



**Verified Carbon
Standard**

DAVIDSON COUNTY LANDFILL GAP VALIDATION REPORT



RUBY CANYON ENVIRONMENTAL

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Report Title	Davidson County Landfill Gap Validation Report
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Summary:

Element Markets, LLC (EM) contracted Ruby Canyon Environmental, Inc. (RCE) to complete the gap validation of the Davidson County Landfill project for the crediting period 1 January 2015 to 31 December 2021 including the validation of the renewal crediting period. RCE was contracted to perform the gap validation with the verification of the first monitoring period in the VCS crediting period; however, this gap validation report is being issued first to meet the Project's deadline to complete the gap validation.

The project activity is located at the Davidson County Landfill in Lexington, North Carolina, United States and consists of a landfill gas collection and control system (GCCS) including 77 vertical extraction wells connected to an engine and a flare. The landfill is owned by Davidson County and the GCCS is owned and operated by Davidson Gas Producers, LLC (DGP), a wholly owned subsidiary of DTE Energy. EM is the Project Proponent.

The GCCS was installed voluntarily and the baseline scenario for the project activity was collecting and venting landfill gas. The Project achieves emission reductions through the collection and destruction of the methane portion of landfill gas (LFG) via an engine and an open flare. The Project was originally registered under the Climate Action Reserve (CAR) and received offsets for 12 June 2009 to 31 December 2014. The Project transferred to Verra's VCS Program and began a new seven-year crediting period on 1 January 2015.

The purpose of the gap validation is to assess the Project's compliance with the VCS Program rules. The scope of the gap validation includes the assessment of the Project Description (PD) and supporting data and documentation against the requirements of the VCS Program Guide, Version 4.0 and the VCS Standard, Version 4.1 as well as the project methodology, the Climate Action Reserve's U.S. Landfill Protocol Version 5.0 (Methodology).

During the gap validation, RCE issued six findings which include one corrective action request and five additional documentation requests. The findings are included as Appendix A.

Based on the results of the gap validation, RCE concludes that the Project complies with the VCS Program rules.

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1 INTRODUCTION

1.1 Objective

The objective of the gap validation is to assess the Davidson County Landfill project's (Project) compliance with the VCS Program rules.

1.2 Scope and Criteria

This is the gap validation for the Project's transition from the Climate Action Reserve (CAR) to Verra's VCS Program. The Project's first 10-year crediting period as defined under CAR was 20 May 2009 to 19 May 2019, with an option to apply for a second 10-year crediting period. For the transition to VCS, the Project renewed the crediting period and defined a 7-year VCS crediting period of 1 January 2015 to 31 December 2021. The project will then be eligible to apply for a final 7-year crediting period.

RCE assessed the Project Description (PD) against the following criteria:

- VCS Standard v4.1, 22 April 2021,
- VCS Program Guide, v4.0, 19 September 2019,
- Climate Action Reserve Landfill Project Protocol, Version 5.0, 24 April 2019 (CAR Protocol),
- VCS Validation and Verification Manual version 3.2, 19 October 2016, and
- ISO 14064-3:2006 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions"

1.3 Level of Assurance

RCE conducted the gap validation to a reasonable level of assurance.

1.4 Summary Description of the Project

The Project is located at the Davidson County Landfill, a municipal solid waste landfill covering approximately 550 acres, in Lexington, North Carolina. Prior to the Project, the baseline scenario included a landfill gas collection system with passive venting. The project activity consists of the voluntary installation of landfill gas destruction devices, and the Project achieves emission reductions through the collection and destruction of methane in the landfill gas by an engine and a backup open flare.

2 VALIDATION PROCESS

2.1 Method and Criteria

RCE used a risk-based approach to assess the Project against the VCS Program rules including the criteria defined in Section 1.2.

The gap validation process included the following independent and objective activities:

- Select a validation team,
- Perform a conflict of interest review,
- Conduct a kick-off meeting with EM to introduce the EM and RCE teams, review the validation objectives, process, VCS requirements, and to confirm the schedule.
- Review the PD against the requirements in Section 3.19.5 of the VCS Standard,
- Develop a validation plan and sampling plan,
- Review the CAR documents associated with the reporting periods for which emission reductions were issued,
- Conduct a virtual site visit,
- Review the accuracy of the emission reduction projections for the crediting period,
- Confirm project ownership is accurately described in the PD,
- Issue corrective action requests (CARs), additional documentation requests (ADRs), and clarification requests (CRs), as necessary, and
- Issue a gap validation report.

The validation team was selected according to RCE's GHG Verification Policies & Procedures to ensure team members are qualified to perform validation activities pertaining to the Project. The validation team consisted of the following individuals:

- Lead Validator: Nina Pinette
- Independent Reviewer: Phillip Cunningham

RCE's primary gap validation activity was a review of the PD and supporting documents to assess the Project's compliance with VCS Program rules. Following its review of the PD, supporting documents and data, and the virtual site visit, RCE delivered a List of Findings to EM. EM provided sufficient responses to all requests.

2.2 Document Review

The gap validation consisted of a review of the Project's PD and supporting documents to demonstrate compliance with the VCS Program rules. RCE reviewed the PD and the following documents and data:

- CAR documents associated with the Project including Verification Statements,
- Evidence of project start date,
- Evidence of project ownership,
- Landfill and Project permits,

- Tier 2 Report, and
- Estimated emission reductions over the 7-year crediting period.

2.3 Interviews

RCE communicated throughout the verification with EM personnel responsible for the project including discussions about the development of the PD, eligibility criteria, and emission reduction estimates and communicating data and document requests and gap validation findings:

- Heather Rogers, Associate of Environmental Products
- Dami Ajijolaiya, Analyst

During the virtual site visit, RCE interviewed personnel with Davidson Gas Producers and Davidson County to obtain an understanding of the history of the landfill and the Project, monitoring and metering equipment, QA/QC procedures for monitoring and metering equipment, and data collection and aggregation procedures:

- Chris Anglin, Davidson Gas Producers, Project Manager
- Mokeima Jackson, Davidson Gas Producers, Project Manager
- Joe Sowers, Davidson Gas Producers, Destruction Facility Manager
- Walter Remski, Davidson Gas Producers, Data Collection Manager
- Charlie Brushwood, Davidson County, Landfill Project Manager

2.4 Site Inspections

RCE conducted a virtual site visit to the Project on 4 May 2021 using the real-time web meeting and screen sharing platform Microsoft Teams. The Lead Validator interviewed key personnel; reviewed GHG sources, sinks and reservoirs (SSRs); observed project components; viewed monitoring and metering equipment; discussed QA/QC procedures for monitoring and metering equipment; and reviewed data collection and aggregation procedures. The virtual site visit was conducted in accordance with the requirements of the International Accreditation Forum Mandatory Document for the Use of Information and Communication Technology for Auditing/Assessment Purposes: Issue 2 (IAF MD4:2018).

2.5 Resolution of Findings

RCE communicated findings to EM via its List of Findings document. Findings included one corrective action request and five additional documentation requests. EM sufficiently resolved all requests during the gap validation process.

The findings are included as Appendix A to this report.

2.5.1 Forward Action Requests

There were no forward action requests during the gap validation.

3 VALIDATION FINDINGS

3.1 Project Details

The Project activity is a landfill gas collection and destruction project at the Davidson County Landfill operated by Davidson County at 220 Davidson County Landfill Road, Lexington, North Carolina. The primary destruction device is a 1.6 MW caterpillar engine. The Project also includes a backup flare. Both devices are operated by Davidson Gas Producers. The project proponent is Element Markets. Prior to the Project, the baseline scenario was a landfill gas collection system with passive venting at the landfill. The Project is not a grouped project.

RCE confirmed that all parties involved in the Project are appropriately identified in the PD. EM has rights to the emission reductions and is the project proponent. Davidson County owns and operates the landfill, and Davidson Gas Producers owns and operates the project destruction devices.

The Project first generated emission reductions under the CAR voluntary offset program, identified by the project number CAR468 and the project name Davidson County Landfill Gas Destruction Project. The Project generated and verified emission reductions for eleven reporting periods beginning on 20 May 2009 and ending on 31 December 2014. RCE reviewed verification reports and statements and information in the CAR Registry to confirm that the periods for which credits are claimed do not overlap. The Project will begin generating VCUs on 1 January 2015. RCE validated that the Project is eligible under VCS and complies with the VCS Program rules. The initial CAR crediting period was 20 May 2009 to 19 May 2019. EM defined the VCS crediting period as 1 January 2015 to 31 December 2021 which is a renewal of the Project's initial crediting period. RCE validated that the Project met the requirements for renewal of a project crediting period as outlined in Section 3.8.9 of the VCS Standard:

1. The Project demonstrated regulatory surplus in accordance with the VCS Program rules by meeting the CAR Protocol's Legal Requirement Test. The emission reductions from the Project would not have occurred due to any regulations or mandates, and the landfill's NMOC emissions do not exceed 34 Mg/year, which is the threshold requiring installation of an LFG collection and control system per the New Source Performance Standards (NSPS) for MSW landfills.
2. The baseline scenario does not require reassessment because the baseline scenario is set by the CAR Protocol. The Project falls under scenario 2 as defined by the CAR Protocol's performance standard test where the Project passes the performance standard test if it involves "Installation of a new qualifying destruction device at an eligible landfill where landfill gas is currently collected and vented, but has never been destroyed in any manner prior to the project start date".

3. EM submitted a Project Description in accordance with the VCS Program rules. RCE's gap validation assessed the Project against the current scope of the VCS.

The Project is estimated to generate 350,000 tCO_{2e} during the crediting period. RCE reviewed the estimates and confirmed that this is reasonable and likely to occur.

The Project sells electricity to Duke Energy via a power purchase agreement between Davidson Gas Producers and Duke Energy. Duke Energy generates renewable energy certificates (RECs). This is allowable because the Project does not generate emission reductions for replacing grid electricity with renewable electricity generation.

The Project start date is 20 May 2009 which is when the flare began destroying landfill gas. The engine was commissioned in November 2010. RCE validated the project start date by reviewing a purchase order for the flare and data for landfill gas flow to the flare at startup.

The Project is included on the Davidson County Landfill's permits: its Title V Air Permit and Solid Waste Management Facility Permit both issued by the North Carolina Department of Environmental Quality. Davidson Gas Producers also has an Air Permit for the construction and operation of the Project. The Davidson County Landfill is subject to the New Source Performance Standards (NSPS) for municipal solid waste landfills codified in 40 CFR 60 subpart XXX which targets landfills that commenced construction, reconstruction, or modifications after July 17, 2014. The regulation requires control of nonmethane organic compounds (NMOC) from landfills according to certain size and emission thresholds. If the NMOC emission rate is equal to or greater than 34 megagrams per year, the landfill owner must install a collection and control system. RCE reviewed results of the landfill's Tier 2 NMOC emission rate estimates from April 2019 which demonstrate that the landfill is not estimated to reach the 34 megagram per year threshold during the Project crediting period.

The Project contributes to sustainable development goals (SDGs) including SDG 13—take urgent action to combat climate change and its impacts—by destroying methane in landfill gas that otherwise would have been emitted to the atmosphere. The Project thereby contributes to holding the increase in the global average temperature to below 2 degrees C above pre-industrial levels.

EM did not identify any commercially sensitive information. RCE concludes that project details included in the PD are accurate, complete, and provide an understanding of the nature of the Project. The Project has been implemented as described in the PD.

3.2 Safeguards

3.2.1 No Net Harm

No negative environmental and socio-economic impacts associated with this project were identified by EM.

3.2.2 Local Stakeholder Consultation

This is the gap validation for the transfer of the Project from the Climate Action Reserve to the VCS Program. There were no comments and no concerns raised by local stakeholders while the Project was generating offsets with the Climate Action Reserve.

3.2.3 Environmental Impact

No environmental impact assessment was required for the Project.

3.2.4 Public Comments

There were no public comments submitted during the public comment period.

3.2.5 AFOLU-Specific Safeguards

N/A, this is not an AFOLU project.

3.3 Application of Methodology

3.3.1 Title and Reference

Climate Action Reserve Landfill Project Protocol, Version 5.0, published April 24, 2019 (CAR Protocol).

3.3.2 Applicability

Because this is a gap validation for the transfer of the Project from CAR to the VCS Program, the methodology applicability section is not required in the PD.

3.3.3 Project Boundary

Because this is a gap validation for the transfer of the Project from CAR to the VCS Program, the Project boundary section is not required in the PD. The Project boundary is consistent with the requirements of the CAR Protocol.

3.3.4 Baseline Scenario

Because this is a gap validation for the transfer of the Project from CAR to the VCS Program, the Baseline Scenario section is not required in the PD. The baseline scenario is consistent with the performance standard test requirements of the CAR Protocol.

3.3.5 Additionality

Because this is a gap validation for the transfer of the Project from CAR to the VCS Program, the Additionality section is not required in the PD. The Project meets the performance standard test and legal requirement test in the CAR Protocol.

3.3.6 Quantification of GHG Emission Reductions and Removals

Because this is a gap validation for the transfer of the Project from CAR to the VCS Program, the quantification section is not required in the PD. Emission reductions from the Project are quantified according to the CAR Protocol.

3.3.7 Methodology Deviations

EM identified one methodology deviation for the Project. The CAR Protocol allows for a single flow meter to be used for multiple destruction devices under certain conditions:

If there are any periods when not all destruction devices measured under a single flow meter are operational, methane destruction during these periods will be eligible provided that the verifier can confirm all of the following conditions are met:

1. The destruction efficiency of the least efficient destruction device in operation shall be used as the destruction efficiency for all destruction devices monitored by this meter; and
2. All devices are either equipped with valves on the input gas line that close automatically if the device becomes non-operational (requiring no manual intervention), or designed in such a manner that it is physically impossible for gas to pass through while the device is non-operational; and
3. For any period where one or more destruction devices within this arrangement is not operational, it must be documented that the remaining operational devices have the capacity to destroy the maximum gas flow recorded during the period. For devices other than flares, it must be shown that the output corresponds to the flow of gas.

The Project deviated from this Protocol requirement for the first VCS monitoring period, 2015-2019, when LFG flow to the flare and engine was available as total flow values, representing the sum of the flow to the engine and the flow to the flare. For that monitoring period, there was no operational activity data for the flare and thus no emission reductions are claimed for the flare. The Project does not meet condition 2 because the engine is equipped with a safety shut off valve, but the flare was equipped with only a manual shut off valve. The valve is manually opened when the engine is not operational for a shutdown or maintenance period. The Project is conservatively assuming that the flare was operating when the output of the engine drops below 100 kWh. For that monitoring period, emission reductions are claimed only for the engine and only for the period when electricity generation is 100 kWh or above.

RCE approved this methodology deviation because it does not negatively impact the conservativeness of the quantification of emission reductions.

3.3.8 Monitoring Plan

Because this is a gap validation for the transfer of the Project from CAR to the VCS Program, the Monitoring section is not required in the PD. Per the requirements of the CAR Protocol, a separate Monitoring Plan document is required.

3.4 Non-Permanence Risk Analysis

N/A for this project type.

4 VALIDATION CONCLUSION

RCE's gap validation determined that the Project complies with the requirements of Version 4 of the VCS Standard and with the VCS Program rules.

By destroying LFG in an engine and a flare, the Project will result in a reduction of GHG emissions that is relevant, complete, consistent, accurate, transparent, and conservative.

EM estimated the emission reductions over the 7-year crediting period from 1 January 2015 to 31 December 2021 to be 350,000 tonnes of CO₂e, resulting in an average of 50,000 tonnes of CO₂e annually. Based on the information provided, the Project is likely to achieve the estimated GHG emission reductions should the assumptions and operational conditions remain the same.

Lead Validator Signature



Nina Pinette

Senior Environmental Scientist

Independent Reviewer Signature



Phillip Cunningham

Environmental Scientist

APPENDIX A: LIST OF FINDINGS

Action Item	Resolution
Corrective Action Requests	
1. Revise the Project Description (PD) to address the following items: a. Section 1.10 – Table 3. Project credit estimation only needs to include estimates for the relevant crediting period, 1 Jan 2015 – 31 Dec 2021. Section 1.1 also requires a revision to the total. b. Section 1.14 – Include all permits relevant for the landfill and/or project (e.g. Air Permit No. 10059ROS). (Also note that section 1.14 is not required for projects transferring from CAR) c. Section 1.16 – This section does not acknowledge that the project is also eligible to generate and/or does generate RECs as demonstrated in the RENEWABLE ENERGY POWER PURCHASE AGREEMENT Between DUKE ENERGY CAROLINAS, LLC and DAVIDSON GAS PRODUCERS, LLC d. Section 1.17 – leakage is N/A to this project type e. Sections 3, 4, and 5 (except 3.6) are not required for projects registered under CAR. f. Ensure that all section numbers are consistent with Verra’s VCS PD Template g. Revise the reference to table 6, just above the table (2015-2023) since the table has been revised to reflect only the years in the current crediting period. h. Revise Section 3.4 Baseline Scenario. The statement “Since the Project had no previous collection or destruction prior to project start date” is inconsistent with other information in the PD and the	22 April 2021: Element Markets revised the PD to address a and e. 7 May 2021: Element Markets revised the PD to address b (1.14 removed), c, d, f, and g. 12 May 2021: Element Markets revised the PD to address h.

Monitoring Plan stating that the landfill had collection and passive venting.	
Additional Documentation Requests	
1. Provide evidence that the project complies with Clarification 1 in Errata and Clarifications - VCS Standard, v4.0 and Registration and Issuance Process, v4.0 related to eligibility and crediting period start date.	21 April 2021: Element Markets provided email communication with Verra confirming the eligibility of the project and details related to the crediting period start date.
2. Provide ownership evidence to demonstrate that Element Markets meets the requirements for a project proponent. <i>Project and jurisdictional proponents shall demonstrate that they have the legal right to control and operate project or program activities (Section 3.6 VCS Standard 4.0). Under the VCS Program, a project is only eligible where the project proponent can demonstrate project ownership. Project ownership is the legal right to control and operate the project activities. (Validation and Verification Manual v3.2, section 3.2.1)</i>	27 April 2021: Verra clarified that if Element Markets “can demonstrate that the operators of the project have given you ownership of the emission reductions, that is sufficient to demonstrate project ownership and the right to be the project proponent”.
3. Provide evidence of Project start date.	7 May 2021: Element Markets provided a PO for the flare and startup data as evidence of start date.
4. Provide any public comments submitted to Verra during the 30-day public comment period April 6 to May 6, 2021.	10 May 2021: Element Markets reported that there were no public comments.
5. Provide the Project Monitoring Plan required under the Landfill Protocol v5.0.	7 May 2021: Element Markets provided the Monitoring Plan.