VERIFICATION REPORT FOR THE GREATER NEW BEDFORD LFG UTILIZATION PROJECT

Document Prepared By First Environment, Inc.

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Summary:

The Greater New Bedford LFG Utilization Project voluntarily captures and destroys methane gas from the Crapo Hill Landfill, a landfill owned and operated by the Greater New Bedford Regional Refuse Management District in Dartmouth, Massachusetts. The verification process consists of the independent third-party assessment of the project design and emission reduction assertion against the criteria stated in the Verified Carbon Standard (VCS) Standard, 15 July 2011, v3.1; the approved CDM Methodology ACM0001 (Version 9.1); and the validated Project Description (PD).

The Project claims emission reductions of 100,371 metric tons CO2e for the verification period from July 1, 2011 through June 30, 2012. First Environment is reasonably assured that the Greater New Bedford LFG Utilization Project meets all relevant requirements in the VCS Standard Version 3, 1 February 2012, v3.2 and is consistent with the CDM Methodology ACM0001 (Version 9.1) and the validated PD.

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1 INTRODUCTION

This report is provided to CommonWealth New Bedford Energy LLC (CNBE), a wholly owned subsidiary of CommonWealth Resource Management Corporation (CRMC), as a deliverable of the Verified Carbon Standard (VCS) project verification process for the Greater New Bedford LFG Utilization Project (the Project) in Dartmouth, Massachusetts. This report covers the verification of greenhouse gas (GHG) emission reductions from the destruction of landfill gas (LFG) over the period from July 1, 2011 through June 30, 2012. First Environment, Inc. (First Environment) conducted the verification from July to September 2012.

1.1 Objective

The purpose of this verification was, through review of appropriate evidence, to establish that:

- the Project conforms to the requirements of the verification criteria discussed in Section 1.2; and
- the data reported are accurate, complete, consistent, transparent, and free of material error or omission.

1.2 Scope and Criteria

The Project creates emission reductions, expressed in metric tons of carbon dioxide equivalents (CO_2e), resulting from the destruction of LFG methane. Emission reductions are submitted for verification as part of the VCS project registration process.

The Project's emissions reductions have been quantified in accordance with the approved Clean Development Mechanism (CDM) Methodology ACM0001, *Consolidated baseline and monitoring methodology for landfill gas project activities*, Version 9.1 (ACM0001). First Environment used the VCS Standard Version 3, 1 February 2012, v3.2 (VCS Standard); the validated Project Description (PD); and the CDM Methodology ACM0001 as the basis for this verification. The project Monitoring Report titled: "*Monitoring Report #2011-2 and #2012-1 for the Greater New Bedford LFG Utilization Project Dartmouth, Massachusetts", 10 September 2012, Version 3* (Monitoring Report) was reviewed to inform the verification assessment. The verification covers the time period of July 1, 2011 through June 30, 2012. Any misstatement greater than five percent of the Project's GHG assertion is considered material. Qualitative non-conformities with the VCS Standard, the validated PD, and ACM0001 are also considered material during the verification process.

1.3 Level of assurance

First Environment and CNBE have agreed that a reasonable level of assurance be applied for the Project.

1.4 Summary Description of the Project

The Project voluntarily captures and destroys LFG methane from the Crapo Hill Landfill located in Dartmouth, Massachusetts (latitude and longitude are 41° 43' 28.12" N and 70° 59' 04.82" W, respectively). The Project captures LFG from the expanded active collection system and destroys it either via four Caterpillar 3516 engine-generator sets or a back-up open flare. The Project achieves emissions reductions through the destruction of LFG that would otherwise have been released to the atmosphere. The back-up flare did not operate for any significant period of time during the current verification period; therefore, emission reductions are not claimed from flaring.

The PD provides additional details regarding the site and gas collection system.

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

The validation process is described in the validation report issued by First Environment on December 30, 2008.

2.2 Validation Findings

Not Applicable

2.3 Gap Validation

Not Applicable

2.4 Methodology Deviations

Not Applicable

2.5 New Project Activity Instances

Not Applicable

2.6 Validation Conclusion

First Environment conducted the validation of the Project's approach, as outlined in the final PD dated December 2005, with additional supplements dated December 2007 and December 23, 2008, and confirmed that the Project adequately conformed with the validation criteria. The validation conclusion is further described in the validation report dated December 30, 2008.

3 VERIFICATION PROCESS

3.1 Method and Criteria

To review the Project's GHG information, the following verification process was used:

- conflict of interest review;
- selection of Audit Team;
- kick-off meeting with CNBE;
- review of the validated PD;
- development of the verification plan and sampling plan;
- site visit;
- desktop review and evaluation of raw data, calculations, and supporting documentation for the period under review;
- follow-up interaction with CNBE for corrective action or supplemental data as needed; and
- final statement and report development.

The verification process was utilized to gain an understanding of the Project's GHG emission sources and reductions, to evaluate and verify the collection and handling of data, the calculations that lead to the results, and the means for reporting the associated data and results.

Conflict of Interest Review

Prior to beginning any verification project, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the Project. No potential conflicts were found for this Project.

Audit Team

First Environment's Audit Team consisted of the following individuals who were selected based on their verification experience, as well as familiarity with landfill operations:

Jeff Daley – Lead Verifier
Natali Ganfer – Verifier
Ross MacWhinney - Verifier
Iris Caldwell – Technical Resource
James Wintergreen – Internal Reviewer

Audit Kick-off

The verification audit was initiated with a kick-off conference call on July 10, 2012 between First Environment and the primary CNBE contact, Thomas Yeransian. The communication focused on confirming the verification scope, objectives, criteria, schedule, and the data required for the verification.

Project Description Review

The Audit Team reviewed the PD as a basis for developing the verification plan.

Development of the Verification Plan

The Audit Team formally documented its verification plan as well as determined the data-sampling plan. The verification plan was developed based on discussion of key elements of the verification process during the kick-off meeting. CNBE was afforded the opportunity to comment on key elements of the plan for verification. Based on items discussed and agreed upon with CNBE, the plan identified the First Environment team members, project level of assurance, materiality threshold, and standards of evaluation and reporting for the verification. It also provided an outline of the verification process and established project deliverables. A separate sampling plan was designed to review all project elements in areas of high risk of inaccuracy or non-conformance. The verification and sampling plans were provided to CNBE on July 11, 2012.

Site Visit

First Environment performed a site visit on August 2, 2012 as part of the verification process. The site visit was conducted by Ross MacWhinney and included a review of site operations, data collection processes, and information management systems, as well as interviews with key project personnel.

Desktop Review

The Audit Team performed a desktop review of the Monitoring Report, GHG emission reduction assertion, and supporting documentation, as further described in Section 3.2 below.

Corrective Actions and Supplemental Information

The Audit Team issued requests for supplemental information, and corrective action during the verification process. The corrective action requests and the responses provided by CNBE are summarized in Section 3.5.

Verification Reporting

Verification reporting documents the verification process and identifies its findings and results. Verification reporting consists of this report and a separate deed of representation to be submitted to the VCS Association.

3.2 Document Review

During the verification process, First Environment reviewed the Project's Monitoring Report, GHG emission reduction assertion, and supporting documentation for the current verification period to ensure consistency with the validated PD and ACM0001. Discrepancies between project documentation and the verification criteria were considered material and identified for corrective action. Monitoring deviations required appropriate justification from CNBE during the verification process and are described in further detail in Section 4.1 below. Additionally, First Environment 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.

3.3 Interviews

Through the course of verification activities, First Environment conducted phone interviews with the following project personnel to inform the verification process:

Thomas Yeransian – Principal at CRMC

3.4 Site Inspections

A site visit was conducted as part of the verification process as described in Section 3.1 above.

3.5 Resolution of Any Material Discrepancy

The Audit Team issued requests for corrective action during the verification process. CNBE's responses were sufficient to resolve all corrective action requests. The corrective action requests and the responses provided are summarized in the table below:

ID	Corrective Action Request	Summary of Participant Response	Verification Conclusion
CAR No.1	A weekly calibration of the gas analyzer did not occur during the week of August 28, 2011.	The calibration event was missed due to a hurricane in the area. Since the gas anaylyzer calibrations the week prior to and after the week of August 28th (August 26 and September 8th respectively) resulted in a drift of less than 0.08%, it can be reasonably assumed that the instrument was under tight calibration during the week of August 28th.	Response is acceptable and is identified as a Monitoring Plan deviation.
CAR No.2	The emission reduction calculations do not reflect the percent drift identified during the gas analyzer calibration event that took place on May 8, 2012.	The emission reduction calculations have been revised to account for the May 8, 2012 methane analyzer drift.	Response is acceptable.
CAR No.3	The flare flow meter has not been calibrated in accordance with the calibration schedule identified in the project-specific MRV.	All flow data associated with LFG destruction at the flare has been removed, and no emission reduction credits are claimed from flaring.	Response is acceptable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The Project was implemented according to the description provided in the validated PD. The Project became operational in January 2002 with the expansion of an existing active LFG collection and destruction system. First Environment previously confirmed the Project's start date during the validation process. Emission reductions from the current verification period were claimed for LFG collected from the expanded active LFG collection system and destructed in the Caterpillar 3516 engine-generator sets. As mentioned above, the back-up flare had limited operation during the current verification period and no emission reductions are claimed from flaring.

First Environment previously verified emission reduction credits from this Project against the requirements of the Chicago Climate Exchange (CCX) and Environmental Resources Trust (ERT) for crediting periods January 1, 2003 through December 31, 2008; GE-AES for crediting periods January 1, 2007 through December 31, 2008; and VCS for crediting period January 1, 2009 through June 30, 2011. GHG emission reduction credits that have not been verified under VCS have been registered with the American Carbon Registry (formerly ERT); and all transactions involving the sale, retirement, or transfer of these GHG credits from CNBE to another party (e.g., to the CCX) are recorded there. CNBE provided First Environment an attestation stating that emission reduction credits over the current verification period will only be registered with a VCS registry.

The monitoring plan was implemented according to the description provided in the validated PD, except where noted below. First Environment discussed the following topics with project personnel during the verification site visit:

- the data collection process used to generate reports, and
- internal documents and protocols that set guidelines for the data collection process.

The information gathered during these discussions and review was used to assess the Project's data management systems and its controls for sources of potential errors and omissions. The primary aspects of the Project's monitoring plan are described below.

LFG flow and methane content data were monitored continuously and recorded at hourly and daily intervals via two separate modules of the supervisory control and data acquisition (SCADA) system. First Environment reviewed the totalized flow and average methane content data from the daily and hourly SCADA summary reports. The flow meter monitoring LFG to the engines was calibrated once per month using a pitot tube. The California Analytical NDIR continuous gas analyzer was calibrated on a weekly basis. First Environment reviewed the results of all calibration events to confirm that the monitoring instruments were operating accurately during the verification period. All calibration events indicated the meter was reading accurately, except for the gas analyzer calibration that took place on May 8, 2012 which showed the instrument to be over reporting by 8.35 percent. As a result, the corresponding methane data from the affected period was adjusted down by 8.35 percent. LFG destroyed by the flare during the verification period was excluded from the emission reduction calculations because the flare did not operate long enough for a calibration event to occur for the flare flow meter.

The Project does not import electricity and no fossil fuels were consumed during the verification period. First Environment confirmed that the back-up generator, which supports the flare skid, did not operate during the verification period; therefore, no sources of project emissions are considered.

The data collection and record keeping procedures utilized for the Project were found to be consistent with those outlined in the monitoring plan described in the validated PD and meet the requirements of ACM0001.

The following methodology deviations were previously validated for the Project:

- The SCADA system was programmed to calculate the methane gas flow in units of million British thermal units (MMBtu) using standardized gas flow (at 68°F and one atmosphere of pressure), methane concentration, the gross heat content (higher heating value) of methane, and the actual temperature and pressure. CNBE determined the volume of methane destroyed by converting the MMBtu values to total methane gas flow in standard cubic feet. This deviation from the monitoring methodology was previously approved by First Environment and had a conservative impact on the quantification of GHG emissions reductions during the verification period.
- The amount of methane destroyed in the baseline scenario, MD_{BL}, was determined by applying a 12.5 percent annual decline rate to the amount of methane destroyed in 2001, the year prior to the project activity. The declining rate was adopted to more accurately account for biological decay and loss of gas collection system effectiveness. This deviation from the monitoring methodology was approved during the validation process.

The following monitoring plan deviation was approved for the Project during verification:

- The California Analytical NDIR gas analyzer was not calibrated during the week of August 28, 2011. First Environment approved this deviation because the analyzer calibrations which occurred the week prior to and after the missed calibration indicated a drift of less than one percent, which indicates the analyzer was operating within specification during the week that calibration was missed.

The data collection and recordkeeping procedures were found to be consistent with those outlined in the monitoring plan described by the PD, except where noted above, and met the requirements of the ACM0001 methodology. There were no remaining issues or material discrepancies from the previous validation or verification processes.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Emission reductions are calculated ex-post using the approach indicated in ACM0001 and the validated PD. Emission reductions were aggregated monthly. First Environment reviewed the emission reduction calculations for the verification period to ensure accuracy in the formulas used and the raw data and default factors used as inputs. The formulas were tested and found to be consistent with the calculations described in ACM0001 and the validated PD.

Project monitoring data were used to calculate the amount of methane destroyed by the project activity. The hourly recording module in the SCADA system stopped working occasionally during the verification period; however, the daily recording module operated continuously. As such, the daily data was used in the emission reduction calculations. First Environment compared copies of the raw data used in the calculations with the values used in the final calculations and tested for transcription and mathematical errors. Specifically, the Audit Team compared the total daily flow and methane content data reported by the SCADA system to the monthly methane flow totals used in the emission reduction calculations to ensure accuracy and consistency.

The quantity of methane destroyed in the baseline scenario by the initial active collection system was subtracted from the total methane destroyed during the verification period. First Environment reviewed the calculation of MD_{BL} in order to confirm that it was consistent with the validated PD.

First Environment reviewed the emission reduction calculations for the entire period to determine whether they were free of material misstatement. The Audit Team performed an independent recalculation of the emission reductions from the verification period using the SCADA data. All calculation methods and emission factors used to determine emission reductions were consistent with those outlined in the validated PD. No material misstatements were observed.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

CNBE provided adequate documentation for the emissions reduction calculations as well as its management systems around the data collection process. Specifically, First Environment was provided a Monitoring Report prepared in accordance with the VCS program template, transparent calculation spreadsheets, records of instrument calibrations, and electronic data associated with gas flow, methane content, and operating hours. The evidence provided was consistent with the requirements of ACM0001 and the validated PD and met generally accepted evidentiary standards for best practice in GHG accounting.

4.4 Management and Operational System

CNBE had adequate management and operational systems in place with respect to monitoring and reporting during the current verification period, as determined through observation during the previous site visit, interviews with project personnel, and review of project documentation. Records of the raw data and equipment calibration checks were adequately documented. CNBE reviewed these records as part of their quality control process and in order to perform the emission reduction calculations. Additionally, the monitoring system was designed to trigger alarms when monitoring parameters fall outside of a specified range.

5 VERIFICATION CONCLUSION

First Environment was retained to provide verification services for the Project's GHG emission reductions assertion based on the following fundamentals:

- *Level of assurance:* Reasonable assurance.
- *Objectives of verification:* To assure project conformance with the VCS Standard, the CDM Methodology ACM0001, and the validated PD.
- *Verification criteria*: VCS Standard, CDM Methodology ACM0001, and the validated PD.
- *Definition of materiality:* Misstatements of greater than five percent of the GHG assertion and qualitative non-conformities with the validated PD are considered material.
- *Scope, including:*
    - *Boundaries of the assertion:* Crapo Hill landfill operations;
    - *The physical infrastructure, facilities, and activities within the assertion:* LFG collection and destruction operations;
    - *GHG sources, sinks, and reservoirs included within the assertion:* Methane emission reductions expressed as carbon dioxide-equivalents; and
    - *The time period for the assertion:* July 1, 2011 through June 30, 2012.

Based on the assessments performed and the historical evidence collected, First Environment concludes with a reasonable level of assurance that the Project implementation and the emission reductions of the Project resulting from the capture and combustion of methane gas for the period from July 1, 2011 through June 30, 2012 are:

- consistent with the validated PD of December 2005 (with supplements);
- in conformance with the VCS Standard Version 3, 1 February 2012, v3.2 and the CDM Methodology ACM0001 (Version 9.1);
- without material discrepancy; and
- meeting the minimum level of accuracy of at least 95 percent.

Verified results show:

July 1, 2011 – December 31, 2011

GHG Emission Reductions or Removals	tCO_2e
Baseline Emissions	49,652
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	**49,652**

January 1, 2012 – June 30, 2012

GHG Emission Reductions or Removals	tCO_2e
Baseline Emissions	50,719
Project Emissions	0
Leakage	0
Net GHG emission reductions or removals	**50,719**

6 LEAD AUDITOR SIGNATURE

Jeff Daley
Environmental Specialist

7 INTERNAL REVIEWER SIGNATURE

James Wintergreen
Senior Associate