



VERIFICATION REPORT FOR SPARTANBURG COUNTY LANDFILL GAS COMBUSTION PROJECT



Document Prepared By TÜV SÜD America, Inc.

Report ID	2024_TÜV SÜD_VCS_12
Project title	Spartanburg County Landfill Gas Combustion Project
Project ID	0947
Verification period	01-January-2023 to 31-December-2023

Original date of issue	23-October-2024
Most recent date of issue	22-April-2025
Version	3
VCS Standard Version	VCS Standard v4.7
Client	Anew Environmental, LLC
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Summary:

TÜV SÜD America, Inc.'s Ruby Canyon Environmental Services group ("TÜV SÜD") 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"). 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 2023 Monitoring Report v3.0, dated 22-April-2025, 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 TÜV SÜD is well documented and free of any material errors or omissions.

During the verification process, TÜV SÜD issued two corrective action requests, four non-material findings, three additional documentation requests, two clarifications, and no recommendations for improvement, all of which were promptly and sufficiently addressed by Anew. The Project reported

76,644 metric tons CO₂e for the verification monitoring period of January 1, 2023 through December 31, 2023. TÜV SÜD 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 TÜV SÜD 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;
- 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 4.7, 16 April 2024 • 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

TÜV SÜD 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 is 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.

The Project has three Project Proponents listed in the monitoring report: Lockhart Power, Milliken & Company, and Spartanburg County DPW. Anew Environmental, LLC acts as the Project Environmental Attribute Developer.

Table 1 below provides a summary of the quantification of emission reductions generated by the project activity from January 1, 2023 – December 31, 2023. The total emission reductions achieved by the project activity to date is 1,244,665 tCO₂e. The average VCU generated annually to date is 91,833 tCO₂e/year.

Summary of Emission Reductions (tonnes CO₂e)

	Jan 1, 2023 – Dec 31, 2023
Baseline Emissions	76,918
Project Emissions	274
Total Emission Reductions	76,644

2 VERIFICATION PROCESS

2.1 Method and Criteria

The current verification began with Anew selecting TÜV SÜD as the verification body. Prior to starting the verification, TÜV SÜD 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 TÜV SÜD verification team, which is responsible for expressing an opinion on the GHG statement based on the verification;
- A kick-off meeting with the Project Proponents was held on 29 April 2024, during which TÜV SÜD reviewed the verification objectives, verification process, and the verification schedule and requested the verification background documents;
- TÜV SÜD 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;
- TÜV SÜD developed a risk-based evidence-gathering plan based upon the strategic review and risk assessment. The verification plan and evidence-gathering plan were used throughout the verification and were revised as needed based upon additional risk assessments;
- TÜV SÜD conducted a virtual site visit on 29 November 2023 for the previous monitoring period. As no material aspects of the Project had changed since the previous monitoring period, a site visit was neither required nor performed in the current verification;
- TÜV SÜD 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;
- TÜV SÜD submitted requests for additional documentation and clarifications as necessary to Anew throughout the verification;
- TÜV SÜD's internal reviewer conducted a review of the verification sampling, verification report, and verification representation;
- TÜV SÜD prepared a final verification report, verification representation and list of findings;
- TÜV SÜD held an exit meeting with Anew on 23 October 2024.

2.2 Document Review

During the verification process, TÜV SÜD conducted an iterative review of the Project Monitoring

Reports, the GHG emissions reduction statement, 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, TÜV SÜD reviewed the Project GHG emission reductions statement workbook and data inputs to assess whether there were any material or non-material misstatements.

2.3 Interviews

During the verification, TÜV SÜD conducted interviews with Anew personnel Sidra Kamal. TÜV SÜD maintained communication with Anew throughout the verification process.

2.4 Site Visits

TÜV SÜD conducted a site visit on 29 November 2023 for the verification of the previous monitoring period which was verified by the same lead verifier as the current monitoring period. As no material aspects of the Project had changed since the previous monitoring period, a site visit was neither required nor performed in the current verification.

2.5 Resolution of Findings

The verification process resulted in two corrective action requests, four non-material findings, three requests for additional documentation, and two 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 Methodology Deviations

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

1) Grid Electricity Emission Factor and TDL

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 2023 is 0.2677 tCO₂/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 monitoring period to the most recent value available from the eGRID database.

Similarly, the TDL_{j,y} parameter, representing Transmission and Distribution Losses, has been fixed ex-ante, despite being an annually monitored parameter as per CDM TOOL 05. To improve the accuracy of emissions quantification, a project description deviation will be applied to enable ex-post monitoring of TDL_{j,y} given the generation mix and emission intensity of electricity generation from the applicable regional grid. A deviation from the methodology is used and the emission factor for electricity generation is determined by examining the electricity grid in the region through the monitoring of TDL_{j,y}.

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. Methane content and monthly landfill gas flow to the flare are monitored on a continuous basis and any flow above and below the specified design limits are voided. Similarly, any methane content below 20% is voided from the calculation worksheet (Jan-Dec 2023 Combined w Calcs).

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 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 monitoring period. TÜV SÜD 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 New Project Activity Instances in Grouped Projects

Not applicable as the Project is not a grouped project.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

4 VERIFICATION FINDINGS

4.1 Project Details

Item	Evidence gathering activities, evidence checked, and assessment conclusion:
Audit history	
Double counting and participation under other GHG programs	The Project is neither registered nor active under any other GHG programs. Anew has indicated this in Section 1.10 of the Project Monitoring Report. Additionally, Anew provided a written

	attestation that the Project is neither registered nor active under any other GHG programs, nor has it been rejected by another GHG program. TÜV SÜD has found no evidence of the Project being registered in any other GHG programs. Additionally, the LFG that flows to different facilities is separately metered and therefore is attributed only to the facility that is receiving LFG from that meter.
No double claiming with emissions trading programs or binding emission limits	The Project is neither registered nor active under any other GHG programs. Anew has indicated this in Section 1.10 of the Project Monitoring Report. Additionally, Anew provided a written attestation that the Project is neither registered nor active under any other GHG programs, nor has it been rejected by another GHG program. TÜV SÜD has found no evidence of the Project being registered in any other GHG programs. Additionally, the LFG that flows to different facilities is separately metered and therefore is attributed only to the facility that is receiving LFG from that meter.
No double claiming with other forms of environmental credit	The Project is neither registered nor active under any other GHG programs. Anew has indicated this in Section 1.10 of the Project Monitoring Report. Additionally, Anew provided a written attestation that the Project is neither registered nor active under any other GHG programs, nor has it been rejected by another GHG program. TÜV SÜD has found no evidence of the Project being registered in any other GHG programs. Additionally, the LFG that flows to different facilities is separately metered and therefore is attributed only to the facility that is receiving LFG from that meter.
Supply chain (scope 3) emissions double claiming	The project proponent is not a buyer or seller of a product whose emissions footprint is changed by the project activities.
Sustainable development contributions	The Project is a landfill gas (LFG) capture and combustion project that implements the capture of landfill gas at the solid waste disposal site (SWDS) for combustion in either the flare, electricity generator or the boilers. This results in SD contributions (SDG 13.2) as under the project condition, methane is converted to CO₂ through combustion which results in measurable greenhouse gas emission reductions.

	SDG 7.2 focuses on increasing the share of renewable energy in the global energy mix. This project contributes to this SDG indicator by capturing landfill gas (LFG) and converting it into usable energy forms such as electricity and heat for boilers. By utilizing LFG as a renewable energy source, the project reduces reliance on fossil fuels, thereby promoting cleaner energy production. Additionally, flaring LFG ensures the safe management of methane, a potent greenhouse gas, while still contributing to energy recovery. This aligns with the indicator's emphasis on renewable energy generation and its integration into the energy mix. SDG 12.2 focuses on sustainable management and efficient use of natural resources. By capturing landfill gas and utilizing it for electricity generation and heating in boilers, the project exemplifies resource efficiency. Instead of letting methane escape into the atmosphere, the landfill recovers and repurposes this valuable resource. This Landfill project contributes by reducing the material footprint of waste disposal through resource recovery and energy generation. Please refer to Appendix X of the Project monitoring report (VCS MR Project 947 01Jan2023-31Dec2023) for supporting evidence of quantification. TÜV SÜD verified that the Project implemented the activities that result in contributions to SDGs 13.2, 7.2 and 12.2 as described in the monitoring report.
Additional information relevant to the project	There is no commercially sensitive information that has been excluded from the public versions of project documents.

4.2 Safeguards and Stakeholder Engagement

4.2.1 Stakeholder Identification

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Stakeholder identification	At validation there was no formal identification of stakeholders and stakeholder consultation was instead conducted through the posting of project documents to the public VCS registry with the monitoring report mentioning that stakeholders can contact Spartanburg or

	other project proponents through the contact information in the monitoring report. Spartanburg County holds council meetings which are open to the public. Any changes to the landfill or project operation are shared with the public, at which time local stakeholders can submit input and raise concerns as they see fit. Additionally, questions or comments can be submitted directly to the Landfill Manager or Public Works Director through e-mail as listed on the website and are addressed as needed. During the 2023 monitoring period, monthly council meetings with stakeholders were held, and all meeting minutes were recorded in PDF documents and uploaded to the website for public viewing: https://www.spartanburgcounty.org/AgendaCenter/Search/?term=&CIDs=all&startDate=01/01/2023&endDate=12/31/2023&dateRange=&dateSelector= TÜV SÜD confirmed this information by review of the Project Monitoring Report and the referenced meeting minutes, and through discussions with Anew.
Legal or customary tenure/access rights	The landfill, waste transfer station, and a homeowners drop off area at the landfill is owned and operated by Spartanburg County. There are no conflicting rights over territories and resources. https://www.spartanburgcounty.org/DocumentCenter/View/761/ULMO-Amendment-O-11-31 TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Stakeholder diversity and changes over time	The Stakeholders would be the residents of Spartanburg County. Based on the U.S census, Spartanburg County is 74% white and 20.3% Black, 2.7% Asian and 0.5% American Indian. The median household income is \$61,955 and 87.8% of residents have a high school diploma and 25.2% have a bachelor's degree or higher. The makeup of the stakeholder group is not expected to change over time because of this project. https://www.census.gov/quickfacts/fact/table/spartanburgcountysouthcarolina,US#

	TÜV SÜD confirmed this information by review of the referenced census data.
Expected changes in well-being	The revenue generated by the project is used to fund the post closure care of the landfill which prevents the release of hazardous constituents to the environment and reduces the burden on the county to fund the post closure care. https://www.spartanburgcounty.org/DocumentCenter/View/14759/Clemson-Economic-Impact-Study TÜV SÜD confirmed this information by review of the referenced data.
Location of stakeholders	Spartanburg County which consists of the municipalities of Campobello, Chesnee, Cowpens, Duncan, Greer, Inman, Landrum, Lyman, Pacolet, Reidville, Spartanburg, Wellford and Woodruff are all affected by this project. https://www.spartanburgcounty.org/520/Municipalities TÜV SÜD confirmed this information by review of the referenced data.
Location of resources	Residents of Spartanburg County have access to the landfill to drop off waste but do not own the facility. Spartanburg County owns the facility. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.2 Stakeholder Consultation and Ongoing Communication

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Ongoing consultation	Spartanburg County regularly conducts monthly council meetings which are open to the public to provide updates on the project. The monitoring reports are also uploaded to VCS which are public and allow for a period where the public can provide comments.
Date(s) of stakeholder consultation	12-January-2023 23-January-2023

	02-February-2023
	20-February-2023
	01-March-2023
	20-March-2023
	17-April-2023
	04-May-2023
	09-May-2023
	15-May-2023
	08-June-2023
	19-June-2023
	17-July-2023
	19-July-2023
	08-August-2023
	21-August-2023
	18-September-2023
	16-October-2023
	20-November-2023
	27-November-2023
	11-December-2023
	https://www.spartanburgcounty.org/AgendaCenter/Search/?term=&CIDs=all&startDate=01/01/2023&endDate=12/31/2023&dateRange=&dateSelector=
	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Communication of monitored results	The Spartanburg County council meetings encourage the public to submit comments and the VCS monitoring report contains a section that encourages the public to send comments to Spartanburg County. There have been no comments over the course of this crediting period.

	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Consultation records	Any emails or comments received would be retained by Spartanburg County. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Stakeholder input	Any input from the council members at the meeting was addressed by Spartanburg County and no comments justified needing to update the project design. Comments and questions were mainly about the landfill rather than concerns about the gas collection and control system project. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.3 Free, Prior, and Informed Consent

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Consent	The project does not affect IPs, LCs and customary rights holders, rights to land, territories, and resources. There was no formal stakeholder consultation conducted during validation but all Spartanburg County presentations at the council meetings mention how Spartanburg County is the owner of the facilities. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Outcome of FPIC discussion	The project did not encroach on land or relocate people without consent. The installation of a gas collection and control system did not affect the land already owned by Spartanburg County for the landfill. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.4 Grievance Redress Procedure

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Grievance received and steps taken to resolve the grievance including the outcomes of the resolution	Any changes to the landfill or project operation are shared with the public at the Spartanburg County council meeting, at which time local stakeholders can submit input and raise concerns as they see fit. There were no grievances identified during the 10- year crediting period and during the current monitoring period. Additionally, questions or comments can be submitted directly to the Landfill Manager or Public Works Director and are addressed as needed. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Grievance redress procedure	See above

4.2.5 Public Comments

Comments received	Actions taken by the project proponent	Evidence gathering activities, evidence checked, and assessment conclusion
N/A	No comments or concerns were submitted during the current monitoring period.	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
...		

4.2.6 Risks to Local Stakeholders and the Environment

4.2.6.1 Management Experience

The management team at the landfill brings extensive experience in implementing project activities related to gas collection and control systems. Over the years, they have successfully overseen the installation, operation, and maintenance of advanced gas collection infrastructure, ensuring efficient capture and utilization of landfill gas. Their expertise encompasses every aspect of these projects, from initial planning and design to execution and ongoing monitoring. This includes managing regulatory compliance, optimizing system performance, and integrating innovative technologies to enhance environmental protection and

energy recovery. Their proven track record in this specialized field underscores their capability to handle complex projects with a high degree of professionalism and technical proficiency. There has been no new entity involved in Project Design and Implementation.

TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew and the landfill staff during the course of the site visit conducted for the verification of the previous monitoring period and associated verification activities.

4.2.6.2 Risk Assessment

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Natural and human induced risks to stakeholders' wellbeing	The project activities have not affected stakeholders' wellbeing, as there are no natural and human associated risks with the project's location in areas where stakeholders have access. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Risks to stakeholder participation	The project activities have not affected stakeholder participation, as there are no associated risks with the project's location in areas where stakeholders have access. The project poses no risks to the social, economic, and cultural diversity among stakeholders. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Working conditions	The project activities have not raised any concerns or identified risks related to the working conditions. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Safety of women and girls	No risks have been identified regarding the safety of women and girls due to the implementation of this project. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Safety of minority and marginalized groups, including children	There are no identified risks concerning the safety of minority and marginalized groups, including children due to the implementation of this project. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

Pollutants (air, noise, discharges to water, generation and release of hazardous materials and chemical pesticides and fertilizers)	This project does not emit any hazardous materials or pollutants into water, land, or air. All the gas produced from landfill waste is captured and flared or employed in electricity generation. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
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4.2.7 Respect for Human Rights and Equity

4.2.7.1 Labor and Work

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Discrimination	All parties participating in this project have implemented comprehensive anti-discrimination policies, training programs and investigation and resolution protocols that prevents any discrimination. The Spartanburg County website mentions that Spartanburg County Government does not discriminate on the basis of any class or characteristic protected by law. https://selfservice.spartanburgcounty.org/ess/employmentopportunities/default.aspx TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Sexual harassment	All parties participating in this project have implemented comprehensive policies, training programs and investigation and resolution protocols that prevents any sexual harassment. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Gender equity in labor and work	Spartanburg County has appointed an Equal Opportunity officer and a Fair Practices officer to ensure compliance with the Governors Code of Fair Employment Practices Executive Order which mentions promoting equal employment opportunity and work force diversification reflective of the availability of women in the relevant labor market.

	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Forced labor	This project does not use victims of forced labor. Work related to the project including flare and engine maintenance are conducted by qualified technicians which does not include victims of forced labor. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Child labor	This project does not use victims of child labor. Work related to the project including flare and engine maintenance are conducted by qualified technicians which does not include children. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Human trafficking	This project does not use victims of human trafficking. Work related to the project including flare and engine maintenance are conducted by qualified technicians which does not include victims of human trafficking. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.7.2 Human Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risks identified	The Project occurs on municipal land so it will not affect the rights of IPs, LCs and customary rights holders. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.7.3 Indigenous Peoples and Cultural Heritage

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risks identified	The Project does not impact the cultural heritage of Indigenous Peoples as project activities occur on municipal land. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.7.4 Property Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risks identified.	The project does not affect the property rights of stakeholders. The landfill is owned by Spartanburg County. The installation of a gas collection and control system had no effect on property rights. There are no disputes over rights to territories and resources. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.7.5 Benefit Sharing

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Summary of the benefit sharing plan	This section is inapplicable as the Project does not impact property rights, and there have been no contentions concerning entitlements to territories and resources. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Benefit sharing during the monitoring period	N/A

4.2.8 Ecosystem Health

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Impacts on biodiversity and ecosystems	Capturing and combusting LFG will have no negative impact on biodiversity and ecosystem health. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Soil degradation and soil erosion	Capturing and combusting LFG will have no negative impact on soils. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

Water consumption and stress	Capturing and combusting LFG will have no negative impact on water consumption. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
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4.2.8.1 Rare, Threatened, and Endangered species

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Species or habitat	This section is not applicable because the Project is not located in, or adjacent to habitats for rare, threatened, or endangered species. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Areas needed for habitat connectivity	This section is not applicable because the Project is not located in, or adjacent to habitats for rare, threatened, or endangered species and does not affect any area needed for habitat connectivity. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

	Evidence gathering activities, evidence checked, and assessment conclusion
Habitats for rare, threatened, and endangered species	This section is not applicable because the Project is not located in, or adjacent to habitats for rare, threatened, or endangered species. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
Areas for habitat connectivity	This section is not applicable because the Project is not located in, or adjacent to habitats for rare, threatened, or endangered species and does not affect any area needed for habitat connectivity. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.8.2 Introduction of Species

Species introduced	Evidence gathering activities, evidence checked, and assessment conclusion
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N/A	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.
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Existing invasive species	Evidence gathering activities, evidence checked, and assessment conclusion
N/A	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

Evidence gathering activities, evidence checked, and assessment conclusion	
Invasive species	TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.2.8.3 Ecosystem conversion

Item	Evidence gathering activities and evidence checked
Ecosystem conversion	This section is not applicable because this is not an ARR, ALM, WRC or ACoGS project. TÜV SÜD confirmed this information by review of the Project Monitoring Report and through discussions with Anew.

4.3 Accuracy of Reduction and Removal Calculations

The emission reduction calculations assessment included a review of the Project assumptions, raw data inputs and accuracy of calculations. TÜV SÜD 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, TÜV SÜD reviewed the functionality of the GHG emission reductions workbook; all equations, references, algorithms, and inputs were checked and confirmed as accurate and transparent.

TÜV SÜD 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 TÜV SÜD were direct from the SCADA. TÜV SÜD 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. TÜV SÜD confirmed the electricity consumption by recalculating 2023 consumption from the electric invoices. TÜV SÜD's recalculation assured any manual transcription errors would be identified. Additionally, TÜV SÜD 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. TÜV SÜD reviewed the Project's LandGEM calculations and confirmed the 2023 total Waste-In-Place value used to inform calculations.

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

4.4 Quality of Evidence to Determine Reductions and Removals

Anew provided excellent documentation for the GHG emission reduction calculations, data management systems, and equipment maintenance procedures. TÜV SÜD reviewed calibration records for all monitoring equipment, methane concentration and flow data, and electricity and fossil fuel consumption records. Additionally, TÜV SÜD 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 2023 Combined w Calcs
2. Spartanburg_Calc_v1.1_10082024
3. VCS MR Project 947 01Jan2023-31Dec2023, 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

4.5 Non-Permanence Risk Analysis

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

5 VERIFICATION OPINION

5.1 Verification Summary

TÜV SÜD, an IAF accredited validation and verification body, conducted the verification of the VCS0947 Spartanburg County Landfill Gas Combustion Project's GHG statement for the monitoring period 1 January 2023 to 31 December 2023. The GHG statement is the responsibility of the project proponents: Lockhart Power, Milliken & Company, and Spartanburg County DPW and the environmental attribute developer: Anew Environmental, LLC. The Project activity is the combustion of landfill gas that would have been emitted to the atmosphere in the absence of the project, which is collected at the Spartanburg County Landfill in Wellford, SC, and combusted by an onsite flare, offsite boilers, or an offsite engine. The data and information supporting the GHG statement were historical in nature.

The verification was conducted to a reasonable level of assurance according to the requirements of ISO 14064-3:2019. The objective was to ensure that the GHG statement is materially correct and conforms to all relevant criteria, including:

- VCS Standard, Version 4.7, 16 April 2024
- 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
- 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

TÜV SÜD verified that the project conforms with the criteria above and that it has been implemented in accordance with the methodology and the validated project description, except as identified in the methodology and project description deviations.

5.2 Verification Conclusion

TÜV SÜD concludes, to a reasonable level of assurance, that there is sufficient and appropriate evidence to support the VCS0947 Spartanburg County Landfill Gas Combustion Project's GHG statement for the monitoring period 1 January 2023 through 31 December and is issuing an Unmodified Opinion. The GHG statement is summarized in the tables below.

Verification period: From 01-January-2023 to 31-December-2023

Verified GHG emission reductions and carbon dioxide removals in the above verification period:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCUs (tCO ₂ e)
01-JAN-2023 to 31-DEC-2023	76,918	274	0	76,644	0	76,644
Total	76,918	274	0	76,644	0	76,644

The non-permanence risk rating (%)	N/A
If applicable, the Long-term Average (LTA), whether it has been properly updated, and if it has been reached.	N/A
Whether a loss has been appropriately accounted for, in accordance with the VCS Program rules, if applicable.	N/A

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCU (tCO ₂ e)	Removals VCU (tCO ₂ e)	Total VCU issuance (tCO ₂ e)
01-JAN-2023 to 31-DEC-2023	76,918	274	0	76,644	76,644	0	76,644
Total	76,918	274	0	76,644	76,644	0	76,644

5.3 Ex-ante vs Ex-post ERR Comparison

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Jan-2023 to 31-Dec-2023	134,858	76,644	-43.2%	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	134,858	76,644		

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

<i>Section</i>	<i>Information</i>	<i>Justification</i>	<i>Assessment method and conclusion</i>
N/A			

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	6.18.2024: The calibration certificate, "Dewey GAC factory calibration 3-6-23" for the Siemens Ultramat lists the analyzer serial number as N1-B3-412 - where is this ? It's not listed on the Calibration tab of the calcs spreadsheet.	This was used as a backup analyzer when the other analyzer(N1-A1-664) was sent for factory calibration. It is included in the calibration tab worksheet.
CAR 2	8-28-2024: Please update the filename of the MR to the correct format per the template instructions	10.8.24 the revised MR was received
NMF 1	The Monitoring Report, "VCS-Monitoring-Report-Template-v4.4-2023_Spartaburg" has several instances of inconsistent fonts and sizes - please review the MR and amend for the final version	10.8.24 the revised MR was received
NMF 2	The Monitoring Report, "VCS-Monitoring-Report-Template-v4.4-2023_Spartaburg" has several instances of inconsistent fonts and sizes - please review the MR and amend for the final version	10.8.24 the revised MR was received
NMF 3	The electric usage for September 2023 was transcribed incorrectly.	10.8.24 the revised calculator was received
NMF 4	The monthly electric usage for the Project was incorrectly calculated. The result is immaterial and conservative	10.8.24 the revised calculator was received
ADR 1	6.18.2024: Please provide the monthly statements from Duke Energy for confirmation of electricity consumption	Anew sent the documents on 9.17.2024

ADR 2	6.18.2024: Please provide the current monitoring report for this monitoring period	7.17.2024: Anew provided the draft MR.
ADR 3	Please submit the January 2024 flare electric invoice to obtain the latter half of December 2023 usage	Received 10.8.2024
ADR 4	Please provide a signed attestation that the Project is neither seeking carbon credits nor is registered with any other carbon registry.	Received 10.15.2024
CR 1	8-28-2024: Monitoring Report, Project Details, section 1.1: language is unclear as to what phase the landfill is operating in. Please clarify in a revised version of the MR	10.8.24 the revised MR was received
CR 2	9-10-2024: Workbook, Jan - Dec 2023 Combined w Calcs, cells T7-18 , please explain why the sumif formula for the CH4 to new flare concentration begins in cell AB18 while the month function begins in cell W4.	10.8.24 the revised calculator was received

APPENDIX X: EVIDENCE OF SD CONTRIBUTIONS

Project		Spartanburg County Landfill Gas Combustion Project						
Proponent		Anew Canada ULC, Lockhart Power						
Crediting Period		June 15, 2020 - June 14, 2030						
Reporting Period		January 1, 2023 - December 31, 2023						
System		Verified Carbon Standard						
Protocol		ACM0001: Flaring or use of landfill gas Version 19						

OFFSET SUMMARY SHEET									
This sheet contains a summary of baseline and project emissions from each SS on the other worksheets, as well as a calculation of the total credits created. Oxidation emissions are calculated in this sheet.									

- $\text{NCV}_{\text{CH}_4} = 0.0555 \text{ TJ/tCH}_4$

Convert to TJ: Energy in TJ=1,232.43 tCH₄×0.0555 TJ/tCH₄

Energy = 68.40 TJ

The EF of Grid Electricity is:

- **0.26771022 t CO₂/MWh**

For electricity produced by the Lockhart Generators (1.23 tCH₄ and taking oxidation factor into account):

$$1.23 \text{ tCH}_4 \cdot 28 = 34.32 \text{ t CO}_2$$

- Convert to MWh: $34.32 \text{ t CO}_2 / 0.26771022 \text{ t CO}_2/\text{MWh} = 128.199 \text{ MWh}$

PROCESS FLOW DIAGRAM:

