



Verification Report

CAR838 IESI-Trinity Timber Ridge Landfill Carbon Project

Reporting Period: October 11, 2020 – February 28, 2021

Prepared for:

Trinity Carbon Management, LLC

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1.0 Introduction

Ruby Canyon Environmental, Inc. (RCE) was contracted to perform the verification of the IESI-Trinity Timber Ridge Landfill Carbon Project (Project) for the reporting period October 11, 2020 through February 28, 2021 to the Climate Action Reserve (Reserve) Landfill Project Protocol 3.0 (Protocol). The Project is located in Richwoods, Missouri at the Timber Ridge Landfill (Landfill).

1.1 *Project Background & Site Description*

The Landfill opened in 2003 and is expected to close in 2100. The landfill was originally owned by the IESI MO Landfill Corporation which transferred legal ownership to the Timber Ridge Landfill Company on June 19, 2018. The Landfill has a design capacity of 10,886,160 MG. The Project consists of the collection of landfill gas (LFG) from the landfill and its subsequent destruction by combustion in an open flare at the site.

1.2 *Responsible Parties*

Project Developer: Timber Ridge Landfill Company

Landfill Owner: Timber Ridge Landfill Company

Consultant: Trinity Carbon Management, LLC (TCM)

1.3 *Verification Team*

The RCE verification team consisted of the following individuals who were selected based upon verification experience and knowledge of the landfill methane sector.

Lead Verifier: David LaGreca

Verifier in Training: Garrett Heidrick

Senior Internal Reviewer: Nina Pinette

1.4 *Objectives*

The goal of the verification activities was to ensure that the claimed GHG emission reductions were complete, consistent, accurate, transparent, and permanent and that the Project was in compliance with the Reserve's project additionality, monitoring, and reporting requirements. Furthermore, the verification activities ensure that the data provided to RCE is well documented and free of any material errors or omissions.

1.5 *Scope*

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

- Review the reporting period's Project Monitoring Plan;
- Conduct a virtual site visit of project operations;
- Review the Project data acquisition and quality control procedures;
- Review the Project's baseline emissions and confirm the baseline and Project boundaries;
- Review the Project's evidence of environmental and regulatory requirements to ensure that the Project is additional;
- Review the Project's emission reduction calculations;
- Review the Project documents and data against the criteria listed in Table 1;
- Issue requests for additional documentation, clarifications, and corrective actions as necessary; and
- Issue a verification report, verification statement, and list of findings to TCM and the Reserve.

1.6 Verification Criteria

Table 1 – Summary of Verification Criteria

Criteria	Details
Standard of Verification	• The Reserve Landfill Project Protocol Version 3.0 (December 2, 2009) • Errata and Clarifications to Landfill Project Protocol Version 3.0 (June 18, 2015) • Reserve Offset Program Manual (March 12, 2021) • The Reserve Verification Program Manual (February 3, 2021)
Verification Process	The Reserve Verification Program Manual and ISO 14064-3:2006 Greenhouse Gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
Level of Assurance	Reasonable assurance
Materiality	97% accuracy level (less than 3% error) because total annual emission reductions are between 25,000 and 100,000 tCO ₂ e.

2.0 Verification Activities Summary

The Verification process consisted of the following activities as outlined in the verification plan:

- RCE completed a NOVA/COI form to identify any potential conflict of interest with the Project, Timber Ridge landfill company, or TCM. The NOVA/COI form was submitted to the Reserve and the COI assessment revealed no conflicts of interest and was approved by the Reserve on May 21, 2021.
- RCE held a verification kick-off meeting with TCM on June 10, 2021. During the kick-off meeting RCE reviewed the verification objectives and process, reviewed the verification schedule, and requested the verification background documents.
- RCE performed a strategic review and risk assessment of the received data and support documents to understand the scope and areas of potential risk in the GHG emissions reductions. In response to the COVID-19 pandemic, the Reserve approved conducting the site visit virtually. RCE assessed the risk of conducting a virtual site visit instead of an onsite visit. The risk was determined to be low since there are no changes to emissions sources or equipment since June 27, 2019 when RCE was previously on site to physically view Timber Ridge Landfill operations. RCE also assessed the impacts of using information control technology (ICT) on the validity and objectivity of the site visit and determined that the same review that had been conducted during site visits to Timber Ridge in the past could be achieved using a real-time video web meeting software with real-time video taken of project equipment and screen sharing.
- 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 August 5, 2021 using a real-time video web meeting and screen sharing software. During the site visit RCE performed key personnel interviews; inspected the Project equipment; and observed the onsite GHG management systems and data gathering, monitoring, and handling practices. The use of this method was effective in achieving the verification objectives.
- RCE conducted a detailed desktop review of 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 to TCM throughout the verification.
- RCE's senior internal reviewer conducted a review of the verification sampling, report, and statement.
- RCE issued a final verification report, verification statement, and list of findings.
- RCE held an exit meeting with TCM.

3.0 Verification Findings

3.1 Assessment of the GHG Emission Reductions Project Operations

The Project currently collects landfill gas from the Landfill and destroys it via combustion through an open flare mounted on a flare skid adjacent to the landfill. The LFG is pulled from 34 wells at the landfill and passes through a clean-out that removes condensate which is transferred to the landfill's condensate collection system.

RCE confirmed that the landfill is not a bioreactor and does not re-circulate leachate nor add any liquid other than leachate in a controlled fashion to accelerate or enhance the anaerobic biodegradation of the waste.

3.2 GHG Project Boundary (sources, sinks and/or reservoirs)

According to the Protocol, carbon dioxide and methane are the only GHGs included in the Project boundary from both the baseline and Project activities. The emissions resulting from the Project activity must be deducted from the Project baseline emissions in order to calculate total emission reductions. These Project emissions include the carbon dioxide resulting from the consumption of electricity from the grid and consumption of propane related to Project activities. Baseline emissions are the total methane vented to the atmosphere less the oxidation of methane by soil bacteria. Table 2 lists the sources of GHG emissions reviewed during the verification of the Project.

Table 2 – Summary of the Project GHG Sources, Sinks and Reservoirs

Activity	GHG Sources, Sinks & Reservoirs
Baseline	• CH₄ vented to the atmosphere. • Percent methane oxidized by soil bacteria. As the landfill is not covered with a synthetic liner, a 10% oxidation factor resulting from natural oxidation by soil bacteria was applied to the baseline emissions.
Project	• CH₄ from the incomplete combustion of LFG sent to the flare. • CO₂ from the combustion of fossil fuels used during operation and maintenance of the Project activity. • CO₂ resulting from the consumption of imported electricity.

3.3 Project Eligibility Criteria

The Protocol specifies four eligibility rules that a project must meet in order to register emission reductions with the Reserve: Location, Project Start Date, Additionality, and Regulatory Compliance. Below is a summary of the Reserve eligibility requirements and the Project's compliance to each requirement.

- **Eligibility Rule 1: Location**

The Project is a US-based landfill located in the town of Richwoods, MO. The Project therefore meets this eligibility requirement. RCE confirmed this information with a site visit in 2019 and virtual site visit in 2020 and 2021.

- **Eligibility Rule 2: Project Start Date**

The Landfill Project Protocol states a project start date is the date when methane was first continuously destroyed in a qualifying destruction device at the site. RCE reviewed the Parnel Biogas Inc. Destruction delivery and initial combustion notice as well as Project Submittal form to confirm that the Project first began continuous methane destruction on March 1, 2011. The Project submittal form was completed and submitted to the Reserve on May 16, 2011.

- **Eligibility Rule 3: Additionality**

Performance Standard Test

Prior to the Project activity, the Landfill neither collected nor destroyed any LFG. RCE confirmed this through review of the State of Missouri DNR Operating permit. In addition to satellite imagery, RCE observed no evidence of a previous landfill gas collection system while on site and during the virtual tour.

Thus, the Project passes the Performance Standard Test number 1 since it involves:

“Installation of a landfill gas collection system and a new qualifying destruction device at an eligible landfill where landfill gas has never been collected and destroyed prior to the project start date”.

Legal Requirement Test

During the virtual site visit, RCE interviewed TCM about the procedures to ensure that the Project meets environmental compliance requirements and the Legal Requirement Test. TCM monitors federal, local, and state regulations to ensure that the Project is in environmental compliance and that there is no mandate to collect and combust LFG. RCE confirmed that there are currently no laws or ordinances requiring the Landfill to collect and destroy LFG.

The Landfill is a municipal solid waste (MSW) landfill that exceeds the design capacity of 2.5 million megagrams (Mg) or 2.5 million cubic meters as specified in the New Source Performance Standards (NSPS) codified in Title 40 of the Code of Federal Regulations (CFR) Part 60, Subpart WWW. The landfill is therefore subject to the requirements of the NSPS for MSW landfills. The Landfill has not been permitted for an expansion from the original design capacity, nor has any construction been undertaken towards an expansion since July 17, 2014, therefore the Landfill is not subject to the NSPS XXX Regulations.

RCE examined the NMOC modeling results for the landfill and found that the calculated NMOC emission rates for 2020 of 45.26 Mg/year are below the 50 Mg/year threshold for a required gas collection and combustion system. The NMOC Tier II test was completed in October 2017 which indicated that Timber Ridge Landfill is not required to install an NSPS GCCS system pursuant to 40 CFR 60.757(b)(1)(ii)”. RCE therefore concluded that the Landfill is not required to destroy LFG.

RCE also reviewed the Project’s Monitoring Plan which defines how the Project continues to exceed the Legal Requirement Test. Landfill personnel review local, state, and federal regulations prior to each verification period in order to confirm that there are no new requirements or laws that mandate the GCCS to be in place. The Attestation of Voluntary Implementation form was also signed after the end of the reporting period and uploaded to the Reserve registry which states that the project was implemented and established voluntarily.

During the review of the supporting evidence, RCE did not observe any indication that the Landfill was mandated to destroy LFG. Additionally, there are no local, state, or federal requirements for the installation of a GCCS at the Landfill. Therefore, the results of the review indicated that TCM is following its Monitoring Plan procedures to assure that it passes the Legal Requirement Test.

- **Eligibility Rule 4: Regulatory Compliance**

RCE reviewed the procedures described in TCM's monitoring plan to ensure that the Project remains in compliance with all applicable local, state, and federal requirements. RCE searched the U.S. Environmental Protection Agency's Enforcement & Compliance History Online (ECHO) database and confirmed with the Missouri Department of Natural Resources (DNR) that there were no compliance issues.

RCE reviewed DNR's quarterly inspections for 2020 and the first quarter of 2021 along with environmental and operating permits including the Landfill's operating permit and the Municipal Solid Waste permit. During RCE's review there was a single instance of unsatisfactory findings and violations from the November 19, 2020 DNR inspection report. The Timber Ridge Landfill Company failed to comply with the effluent limits for pH. DNR confirmed that The Timber Ridge Landfill Company has resolved the issue. As this issue pertains to stormwater and is not related to the landfill gas collection and destruction system, RCE determined that this was not project related. RCE confirmed that there are no ongoing issues of noncompliance, and the procedures for ensuring regulatory compliance in the Monitoring Plan were being properly followed. Finally, RCE confirmed signature of the Attestation of Regulatory Compliance, after the end of the reporting period, which was uploaded to the Reserve.

3.4 Ownership of Generated Emission Reductions

RCE reviewed the completed Attestation of Title which state that Timber Ridge Landfill Company owns the emission reduction credits generated by the Project. RCE also reviewed the Verified Emissions Reductions Development Agreement between the Landfill and TCM and the amendments to confirm ownership.

3.5 GHG Monitoring and Management Systems

RCE reviewed the data management systems during the virtual site visit and desktop review. RCE completed the majority of the GHG management systems review during the virtual site visit by observing the onsite procedures and interviewing the personnel responsible for the Project. The virtual review included an assessment of the Project data collection, processing and handling procedures, recordkeeping and data storage, quality control and assurance procedures, record retention systems, and a field tour of the Project equipment.

RCE also assessed the impacts Information and Communication Technology (ICT) may have on the validity and objectivity of the information gathered during the virtual site verification. Per International Accreditation Forum Mandatory Document 4:2018 Section 4.2.4, "When using ICT, auditors/assessors and other involved persons (e.g. drone pilots, technical experts) shall have the competency and ability to understand and utilize the information and communication technologies employed to achieve the desired results of audit(s)/assessment(s). The auditor/assessor shall also be aware of the risks and opportunities of the information and communication technologies used and the impacts that they may have on the validity and objectivity of the information gathered." Timber Ridge confirmed that they were familiar with Zoom, the client-chosen platform for the virtual site visit, and with cell phone calls as a back-up, and that the platform did not impact the integrity of RCE's review. The lead verifier was provided with a tour of the Project Site and was able to confirm all necessary components. As the virtual verification took place in real time, technology had no impact on the validity or objectivity of data gathered and presented.

The desktop review included a detailed review of the Project monitoring plan and its conformance to Protocol requirements. RCE also confirmed that the Project was implemented according to the Monitoring Plan. The primary project data include the LFG flow to the open flare, thermocouple temperature of the flare, and methane content of the LFG. The LFG flow is continuously measured by one Thermal Instrument 62-9/9500 flow meter installed in the horizontal section of pipe leading from the blowers. During the virtual site visit,

RCE observed the position of the flow meter is correct to allow for laminar flow of landfill gas. The flow meter internally corrects for temperature and pressure at 60°F and 1 atm. The flare temperature is continuously measured by a thermocouple installed in the flare housing. All continuously monitored data is recorded continuously by a Honeywell data recorder and a SCADA PLC System. The methane content of the landfill gas was measured weekly with an Elkins ENV100 or Landtec GEM500 model handheld analyzer.

Beginning in December 2020, personnel changes on site impacted the frequency of data being retrieved from the Honeywell data aggregator as well as the frequency of methane readings. Third party consultant, SCS took handheld methane readings while onsite monthly during the period between December 2020 and February 2021. These readings were used as the weekly readings, when available, in the emission reduction calculations during the October 11, 2020 to February 28, 2021 reporting period. RCE confirmed that all data substitution was properly conducted according to Protocol guidelines.

During the virtual site visit RCE reviewed the data storage and retention policies of TCM and the LF and verified they were in conformance with the Protocol requirements and followed the Monitoring Plan. All data is kept for a period of ten years after the information is generated or seven years after the last verification.

3.6 Instrument QA/QC

RCE reviewed evidence that the flow meters and portable methane analyzers met instrument QA/QC requirements as outlined in the Protocol for cleaning, inspection, and calibration. The Project Monitoring Plan describes the procedures for instrument field checks and calibrations. These procedures in the Monitoring Plan are in compliance with the Protocol requirements. Elkins Earthworks and Landtec recommend the ENV100 and GEM 5000 units used during the reporting period to be factory calibrated annually. RCE confirmed that all GEMs and Elkins units had as found % drift <5% at all factory and field checks. See Table 3 for history of calibration for handheld gas analyzers and flow meters in use during the reporting period verified.

Table 3 – Gas analyzer and flow meter calibrations

Device	Serial Number	Dates of Use	Calibration Dates
ENV100	1101015	12/27/2019- 11/19/2020	12/17/2019
ENV100	1606201	10/9/2019- 12/18/2019	5/10/2019
GEM5000	G500838	12/4/2020, 12/23/2020	4/28/2020 4/20/2021
GEM5000	G504045	1/15/2021, 2/5/2021, 2/25/2021	1/4/2021
TI 62- 9/9500PI	2013293	Entire period	10/25/2019, 10/25/2020

Landfill staff performed quarterly cleanings and inspections of the flow meter on 9/22/20, 10/22/20, and 2/26/21, which was documented in inspection forms reviewed by RCE. These forms properly document the “as found” and “as left” condition of the equipment. All calibration accuracy checks performed on the flow meters were within the +/- 5% accuracy level.

The flow meter manufacturer, Thermal Instruments, recommends a calibration accuracy check every 12-18 months. In addition to being checked for accuracy, the project flow meter was calibrated by Thermal Instrument Company, Inc. on 10/25/19 and 10/25/20. The most recent factory calibration accuracy check was within 18 months of the previous calibration. The Project flow meter is calibrated annually, which is more

frequent than manufacturer recommendations. The accuracy check on 2/26/21 falls within the last two months of the reporting period verified.

3.7 Assessment of GHG Emission Reductions Calculations

The emission reduction calculation assessment included a review of Project assumptions, raw data inputs, and accuracy of calculations. RCE assessed the completeness of the raw data and how the data are transferred to the calculation spreadsheet. RCE reviewed the formulas and raw data inputs for accuracy and compliance with Protocol requirements.

The Project data consisted of raw data in the form of spreadsheets of flare flow, handheld methane analyzer measurements, and the calculation workbooks. RCE compared data in the flare spreadsheets to the respective daily sums, and then compared those data and the weekly methane readings to the calculation workbooks. RCE confirmed that a 10 percent discount was applied for weekly methane readings and an additional 10 percent discount was applied for methane oxidation in the unlined landfill. RCE confirmed that a 96 percent destruction efficiency was assigned to the Project's open flare. RCE also ensured that operational checks for flare temperature (>500 °F) were correctly applied.

RCE reviewed source documentation for Project emissions from purchased electricity and propane, confirmed that appropriate emission and conversion factors were used, and reviewed the use of Protocol equations for Project emissions in TCM's calculation workbook.

RCE recalculated the GHG emission reductions and compared the results to TCM's calculations to determine if the GHG emission reductions were materially correct. RCE's calculations involved recalculation of the daily total of LFG flow to the flare, calculation of monthly methane destroyed, and recalculation of the project and baseline emissions. RCE found no material misstatements in the final Project GHG reductions calculations.

Emissions reductions generated in the 10th reporting period, from October 11, 2020 – February 28, 2021, were significantly limited due to personnel changes which resulted in lost data from the Honeywell transmitter and multiple missing field readings for methane concentration. RCE confirmed that all data used was conservative and that appropriate QA/QC measures were incorporated in data gathering and calculations.

4.0 Verification Results

TCM provided sufficient evidence and documentation of its emission reductions, data collection procedures, and monitoring and quality control procedures. The verification process focused on verifying the emission reduction calculations and the source data used to quantify the emission reductions in accordance with the Reserve Landfill Project Protocol 3.0. The following is a summary of the verification results.

Tables 4 and 5 show reported and verified emission reductions by reporting period and vintage.

During final review, RCE identified no material misstatements in the data or emission reductions calculations. Table 3 defines the emission reductions verified for the reporting period. During the verification process, RCE made requests for additional documentation and clarifications to complete the verification. TCM sufficiently addressed all requests. The details of these requests are documented in RCE's List of Findings provided to the Reserve and TCM.

5.0 Conclusion

RCE conducted a risk-based analysis of the Project's GHG emission reductions including a strategic review of the Project data and evidence. Based upon the processes and procedures and the evidence collected, RCE

concludes that the Project emission reductions resulting from the capture and destruction of LFG during the reporting period October 11, 2020 through February 28, 2021 can be considered:

- In conformance with the Reserve Landfill Project Protocol 3.0,
- Without material discrepancy, and
- Verified to a reasonable level of assurance

Table 4 - Emission Reductions Verified by Reporting Period

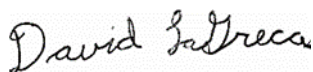
Reporting Period	Baseline Emissions CO ₂ e (tonnes)	Project Emissions CO ₂ e (tonnes)	Emission Reductions CO ₂ e (tonnes)
October 11, 2020 – February 28, 2021	14,905	63	14,842

Table 5 - Emission Reductions Verified by Vintage

Year	Baseline Emissions CO ₂ e (tonnes)	Project Emissions CO ₂ e (tonnes)	Emission Reductions CO ₂ e (tonnes)
2020	10,281	36	10,245
2021	4,623	26	4,597
Total	14,905	63	14,842

Note: Due to rounding, individual values might not equal totals and values are not representative of raw data used in the emission reductions calculation.

Lead Verifier Signature



David LaGreca

Senior Internal Reviewer Signature



Nina Pinette