

VERIFICATION REPORT FOR

BLUE SOURCE HENRICO COUNTY

LANDFILL GAS COMBUSTION PROJECT



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Summary:

SCS Global Services (SCS) conducted a periodic verification of the Blue Source Henrico Landfill Gas Combustion Project. In this project, methane gas was collected from active and inactive portions of the Springfield Road Landfill located in Henrico County, Virginia. Landfill gas was destroyed in one of two destruction devices: 1) Landfill gas was used to generate electricity from a 4 MW power generating facility constructed and maintained by Ingenco and 2) Landfill gas not consumed by the Ingenco power generating facility was burned in an open flare. These activities resulted in a net reduction of CO₂-equivalent emissions. The Project also displaced fossil fuels consumed for baseline thermal energy generation. These activities resulted in a net reduction of CO₂-equivalent emissions.

Blue Source LLC engaged SCS to verify its emission reductions from October 1, 2013 to December 31, 2013. SCS verified the asserted emission reductions against criteria stated in the Verified Carbon Standard (VCS) Standard dated October 8, 2013, v3.4, and the Approved consolidated baseline methodology ACM0001: "Consolidated baseline and monitoring methodology for landfill gas project activities": Version 10.

The objective of the verification was to determine, with reasonable assurance, that the calculated emission reductions for this project were, in all material respects, accurately stated. The SCS verification team conducted its verification in accordance with ISO 14064, Part 3, *Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions*. During the verification process, SCS issued several new information requests – all of which were addressed sufficiently by the project participants.

On the basis of work conducted, SCS was able to conclude with reasonable assurance that Blue Source asserted vintage October 1 to December 31, 2013 methane emission reductions were fairly stated. More detail concerning this conclusion is provided in Section V of this report.

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Introduction

1.1 Objective

The objective of this verification audit was to determine, with reasonable assurance that

- Methods and monitoring procedures were implemented in accordance with the validated project description. This includes ensuring conformance with the monitoring plan.
- GHG emissions reductions quantified, monitored, and reported in the monitoring report were materially accurate.

1.2 Scope and Criteria

The scope of the engagement included quantification, monitoring and reporting of greenhouse gas project emissions reductions associated with the voluntary destruction of landfill gas from an expanded landfill gas collection system at the Springfield Road Landfill in Henrico County, Virginia.

The Project consisted of two stages. Stage 1 was the expansion of the pre-existing well field and replacement of a small candlestick flare with a larger capacity flare station.

Stage 2 was the implementation of a beneficial use project where the landfill gas (LFG) was destroyed in an on-site power generation facility and the resulting electricity was exported to the grid.

The project boundary is defined as the landfill, which is the site where landfill gas is collected via separate header and piping system from a pre-existing landfill gas conveyance and collection system, an expanded collection system built in 2005, (expanded again in 2006 and yet again in 2010), the flare station and the Ingenco 4 MW power generating facility located on the landfill property.

The gases included in the project included methane (CH₄) and carbon dioxide (CO₂). The period under this verification is October 1, 2013 to December 31, 2013.

The project developers implemented their methane emission reduction project in accordance with the requirements of the CDM methodology ACM0001– *Consolidated baseline and monitoring methodology for landfill gas project activities*, Version 10 and the Verified Carbon Standard Version 3.4. SCS conducted its verification of the reported emission reductions in accordance with:

- the Verified Carbon Standard Version 3.4, (10-08-2013),

- the Verified Carbon Standard Program Guidelines Version 3.5 (10-08-2013),
- ISO 14064-2 Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements, and
- ISO 14064:2006 Part 3, Greenhouse gases – Specification with guidance for the validation and verification of greenhouse gas assertions.

1.3 Level of Assurance

This engagement was performed at a reasonable level of assurance. Emission reduction reports were considered fairly stated if they varied by no more than 5% from a complete statement of the project's emission reductions.

1.4 Summary Description of the Project

The Project captures and destroys LFG methane from the Springfield Road Landfill located at 10600 Fords Country Lane, Glenn Allen, Henrico County, VA (latitude/ longitude: 37°40' 45" N / 77° 33' 58" W)

The Project consists of two stages. Stage 1 of the Project was the installation of an active gas collection system. During this stage, the gas captured from this system was flared, thereby converting methane to biogenic CO₂. As part of this project phase, in December 2004, Henrico County decommissioned the pre-existing flare and in June 2005, a larger flare station was installed. An additional 87 wells were installed during this time period. The wellfield was further expanded in 2006 with the addition of 5 new wells. In the fall of 2010, the collection system was expanded again with 18 new wells, bringing the total number of eligible wells to 110.

Stage 2 of the Project involved the implementation of a beneficial use project. The captured biogas was transported to an electrical power generating facility ("Ingenco") that uses modified diesel engines to run generators. The generators are located on the landfill property. This stage of the project became operational in September 2010 and most of the gas collected from the landfill was destroyed by Ingenco for electricity generation. Note that for this reporting period, there was not much electricity generation due to a fire that damaged some of the equipment in November, 2013.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The following is a summary of the verification process implemented by SCS:

- Conflict of Interest Review and Appointment of Team
- Kick-off meeting with Blue Source;
- Begin Risk Assessment by conducting a Documents Review including the Project Description (PD), the monitoring report, and supporting data;
- Development of the verification and sampling plan;
- Execution of the sampling plan;

- Review and evaluation of raw data and emission reduction calculations for the period under review;
- Follow-up of Non-conformities and Clarification Requests as needed; and
- Final statement and report development.

Conflict of Interest Review

Conflict of Interest inquiries were completed for SCS and for the verification team and a finding of low COI risk was confirmed by SCS's internal COI process. The COI assessment was conducted to identify any potential conflict of interests with the verification/project.

Appointment of Verification Team

This verification was performed by Mark Lutz, SCS Lead Verifier, and reviewed by Tina Sentner, SCS Internal Reviewer. Mark Lutz and Tina Sentner are lead verifiers approved by SCS to conduct landfill gas project verifications.

Project Kick off Meeting

Kick off of the project was initiated by a phone call and a series of e-mails exchanged between the Lead Verifier and Blue Source. The purpose was to review the timeline of verification; confirm verification criteria; determine any changes in the site, sources, GHG management systems or personnel, and to begin gathering information.

Desk Review

SCS reviewed the Project Description Document, Project monitoring report, the Validation Report and supporting documentation. A detailed discussion is provided below. A risk assessment was conducted to identify key factors that impact the reported emission reductions and removals. A Verification Plan was created to focus on the critical elements presenting potential risk for errors with the project. A separate sampling plan was designed to review all project elements in areas of high risk of inaccuracy or non-conformance. In addition, a Risk Assessment and Verification Plan were finalized.

Site Visit

The last site visit was conducted November 5, 2013 for the previous monitoring period. The results of our Risk Assessment indicated that, because there were no significant changes in this project from the previous verification period, an additional site visit was not warranted. In addition, this site visit was well into the reporting period for this verification. Some of the information gathered from the November 5, 2013 site visit was also used for this reporting period to verify the project equipment; to review and evaluate the project GHG management systems and data collection and handling.

Quantitative Review

An assessment of the emission reduction calculation inputs and procedures was performed to review the quantitative analyses undertaken by the Project Proponent, of converting the raw inventory data into emission reduction estimates.

Findings

Throughout the verification, there was an iterative exchange between SCS and the Project Proponent to gather additional information for review and examination. The Project Proponent

responded to all Findings and subsequently all issues were closed by SCS. See section 2.5 below.

Final Report and Opinion

The last step in the verification process included a final review of the submitted data, completion of the Verification Report, and drafting of the Deed of Representation. The draft report is presented to an internal SCS Technical Reviewer who determines the Verification Opinion to be justified given the evidence presented. Once completed, the Verification Report and Deed of Representation are presented to the project proponent for approval and subsequent submittal to the VCS.

Exit meeting with client:

The exit meeting entails a review of the remaining steps of the verification process and a summary of the verification findings

2.2 Document Review

The verification team conducted a document review to inform the planning process in advance of performing verification activities. Documents reviewed included the Henrico County Monitoring Report, Oct-Dec 2013 version 3.0, (February 17, 2014) against the project developer's Validated Project Design Document, (November 19, 2009) and ACM0001 Version 10 with the following associated "tools":

- CDM Flare Tool to determine project emissions from flaring gases containing methane (version 1).
- CDM Fuel Tool, Equations #1 and #4
- CDM Annex 7 "Tool to calculate baseline, project and / or leakage emissions from electricity consumption", option A2

A risk assessment was conducted to identify key factors that impact the reported emission reductions and removals. As a result of the document review and correspondence with project management personnel, a sampling plan was developed for this engagement. A verification plan with an audit agenda was submitted prior to the site visit on November 5, 2013. Discrepancies between project documentation and the verification criteria were considered material and identified for corrective action. Monitoring deviations were reviewed and justification from Blue Source was re-assessed. In addition, SCS assessed the GHG emission reduction assertion and underlying monitoring data to determine if either contained material or immaterial misstatements. The results of these reviews are discussed in greater detail below.

2.3 Interviews

Throughout the course of verification activities and during the November 5, 2013 site visit, SCS interviewed the following project personnel:

Person	Title	Organization
Nathan Mathews	Engineer	Draper Aden Associates
Don Marcokovich	Engineer	Draper Aden Associates
Will Overly (by phone during the site visit)	Manager, Carbon Projects	Blue Source LLC

The purpose of the interviews were to assess and confirm information and data provided in the Project Description and monitoring report, identify relevant competencies to assigned roles and responsibilities, and to assess the GHG management systems implemented onsite.

2.4 Site Inspections

As a result of its prior planning process for the verification of the first nine months reporting, on November 5, 2013, SCS Global Services conducted a site visit of the Springfield Road Landfill located in Henrico County, Virginia and the electrical generation facility located at the landfill. The nature of verification activities conducted included an assessment of the management control environment of the Henrico County Landfill, Ingenco and Blue Source LLC. Controls include staffing key positions with competent personnel, exercising supervisory and management oversight, and managing data.

The nature of verification activities conducted included:

- Verification of the implementation of the landfill gas project to report emission reductions in accordance with the Validated Project Design Document, the Henrico County Monitoring Report, Oct-Dec 2013 version 3.0, (February 17, 2014) and the ACM 0001, Version 10, "Consolidated baseline and monitoring methodology for landfill gas project activities";
- Verification of evidence presented by the various Project Proponents to demonstrate their knowledge of and assertion of compliance with applicable air and water regulations;
- Verification of applicable methane and carbon dioxide emission sources within the project boundary and their quantification as defined by the Validated Project Design Document, the Monitoring Plan and the ACM 0001, Version 10, "Consolidated baseline and monitoring methodology for landfill gas project activities";
- Verification of the Project's compliance with monitoring of key operational parameters of its landfill gas collection and destruction project as noted in the project description;
- Assessment of the capability of the Project's management system and procedures to produce accurate, reliable, and reproducible data and information;
- Determination of the Project's conformity in all material respects with the requirements of the Validated Project Design Document, the Monitoring Plan and ACM 0001, Version 10, "Consolidated baseline and monitoring methodology for landfill gas project activities";
- Visiting the selected work locations and interviewing personnel, observing operations, and reviewing relevant documents and records, and
- Reviewing the basis for and results achieved from the calculated methane emission reductions from its landfill gas collection and destruction project.

2.5 Resolution of Findings

SCS Global Services issued requests for clarification and non-conformities during the verification process. This exchange included Findings—New Information Requests (NIR), Non-Conformity (NC) and Opportunities for Improvement (OFIs)—that were issued by SCS to the Project Proponent. For this project, six NIR's were issued. Blue Source responses were sufficient to resolve all clarification requests. The findings with the responses provided are summarized in the table below:

#	Type	Issue	Reply of Responsible Party	Auditor Response
1	NIR	SN#1006 (continuous gas analyzer) was used during the apx month during the reporting period per "Henrico_Oct-Dec_2013 Data." How was the suspect 100% methane data treated?, i.e. was there a manual search/deletion? ...or some other method?	The data that showed 100% methane was deleted and credits for these periods were not counted in the emission reductions.	Reviewed the times in the data where the 100% methane were recorded and verified that no emission reductions were claimed during this time period.
2	NIR	No reference in the Monitoring Report regarding the status of the Ingenco plant (down for much of this period due to a fire. Please clarify this in the Monitoring Report.	The Monitoring Report has been updated to reflect the Ingenco Plant Fire	Reviewed updated report, v2. Closed
3	NIR	Blue Source uses an internal QA/QC checklist, as mentioned in the report. Can Blue Source supply a copy of this checklist?	File "Henrico_Oct-Dec 2013_QA_QC_KT Reviewed 01.31.2014.pdf" is the internal QA/QC checklist	Response accepted. Closed.
4	NIR	Please clarify the circumstances that cause an "unplanned shutdown" at the flare 11/18 through 11/19/2013.	I do not know for sure what caused the shutdown. We were not on-site during that time period. The shutdown started sometime after 1250 on the 18th. As there were no data logged at 1255, 1300 and 1305, that would indicate that power was lost to the blower flare station. The power came on at 1310, but the station did not run until 1750 on the 19th. Most probably, the landfill staff noticed the station not running on the 19th and started it back up.	Response accepted. Closed

5	NIR	A review of the current Monitoring plan found the values below to be missing. Please clarify in the monitoring plan to update the values for the verification period Oct 1 to Dec 31 2013 for the following parameters: 1. Operational hours of the Ingenco plant 2. PE EC,y value 3. EC PJ, Grid,y value 4 ECflare and pipeline,y value 5. FC Diesel,y 6. PEpropane, y 7. FC flare, propane, y 8. Wx 9. PE flare,y: The value listed here does not match calculations. Please correct.	1. 696 hours 2. 9.76 tonnes of Co2 3. 19.62 MWh 4. 19.62 MWh 5. 2559.5 gallons of diesel 6. 0.22 tonnes of Co2 7. 40 gallons of propane 8. 85,660.98 tons 9. 242 tonnes of Co2	Verifier confirmed revised data is accurate to the Monitoring Plan and our independent calculations. Closed.
6	NIR	EF CO2,Diesel,y: My value is 0.06638 tonnes CO2 / MMBtu. Pleaseclarify how you arrived at .07315.	Using the 19.95 kg C per MMBTU factor from EPA the Carbon needs to be multiplied by (44/12) or 3.667 to get 73.15 Kg Co2/MMBTU. Which is multiplied by 2.2046 kg/lbs which equals 161.26649 lbs Co2/MMBTU. Then you divide the 161.26649 by 2204.6lbs CO2/Tonnes of Co2.= 0.07315--> See Below in C18	Calculation clarification accepted. Issue Closed.

2.5.1 Forward Action Requests

There were no Forward Action Requests reviewed this verification period.

2.6 Eligibility for Validation Activities

No validation activities were conducted for this engagement.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

This project does not seek registration under other GHG Programs.

3.2 Methodology Deviations

For this reporting period, there were no new methodology deviations. There were deviations in previous reporting periods and these were verified as continuing to be in force for this reporting period. See Section 4.1 for details

3.3 Project Description Deviations

For this reporting period, there were no new project description deviations. There were deviations in previous reporting periods and these were verified as continuing to be in force for this reporting period. See Section 4.1 for details

3.4 Grouped Project

This section does not apply.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The Project was confirmed as being operational throughout this latest monitoring period. Implementation of the project activity was confirmed during the site visit on November 5, 2013. The project activity consisted of both Stage 1 (the expansion of the existing well field and the construction of a flare) and Stage 2 (capturing biogas to be transported to a power generating facility located on-site and used for electricity generation). It was noted during the site visit in November, 2013 that the Ingenco power generating facility was down due to a fire that happened shortly before the site visit. Hence, for this reporting period, all of the biogas captured after the fire was routed to the flare for destruction.

The Project continued to be implemented according to the description provided in the validated PDD and the Project Monitoring Plan. The Project's start date of June 3, 2005 was confirmed during the original validation.

The project was reviewed for any changes and SCS Global Services confirmed that there were no substantive changes made during this verification period, except that the electricity generation plant was down for the bulk of this reporting period.

SCS Global Services reviewed evidence for any data, variables or methodologies written in the Monitoring Report that differed from those stated in the validated PDD. SCS also verified, through an examination of an agreement (still in force) between Ingenco Renewable Development, LLC and Henrico County, that Ingenco continues to own the rights to GHG credits produced from this Project. In addition, Henrico County continues to own and operate the LFG collection system and flare station. Blue Source continues to be contracted with Ingenco to monetize the emission reduction credits associated with the Project.

Project Monitoring:

Project monitoring was implemented and performed by Draper Arden Associates (DAA). DAA handles all the operations and management of the gas collection system, has field technicians that balance the well field, and downloads the data from the Red Lion data logger for off-site storage. DAA staff downloads the data from the data logger and submits data to Blue Source for integration into emission reductions calculations. Blue Source saves the raw data files and then, after applying the appropriate emission reduction parameters, creates the emission reduction calculations that undergo an internal QA/QC checklist. The raw data used in the emission reduction calculations is also used for the County's Title V and GHG reporting. All monitoring results were reported to Blue Source LLC and reviewed by SCS Global Services.

The flow rate of Landfill gas (LFG) was metered at two locations; at the flare station prior to destruction of landfill gas at the flare and at the Ingenco Electricial Generation Plant prior to destruction of landfill gas used to generate electricity. The following is an overview of the metering and measurement:

Location 1: Flow Measurement at the Flare Station: Landfill gas flow was measured continuously at the flare blower/ flare station using a Rosemount Orifice Plate Model 1495C flowmeter with a Rosemount 3095 Multi-Variable Pressure Transmitter that monitors continuously with readings being taken two times per second. Flow was measured on a wet basis and was recorded at 68 F & 1 atm but was manually corrected to 70 degrees F and 1 atmosphere. The flow meter is located at the blower / flare station after the condensate knockout pot and after the blowers. Two LFG Industries Type k thermocouples are used to ensure the flare and pilot flame are burning. The data logger records flare temperature to show whether or not the flare was burning.

Location 2: Flow measurement at the Flare Station: Landfill gas flow was measured continuously at the Ingenco Electricity Generation Plant using a Rosemount Orifice Plate Model 1495C flow meter with a Rosemount 3095 Multi-Variable Pressure Transmitter that monitors continuously with readings being taken two times per second. Flow was measured on a wet basis and was recorded at 68 F & 1 atm but was manually corrected to 70 degrees F and 1 atmosphere.

Methane concentration for the Project was measured at Location 1 using an in-line Landtec FAU-TDL continuous gas analyzer. SN# 1037 was in place during the monitoring period from October 1st – November 26th 2013, then it was replaced with SN#1006 which was installed from November 26th-December 31, 2013. SN#1037 was then re-installed on December 31st, 2013. The gas analyzers were both factory calibrated prior to installation and observed to be field calibrated to span gas on a quarterly basis. The FAU-TDL Continuous Gas Analyzer does not require factory calibration and service, however the manufacturer recommends that the instruments be checked for proper operation “at least annually.” The internal policy is to check the analyzer annually and send for factory calibration every two years. SCS reviewed the calibration records which indicated the meters were operating accurately.

A Red Lion data logger was verified as having been used during this verification period with the capability to record flow, methane concentration and flare temperature. All calibrations for the flow meters and gas analyzer to both the flare and to the Ingenco plant were checked to verify that they were calibrated to manufacturers' specifications. The following is a synopsis of calibrations for the flow meters and gas analyzers:

MLM

Parameter	Instrument	OEM Calibration Recommendation	Verified Factory Calibration or calibration checks	Comments
Total amount of landfill gas sent to flare.	Rosemont Orifice Plate: Model 1595C with Rosemount 3095 Multi-Variable Pressure Transmitter. (Serial No. 135079)	Annually.	1/19/2010 1/14/2011 1/10/2012 1/08/2013 12/18/2013	Orifice Plate checked once per year. Transmitter calibrated and maintained within OEM specifications
Total amount of landfill gas sent to Ingenco	Model 1595C with Rosemount 3095 Multi-Variable Pressure Transmitter. (Serial No. 306661)	Annually	8/24/2011, 8/24/2012 8/12/2013	Orifice Plate checked once per year. Transmitter calibrated and maintained within OEM specifications
Methane fraction	Landtec FAU-TDL Continuous	"The FAU-TDL will	9/19/2011	In place during the

in landfill gas sent to the flare and to Ingenco	gas analyzer. (Serial No. 1037)	not require factory calibration and service however it is recommended that the instrument be checked for proper operation at least annually."	4/23/2012 12/12/2013	monitoring period from October 1st – November 26th 2013. Was replaced with SN#1006 from November 26th-December 31st. SN#1037 was then re-installed on December 31st, 2013. Note: There is also a periodic automatic self-calibration routine for this analyzer.
Methane fraction in landfill gas sent to the flare and to Ingenco	Landtec FAU-TDL Continuous gas analyzer. (Serial No. 1006)	"The FAU-TDL will not require factory calibration and service however it is recommended that the instrument be checked for proper operation at least annually."	8/26/2013	This analyzer was a "loaner" and was used from November 26th-December 31 st 2013 when #1037 was re-installed.
Flare Temperature at the flare	Two LFG Industries Type k thermocouples	No OEM guidance	1/8/2013	In addition, monthly site visits: Temp readout from the main flame thermocouple (upper) is recorded and checked for consistency with the flame condition. No inconsistent readings were observed during the reporting period.

SCS verified that the operation hours of the Ingenco Plant were monitored to ensure that methane was only flowing to the engines when operating by review of logs. The operation of the flare was monitored through the flare's thermocouple temperature readings. The Ingenco Plant is equipped with fail-safe values that automatically shut when the landfill gas line is switched off or the Ingenco Plant goes down.

SCS has concluded from the evidence presented that the flow meters remained reliable during the reporting period and the project monitoring was implemented as indicated in the validated PDD with the exception of the deviations noted below.

There were no remaining issues from validation.

The initial validation of the project identified three methodology deviations between the monitoring or measurement requirements of the validation criteria and the Project's monitoring plan. The methodology deviations were reviewed by the validation body and found to be acceptable, as summarized in the following tables:

Parameter	ACM0001 Requirement	Deviation from Requirement	Validation Conclusion
MDproject, y – Ex ante of the amount of methane that would	Use a first order decay model per the CDM Annex 10 "Tool to determine methane emissions	Emission reductions for 2009 through 2018 are estimated using the quantity of waste	Deviation acceptable. The gas volumes generated by the LandGEM model are for

have been destroyed or combusted during the year.	avoided from disposal of waste at a solid waste disposal site."	disposed at the Landfill and the US EPA's LandGEM model.	illustrative purposes only, as emission reductions will be based on <i>ex-post</i> monitoring data of the Project performance.
EFEL,j,y – Emission factor for electricity generation for source <i>j</i> in year <i>y</i> .	Following option A2 of the "Tool to calculation baseline, project, and/or leakage emissions from electricity consumption," a conservative default value of 1.3 tCO ₂ /MWh may be used.	An emission factor for electricity generation (EFEL,j,y) is assigned a value of 0.515 tonnes CO ₂ per MWh based on US EPA's eGrid 2007 for SRVC subregion. This value will be reviewed annually upon the release of updated eGrid data.	The 1.3 tCO ₂ /MWh default value provided by the tool is not representative of the emission intensity of grid-connected electricity generation in the US. Further, the Project does not consume a significant quantity of electricity and electricity consumption does not represent a large emission source for the project. As such, this approach is reasonable.
η _{flare,h} – Flare efficiency	A default flare efficiency of 50% for open flares and 90% for enclosed flares must be applied in cases where methane composition is measured quarterly.	The flare efficiency has been fixed ex-ante as 98%.	For projects where gas composition is measured continuously, no such default values are specified. 40 CFR §60.18 specifies requirements for flare operating variables(i.e., Btu content, exit velocity) that must be met in order to achieve a 98% or higher flare destruction efficiency. As long as the installed flare is designed and operated in accordance with 40 CFR §60.18, a 98% destruction efficiency is acceptable.

During this verification period, there were no new additional deviations. The following deviations were previously noted between the monitoring systems described in the validated PDD and those described in the monitoring report, as follows:

Parameter	Monitoring	Deviation	Verifier Conclusion
PDD states on page 37- "Annual verification" under the 'Schedule' in section 7.	Alternative verification periods	Verification for this last verification period was for 16 months instead of the annual verifications.	Deviation acceptable. . Does not impact eligibility, conformance, or performance of Project against ACM0001

PDD states on page 2 that "The Landfill's NMOC emissions will be assessed annually to ensure that the Landfill is not required to install a collection system."	Alternative monitoring method	A five- year assessment is done. Also, monitoring is performed by the County and Engineering firm constantly reviewing any new local, state, regional or federal updates to the regulations as well as performing the appropriate documentation for the Title V and GHG reporting.	Deviation acceptable. Does not impact eligibility, conformance, or performance of Project against ACM0001.
PDD states on page 31- "Section 4.4 "Emission reductions are calculated as the difference between the baseline methane emission rate and project emissions from electricity and fuel consumption at the site." but no equation was given therefore Equation 17 was included.	None – for clarification purposes only	Added equation 17 in the Monitoring Report : $ER_y = BE_y - PE_y$ Where: ER_y = Emission reductions in year y (tCO ₂ e) PE_y = Project emissions in year y (tCO ₂ e) BE_y = Baseline emissions in year y (tCO ₂ e)	Deviation acceptable. Does not impact eligibility, conformance, or performance of Project against ACM0001.
PDD states on page 25- Methane Density at 70 F & 1 atm is 0.000669 to be used in the calculations	Alternative factor	PDD, page 25: Methane Density at 70 F & 1 atm is 0.000669. The correct value is 0.00664321412. This correct density factor has been applied to the calculations.	Deviation acceptable. No impact on eligibility, conformance or performance of project.

SCS confirmed the GHG emission reductions or removals generated by the project were not intended to be included in an emission trading program or any other mechanism that includes GHG allowance trading by interview of Blue Source LLC and by review of the project monitoring plan that indicated no such activities were considered. In addition, during the kick-off meeting, Blue Source confirmed the project has not received or sought any other form of environmental credit, or become eligible to do so since validation or previous verification. Lastly, the project has not participated or been rejected under any other GHG programs since validation or previous verification. This was confirmed through a review of other registry websites.

Based on the above review, SCS concluded that the project was implemented as described in the project description and the project monitoring remained effective during the verification period.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The verification process was focused on independent testing and checking of the supplied spreadsheets to ensure that they were consistent with the formulas and equations described in ACM0001 (Version 10) and the validated PDD. In addition, checks of raw data used in the calculations, including flows and methane content and utility and fossil fuel invoices, were checked to the values used in the final calculations and tested for transcription or mathematical errors.

SCS Global Services reviewed emission reduction calculations for the reporting period, using the following specific tests and checks:

- Samples of raw data were tested for continuity and consistency of flow rates, methane content and for handling of outliers.
- Excel formulas that transposed data from one worksheet to another were checked.
- All formulas used were tested to ACM 0001 v10 and to the validated PDD.
- Samples of raw data were examined and followed through to final calculations.
- Samples of raw data were also examined for operation of the flare to the required parameters (temperatures and flow rates) defined in the validated PDD.
- Samples of spreadsheet aggregation formulas were checked for accuracy.
- Default factors were verified to the validated PDD.
- Data from project emissions were checked against samples of original invoices.
- Independent calculations, using aggregated spreadsheet data, were used to compare final results from Blue Source spreadsheets

SCS Global reviewed the project monitoring data for methane fraction (W_{CH_4}), total LFG eligible for the project ($MD_{project, y}$), and total landfill gas destroyed by the generation of electricity ($MD_{electricity, y}$) as used to calculate the amount of methane destroyed by the project.

Incremental flow was first calculated by taking the total flows difference between the aggregated monitoring periods from the raw data. The incremental methane destroyed flow was then calculated based on the above parameters with temperature and maximum flow capacity taken into consideration.

Per the CDM “Tool to determine project emissions from flaring gases containing methane” version 1, a flare efficiency of 98% is used if the methane monitoring is continuous. The raw data was verified as being continuous and the aggregated data was checked in this time period to test that the correct percentages were used to calculate emissions.

Landfill gas flare methane was calculated as the summation of aggregated LFG gas flow multiplied by the methane content and density of methane per cubic meter from which project emissions of the residual gas stream in the flare was subtracted.

Incremental methane destroyed from each destruction device was aggregated on a monthly basis and the annual monthly summaries were brought forward to the emission reduction calculation spreadsheet for further calculation. The methane destroyed by the Project ($MD_{project, y}$) was calculated based on the quantity of methane flared and the methane used to generate electricity as follows:

$$\begin{aligned} MD_{project, y} &= MD_{flared, y} + MD_{electricity, y} \\ MD_{project, y} &= 565.24 + 266.21 \\ &= 831.45 \text{ metric tonnes } CH_4 \end{aligned}$$

Multiplying metric tonnes CH_4 by 21 to convert to metric tonnes CO_2 :

$$\begin{aligned} MD_{project, y} &= 11,870.14 + 5,590.39 \\ &= 17,460.53 \text{ metric tonnes } CO_2 \end{aligned}$$

Raw data collected for $MD_{flared, y}$ and $MD_{electricity, y}$ included landfill gas flow, operational hours, and methane fraction on a continuous electronic basis by an electronic data logger. Our review of the

raw data confirmed the project correctly adjusted flow to standard conditions of 70 degrees F and 1 atm as required by the PDD. All data was adjusted according to the parameters in the PDD and formulas used were appropriately notated on the top of each work sheet.

Baseline emissions were then further correctly calculated using the formula:

$$BE_y = (MD_{\text{project}, y} - MD_{\text{BL}, y}) * GWP_{\text{CH}_4}$$

$$BE_y = (831.45 - 93.95) * 21$$

$$= 15,487.49 \text{ metric tonnes CO}_2$$

The pre-project collection system (the baseline deduction $MD_{\text{BL}, y}$) was equal to historic data calculations that were derived from the validated PDD, pro-rated for 3 months $(375.84/4) = 93.95$ metric tonnes CH₄.

Project emissions from electricity use and propane consumption were calculated and deducted from the overall emission reductions created by the project in conformance with the validated Project Description using equation:

$$ER_y = BE_y - PE_y$$

$$ER_y = (15,487.49 - 35.95)$$

$$= 15,451.54 \text{ metric tonnes CO}_2$$

Through examination of the calculations in the Excel spreadsheet provided by Blue Source LLC, and through an independent recalculation of the emission reductions from the verification period using the available raw flow, and methane data, SCS confirmed the emission reduction calculations were free from material misstatement.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Documentation was provided by Blue Source LLC for emission data, the data collection process and the quality systems associated with this project. Additional supplementary evidence was provided on-site with oral and documented evidence provided by both Draper Aden Associates and Blue Source LLC regarding details of the landfill itself, monitoring equipment history, maintenance and calibration and details of both the equipment on the flare skid and the gas collection system associated with the landfill.

Documented evidence included electronic flow records, methane analyzer records, flow aggregation and calculation records, invoices and equipment/well field O&M records.

SCS Global reviewed evidence of the above data sources to a sampling plan and did an independent review of the factors associated with methodology and the calculations themselves. The reliability of the evidence was demonstrated by interviews with Draper Aden Associates concerning their reviews of the raw data during the site visit in November 5, 2013. In addition, the site visit to the flare flow meter and methane analyzer spot checked data corroborated well with the flows and methane content provided in the data records.

Monitored data was available directly on the SCADA system in real time and a raw data is provided to Blue Source. Operating reports are internally checked by Draper Aden Associates

periodically for any irregularities. Blue Source also cross checks the reported gas flow to the various destruction devices to identify irregularities in reporting.

Data permanence was assured through redundancy of computers with data kept by Draper Aden, Henrico County Landfill and by Blue Source. The SCADA system uploads data to the on site server on a monthly basis and data also be aggregated on a monthly and yearly basis.

Project monitoring is documented in the Project Design Document (November 9, 2009), and in the Henrico County Monitoring Report, Oct-Dec 2013 version 3.0, (February 17, 2014.) For this project period, SCS reviewed three versions of the monitoring report with the final revised version stated as version 3.0 (February 17, 2014) referenced above.

The evidence provided was sufficient for verification of the project and consistent with the requirements of the VCS Standard, October 8, 2013, v3.4, ACM0001 (Version 10), the validated PDD and the Project Monitoring Report and meets generally accepted evidentiary standards for best practice in GHG accounting.

4.4 Non-Permanence Risk Analysis

This section is not applicable to the project.

5 VERIFICATION CONCLUSION

Blue Source LLC has supplied a Project Monitoring report, Validated Project Design Document and the necessary evidence requested during the verification process to enable SCS to arrive at an opinion on the Blue Source Henrico County Landfill Gas Combustion Project. The emission reductions generated from the capture and destruction of landfill gas methane via a flare and a beneficial use project consisting of electricity generation have been compiled in a transparent manner, the data was found to be accurate within the uncertainty limits of the measurement equipment and emission reduction calculations were found to include all the required sources.

SCS has determined that the Blue Source Henrico County Landfill Gas Combustion Project, developed by Henrico County, Draper Aden Associates and Ingenco, is in conformance with the Consolidated Baseline Methodology ACM001, version 10 and the VCS Standard v 3.4 (October 8, 2013). Furthermore, the Project Plans and data are considered accurate, complete, transparent, and free of material misstatements. The GHG emission reductions are considered verified to a reasonable level of assurance.

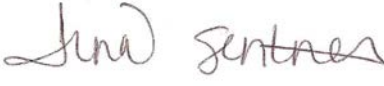
Verification period: From 1 October 2013 to 31 December 2013

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2013 (Oct-Dec)	15,487.49	35.95	0	15,451
Total	15,487.49	35.95	0	15,451*

* Rounded down

Verification Summary:

Project Developer	Blue Source, LLC., as credit originator for the Blue Source Henrico County Landfill Gas Combustion Project
Project Location	10600 Fords County Lane, Glenn Allen, VA, USA
Project Type	Landfill gas destruction
Project Periods:	1 October – 31 December, 2013
Verification Objective	To determine, with reasonable assurance, that Blue Source, LLC had quantified, monitored, and accurately reported to the Verified Carbon Standard its landfill gas emission reductions in accordance with all applicable criteria.
Verification Scope	The scope of the engagement included the quantification, monitoring and reporting of greenhouse gas project emissions reductions associated with the operation of 1) open flaring, and 2) modified diesel engine electricity generators.
Nature of Data Verified	Historical
Protocol/Methodology	CDM ACM0001, version 10 Verified Carbon Standard Version 3.4 (October 8, 2013) Verified Carbon Standard Program Guidelines Version 3.5 (October 8, 2013)
Emissions/Removals Verified	Vintage 2013 (October 1 – December 31, 2013): 15,451 metric tons of CO ₂ -equivalent
Verification Conclusion, with Reasonable Assurance	Based upon the verification activities described above, SCS Global Services has concluded that the reported October 1 – December 31, 2013 vintage methane emission reductions are, in all material respects, fairly stated.
Representation	SCS Global Services represents that the Emission Reductions verified in this report have occurred in accordance with the applicable VCS rules.
Lead Verifier	 Mark Lutz, Lead Verifier, February 24, 2014
Internal Reviewer	 Tina Sentner, 03-10-2014
<i>This verification statement is valid when signed and dated by an SCS Global Services internal</i>	

<i>reviewer.</i>
