



**Verified Carbon
Standard**

GAS LEAKAGES WITHIN THE TITAS GAS DISTRIBUTION NETWORK IN BANGLADESH



Carbon
— CHECK —

Document Prepared By

Carbon Check (India) Private Ltd.

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Project title	Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh
Project ID	2930
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¹ Worked until 16/12/2024

Summary:

- **A description of the verification of the project**

Verification: Carbon Check (India) Private Ltd. (CC IPL) has been contracted by NE Climate A/S, the project proponent, on 27-June-2024 to carry out the verification of voluntary greenhouse gas emission reductions generated by the Project, “Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh”. The verification is based on the desk review of the Monitoring report /01/, VCS PD /B03/, supporting emission reduction calculation spread sheets /02/ and other relevant supporting documents made available to the verification team by the project proponent accompanied by remote interviews. This verification involves the period of 01-January-2023 to 31-December-2023 (including both days).

Project: The project is hosted by Titas Gas T & D Co. Ltd. (TGTDCL). The company’s headquarters are based in Dhaka, Bangladesh with the coordinates of 23.7000°N, 90.3833°E. The project leads to reductions in methane, a potent greenhouse gas (GHG). The project reduces gas leakages from components in the natural gas transmission and distribution system operated by Titas Gas T & D Co. Ltd. (TGTDCL) in Bangladesh. During the present monitoring period, the project has reported a total of 38,231 leaks within the project boundary. The present monitoring period is the third monitoring period with the duration from 01- January-2023 to 31-December-2023. During the third monitoring period, the project has achieved 4,111,740 tCO₂e GHG emission reduction.

- **The purpose and scope of verification**

Purpose: The purpose of the verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive, and presented in a concise and transparent manner. In particular, the monitoring plan, monitoring report, and the project’s compliance with relevant VCS, UNFCCC, and host party criteria are verified to confirm that the project has been implemented in accordance with the previously registered design and conservative assumptions, as documented.

Scope: The scope of the verification is:

- To verify the project implementation and operation with respect to the registered VCS PD /B03/.
- To verify the implemented monitoring plan with the registered VCS PD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate to be certified.

- **The monitoring period**

This is the 3rd monitoring period from 01- January-2023 to 31-December-2023 (including both days).

- **The method and criteria used for verification**

- (a) Desk review, involving:

- (i) Review of the data and information presented to verify their completeness.
- (ii) Review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.
- (iii) 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.

- (b) Remote assessment involving:

- (i) Assessment of the implementation and operation of the proposed VCS project activity as per the registered VCS PD
- (ii) Review of information flows for generating, aggregating, and reporting the monitoring parameters
- (iii) Interview with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan in the registered VCS PD
- (iv) A cross-check between information provided in the monitoring report and data from other sources such as inventories, purchase records, or similar data sources
- (v) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the VCS PD/03/ and the selected methodology
- (vi) Review of calculations and assumptions made in determining the GHG data and emission reductions
- (vii) 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.

According to §4.1.12 of the VCS Standard version 4.6: A site visit that includes a visit to facilities and/or project areas shall be conducted at verification under the following circumstances:

- 1) The first verification of the project after validation;
- 2) Verifications that include project baseline reassessments; and

- 3) Verifications that assess a project description deviation where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

For the subject project (VCS 2930), this is the 3rd periodic verification under VCS and the project baseline is same as validation, as well as there is no methodological or project description variation. Therefore, as per the above requirement, an on-site visit is not mandatory.

Furthermore, Indian citizens are advised against traveling to Bangladesh until further notice, as stated in the "Advisory for Bangladesh" issued by the Ministry of External Affairs, Government of India, on August 4, 2024.

Therefore, the verification team conducted the verification for this project remotely using alternative means as defined in the verification standard.

- **The number of findings raised during verification**

A risk-based approach has been followed to perform this verification. During the course of verification, a total of 10 findings were raised, which include:

05 Corrective Action Requests (CARs);

05 Clarification Requests (CLs);

00 Forward Action requests (FARs) was raised during validation.

All the raised findings are resolved by the PP.

- **Any uncertainties associated with the verification**

The MR /01/, emissions reduction calculations sheet/02/ along with the supporting documents provided are considered to be in line with the VCS requirements /B01/. The verification team has detected no further uncertainties or quality restriction.

- **Summary of the verification conclusion**

In CCIPL's opinion, the emission reductions reported for the "Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh" in the monitoring report (version 5, dated 03-June-2025) are fairly and correctly stated. CCIPL is therefore able to certify that the emission reductions from the project during the period 01-January-2023 to 31-December-2023 (including both days) are, 4,111,740 tCO₂e.

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1 INTRODUCTION

1.1 Objective

Carbon Check (India) Private Ltd. (CC IPL) has been contracted by NE Climate A/S, the Project Proponent (PP), on 27-June-2024 to undertake the verification of the project titled “Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh” for the monitoring period 01-January-2023 to 31-December-2023 (including both days). Through the verification activities, it is to be confirmed that:

- The project is implemented as described in the VCS Project Description document /B03/,
- The monitoring system is implemented and fully functional to generate emission reductions without any double counting, and
- The data reported are accurate, complete, consistent, transparent, and free of material error or omission by checking the monitoring records and the emissions reductions calculation.

The verification followed the requirements of the current version of the VCS Standard Version 4.3 /B01/ and VCS Program Guide version 4.4 /B01/ to ensure the quality and consistency of the verification work and the report.

1.2 Scope and Criteria

The verification of this project is based on the monitoring report of this monitoring period /01/, registered VCS PD /B03/, ex-post emission reduction calculation spreadsheet /02/, supporting documents made available to the verifier /03/-/26/ and information collected through performing remote interviews. Furthermore, publicly available information was considered as far as available and required.

CC IPL has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

The verification is carried out on basis of the following requirements, applicable for this project activity:

- VCS Program Guide (v4.4) /B01/
- VCS Standard (v4.3) /B01/
- VCS Program Definitions (v4.4) /B01/
- Registration & Issuance Process (v4.4) /B01/
- VCS Validation and Verification Manual (v3.2) /B01/
- CDM Methodology: AM0023, Version 04 /B02/
- Other relevant rules, including the host country legislation

The scope of this verification, by independent checking of objective evidence, is as follows:

- To verify that the project is implemented as described in the registered the VCS PD.
- To assess the project's compliance with other relevant rules including the host country legislation.
- To confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions without any double counting.
- To establish that the data reported are accurate, complete, consistent, transparent, and free of material error or omission by checking the monitoring records and the emissions reduction calculation.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.
- The verification shall ensure that the reported emission reductions are complete and accurate to be certified.

The method and criteria used for verification consisted of the following phases:

1. Completeness check and desk review;
2. Remote visit interviews with stakeholders;
3. Resolution of outstanding issues and issuance of final verification report and applicable VCS Validation and Verification Deeds of Representation.

CC IPL conducts all its work under strict rules to safeguard impartiality and ensure the independence of the verification team. The verification team does not provide any consulting or recommendations for the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

1.3 Level of Assurance

The verification report is based on the Monitoring report /01/, registered VCS PD /B03/, supporting documents /03/-/26/ made available to the verifier, and information collected through performing interviews.

The verification has been planned and organized to achieve a:

- ☒ Reasonable level of assurance as per VCS Standard (v4.3)
- ☐ Limited level of assurance

1.4 Summary Description of the Project

This is the third monitoring report under VCS for the project which employs the CDM methodology; AM0023, Version 04 /B02/. The project aims to reduce gas leakages from components found across the entire above ground gas distribution system found in the service and franchise areas operated by Titas gas distribution networks across Bangladesh. The project reduces the leaks in the transmission/distribution system caused by normal component wear, thermal and vibrational stresses, and seasonal expansion/contraction cycling from ambient air temperature changes. The project implements advanced leak detection and repair (LDAR) procedures to identify and implement various interventions to arrest leakage and thus reduce methane emissions through various sources including, thread connections of gas pipes, broken gaskets and other broken parts of ball/plug valves, broken membranes of pressure regulators and connectors, The project proponent for the project activity is NE Climate A/S, which owns the rights to VCU's /04/.

The total GHG emission reductions achieved from Project activity are 4,111,740 tCO₂e for this monitoring period 01- January-2023 to 31-December-2023 (including both days).

The project activity has been implemented as described in the VCS PD and the emission reductions are calculated conservatively as per the applied methodologies /B02/.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Key Milestones	Date
Kick off Meeting	20- September-2024
Desk Review	23-September-2024 to 27-October-2024
Remote Inspection	28-October-2024 to 29-October -2024
Opening Meeting	28-October -2024
Closing Meeting	29-October -2024
DVR Issuance	12-November-2024
Technical Review	05-December-2024

Final Submission	09-June-2025
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The verification consists of the following three phases:

1. Completeness check and desk review of the registered VCS PD, validation report, monitoring plan, monitoring report /01/, monitoring methodology, applicable tools in particular attention to the frequency of measurements, quality of metering equipment including calibration requirements, QA/QC procedures and other relevant documents.
2. Remote interviews (including follow-up interviews with project stakeholders, when deemed necessary). The remote interviews include the following:
 - An assignment of implementation and operation of project activity with respect to validated VCS PD.
 - Review of information flows for generating, aggregating, and reporting the monitoring parameters.
 - Interview with relevant personnel to determine whether the operational and data collection procedures are implemented and in accordance with the monitoring plan of the validated VCS PD,
 - Cross check of information and data provided in the monitoring report with purchase records or similar data sources.
 - Review of assumptions made in calculating the emission reductions (if any).
 - Implementation of QA/QC procedure in-line with the registered VCS PD and methodology requirements.
3. Resolution of outstanding issues and the issuance of the final verification report along with the VCS Verification Deed of Representation.

2.2 Document Review

During the document review, CCIPL has applied standard auditing techniques to assess the quality of information provided. The verification was performed primarily based on the review of the monitoring report and the supporting documentation. This process included:

- A review of the data and information presented to verify completeness and consistency in accordance with VCS standard version 4.3 requirements.

- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, quality of metering equipment including calibration requirements and QA/QC procedures.
- An evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The monitoring report (version 1, dated 12-September-2024)/01/ was initially reviewed and CCIPL requested the PP to present the supporting information and documents /03-/-26/. The documents were reviewed by CCIPL. Through the process of the verification, the revised monitoring report (version 5, dated 03-June-2025) /01/ and the supporting documents were evaluated to confirm the actions taken by the PP to resolve the CARs and CLs issued by the verification team.

The list of documents referred during this verification has been provided in Appendix – 2.1.

2.3 Interviews

A remote inspection to the project activity was undertaken from 28-October -2024 to 29-October-2024 to confirm the information as outlined in the table below and to resolve issues identified in the document review. The remote visit was conducted to assess the implementation and operation of the project activity and to review evidence, and interview key personnel to confirm evidence associated with the project design, implementation, plant operations, environmental impacts, stakeholders etc.

The key personnel interviewed, and the main topics of the interviews are summarized in the table below:

SL	Date	Name	Organisation	Topic	Interviewed by
1	28-October - 2024 and 29-October-2024	Kevin James	Director, Climate Compass LLC, USA	• Project Design • Roles and responsibility • Project Implementation	Manas Halder (Team Leader)
2	29-October-2024	Daragh Glynn	Head of Climate Change, NE Climate A/S, Denmark	• Project start date and Project Location • Methodology applicability • Baseline Scenario • Additionality	R V Nesari (Technical Expert)
3	28-October - 2024 and 29-October-2024	Volodymyr Potapenko	Director, MBS Ltd, Ukraine	• Qualification and Training • Monitoring and reporting documentation	Tarpan Ghosh (Trainee Assessor)

4	28-October - 2024 and 29-October-2024	Oleksandr Potapenko	Director, MBS Ltd., Ukraine	- Quality Assurance – Management and operating system - Social and Environmental Impacts - Local Stakeholders meeting process - Compliance with relevant laws	
5	28-October - 2024	Engr. Satyajit Ghosh	General Manager, Planning & Development Division, TGTDC	Pre project / baseline scenario, Additionality, Leak maintenance under safety and emergency situations	
6	28-October - 2024	Engr. Mohammad Sahadot Hossain	Deputy General Manager, Pipe Line Design Department, TGTDC	Pre project / baseline scenario, Additionality, Leak maintenance under safety and emergency situations, Project implementation and operation	
7	28-October - 2024	Engr. Masud Rana	Manager, CDM Cell, TGTDC	Pre project / baseline scenario, Additionality, Leak maintenance under safety and emergency situations	
8	28-October - 2024	Engr. Md. Mominul Islam	Deputy Manager, CDM Cell, TGTDC	Pre project / baseline scenario, Additionality, Leak maintenance under safety and emergency situations	
9	28-October - 2024	Engr. Md. Akharuzzaman	Deputy Manager, CDM Cell, TGTDC	Pre project / baseline scenario, Additionality, Leak maintenance under safety and emergency situations	
10	28-October - 2024	Asma Huque	Managing Director, PSL	Project implementation and operation	
11	28-October - 2024 and 29-October-2024	Engr. Shah Ashequr Rahman	Project Manager, PSL	Project implementation and operation	
12	28-October - 2024 and 29-October-2024	Tanvir Ahmed	Deputy Project Manager, PSL	Project implementation and operation	

13	28-October - 2024 and 29-October-2024	Tuhin Shuvra Ghosh	Database Manager, PSL	Project implementation and operation	
14	28-October - 2024 and 29-October-2024	Asadujjaman Akash	Operating Manager, PSL	Project implementation and operation	
15	28-October - 2024 and 29-October-2024	Golam Mourtuza	Operating Manager, PSL	Project implementation and operation	
16	28-October - 2024 and 29-October-2024	Tofazzel Hossain	Operating Manager, PSL	Project implementation and operation	
17	28-October - 2024 and 29-October-2024	Masud Parvez	Operating Manager, PSL	Project implementation and operation	
18	28-October - 2024 and 29-October-2024	Md. Rafik Sikdar	Technician/Repairman, PSL	Project implementation and operation	
19	28-October - 2024 and 29-October-2024	Md. Shohidul Islam	Technician/Repairman, PSL	Project implementation and operation	
20	28-October - 2024 and 29-October-2024	Md. Arifur Rahman	Technician/Repairman, PSL	Project implementation and operation	

The verification team has carried out remote interviews to assess the information included in the monitoring report and monitoring measurement procedures adopted during the monitoring period. During the desk review, the relevant monitoring records were checked.

Through the review of validation reports, comparing the relevant evidence, and interviewing with the PP's representatives through remote interviews, CCIPL has confirmed that the project is implemented in line with the registered VCS PD /B03/ during the monitoring period. There is no change in the project design, operation and monitoring plan.

2.4 Site Visits

CC IPL has conducted a remote inspection (from 28-October-2024 to 29-October-2024) to confirm all physical features of the project activity proposed in the registered PD/B03/ are in place and that the project proponent has operated and correctly monitored all parameters of the project activity as per the registered VCS PD during this monitoring period. A reasonable level of assurance has been maintained for verification as follows:

- 1) An assessment of the implementation and operation of the project activity as per the registered VCS PD
- 2) A review of information aggregating and reporting of the monitoring parameters
- 3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the MP.
- 4) A cross-check between product sales information provided in the MR and data from other sources.
- 5) A check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the registered PD /B03/ and the applied monitoring methodologies
- 6) A review of calculations and assumptions made in determining the GHG data and ERs, and
- 7) An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.

The total number of leaks identified, repaired, and then re-surveyed within the monitoring period was cross-checked by the verification team with the ER calculation spreadsheets /02/ and can be confirmed to be correct.

The verification team took note of paragraphs 26 and 27 of the CDM Sampling Standard, version 09 which states the following:

Paragraph 26: The DOE may apply a sampling approach for on-site visits and/or remote surveys as part of validation/verification, applying the “Guideline: Sampling and surveys for CDM project activities and programme of activities”, irrespective of whether the above-mentioned sampling plan exists or the project participants or the coordinating/managing entity have undertaken sampling surveys.

Paragraph 27: When the project participants or the coordinating/managing entity have not applied a sampling approach, the DOE may apply a sampling approach, choosing a different confidence/precision than the ones indicated in paragraph 11 above, provided that samples are randomly selected and are representative of the population.

As it is not possible to individually verify all the reported leaks, the verification team applied a sampling approach for the remote assessment/inspection. The verification team then randomly selected 50 sample points (samples size calculated is 25) for the remote inspection. The detailed method/steps applied to randomly select the sample points out of the total leaks are provided below:

The verification team used an online Raosoft calculator to derive an appropriate initial number of samples for a remote visit. The verification team has applied a 90/10 confidence/precision (assuming response distribution as 90%) and the sample size calculated is 25 and the same is conveyed to the PP in the verification audit plan. The verification team had also indicated in the verification audit plan, that during the remote inspection if a discrepancy is identified in the selected samples, the verification team shall increase its sample size (applying the materiality concept in line with CDM VVS for project activities, version 03.0).

During the assessment of sample points, as applicable, the verification team has conducted a remote inspection and also a plausibility check of information provided in:

- (i) Hard copy protocols
- (ii) Data tags fixed on-site at every surveyed leak,
- (iii) Leak report files,
- (iv) ER calculation spreadsheets and HFS Data Log Files.

Identification of risks, their level and assessment

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the potential risk		Assessment of the records/information/interview with personnel to check controls/ mitigation measures
		Risk level	Justification	
1.	Human Error: Recording and reporting of the information in the ER spreadsheet.	Medium	All the ER spreadsheet data. This includes all the parameters to be monitored ex-post as per the PD	The risk was mitigated by reviewing the training of the personnel involved in the data capture, calculation and by following the monitoring responsibilities. The training records will be reviewed which will also be confirmed during the off-site visit interviews.

2.	Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security	Medium	The date is recorded in the spreadsheets based on the raw data collected during the field visits. The access to the spreadsheets for calculation of ERs, monitoring database	The identified risk was mitigated by reviewing the management of access to the records. It will be confirmed through interviews whether the raw data is collected by the field personnel and then transmitted and stored electronically to the PP's office. The data quality control to be checked
3.	Accuracy of the measuring equipment	Low	Check the calibration records for the measurement equipment used for efficiency test	The risk due to accuracy of the measuring equipment was ensured by planning to check calibration certificates of the measuring equipment

All information of the selected sample points verified was consistent and plausible and thus no further samples were conducted by the verification team and the records of all the repaired leaks were acceptable to the verification team. The verification team carried out remote interviews with representatives of PP to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable to the VCS.

2.5 Resolution of Findings

CC IPL, during this verification, identified issues related to the monitoring, implementation, or operation of the VCS project that could impair the capacity of the proposed VCS project to achieve project emission reductions or influence the reporting of emission reductions. CC IPL has identified and discussed these issues within the Verification report in Appendix 4.

- Clarification requests (CLs): Project reporting lacks transparency and further information is needed to determine if a material discrepancy is present.
- Corrective action requests (CARs): The VVB has identified a material discrepancy or non-conformance that the project proponent must address.

The verification team identified 05 CARs and 05 CLs. All CARs and CLs raised by CC IPL during this verification have been resolved by the PP.

2.5.1 Forward Action Requests

Forward Action Request (FAR) is to be raised when the monitoring and reporting require attention and/or adjustment for the next verification period. FARs do not relate to VCS requirements for issuance of ERs achieved during subject monitoring.

No FAR was raised either during CDM validation or previous verifications. CCIPL has not raised any FAR during this verification.

2.6 Eligibility for Validation Activities

The project activity falls under sectoral scope 10: Fugitive emissions from fuels (solid, oil and gas). CCIPL is accredited for validation /verification of project activities under this scope.

3 VALIDATION FINDINGS

3.1 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.2 Project Description Deviations

There is no project description deviation identified during the current monitoring period.

3.3 New Project Activity Instances in Grouped Projects

This is not a group project; hence this section is not applicable.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

4 VERIFICATION FINDINGS

4.1 Project Details

Item	Evidence gathering activities, evidence checked, and assessment conclusion:				
Audit history	Audit Type	Period	Program	VVB Name	Number of Years
	Validation	12-December-2022 (date of Registration)	VCS	CC IPL	10 Years
	Verification	01-January-2021 – 31-December-2021 (Including both days)	VCS	CC IPL	1 Year
	Verification	01-January-2022 – 31-December-2022	VCS	KBS	1 Year
	Verification	01-January-2023 – 31-December-2023	VCS	CC IPL	1 Year

Double counting and participation under other GHG programs

- The monitoring system is implemented and fully functional to generate emission reductions without any double counting. A project is not receiving or seeking credit for reductions and removals from a project activity under another GHG program.

The verification team by means of document review and remote interviews confirms that GHG emission reduction or removals are not in a supply chain as the producer or retailer of the impacted goods or services are not involved in the project in conformance with §3.21 of VCS Standard version 4.3 /B01/.

- The project is not registered or seeking registration under any other GHG programs.
- The project has not been rejected by another GHG program
- It should be noted that the project is registered under the United Nations Clean Development Mechanism (CDM) Program with the registration number 10077.
- The repairs of leaky components implemented through this project that form the project boundary are demonstrably unique in their location through GPS coordinates, street address, visual markings, engineering schematics, component type, etc. and not included in any of the above-mentioned projects. The PP has kept a full set of data maintained in the database that shows all the relevant information for each of the leaks including the exact location of the leak by photo and engineering schematic, types and quantity of repair materials used, and the person responsible for the repair, etc. The VVB has visited in the field remotely during verification some gas pressure regulation equipment included in the project boundary and confirms that they are spatially distinct in their location to be uniquely identified through address and GPS. The verification team verified the project boundary, implementation status and all relevant information on the repair of the detected physical leak via physical inspection of 50 randomly selected sample leaks and full database check of 100 randomly selected leaks during remote visit /15/.

No double claiming with emissions trading programs or binding emission limits	The project emission reductions and removals are not included in any emissions trading program or binding emission limit. The verification team by means of document review and remote interviews confirms the same in conformance with §3.24.3 of VCS Standard version 4.3 /B01/.
No double claiming with other forms of environmental credit	The project activity has not sought, received, or is not planning to receive credit from another GHG-related environmental credit system. The verification team by means of document review and remote interviews confirms the same in conformance with §3.24.1 of VCS Standard version 4.3 /B01/.
Supply chain (scope 3) emissions double claiming	The GHG emission reduction or removals are not in a supply chain as the producer or retailer of the impacted goods or services are not involved in the project. Therefore, the verification team by means of document review and remote interviews confirms there will be no scope 3 emission double claiming for this project activity in conformance with §3.24.7 of VCS Standard version 4.3 /B01/.
Sustainable development contributions	The project has implemented the activities that result in the SD contributions described in section 1.12 of the monitoring report. Please refer to Appendix 6 below for a detailed assessment on the sustainable development contribution achieved during this monitoring period and over the project lifetime.
Additional information relevant to the project	No commercially sensitive information that has been excluded from the public versions of project documents conforms with the VCS Program.

4.2 Safeguards and Stakeholder Engagement

4.2.1 Stakeholder Identification

Stakeholder Identification	Not Applicable as the stakeholders have not changed since validation.
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Legal or customary tenure/access rights	The gas equipment is wholly owned by the gas company. It is deemed acceptable to VVB by means of desk review and interview during remote visit.
Stakeholder diversity and changes over time	A large portion of the population is connected to the gas grid involving customers of all social, economic and cultural groups. It is deemed acceptable to VVB by means of desk review interview during remote visit.
Expected changes in well-being	The stakeholder characteristics were not expected to change in the baseline case.
Location of stakeholders	The location of stakeholders has not changed as gas system is static in relation to the customer base and no new sections of pipeline will be included in the project.
Location of resources	The gas equipment is wholly owned by the gas company and access to the system has not changed.

4.2.2 Stakeholder Consultation and Ongoing Communication

No stakeholder consultation was carried out during this monitoring period. However, section 2.2 of the registered PD /B03/ and section 3.2.2 of corresponding validation report contains local stakeholder consultation performed and its endorsement during baseline surveys.

Ongoing consultation	To undertake the baseline and monitoring activity, the teams attempt to visit every piece of above ground gas equipment included in the database return at least one time in each monitoring period. In the process of conducting the monitoring, they regularly meet the customers and neighbours near the gas equipment and explain that they are repairing and maintaining leaks. The local customers are the people most directly impacted by the work and also benefit directly from the improved service and eliminated odor and local air pollution elimination. The teams receive regular feedback from customers. In addition, the gas company maintains a customer service line and any issues that arise would be passed to the teams as needed. The PP also holds regular
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	consultations with the gas distribution company management and key government officials. The feedback from all these sources can be summed up as “please find and repair more leaks and faster”.
Date(s) of stakeholder consultation	01-January-2023 to 31-December-2023- Ongoing communication with customers in person and ongoing reporting of results to Titas Gas.
Communication of monitored results	No comment has been received during this monitoring period. Titas Gas gets regular updates of activities and transmits the results through regular reporting to relevant government agencies. Customers who are present during the monitoring are notified in real-time of the results and any questions are answered by the teams at the time.
Consultation records	Internal government reports.
Stakeholder input	The input PP has received from all the stakeholder is that the gas leak reductions are welcome.

4.2.3 Free, Prior, and Informed Consent

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Consent	Not Applicable- The gas equipment is wholly owned by the gas company. Fixing leaks in no way disrupts IP, LCs, and customary rights holders as the system already exists and repairs are made only to the existing system
Outcome of FPIC discussion	Not Applicable- The Gas Distribution Company owns the gas distribution system. There is general agreement that repairing leaks is beneficial to the local population.

4.2.4 Grievance Redress Procedure

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Grievance received and steps taken to resolve the grievance including the outcomes of the resolution	No grievance registered by any stakeholders during the current monitoring period. The same is verified by verification team through the letter provided by the gas company confirming that no leaks scheduled for replacement or emergency repair were included in the emission reduction calculation spreadsheet and emergency logbook /16/.
Grievance redress procedure	If any issue raised, the customer could ask the workers in the field directly for clarification. If the response they received was not satisfactory, they could communicate any issues with the local gas company directly or to government officials. At the stakeholders meeting, the attendees were provided with direct contact information of the project managers and invited to communicate any issues at any time. Same has been checked during remote by the verification team. This procedure is deemed sufficient and acceptable to the VVB.

4.2.5 Public Comments

Comments received	Actions taken by the project proponent	Evidence gathering activities, evidence checked, and assessment conclusion
At the stakeholder meeting on 18-November-2013 the PP received the following comments.		
There is not much potential in the CGS/TBS. Gas leakages are mostly in the branch lines	We have looked for leakage everywhere on the gas distributions system and found most of the leakage on the branch lines and focused most of our ongoing attention there.	PP has always looked for leakage in the distribution system and focused on repairing the leakages. VVB confirmed the same means of the remote interview.

How much money is generated by the CDM project and who will receive the money	The sales of carbon credits from the project dictate the amount of money the project generates. The PP has worked with Titas and the investor group to ensure the correct split of the revenue.	PP has confirmed the sales of the carbon credits from the project dictate the amount of money the project generates with the confirmation from Titas. VVB confirmed the same means of the remote interview.
What will the project cost Titas?	Titas has provided some in-kind support in getting data and providing input into the project but does not pay any implementation costs.	Titas has provided constant support to provide input into the project, without paying any implementation costs. VVB confirmed the same means of the remote interview.
How will the leaks be measured and the calculations be made? What type of equipment will be used to detect leaks?	We are using Gasurveyor-500s to detect the leaks and Hi-Flow samplers to measure the leaks. We have imported advanced repair materials from around the world to effectively repair leaks that we find in the project.	PP is using Gasurveyor-500s to detect the leaks and Hi-Flow samplers to measure the leaks. They are also using advanced repair materials for repairing leaks that they had found in the project boundary. VVB confirmed the same means of the remote interview.
Will the project be dealing with leakages only?	The project is focused on reducing leakages.	PP confirmed that the project is focused on reducing leakages only.

Have you done a baseline survey? What amount of GHG emissions will be reduced?	Over 416,541 liters per minute of leaks were found and repaired eliminating possible dangerous and harmful local emissions. This has prevented the release of over 23,295,273 tonnes of carbon dioxide equivalent methane into the atmosphere since the project began.	PP found over 416,541 liters per minute of leaks and repaired those. This repair has prevented the release of over 23,295,273 tonnes of carbon dioxide equivalent methane into the atmosphere since the project began. VVB confirmed the same means of the desk review and remote interview.
Underground pipeline leakage is also important and should be addressed	The methodology does not allow for underground leakages to be included in the project.	The applied methodology, AM0023 does not allow repair of leaks for underground pipeline.
How will the project be implemented?	Climate Compass and its partner MBS have about 20 years of experience implementing these types of projects and they are working with local partner PSL to implement the project.	Climate Compass and its partner MBS have about 20 years of experience implementing these types of projects and they are working with local partner PSL to implement the project. VVB confirms the same by means of the desk review.
Which equipment / spare part will be used for repairs?	More than 38,000 leaks have already been repaired using advanced repair materials such as Tangit thread, O-rings, Paste, Valves, Membrane material sheets, and Teflon tape, Fittings and pieces of pipes with gas threads and Insulating Joints.	PP has already repaired 38,000 leaks by using advanced repair materials such as Tangit thread, O-rings, Paste, Valves, Membrane material sheets, and Teflon tape, Fittings and pieces of pipes with gas threads and Insulating Joints. VVB confirmed the same means of the remote interview.

4.2.6 Risks to Local Stakeholders and the Environment

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Risks to stakeholder participation	No risks identified in the project related to stakeholder participation. There were no risks to stakeholders encouraging our teams to find and fix leaks.
Working conditions	Working with natural gas and natural gas systems has risks if workers are not properly trained and equipped with needed safety gear. Only staff deemed qualified as confirmed by TGTDC/PSL were invited to apply for a position in the project. Those workers chosen were given appropriate safety gear and training.
Safety of women and girls	No risks identified in the project related to safety of women and girls. No unique dangers were posed to woman and girls from fixing leaks
Safety of minority and marginalized groups, including children	No risks identified in the project related to safety of minority and marginalized groups, including children. No unique dangers were posed to woman and girls from fixing leaks
Pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials)	No risks identified in the project related to pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials) generated due to operation of project. Fixing leaks does not lead to any pollutants and instead eliminates the emission of natural gas.

4.2.7 Respect for Human Rights and Equity

4.2.7.1 Labor and Work

Item	Evidence gathering activities, evidence checked, and assessment conclusion
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Discrimination and sexual harassment	VVB confirmed there is no discrimination or sexual harassment were received during the monitoring period in project location by means of remote inspection interview .
Management experience	The implementing company, PSL, is a woman owned enterprise and the Project Head is a woman- Asma Huque. VVB confirms that by means of interview during remote interview.
Gender equity in labor and work	The key senior manager in the project is a woman. The pay scale is based on position and years of experience and has no relation to gender. VVB confirms the same by means of remote inspection interview.
Human trafficking, forced labor, and child labor	Each worker is a certified and trained expert in gas systems that sought out the employment opportunity and can leave the project at any time. No children are employed in the project. VVB confirms by means of remote inspection interview.

4.2.7.2 Human Rights

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Human rights	The project which finds and repairs leaks in an existing gas distribution system has no direct impact on rights of IPs, LCs, or customary rights holders. The project has tried to fix leaks in all areas of the country to everyone's benefit. VVB confirms the same by means of remote inspection interview.

4.2.7.3 Indigenous Peoples and Cultural Heritage

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Preservation and protection of cultural heritage	The project continues to preserve and protect cultural heritage as part of project activities. The project is designed to ensure all workers are able to celebrate critical cultural and religious events in order to help maintain and preserve their connection to their cultural heritage. VVB confirms that the cultural heritage

	has been preserved and protected in the project boundary by means of remote inspection interview.
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4.2.7.4 Property Rights

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Disputes over rights to territories and resources	N/A
Respect for property rights	N/A The project repairs leaks in equipment wholly owned by the gas distribution company.

4.2.7.5 Benefit Sharing

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Summary of the benefit sharing plan	There is no impact on property rights from this project.
Benefit sharing during the monitoring period	There are no adversely affected local stakeholders. Everyone benefits from reduced gas leaks. VVB has confirmed during the remote visit inspection and deemed acceptable.

4.2.8 Ecosystem Health

Item	Evidence gathering activities, evidence checked, and assessment conclusion
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Impacts on biodiversity and ecosystems	Reducing gas leaks on an existing gas distribution system has only a beneficial impact on ecosystems. Therefore, VVB confirms that there is no impact on biodiversity and ecosystems by the project activity by means of remote inspection and interview.
Soil degradation and soil erosion	Reducing gas leaks on an existing gas distribution system has only a beneficial impact on ecosystems. Therefore, VVB confirms that the project activity does not cause soil degradation or soil erosion by means of remote inspection and interview.
Water consumption and stress	Reducing gas leaks on an existing gas distribution system has only a beneficial impact on ecosystems. Therefore, VVB confirms that there is no impact on water consumption and stress by the project activity by means of remote inspection and interview.
Usage of fertilizers	Reducing gas leaks on an existing gas distribution system has only a beneficial impact on ecosystems. Therefore, VVB confirms that the project activity does not involve usage of fertilizers by means of remote inspection and interview.

4.2.8.1 Rare, Threatened, and Endangered species

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Species or habitat	The project does not intrude on the habitat of species. VVB confirms the same by means of remote inspection and interview.

4.2.8.2 Introduction of Species

Not Applicable as this is a project with no planting or species introduction

Species introduced	Evidence gathering activities, evidence checked, and assessment conclusion
N/A	N/A
Existing invasive species	Evidence gathering activities, evidence checked, and assessment conclusion

N/A

N/A

4.2.8.3 Ecosystem conversion

Item	Evidence gathering activities and evidence checked
Ecosystem conversion	Not applicable as the project does not affect existing ecosystems.

4.3 Accuracy of Reduction and Removal Calculations

The equations and choices provided in the methodology and all other methodological tools are correctly quoted in the MR /01/. The verification team checked the Emission Reduction calculation sheet /02/ and confirms that the equations used have been correctly applied and as per the selected methodology AM0023, version 04, “Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities”/B02/. The verification team has reviewed the emission reduction spreadsheets (ER sheets) and checked all the formulae and found they are correct and are in accordance with the monitoring plan of the registered PD and the applied monitoring methodology.

Baseline emissions:

The fundamental calculation of baseline ERs for every leak as per the methodology is as follows:

The baseline leak flow rate (F_{CH_4}) is measured using a HiFlow Sampler or Leak Measurement Device (LMD) and converted from litres of CH_4 /minute to $m^3 CH_4$ /h (ConvFactor) for each leak included in the baseline (j). Any reappeared leakage found during the subsequent monitoring is measured using the HiFlow Sampler or LMD in the same way and subtracted from the initial measurement. The calculated uncertainty (UR) of the measurement using the guidelines in the methodology is deducted from this leak rate to ensure a conservative result. This conservative leak rate value for each leak during the monitoring period is then multiplied by the hours of operation (t) of the same leak between the baseline measurement and the monitoring measurement taking into account any temporary shutoffs of the equipment. Finally, the number of tonnes of CO₂e emission reductions generated in the monitoring period by each leak is calculated using the GWP of methane. The values for all the leaks monitored are then added together to get the ER amount. The calculations are found in more detail in the ER calculation spreadsheet provided. The formulas that the baseline calculations are based on are as follows:

The formulas that the baseline calculations are based on are as follows:

$$BE_y = \min \left\{ BE_1, ConvFactor \times \sum_j \left[F_{CH_4,j} \times T_{j,y} \times (1 - UR_j) \right] \times GWP_{CH_4} \right\}$$

With,

$$BE_1 = ConvFactor \times \sum_j [F_{CH_4,j} \times T_{j,y=1} \times (1 - UR_j)] \times GWP_{CH_4}$$

Where:

BE_1	=	Baseline emissions for the first crediting year of the crediting period (tCO ₂ e).
BE_y	=	Baseline emissions for crediting year y (tCO ₂ e)
ConvFactor	=	Conversion factor to convert Nm ³ CH ₄ into tCH ₄ . The Hi-Flow sampler automatically accounts for standard temperature and pressure in data readings; as such this factor amounts to 0.0007168tCH ₄ /Nm ³ CH ₄ (i.e., 0 degree Celsius and 101.3 kPa).
j	=	All physical leaks that are included in the project activity for which physical leaks were detected and repaired and which would leak in the baseline scenario during the crediting year y.
$F_{CH_4,j}$	=	Measured flow rate of methane for the physical leak j from the leaking component (Nm ³ CH ₄ /h)
UR_j	=	Uncertainty range for the flow rate measurement method applied to physical leak j . The uncertainty of the measurement is taken into account by using the flow rate at the lower end of the uncertainty range for the measurement at a 95% confidence interval for baseline emissions from leaks
$T_{j,y}$	=	The time the relevant component, in which physical leak j occurred, would leak in the baseline scenario and would be eligible for crediting during the crediting year y (hours)
GWP_{CH_4}	=	The global warming potential for methane valid for the commitment period (tCO ₂ e/tCH ₄). After the commitment period, this value may be revised based on any decision by the CMP.

Uncertainty is calculated using the following formula:

$$UR_j = \frac{\sqrt{(UR_1 * x_1)^2 + (UR_2 * x_2)^2 + \dots + (UR_n * x_n)^2}}{x_1 + x_2 + \dots + x_n}$$

Where:

UR_j = the percentage uncertainty in the sum of the quantities (half the 95% confidence interval divided by the total (i.e. mean) and expressed as a percentage);

x_n and UR_n = the uncertain quantities and the percentage uncertainties associated with them, respectively.

(Note: “n” in this case refers to each recorded leak rate of each component surveyed)

Project emissions:

It is assumed that the leak resumed on the day when the leak was last checked and confirmed not to leak and that it continued to leak for the entire time since that date. Any new leaks or leaks that reappear are immediately repaired. For this reason and the fact that finding and repairing gas leaks does not create emissions, PP assumed that there are no project emissions and has not calculated it.

Leakage emissions:

As per the applied methodology AM0023, version 04 /B02/ no leakage effects are accounted for. Thus, there will be no leakage emissions from the project activity.

According to the applied methodology, the emission reductions are calculated as:

$$ER_y = 4,111,740 \text{ tCO}_2\text{e}$$

The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence, and calculations are done in accordance with the pre-defined formulae from registered PD /B03/. As the measuring instruments directly read out the amount of methane leakage rate per unit time, the “sample gas methane concentration” and “ambient air methane concentration” parameters are rendered redundant in the calculation of ER. The total number of emission reductions achieved during the monitoring period is 4,111,740 tCO₂e.

Emission reductions have been calculated in accordance with the applied methodology AM0023, version 04 /B02/, registered VCS PD /B03/. The PP has used monitored data and ex-ante fixed data including default values as mandated/permitted by the applied methodology. The values used for the calculation of GHG emission reductions have been thoroughly checked by the verification team and were found appropriate and correct.

Parameters determined ex-ante:

Parameter	Unit	Value	Assessment
GWP _{CH4}	tCO ₂ e/ tCH ₄	28	Fixed ex-ante in the PDD from the 5th Assessment Report of the IPCC.

ConvFactor	tCH ₄ / Nm ³ CH ₄	0.0007168	The value of the parameter is fixed ex-ante in the PDD. As per the methodology, the leak flow rate (F_{CH₄,j}) and conversion factor (ConvFactor) should be reduced to the same reference conditions. The verification team has checked that the Hi-Flow Samplers automatically account for standard temperature and pressure (i.e., 0 degree Celsius and 101.3 kPa) in its leak flow rate measurements.
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The spreadsheet submitted by the PP clearly and transparently mentions values of the data parameters used for calculation of emission reductions. The input values have been verified from reliable and authentic sources including monitoring records, Monitoring Report /01/, and applied methodology /B02/. The emission reductions calculated were compared with the emission reduction spread sheet /02/ and found to be correct.

The details of monitoring parameters used for calculation of emission reductions are provided below:

Parameters monitored ex-post:

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (As in monitoring plan of VCS PD):	The time the relevant component, in which physical leak j, occurred, would leak in the baseline scenario and would be eligible for crediting during the crediting year y (hours) (T _{j,y})
Measuring frequency/Time Interval:	The measuring is ongoing throughout the monitoring period and the final value calculated at the end of the monitoring period.
Reporting frequency:	The measuring is ongoing throughout the monitoring period.
Reported value:	Multiple Values for each leak 'j' (Please refer to the ER Calculation spread sheets for each leak including shut offs where applicable) /02/
Is measuring and reporting frequency in accordance with the monitoring plan and	Yes

monitoring methodology? (Yes / No)	
Details of monitoring equipment:	This is a calculated parameter. Not applicable
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA.
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross- checked with other available data?	The reported data on the hours of operation, during which each leak is venting gas was verified by examination of the formula for the calculation of hours between each corresponding date of leak flow measurement in ER calculation spreadsheet /02/. It can be confirmed that the final calculation of hours of operation, during which each leak is venting gas was done in the correct manner in line with procedures defined in PD, and the hours of shut offs where the leaks ceased to operate were appropriately subtracted from the total amount of hours of operation. During the desk review of the leak reports and remote surveys for the sampled leaks, the verification team has come to the conclusion that all the leak repairs were made with advanced repair material, as specified in PD. It can be confirmed that there have been no hours of operation calculated for the equipment replaced for a non-leak related reason (i.e., when it breaks down), or when replacement of the equipment is made.

How were the values in the monitoring report verified?	The values were verified with the ER spreadsheets. The recording of hours has been verified from the complete data for each leak j, in the baseline scenario and also from the shutdown records.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures the correct transfer of data and reporting of emission reductions, and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the WB	
Data / Parameter: (as in monitoring plan of VCS PD):	Temperature and pressure of natural gas (°C and bar)	
Measuring frequency/Time Interval:	As and when a leak is measured using HFS	
Reporting frequency:	Done with each leak measurement.	
Reported value:	The Hi-Flow™ Sampler automatically adjusts readings to standard temperature and pressure (0°C and 101.3 kPa) and is integrated into the results from the Hi-Flow sampler device /19/. The verification team confirms that the values are automatically corrected in accordance with the HFS manual. This is in line with the monitoring plan in PD /B03/ and monitoring methodology /B02/.	
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes	
Details of monitoring equipment:	Instrument Name	Hi-Flow Sampler

	Manufacturer	Heath Consultants
	Serial Numbers	16020932,16020933,16020936
	Accuracy Class	+/-10%
Is the accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes	
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Every 30 days while in use	
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes	
Company performing the calibration(internal or external calibration):	Calibration of the HFS was done internally by the trained personnel by MBS /18/ /23/. The competence of the calibrating persons could be confirmed during the remote interviews by the verification team including a live demonstration of the same.	
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	
Is (are) calibration(s) valid for the whole reporting period?	Yes	
If applicable, has the reported data been cross- checked with other available data?	-	
How were the values in the monitoring report verified?	-	
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	-	

In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA
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Monitoring Parameter Requirement	Assessment/ Observation by the VCB
Data / Parameter:(as in monitoring plan of VCS PD):	The uncertainty range for the measurement method applied to leak j (UR _j)
Measuring frequency/Time Interval:	As and when a leak is measured using HFS
Reporting frequency:	Measurements are taken regularly with the Uncertainty calculated from all the measurements
Reported value:	0.000753911
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The UR _j is calculated using leakage flow rates and the respective UR of the Hi-Flow sampler used for the leak. Leaks are measured using the Hi-Flow samplers. The readings as per the operator's manual are $\pm 10\%$ accurate /17/. Having applied uncertainty values of 10% for each individual HFC measurement undertaken (as given as "accuracy of calculated leak rate" in the HFS manual /17/), a total uncertainty of 0.00075592 had been calculated correctly by the PP based on 2000 IPCC Good Practice Guidance. The calculation procedure is given as separate sheets attached to the VCU calculation spreadsheets /02/ which have been checked and found to be correct by the verification team.
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards /	Every 30 days while in use

manufacturers specification	
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes
Company performing the calibration(internal or external calibration):	Calibration of the HFS was done internally by the trained personnel of PSL by MBS /18/ /23/. The competence of the calibrating persons could be confirmed during the remote interviews by the verification team including a live demonstration of the same.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes
If applicable, has the reported data been cross- checked with other available data?	The reported data was verified by examination of the formula for the calculation in ER calculation spreadsheet /02/.
How were the values in the monitoring report verified?	The uncertainty data is calculated using leakage flow rates and the respective UR of the Hi-Flow sampler used for the leak. The uncertainty calculations are included in the VCU calculations spreadsheet and the same has been checked by the audit team for all the leaks.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the WB
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Data / Parameter: (as in monitoring plan of VCS PD):	The leak flow rate of methane for leak (j, z) from the leaking component ($F_{CH_4,j}$ / $F_{CH_4,z}$)	
Measuring frequency/Time Interval:	As per the applied methodology and the registered PD, it is to be monitored annually. This monitoring period is of one year, and this parameter has been measured once during the monitoring period.	
Reporting frequency:		
Reported value:	See ER calculation sheet for the values of each j and z.	
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes	
Details of monitoring equipment:	Instrument Name	Hi-Flow Sampler
	Manufacturer	Heath Consultants
	Serial Numbers	16020932,16020933,16020936
	Accuracy Class	+/-10%
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	Yes	
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Every 30 days while in use	
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	Yes	
Company performing the calibration(internal or external calibration):	Calibration of the HFS was done internally by the trained personnel by MBS. The competence of the calibrating persons could be confirmed during the remote interviews by the verification team including a live demonstration of the same.	

Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes
If applicable, has the reported data been cross- checked with other available data?	Yes, the value of the parameter has been cross-checked with the Hi-Flow sampler readings records for the baseline study period and also during the monitoring
How were the values in the monitoring report verified?	The values were verified with the raw data sheet and calculations in the ER spreadsheets. Measurements with Hi-Flow™ Sampler are automatically adjusted to the methane content, temperature, and pressure and, thus, will directly yield methane leak flow rates. The audit team has verified the leak flow rate of methane for leaks j and z from the complete data for the leaks.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures the correct transfer of data and reporting of emission reductions, and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VCB
Data / Parameter: (as in monitoring plan of VCS PD):	Capped quantity of the baseline emissions, defined as the expected baseline emissions for the first full year of the crediting period (BE_{cap})
Measuring frequency/Time Interval:	Monitored baseline emissions during the first year of the first crediting period
Reporting frequency:	Once during baseline and calculated. Calculated after the baseline leak detection and repair period is completed
Reported value:	4,315,391
Is measuring and reporting frequency in	Yes

accordance with the monitoring plan and monitoring methodology? (Yes / No)	
Details of monitoring equipment:	NA
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practice?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practice?	NA
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross- checked with other available data?	NA
How were the values in the monitoring report verified?	The values were verified in the ER spreadsheets /02/

The verification team has checked and confirmed the calculations in the spreadsheet and found them to be accurate. The monitoring report is supported by the emission reduction spreadsheet. The consistency and formula were verified and found to be accurate.

Also, it is noted that any new leaks or leaks that reappear are immediately repaired. For this reason and the fact that finding and repairing gas leaks does not create emissions, PP assumed that there are no project emissions and has not calculated it, which is deemed reasonable and acceptable, since a search of all the reappeared leaks in the database shows that leak repairs

were done immediately to all reappeared leaks in the database, and all additional leaks found on the same component after the completion of the baseline period are also repaired on the same day they were identified.

4.4 Quality of Evidence to Determine Reductions and Removals

When verifying the report emission reduction, CCIPL ensured that there was a clear audit trail that contained the evidence and records that validate the stated figures. All source documents that form the basis for assumptions and other information underlying the GHG data are shown above.

When assessing the audit trails, CCIPL also examined:

1. Whether sufficient evidence was available, both in terms of frequency and in covering the full monitoring period
2. The source and nature of the evidence
3. If comparable information was available from sources other than that used in the monitoring report, CCIPL cross-checked the monitoring report against the other sources to confirm that the stated figures were correct. The sources and the data referenced are shown in Appendix 2 below.

The verification team confirms that all the monitoring equipment has been provided to adhere to the monitoring requirement as specified in the project activity as per the registered monitoring plan.

All Hi-Flow Samplers and Gasurveyors are calibrated to ensure accuracy in their measurements. The calibration is done as per the manufacturer's recommended calibration procedures within at least 30 days and 12 months prior to the measurements with HFS and GS respectively by certified and trained staff on the calibration procedure /18/ /23/ in line with the PD and applied methodology. The verification team confirms that HFS and GS used for monitoring leaks were duly calibrated at the time of their usage for the current monitoring period. The Verification team checked the calibration records and the same was found to be satisfactory /20/.

CCIPL also assessed that the data collection system met the requirements of the monitoring plan as per the applied methodology.

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity.

The monitoring personnel at site are well trained and follow reproducible routines. Thus, they are competent to carry out the relevant tasks with sufficient accuracy.

4.5 Non-Permanence Risk Analysis

The project activity was operational throughout the monitoring period. Hence there is no further requirement for the non-performance analysis rating during the monitoring period of the project activity.

5 VERIFICATION OPINION

5.1 Verification Summary

The Project Proponent, NE Climate A/S has commissioned the VVB, Carbon Check (India) Private Ltd. to perform a verification of the VCS Project Activity “Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh”. This report summarises the findings of the verification of the project, performed based on VCS criteria, as well as criteria given to provide for consistent project operations, monitoring, and reporting.

The verification process was performed on the basis of all guidance and criteria as provided in VCS Standard version 4.3 /B01-a/, VCS Program Guide version 4.4 /B01-b/, VCS Validation and Verification Manual version 3.2 /B01-c/ and Registration & Issuance Process version 4.4 /B01-d/.

The selected baseline and monitoring methodology AM0023, Version 04 /B02/ is applicable to the project and correctly applied.

The verification team confirm that the project has been implemented in accordance with the project description.

Verification period: From 01- January-2023 to 31-December-2023 (including both days)

Verified GHG emission reductions and removals in the above verification period, broken down by calendar year:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCUs (tCO ₂ e)
01-Jan-2023 to 31-Dec-2023	4,111,740	0	0	4,111,740	-	4,111,740

Total	4,111,740	0	0	4,111,740	-	4,111,740
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The verification team is of the opinion that the project has been implemented in accordance with the registered project description, the monitoring plan complies with the approved monitoring methodology. Monitoring was carried out in accordance with the monitoring plan, and that the monitored data and ER calculations were assessed and confirmed to be correct.

5.2 Verification Conclusion

Carbon Check (India) Private Ltd concludes the verification with a positive opinion that the VCS Project Activity “Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh” as described in the VCS MR, meets all the applicable VCS requirements, including those specified in the Project Standard, relevant methodology, tools and guidelines.

The selected baseline and monitoring methodology (AM0023, version 04: “Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities”) is applicable to the project and correctly applied. VVB confirms that the project has been implemented in accordance with the Monitoring report.

Verification period: From 01- January-2023 to 31-December-2023 (including both days)

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

For projects that are not required to assess permanence risk, use the following table:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCU (tCO ₂ e)
01-Jan-2023 to 31-Dec-2023	4,111,740	0	0	4,111,740	-	4,111,740
Total	4,111,740	0	0	4,111,740	-	4,111,740

5.3 Ex-ante vs Ex-post ERR Comparison

<i>Vintage period</i>	<i>Ex-ante estimated reductions/removals</i>	<i>Achieved reductions/removals</i>	<i>Percent difference</i>	<i>Explanation for the difference</i>
01-Jan -2023 to 31-Dec-2023	3,950,039	4,111,740	4.0%	The estimated Ex-ante emissions are based on the Gap Analysis estimates done as part of the registration of the project with VCS. The actual results which are quite close to the estimate are reflected in the achieved results.
Total	3,950,039	4,111,740	4.0%	The estimated Ex-ante emissions are based on the Gap Analysis estimates done as part of the registration of the project with VCS. The actual results which are quite close to the estimate are reflected in the achieved results.

The verification team is of the opinion that the project has been implemented in accordance with the registered project description, the monitoring plan complies with the approved monitoring methodology, the monitoring complies with the monitoring plan, and the monitored data and calculation of ERs are assessed and confirmed as correct.

Therefore, CCIPL hereby certifies and requests the issuance of the reported ERs during the monitoring period of 01-January-2023 to 31-December-2023 amounting to 4,111,740 tCO₂e to the VCS registry.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

No commercially sensitive information is identified.

APPENDIX 2.1: REFERENCE DOCUMENTS

Sr.no	Document
/01/	a. Monitoring Report version 01 dated 12-September-2024 b. Monitoring Report version 02 dated 13-November-2024 c. Monitoring report version 03 dated 04-December-2024 d. Monitoring report version 04 dated 05-May-2025 e. Monitoring report version 05 dated 03-June-2025
/02/	a. Ex-post emission reduction calculation spreadsheet corresponding to /01-a/ b. Ex-post emission reduction calculation spreadsheet corresponding to /01-b/ c. Ex-post emission reduction calculation spreadsheet corresponding to /01-c/ d. Ex-post emission reduction calculation spreadsheet corresponding to /01-d/
/03/	Evidence for project start date - letter from MBS confirming first repair date to be 29/01/2017, dated 24/05/2024
/04/	Proof of project ownership complying with section 3.6.1 of VCS Standard version 4.3 (certified emission reductions project investment agreement between NE Climate A/S and Titas Gas Transmission and Distribution Company Limited dated 06/12/2012
/05/	Evidence for legal status of the project proponent, NE Climate A/S - certificate of registration under Danish Business Authority dated 18/12/2018
/06/	Evidence for operational rights of MBS (engineering services contract between Climate Compass and MBS)
/07/	Map - Transmission and distribution pipeline of TGTDC
/08/	Project service agreement: between NE Climate A/S and Climate Compass LLC in 2015
/09/	Organization structure for the project activity
/10/	The feasibility study report of the project dated July 2013
/11/	Declaration from TGTDC for the applicability conditions of the methodology AM0023, version 04 dated 05/17/2022 - During the last three years prior to the implementation of the project activity, no advanced LDAR program was in place to address physical leakage from components that are included in the project boundary. - New physical leaks that are detected at components during the crediting period (e.g., not at the time the project starts) are accountable only if the components were included in the project boundary at the validation of the project activity. - Physical leaks that are detected and repaired under a conventional LDAR program are not covered in the project activity. - Physical leaks that can be repaired by tightening/re-greasing or by similar

	measures are not covered in the project activity. Physical leaks that are identified on components where the latest scheduled maintenance or replacement was not done before the starting date of project activity as documented through maintenance logs, maintenance schedules, maintenance guidelines, worker logbooks, or other similar sources.
/12/	Summary report from MBS for the project monitoring including inspection visits and baseline study database and monitoring database dated 24/05/2024
/13/	Letter regarding the lifetime of the repair materials used in the leak repairs dated 24/05/2024
/14/	Log of the materials used for leakage repairing using advanced LDAR dated 24/10/2024
/15/	Detailed log sheets of all leaks with leak code, photographs, and GPS coordinates the leaks detected, measurements were done following with repairs carried out (along with all relevant details as stated under bullet points 1 to 11 under step 2 in section B.6.1 of the PDD: like along with the records of the downloaded data taken from the memory of HFS photographs, tags, handwritten records with raw data, etc.)
/16/	- Letter provided by the gas company confirming that no leaks scheduled for replacement or emergency repair were included in the emission reduction calculation spreadsheet - Emergency logbook
/17/	Technical specifications and manuals for the Hi-Flow Samplers and GMI Gas surveyor (500 Series) and Photographs of the HFS and GS used during the monitoring period
/18/	Letter from MBS for confirming skills to perform the calibration of HFS and GS dated 24/05/2024
/19/	Evidence to confirm the Hi-Flow Sampler automatically accounts for standard temperature and pressure (i.e., 0 degrees Celsius and 101.3 kPa) in its leak flow rate ($F_{CH_4,i}$) measurements dated 24/05/2024
/20/	Calibration records for all the Hi-Flow Sampler and GS used during the monitoring period
/21/	Statutory Documents: - Natural Gas Safety and Security Law - Gas distribution rules (Domestic) & (Industry) - Gas Act - Gas Marketing Law
/22/	Letter from TGTDCCL confirming no system outages in gas supply during the monitoring period
/23/	Training-related letters and certificates for competence of the personnel involved in the monitoring
/24/	Letter for demonstrating number of employments generated by the project
/25/	Declaration from NE Climate A/S stating: - This project is not claiming carbon credits under any other program.

	- This Project is not covered under any other trading programs or binding limits and does not receive any other forms of environmental credits.
/26/	Error List of this MP

APPENDIX 2.2: BACKGROUND REFERENCE DOCUMENTS

	Document
/B01/	VCS Requirements: a. VCS Standard (v4.3) b. VCS Program Guide (v4.4) c. VCS Validation and Verification Manual (v3.2) d. Registration and Issuance Process (v4.4) e. VCS Program Definitions (v4.5) f. VCS Monitoring Report Template (v4.3) g. VCS Verification Report Template (v4.3)
/B02/	Applied baseline and monitoring methodology. AM0023, version 04, “Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities”
/B03/	Registered PD for VCS project “Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh” v2.2, dated 03-November-2022 and the corresponding Validation Report v3, dated 04-November-2022.
/B04/	“Standard for sampling and surveys for CDM project activities and programme of activities” (version 09.0) Guidelines for sampling and surveys for CDM project activities and Programme of Activities (version 04)
/B05/	Website and links: http://cdm.unfccc.int http://www.terra.org

APPENDIX 3: ABBREVIATION

BE	Baseline Emission
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CL	Clarification Request
CO₂	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
DVR	Draft Verification Report
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
FVR	Final verification Report
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
NA	Not Applicable
OSV	On-Site Visit
PA	Project Activity
PD	Project Description
PP	Project Proponent
QC/QA	Quality control/Quality assurance
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VB	Validation/Verification Body
VS	Validation and Verification Standard

APPENDIX 4: CERTIFICATES OF COMPETENCE



Carbon Check (India) Private Limited

Certificate of Competency

Mr. Manas Halder

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS, A 6.4 AS/ ISO/IEC 14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

☒ Validator	☒ Verifier	☒ Team Leader	☒ Technical Expert
☐ Technical Reviewer	☐ Validator/Verifier (Trainee)	☐ Gender Expert	☐ Plastic Waste Expert
☐ CCB Expert	☐ Legal Expert	☐ Financial Expert	☐ Environmental, Health and Safety financial matters
☐ SDG Expert	☐ Expert Social aspect	☐ Expert Environmental Aspect	☐ Health Expert
☒ Regional Expert for India and Bangladesh		☒ FOEN Approved Technical Expert	☐ FOEN Approved Quality officer

in the following Technical Areas:

☐ TA 1.1	☒ TA 1.2	☐ TA 2.1	☒ TA 3.1	☐ TA 4.1
☐ TA 4. n	☐ TA 5.1	☐ TA 5.2	☐ TA 7.1	☐ TA 8.1
☐ TA 9.1	☐ TA 9.2	☐ TA 10.1	☒ TA 13.1	☐ TA 13.2
☐ TA 14.1	☐ TA 15.1	☐ TA 16.1		

Issue Date

06th February 2025

Expiry Date

31st December 2025



Mr. Vikash Kumar Singh
Director - Compliance

Revision History of the document:

Revision Date	Summary of changes
Jan 2025 ¹	Revised as per latest organogram
Feb 2025	Revised to include FOEN requirements

CCIPL_FM 7.9 Certificate of Competency_V8.0_05022025
¹ Please refer to previous version of FM 7.9 for the revision history



Carbon Check (India) Private Limited

Certificate of Competency

Mr. R V Nesari

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS, A 6.4 AS/ ISO/IEC 14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

- | | | | |
|--|---|---|---|
| ☐ Validator | ☐ Verifier | ☐ Team Leader | ☒ Technical Expert |
| ☐ Technical Reviewer | ☐ Validator/Verifier (Trainee) | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☐ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☐ SDG Expert | ☐ Expert Social aspect | ☐ Expert Environment | ☐ Health Expert aspect |
| ☐ Regional Expert for India | | ☐ FOEN Approved Technical Expert | ☐ FOEN Approved Quality officer |

in the following Technical Areas:

- | | | | | |
|---|--|---|---|----------------------------------|
| ☒ TA 1.1 | ☒ TA 1.2 | ☒ TA 2.1 | ☒ TA 3.1 | ☐ TA 4.1 |
| ☒ TA 4. n | ☒ TA 5.1 | ☒ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☒ TA 9.1 | ☒ TA 9.2 | ☒ TA 10.1 | ☒ TA 13.1 | ☐ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | ☐ TA 16.1 | | |

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Mr. Vikash Kumar Singh
Director - Compliance

Revision date	Summary of changes
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¹ Please refer to previous version of FM 7.9 for the revision history



Carbon Check (India) Private Limited

Certificate of Competency

Mr. Sanjay Kumar Agarwalla

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS, A 6.4 AS/ ISO/IEC 14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

- | | | | |
|--|--|--|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☒ Technical Reviewer | ☐ Validator/Verifier (Trainee) | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☒ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☒ SDG Expert | ☒ Expert Social aspect | ☒ Expert Environmental Aspect | ☐ Health Expert |
| ☒ Regional Expert for India and Bangladesh | | ☒ FOEN Approved Technical Expert | ☐ FOEN Approved Quality officer |

in the following Technical Areas:

- | | | | | |
|--|--|---|---|---|
| ☒ TA 1.1 | ☒ TA 1.2 | ☒ TA 2.1 | ☒ TA 3.1 | ☒ TA 4.1 |
| ☐ TA 4. n | ☒ TA 5.1 | ☒ TA 5.2 | ☒ TA 7.1 | ☐ TA 8.1 |
| ☒ TA 9.1 | ☒ TA 9.2 | ☒ TA 10.1 | ☒ TA 13.1 | ☒ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | ☒ TA 16.1 | | |

Issue Date

06th February 2025

Expiry Date

31st December 2025



Mr. Vikash Kumar Singh
Director - Compliance

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¹ Please refer to previous version of FM 7.9 for the revision history



Carbon Check (India) Private Limited

Certificate of Competency

Ms. Indumathi C

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS, A 6.4 AS/ ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

for the following functions and requirements:

- | | | | |
|--|--|--|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☒ Technical Reviewer | ☐ Validator/Verifier (Trainee) | ☐ Gender Expert | ☒ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☒ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☒ SDG Expert | ☒ Expert Social aspect | ☒ Expert Environmental Aspect | ☐ Health Expert |
| ☒ Regional Expert for India and Srilanka | | ☒ FOEN Approved Technical Expert | ☐ FOEN Approved Quality officer |

in the following Technical Areas:

- | | | | | |
|--|--|----------------------------------|---|---|
| ☒ TA 1.1 | ☒ TA 1.2 | ☐ TA 2.1 | ☒ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☒ TA 13.1 | ☒ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | ☐ TA 16.1 | | |

Issue Date

06th February 2025

Expiry Date

31st December 2025



Mr. Vikash Kumar Singh
Director - Compliance

Revision History of the document:

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APPENDIX 5: FINDINGS LOG

Table 1. CLs from this verification

Finding	CL 01
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding (VVB)	The Verification Team has noticed: 1. In section 1.1 of MR, under emission reduction table the monitoring period number is indicated as 5th however, this is the 3rd monitoring period under VCS. 2. In section 4.3 of the MR, the monitoring period number is indicated as 4th; however, this is the 3rd monitoring period under VCS. 3. Similarly, the 'Title Page' worksheet of the ER calculation spreadsheet mentions this as "VCS 2930 – VCS- Verification Period 5". The PP is requested to clarify the above discrepancy.
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	<i>Edits have been made to the various sheets to correct this error.</i>
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	The PP has revised the monitoring report and the ER calculation spreadsheet to indicate the monitoring period number to be the third monitoring period under VCS throughout these documents. The VVB has reviewed the revised documents and found this to be appropriate and correct. Hence, CL 01 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CL 02
Classification	☐ CAR ☒ CL ☐ FAR

Finding	CL 02
Description of finding (VVB)	The ER calculation spreadsheet, when compared with that of previous monitoring periods, the following have observed: 1. On 'Outage' worksheet, leak "GA-R.3.CR.13.1" is noted as "outage" in cell J4; however, this was noted as "cut-off" in the ER calculation spreadsheet corresponding to the 2021 monitoring year. 2. In 2021, there were 37,741 leakages were listed and there were 283 cut off points, and in 2022, 432 new leakages were listed. Hence, the total number of leaks, based on 2021 records, should be $37,741 - 283 + 432 = 37,890$, but in 2022 only 37,630 leakages were listed. Therefore, there is a discrepancy of (-)260 leaks compared to 2021. 3. In 2022, there were 251 cut off points, and in 2023, 543 new leakages were listed. Hence, the total number of leaks based on 2022 records, should be $37,630 - 251 + 543 = 37,922$. Therefore, there is a discrepancy of (+)7 leaks compared to 2022 and (-)253 compared to 2021. 4. As per the 'Total' worksheet of 2022, the total number of leaks detected and repaired 2022 were 432, whereas as per the 'Total' worksheet of 2023, the total number of leaks detected and repaired in 2022 were 431. 5. In the 'Outage' worksheet, total number of outages plus cut off points listed are 6504 (193 cut offs + 6311 outages). Out of 6311 outages, in 1023 numbers of outages the gas supply was not resumed till 31.12.2023. The shut off dates in most of these outages out of 1023 are in the beginning of the year 2023. Normally an outage is temporary one to carry out maintenance work on the gas supply or distribution lines. So, the "outage" list needs to be reviewed The PP is requested to clarify on the above discrepancies.

Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	1. This leak was incorrectly noted as a cut-off in 2021 due to human error. This leak was actually temporary disconnected (TDC) and it is still TDC in 2023. We have included this in our error list. 2. There were 307 leaks in 2021 database that were excluded from 2022 and 2023 database by mistake. All these 307 leaks are now included in the spreadsheet. These leaks were not monitored in 2023. There were 46 old leaks in the 2022 database that were mistakenly excluded from 2021 database. These 46 leaks were returned in total 2022. We have included this in our error list. 3. The sub-area codes of 5 leaks were incorrect in 2022 ER sheet, and we corrected codes in 2022. There were 2 old leaks that were identified as new leaks in 2022 but mistakenly excluded from the 2022 ER sheet. Later, we found this error and added these 2 leaks in 2023 ER sheet. We have included the above information in our error list. 4. Leak MD-5.22.RR.1569.2 was first repaired on 22/05/2022; however, this was mistakenly not in 2022 Total sheet. We have included this in our error list. Leak NA-J.50.RR.4073.2 was shown in 2023 Total sheet as repaired on 21/06/2021 but the correct year of initial date should be 21/06/2022 as shown in in 2022 Total sheet. The repair date is now fixed in 2023 Total sheet. Leak NA-J.50.RR.9144.2 was repaired on 28/05/2018 as shown in 2023 Total sheet. The repair date was shown in 2022 Total sheet as 28/05/2022 in error. We have included this in our error list. 5. These leaks represent shut-off for non-payment. They are correct. The risers still exist and the repairs remain, so we cannot remove these from the total, but they are not pressurized so no emission reductions can be counted unless they are turned back on. Please refer to the error list provided for complete details on the above including all relevant leak codes.
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Finding	CL 02
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	1. PP has confirmed that the leak GA-R.3.CR.13.1 was incorrectly noted as cut-off in 2021 due to human error, and this leak was actually temporary disconnected. 2. A total of 307 leaks were excluded mistakenly from 2022 database. All these 307 leaks are now included in revised 2023 spreadsheet. Also, 46 old leaks in the 2022 database were mistakenly excluded from 2021 database. This, in conjunction with the explanation stated above in #1, explains the discrepancy of 260 ($307 - 46 - 1 = 260$). 3. PP has confirmed that 5 of these 7 leaks were coded incorreced and 2 were mistakenly omitted from 2022 database. 4. PP has confirmed that 1 leak mistakenly omitted from 2022 Total sheet. For 1 leak in 2023 'Total' worksheet, the initial repair date was incorrectly reported as 21/06/2021 and the correct date should be 21/06/2022. This has now been corrected in the revised ER sheet of 2023. For 1 leak in 2022 'Total' worksheet the initial repair date was shown as 28/05/2022, which should be 28/05/2018 as shown in 2023 'Total' worksheet. Hence, the correct number of leaks detected and repaired in 2022 is $431 + 1 = 432$ as per revised 2023 'Total' worksheet. PP has provided an updated detailed error list /26/ for 2023, and the verification team has cross-checked this and found all the above information to be correct and appropriate. 5. PP has confirmed that shut-offs in these 1023 lines were due to non-payment issues and these risers still exist and the repairs remain and hence are not removed the 'Total' worksheet. However, since they are not pressurized, no emission reductions will be counted unless they are turned back on. This is deemed reasonable and acceptable to the verification team. Hence, CL 02 is closed.

Finding	CL 02
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CL 03
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding (VVB)	Out of 6,311 outages, in case of 1,023 numbers of outages, the gas supply was not resumed as of 31/12/2023. The shut-off dates in most of these 1,023 outages are in the beginning of year 2023. While an outage is normally a temporary one to carry out maintenance work on the gas supply or distribution lines. Hence, the PP is requested to clarify on these abnormally long-duration outages.
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<i>These leaks represent shut-off for non-payment. They are correct. The risers still exist and the repairs remain, so we cannot remove these from the total, but they are not pressurized so no emission reductions can be counted unless they are turned back on.</i>
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	The PP has confirmed that these shut-offs are due to non-payment issues and not permanent in nature or cut-off from the distribution network. Moreover, the VVB has checked and confirmed from the ER calculation spreadsheet that emission reductions are not claimed for these leaks. Hence, CL 03 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CL 04
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding (TR)	In section 1.8 of the MR, it is not clear whether a database of all components within the project boundary has been established to include the following: 1. <i>“Data to clearly identify the component: ID number, type of component, size of component, service, process unit or area, location of the component, type of the facility, digital photo number, etc.”</i> as per ‘Step 2 (1)’ of the ‘Baseline emissions’ section of AM0023 version 4. 2. <i>“Relevant information on the detection of the physical leak: date of detection, detection method applied, who detected the leak, detection reading if applicable e.g. screening value or leak image, etc.”</i> as per ‘Step 2 (2)’ of the ‘Baseline emissions’ section of AM0023 version 4. 3. <i>“Hours during which the component is in pressurized natural gas or refinery gas service since the last leak survey or facility turnaround”</i> as per ‘Step 2 (4)’ of the ‘Baseline emissions’ section of AM0023 version 4. PP is requested clarify.
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	1. <i>It is made clear in the monitoring plan section 5.3 of the PD all the data collected in accordance with the methodology. We have also shared copies of the full set of data we maintain in the database that shows all of these pieces of data for each of the leaks for more than 150 leaks. The Verifier have full access to these records and can review them as needed to confirm this.</i> 2. <i>See response to #1.</i> 3. <i>We have provided a letter from the gas company confirming that the system was fully pressurized during the monitoring period and also listing the individual leaks affected by any shut-offs for maintenance or non-payment or any cut-offs. The calculation of hours is straight forward in that the total hours that the system was pressurized is the total hours of the monitoring period and any leak specific shut-downs are subtracted from the hours. This can clearly be seen in the total calculation.</i>

Finding	CL 04
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	1. In sections 4.1 (Baseline Emissions) and 5.3 (Monitoring Plan) of the PD, PP has clearly mentioned the captured data during baseline study and monitoring in accordance with the methodology. A detailed description of this is already there in section 4.3 (Monitoring Plan) of the MR. PP has also updated section 1.8 and 3.1 of the MR to provide reference of relevant sections of the PD for more clarity. The details of the leaks (baseline and monitoring database) were verified via physical inspection of 50 randomly selected sample leaks and full database check of 100 randomly selected leaks during remote visit /15/. 2. Same as above. 3. The total hours that the system was pressurized is the total hours of the monitoring period and any leak-specific shut-downs/outages are subtracted from the hours. This is shown on the 'Total' and 'Outage' tabs of ER calculation spreadsheet and has been verified from the letter provided by the gas company confirming that the system was fully pressurized during the monitoring period with a list of individual leaks affected by any shutoffs for maintenance or non-payment or any cut-offs /22/. Hence, CL 04 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CL 05
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding (TR)	In section 3.1 of the MR, 1. The relevant information on the repair of the physical leaks detected are not sufficiently provided. 2. The frequency of regular surveys following the initial survey is not specified. PP is requested to clarify.

Finding	CL 05
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	1. We have shared copies of the full set of data we maintain in the database that shows all of these pieces of data for each of the leaks for more than 100 leaks including the exact location of the leak by photo and engineering schematic, types and quantity of repair materials used, and the person responsible for the repair. The Verifier has full access to these records and can review them as needed to confirm this. 2. The methodology specifies that the leaks will be visited at least once per year period and we will follow the methodology. The MR has been updated to clarify that the team plans to visit every leak possible at least once per year.
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	1. PP has kept a full set of data maintained in the database that shows all the relevant information for each of the leaks including the exact location of the leak by photo and engineering schematic, types and quantity of repair materials used, and the person responsible for the repair, etc. The details of the leaks (baseline and monitoring database) were verified via physical inspection of 50 randomly selected sample leaks and full database check of 100 randomly selected leaks during remote visit /15/. 2. As per the methodology, the leaks need be visited at least once per year. This is the first monitoring period, hence not relevant to this period. Future monitoring reports will demonstrate that the requirement of one-year monitoring frequency is met during those periods. Hence CL 05 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Table 2: CARs from this verification

Finding	CAR 01
Classification	☒ CAR ☐ CL ☐ FAR

Finding	CAR 01
Description of finding (VVB)	As per the instructions for completing the monitoring report template: 1. The file name for the MR needs to be in the following format: <i>VCS MR Project ID DDMMYYYY-DDMMYYYY</i> where '<i>DDMMYYYY-DDMMYYYY</i>' should be the start and end dates of the monitoring period. 2. The font type, size and color prescribed in monitoring report template should be retained, and a consistent formatting throughout the monitoring report should be maintained. PP is requested to comply with the above.
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	<i>The dates and fonts have been updated.</i>
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	1. The PP has renamed the monitoring report document as '<i>VCS MR 2930 01012023-31122023.docx</i>' which is in line with the MR template guideline. 2. The PP has corrected formatting errors and the font type, size and color are now consistent throughout the document and are as prescribed in the MR template. Hence, CAR 01 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CAR 02
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding (VVB)	The PP has indicated the version number of the VCS Standard used by the project as 4.4. However, VCS standard v4.6 was published by the time the original date of issue of the MR. PP is requested justify using an older version of the VCS Standard for this project.
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	<i>The version number of the VCS Standard used by the project as per the approved PD is 4.3. This has been updated on the title page of the MR accordingly.</i>

Finding	CAR 02
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	The PP has corrected the 'Version number of the VCS Standard used by the project' on the title page of the revised Monitoring Report. This is now in line with the registered and approved PD. Hence CAR 02 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CAR 03
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding (VVB)	In section 1.9 of the MR, PP has not indicated the 'Reference ID if applicable' against the "Combined tool to identify the baseline scenario and demonstrate additionality".
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	This has been updated.
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	Reference ID for tool "Combined tool to identify the baseline scenario and demonstrate additionality" has now been provided in 'Title and Reference of Methodology' table in section 1.9 of the revised MR. Hence, CAR 03 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CAR 04
Classification	☒ CAR ☐ CL ☐ FAR

Finding	CAR 04
Description of finding (VVB)	In section 2.1.5 of MR, As per MR template guideline, “Use the table below to provide a summary of all comments received as part of stakeholder consultation and any comments received outside of the public comment period. Include details on when the comments were received, and any updates to the project design or demonstrate insignificance or irrelevance of comments below”, PP needs to include details of public comments.
Corrective Action or clarification #1 (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	This has been updated.
VVB Assessment #1 The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.	The PP has updated with the comments received as part of stakeholder consultation and public comment period in section 2.1.5 of the revised MR in line with the monitoring report template guideline. Hence, CAR 04 is closed.
Conclusion Tick the appropriate checkbox	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CAR 05
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding (VVB)	On ‘Total’ worksheet of the ER calculation spreadsheet the following have been observed: 1. In cell AN9, the ‘End of Monitoring Period’ date mentioned as “01.01.2024” but this monitoring period ends on 31.12.2024. 2. The dates of repairs during baseline survey (column D) are not matching with the database for some leaks. 3. For some leaks, during monitoring survey, the HFS numbers are mentioned (column L), while as per database, these measurements were taken with GS and not by HFS.

Finding	CAR 05
	PP is requested to rectify this.
Corrective Action or clarification #1 <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	1. The date has been updated. 2. The Column D has been renamed as “ Date of measuring at BS” and an additional column with date of repair added. 3. The numbers of HFS were incorrectly entered. Instead, the operator should have entered GS instead of the HFS number. All such leaks were fixed in the Final total.
VVB Assessment #1 <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	1. The ‘End of Monitoring Period’ date is now correctly reflected as 31.12.2024 in cell AN9. 2. PP has confirmed that the dates mentioned in column ‘D’ are actually measurement date dates at baseline and repair dates are now shown in newly included column ‘E’. The formula to determine the ‘Later of Date of repair or start date of Monitoring Period’ in column ‘K’ is also updated accordingly. 3. Incorrectly entered HFS numbers are now removed where the measurements were taken by GS. The VVB has checked the revised ER calculation spreadsheet and verified all above from the database. Hence, CAR 05 is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Table 3. FARs from project validation

Nil.

APPENDIX 6: SUSTAINABLE DEVELOPMENT CONTRIBUTION ASSESSMENT

SL	SDG target and indicator	Contributions during current monitoring period	Contributions over project lifetime	Assessment
1	Target: 7.1 Indicator: Cost savings from loss reduction per customer (\$ savings/customer)	\$12.76 savings/customer for all leaks accounted for the current monitoring period \$0.14 savings/customer for new leaks found during the current monitoring period	\$38.29 savings/customer over the three years' lifetime of the project	The verification team has reviewed the emission reduction calculation spreadsheets /02/ and checked all the formulae and found they are correct and are in accordance with the monitoring plan of the registered PD /B03/ and the applied monitoring methodology /B02/. Cost of per unit (cubic meter) gas and number of domestic customers were cross-checked from the online news source² and annual report available on the official portal of Titas Gas³.

² <https://www.tbsnews.net/bangladesh/energy/titas-wants-47-hike-non-metred-domestic-gas-bills-631974> (metered customers)

³ https://titasgas.portal.gov.bd/sites/default/files/files/titasgas.portal.gov.bd/page/42fc2a22_e683_4f2c_a758_2830f057f723/2024-12-09-09-11-debcdeeee7915b1bb8a4dbed48e7f89f.pdf (page 13 Corporate Information)

2	Target: 9.4 Indicator: Tonnes of CO2 equivalent emissions reduction from LDAR activities per customer served (tCO₂e reductions/customer)	1.44 tCO ₂ e reductions/customer during the current monitoring period	8.15 tCO ₂ e reductions/customer over the three years' lifetime of the project	The verification team has reviewed the emission reduction calculation spreadsheets /02/ and checked all the formulae and found they are correct and are in accordance with the monitoring plan of the registered PD /B03/ and the applied monitoring methodology /B02/. Number of domestic customers was cross-checked from the annual reports available on the official web portal of Titas Gas ⁴ .
3	Target: 13.0 Indicator: Tonnes of greenhouse gas emissions avoided or removed (tCO₂e/year)	4,111,740 tCO ₂ e/year during the current monitoring period	23,295,208 tCO ₂ e/year over the three years' lifetime of the project	The verification team has reviewed the emission reduction calculation spreadsheets /02/ and checked all the formulae and found they are correct and are in accordance with the monitoring plan of the registered PD /B03/ and the applied monitoring methodology /B02/.
4	Target: 11.6 Indicators: Total methane emissions avoided in m³ (CH₄ Leakage reduced in m3) Total number of leaks reduced (# of leaks reduced)	2,420,304 m³ of CH₄ as a result of repair of 543 new leaks found during the current monitoring period 543	656,801,123 m³ of CH₄ as a result of 38,231 leaks found over the three years' lifetime of the project 38,231	The verification team has reviewed the emission reduction calculation spreadsheets /02/ and checked all the formulae and found they are correct and are in accordance with the monitoring plan of the registered PD /B03/ and the applied monitoring methodology /B02/.

⁴ https://titasgas.portal.gov.bd/sites/default/files/files/titasgas.portal.gov.bd/page/42fc2a22_e683_4f2c_a758_2830f057f723/2024-12-09-09-11-debcdeeee7915b1bb8a4dbed48e7f89f.pdf (page 13 Corporate Information)

5	Target: 8.5 Indicator: Number of people employed in an Advanced LDAR activity (# of employees)	23	23	The verification team has reviewed the emission reduction calculation spreadsheets /02/ and found that the reported contribution is in accordance with the monitoring plan of the registered PD /B03/ and the applied monitoring methodology /B02/. Number of people employed was cross-checked from the declaration provided by the PSL /24/ and confirmed during remote interview.
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