FINAL VERIFICATION REPORT

GREATER NEW BEDFORD LFG UTILIZATION PROJECT

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Project Title	Greater New Bedford LFG Utilization Project
Version	1.0
Report ID	11203966-RPT-2

Report Title	Greater New Bedford LFG Utilization Project Verification Report

Client	CommonWealth Resource Management Corporation, for its wholly-owned subsidiary CommonWealth New Bedford Energy, LLC
Pages	28
Date of Issue	25-08-2020
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Summary:

CommonWealth Resource Management Corporation (CRMC), for its wholly owned subsidiary Commonwealth New Bedford Energy (CNBE), LLC engaged GHD Services, Inc. (GHD) to complete the verification of the Greater New Bedford LFG Utilization Project (Project Activity and Verified Carbon Standard (VCS) ID: 138) for the October 1, 2019 through June 30, 2020 Monitoring Period under the requirements of the VCS. The Project Activity is located at the Crapo Hill Landfill in Dartmouth, Massachusetts, United States. The Project is operated by CRMC (Project Proponent).

The Project Activity consists of a landfill gas collection system and four Caterpillar 3515 engine-generators designed to capture and combust methane generated within the Crapo Hill solid waste landfill. A back up flare is also connected to the Landfill Gas (LFG) collection system to combust the LFG, as needed, when the engines are not operational. The baseline scenario of the Project Activity consisted of the voluntary installation of twenty-one vertical LFG extraction wells and a flare to combust the collected LFG. The project scenario consists of an expanded LFG collection system with additional vertical and horizontal extraction wells and the addition of the four LFG combustion engines. Blowers are used in the baseline and project scenarios to create a vacuum and draw in LFG to the LFG collection system. The Project Activity achieves emissions reductions through the collection and destruction of the methane within the LFG in

either the four combustion engines or the flare that convert the methane to carbon dioxide, thereby preventing the release of methane to the atmosphere.

The Project Proponent utilized the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism (CDM) methodology ACM0001 entitled: "Large scale Consolidated Methodology – Flaring or use of landfill gas", Version 16.0 dated 16 October 2015, as per the registered VCS Project Description (VCS PD), dated 17 December 2015.

The scope of this verification is such that GHD, recognized as an independent third-party Validation and Verification Body by the VCS (Registration Number 027), is responsible for reviewing the Project Activity's Monitoring Report, along with accompanying supporting materials and previous VCS Verification and Validation Reports. GHD utilized a risk-based analysis against the relevant requirements of both the interpretation from the VCS Program Guide, Version 4.0, and VCS Standard Version 4.0, as applicable.

As part of the verification process, GHD reviewed the completeness, conservativeness, and accuracy of the underlying evidence for the assumptions and claims made, and data sources used. The results of the investigation were then, together with the results of the review of other areas, combined to form the necessary input for the verification report and opinion.

The verification report and associated annexes document a total of twenty (20) findings, which include:

- Twelve (12) Corrective Action Requests (CARs)
- Nine (9) Clarification Requests (CLs)
- Zero (0) Forward Action Requests (FAR)

Upon review of the documentation and explanations provided by the Project Proponent, all findings were closed in a clear and transparent manner. GHD completed the verification in accordance with the VCS Program Guide, Version 4.0, and VCS Standard, Version 4.0, in addition to the UNFCCC CDM methodology and associated methodological tools. Based on the results of the verification, GHD is issuing a Positive Verification Opinion in regards to this Project Activity and Reporting Period. GHD therefore recommends/certifies that the registered Project Activity has obtained the reported emission reductions of 66,546 tonnes of carbon dioxide equivalent.

1 INTRODUCTION

1.1 Objective

CommonWealth Resource Management Corporation (CRMC) for its wholly owned subsidiary, CommonWealth New Bedford Energy, LLC (CNBE) (Project Proponent) engaged GHD Services, Inc. (GHD) to complete the third-party greenhouse gas verification of the 2020 Monitoring Period (1 October, 2019, through 30 June, 2020) for the following Verified Carbon Standard (VCS) Project Activity:

- Greater New Bedford LFG Utilization Project (Project Activity) located at the Crapo Hill Landfill in Dartmouth, Massachusetts, United Sates, VCS Project ID: 138 (Project Activity)

GHD completed the verification pursuant to the relevant requirements outlined in Section 1.2 as well as translational guidance from the UNFCCC CDM. As detailed in Section 4.1 of the VCS Standard, *"Verification is the periodic ex-post independent assessment by a validation/verification body of the GHG emission reductions and removals that have occurred as a result of the project during the monitoring period, conducted in accordance with the VCS Program rules."*

The objective of GHD, on behalf of the VCS, is to ensure that only Project Activities that meet the established criteria receive a positive and unconditional verification representation. Specifically, the criteria states that the registered Project must result in emission reductions that are:

- Relevant
- Complete
- Consistent
- Accurate
- Transparent
- Conservative

In the verification of this VCS Project, GHD used a risk-based verification approach to focus and determine the detailed scope of the verification. The VCS and the CDM are rules-based mechanisms; GHD has ensured that the emission reductions for the 2020 Monitoring Period were developed in accordance with the VCS Program Guide Version 4.0 and the VCS Standard Version 4.0.

1.2 Scope and Criteria

The scope of the third-party verification services completed by GHD are as follows:

- Verification of the Greater New Bedford LFG Utilization Project (Project Activity) located at the Crapo Hill Landfill in Dartmouth, Massachusetts, United States, for the Monitoring Period of October 1, 2019, through June 30, 2020, under the requirements of the VCS.

This Project Activity falls under Sectoral Scope 1 – Energy industries (renewable/nonrenewable sources), which is one of the sectoral scopes for which GHD is accredited.

The Verification activities were completed pursuant to the most up to date related rules, requirements, regulations, modalities, criteria, guidelines, emission reductions yield, and principles in relation to the VCS Project Document (VCS PD) supplied by the Project Proponent. The Project Activity utilizes the UNFCCC CDM methodology ACM001: Large scale Consolidated Methodology – Flaring or use of landfill gas, dated October 16, 2015, Version 16.0.

The scope of this verification is such that GHD, as an independent third party recognized as a Validation and Verification Body by the VCS (Registration Number 027) is responsible for reviewing the Monitoring Report including accompanying materials, the previous Validation Report, and the VCS PD including the Monitoring Report, baseline assessment, and any supporting documentation.

GHD has prepared this verification report in accordance with ISO Standard ISO 14064 Greenhouse gases Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions, 2006, (ISO 14064 3) along with the criteria presented in the following documents:

- VCS Program Guide, dated 19 September 2019, Version 4.0 (VCS Program Guide)[1]
- VCS Standard, dated 19 September 2019, Version 4.0 (VCS Standard)[2]
- VCS Validation and Verification Manual, dated 19 October 2016, Version 3.2 (VCS VVM)[3]
- UNFCCC CDM ACM001: Large scale Consolidated Methodology – Flaring or use of landfill gas, dated 16 October 2015, Version 16.0

1.3 Level of Assurance

GHD conducted this verification to a reasonable level of assurance. Per the VCS Standard Section 4.1.8, “The threshold for materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions and/or removals shall be five percent for projects and one percent for large projects.”

[1] https://verra.org/wp-content/uploads/2019/09/VCS_Program_Guide_v4.0.pdf

[2] https://verra.org/wp-content/uploads/2019/09/VCS_Standard_v4.0.pdf

[3] https://verra.org/wp-content/uploads/2018/03/VCS_Validation_Verification_Manual_v3.2.pdf

Based on the reported emission reductions (i.e. less than 300,000 tonnes of carbon dioxide equivalent [tCO2e]), the Project Activity is classified as a project, therefore the materiality was set at five (5) percent.

1.4 Summary Description of the Project

The Project Activity (VCS ID: 138) is located at the Crapo Hill Landfill in Dartmouth, Massachusetts. The Project Activity consists of a LFG collection system and four (4) combustion engines designed to capture and combust methane generated within the Crapo Hill solid waste landfill. A back up flare is also connected to the LFG collection system to combust the LFG, as needed, when the engines are not operational. Blowers are connected to the network of piping along with vertical and horizontal extraction wells that are used to apply a vacuum to the system and collect the LFG.

The Project Activity achieves emissions reductions through the collection and destruction of the methane within the LFG in either the four combustion engines or the flare that convert the methane to carbon dioxide, thereby preventing the release of methane to the atmosphere. The baseline scenario consists of twenty-one vertical LFG extraction wells and the flare, whereas the project scenario includes an expanded LFG collection system containing additional vertical and horizontal extraction wells and four engines that generate electricity.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The Project Team has assessed and verified that the implementation of the Project Activity and the steps taken to report the emission reductions comply with the VCS criteria and relevant guidance provided by the VCS as well as relevant criteria of the UNFCCC CDM. The criteria used in the verification has been outlined in Section 1.2 above. The verification included a review of relevant documentation, records, and notes from a past Site Inspection.

GHD followed a risk-based verification approach. As such, GHD identified the key reporting risks related to the claimed emission reductions and assessed to what extent the Project Activity's control systems are adequate for mitigating any perceived reporting risks.

Key reporting risks that are not sufficiently addressed by the Project Activity's control system represent residual risks. GHD conducted a detailed verification to investigate the residual risks. Key risks assessed during the verification included, but were not limited to, verification of correct use of emission factors, correct use of conversion factors, and consistency in aggregation of emissions data. Wherever practical, direct reading instruments were to be used to ensure any reporting risks were kept within equipment and instrumentation performance limits. GHD included a Risk Assessment and Sampling Plan within the Verification Plan. GHD updated the Verification Plan throughout the verification as necessary. The Final Verification Plan is provided as Appendix A.

During the verification process, the GHD Project Team considered both quantitative and qualitative information on emission reductions. Quantitative data was comprised of the Monitoring Report and accompanying information submitted to the GHD Project Team by the Project Proponent. Qualitative data was comprised of information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, and review and internal audit of calculations/data transfers.

The main components of GHD's verification process were as follows:

- Document review
- Findings Assessment and Issuance of Corrective Action Requests (CARs), Forward Action Requests (FARs) and/or Clarification Requests (CLs)
- Response to CARs, FARs, and CLs
- Draft Verification Report Issuance
- Technical Review
- Final Verification Report and Verification Statement Issuance

GHD document review during the verification process was comprised of an evaluation of the following:

- The documentation, data and information is complete and comprehensive
- The monitoring methodologies are justified and appropriate for the specific Project Activity
- All aspects related to direct and indirect emissions, including leakage, are captured as applicable
- The calculation of GHG emission reductions is appropriate and uses conservative assumptions for estimating emission reductions
- The technical features of the Project Activity, as well as other information about the Project Activity have been sufficiently addressed
- The monitoring plan clearly identifies the frequency of, responsibility and authority for, monitoring, measurement, and data recording activities and sufficiently describes quality control/quality assurance/management control procedures

The outcome of the document review process was the creation of a Findings Assessment. GHD issued the Findings Assessment to the Project Proponent for response to any corrective actions or clarification requests. Upon closing all findings identified by GHD, a Draft Verification Report was prepared. The Technical Reviewer completed a peer review of the Draft Verification Report, and found no additional findings that required response from the Project Proponent. GHD issued a Draft Verification Report to the Project Proponent for review and comment. GHD then incorporated the Project Proponent's comments, as applicable and issued the Final Verification Report along with a completed Verification Representation.

GHD based the Verification Representation conclusion on the interaction of three key verification principles as follows:

1. Compliance with the monitoring plan
2. Accuracy
3. Quality of evidence.

2.2 Document Review

The VCS verification process relies heavily upon document review. The primary document for review is the 2020 Monitoring Report. The Project Proponent provided GHD with the Monitoring Report and revised Monitoring Report as detailed below:

Document Date	Date Issued to GHD	Version Number	Methodology
13 July, 2020	13 July, 2020	1	ACM0001 Version 16.0
27 July, 2020	27 July, 2020	2	ACM0001 Version 16.0
7 August, 2020	7 August, 2020	3	ACM001 Version 16.0

GHD reviewed the above submissions. GHD did not identify any issues in the Monitoring Report Version No. 3.

During the document review, GHD became familiar with the Project Activity to ensure the Project Proponent accurately described the on-Site conditions within the Monitoring Report. During the document review, GHD completed the following:

- Review of the data and information presented to verify completeness
- Review of the VCS PD and Monitoring Report, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures
- Evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions
- Review of the last revision of the previous verification and validation reports
- Review of operation licenses from local authorities
- Cross-check of available documentation with the registered VCS PD and Monitoring Report
- GHD followed the audit trails and data sets for specific indicators, and cross-checked the applicable records.

As part of the verification process GHD requested and reviewed, additional documentation supplemental to the Monitoring Report. This supplemental information included the following documents:

Date Issued to GHD	Document(s)	Description
27 July 2020	March 26, 2019 NSPS Design Report and October 9, 2019 NMOC Emission Rate Report for 2019	Rate of non-methane organic compounds (NMOCs) from the Crapo Hill Landfill for the 2019 calendar year. Design Capacity report for the Crapo Hill Landfill
27 July 2020	Department of Environmental Protection, Air Quality Operating Permit	Air quality monitoring permit for the Crapo Hill Landfill
27 July 2020	Renewable Energy Credits (REC) Agreements	REC agreements pertaining to the monitoring period.
27 July 2020	Eversource Usage Data 2020	Usage History Report for the Site displaying electricity use over the Monitoring Period.
19 August 2020	EPA Confirmation Q1	EPA confirmation regarding monitoring results
19 August 2020	EPA Confirmation Q2	EPA confirmation regarding monitoring results

2.3 Interviews

GHD completed interviews as required throughout the verification. Michelle Hirst and Filzah Nasir corresponded via email with Mr. Thomas Yeransian regarding various aspects of the Project Activity. GHD notes that in-person interviews were completed with relevant project stakeholders at the site visit during the verification of the 2018 reporting year. The following Project Stakeholders were interviewed by GHD for this Monitoring Period:

Name of Interviewee	Position and Company	Details of Items Discussed
Mr. Thomas Yeransian	Principal, CRMC	- Active permits and permitting requirements - Renewable energy credits associated with the Project Activity - CLs and CARs identified through the verification - Any changes to the Project Activity from the previous verification - Components of the LFG collection system - Monitoring parameters for the LFG collection system and electricity generation plant - Electricity consumption and back-up generator - Implication of digester biogas to the Project Activity - Agreement for ownership of the LFGNon-compliance notifications -

2.4 Site Inspections

The verification process consisted of a thorough document review. GHD elected not to complete a Site Inspection during the verification of the 2020 Monitoring Period as GHD completed a Site Inspection on February 19, 2019 during the verification of the 2018 Monitoring Period. Given that none of the core Project Activity components (e.g. data collection, data management, metering, etc.) changed from the previous verification and associated Site Inspection, GHD determined that a Site Inspection for the 2020 Monitoring Period was not required to achieve a reasonable level of assurance.

The completion of the February 2019 Site Inspection provided the GHD Project Team with an added level of assurance that the information provided within documentation from the Project Proponent is complete and accurate as it relates to the Project Activity and emission reductions for the 2019 Monitoring Period. During the February 2019 Site Inspection, GHD completed the following:

- A walkthrough of the Site and observation of the Project Activity's implementation/operation status
- Interviewed personnel with knowledge of the Project Activity and its implementation/operation to cross-check information provided
- Inspected all monitoring equipment and a review of calibration and inspection data
- Requested information from personnel either not made previously available or deemed necessary following site walkthrough or following interviews
- Reviewed compliance related to the Project Activity and the registered VCS PD
- Reviewed each major component of the Project Activity including the engines, metering equipment, supervisory control and data acquisition (SCADA) system, LFG extraction wells and associated piping, and the flare

During the February 2019 Site Inspection, GHD focused on the key areas identified as follows:

- An assessment of the implementation and operation of the Project Activity as per the registered VCS PD
- A review of information flows for generating, aggregating, and reporting the monitoring parameters
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan in the VCS PD
- A cross-check between information provided in the Monitoring Report and data from other sources such as plant log books, inventories, purchase records, or similar data sources
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the VCS PD
- A review of calculations and assumptions made in determining the GHG data and emission reductions
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters
- An inspection of physical and organizational aspects of the Project Activity

During the February 2019 Site Inspection, GHD also verified that the Project Activity is located at 300 Samuel Barnet Boulevard, New Bedford, Massachusetts at the following grid coordinates:

Latitude: 41.72ºN

Longitude: -70.98ºW

Through interviews with the Project Proponent and desktop review, GHD confirmed that there were no major changes made to the Project Activity from the previous 2018 Monitoring Period that would impact GHD's ability to provide the verification for the 2020 Monitoring Period to a reasonable level of assurance.

2.5 Resolution of Findings

The Verification findings are categorized either as a Corrective Action Request (CAR), Forward Action Request (FAR), or as a Clarification Request (CL).

The GHD Project Team raised CAR's in this Assessment if:

- The Project Proponent had made mistakes in assumptions or in the Project documentation that directly influenced the Project results
- The VCS requirements deemed relevant for verification of the Project Activity were not met
- There was a risk that the Project would not be registered by the VCS or that emission reductions cannot be monitored, calculated, verified, and/or certified
- The Project Proponent made mistakes that would influence the ability of the Project Activity to achieve relevant, complete, consistent, accurate, transparent, and conservative emission reductions
- The VCS requirements have not been met

When issued, FAR's highlight issues related to Project implementation that require review during the subsequent verification of the Project Activity. FAR's do not relate to the VCS requirements for registration and thus do not require any formal response from the Project Proponent. No FAR's were issued during this verification. A FAR was raised during the validation of the Project Activity which is discussed further in Section 2.6.

CL's were issued to CRMC if the GHD Project Team determined that the information provided by CRMC was insufficient, unclear or not transparent enough to establish whether the applicable requirements are met.

Each CAR and CL raised by GHD was presented in individual rows of a large table that comprised the findings assessments. CRMC was required to complete the appropriate responses and to provide, where necessary, documentation as evidence of their assumptions and/or responses. The final Version of the Findings Assessment is provided in Appendix B.

A summary of the final results of the findings assessments is presented as follows:

Finding Category	Number of Findings
CAR	12
FAR	0
CL	9
TOTAL	20

2.5.1 Forward Action Requests

A FAR was raised as a part of the validation process in order to address the future capacity of the Crapo Hill Landfill Site and the associated regulatory implications. The details of the FAR are presented below along with the verification activities that GHD performed to address it during the 2020 Monitoring Period.

“GHD notes that at the time of Re Validation the capacity of the Crapo Hill Landfill (landfill site) is below the threshold of approximately 2.5 million cubic meters of design disposal capacity and 50 Mg of NMOC emissions that are set out as per New Source Performance Standards (NSPS) and Existing Facility Guidelines (EGs) for Landfills (40 CFR 51, 52 and 60 March 12, 1996). However, as per the PDD the landfill site is due to be expanded in the future to a capacity greater than 2.5 million cubic meters and there may also be amendments or updates to the regulations as per the proposals issued by the U.S. Environmental Protection Agency (EPA) on August 14, 2015. As a result, GHD has raised this forward action request for future verifications during the crediting period to address any changes in the capacity of the landfill site and the applicable regulations.”

GHD discussed the FAR during the verification of the 2020 Monitoring Period. The Project Proponent provided GHD with the NSPS Design Capacity Report for 2019 and the non-methane organic compound (NMOC) Emissions Report for 2019. GHD notes that the Design Capacity Report states that the current design capacity of the landfill is 2,809,271 cubic meters, thus exceeding the 2.5 million cubic meter threshold. However, the site sampled the annual uncontrolled NMOC emission rate. The total NMOC emissions for the Site were measured to be 6.6 Mg/year which is less than the 50 Mg/year (55 tons/year) specified in the NSPS Existing Facility Guidelines for Landfills. Thus, only one of the required criteria set forth in the NSPS were met and therefore mandatory LFG collection system installation is not required.

Eligibility for Validation Activities

Validation activities were not performed as part of this verification.

3 VALIDATION FINDINGS

There were no validation activities that took place during the verification of this Monitoring Period.

3.1 Participation under Other GHG Programs

There were no validation activities that took place during the verification of this monitoring period. .

3.2 Methodology Deviations

There were no validation activities undertaken as a part of the verification of this monitoring period.

3.3 Project Description Deviations

There were no validation activities undertaken as a part of the verification of this monitoring period.

3.4 Grouped Project

There were no validation activities undertaken as a part of the verification of this monitoring period and this is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The Project Activity received its Re-Validation Representation with the VCS dated 16 May 2016 as a Renewable Energy Industries type project under Sectoral Scope 1 defined by the UNFCCC and adopted by the VCS. The Project Activity was registered utilizing the approved consolidated large scale methodology ACM0001 titled “Flaring or use of landfill gas”, dated 16 October 2015, Version 16.0 with a second crediting period of ten (10) years commencing on the 29 March 2016 immediately following the end of the Project Activity’s first crediting period and ending 28 March 2026.

Section 3.7 of the Standard states that “The project start date is the date on which the project began generating GHG emission reductions or removals”. The earliest credit start date established under the initial validation is March 28, 2006. The initial 10-year crediting period therefore began on March 28, 2006 and concluded on March 28, 2016. The Project Activity was then re-validated in 2016 and the second crediting period began on March 29, 2016 and will conclude on March 28, 2026. The stated crediting period is in accordance with the project crediting period Standard requirements. Monitoring data was provided for the 2020 Monitoring Period related to the destruction of LFG from the Crapo Hill Landfill in four (4) engines. The monitoring data indicates the Project was in consistent operation through the Monitoring Period. GHD verified that the data collected in 2020 was in accordance with the monitoring requirements of the registered VCS PD.

The four (4) engines actively destroyed LFG during this Monitoring Period. The back-up flare had limited use during the 2020 Monitoring Period and as a result, no emission reductions are claimed from flaring.

Based on a review of project information and observations from the Site Inspection, GHD determined that there are no material discrepancies between project implementation and the VCS PD.

GHD’s review of the monitoring plan and monitoring systems confirmed that the Project Activity is operating according to the monitoring plan, and the data collection methods and monitoring systems implemented at the Project Activity are robust.

The Project is currently registered with the American Carbon Registry (ACR) with the Project ID; ACR 113. However, emission reductions for this Monitoring Period have not and will not be claimed under ACR. GHD verified that the Project Proponent has not claimed GHG emission reductions in emissions trading programs or any other mechanism that includes GHG allowance trading. GHD notes that emission reductions were only claimed under ACR for the following Monitoring Periods:

- January 1, 2007 to June 30, 2007
- July 1, 2007 to December 31, 2007
- January 1, 2008 to June 30, 2008
- July 1, 2008 to December 31, 2008

The Project is also qualified under the Massachusetts, Connecticut, Maine and New Hampshire Renewable Energy Portfolio Programs to produce Class I Renewable Energy Credits in Massachusetts, Connecticut and Maine; and Class III Renewable Energy Credits in New Hampshire. The Renewable Energy Credits from these Programs do not result in any GHG emission reduction attributes associated with the destruction of methane.

The Project Activity supports sustainable development as it involves renewable energy generation.

The following table outlines the methodology deviations previous validated and approved for the Project Activity:

Number	Deviation	When approved?
1.	A separate LFG meter is not present on each of the four combustion engines. A single meter is used immediately before the piping splits to each engine. This meter is continuously recording data. Operating data is tracked for each engine so it is possible to calculate the flow destroyed by each engine and to ensure that LFG is destroyed. Flow controls are in place to ensure no LFG is sent to an engine that is not operating. This does not affect the conservativeness of the emissions reductions claimed.	Approved during the re-validation assessment in 2016.
2.	Ex-ante emissions reductions calculations use historic Project specific data as the basis for projecting future emissions rather than the required CDM estimation tools. Using real data allows the estimations to be more accurate and reflect actual Project operating conditions. This does not affect the conservativeness of the emissions reductions claimed but increases the accuracy of the ex-ante projections ensuring the project is forecasting obtainable, appropriate emissions reductions.	Approved during the re-validation assessment in 2016.

Number	Deviation	When approved?
3.	There is no flow meter installed on the collection pipe from the District Initial System to separately monitor the contribution of the original baseline system. Given the collection system design and meter requirements, installing a meter at this location would not produce reliable, meaningful results. Instead, well-head flow measurements are collected manually two times each month. These results are used to calculate the relative contribution of the District Initial System to the overall flow of LFG destroyed by the engines. This portion of the total flow represents $FCH_{4,BL,y}$ and will be calculated on a monthly basis and subtracted from the total flow to account for the amount of methane destroyed in the baseline scenario. This approach represents an accurate measurement of the flow because (a) the portion of the landfill that includes the District Initial System (Phase 1) is capped so no landfill gas can be passively emitted to the atmosphere, and (b) the remaining active wells from the District Initial System are located in such a way as to enable capture of LFG generated within the sphere of influence of the District Initial System. This deviation decreases the conservativeness of the emissions reductions claimed but significantly increases the accuracy of the calculations as is allowable under VCS Standard v4.0, Section 3.17.	Approved during the re-validation assessment in 2016
4.	The Project uses the eGrid electricity emissions factor rather than the default emissions factor provided in the CDM tool as explained in the project emissions section. This deviation decreases the conservativeness of the emissions reductions claimed but significantly increases the accuracy of the calculations as is allowable under VCS Standard v4.0, Section 3.17.	Approved during the re-validation assessment in 2016.

Number	Deviation	When approved?
5.	The SCADA system was programmed to calculate the methane gas flow in units of million British thermal units (MMBtu) using standardized gas flow (at 68ºF and one atmosphere of pressure), methane concentration, the gross heat content (higher heating value) of methane, and the actual temperature and pressure. CNBE determines 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 independent verifiers and had a conservative impact on the quantification of GHG emission reductions.	Approved during the validation of the initial crediting period.
6.	The Project reference conditions are 20 degrees Centigrade and 1 atmosphere rather than ACM0001 reference conditions of 0 degrees Centigrade and 1 atmosphere.	Approved during the validation of the initial crediting period.

Based on the information provided to GHD from the Project Proponent, GHD concludes that the Project Activity has been implemented as described in the VCS PD and the deviations applies are appropriate.

4.1.1 No Net Harm

The Project Proponent did not identify any negative environmental and socio-economic impacts. GHD performed an independent review of the permits associated with the Project Activity and the EPA's ECHO database. It was identified via CAR#12 in the Findings Assessment that there was a notice of violation associated with the Crapo Hill Landfill that resulted in the landfill being out of compliance from October 1, 2019 to March 31, 2020 due to failure to provide Discharge Monitoring Reports (DMRs) for stormwater discharge under the Clean Water Act. This violation is specific to the landfill site which is not owned or operated by the Project Proponent and therefore is not directly linked to the Project Activity. However, the Project Proponent was able to provide supporting evidence that the DMR's for the out of compliance period, were provided and processed by the EPA on December 17, 2019 and June 24, 2020. No further violations directly applicable to the Project Activity were identified during the 2020 Monitoring Period.

As noted in Section 2.5.1, the capacity of the Crapo Hill Landfill associated with the Project Activity exceeded the 2.5 million cubic meter threshold. However, the site tested emissions associated with NMOC and measured them to be 6.6 Mg/year for 2019, which is significantly less than the 50 Mg/year (55 tons/year) specified in the NSPS Existing Facility Guidelines for Landfills, meaning that only one of the criteria set forth in the NSPS Guideline was met and therefore mandatory LFG collection system installation is not required. This standard is intended to identify and address landfill sites that may result in harm to the environment.

4.1.2 Local Stakeholder Consultation

The Project Proponent regularly engages with local stakeholders to gather input. Tours are provided of the Project Activity to interested parties such as school groups, college students, environmental advocacy groups, and political leaders. The Project is often used as an example by the State of Massachusetts Clean Energy Council and Department of Environmental Protection as an important environmental project which helps Massachusetts achieve their environmental, renewable energy, greenhouse gas reduction, and sustainability goals. In addition, the Project was awarded the Silver Medal for Excellence in 2010 for LFG and biogas projects by the Solid Waste Association of North America (SWANA).

4.2 AFOLU-Specific Safeguards

The Project Activity is not an Agriculture, Forestry and Other Land Use (AFOLU) project; therefore, there are no AFOLU-Specific safeguards.

4.3 Accuracy of GHG Emission Reduction and Removal Calculations

4.3.1 Monitoring Parameters

The following is a list of the monitoring parameters that the Project Proponent monitor and record throughout the crediting period in order to calculate the claimed emission reductions for the specific Monitoring Period:

Symbol	Description (Units)	Frequency
$EGfacility_{,y}$	Percent Methane content of landfill gas and biogas entering the engines (% v/v)	Continuous/real-time measurement, hourly, daily (SCADA)
$FCH_4,EL_{,y}$ (symbol only represents landfill gas portion)	Volume of landfill gas and biogas entering the engines (acfm)	Continuous/real-time measurement, hourly, daily (SCADA)
-	Temperature of landfill gas and biogas entering the engines (ºF)	Continuous (SCADA)
-	Pressure of landfill gas and biogas entering the engines (PSIG)	Continuous (SCADA)
-	Percent methane content of biogas from the anaerobic digester (% v/v)	Continuous and at totalization of biogas volume
-	Volume of biogas from the anaerobic digester (scfm)	Continuous and at totalization of biogas volume
-	Temperature of the biogas from the anaerobic digester (ºF)	Continuous (SCADA)
-	Pressure of biogas from the anaerobic digester (PSIG)	Continuous (SCADA)
$FCH_4,flared,_y$	Volume of landfill gas to the flare (scfm)	Continuous, hourly, daily
%DistrictInitialSystem	Fraction of total LFG collected attributable to District Initial System represents the amount of landfill gas destroyed in the baseline scenario (%)	Twice per month (approximately every two weeks)
$EF_{EL,Grid,y}$	Emission factor for electricity generation in year y (tonnes CO_2/MWh)	Annual
$TD_{LGrid,y}$	Average technical transmission and distribution losses for grid in year y (no units)	Annual

Symbol	Description (Units)	Frequency
$EC_{Grid,y}$	Amount of grid electricity consumed by the project (MWh)	Annual
$FC_{Diesel,y}$	Amount of diesel fuel consumed by the emergency generator (gallons)	Compiled annually
NCV_{diesel}	Energy content of diesel fuel (MMBtu/gallon)	Annual
$EF_{CO2,Diesel,y}$	Emission factor for diesel fuel	Annual

The GHD Project Team reviewed the monitored parameters and their frequency, equipment used, and description. The GHD Project Team also verified that the monitoring of the above parameters coincides with the CDM Methodology and VCS guidance for the projected emission reductions. The parameters listed above are is consistent with the registered VCS PD.

The GHD Project Team also notes that the parameters available at validation detailed in the registered VCS PD have been applied appropriately. One parameter, Methane Oxidation for Flare, was not included in re-validated VCS PD, however, it was listed as a default parameter in the methodology.

4.3.2 Methods for Recording Monitoring Parameters

SCADA System Monitoring

The Project Activity uses their internal SCADA system to record the monitoring parameters listed in Section 4.2.1 where the frequency of collection is continuous. The SCADA system measures and records methane content and gas (LFG and biogas) volume to the engines and flare once per minute, and then calculates methane quantities each minute. The results are then accumulated to provide hourly and daily totals in units of million British thermal units on a higher heating value basis [MMBtu (HHV)] and thousand standard cubic feet (KSCF) of LFG. This data is automatically saved from the SCADA system via a Microsoft Excel file that contains a summary of the hourly and daily total gas flows (LFG and biogas), methane content, heating value and then additional information pertaining to the operation and output of each of the four engines. This data is saved at the Project Activity but is also backed-up and can be accessed remotely.

The total gas flow provides data regarding the mixed LFG from the landfill and biogas from the anaerobic digester system. The same conversion of gas flow to heating value is made using data from the biogas feed pipe. The difference between the total BTUs entering the engines and the total BTUs received from the biogas facility is the quantity attributed to the LFG collected and is used in the calculations described previously in the VCS PD. The data collection method is consistent with the Project Activity deviation number 5 noted in Section 4.1 above and results in an accurate separation of the methane associated with the LFG and the methane associated with the biogas.

GHD reviewed the SCADA system during the Site Inspection on February 19, 2019, during the 2018 Monitoring Period. GHD confirmed that the SCADA system is backed-up on-Site and externally. GHD verified that the above noted parameters are recorded via the SCADA system along with a significant number of other parameters related to the operation of the Project Activity but not specifically associated with the emission reductions (e.g. blower bearing temperature, engine temperature, and other maintenance related parameters). GHD confirmed that there have been no changes to the SCADA system during the 2020 Monitoring Period. GHD determined that using the SCADA system to record the above noted parameters is appropriate and consistent with the VCS requirements.

The 2020 Monitoring Report Section 4.3 provides further details associated with how and where flow measurement and methane content data is collected. GHD was able to verify that the data associated with these parameters is accurate and consistent with the Monitoring Report and registered VCS PD. Through the review of the Project Proponents GHG calculation spreadsheet and daily reported data, GHD verified that the data from these parameters is consistent with the data within the Monitoring Report and VCS PD.

Volume of LFG to the Flare

In the 2020 Monitoring Report, the Project Proponent has not attributed any LFG flow to the flare (refer to Exhibit 3 of the Monitoring Report). However, GHD identified that based on the data provided by the Project Proponent for the Monitoring Period, there was a small amount of LFG flow to the flare in 2020. To be conservative the Project Proponent elected not to quantify the emission reductions from LFG flow to the flare. GHD verified that the Project Proponent has used a conservative approach by assigning the volume of LFG flow to the flare (FCH_4,flared,y) during the 2020 monitoring period as 0 scfm. Therefore this parameter was not monitored in accordance with the VCS PD during the 2020 Monitoring Period however, the Project Proponent has applied a conservative value to this parameter as a result, which GHD has determined is appropriate.

Methane Content of the Gas and Biogas

The methane content of the gas to the engines (LFG and biogas mixed) is measured continuously using a California Analytical non-dispersive infrared (NDIR) meter on a continuous basis. The metered results from this monitoring equipment is then aggregated by the SCADA system on an hourly and daily basis. Refer to Exhibit 5 of the 2020 Monitoring Report. The Project Proponent provided the calibration results to GHD for review during the 2020 Monitoring Period. GHD reviewed the calibration results for the NDIR meter and determined they were in compliance during the 2020 Monitoring Period.

The methane content of the biogas from the anaerobic digestion system is measured continuously using a Hitech Model NDIR meter on a continuous basis. The metered results from this monitoring equipment is then aggregated by the SCADA system on an hourly and daily basis. This information aids in subtracting the ineligible biogas fraction, from the biogas/LFG mixture that is being fed into the engines.

District Initial System

The District Initial System consisted of the voluntary installation of 21 vertical LFG extraction wells and a flare to combust the collected LFG and represents the operations of the Project Activity in the baseline scenario. Typically on a bi-weekly basis (or twice per month) the Project Proponent uses a portable gas analyzer (Landtec GEM2000) to measure the LFG flow rate from each of the 21 vertical LFG extraction wells associated with the District Initial System. This flow information is used to establish the fraction of flow (%) of LFG to the engines that is attributed to the District Initial System during each monitoring event. The Project Proponent calculated the average fraction of flow that the District Initial System through the Monitoring Report. GHD issued CAR#6 related to a correction of the average fraction used to a weighted average fraction calculated through the Monitoring Period. The Project Proponent made this update, however the Project Proponent weighted the fraction of flow by the number of days in each month instead of the monthly LFG Flow. This resulted in a 0.006% understatement in total reported emissions reductions. The average fraction of LFG flow (4.25%) was used to calculate the baseline emissions associated with the District Initial System in 2020. GHD notes that during monitoring of the LFG flow at each of the 21 extraction wells, the Project Proponent also monitors the methane, carbon dioxide, oxygen and balance gas concentrations to normalize the flow of methane to the total flow of LFG to the engines.

GHD notes that generally the above method was followed, however the Monitoring Report notes that for this parameter the data is collected on a bi-weekly/twice per month basis and in 2020 this data only appeared to be collected on a monthly basis. Given that the maximum deviation for monthly fraction of LFG flow is 0.6% during the Monitoring Period, GHD determined that the use of monthly flow is acceptable. GHD therefore verified that the monitoring method used for this parameter is accurate, conservative, and generally consistent with the Monitoring Report and VCS PD.

4.3.3 Calculation of Emission Reductions

Baseline Emissions

To quantify Baseline Emissions for the Project, the following methodology was used:

- UNFCCC CDM "Large-scale Consolidated Methodology – Flaring or use of landfill gas", ACM0001, Version 16.0 dated 16 October 2015.

The calculation methodology was applied to the calculation of emissions from methane contained within LFG which is generated from the decomposition of solid waste from within the landfill and combusted during electricity generation or in a flare.

For this Project Activity the baseline emissions consist of those associated with the volume of LFG that is destroyed in the flare and the engines to generate electricity. Further, the emissions associated with the fraction of LFG related to the District Initial System, need to be subtracted as this system was installed voluntarily as part of the baseline of the Project Activity. This subtraction of emissions is understood to occur in the baseline of the Project Activity.

The Baseline Emissions also include quantification of the fraction of methane in the LFG that would be oxidized in the top layer of the landfill in the baseline. This is a dimensionless value (0.1) that was available at validation and is therefore defined in the VCS PD. GHD verified that the Project Proponent has applied the Baseline Emissions calculations appropriately and they are consistent with the VCS PD.

Project Emissions

The following methodology and tool were used to quantify Project Emissions:

- UNFCCC CDM "Large-scale Consolidated Methodology – Flaring or use of landfill gas", ACM0001, Version 16.0 dated 16 October 2015.
- UNFCCC CDM “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (Version 01) 16 March 2008.

The calculation methodology for the project emissions was applied to the calculation of emissions from the following sources:

- Fossil Fuel Emissions – CO_2 – Generated from the combustion of fossil fuels (diesel) in an emergency generator
- Electricity Consumption Emissions – CO_2 – Generated from the grid consumption of electricity within the Project Boundary

GHD verified that the Project Proponent has applied the Project Emissions calculations appropriately and they are consistent with the VCS PD.

Leakage

As per methodology ACM0001; "No leakage effects are accounted for under this methodology"

Net GHG Emission Reductions or Removals

The net GHG emission reductions are simply calculated by subtracting the project emissions from the baseline emissions. GHD verified that this calculation has been performed appropriately by the Project Proponent for the 2020 monitoring period.

Uncertainty Associated with the Calculation of Emissions

GHD identified the following minor uncertainties associated with the calculation of the Baseline and Project emissions which were addressed through the issuance of the following CAR's:

- Baseline Emissions – CAR#6 – The Project Proponent updated the average percentage of the DIS to be a weighted average. However, the weighted average calculation contained an error resulting in a 0.006% understatement in reported emissions reduction assertion.
- Baseline Emissions – CAR#10 – The Project Proponent updated the gas constant, molecular weight of methane and conversion factor used in the baseline emissions calculation to include significant figures. However, rounding in the conversion of the gas constant from metric to imperial units resulted in an overstatement of emissions reduction assertion by 0.019%.
- Baseline Emissions – CAR#9 – The Project Proponent reported that flaring emissions were not included as the flare had very limited operation during the monitoring period. GHD determined this was a conservative approach and no changes were made to the GHG assertion.
- Project Emissions – CAR#7 – The Project Proponent updated the calculations and Monitoring Report as emissions from the emergency generator were double counted in the GHG assertion.
- Project Emissions – CAR#8 – The Project Proponent updated the methane oxidation efficiency for the Flare to 50% from 90%.
- Project Emissions – CAR#11 – The Project Proponent updated the DIS emissions calculations to correct the emissions split between 2019 and 2020.

Documentation

The Project Proponent provided a calculation spreadsheet to support applicable calculations. Additional documentation and information was provided by the Project Proponent to support the values used in the calculation spreadsheet.

Default Values

GHD reviewed the appropriateness of the default values applied by the Project Proponent which were mainly attributed to conversion from imperial to metric units along with default conversion factors for converting BTUs of methane to standard cubic feet. GHD determined that the default values applied were appropriate.

Conclusion

The referenced methodology has been applied correctly to calculate baseline emissions, project emissions and net GHG emission reductions.

Relevant assumptions and data have been listed in the VCS PD and have been followed.

Data and parameter values used in the VCS PD are reasonable in the context of the Project and have consistently been applied during the 2020 Monitoring Period, unless otherwise noted.

Estimates of the baseline and project emissions can be replicated using the provided data and parameters values listed in the VCS PD and 2020 Monitoring Report. There is a 0.013% discrepancy (overstatement) in total reported emission reductions.

4.4 Quality of Evidence to Determine GHG Emission Reductions and Removals

GHD reviewed the quality of the evidence provided during the verification and requested additional evidence as required to further support the determination of emission reductions. Provided below is a summary of the CL's that were used through the verification process to address specific evidence requirements and clarify the quality of evidence:

CL#1 – Request for the Project Proponent to provide supporting evidence related to the electricity consumption by the project activity.

CL#2 – Request for the Project Proponent to provide a picture of the electricity meter.

CL#3 – Request for the Project Proponent to provide additional evidence regarding calibration events

CL#4 – Request for the Project Proponent to provide additional evidence regarding the capacity of the landfill

CL#5 – Request for the Project Proponent to confirm any planned/unplanned shutdowns or downtime for the engines or LFG capture system.

CL#6 – Request for the Project Proponent to provide applicable permits

CL#7 – Request for the Project Proponent to provide clarification regarding the use of the methane oxidation efficiency for flare

CL#8 – Request for the Project Proponent to provide meter numbers.

CL#9 – Request for the Project Proponent to provide REC purchase agreements.

Each of the above noted CL's were closed out by GHD through explanation by the Project Proponent and the submission of additional supporting evidence to GHD, refer to Appendix B for additional details. External evidence was provided by the Project Proponent as detailed in Section 2.2. Internal evidence that GHD reviewed consisted of but was not limited to; factory calibration requirements for various meters, ECHO database review, historic verification reports, re-validation report, and VCS PD. A significant portion of the evidence and the quality of the evidence was verified by GHD through a review of the provided documentation. Additionally, GHD cross-checked the provided documentation with internal and external sources.

GHD also issued the following CARs related to the Monitoring Report based on the review of the evidence:

CAR#1 – The Project Proponent updated the Monitoring report to include explanations for any section which were deemed not applicable.

CAR#2 – The Project Proponent updated the Monitoring Report to address the last year that credits were registered under the American Carbon Registry.

CAR#3 – The Project Proponent updated the Monitoring Report to include a description of how the Project contributes to achieving any nationally stated sustainable development priorities.

CAR#4 – The Project Proponent reviewed the PDD to ensure the parameter "methane oxidation efficiency for flare" was included in the PDD.

CAR#5 – The Project Proponent reviewed the description of the parameter "methane oxidation efficiency for flare" in the Monitoring Report.

Through a review of each of the different sources of evidence provided by the Project Proponent, GHD was able to verify that the evidence clearly and transparently conveys the data generation, aggregation, recording, calculation, and final transposition into the 2020 Monitoring Report. The information is clearly conveyed by the Project Proponent from the metering through to the SCADA system, the accompanying excel spreadsheets, and the calculation spreadsheet. The instrument calibration documentation, 2020 Monitoring Report, raw data, and permitting documentation support the transparency and quality of the information provided by the Project Proponent.

Monitoring Equipment Calibration Frequency

During the verification, GHD performed a review of the monitoring frequency provided in the 2020 Monitoring Report for the monitored parameters and confirmed that it was consistent with the VCS PD. GHD reviewed the calibration requirements and determined that the manufacturer calibration frequency requirements were met in the 2020 Monitoring Report.

Conclusion

GHD concluded that the Project Proponent provided the required evidence with appropriate quality that allowed for accurate determination of the GHG emissions reductions from the Project Activity for the 2020 Monitoring Period.

4.5 Non-Permanence Risk Analysis

The Project Activity is not an Agriculture, Forestry, and Other Land Use (AFOLU) project, therefore a non-permanence risk analysis is not required.

5 VERIFICATION CONCLUSION

The verification of the Project Activity was performed in accordance with the following documents:

- ISO Standard ISO 14064 Greenhouse gases Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions (ISO 14064 3) along with the criteria presented in the following documents:
- VCS Program Guide, dated 19 September 2019, Version 4.0
- VCS Standard, dated 19 September 2019, Version 4.0
- VCS Validation and Verification Manual, dated 16 October 2016, Version 3.2, and
- VCS Project Description, dated 12 May 2016
- UNFCCC CDM ACM001: Large scale Consolidated Methodology – Flaring or use of landfill gas, dated 16 October 2015, Version 16.0 and associated tools

Through the collection of LFG from the LFG collection system in the Crapo Hill Landfill, including blowers, and subsequent destruction of the LFG in four electricity generation engines and/or a back up flare, the Project Activity resulted in a reduction of GHG emissions that are relevant, complete, consistent, accurate, transparent and conservative.

Furthermore the emission reductions generated by the Project Activity serve to contribute to sustainable development, and will result in long term benefits to the mitigation of climate change.

Provided below is a summary of the emissions reductions:

Verification period: From 1 October 2019 to 30 June, 2020

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2019	22,070.48	0	0	22,070.48
2020	44,475.27	0	0	44,475.27
Total	66,546	0	0	66,546

It is GHD's opinion that the emission reductions attributable to the Project Activity are free of material misstatements and concludes to a reasonable level of assurance that the emission reductions are additional to any emission reductions that would occur in the absence of the Project Activity. As a result, GHD is issuing a positive Verification Opinion in regards to this Project Activity and will therefore be approving the Project Activity for registration with the VCS with no limitations or qualifications. The Verification Deed of Representation is provided in Appendix C. GHD has not raised any qualifications or limitations.

Michelle Hirst – Lead Verifier

Jason Clarke – Technical Reviewer

APPENDIX A: VERIFICATION PLAN

August 20, 2020 Reference No. 11203966

Mr. Thomas Yeransian
CommonWealth Resource Management Corporation
7 Winslow Way
Mansfield, Massachusetts
02048

Dear Mr. Yeransian:

Re: Verification Plan
Greater New Bedford Landfill Gas Utilization Project, Dartmouth, Massachusetts, USA
VCS ID: 138
Monitoring Period: October 1, 2019 to June 30, 2020

1. Introduction

CommonWealth Resource Management Corporation (CRMC) retained GHD Services, Inc (GHD) to complete an independent third-party greenhouse gas (GHG) verification of the Greater New Bedford Landfill Gas (LFG) Utilization Project (Project Activity), which is listed as under the Verified Carbon Standard (VCS) as VCS ID: 138. The project is located in Dartmouth, Massachusetts, United States of America. The owner of the Project is CommonWealth New Bedford Energy, LLC (CNBE) which is a wholly-owned subsidiary of CommonWealth Resources Management Corporation (CRMC) CRMC is the Project Proponent. The verification will be of the 2020 monitoring period (October 1, 2019 to June 30, 2020).

The VCS is established under Verra to provide a global standard for both validation and verification projects on a voluntary basis. The VCS takes the most stringent principles and standards available to the international GHG market, including and comprising of the United Nations Framework Convention on Climate Change (UNFCCC) and Climate Action Reserve, with reporting completed to the International Standards Organization (ISO) 14604 Part 3 standard.

GHD is a VCS-recognized GHG Validation/Verification Body (VVB) (Registration Number 027) and is accredited by the ANSI National Accreditation Board (ANAB) [1] under ISO 14065 to provide organizational and project level validation and verification services.

The VCS defines verification as "the periodic ex-post independent assessment by a validation/verification body of the greenhouse gas emission reductions and removals that have occurred as a result of the project during the monitoring period, conducted in accordance with the VCS Program rules".[2] This

[1] ANAB is a member of the International Accreditation Forum (IAF).
[2] https://verra.org/wp-content/uploads/2020/03/VCS-Standard-v4.0_Updated.pdd (Section 4.).

Verification Plan has been prepared in accordance with the requirements presented in the following documents:

- VCS Program Guide, Version 4.0, dated September 19, 2019 (VCS Program Guide)
- VCS Standard, Version 4.0, dated September 19, 2019 (VCS Standard)
- VCS Validation and Verification Manual, Version 3.2, dated October 19, 2016 (VCS VVM)

In accordance with the VCS Program Guide, eligible GHG emissions reductions projects are to be evaluated by an accredited Validator/Verifier who has been approved under an accredited GHG program. GHD is a recognized Validator/Verifier under the VCS for projects within the following sectoral scopes:

- Sectoral Scope 1 - Energy industries (renewable/non renewable sources)
- Sectoral Scope 4 - Manufacturing industries
- Sectoral Scope 5 - Chemical industry
- Sectoral Scope 8 - Mining/Mineral production
- Sectoral Scope 9 - Metals production
- Sectoral Scope 10 - Fugitive emissions from fuels (solid, oil, and gas)
- Sectoral Scope 12 - Solvents use
- Sectoral Scope 13 - Waste handling and disposal

2. Verification Objective

GHD, as an independent third-party recognized as a VVB by the VCS (Registration Number 027), was responsible for reviewing the 2020 Monitoring Report including accompanying materials, previous Validation Report, and the VCS Project Description (PD) including the monitoring plan, baseline assessment, and any supporting documentation.

The objective of the verification was for GHD to provide the Project Proponent and VCS with an opinion regarding whether the 2020 Monitoring Report contains any material discrepancies and whether the Monitoring Report was prepared in accordance with VCS Program Guide Version 4.0 and VCS Standard Version 4.0 as well as the translational guidance from the UNFCCC CDM.

Per the VCS VVM, during verification VVBs must evaluate the Monitoring Report and assess the following:

- The extent to which methods and procedures, including monitoring procedures, have been implemented in accordance with the validated PD. This includes ensuring conformance with the monitoring plan.

- The extent to which GHG emission reductions and removals reported in the monitoring report are materially accurate.

3. Level of Assurance

The verification was conducted to a reasonable level of assurance.

4. Materiality Threshold

Materiality threshold for the Project Activity has been set at 5 percent based on the understanding that the Project Activity produces less than 300,000 tons of carbon dioxide equivalent (tCO_2e) of GHG emission reductions per year, and is categorized as a “project” in accordance with Section 3.9.1 of the VCS Standard. A single error, omission, or misstatement, a series of discrete errors, omission or misrepresentation, or one or more qualitative factors, when aggregated may be considered material.

5. Verification Standards and Criteria

The verification of the 2020 monitoring period was conducted in accordance with the requirements presented in the following documents:

- VCS Program Guide, Version 4.0, dated September 19, 2019 (VCS Program Guide)
- VCS Standard, Version 4.0, dated September 19, 2019 (VCS Standard)
- VCS Validation and Verification Manual, Version 3.2, dated October 19, 2016 (VCS VVM)
- UNFCCC CDM Methodology ACM0001 "Large-scale Consolidated Methodology – Flaring or use of landfill gas", Version 16.0, dated October 16, 2015 (Methodology)
- ISO 14064 Greenhouse Gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions, ISO, March 2006 (ISO 14064-3:2006)

6. Scope of Services

The scope of services to be completed by GHD are as follows:

- Verification of the New Bedford LFG Utilization Project located in Dartmouth, Massachusetts, U.S.A for the monitoring period of October 1, 2019 through June 30, 2020 under the requirements of the VCS.

The Project Activity (VCS ID 138) is located at the Crapo Hill Landfill in Dartmouth, Massachusetts (Landfill, Facility, or Site). The Project Activity consists of the landfill gas (LFG) collection system and four (4) combustion engines, designed to capture and combust methane generated within the Landfill. A

back-up landfill flare is also connected to the LFG collection system to combust LFG, as needed, when the engines are not operational. The original baseline scenario of the Project Activity consists of the voluntary installation of twenty-one (21) vertical LFG extraction wells and a flare to combust the collected LFG.

This Project Activity falls under Sectoral Scope 13 – Waste handling and disposal, which is one of the sectoral scopes for which GHD is accredited. GHD understood for the purposes of this verification that all correspondence with respect to this Project Activity was to be with CRMC of which CNBE is a subsidiary, unless otherwise noted.

The verification activities were completed pursuant to the most up-to-date related rules, requirements, regulations, modalities, criteria, guidelines, emission reductions yield, and principles in relation to the PD supplied by the Project Proponent. The Project Activity utilized the UNFCCC CDM methodology ACM0001: Large-scale Consolidated Methodology – Flaring or use of landfill gas", Version 16.0, dated October 16, 2015. This methodology has been accepted for use by the VCS.

6.1 Verification Team

The Verification Team consisted of the following members:

Lead Verifier and Technical Expert – Ms. Michelle Hirst

Ms. Hirst has over 12 years' of professional experience, with 9 years working directly in greenhouse gas roles. Ms. Hirst has held roles in greenhouse gas teams in Germany, Canada, and the USA. Ms. Hirst is experienced in leading ozone depleting substances (ODS), mine methane capture, and livestock offset project verifications under the ARB, livestock and ODS offset projects under the Climate Action Reserve (CAR), and Industrial offset projects under the American Carbon Registry (ACR). Ms. Hirst has is also an experienced forestry verifier under ARB and CAR. In regards to emission reporting, Ms. Hirst has experience with the British Columbia (BC) Reporting Regulation, Alberta Environment and Parks (AEP) Specified Gas Emitters Regulation (SGER), and Ontario Regulation (O. Reg.) 390/18 in Canada, and corporate emission reports submitted under the Global Reporting Initiative. Ms. Hirst is an ARB accredited Lead Verifier and Offset Project Specialist for livestock, mine methane capture and ODS projects, and a CAR accredited Lead Verifier and Landfill Project Specialist. Ms. Hirst is also accredited under the Climate Forward program for Solar PV and Pool Cover projects. Ms. Hirst is also an ARB accredited Low Carbon Fuel Standard (LCFS) Lead Verifier for Alternative Fuel Transactions.

Role of Lead Verifier: As Lead Verifier, Ms. Hirst is the primary contact for CRMC/CNBE. The Lead Verifier is responsible for establishing that no conflicts of interest are present prior to initialization of the work. During the verification Ms. Hirst was responsible for preparing and/or reviewing and issuing the findings assessments as well as the transfer of material to the Independent Technical Reviewer when required.

Co-Lead Verifier – Valerie Chan

Ms. Chan is a licensed Professional Engineer in the province of Ontario, is GHD's Greenhouse Gas Assurance Services Manager, and a California Air Resources Board-accredited offset verifier and ozone-depleting substances (ODS) project specialist. Valerie has completed the validation and verification of small and large scale projects under the UNFCCC Clean Development Mechanism (CDM) program, Verra: VCS, and The Gold Standard. Valerie has completed GHG verifications as lead verifier or independent peer reviewer under British Columbia, Alberta, Saskatchewan, and Ontario Regulations, and The Climate Registry. Valerie's GHG project experience includes validation and verification of emissions from renewable energy projects, oil and gas facilities, industrial processes, including power generation and electricity generation facilities, and biomass based thermal energy projects.

Role of Co-Lead Verifier: As Co- Lead Verifier, Ms. Chan supported the Lead Verifier in preparing and/or reviewing and issuing the findings assessments as well as the transfer of material to the Independent Technical Reviewer when required.

Team Member and Verifier – Filzah Nasir

Ms. Nasir has a Masters in Environmental Engineering which specialized in developing an emissions inventory and quantifying emissions of greenhouse gases and criteria air contaminants. Filzah has completed GHG verifications as a verifier for multiple jurisdictions including Ontario, Alberta, Newfoundland, and Saskatchewan. In addition to regulatory greenhouse gas verifications, Filzah also has experience with analysis and calculation of emissions of greenhouse gases for voluntary projects under the American Carbon Registry and the Ontario Centres of Validation. In addition to GHG Assurance Services, Filzah has developed a calculation methodology and emissions calculation tool for the calculation of criteria air contaminants for Canadian Railways for Transport Canada. Filzah has also worked on several projects involving greenhouse gas mitigation including calculation of baseline emissions and researching reduction opportunities.

Role of Team Member: Ms. Nasir is responsible for supporting the lead verifier in preparing and/or reviewing and issuing the findings assessments as well as the transfer of material to the Technical Reviewer when required.

Technical Reviewer and Technical Expert – Jason Clarke

Mr. Clarke is a licensed professional engineer in the province of Ontario and is a California Air Resources Board-accredited lead offset verifier and livestock and ozone depleting substances (ODS) project specialist. Mr. Clarke is also a Lead Verifier for the verification of a variety of Ontario based facilities under O. Reg. 452/09 and 390/18, and a Lead Verifier and Landfill Project Specialist under the Climate Action Reserve. Mr. Clarke also participated in the Landfill Protocol Workgroup for updates to the Climate Action Reserve Landfill Protocol and is also registered as a Project Expert under the Climate Action Reserve Climate Forward Program. Further, Mr. Clarke has been a validation/verification team member for a variety of GHG Validation and Verification projects registered under ANSI and UNFCCC Clean Development Mechanism (CDM). Mr. Clarke has been involved in verification teams for various GHG

projects associated with the Ontario Ministry of the Environment and Parks (MECP), ANSI, The Climate Registry (TCR), Verra (VCS), and the UNFCCC CDM. Mr. Clarke also has experience with the internal and external auditing related to GHG Verification and Validation projects in Ontario, Quebec, Alberta, British Columbia, and Massachusetts.

Role of Technical Reviewer and Technical Expert: As the Technical Reviewer and Technical Expert, Mr. Clarke is responsible for the third party review of the verification report prepared by the Verification Team against the requirements of the VCS specifically providing technical expertise for the overall independent review process.

7. Verification Process

The main components of GHD's verification process were as follows:

- Document Review
- Preparation of Assessment List and Completion of a Site Visit
- Verification Assessment and Issuance of Corrective Action Requests (CARs)/Clarification Requests (CLs)
- Response to CAR(s)/CL(s)
- Review and/or development of Forward Action Requests (FARs), as applicable
- Technical Review
- Draft Verification Report Issuance
- Final Verification Report Issuance
- Verification Representation

The timelines associated with each of these items are discussed in the sections to follow.

7.1 Overview of Verification Process

The Verification Team assessed and verified that the implementation of the Project Activity and the steps taken to report GHG emission reductions comply with the VCS criteria and relevant guidance provided by the VCS outlined in Section 4. The verification included a review of relevant documentation and records.

During the verification process, GHD's Verification Team considered both quantitative and qualitative information on emission reductions. Quantitative data comprised of the Monitoring Report(s) submitted to the Verification Team by the Project Proponent. Qualitative data comprised of information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, and review and internal verification of calculations/data transfers.

The verification conclusion was based on the interaction of the VCS Program principles as follows:

1. Relevance
2. Completeness
3. Consistency
4. Accuracy
5. Transparency
6. Conservativeness

7.2 Verification Findings

During the verification process, the Verification Team may identify findings related to the Project Activity's ability to meet VCS requirements and achieve credible emission reductions. Although there are different methods of reporting such results, it was imperative that these issues are transparently identified, discussed, and resolved in the Verification Report.

If during the verification of the Project Activity, the Verification Team identified findings that needed to be addressed to confirm that the Project Activity meets the VCS requirements, the Lead Verifier will issue a CAR, CL, and/or a FAR, as appropriate, to the Project Proponent via a findings assessment.

Iterations of these requests were continued until such a time as the Lead Verifier can adequately resolve or "close out" the identified CAR(s), CL(s), and/or FAR(s), as applicable.

Each of these procedures is discussed in further detail below.

Corrective Action Request (CAR)

A CAR is issued during a verification if the VVB has identified a material discrepancy or non-conformance that the Project Proponent must address. More specifically, the CDM provides a standard that the VVB can use for the issuance of CARs, as detailed below, based on Section 9.1.3.2 of the CDM Validation and Verification Standard [3]:

- Non-compliance with the registered monitoring plan, the applied methodologies, the applied standardized baselines or the other applied methodological regulatory documents is found in monitoring and reporting and has not been sufficiently documented by the Project Participant(s), or if the evidence provided to prove conformity is insufficient.
- Modifications to the implementation, operation and monitoring of the registered CDM project activity has not been sufficiently documented by the Project Participant(s).
- Mistakes have been made in applying assumptions, data or calculations of GHG emission reductions or net anthropogenic GHG removals that will impact the quantity of emission reductions or removals.

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[3] CDM validation and verification standard for project activities

- Issues identified in a FAR during the validation to be verified during the verification or the previous verification(s) have not been resolved by the Project Participant(s)

The above issues could result in the expected emission reductions not being realized.

The Lead Verifier resolved or "close out" CARs only if the Project Proponent modifies the Monitoring Report, or provides adequate additional explanations or evidence that satisfies the Verification Team's concerns and the VCS requirements. GHD is unable to issue a Verification Representation prior to the resolution of all CARs. The Verification Team reported on all CARs in the findings assessment and Verification Report.

Clarification Request (CL)

In general, a CL is a request for additional clarification made by the Verification Team to the Project Proponent when the Project Activity reporting, lacks transparency, is unclear, and further information is needed to determine whether the applicable requirements are met.

The Lead Verifier resolved or "close out" CLs only if the Project Proponent provides adequate additional explanations or evidence that satisfies the Verification Team's concerns and the VCS requirements.

Forward Action Request (FAR)

A FAR is a request made during the validation to "identify issues related to project implementation that require review during the first verification of the proposed CDM project activity."[3]

The Lead Auditor addressed any FAR(s) raised from the validation during the verification, as required. In addition, FAR(s) may also require review in subsequent verifications. The Project Auditing Team reported on all FARs in the findings assessment and Verification Report.

7.3 Site Visit

GHD performed a preliminary risk assessment of the Project Activity. Included in this risk assessment is a review of the whether or not there have been significant changes to the Project Activity since the last monitoring period verified by GHD (2019) to warrant the completion of a Site inspection for the 2020 monitoring period. Based on the preliminary risk assessment and discussions with CRMC/CNBE, GHD has determined that there have been no significant changes from the previous monitoring period with regards to the methodology, equipment, data collection, data management, and the GHG calculations associated with the Project Activity. As a result, GHD determined that a Site inspection for the 2020 monitoring period was not likely required to achieve a reasonable level of assurance.

The last site visit of this Project was completed by GHD on February, 19, 2018.

7.4 Reporting

The Verification Report described the verification process, any findings raised, resolution of findings, and the conclusions reached by the VVB during the verification. GHD used the most recent VCS Report Template.

The results of the verification give the necessary input for the Verification Representation. The Verification report included a statement that provides all required details identified in Section 4.1.17 of the VCS Standard, Version 4.0:

- Description of the level of assurance of the verification
- Description of the objectives, scope and criteria of the verification
- Description as to whether the data and information supporting the GHG assertion were hypothetical, projected and/or historical in nature
- Inclusion of the VVB's conclusion on the GHG assertion, including any qualifications or limitations

The Verification Report stated the volume of verified GHG emission reductions or removals generated during the monitoring period.

8. Risk Assessment

GHD followed a risk-based verification approach. As such, GHD identified the key reporting risks related to the claimed emission reductions and assessed to what extent the Project Proponent's control systems were adequate for mitigating any perceived reporting risks.

Key reporting risks that are not sufficiently addressed by the project operator's control system represents residual risks. The Verification Team conducted a detailed verification to investigate the residual risks. Key issues in verification include, but are not limited to, verification of correct use of emission factors, correct use of conversion factors, and consistency in aggregation of emissions data. Wherever practical, direct reading instruments are used to ensure that any reporting risks were kept within equipment and instrumentation performance limits.

Potential Risk Area	Percent of total Site Emissions (%) and Percent Change of Source Specific Emissions Year Over Year (%)	Risk Type (Inherent, Control, Detection)	Risk Level (High, Medium, Low)	Justification
Baseline Emissions				
LFG Destruction	100% / -14.3%	Inherent	Medium	An on-site SCADA system measures methane content and gas volume to the engines and flare

Potential Risk Area	Percent of total Site Emissions (%) and Percent Change of Source Specific Emissions Year Over Year (%)	Risk Type (Inherent, Control, Detection)	Risk Level (High, Medium, Low)	Justification
				each minute. Meters are calibrated regularly. This source is considered a significant contributor to emissions. Therefore, the inherent risk is set to medium.
		Control	High	Meters are calibrated regularly. The SCADA system is automatically backed up daily. The file is backed up both at the Facility and off site. This leads to a low control risk related to data acquisition and control, however the control risk was set to high to account for the significant change in emissions from previous Monitoring Period.
		Detection	Low	GHD will review SCADA data related to on-site methane content and gas volumes and meter calibrations for the entire monitoring period. There is a low risk that a material error would not be detected.
Project Emissions				
Fossil Fuel Consumption	0.13% / -121.0%	Inherent	Medium	Fossil fuel consumption is recorded internally, however this is a relatively low contributing source of emissions. Therefore, the inherent risk is set to medium.
		Control	Medium	While there was a significant decrease in emissions for this source from the previous monitoring period, the overall change in emissions is very low as this is a low magnitude source; however fossil fuel consumption was recorded internally, therefore the control risk was medium.
		Detection	Low	GHD will review the internal fossil fuel consumption records, and defaults and emission factors used

Potential Risk Area	Percent of total Site Emissions (%) and Percent Change of Source Specific Emissions Year Over Year (%)	Risk Type (Inherent, Control, Detection)	Risk Level (High, Medium, Low)	Justification
				in the calculations. There is a low risk that a material error would not be detected.
Electricity Consumption	0% / 0%	Inherent	Low	Electricity consumption is determined from third-party invoices, therefore the inherent risk is low.
		Control	Low	Electricity consumption is determined from third-party invoices, therefore the control risk is low.
		Detection	Low	GHD will review third-party invoices and all defaults and emission factors used in the calculations. There is a low risk that a material error will be not detected.
District Initial System LFG Destruction	99.87% / -36.6%	Inherent	Medium	LFG destroyed in the baseline is determined with well head measurements of District Initial System. Data is collected with a portable gas analyzer that requires regular calibration. The inherent risk is medium.
		Control	Low	Calibration of the portable gas analyzer is completed prior to obtaining each set of measurements and documented. GHD will review all accompanying documentation, therefore the control risk is low.
		Detection	Low	GHD will review each measurement, the qualifications of the responsible party, and the associated calibration records for the monitoring period. There is a low risk that a material error is not detected.

9. Sampling Plan

GHD prepared the below draft sampling plan for the verification.

Data/Information Description	Percentage of total Site Emissions (%)	Data/Information Source	Collection Frequency	Sample Size/Assessment Method
Baseline Emissions				
LFG Destruction	100%	• SCADA system	Continuous and aggregated hourly and daily	• Review full year of daily aggregated data • Review calibrations and QA/QC procedures for relevant monitoring equipment • Review calculation for conversion to BTUs
Project Emissions				
Project Fossil Fuel Consumption	0.13%	• Fuel use by the Emergency Generator	Plant operator maintains a run time log, data compiled annually	• Review calculations for fossil fuel consumption by the Emergency Generator and defaults and emission factors used
Project Electricity Consumption	0%	• Electricity consumption	Bills are compiled annually	• Review full year of electricity consumption data • Review calculations for electricity consumption and defaults and emission factors used
District Initial System LFG Generation and Destruction	99.87%	• Fraction of total LFG collected attributable to the District Initial System	Well head measurement of District Initial System collected twice a month	• Review full year of measurements from each well-head • Review calibrations and QA/QC procedures for the hand-held instrument(s) • Reviewed calculation for determination of the fraction

Data/Information Description	Percentage of total Site Emissions (%)	Data/Information Source	Collection Frequency	Sample Size/Assessment Method
Detailed Process Overview	N/A	• Review of Process Details • Process flow diagram for the Facility	N/A	• Review during Site Visit • Interview Project Proponent personnel as applicable
Back up of data acquisition systems	N/A	• General Data Management System • Controls and QA/QC procedures • Document retention policy	N/A	• Review frequency of data backup • Interview Project Proponent personnel as applicable
Data acquisition and flow from meters to data collection/process monitoring system software to data historian	N/A	• Project Proponent	N/A	• Review data systems • Interview Project Proponent personnel as applicable
Compliance with PD	N/A	• Project Description	N/A	• Site Visit • Monitoring Plan • Interview Project Proponent personnel as applicable
Compliance of the Monitoring Plan	N/A	• Project Description • Monitoring Plan	Annual	• Ensure Monitoring Plan and supporting documents were complete, verifiable, and in accordance with VCS requirements • Review any changes to the Project Activity, as applicable
Accuracy	N/A	Electricity Meters	Continuous records and calibration records	• Review calibration certificates and meter data

10. Verification Timelines

GHD is committed to providing efficient and effective services to all of its clients. In order for GHD to maintain a strict schedule, it is additionally the responsibility of CRMC to maintain adherence to the proposed schedule.

The following table presents the timelines based on the general information provided by the Project Proponent with regard to the date on which the PD was available to GHD. A key component to maintaining the proposed timelines is the timely and complete response of the Project Proponent to any/all CAR(s), CL(s), and FAR(s).

GHD reserves the right to revise or change the proposed timelines and the associated fees given the following occurrences:

- A CAR/CL is not adequately responded to in accordance with VCS standards within ten (10) days of submittal of the request by GHD to the Project Proponent
- The VCS guidance related to the verification is revised during the verification process

Assuming that none of the previously mentioned events occur during GHD's verification assessment such that the verification process timelines would be altered, the following table presents the proposed timelines for completing the verification.

Table 11.1 Proposed Verification Timeline

Date	Milestone	GHD Deliverable
Start Date (Late-June 2020)	Contract is Duly signed by CRMC and GHD	Duly signed contract
State Date +1 week (Early July 2020)	GHD submits Verification Plan and CRMC provides VCS Monitoring Report, Monitoring Plan, and PD	Verification Plan
Start Date + 2 weeks (Mid-July 2020)	Verification Team reviews the documentation and formulates CARs/CLs and issues a Summary of Findings to CRMC	Summary of Findings consisting of CARs, CLs, and FARs
Client dependent (Late-July 2020)	CRMC submits documentation addressing all CARs/CLs in a single submission package to GHD for the Project Activity	Not applicable
Issues Log Closeout (Mid-August 2020)	Verification Team reviewed the additional supporting documentation and any changes to the PD or the Monitoring Report. If required, GHD provides CRMC with additional/revised CARs/CLs. Upon closure of all CARs/CLs GHD issued the Draft Verification Report to Technical Reviewer.	Summary of Findings, if applicable

Date	Milestone	GHD Deliverable
Draft Verification Report (Mid-August 2020)	Final review of the Monitoring Report and Draft Verification Report by the Technical Reviewer. Revisions to the Draft Verification Report to address Technical Review comments.	A request for any additional information required resulting from the Technical Review Draft Verification Report
Final Verification Report and Verification Statement (Late August, 2020)	Revisions to the Draft Verification Report to address CRMC comments. Preparation of Final Verification Report and Statement.	Submit of the Final Verification Report and Verification Representation to Client for upload to VCS

11. Closing

The Verification Plan is considered to be a dynamic document that may require modification and adaptation to conditions as encountered during the completion of the Verification process.

All of Which is Respectfully Submitted,

GHD

Michelle Hirst, Lead Verifier

Jason Clarke, Technical Reviewer

MH/cb/1

APPENDIX B: FINDINGS ASSESSMENT

Findings Assessment
New Bedford LFG Utilization Project
2020 Monitoring Period Verification

Rev. No.	Date Issued
0	July 24, 2020
1	August 7, 2020
2	August 18, 2020

CL #	Clarification Request	Explanation/Response	Changes applied to Project Documents	Status
1	GHD requests that the Project Proponent provide the raw data file associated with the Eversource electricity billing for clarification on the project emissions associated with electricity consumption which covers the entire reporting period (please note that the billing details provided stop at September 17, 2020).	Project Proponent has included the raw data file provided by Eversource for electricity consumption as Project in attached Excel File labeled "Usage". This is the same data as provided by copying website data included in the Monitoring Report.		Closed
2	GHD requests that the Project Proponent provide a photo of the electricity meter referenced in Exhibit 4 of the Monitoring Report (number: 5120378). Is this is the only meter used to measure electricity consumption from the grid?	Project Proponent has included the photo of electricity meter to the Monitoring Report Version 2 in Exhibit 5. This is the only meter that measures electricity consumption from the grid.		Closed
3	GHD requests that the Project Proponent provide clarification regarding the calibration events for the following parameters and associated monitoring equipment during the monitoring period: - Temperature of gas (LFG and biogas) - Pressure of gas (LFG and biogas) - Volume of biogas - Temperature of biogas - Pressure of biogas - Volume of LFG to flare	Temperatures and pressures of LFG and biogas combined are each calibrated using thermometer and pressure gauge. These are calibrated at the time of the landfill gas and biogas flow calibration as shown on the calibration sheets included in Exhibit 6. Temperature and pressure measurements are extremely reliable and did not require adjustment during the monitoring period. Temperature and pressure of biogas are each calibrated using thermometer and pressure gauge. Temperature and pressure measurements are extremely reliable and did not require adjustment during the monitoring period. Volume of biogas is calibrated once per month using pitot tube and manometer. The calibration data for biogas methane content, volumetric flow, temperature and pressure is included and shown in Exhibit 6 of the Monitoring Report. Volume of LFG to flare is not routinely calibrated and Project Proponent is not quantifying carbon offsets associated with the LFG combusted in the flare.		Closed
4	Please provide documentation confirming the current capacity of the landfill.	See attached in Attachment 1 the March 26, 2019 NSPS Design Report and October 9, 2019 NMOC Emission Rate Report for 2019. The NMOC Emission Report demonstrates that the NMOCs emissions are below the NSPS applicability threshold and therefore the Crapo Hill Landfill is not subject to the requirements of NSPS.		Closed
5	Please confirm if there was any planned/unplanned shutdowns or downtime for the engines or LFG capture system during the Reporting Period.	All planned and unplanned shutdowns are shown in the Daily reports (Rows 107 thorugh 141) provided in Exhibit 5 of the Monitoring report and in the Spreadsheet titled "Daily Report 2020 GHG.xls".		Closed
6	GHD requests that the Project Proponent provide the most recent of each of the following permits and/or documents: - Operating Permit Renewal Application. - Massachusetts Department of Environmental Protection- Air Quality Operating Permit - Final Approval Document from MA Department of Environmental Protection	See in Attachment 2 the current Final Air Quality Operating Permit issued July 23, 2020. Note that your items #2 and #3 are the same item. The permit application is web-based and is attached as well.		Closed

Findings Assessment
New Bedford LFG Utilization Project
2020 Monitoring Period Verification

Rev. No.	Date Issued
0	July 24, 2020
1	August 7, 2020
2	August 18, 2020

CL #	Clarification Request	Explanation/Response	Changes applied to Project Documents	Status
7	Please provide further details on the source of the parameter "Methane Oxidation efficiency for flare". The monitoring report references "VCS" for the source.	The specific reference used in the Exhibit 3 is UNFCCC's CDM methodology ACM0001 (Version 16) Standard of Verification: Flaring or use of landfill gas. Exhibit 3 also refers to Verified Carbon Standard Version 3, October 19, 2016, v3.6. However, I believe that the reference for the flare is only to ACM0001 (Version 16) Standard of Verification: Flaring or use of landfill gas wherein it states *"Provide a default value for methane destruction flare efficiency (50%) should the methane destruction efficiency not be measured."* Page 38 of 39 of ACM0001. The methane oxidation factor is not used in Exhibit 3 because we do not to quantify the emission reductions associated with the flaring. The factor is only used in establishing emissions associated with the District Initial System in Exhibit 4. Reviewing Exhibit 4, there was an error in the calculation because it did not use the 50% methane oxidation flare factor. I have revised Exhibit 4 and 1 in Monitoring Report Version 2 to reflect this correction.		Closed
8	GHD notes that the "California Analytical' Analyzer Calibration Results" is provided but there is no identifying meter number. Please confirm the meter number for the methane analyser calibrations	The California Analytical Instrument, Model 602P NDIR, Serial #S07002. NDIR means non-dispersive infrared.		Closed
9	GHD requests the REC Purchase Agreement for the 2020 Monitoring Period.	See Attachment 3 containing the REC Agreements for 2020 Monitoring Period. These Agreements are to be treated as Confidential Information per our Confidentiality Agreement.		Closed
CAR #	**Corrective Action Request**	**Explanation/Response**	**Changes applied to Project Documents**	**Status**
1	The VCS Monitoring Repoirt Template v4.0.docx requires explanations where a section is identified as not applicable. There are several sections where the response is 'none' or 'not applicable'. Please update the Monitoring Report accordingly.	Explanations have been made in Monitoring Report.	the Project Proponent updated the documents to ensure compliance with the Monitoring Report template	Closed
2	Section 1.9 of the Monitoring Report does not state the last year that credits from this project were registered under ACR. Update the Monitoring Report accordingly.	The last year that credits from this Project were registered under the ACR were for the full year of 2008 vintage.	The Monitoring Report has been updated to address the last year that credits were registered und ACR. Specifically, Section 1.9 reads as follows: Participation under Other GHG Programs: The Project is registered at the American Carbon Registry – Project ID of ACR 113. The emission reductions verified for this monitoring period will not be claimed under or registered on the ACR or any other registry. The last year that credits from this Project were registered under the ACR were for the full year of 2008 vintage.	Closed
3	Section 1.11 of the VCS Monitoring Repoirt Template v4.0.docx requires a description of "how the project contributes to achievng any nationally stated sustainable development priorities, including any provisions for monitoring and reporting same". Please update the Monitoring Report accordingly.	Section 1.11 has been updated in the revised Monitoring Plan.	the Project Proponent updated the documents to ensure compliance with the Monitoring Report template	Closed
4	In Section 4.1 of the Monitoring Report, the Data Unit/Parameter "Methane Oxidation efficiency for flare" is included however this is not included as a parameter in the PDD	The methane oxidation efficiency of the flare was included in the orginal PDD (December 2008). The latest PDD used for revaluation inadvertently dropped this factor as a parameter.	NA	Closed

Findings Assessment
New Bedford LFG Utilization Project
2020 Monitoring Period Verification

Rev. No.	Date Issued
0	July 24, 2020
1	August 7, 2020
2	August 18, 2020

CAR #	Corrective Action Request	Explanation/Response	Changes applied to Project Documents	Status
5	In Section 4.2 of the Monitoring Report, the description used in the 'Methane Content of Biogas' parameter is not complete. Please update accordingly.	The description appears to be complete.	NA	Closed
6	GHD requests that the Project Propenent corrects the average on the "DistrictInitialSystem" page within the "CNBE VCS calc 2019 02Oct2019" calculation spreadsheet to a weighted average of the reporting period.	Added days in each month and calculated weighted average using the days in month. Supporting information for Exhibit 4 revised.	Weighted average was used in Exhibit 4, Cell I25 as show in revised Exhibit 4 of the Monitoring Report.	Closed - Minor discrepancy due to weighted average based on days instead of LFG flow.
7	Based on GHD's review, emergency generator emissions were double counted. Total emissions are 2..17 tonnes for the monitoring period whereas the project proponent reported 2 tonnes for the 2019 monitoring period and the 2020 monitoring period. Please review and confirm. Immaterial discrepancy of 0.003%.	The emissions associated with the Emergency Generator occurred during 2020. Exhibit 1 reflects that 0 occurred during Oct 1 - December 31, 2019 and the 2.17 tons of CO2 occurred during 2020 monitoring period.	Project Proponent updated calculations and monitoring report.	Closed
8	Based on GHD's review, the FCH4 BL calculation (exhitbit 4, cell B27) uses a factor of 0.9 instead of 0.5. Please review and provide an explanation for this.	The 0.9 was in error. The 0.5 should have been used. The correction has been made in Exhibit 4.	Project Proponent updated calculations and monitoring report.	Closed
9	Based on GHD's review there was approximately 427 MMBTU of flared gas during the Project Period. Please provide an explanation why emissions from flaring were not included in baseline emissions calculations.	The back-up flare had very limited operation during the current verification period. Because of the very limited use, calibrations are not conducted to reasonably quantify the accuracy of the quantity of emissions reductions as a result of the flare. Therefore, no emission reductions are claimed from flaring.	No changes were made - GHD determined the Project Proponent's approach was conservative.	Closed
10	Please explain why DIS emissions are reduced by factors of 0.33 and 0.5 (exhibit 1, Cell L45 and M45). Is this to split up emissions between the 2019 and 2020 periods? If yes, some emissions are excluded from the total. Total DIS emissions based on calculations in Exhibit 4 are approximately 1511 whereas total DIS emissions in Exhibit 1 are approximately 1255. Please review and explain.	DIS was split between the last 3 months of 2019 and the first 6 months of 2020. The 2020 factor is in error. The factor for 2019 should be 3/9 or 0.333 and the factor for 2020 should be 6/9 or 0.6667. This correct has been made and is reflected in Exhibit 1. DIS emissions are 1609 split in 2019 at 536 and 2020 at 1,073.	Exhibit 1 revised.	Closed
11	Minor immaterial discrepancies in overall emissions due to rounding of conversion factors, gas constant and molecular weight of methane.	Added significant figures to the conversion factors gas constant, molecular weight of methane, and pounds per metric tons. Exhibits 1, 2 and 3 show revised calculations as a result.	Exhibits 1, 2 and 3 show revised calculations as a result.	Closed - Minor discrepancy due to rounding in coversion of gas constant from metric to imperial units.
12	The EPA ECHO database indicates that the Crapo Hill Landfill is out of compliance from October 1, 2019 to March 31, 2020 due to failure to report Clean Water Act monitoring results to DMR. Please provide further details on this noncompliance, including the letter sent from EPA to Crapo Hill Landfill.	The EPA noncompliance that you are referencing is for the Crapo Hill Landfill. The Crapo Hill Landfill is owned and operated by the Greater New Bedford Regional Refuse Management District (the “District”), a public instrumentality created by an act of the Massachusetts legislature. None of CRMC or its wholly owned subsidiaries, CommonWealth New Bedford Energy, LLC or CRMC Bioenergy, LLC, are the owners of the Crapo Hill Landfill. Our entities are tenants only. We did not receive, and would not have received the notice of violation referred to because it’s not our violation and is in no way associated with our facilities. We hold no discharge permits issued by the EPA and we have no obligation to report any monitoring data under the Clean Water Act to the EPA. I conferred with Scott Alfonse, the Executive Director of the District to determine the status. The District has not received any letter correspondence from EPA regarding this issue. The Discharge Monitoring Report is required under a NPDES permit issued to the District from EPA for stormwater discharges at 3 locations. The DMR is due quarterly for the 3 locations. Evidence that the DMRs were submitted to EPA and were successfully processed is shown for Q4 2019 and Q1 2020.	NA	Closed

APPENDIX C: VERIFICATION DEED OF REPRESENTATION

VCS VERIFICATION DEED OF REPRESENTATION

BY

GHD SERVICES, INC

THIS DEED OF REPRESENTATION is made on 25 August 2020

BY

GHD Services, Inc., 455 Phillip Street, Waterloo, Ontario N2L 3X2, Canada (as **VVB**)

THIS DEED WITNESSES as follows:

1. **INTERPRETATION**

1.1 In this Deed:

"Accountholder" means the holder of an account in the Verra Registry;

"**AFOLU**" means agriculture, forestry and other land use;

"**GHG**" means greenhouse gas;

"**GHG Program**" means a formal or organized program, scheme or arrangement for the recognition of activities leading to Reductions, or the crediting or issuance of instruments representing, or acknowledging, Reductions;

"Project" means Greater New Bedford LFG Utilization Project;

"Project Crediting Period" means the time period for which GHG emission reductions or removals generated by the Project are eligible for issuance as VCUs (the rules with respect to the length of such time period and the renewal of the project crediting period are set out in the *VCS Standard*);

"**Project Ownership**" means the legal right to control and operate the project activities. Distinct from proof of right;

"**Project Proponent**" means the individual or organization that has overall control and responsibility for the Project, or an individual or organization that together with others, each of which is also a Project Proponent, has overall control or responsibility for the Project. The entity(s) that can demonstrate Project Ownership in respect of the Project. For the avoidance of doubt where an individual executes this Representation in their capacity as an authorized office holder of the company who is the Project Proponent, this Representation is made by the company, not the authorized office holder;

"Reduction" means a reduction or removal of one tonne of CO_2e caused by the activities of a Project during the Project Crediting Period;

"Validation/Verification Body" or "**VVB**" means an organization approved by Verra to act as a validation/verification body in respect of providing validation and/or verification services in accordance with the VCS Program Rules;

"VCS Program" means the GHG Program operated by Verra which establishes the rules and requirements that operationalize the VCS to enable the validation of GHG projects and the verification of GHG emission reductions and removals;

"VCS Program Rules" means the rules and requirements set out in the *VCS Program Guide*, the *VCS Standard* and the other VCS Program documents, as such rules and requirements may be updated from time to time;

"Verification Report" means the written report of verification covering the Reductions

generated by the Project from 1 October 2019 to 30 June 2020 and prepared by the VVB in accordance with the VCS Program Rules; and

"**Verified Carbon Unit" (VCU)** means a unit issued by, and held in the Verra Registry representing the right of an Accountholder in whose account the unit is recorded, to claim the achievement of a Reduction that has been verified by a validation/verification body in accordance with the VCS Program Rules. Recordation of a VCU in the account of the Accountholder at the Verra Registry is *prima facie* evidence of that Accountholder's entitlement to that VCU.

"**Verra Project Database**" means the database that provides public access to all project and VCU information, including retirement and tracking of the AFOLU pooled buffer account (and serves similar functions for other Verra programs);

1.2 **"Verra Registry"** means the registry used by Verra that ensures all required Project and program documents have been submitted, maintains accounts of VCUs, issues and ensures the seamless flow of VCUs between registry accounts, and maintains custody and records of VCU legal ownership;Documents referred to in this Deed but not defined shall be the VCS Program documents, as updated from time to time, to which the relevant term relates.

2. **REPRESENTATIONS**

2.1 I am the Validation/Verification Body in relation to the verification of the Project.

2.2 I hereby represent and warrant that:

2.2.1 I have independently verified the Reductions generated by the Project in accordance with the VCS Program Rules;

2.2.2 In relation to any validation findings and conclusions provided in the Verification Report, I have independently validated the Project's compliance with the VCS Program requirements as set out in the VCS Program Rules; and

2.2.3 All factual information that I provide in relation to this Deed or have provided in the Verification Report is to the best of my knowledge following due inquiry true, accurate and complete in all material respects and I have not made or provided, and will not make or provide, false, fraudulent or misleading statements or information in relation to this Deed or the Verification Report.

2.3 I hereby acknowledge and agree that:

2.3.1 The following persons may rely on and enforce the terms of this Deed:

(a) Verra;

(b) each person who is an Accountholder holding VCUs relating to the Project at any given time;

(c) each person on whose behalf VCUs relating to the Project were retired by an Accountholder; and

(d) each of the successors and assigns of those persons listed in clauses 2.3.1(a), 2.3.1(b) or 2.3.1(c);

2.3.2 Neither Verra, nor any of its respective affiliates, directors, employees, agents, licensors and/or contractors, shall be liable with respect to any claims whatsoever arising out of this Deed or erroneous information within the Verification Report

submitted to the Verra Registry for indirect, consequential, special, punitive or exemplary damages, including, without limitation, claims brought against Verra by Accountholders, Project Proponents, other Validation/Verification Bodies or any other third party. This paragraph shall apply regardless of any actual knowledge or foreseeability of such damages;

2.3.3 I have read, understood and will abide by the VCS Program Rules; and

2.3.4 Verra has an absolute right to amend any of the VCS Program Rules at any time and shall not bear any liability for loss or damage or liability of any kind sustained by the Validation/Verification Body or any other party involved in the Project in any way under the VCS Program as a consequence of such amendment.

3. GOVERNING LAW AND JURISDICTION

This Deed is governed by and interpreted in accordance with English law, and the English courts shall have exclusive jurisdiction to settle any dispute arising from or connected with this Deed including a dispute regarding the existence, validity or termination of this Deed or the consequences of its nullity.

4. SOVEREIGN IMMUNITY

To the extent that the Validation/Verification Body enjoys any right of immunity from set-off, suit, execution, attachment or other legal process with respect to its assets or its obligations under this Deed, the Validation/Verification Body waives all such rights to the fullest extent permitted by law.

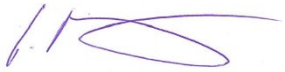
5. COUNTERPARTS

This Deed may be executed in any number of counterparts, each of which when executed and delivered is an original and all of which together evidence the same deed.

6. DELIVERY

This Deed is delivered on the date written at the start of the Deed.

EXECUTED by GHD Services, Inc. as a deed



_____ Signature of director

____Gordon Reusing_____ Name of director

_____ Signature of director/secretary

_____ Name of director/secretary