



Verification Report for

Rio Grande Valley Landfill

Donna, Texas, USA

Project ID CAR 512

Climate Action Reserve

Landfill Project Protocol

Version 2.1

17 March 2011

Report Prepared for:

BFI Waste Systems
of North America, LLC
18500 North Allied Way
Phoenix, Arizona 85054

Report Prepared by:

NSF International Strategic
Registrations, Ltd.
789 Dixboro Road
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Summary

BFI Waste Systems of North America, LLC engaged NSF International Strategic Registrations, Ltd. (NSF-ISR) to verify its destruction of methane gas from a destruction project reported to the Climate Action Reserve for the reporting period 8 January 2010 through 27 December 2010. BFI Waste Systems of North America, LLC is a project developer as described by NAICS code 56221. The project consists of the collection and flaring of landfill gas (LFG) from Rio Grande Valley Landfill located at Farm to Market 493 and Mile 12 Road, Donna, Texas 78753, Hidalgo County, USA.

1. Introduction

1.1 Objective

The objective of this verification audit was to determine, with reasonable assurance, that BFI Waste Systems of North America, LLC had met all eligibility rules and had quantified, monitored and fairly reported to the Climate Action Reserve emission reductions of methane from the destruction of landfill gas in a flare.

1.2 Scope

The scope of the engagement included verification of the quantification, monitoring and reporting of greenhouse gas emission reductions from the project at the Rio Grande Valley Landfill for the reporting period of January 8, 2010 through December 27, 2010. The scope included verification of the calculated project emissions associated with combustion of fossil fuel in a single flare and indirect emissions attributed to electricity consumption from project-related activities. And finally, the scope of this verification covered a review of all eligibility rules for this project per the requirements in the Landfill Project Protocol.

1.3 Criteria

BFI Waste Systems of North America, LLC implemented its methane reduction in accordance with the requirements of the Climate Action Reserve's Landfill Project Reporting Protocol, version 2.1; the Climate Action Reserve's Program Manual (March 16, 2010) and the Landfill Protocol v2.1 Errata and Clarifications (January 4, 2011). NSF-ISR conducted its verification of the reported emission reductions in accordance with the requirements of The Climate Action Reserve's Landfill Project Verification Protocol 2.0 (November 18, 2008), the Verification Program Manual (June 17, 2009) and ISO 14064:2006, Part 3, *Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions*.

1.4 Materiality

In accordance with the Climate Action Reserve Landfill Project Protocol, emission reduction assertions were considered fairly stated if they varied by no more than 5% from a complete statement of the project's methane emission reductions. Thresholds of materiality defined in the Climate Action Reserve Verification Program Manual allowed verifiers of emission reduction reports to consider as immaterial discrepancies of 5% or less. In addition, deviations from the protocol are considered material.

1.5 Level of Assurance

This engagement was performed at the reasonable level of assurance.

2. Verification Approach

2.1 Team appointment and COI Review

This verification was performed by Mark Lutz, NSF-ISR Lead Verifier and reviewed by John Shideler, NSF-ISR Senior Internal Reviewer. Conflict of Interest inquiries were completed for NSF-ISR, the Lead Verifier and the Senior Internal Reviewer. A finding of low COI risk was confirmed by the Climate Action Reserve on 20 December 2010.

2.2 Document Review

The Lead Verifier conducted a document review to inform the planning process in advance of performing on-site verification activities. Documents reviewed included BFI Waste Systems of North America, LLC's project documentation submitted to the Climate Action Reserve, project reports, flow metering and data logging instrumentation documentation, calibration documentation, data logging records, monitoring plan, compliance attestations and supporting documents and site equipment and drawings.

2.3 Planning

NSF-ISR's verification approach is risk-based. It draws upon our understanding of risks to fair statement of reported emissions and the operation of controls to reduce such risks. As a result of the document review and preliminary conversations with Element Markets, LLC personnel (Element Markets, LLC is the company contracted by BFI Waste Systems of North America, LLC to assist them in this project) a verification plan and a sampling plan were developed for this engagement.

2.4 Verification Activities

As a result of its planning process, NSF-ISR conducted a site visit at Rio Grande Valley Landfill in Donna, Texas. The site visit was conducted from January 6 through January 7, 2011.

Verification activities included:

- Confirmation of the project start date, eligibility, ownership of the project, and quantification of project emission reductions;
- Review of the project eligibility details under NSPS Emission Guidelines for MSW Landfills;
- Confirmation of the continued control environment, information management systems and monitoring plans at offices and facilities operated by BFI Waste Systems of North America, LLC;
- Review, on a sampling basis, of compliance with relevant environmental regulatory requirements at the Rio Grande Valley Landfill site;
- Selecting locations and processes within the scope of BFI Waste Systems of North America LLC's landfill gas project to visit based on an assessment of risks to fair reporting;
- Reviewing the basis for and results achieved from the calculated methane emission reductions from its landfill gas collection and destruction project;

- Verification that BFI Waste Systems of North America LLC's monitoring program and data management system addressed and recorded Protocol monitoring parameters during each project period; and
- Verification that BFI Waste Systems of North America LLC's records management system contains procedures for acquisition and retention of all Protocol-required information, and that such procedures have been implemented.

3. Verification Findings

3.1 Project Description

The project consisted of methane collected from a landfill that included 64 LFG vertical extraction wells, associated piping and a blower/flare skid. The LFG was combusted in one open flare. The landfill consists of 134.5 acres with a total permitted footprint of 94.1 acres. There are eight cells on this landfill that currently total 92.1 acres. The final two acres of cell 8 will be constructed in 2012.

3.2 Eligibility and Title

Project Location: The project was located in Donna, Texas – located entirely within the U.S. and was eligible as a landfill project under the Climate Action Reserve Protocol.

Project Start Date: BFI Waste Systems of North America, LLC provided various documents to support the evidence of the construction of the landfill project including documentation of flow meter readings and temperature data at the flare skid before and after the project began; a construction report by Weaver Boos Consultants-Southwest (an outside contractor) to BFI Waste Systems of North America, LLC (August, 2005) and an e-mail from Practical Controls (a third-party engineering firm contracted by BFI Waste Systems of North America, LLC) who witnessed the start-up. These documents confirmed that the project start date was 21 February 2005, and that the project met the start date eligibility requirements.

Crediting Period: The crediting period was from 21 February 2005 (the project start date) to 20 February 2015. The reporting period, (8 January 2010 through 27 December 2010) is within this crediting period.

3.3 Additionality

Legal Requirement Test: The New Source Performance Standard (NSPS) for MSW landfills requires that landfills that began receiving waste after May 30, 1991, with a design capacity greater than 2.5 million megagrams to control emissions of non-methane organic compounds ("NMOC") when the estimated NMOC emissions exceed 50 megagrams per year. A review was done of a Tier II Report conducted by Weaver Boos consultants, LLC–Southwest during the week of July 13, 2009. The report concluded that Rio Grande Valley's NMOC emissions were less than 50 megagrams in 2009 and were projected to be 42.4 megagrams in 2010. The report concluded that Rio Grande Valley Landfill is not required to capture and destroy landfill gas under federal regulations.

NSF-ISR also confirmed that Rio Grande Valley Landfill is not required to manage its landfill gas under both the Texas Commission of Environmental Quality and local regulations. A review was done of a permit modification from the Texas Commission of Environmental Quality (#MSW-1948, issue date 3

November 2003) that stated: "The permit modification allows Rio Grande Valley landfill to voluntarily install a landfill gas collection system."

NSF-ISR examined the "Attestation of Voluntary Implementation" signed by James Van Weelden, Senior V.P., Environmental Development and Compliance, BFI Waste Systems of North America, LLC on 4 January 2011, attesting that there were no regulatory requirements that required capture and destruction of landfill gas at Rio Grande Valley Landfill, and found the document to be free from defect. On the basis of all the evidence considered, NSF-ISR has concluded that Rio Grande Valley Landfill has met the Legal Requirements Test.

Performance Standard Test: Per the protocol, projects must pass the Performance Standard Test – a standard of performance applicable to all landfill projects. According to the Environmental Manager for Republic Services, there were no flares connected to the leachate riser system and there was no evidence of a previous flare onsite. A visit to the site and interviews with site and project development personnel confirmed as-built drawings and engineering specifications/construction documents, showing the installation of new collection and destruction equipment as of the dates specified in the documents.

As a result, NSF-ISR verification activities show evidence that the site was not collecting and destroying landfill gas prior to the project start date and is considered "additional" under "Scenario 1" of the protocol – i.e. *"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."*

Regulatory Compliance: NSF-ISR reviewed regulatory compliance documents of the Rio Grande Valley Landfill site: A Municipal Solid Waste General Operating Permit #517; an Operating Permit #O-2526 and a Landfill Permit #MSW-1948A. These permits included, as applicable, inspection frequencies, sampling frequencies and reporting requirements. NSF-ISR verified that these permits were all current.

In addition, NSF-ISR reviewed the processes in place at Rio Grande Valley Landfill for on-going monitoring of regulatory compliance to Federal, State and local regulations and related permit requirements. This was done through a review of the regulatory monitoring plan described in Rio Grande Valley Landfill's "Project Design Document" and interviews with both Republic Services Inc.'s Environmental Manager and Rio Grande Valley Landfill's Operations Manager. Through a review of the monitoring plan, interviews, and a review of the permits, it was found that there were robust controls in place for monitoring regulatory requirements and that there were no NOV's from any regulatory agencies during the project reporting period.

NSF-ISR examined the "Attestation of Regulatory Compliance" signed by James Van Weelden, Senior V.P., Environmental Development and Compliance, BFI Waste Systems of North America, LLC on 4 January 2011 and found the document free of apparent defect. This attestation was signed prior to commencement of NSF-ISR's verification activities and was on file in the Reserve's database.

3.4 Ownership

BFI Waste Systems of North America, LLC was a subsidiary of Republic Services, Inc. NSF-ISR conducted a review of current permits: 1) A Municipal Solid Waste General Operating Permit #517; 2) An Operating Permit #O- 2526; and 3) A Landfill Permit #MSW-1948A. All three of these permits

were issued from the Texas Commission on Environmental Quality. All three referenced BFI Waste Systems of North America LLC's ownership and operation of Rio Grande Valley Landfill.

In addition, the relationship of Element Markets, LLC to BFI Waste Systems of North America, LLC was reviewed. NSF-ISR examined an agreement ("Carbon Credit Development and Management Agreement" dated September 3, 2009) stating that Element Markets, LLC would work together with the project developer to, among other things, assist with monitoring, verification and issuance of carbon credits that may be generated by this project.

NSF-ISR also examined a "Project Developer's Attestation of Title" completed by BFI Waste Systems of North America, LLC (James Van Weelden, Senior V.P. of Environmental Development and Compliance, 4 January 2011) on file in the Reserve's database and found it to be free from defect. From the above evidence, NSF-ISR has concluded that BFI Waste Systems of North America, LLC owns and operates the Rio Grande Valley Landfill, there is no evidence that the gas rights and/or carbon credits have been sold or contracted to another party and that BFI Waste Systems of North America, LLC owns the carbon credits and environmental attributes associated with the landfill.

3.5 Project Boundaries and Emission Sources

NSF-ISR reviewed the project boundaries per the requirements of the protocol and found that the assessment boundaries correctly begin with the project landfill gas collection system (gas wells and lateral collectors) in the well field leading to a blower/flare skid and associated valves and instrumentation and ending with the flare itself. NSF-ISR found that there were no engines, turbines, boilers or other devices and that the flare was the sole destruction device.

GHG sources, sinks and reservoirs associated with the baseline scenario (the pre-project state of the landfill was verified as a landfill where no previous collection or destruction took place prior to the project start date):

- CO₂ from the oxidation of CH₄ by soil bacteria. As the landfill is not covered by a synthetic liner, the Landfill Project v. 2.1 Reporting Protocol assumption that 10 percent of the methane produced would be naturally oxidized by soil bacteria has been applied.
- Uncontrolled GHG released from the landfill.

GHG sources, sinks and reservoirs associated with the project:

- CH₄ from the incomplete combustion of CH₄ in the flare.
- CO₂ from the combustion of fossil fuels used during operation and maintenance activities for the project activity.
- CO₂ resulting from the consumption of imported electricity.
- The gases reviewed include CO₂ and CH₄. All gases have been converted to CO₂ equivalents.

3.6 Performance Against Project Protocol/Methodology

During the site visit, a review of the project greenhouse gas management system was conducted with the project developer. This review included a detailed look at the project data handling and processing procedures, recordkeeping and data storage and the quality control and assurance procedures. The following is the result of this review.

NSF-ISR reviewed Rio Grande Valley Landfill's "Project Design Document: Rio Grande Valley Landfill." This document was reviewed both in the document review stage of our verification process and on-site to verify monitoring activities and records against this document. A monitoring plan for the reporting period 8 January 2010 through 27 December 2010 was verified from this document. NSF-ISR verified that this monitoring plan was implemented correctly and meets the monitoring requirements of the protocol.

Although the project began in August 2005, there were no credits claimed until January 2010. This was due to the fact that not all protocol requirements were met before 2010. The chart recorder was not accurate enough and methane concentration measurements were random before 2010.

During the reporting period, the operation of the flare was continuously monitored using a thermocouple located within the flare shroud connected to FleetZOOM/Yokogawa digital data logger to sense temperature and provide information for calculating the operating hours of the flare.

LFG flow was measured continuously and recorded every 5 minutes using a Thermal Instrument (TI) Model #62-9/9500 and a FleetZOOM data recorder until March, 2010. A Yokogawa model F X106 digital data logger was then installed and used through the duration of the reporting period. With the new digital data logger, LFG flow was recorded every two or four minutes.

The TI measurement device automatically adjusted flow to compensate for the temperature and pressure of the LFG stream. The original factory calibrations were configured to measure flow (scf) at 70°F and 14.7 psia. After 15 September 2010, the TI calibration was changed to automatically meet protocol requirements of 60°F and 14.7 psia. The raw data spreadsheets were sampled before 15 September 2010 to verify that the proper corrections were made.

From 8 January 2010 through 17 March 2010, methane measurements were taken and recorded at least once every week using either a Landtec GEM-500 or Landtec GEM-2000 portable gas analyzer. Spreadsheet calculations were reviewed to verify a 10% discount for weekly methane concentration measurements per the protocol. A Siemens Ultramat 23 continuous gas analyzer was installed and became fully operational on 2 April 2010. Methane was then measured continuously and recorded every 2 minutes (from 2 April 2010 to 11 May 2010), but was changed to every 4 minutes through the end of the reporting period. Portable methane measurements were still taken and recorded to provide a data check.

The Yokogawa data logger stores the data on a compact flash drive and its internal memory. The individual daily files were then automatically downloaded each day using a software package. The files were automatically converted and stored in Element Markets LLC's internal server. The data was processed and stored in a Microsoft database. From this database, the data was queried and downloaded into Excel files to aggregate amounts and to calculate total emission reductions.

The Excel spreadsheets were designed to disregard low temperature readings below 400 degrees Fahrenheit. Raw data samples and weekly data samples were taken during the verification per a sampling plan. Each sample was examined for periods where there were no data, data reported as "0", any periods of sudden variation, periods where methane concentrations temperatures or flows were missing and other anomalies. These periods were correlated through interviews with personnel with times where the flare was down due to equipment issues, weather-related, electrical outages, maintenance, etc. The samples showed that the Excel spreadsheets were filtering out the data per the parameters stated above and no emission reductions were claimed during those periods.

NSF-ISR verified that the required documents for the project's reporting period had been completed and submitted to the Reserve. These included the signed Attestation of Title, the signed Attestation of Voluntary Implementation and the signed Attestation of Regulatory Compliance.

3.7 Project Management System

The project management system was described in "Project Design Document: Rio Grande Valley Landfill" written by Element Markets LLC. This Project Design Document incorporated a description of the relationship/ responsibilities of all parties connected with the project, a detailed description of the project, calculation methodologies and a monitoring plan to track emission reductions. In addition, the plan included monitoring details of landfill gas delivered to the flare, the monitoring of the percent of methane content and the monitoring of flare temperatures to ensure complete destruction of methane. This document was verified to address the requirements of Version 2.1 of the Landfill Project Reporting Protocol.

The TI flow meter was verified by records as inspected, cleaned as needed and field-checked for calibration by two outside contractors (AECOM or Practical Controls) on a quarterly basis. In addition, it was verified that the calibration procedure followed the Thermal Instruments' recommended field check calibration procedure and the protocol's requirement of a confirmation of accuracy below a $\pm 5\%$ threshold. The last calibration date was 22 December 2010 - well within the protocol requirements that the last field check must not be more than two months before the end of the reporting period.

The Siemens Ultramat 23 gas analyzer was verified by records as inspected, cleaned as needed and field checked for calibration on a quarterly basis by an outside contractor, Practical Controls. None of these calibrations showed a drift that was beyond the $\pm 5\%$ threshold per protocol requirements. Two portable gas analyzers were used during the reporting period and it was verified that they were both calibrated annually by either the manufacturer or an ISO 17025 accredited laboratory.

Through an interview with a representative from Element Markets LLC, internal procedures were described for daily flare data monitoring (using cellular telemetry starting in April 2010) which includes monitoring of periods of unusual flow/ temperature, gaps, etc. In addition, internal procedures were described for checking the accuracy of the calculations, review of the raw data, methane readings, flare temperatures, Excel formulas, etc.

The Project Description Document outlined procedures that described what records would be kept, by whom and for how long. In general, records are stored for a period of 10 years after the information was generated or 7 years after the last verification. In addition, data were backed up on a separate system in Austin, Texas, every night.

The Project Description Document also outlined how applicable local, state, and national regulations and permit requirements are monitored on an ongoing basis. This was verified by an interview with Republic Services' Environmental Manager.

NSF-ISR found an adequate control environment per the documented project management system for the project for the reporting period, including a record-keeping plan, monitoring of landfill regulations, the role of individuals performing specific monitoring activities and QA/QC provisions to ensure that data acquisition and meter calibrations were carried out consistently and with precision.

3.8 Calculation of GHG Emission Reductions

Monitoring Plan data calculation procedures were reviewed for consistency with the Landfill Project Reporting Protocol v. 2.1 requirements as part of this verification. No discrepancies with requirements were found.

NSF-ISR independently verified calculated project emission reductions for the year 2010 from information on data calculation spreadsheets. The correct discount factor (10%) was verified as being used when weekly methane measurements were taken and recorded at least once a week from 1/8/2010 through 4/2/2010.

Landfill Gas Destruction Project emission reductions were calculated per the formula defined in the Climate Action Reserve Landfill Gas Reporting Protocol version 2.1. The basic formula was:

- Total Methane destroyed
- Methane destroyed (above) converted to CO₂e
- Less the oxidation factor
- Less the discount - 10% only for those periods of weekly methane monitoring in the beginning of 2010.
- Less the fossil fuel emissions used for the project, converted to CO₂ (in this case, the propane used for flare start ups.)
- Less the total annual electricity consumed by the project landfill gas project (with conversion factors to convert from MWh to CO₂, and then conversion of lb/CO₂ to tonnes of CO₂.)

= Project Emission Reductions.

Note: For this project, there was no supplemental natural gas utilized, nor were there any pre-project destruction devices, so there was no need to calculate these factors. NSF-ISR further verified the data for accuracy, based on its sampling plan, the trail of data beginning from the raw data outputs to the spreadsheets capturing this data to the final calculations. NSF-ISR independently calculated the data based on the calculations in the Protocol and found Rio Grande Valley's claimed emission reductions were fairly stated.

No flow rates were substituted during the reporting period. For missing methane data, there was missing data for the weeks of 2/26/2010–3/4/2010 and 3/12/12–3/18/2010 when no methane concentration measurements were recorded. It was verified that substitution was correctly used for these two weeks (using the minimum methane measurements from either the previous week or the following week) per the Landfill Gas Project Protocol version 2.1, Appendix E, requirements.

3.9 Corrective Action Requests/Recommendations

NSF-ISR issued two corrective actions and one recommendation for improvement for this project. All material and immaterial issues were resolved. Details on the corrective actions and clarifications requested were provided to the Project Developer and to the Reserve in a List of Findings, a private document.

3.10 Approved Variances or Deviations

There were no requested variances or approved deviations for this project.

4. Verification Results

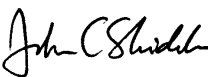
4.1 Verification Team Recommendation:

Based on the verification activities described above, the verification team has concluded that the Rio Grande Valley Landfill's project has achieved the following emission reductions:

Vintage Year :	Baseline Emissions	- Project Emissions	- Adjustments	= Metric tons CO ₂ -e Removals (net)*
2010	52,789.36	6,488.48	0	46,300

* Rounded Down

4.2 Verification Audit Summary:

Project Developer	BFI Waste Systems of North America, LLC 18500 North Allied Way Phoenix, Arizona 85054
Project Location	Rio Grande Valley Landfill Farm to Market Route 493 and Mile 12 Road, Donna, Texas, USA 78753 Lat: 26° 13' 31.58" N/ Long: 98° 01' 54.93" W
Project Type	Collecting and Destroying Methane from Landfills
Project Period	8 January 2010, through 27 December 2010
Protocol Methodology	Climate Action Reserve, Landfill Project Protocol, Version 2.1
Emission Removals Verified	Vintage 2010: 46,300 metric tons of CO ₂ -e
Verification Conclusion	Based upon the above, NSF-ISR has concluded that Rio Grande Valley Landfill's 2010 vintage methane emission reductions of 46,300 metric tons (CO ₂ -e) reported to the Climate Action Reserve are, in all material respects, fairly stated.
Lead Verifier	 Mark Lutz, 2011-03-17
Internal Reviewer	 John Shideler, 2011-03-17
<i>This verification statement is valid when signed and dated by an NSF-ISR internal reviewer.</i>	