ("PD"), dated 21 June 2021 • Applicable Corrections and Clarifications to the VCS Program Rules and Requirements • Approved methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities," Version 19, 14 June 2019
Verification Process	• VCS Standard • VCS Program Guide: VCS Version 4.4, 29 August 2023 • VCS Validation and Verification Manual, v3.2, 19 October 2016 • ISO 14064-3:2019: Greenhouse gases- Part 3: Specification with guidance for the validation and verification of greenhouse gas statements

Materiality Threshold	5%, meeting the VCS Standard requirements for projects: less than or equal to 300,000 tonnes CO ₂ e per year
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1.3 Level of Assurance

RCE and Anew have agreed upon a reasonable level of assurance for all verification activities as required by VCS.

1.4 Summary Description of the Project

The Wellford Landfill (the “Landfill”) consists of six phases designated as Phases I through VI. Phases I through IV include approximately 65 acres of unlined cells whilst Phase V includes approximately 35 acres of Subtitle D lined landfill. The Landfill is currently operating in Phase VII.

The Spartanburg County Landfill Gas Combustion Project (“the Project”) consists of three stages, all implemented at the Wellford Landfill. Stage one (1) of the Project involves the installation of an active gas collection system, consisting of 103 wells and associated piping, in Phases I through V (with planned future expansion into Phase VI) of the Landfill. The Project now contains more than 103 wells. During this stage, the gas captured from this system is flared, thereby converting methane to biogenic CO₂. As evidenced by the meeting minutes provided by SCS Engineers from April 29, 2010, the project start date is April 29, 2010, when these wells were connected and began extracting and combusting landfill gas (LFG). The system will continue to be expanded throughout the duration of the crediting period. Note that the piping systems and headers for the project LFG collection and control system (LFGCCS) were constructed separately from the pre-project. Since the project’s initial crediting period, the physical piping that allows the pre-project gas stream to mix with the project gas stream has been removed; therefore, quantifying pre-project gas in the emission reduction calculations is not possible.

Stage two (2) of the Project involves the implementation of a beneficial use project, whereby captured biogas will be transported by pipeline approximately 6.5 miles to the Milliken Dewey Chemical Plant (the “Milliken Facility”) for use in its natural gas equipment (i.e. two steam boilers and one hot oil boiler). As part of this stage, gas will be compressed, treated and transported to the Milliken Facility for direct use. The date of commissioning of this phase was June 23, 2011.

Stage three (3) of the Project involves the implementation of a LFG to electricity project, whereby LFG will be sold to Lockhart Power (“Lockhart”) for use in electricity generation. Lockhart will use the captured biogas to generate up to 1.6 MW of electricity using a Caterpillar 3520 engine-generator unit. Note that no emission reductions are claimed for offsetting grid connected electricity generation.

Table 1 below provides a summary of the quantification of emission reductions generated by the project activity from January 1, 2022 – December 31, 2022. The total emission reductions achieved by the project activity till date is 1,168,021 tCO₂e. The average VCU generated annually till date is 73,001 tCO₂e/year.

Summary of Emission Reductions (tonnes CO₂e)

	Jan 1, 2022 – Dec 31, 2022
Baseline Emissions	65,862
Project Emissions	368
Total Emission Reductions	65,494

2 VERIFICATION PROCESS

2.1 Method and Criteria

The current verification began with Anew selecting RCE as the verification body. Prior to starting the verification, RCE developed a verification plan that was followed throughout the verification. The verification plan consisted of the following activities:

- A conflict of interest review which found no potential conflict with the Project or Project Proponents;
- Selection of the RCE verification team;
- A kick-off meeting with the Project Proponents was held on 13 July 2023, during which RCE reviewed the verification objectives, verification process, and the verification schedule and requested the verification background documents;
- RCE performed a strategic analysis and risk assessment of the received data and support documents in order to inform the evidence gathering plan as well as understand the scope and areas of potential risk in the GHG emissions reductions;
- RCE developed a risk-based sampling plan based upon the strategic review and risk assessment. The verification plan and sampling plan were used throughout the verification and were revised as needed based upon additional risk assessments;
- RCE conducted a virtual site visit on 29 November 2023;
- RCE conducted a risk-based desktop review of the submitted verification documents including an assessment of the GHG calculation methods and inputs, source data completeness, GHG management and monitoring systems, evidence of regulatory compliance and record retention practices;
- RCE submitted requests for additional documentation and clarifications as necessary to FCDSW throughout the verification;
- RCE's internal reviewer conducted a review of the verification sampling, verification report, and verification representation;
- RCE prepared a final verification report, verification representation and list of findings;
- RCE held an exit meeting with Anew on 29 February 2024.

2.2 Document Review

During the verification process, RCE conducted an iterative review of the Project Monitoring Reports, the GHG emissions reduction assertion, and the submitted support documentation. These documents were compared to the Project's validated PD and the ACM0001 methodology for consistency and accuracy. Any discrepancies between the Project documentation and the verification criteria are considered material; there were no such discrepancies and thus no corrective actions. Additionally, RCE reviewed the Project GHG emission reductions assertion workbook and data inputs to assess whether there were any material or non-material misstatements.

2.3 Interviews

During the verification, RCE conducted interviews with Anew personnel Bianca Glascott and Sydney Flowerday. RCE maintained communication with Anew throughout the verification process.

2.4 Site Visit

RCE conducted a site visit on 29 November 2023 during the verification. The visit included a review of the Project equipment operation, maintenance, and calibrations, data collection process, a tour of the landfill, and an interview with Scott Thompson, the landfill Operations Manager, who is very familiar with the Project and conducts the regular on-site activities. RCE reviewed with Scott data acquisition and storage procedures, and discussed procedures to review environmental regulations and compliance, Scott described and demonstrated his visual checks on the gas analyzer as well as handheld methane checks to confirm the analyzer output. He also described and demonstrated the monthly autocalibration procedure, as well as the regular visual checks of the flow meters. During the equipment tour, there were discussions of the supplemental propane for the flare and the refill procedures for the propane tank. RCE found the site to be very well maintained and regularly inspected, and operated as described in the Monitoring Report.

2.5 Resolution of Findings

The verification process resulted in one corrective action requests, two requests for additional documentation, and seven clarification requests. See Appendix A for additional detail.

2.5.1 Forward Action Requests

There were no Forward Action Requests.

2.6 Eligibility for Validation Activities

Not applicable; no validation activities conducted.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Not applicable; the Project does not participate in other GHG programs.

3.2 Methodology Deviations

There were no new deviations to the Methodology in the current reporting period. There are 11 previously validated deviations to the Methodology documented in the Project's PD, which have been applied to the current reporting period. RCE reviewed each deviation and concluded all are appropriately applied and remain valid. The deviations are as follows:

1) Grid Electricity Emission Factor

Project emissions associated with electricity consumption are calculated in accordance with CDM Tool 5: "Tool to calculate baseline, project and/or leakage emissions from electricity consumption". Following the Tool, a default grid CO₂ emission factor of 1.3 t CO₂/MWh would be applied. However, given the generation mix and emission intensity of electricity generation from the applicable regional grid, this value is not representative of the emissions associated with electricity generation for the Landfill. A deviation from the methodology is used and the emission factor for electricity generation is determined by examining the electricity grid in the region.

The Landfill draws electricity from the SRVC (SERC Virginia/Carolina) region. According to the USEPA's eGRID database, the emission rate of electricity generation from this grid for 2021 is 639.7 lbs CO₂/MWh. This emission intensity is representative of the actual emissions associated with the generation of electricity used at the site which increases the accuracy of the quantification. This value will be updated in subsequent reporting period to the most recent value available from the eGRID database.

2) Ex Ante Estimate of Emission Reductions

Following the Methodology, project proponents must provide an ex-ante estimate of emission reductions by projecting the future GHG emissions of the Landfill.

Instead of estimating ex-ante baseline methane emissions using the CDM "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", the USEPA LandGEM Landfill Gas Emissions model is used. This is the accepted standard for developing LFG curves in the United States. The LandGEM model requires

the user to input variables to determine the emissions associated with disposal of waste at the solid waste disposal site. For this project, proprietary K and LO values are inputted into the LandGEM model. The use of the LandGEM model is generally accepted as the most accurate way to model landfill gas emissions in the United States and only impacts the estimation of ex-ante emission reductions. It does not impact the conservativeness of emission reduction quantification.

3) Efficiency of the Flare

A deviation from the CDM Tool 6: “Project emissions from flaring” (version 3.0) default value is used as this value is not an accurate representation of the flare efficiencies typically achieved in the United States for flares designed in accordance with 40 CFR 60.18. This deviation from the Tool is necessary to reflect the equipment used and destruction efficiencies commonly observed at the flares located in the United States and to increase the accuracy of the emission reduction claim. A flare efficiency value of 98% will be used in project calculations.

The Landfill operates a PEI candlestick flare to destruct landfill gas. The flare’s design limits specify that landfill gas must have a composition of at least 20% methane to maintain a stable flame and a 98% destruction efficiency. The flow range must be between 30 scfm and 1800 scfm. The average monthly methane content and average monthly flow of landfill gas to the flare will be monitored to ensure they are within design limits.

4) Electricity consumed by the Heat Generation Device

The methodology applied for this Project deviates from the CDM Tool 5: “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 3.0). To determine the amount of electricity consumed by the boilers in the project condition, the power rating of the heat generation equipment in MW is multiplied by the time of operation of said equipment. It is assumed that the heat generation equipment is in operation for 24 hours, which is conservative.

5) Net calorific value of methane

The net calorific value of methane from the NIST Chemistry Webbook will be used instead of the one recommended under Parameter Table 4 of ACM0001. The NIST Chemistry Webbook value represents the most accurate and relevant value for the Project.

6) Emissions factor for stationary combustion of natural gas

The emission factor for stationary combustion of natural gas from the USEPA will be used instead of the 2006 IPCC Guidelines on National GHG Inventories as recommended under Parameter table 5 of AMC0001. The USEPA value represents the most accurate and relevant value for the Project.

7) Reference conditions in the project

The Project uses 60F and 1 atm as standard reference conditions, whereas the Methodology uses 32F and 1 atm as the reference conditions. Flowmeters in the Project correct the gas flow data to the project-specific standard reference conditions. Parameters that are a function of temperature and pressure such as density are taken at the project-specific standard reference conditions.

8) Equation to calculate methane emissions that result from LFG combustion in the flare, heat generation device, and electricity generation device

The method to monitor and measure methane emissions related to the LFG that is destroyed in the project will be modified from its original format as written in CDM Tool 8. This modification is permissible under the VCS standard given that the modification will increase the accuracy of the quantification. For conservativeness, if the amount of eligible project LFG is greater than the amount destroyed, then the destroyed amount is used to multiply by the proportion of LFG that is flared, combusted by electricity generation, and combusted by heat generation. Otherwise, the eligible amount of gas is used to multiply by said proportions. This deviation mitigates the overstatement of emission reductions, which is possible if the eligible LFG project is more than the LFG destroyed.

9) Efficiency of Heat Generation Equipment in Project

The quantity of thermal energy produced utilizing LFG which in the absence of the project activity would have been produced from onsite/offsite fossil fuel fired boiler, Given that Milliken uses LFG in three different units, a deviation is applied in monitoring the heat generation equipment efficiency. Because the amount of LFG combusted is not monitored per heat generation equipment, the quantity of thermal energy displaced by LFG-sourced heat is amalgamated.

Moreover, the heat generation efficiency of the Cleaver-Brooks boilers are established by the manufacturer at 82%. The Carotek heater is rarely used, and thus, a deviation is applied to assume that this efficiency is applicable to all equipment used at the Milliken facility.

10) Operation of the Boiler/Air Heater/Heat Generation Equipment

Rather than measuring operation of the boiler/air heater/heat generating equipment in terms of hours of operation (which would not be accurate given Milliken's concurrent use of natural gas in its boilers), to ensure that all LFG sent to the Milliken boilers is burned and not vented to the atmosphere, Milliken has failsafes built into the control system on each boiler gas train that include two automatic valves that shut anytime the landfill gas line is switched off or the boiler goes down. This stops the flow of gas to the boiler. This deviation pertains to measurement of an operational parameter and does not negatively impact conservativeness in any way.

11) Use of Reference density in the project quantification

Because temperature and pressure are determined to be standard reference values, consequently, density used in the project quantification is the density at the reference temperature and pressure. This is a deviation from CDM Tool 8 which requires project proponents to calculate density based on continuous measurement of temperature and pressure.

In addition, there are two methodology deviations from previous monitoring periods that are applicable to the current monitoring period.

- 1) The PD states that the equations 6-8 (MDflared,y, MDelectricity,y , and MDthermal, y) are calculated by using an equation format such as MDdestructiondevice,y= LFG Project total,y* wCH4,y* DCH4 *Proportion destructiondevice,y, This equation format could result in overstating emission reductions thus a change to the equation is necessary. This overstatement is possible if the LFG eligible project is more than LFG destroyed. Therefore, for conservativeness a comparison of CH4 eligible vs CH4 destroyed is taken into consideration so that emission reductions would not be overstated. This is taken into consideration in the calculations on tabs "Project_Flaring, Project Milliken, Project_Lockhart" in column D. An IF statement is used to determine: If the eligible gas is greater than the amount destroyed:-if true, then the destroyed amount (which is lesser of the two) is used to multiply against the % proportion.-if eligible gas is less than the amount destroyed (false) then the eligible amount of gas (which is less than destroyed) is used to multiply the % proportion.
- 2) Engine flow is measured on a dry basis while corresponding methane is measured on a wet basis. Measuring methane content (along with temperature and pressure) on a wet basis and flow rate on a dry basis result in a conservative calculation of the fraction of methane in the landfill gas. This is because after the gas is de-watered, the methane fraction will be larger, while the overall volume of gas will be smaller. If methane fraction is measured on a wet basis and flow is measured on a dry basis, the resulting figures for methane volume will always be lower than if both measurements were taken on the same basis (both wet or both dry).

3.2.1 Project Description Deviations

There are no deviations to the Project Description that impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario.

There are no deviations to how the project was defined that were applicable in previous monitoring periods and apply during this monitoring period. There are, however, two deviations from how the project was defined in the PD that are applicable to this reporting period. RCE concurs that both project description deviations are valid, justified, and the Project remains in conformance with the VCS rules.

1) Calibration Frequency of Flowmeter at Location 2 (Flare):

As per the PD, the set of flowmeters used to record gas flow at location '2' will be calibrated every 12 to 18 months following manufacturer recommendations. The

flowmeters in question are SN 21996, 21997 and 21998, all Rosemount 2051 differential pressure flow meters. All three flow meters are still used at the facility. However, there is an additional flow meter that was installed with the new flare, SN 22000. The primary flow meters are currently 21998 and 22000. According to the correspondence from the manufacturer, the Rosemount 2051 differential flow meters need to be calibrated every 3.5 years when considering the effects of temperature variation. The meters listed above are calibrated once every 3 years as an additional accuracy measure. Therefore, the calibration frequency deviates from the original specification of every 12 to 18 months. This does not affect the accuracy of the quantification as meters are still calibrated more frequently than recommended by the manufacturer.

2) Flowmeter Serial ID at Location 4 (Milliken Facility):

The flowmeter listed in the PD at location 4 'Milliken Facility' is Flowmeter SN 43317. This flowmeter, however, is located at the delivery point between Lockhart and the Milliken Facility and not at gas skid 2. Flowmeter SN 42055 is located at gas skid 2 and thus, the schematic has been updated to reflect this. SN 42055 records at least approximately every 15 minutes and feeds into the SCADA system. This flowmeter will be used in the quantification. This deviation improves accuracy as the serial ID listed in the PD was not that of the flowmeter used in the quantification. Providing the correct serial ID enables the data to be easily traced back to its source and for the corresponding calibration records to be attached to the correct flowmeter.

3.3 Grouped Project

Not applicable as the Project is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The Project as evaluated during the current verification period was implemented as described in the validated VCS PD and Project Monitoring Report. RCE examined the Project Monitoring Report and found the monitoring system, which includes the process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters, is implemented as described in the Monitoring Report and validated VCS PD. There were no material discrepancies between the actual monitoring system and the monitoring plan set out in the PD and the ACM0001 methodology.

RCE confirmed that the GHG emission reductions generated by the project are not registered with any other GHG program and that the project has neither received nor sought any other form of environmental credit nor has become eligible to do so since the previous validation. In addition, the GHG emission reductions generated by the Project have not been included in an emissions trading program or any other mechanism that includes GHG allowance trading.

RCE reviewed the repair and maintenance schedule and information in section 3.1 of the Monitoring Report, and found the information to be a thorough description of process,

RCE also reviewed the audit history table as shown in the Project Monitoring Report and determined that the information provided within is accurate. RCE reviewed the evidence provided for the Project start date and confirmed that the evidence supports the start date of April 29, 2010. RCE has concluded that the Project is implemented as described in the validated, registered PD

4.2 Safeguards

4.2.1 No Net Harm

There are no known potential negative environmental and socio-economic impacts identified by the Project.

4.2.2 Local Stakeholder Consultation

The Project validated PD confirmed that local stakeholders are encourage to engage in the Project at any time. No comments or concerns from local stakeholders have been brought forward during the current renewal, or during the original 10-year crediting period. During a telephone conference, Anew described and demonstrated to RCE the monthly council meetings which stakeholders may attend and comment. These meetings are recorded in minutes that are available for public viewing.

4.3 AFOLU-Specific Safeguards

The Project is a non-AFOLU project.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The emission reduction calculations assessment included a review of the Project assumptions, raw data inputs and accuracy of calculations. RCE assessed the formulas, raw data inputs, and default values used to determine the emission reduction calculations as described in ACM0001, the Project Monitoring Report and the validated PD. Additionally, RCE reviewed the functionality of the GHG emission reductions workbook; all equations, references, algorithms, and inputs were checked and confirmed as accurate and transparent.

RCE first assessed the completeness of the raw flow and methane data and how the data were transferred to the calculation spreadsheet. The data from the SCADA are transferred to an Excel format without any manipulation, so the raw data as presented to RCE were direct from the SCADA. RCE recalculated the flow of methane destroyed, using the conversions listed in the validated PD and Project Monitoring Reports.

The project emissions included electricity consumed from the grid, and propane combusted in the various Project equipment. RCE confirmed the electricity consumption by recalculating 2022 consumption from the electric invoices. Additionally, RCE confirmed the correct application of the US EPA eGRID emissions factor for the SRVC subregion from the most recently available data at the time of preparation of the calculations.

For the purpose of ex ante estimation of emission reductions, projects must estimate the amount of emission reductions by projecting the future greenhouse gas emissions of the landfill. ACM0001 requires the use of CDM “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”. However, as a deviation, the project has elected to use the US EPA LandGEM Landfill Gas Emissions model which is considered best practice for predicting landfill emissions in the United States. RCE reviewed the Project’s LandGEM calculations and confirmed the 2022 total Waste-In-Place value used to inform calculations.

Based on the assessment of the data, emission factors, and all other inputs, RCE concludes the GHG emission reductions were correctly quantified in accordance with the Project monitoring report, the validated VCS PD and the ACM0001.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Anew provided excellent documentation for the GHG emission reduction calculations, data management systems, and equipment maintenance procedures. RCE reviewed calibration records for all monitoring equipment, methane concentration and flow data, and electricity and fossil fuel consumption records. Additionally, RCE interviewed site personnel to assess their understanding of the Project equipment and data outputs and found all personnel to be competent and thorough. All equipment maintenance and calibration schedules met or exceeded manufacturer recommendations. The evidence provided for the current verification period is consistent with the requirements of the validated VCS PD and the ACM0001 methodology.

List of documents reviewed:

1. Jan - Dec 2022 Combined w Calcs
2. Spartanburg_Calc_v1.3_05152023
3. SpartanburgMR_v1.0_20220517, all updates and versions
4. 4a Lockhart Power & Spartanburg County Gas Purchase Agreement
5. 4b Milliken & Spartanburg County Gas Purchase Agreement.pdf
6. All calibration certificates
7. Daily flare logs
8. Flare and Generator electricity invoices
9. Raw and consolidated generator data
10. Raw and consolidated flow data
11. Email regarding propane usage
12. Raw and consolidated skid data
13. Tier 2 report
14. GHG emissions calculations
15. VCS issuance deed
16. Site permits
17. Validated PD
18. Stakeholder consultation records

19. Repair and maintenance emails and descriptions

4.6 Non-Permanence Risk Analysis

Not applicable as there is no risk for non-permanence with this project type.

5 VERIFICATION OPINION

Ruby Canyon Environmental conducted a risk-based analysis of Anew's Project's GHG emission reductions assertion including a strategic review of the Project data and evidence. Based upon the processes and procedures and the evidence collected, RCE concludes that the GHG assertion is a fair representation of the Project emission reductions resulting from the capture and destruction of landfill gas during the reporting period January 1, 2022 through December 31, 2022, and can be considered:

- In conformance with the VCS Standard, the validated PD, and applicable CDM methodologies;
- Without material discrepancy;
- Verified to a reasonable level of assurance; and
- Conducted in accordance with ISO 14064-3:2019.

Verification period: From 01-01-2022 to 31-12-2022

Verified GHG emission reductions and removals in the above verification period, broken down by calendar year:

Year	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions (tCO ₂ e)
01-01-2022 to 31-12-2022	65,862	368	0	65,494
Total	65,862	368	0	65,494

The total emission reductions achieved by the project activity to date is 1,168,021 tCO₂e. The average VCU generated annually to date is 73,001 tCO₂e/year.

Year	Ex-ante estimated reductions/removals	Achieved emissions reductions	Percent difference	Justification for the difference
01-01-2022 to 31-12-2022	134,684	65,494	-51.37%	The Wellford Landfill produced reduced amounts of landfill gas compared to earlier years. Consequently, there is a decrease in the volumes of landfill gas being flared, utilized in boilers, and employed in generators to produce electricity.
Total	134,684	65,494	-51.37%	

APPENDIX A: LIST OF FINDINGS

Corrective Action Requests (CARs), Non-Material Findings (NMF), Additional Documentation Requests (ADRs) and Clarification Requests (CRs)		
ID #	Action Item	Resolution
CAR 1	Please update the eGrid data to the most recent for the data set, 2021, or justify the use of the 2019 data set	TDL was updated to 2021. EF for electricity was not properly updated. Nonmaterial difference.
NMF 1	The gas analyzer serial number on the calibration frequency tab of the workbook "Spartanburg_Calc_v1.3_05152023" does not match that on the MR.	Please note that the flow meter serial no. mentioned were the previous flow meters used (before 2019) and we did mention in the QA/QC the serial number of the newly installed flow meters(in 2019). I have changed the serial no in the MR to reflect the flow meters used currently in the Project.
NMF 2	Please update the monitoring plan to the current number of landfill collection wells	Anew updated the MP
ADR 1	Please provide the most recent version of the validated PD	Anew provided the PD
ADR 2	Please provide the previous calibration certificate for the site Siemens gas analyzer to confirm its calibration was in compliance prior to the 8/18/2022 certificate.	I have provided it. It was calibrated on 9/27/2021
ADR 3	Please provide the sales agreement between Lockhart Power and the county, as well as any contracts between the county and Milliken.	Anew provided items 4a and 4b (agreements) to satisfy this request.
CR 1	Please explain the previous and due calibration dates for the Siemens analyzer on the calibration frequency tab of Spartanburg_Calc_v1.3_05152023.	The calibration frequency are being followed based on the manufacturer specification. Most of the calibrations are due in 2023 with the exception of Ultramat 23 continuous gas analyzer and Milliken Pressure Transmitter for Flow Calc which has already been provided.

CR 2	Explain the intent of the weekly WREN report and why not all weeks are not in the data package.	We haven't really used any data from WREN report for our quantification therefore it isn't necessary to have all the weekly reports. The purpose of WREN report is basically to show the average weekly landfill gas flow to the flare, Milliken facility and to the generator and to include any outage logs.
CR 3	Explain the purpose and parameters on the Dewey Data sheets.	We haven't used any data for quantification from Dewey folder.
CR 4	Please confirm the FCI flow meter (324341) flow is not used in the calculations.	We have used calculation from FCI flow meter (324341) because new wellfield flow is measured by FCI flow meter, therefore eligible wellfield CH ₄ captured is calculated through this. I have changed this in the MR.
CR 5	Please provide a list of the calibration tolerances for each of the monitoring devices (flow and composition). Describe the procedure for out of range as found readings and how this is accounted for in the calculation workbooks.	N1-B3-412: % drift=4(checking for methane exclusively), FCI Flow meter(32431): % drift<5%, Flare Flow transmitter 21998: % drift<5%, Flare Pressure Transmitter 22000: <5%, Flare Flow Transmitter 21997: <5%. Kindly refer to all the calibration records provided for all the devices used in the project. This is something the verifier has to check themselves!!!! All the % drift is less than 5% and therefore there has been no adjustment made in the calculation. Response: RCE as verifier did check this information, thank you. We simply wanted some input from the Project Developer as to procedures in place should out of tolerance calibration results occur, and how those might be accounted for in the project calculations. We observed that all readings were in range and thus did not expect a calculation adjustment.

CR 6	Please explain the determination of the monthly genset electricity consumption values on the Data Entry tab of Spartanburg_Calc_v1.3_05152023	These are obtained from the Monthly Invoices provided from Duke Energy. Kindly check the gen utility invoices provided.
CR 7	Please confirm that the values in cells H33 - H44 of the Data Entry tab in spreadsheet Spartanburg_Calc_v1.3_05152023 are correct.	Yes, we have corrected them!!