



**Periodic Verification Report
For
The McKinney Landfill Gas Destruction
And Utilization Project**

As prepared for:

Montauk Energy Capital LLC

November 13, 2009



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1. Introduction

1.1 Objective

SGS North America Inc. was commissioned by Montauk Energy Capital LLC to undertake the periodic project verification of the McKinney Landfill Gas Destruction and Utilization Project. The project consists of the collection of landfill gas (LFG) from the McKinney Landfill, located in the town of McKinney in Collins County, Texas, and subsequent destruction through combustion in a permanent open flare with the option to use the gas for generation of electricity in the future. This report covers the verification period of January 1, 2009 to June 30, 2009 as a project deliverable into the Climate Action Reserve.

1.2 Scope and Criteria

The scope of the verification is defined as an independent and objective review of the project description document, the project's baseline study, monitoring plan and emissions reductions calculations. The information in these documents is reviewed against the requirements of the Climate Action Reserve Landfill Reporting Protocol V.2., the Landfill Verification Protocol V.2 and CCAR General Reporting and Verification Protocols V. 3.1 respectively.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Materiality:

The data reviewed meets the principles of accuracy, completeness, transparency and is free of material error or omission. For this assessment, a materiality threshold of plus or minus 5% has been defined. Misstatements greater than 5 percent are considered material.

1.4 Level of Assurance:

The level of assurance provided for this verification is Reasonable Assurance.

2. Verification Process

2.1 Summary

The verification process consisted of the following:

- Project listed and SGS North America Inc. selected as project verifier: The McKinney Landfill Gas Destruction and Utilization Project was listed on the California Climate Action Reserve (CAR) website. Montauk Energy Capital selected SGS North America Inc. as their verification body.
- A Renewal Conflict of interest and notification of verification activities was submitted to CAR online. The COI assessment was conducted to identify any potential conflicts interests with the verification/project. No conflicts were identified and a determination of low potential for conflict of interest was received from the Climate Action Reserve prior to

- the commencement of verification activities on June 23, 2009 (Ref.1 Climate Action Reserve COI Approval. msg).
- A kick off meeting was held with the client on July 6, 2009 to review the verification activities and initiate emission data transmission.
 - A Strategic Review and Risk Assessment (SR&RA) exercise was completed so the verification team could understand the scope and risks associated with the emissions reductions reported by the project. The SR&RA is a culmination of a desk review and site visit. The results of the SR&RA determine the verification plan and sampling plan and are utilized throughout the verification process. The SRRA for this verification period was adapted from the initial verification and site visit of the project (September 1, to Dec. 31, 2008) (Ref. 10 US.WS.GP5611 Work Sheet_Mckinney 11-02-09.xls).
 - A Site visit was not conducted for this periodic verification. A site visit was conducted on February 17, 2009 for the initial verification of the project and per CAR requirements, a site visit is only required once per year if site conditions remain constant.
 - A review and evaluation of GHG management systems, data collection and handling, and emission reduction calculations and procedures was conducted during the initial site visit. Changes in the GHG management systems were review as part of the desk review for this verification period.
 - Issuance and resolution of Corrective Actions and New Information requests were conducted throughout the verification process.
 - An assessment of the emission reduction calculation inputs and procedures was performed.
 - Development of a final verification report and opinion statement.
 - Exit meeting with client.

2.2 Verification Team

The verification was undertaken by Tina Sentner, Lead assessor, Atul Kandhari, expert, both of SGS NA. The Technical Review was performed by Edgar Salinas of SGS NA.

2.3 Itinerary

A kick off meeting was conducted between the verification team and Sharon Frank of Montauk Energy Capital on July 6, 2009. The purpose of the kick off meeting was to review the timeline of audit; confirm verification criteria; determine any changes in the site, sources, GHG management systems or personnel, and to begin gathering information.

The activity schedule and audit plan are included as Reference 02 (Ref. 2 US Audit Plan_CAR Ver 0077_ McKinney. docf).

3. Verification Findings

3.1 Assessment of the GHG Reduction Project

The McKinney Landfill Gas Destruction and Utilization Project ("The Project") collects landfill gas (LFG) from the McKinney Landfill and destroys it via combustion through an open candlestick flare or in two Caterpillar 3520 lean burn internal combustion engines (to produce electricity) each with a rated capacity of 1.6 MW. At the time of this assessment, the internal combustion engines were not yet operational at the site. The project is located at the McKinney Landfill in the town of McKinney in Collins County, Texas, 30 miles north of Dallas, Texas. The landfill is

an inactive solid waste sanitary landfill and covers approximately 65 acres. The landfill began accepting wastes in 1968. In 2004, the landfill ceased accepting municipal wastes and began accepting only Construction and Demolition type debris until its closure on December 31, 2008.

The Gas Collection and Conveyance System consists of a series wellheads that pull gas from vertical and horizontal extraction points. The gas is then routed via a main header line into the flare skid. The landfill gas is pulled by a blower and passes through various knockout vessels to remove moisture prior to passing through the flow meter in route to the candlestick flare. A Passive Solar Flare, connected to the landfill leachate riser system, was installed at the site voluntarily prior to the installation of the project gas collection and conveyance system. The Solar flare is operated only when sufficient gas is collected from the leachate lines. There have been no changes to the GCCS since the initial verification.

The project proponent indicated during the teleconference meeting on July 6, 2009 that there had been no changes to the site conditions or sources since the initial verification. The landfill remains closed, there were no new wells added to the project, the caterpillar engines originally planned for installation were not yet installed and the original project equipment did not change. This was further confirmed during our review of the instrument serial numbers on calibration documents and verification of the sources in the data calculations.

3.2 Project Eligibility

There are three eligibility rules the project must meet in order to register reductions with the Climate Action Reserve. There have been no changes to the project eligibility status since the initial project verification. A complete assessment of the project eligibility can be found in the initial McKinney Landfill Gas Destruction Report dated May 13, 2009 (Ref. 3 McKinney LFG Project Verification Report 05-13-09.pdf).

Eligibility Rule 1: Location:

The project is a US based landfill located in the town of McKinney in Collins County, Texas, USA and therefore meets this eligibility requirement.

Eligibility Rule 2: Project Start Date:

As stated in the Landfill Gas Reporting Protocol, pre-existing projects must have a start date on or after January 1, 2001 and must be listed with the Reserve twelve months from the effective date of the protocol (LFG Reporting Protocol V. 2.0, November, 2008). The start date is defined as the date at which a qualifying destruction device becomes operational. McKinney began flaring gas on August 1, 2008.

Eligibility 3: Additionality

Project Proponents must indicate that reductions are above and beyond business as usual. In order to do so, the project must pass a Performance Standard test and the Regulatory test.

The McKinney Landfill was previously collecting and destroying gas with a non-qualifying destruction device prior to implementation of the project (a Passive Solar Flare) and considers only landfill gas destroyed beyond that resulting from the pre-project passive collection and destruction system as additional. Therefore, the project proponent meets the performance standard threshold under option 2.

For the Regulatory Test, project proponents must ensure that emission reductions achieved by the project would not have occurred in the baseline case due to federal, state, or local regulations.

The McKinney Landfill is subject to NSPS regulation requiring the facility to conduct Non-Methane Organic Compound (NMOC) emission rate testing. The most recent Tier 2 NMOC Emission Rate Report for McKinney Landfill was 41.5 Mg/year. McKinney has submitted a Closure report for this facility and should not be required to recalculate NMOC emissions unless additional information or Tier 2 testing is required by the TCEQ.

In addition, a regulatory review of the Landfill Gas project and landfill were conducted by the project proponent. The results of the regulatory review indicted the landfill is in compliance with Federal, State and Local regulations. There are no mandatory regulatory requirements for the installation of a gas collection and conveyance system. An Attestation of Compliance has been signed by the Vice President of Montauk Energy Capital, LLC on April 17, 2009 and again on November 13, 2009 which is on file with CAR.

Lastly, the verification team reviewed the gas purchase rights agreement on July 10, 2007 regarding the purchase and ownership of Emission Reduction Credits between Montauk Energy Capital LLC and North Texas Municipal Water District during the initial assessment.

3.3 The GHG Assessment Boundary

The project includes all emission sources from the operation of the landfill gas collection system to the ultimate destruction of the landfill gas. The sources of GHG emissions reviewed in the McKinney Landfill Gas Destruction and Utilization Project include:

The GHG sources, sinks, and reservoirs associated with the baseline scenario are:

- CH₄ vented to the atmosphere.
- CH₄ destroyed in the Passive Flare
- CO₂ from the oxidation of CH₄ by soil bacteria. As the landfill is not covered with a synthetic liner, the CCAR Landfill Project v.2 Reporting Protocol assumption that 10 percent of the methane produced would be naturally oxidized by soil bacteria has been applied.

The GHG sources, sinks, and reservoirs associated with the project are:

- CO₂ from the 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, CH₄]. All gases are converted to CO₂ equivalents.

3.4 Review of Project GHG Management Systems

During the initial site visit, a review of the project greenhouse gas management systems was reviewed with the project proponent. 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 results of the assessment are detailed in the McKinney Landfill Report dated May 13, 2009.

The primary data gathered for the project is landfill gas flow, pressure, temperature and methane content of the landfill gas. A Thermal Instrument 62-9/9500 Flow Meter continuously monitors flow after the blower and a knockout prior to combustion in the candlestick flare. The position of the flow meter is adequate to ensure laminar flow. This meter was factory calibrated prior to installation and is quarterly calibrated in the field using a single point test with Pitot tube and manometer. The calibration results for the first and second quarter 2009 were reviewed for this verification period and indicate the instruments are reporting accurate data (Ref. 4 Flow Meter Calibration.zip).

Methane content is continuously monitored using the ABB Natural Gas Chromatograph Model # NGC 8200. The Gas analyzer was factory calibrated on May 30, 2008 at the onset of the project. The instrument is programmed to perform daily self calibrations against reference gases of known concentrations. Self calibration records for the Gas Chromatograph for the first quarter 2009 were not available for review, however the instrument was verified by other satisfactory evidence of calibration for the first quarter 2009 (see CAR: #11 in Findings Overview and Ref. 6 McKinney CAR-11 GC calibration evidence.zip). For the second quarter, an ABB representative conducted a field calibration for the instrument (Ref. 5 McKinney ABB GC 2nd qtr 2009 field calibration.pdf). Data from this device is digitally recorded in the Yokogawa¹ every five minutes and transmitted to the Montauk ftp internet site on an hourly basis. The data is downloaded weekly and the average methane content of the landfill gas for each day is entered into a log.

The operation of the flare is continuously monitored using a thermocouple located within the flare shroud to record the temperature and operating hours of the flare. Temperature readings are transmitted to the Yokogawa recorder and electronically transmitted to the Montauk ftp internet site on an hourly basis. An automatic valve is used to stop flow to the flare if the flame is extinguished. In addition, site personnel observe the flare and notify the field technician in the event the flare is inoperable and recorded in a shut down log.

The Yokogawa data logger has a compact flash card with 2GB capacity and can retain approximately two months worth of raw data. In addition, data from the FTP website is downloaded weekly and transferred to Compact Disks for storage.

A revised monitoring plan and Project description were submitted for the project to incorporate the revised monitoring procedures for the Gas Chromatograph and to incorporate new staff roles and responsibilities. (Ref. 7 McKinney Monitoring Plan v. 10-13-09.doc and McKinney PDD v. 5_7-7-2009 .doc).

3.5 GHG Emissions Reductions Calculation Assessment

The emission reduction calculation assessment included the review of project assumptions, raw data inputs and accuracy of calculations. The formulas and raw data inputs used to determine emission reduction calculations as described in the McKinney Project Design Document and the calculation spreadsheets (Ref. 8 McKinney Calcs - 10-19-09, rev.4 xls.xls) were first reviewed for compliance with the Landfill Project Reporting Protocol V.2.0. The main parameters of formula 5.1 and 5.2 were verified as follows

Total annual methane emissions destroyed by the project landfill gas collection and destruction system (CH₄ Dest_{PR})

The amount of methane destroyed is calculated from the continuously metered landfill gas data (i.e. gas flow and methane concentration as per equation 5.2). For the period of January 1, 2009 to February 18th, 2009, data was electronically aggregated by the Yokogawa on intervals of two seconds and totalized on a daily basis for the purpose of the calculations of emissions reductions. On February 18th, @ 15:49 the data logger was reconfigured to capture data on a 1 minute interval in order to streamline the data acquisition procedure and reduce the electronic file size to allow more capacity on the compact flash card. The main monitored parameters needed to calculate the amount of methane destroyed are:

¹ The Yokogawa is a data acquisition device or data logger which records landfill gas flow and or gas analyzer readings electronically at specified time intervals.

$LFG_{i,t}$ = total quantity of landfill gas fed to the destruction device²; and
 $PR_{CH4\ i,t}$ = the average methane fraction of the landfill gas in time interval t as measured

Flare flow is first adjusted for low temperature by voiding the flow for any period when the flare temperature is below the threshold of 500 deg F. Daily flow is then calculated by summing the flare flow for each interval period to produce a daily total. The incremental methane destroyed flow is calculated based on average methane concentration by the daily total of landfill gas with temperature and pressure taken into consideration. Total daily destroyed methane is carried forward into further calculations for the flare to determine emission reductions for the project (Ref. 8 McKinney Calcs - 10-19-09, rev.4 xls.xls)

The raw data consisted of a total of 2,263,680 data sets. A sample set of approximately 55% raw flow data (consisting of landfill gas flow, and temperature) and methane concentration was randomly selected and reviewed in order to identify material misstatements due to transcription mistakes, mathematical errors or malfunction of instruments.

Blocks of multiple raw data was taken electronically from the Yokogawa device directly into DDS files. The DDS files were converted into excel files using the software DAQ Standard. The incremental registries in the two second and one minute data sets were compared against the McKinney Calculation Data spreadsheet entries for the entire block of data samples. The parameters of minimum temperature and cumulative flow were reviewed for consistency.

Default methane destruction efficiency for device (DEi)

The value applied was 0.960 for Open flares, as prescribed by the protocol. The project developer has taken an approach of applying a 500 deg F temperature minimum to emission reduction calculations to ensure 96% destruction efficiency of the flare.

Factor for the oxidation of methane by soil bacteria (OX)

The project does not incorporate a synthetic liner in its cover system; therefore a 10% methane soil oxidation factor was applied to the baseline scenario.

Discount factor to account for uncertainties associated with the project monitoring equipment (DF)

As per the methodology, DF equals to zero if using continuous methane monitor with no missing data and all calibration tests are within a 5% margin of error. It was indeed verified that measurement readings are continuous and that calibration certificates indicated that instruments were within the thresholds for permissible error (see section above: Review of Project GHG Management Systems).

Adjustment to account for pre-project LFG destruction device ($PRE_{discount}$)

An adjustment to the project baseline was necessary due to the installation of a pre-project destruction device, a Passive Solar Flare connected to the leachate riser system. The discount for the amount of methane destroyed by the pre-project Passive Flare was applied to the baseline scenario. This value was calculated as per equation 5.3 of the protocol

$$PRE_{discount} = (NQ_{discount} + Dest_{max}) * 0.423 * 0.000454 * 21$$

² Landfill gas flow was corrected from a temperature of 70°F and one atmosphere of pressure to 60°F and one atmosphere of pressure.

Where,

$PRE_{discount}$	=	Adjustment to account for the baseline methane destruction associated with a pre-project destruction device. Equal to zero if there is no pre-project installation. (tCO ₂ e)
0.0423	=	Density of methane (lbCH ₄ / scf)
0.000454	=	Conversion factor (tCH ₄ / lbCH ₄)
$Dest_{max}$	=	Not applicable
$NQ_{discount}$	=	See below

$$NQ_{discount} = LFG_{PP1} * PP_{CH4}$$

Where,

$NQ_{discount}$	=	Adjustment to account for the methane which would have been combusted in the baseline, non-qualifying combustion device.
LFG_{PP1}	=	Pre-project annual amount of landfill gas destroyed by the original, non-qualifying destruction system
PP_{CH4}	=	Pre-project methane fraction in the landfill gas of the original collection system

The first verification period started on November 5, 2008 and the McKinney Landfill Gas Destruction and Utilization Gas Project never performed monitoring of this passive flare, which means that the monitored data required by the Addendum to the Landfill Project Reporting Protocol on Pre-project Monitoring and Calculation of $NQ_{discount}$ was unavailable. Instead, project participants estimated $NQ_{discount}$ based on the maximum flow capacity of the solar passive flare $LFG_{PP1} = 50$ scfm (as per Table 6.1 of the protocol), which is a conservative approach.

Total annual indirect carbon dioxide emissions from the consumption of electricity from the grid (EL_{CO2}) and total annual carbon dioxide emissions from the destruction of fossil fuel (FF_{CO2})
CO₂ emissions result from consumption of electricity to power project equipment and activity data for this source was tracked by reviewing utility invoices from the power supplier TXU Energy. Direct CO₂ emissions result from propane used to assist the ignition of the flare. This activity data is taken from purchase invoices and estimates from propane used (Ref. 3 Electric Invoices Jan 1-June 22, 2009.zip). The Emission Factors for electricity and propane were verified and no material errors were found.

Project emissions consisting of indirect emissions from electricity and direct emissions from propane use are subtracted from the total amount of methane destroyed. The values are presented in the final McKinney Calculation Spreadsheets (Ref. 8 McKinney Calcs - 10-19-09, rev.4 xls.xls) for the verification period.

Missing Data Procedures

Missing Data calculation procedures were reviewed for consistency with the Landfill Gas Protocol v. 2.0 requirements as part of this verification. Missing Data procedures were not applied to the data in this verification period.

4. Verification Results

The verification of the McKinney Landfill Gas Destruction and Utilization project focused on the accurate collection of data and quantification of emission reductions as implemented by Montauk Energy Capital LLC in accordance to with the Landfill Project Protocol. The following provides a summary of the verification results:

Initially project proponents reported 30,108 metric tonnes as per the information provided in the initial McKinney Calculation spreadsheet (06-15-09). This was the initial value upon which the verification began. During the verification, corrective action requests were raised (See CAR12) with regard to the way the calculation of emission reductions had been presented and the verification of those calculations was put on hold until a new set of data was provided. As a result of the required amendments, Montauk Energy Capital LLC submitted a new set of calculations.

The amount of emission reductions verified resulted as follows:

Emissions Verified		January 1, 2009 to June 30, 2009
Baseline Emissions		42721.71
Project Emissions		.0072
Project electricity		29.644
Pre-Discount		2892.59
Total Emission Reductions		39,799.46

4.1 Findings Overview

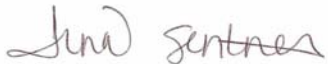
As an integral part of the verification process, SGS made several supplemental documentation requests in the form of Corrective Action, New Information requests, Forward Action requests and Observations. These requests provided clarification regarding the project. In total 3 CARs, 0 NIRs, 0 FARs and 1 Observations were issued throughout the verification. The details and resolution of these requests are documented in the SGS Findings Overview form and attached separately (McKinney Jan 1 to June 30 Findings Overview vFinal_11-02-09.pdf).

4.2 Conclusion on Data Quality and Decision on Materiality

Based on the data collected and reviewed, the McKinney Landfill Gas Destruction and Utilization Project is considered to comply with the guidelines of the Climate Action Reserve Landfill Gas Project Reporting and Verification Protocols v2.0. The emission reductions generated from the capture and destruction of landfill gas methane has been compiled in a transparent manner, protocols have been applied consistently; the data were found to be accurate within the uncertainty limits of the measurement equipment and emission reduction calculations were found to include all the required sources. No material errors or omissions have been identified for the period of January 1, 2009 to June 30, 2009. The Emission reduction CRT(s) are considered verified to a reasonable level of assurance.

5. Recommendation

The Verification Team Lead Verifier recommends that SGS issue a Verification Opinion stating the following:

Name and address of project developer	Montauk Energy Capital LLC Foster Plaza 10, 5 th Floor 680 Andersen Drive Pittsburgh, PA 15220
Location of the project activity	500 East Old Mill Road, McKinney, Texas 75069 McKinney, Collins County, Texas. USA
Scope of verification	Emission reductions arising from the capture and destruction of Landfill Gas Methane from the McKinney Landfill Gas Destruction and Utilization Project.
Verification period	The emissions have been calculated from data collected during the period January 1, 2009 to June 30, 2009.
Total GHG emissions verified	39,799 metric tonnes [CO ₂ e]
GHG protocol(s) used for Verification	California Climate Action Registry Landfill Project and Verification Protocols v2.0 , California Climate Action Registry General Reporting and Verification Protocols v. 3.1
Verification opinion with regard to data quality and materiality	The data are considered to be complete, transparent and free of material error or omission.
Date of verification	The Verification Statement is to be dated when the technical reviewer accepts the recommendation to issue the statement.
Dated and signed on behalf of the verification body by authorized signatory	 Tina Sentner 11-13-2009
Dated and signed on behalf of the verification body Technical Reviewer	 Edgar Salinas 11-17-2009

Confidentiality Statement

All members of the verification team are bound by the terms of Non-Disclosure included in employment / sub-contractor agreements.

List of References

Reference #	File Name	Document Type
0	Ref. 0 Signed SGS Proposal 6-12-09.pdf	
0.1	Ref. 1.1 Signed Verification Agreement 7-20-09.pdf	Electronic-pdf
0.2	Ref. 1.2 US PW2 CCAR0077 McKinney LFG_TX.pdf	Electronic-pdf
01	Ref. 1 2009-COI-Determination-CAR436.pdf	Electronic- ms outlook
02	Ref. 2 US Audit Plan_CAR Ver 0077_McKinney.doc	
03	Ref. 3Electric Invoices Jan 1-June 22, 2009.zip	Electronic-pdf
04	Ref. 4 Flow Meter Calibration.zip	Electronic, zip
05	Ref. 5 Gas Chromatograph Calibration.zip	Electronic- pdf
06	Ref. 6 McKinney CAR-11 GC calibration evidence.zip	Electronic-pdf
07	Ref. 7 McKinney Monitoring Plan v. 10-13-09.doc	Electronic- pdf.
07	Ref. 7 McKinney PDD v. 5 7-7-2009 .doc	Electronic- pdf.
08	Ref. 8 McKinney Calcs - 10-19-09, rev.4 xls.xls	Electronic- pdf.
09	Ref. 9 CAR Project Emission Reductions 11-3-09.pdf	Electronic-pdf
10	Ref. 10 US.WS.GP5611 Work Sheet_McKinney 11-02-09.xls	Electronic- xls Not included in client submittal.
	Findings Overview	Electronic- Word
	SGS Working Copies	Electronic- xls. –not included in client submittal.