

VERIFICATION & CERTIFICATION REPORT

For the GS-VER Project Activity

GS10959 VPA01 SAFE WATER PROJECT IN RWANDA I
GS10959 VPA02 SAFE WATER PROJECT IN RWANDA II
GS10959 VPA03 SAFE WATER PROJECT IN RWANDA III
GS10959 VPA04 SAFE WATER PROJECT IN RWANDA IV
GS10959 VPA05 SAFE WATER PROJECT IN RWANDA V
GS10959 VPA06 SAFE WATER PROJECT IN RWANDA VI
UNDER POA

***" SAFE WATER PROGRAMME IN AFRICA AND
ASIA "***
(GS REF. No. GS10959)

REPORT No.
GS.22.VER.025

1st Monitoring Period

VPA No.	Start date	End date
VPA01	27/11/2021	24/07/2022
VPA02	26/11/2021	24/07/2022
VPA03	26/11/2021	24/07/2022
VPA04	09/01/2022	24/07/2022
VPA05	12/12/2021	24/07/2022
VPA06	10/01/2022	24/07/2022

(Including both the days)

<i>Date of this issue:</i> 27/03/2023	KBS Ref. No.: GS.22.VER.025 MP01																							
<i>VPA Titles:</i>	1. GS10959 VPA01 SAFE WATER PROJECT IN RWANDA I 2. GS10959 VPA02 SAFE WATER PROJECT IN RWANDA II 3. GS10959 VPA03 SAFE WATER PROJECT IN RWANDA III 4. GS10959 VPA04 SAFE WATER PROJECT IN RWANDA IV 5. GS10959 VPA05 SAFE WATER PROJECT IN RWANDA V 6. GS10959 VPA06 SAFE WATER PROJECT IN RWANDA VI																							
<i>Organization:</i>	KBS Certification Services Pvt. Ltd.																							
<i>Client:</i>	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.																							
<i>Monitoring Period:</i>	<table><tr><th>VPA No.</th><th>Start date</th><th>End date</th></tr><tr><td>VPA01</td><td>27/11/2021</td><td>24/07/2022</td></tr><tr><td>VPA02</td><td>26/11/2021</td><td>24/07/2022</td></tr><tr><td>VPA03</td><td>26/11/2021</td><td>24/07/2022</td></tr><tr><td>VPA04</td><td>09/01/2022</td><td>24/07/2022</td></tr><tr><td>VPA05</td><td>12/12/2021</td><td>24/07/2022</td></tr><tr><td>VPA06</td><td>10/01/2022</td><td>24/07/2022</td></tr></table>			VPA No.	Start date	End date	VPA01	27/11/2021	24/07/2022	VPA02	26/11/2021	24/07/2022	VPA03	26/11/2021	24/07/2022	VPA04	09/01/2022	24/07/2022	VPA05	12/12/2021	24/07/2022	VPA06	10/01/2022	24/07/2022
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VPA06	10/01/2022	24/07/2022																						
<i>Summary:</i>																								

KBS Certification Services Pvt. Ltd. has performed the 1st performance review (verification) of the GS-VER VPAs vide the reference numbers GS 11098, GS 11133, GS 11134, GS 11135, GS 11136, GS 11137. The verification includes confirming the implementation of the monitoring plan of the registered/most recent version of GS4GG PoA/VPA-DDs and the application of the applied monitoring methodology “Technologies and Practices to Displace Decentralized Thermal Energy Consumption” version 3.1. A physical assessment was conducted to check the implementation of registered monitoring plan and verify the data submitted in the monitoring report. KBS confirms the following has been reviewed;

- The registered/most recent version of GS4GG VPA/PoA DD and the monitoring plan and the corresponding validation opinion;
- The validation report;
- The applied monitoring methodology(ies);
- The monitoring report to verify that it is as per the standardized format;
- Monitoring results for the applied monitoring period
- Any other information and references relevant to the project activity's emission reductions (e.g., IPCC reports, data on electricity generation in the national grid or Laboratory analysis and national regulations);
- VER calculations sheets and all supporting documents.

KBS Certification Services Pvt. Ltd. confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

Based on the information seen and evaluated, we confirm that the implementation of the project has resulted in following SDGs.

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved			Units/ Products
SDG 13 Climate Action	Emissions Reductions			Amount Achieved	VERs
		V P A N o .	Start Dates	End Dates	
		V P A 0 1	27/11/2021	31/12/2021	
			01/01/2022	24/07/2022	
		V P A 0 2	26/11/2021	31/12/2021	
			01/01/2022	24/07/2022	
		V P A 0 3	26/11/2021	31/12/2021	
			01/01/2022	24/07/2022	
		V P A 0 4	09/01/2022	24/07/2022	
		V P A 0 5	12/12/2021	31/12/2021	

		<table><tr><td></td><td>01/01/2022</td><td>24/07/2022</td><td>30,334</td></tr><tr><td>V P A O 6</td><td>10/01/2022</td><td>24/07/2022</td><td>22,686</td></tr><tr><td></td><td></td><td>Total</td><td>178,511</td></tr></table>		01/01/2022	24/07/2022	30,334	V P A O 6	10/01/2022	24/07/2022	22,686			Total	178,511					
	01/01/2022	24/07/2022	30,334																
V P A O 6	10/01/2022	24/07/2022	22,686																
		Total	178,511																
SDG 3 – Good Health and Well-Being	Reduce the incidence of waterborne illness within the project area	38.45%	Percentage																
SDG 5 –Achieve gender equality and empower all women and girls	Reduce the time spent to fetch and purify water by women and girls	51.11%	Women having more time for self-empowerment																
SDG 6 –Ensure availability and sustainable management of water and sanitation for all.	Provide safe water to local residents	<table><tr><td>VPA No.</td><td>P_{p,y}</td></tr><tr><td>01</td><td>33,750</td></tr><tr><td>02</td><td>31,855</td></tr><tr><td>03</td><td>32,320</td></tr><tr><td>04</td><td>33,221</td></tr><tr><td>05</td><td>33,514</td></tr><tr><td>06</td><td>32,314</td></tr><tr><td>Total</td><td>196,974</td></tr></table>	VPA No.	P _{p,y}	01	33,750	02	31,855	03	32,320	04	33,221	05	33,514	06	32,314	Total	196,974	Additional people using safe water
VPA No.	P _{p,y}																		
01	33,750																		
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04	33,221																		
05	33,514																		
06	32,314																		
Total	196,974																		

Subject Group GS Verification Version of GS rules: GS4GG	Sectoral Scope(s): 1.1 & 3.1	Methodology: Technologies and Practices to Displace Decentralized Thermal Energy Consumption” version 3.1	
Verification Team:		Monitoring report:	
Team Leader, Technical Expert (1.1, 3.1)	Sanjay Kandari	First version	17/11/2022
		Final version	20/02/2023
Local Expert (Rwanda)	David Lubanga		
Independent Technical Reviewer Team		Verification status:	
Date:27/12/2022			
Technical Reviewer	Tushar Eknath Chaudhari	☐ Findings not closed.	
TR Expert (1.1, 3.1)	Tushar Eknath Chaudhari	☐ Draft verification opinion	
		☒ Final verification opinion	
Date: 28/03/2023			
Manager T&C	Tushar Eknath Chaudhari		
Authorized Signatory:			
Date: 28/03/2023			

Managing Director	Kaushal Goyal	☒ No distribution without permission from client ☐ Unrestricted distribution ☐ Limited distribution
Revision history:		
Date	Rev. No.	
12/01/2023	0	
27/02/2023	1	

Abbreviations

CAR	Corrective Action Request
CME	Coordinating & Managing Entity
CL	Clarification Request
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
CRF	Carbon Rights Form
EB	Executive Board
ER	Emission Reduction
FT	Fuel Test
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GPS	Global Positioning System
GS	Gold Standard
HH	Household
IPCC	Intergovernmental Panel on Climate Change
KPT	Kitchen Performance Test
MKS	Monitoring Kitchen Survey
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-governmental Organization
NRB	Non-renewable biomass
OSV	On-site visit
POA DD	Programme of Activity Design Document
PP	Project proponent
PTD	Project Technology Days
QA/QC	Quality Assurance/Quality Control
SC	Sustain Cert
SD	Sustainable Development
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
VPA	Voluntary Project Activity
VVB	Validation and Verification Body
VER	Voluntary Emission Reduction
VVS	Validation and Verification Standard for project activities
WCFT	Water consumption field test

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1. INTRODUCTION

1.1 Objective

KBS has been commissioned by Guangzhou Iceberg Environmental Consulting Services Co., Ltd. to perform an independent verification of its registered GS-VER VPAs GS 11098, GS 11133, GS 11134, GS 11135, GS 11136, GS 11137 for the monitoring period referred at the cover page of report for each VPA. The Gold Standard projects must undergo independent third-party verification and certification of emission reductions as the basis for issuance of Gold Standard Voluntary Emission Reductions (GS VERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the registered PoA/VPA-DDS/2/ and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place.
- Monitoring report and other supporting documents are complete.
- The actual monitoring systems & procedures and monitoring report conforms with the requirements of the approved monitoring plan and the approved monitoring methodology.
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on review of monitoring report, supporting information and

- (a) The registered PoA/VPADD, including the monitoring plan and the corresponding validation opinion(s);
- (b) Monitoring report for the monitoring period under verification including GS VER calculations sheets and all supporting documents.
- (c) The applied monitoring methodology.
- (d) Relevant decisions, clarifications and guidance from the CMP and the Gold Standard Board.
- (e) All information and references relevant to the project activity's resulting in emission reductions

The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

KBS has, based on the recommendations in the applicable version of GS4GG and CDM Validation and Verification Standard, employed a rule-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

1.3 Description of the Project Activity

VPA Titles:	1) GS10959 VPA01 Safe Water Project in Rwanda I 2) GS10959 VPA02 Safe Water Project in Rwanda II 3) GS10959 VPA03 Safe Water Project in Rwanda III 4) GS10959 VPA04 Safe Water Project in Rwanda IV 5) GS10959 VPA05 Safe Water Project in Rwanda V 6) GS10959 VPA06 Safe Water Project in Rwanda VI
Methodology Applied:	Gold Standard Methodology: "Technologies and Practices to Displace Decentralized Thermal Energy Consumption". Version 3.1
Sectoral Scopes:	3.1

Start date of crediting period:	GS 11098: 27/11/2021 GS 11133: 26/11/2021- GS 11134: 26/11/2021 GS 11135: 09/01/2022 GS 11136: 12/12/2021 GS 11137:10/01/2022
CME	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.
Location of the project activity:	Rwanda

The purpose and goal of the VPAs is to reduce emissions from burning of greenhouse gas emitting fuels, including non-renewable biomass, for water treatment. The use of non-renewable biomass such as wood for water boiling, leads to the emission of greenhouses gases, deforestation and poor indoor climate. The VPA involves installation of infrastructure, thus improving the access to safe water for communities in the southern province of Rwanda, under the PoA, to significantly reduce the consumption of non-renewable biomass and other greenhouse gas emitting fuels for water treatment.

The VPA under the GS PoA " Safe Water Programme in Africa and Asia " GS 10959, are eligible for Gold Standard methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 3.1".

The VPA involves installation of safe water technologies (access to safe water)/borehole, which will reduce the amount of firewood purifying water from unsafe sources for the local communities.

There is no public funding involved for the implementation which will result in a diversion of Official developmental Assistance as confirmed from the signed declaration for all the VPA, this was also confirmed during design review as same team of VVB has undertaken the design review part. Voluntary Project Activities will be financed by the generation and marketing of Voluntary Emission Reductions (VERs), which has been confirmed during the physical audit interview of PP/CME representatives.

It has also been confirmed that the PP/CME, in order to establish the boundary, have taken into consideration all applicable national and/or sectoral policies and regulations^{5/} within the chosen boundary.

VPA supports the provision of safe water using the safe water distribution technology to hundreds of households and reduce CO_{2e} emissions by reducing use of firewood for water purification. The water connections in the project scenario saves carbon emissions as less firewood is burnt on making water safe for consumption.

The VPA ensured that the quality of the water delivered by the the boreholes under the VPAs includes human consumption of water for the entire length of the project, which will be a minimum five years, is meeting health standards. Quarterly water quality tests will be done as per the WHO standard/17/,/18/. As per the requirement of the applied methodology TPDDTEC/06/, the Water quality must be tested every quarter, with the first test within 6 months of the stated project start date /9/. The WQT reports /18/ of the existing connections have been checked and found to be within the 6 months of the project start date.

Furthermore, the VPAs have significantly reduced the number of days when the project boreholes were out of work compared to the data from a paper showing that 36% of handpumps were non-functional*, which is equivalented to an average of 36% of a year when pumps were non-functional. Therefore the non operational days were verified as reasonable by the VVB.

* <https://www.waterpointdata.org/wp-content/uploads/2020/11/Functionality-of-handpump-water-supplies.pdf>

The emission reductions achieved during the current monitoring period are following for the 6 VPAs included in the monitoring report:

VPA Number	SDG#13
VPA01	30,311 CO ₂ e _{2e}
VPA02	34,531 CO ₂ e
VPA03	34,877 CO ₂ e
VPA04	22,813 CO ₂ e
VPA05	33,293 CO ₂ e
VPA06	22,686 CO ₂ e
Total	178,511 CO ₂ e

2. METHODOLOGY

KBS follows a rule-based verification approach, wherein, as a first step, the contract review is undertaken as per latest version of CDM Accreditation Standard and GS requirements for VVB. Subsequently, after the contract is signed, the monitoring report of the project activity is reviewed in accordance with Gold Standard rules.

A desk review of the project documentation is undertaken, which is followed by a physical onsite visit by the members of verification team in accordance with the latest version of CDM AS/GS4GG requirements. The verification protocol is filled by the verification team that is based on standard auditing practices and latest version of CDM VVS, to capture the assessment of applicable CDM requirements viz., latest version of CDM Project Standard, registered/recent version of GS4GG PDD, applied methodology/ies and/or tools and recent decisions. The verification protocol provides transparent means to record the observations and compliances by the verification team members and the nonconformities, if any. The verification protocol is an internal document and is available on request. Following are the major milestones for the verification under consideration.

Duration of verification

<i>Verification Contract (Combined contract for validation & Verification)</i>	11/06/2020
<i>onsite verification</i>	05/12/2022 to 07/12/2022
<i>Draft Verification Report</i>	17/12/2022
<i>Final Verification Report</i>	27/03/2023

2.1 Review of Documentation

A desk review is undertaken, involving but not limited to,

- A review of the data and information presented to verify their completeness.
- A 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.
- An 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.

The list of documents reviewed is included in the section 'References'

2.2 Site Visits

Details of interviewees, topics covered and additional information presented below:

Location:	Rwanda (Physically)
Dates:	05/12/2022 to 07/12/2022
Key points discussed:	Refer below table

List of households interviewed (Rwanda)

Location				Various Districts of Southern Province Rwanda
Dates				05/12/2022 to 07/12/2022
S. No.	Name of person interviewed	Designation, Organization	Means of interview	Key points discussed
1.	Ji Bao	Guangzhou Iceberg Environmental Consulting Services Co., Ltd. (CME)	Physically on Skype	- General aspects of the project - Changes since validation / previous verification - Remaining issues from validation/ previous verification - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - Procedural aspects of the Monitoring - Maintenance - Data analysis - Data Analysis - Issues in the MR - ER calculation
2.	Buiera Kayonga David	Guangzhou Iceberg Environmental Consulting Services Co., Ltd. (CME)	In person	- Survey Methodology and Sampling - Project Implementation - Compliance of statutory requirements - Water Quality Tests and methodology
3.	Ndagijimana Alex	Kabaja, Ruhango District (Borehole user)	In person	- Verification of data collected through survey - Awareness about ownership of VERs - Working condition of boreholes - SD parameters verification - Water quality
4.	Mutanyuranya Claver	Kaaba, Rango District (Borehole user)	In person	
5.	Nyiranbazungu Epiphame	Kabaja, Ruhango District (Borehole user)	In person	
6.	Nkuriyungoma Mical	Kabaja, Ruhango District (Borehole user)	In person	
7.	Ndidiriyimana Everiane	Gukomeya, Southern Province	In person	

		(Borehole user)		
8.	Kagambi Aimable	Ntinyinshyi, Rahungo District (Borehole user)	In person	
9.	Shumbusho Augustin	Ntinyinshyi, Rahungo District (Borehole user)	In person	
10.	Shumbusho Charles	Ntinyinshyi, Rahungo District (Borehole user)	In person	
11.	Unozeria Clande	Buhoro, Rahungo District (Borehole user)	In person	
12.	Musoni Boniface	Buhoro, Rahungo District (Borehole user)	In person	
13.	Mbanziriza Hesilon	Buhoro, Rahungo District (Borehole user)	In person	
14.	Mbyinuwuh e Wellaris	Gokameya, Mabanga, Southern Province	In person	
15.	Simbizi Martin	Gokameya, Mabanga, Southern Province (Borehole user)	In person	
16.	Hishamunda Sylville	Gokameya, Mabanga, Southern Province (Borehole user)	In person	
17.	Nkurikiyinka Emmannel	Gokameya, Mabanga, Southern Province (Borehole user)	In person	
18.	Ayigeheye Vestin	Gokameya, Mabanga, Southern Province	In person	

		(Borehole user)		
19.	Mujanayez w Marita	Kabaja Ruhango District	In person	
20.	Kazanyirwa Lowise	Kabaja Ruhango District (Borehole user)	In person	
21.	Nhigasigwa Donatha	Kabaja Ruhango District (Borehole user)	In person	
22.	Nwberwka Celistin	Kabaja Ruhango District (Borehole user)	In person	
23.	Karara Dies	Kabaja Ruhango District (Borehole user)	In person	Other SDSs aspects other than SDG#13
24.	Yankurije Viwlette	Kabaja Ruhango District (Borehole user)	In person	Other SDSs aspects other than SDG#13
25.	Mwakama za Violette	Kabaja Ruhango District (Borehole user)	In person	Other SDSs aspects other than SDG#13

2.3 Reporting of Findings

During the course of verification, the findings may be raised as under;

CAR is raised if one of the following occurs:

- Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient.
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants.
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions.
- Issues identified in a FAR during validation to be verified during verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

FAR is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

The verification report contains (section 7) all CARs, CLs and FARs raised during this verification in transparent manner and provides clear information of the issues raised, response received and its resolutions, including the changes in the documents.

2.4 Verification Assessment

Based on the desk review and physical site visit the team leader follows the verification protocol to identify and record the findings in the context of the project activity. The findings are communicated to the client in the findings document (section 7 of report). The project documentation, including responses to the findings is reviewed by the team leader in consultation with team members, wherever appropriate. The team leader prepares the draft verification report subject to closure or non-closure of the findings.

2.5 Internal Quality Control

The draft verification report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by KBS are duly followed and the verification report/opinion is reached in an objective manner and complies with the applicable GS4GG requirements.

The independent technical reviewer may approve or reject the draft verification report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before the request for issuance is submitted to Gold Standard. The final decision is taken by the Manager Technical and Certification. The technical reviewer and Manager T&C can be same person.

The final decision is authorized by Managing Director, KBS once the report is approved by the Manager T&C.

3. VERIFICATION FINDINGS

3.1 Remaining Issues (FARs from Previous Validation or Verification)

Discussion:

During the design review of the VPAs seven FAR were raised by Sustaincert/GS. CME has responded the FARs in MR as well as in the verification findings and the response and assessment are reported in Appendix of FVR.

Findings:

FAR#01, FAR#02, FAR#03, FAR#04, FAR#05, FAR#06 & FAR#07 were raised based on the GS review and closed.

3.2 Compliance of project implementation with registered VPA-DDS

Discussion:

CME:	Guangzhou Iceberg Environmental Consulting Services Co., Ltd.
Project Parties:	NA being a voluntary project
Title of voluntary project activity:	1) GS10959 VPA01 Safe Water Project in Rwanda I 2) GS10959 VPA02 Safe Water Project in Rwanda II 3) GS10959 VPA03 Safe Water Project in Rwanda III 4) GS10959 VPA04 Safe Water Project in Rwanda IV 5) GS10959 VPA05 Safe Water Project in Rwanda V 6) GS10959 VPA06 Safe Water Project in Rwanda VI
GS registration No:	GS 11098, GS 11133, GS 11134, GS 11135, GS 11136, GS 11137
Baseline and monitoring methodology:	Gold Standard Voluntary Methodology "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" version 3.1/6/
Project Type:	Access to safe drinking water.
Location of the project activity:	Rwanda
Project's crediting period:	GS 11098: 27/11/2021-26/11/2026, GS 11133: 26/11/2021-25/11/2026 GS 11134: 26/11/2021-25/11/2026, GS 11135: 09/01/2022-08/01/2027, GS 11136: 12/12/2021-11/12/2026, GS 11137: 10/01/2022-09/01/2027 The VPA DDs mentioned the expected dates of the crediting periods as all the VPAs were not implemented at the time of VPA inclusions therefore expected date as per Paragraph 4.1.40 of Principles & Requirements (Version 1.2) was mentioned. During the verification the start date is mentioned actual date of rehabilitation of first borehole. The date is verified in compliance with the above cited para of the 'Principles & Requirements (Version 1.2). The dates were verified with the certificates of rehabilitation of first borehole in each VPA.
Total Duration of the project:	5 years (renewal)

Period verified in this verification:	<table><tr><th>VPA No.</th><th>Start date</th><th>End date</th></tr><tr><td>VPA01</td><td>27/11/2021</td><td>24/07/2022</td></tr><tr><td>VPA02</td><td>26/11/2021</td><td>24/07/2022</td></tr><tr><td>VPA03</td><td>26/11/2021</td><td>24/07/2022</td></tr><tr><td>VPA04</td><td>09/01/2022</td><td>24/07/2022</td></tr><tr><td>VPA05</td><td>12/12/2021</td><td>24/07/2022</td></tr><tr><td>VPA06</td><td>10/01/2022</td><td>24/07/2022</td></tr></table>			VPA No.	Start date	End date	VPA01	27/11/2021	24/07/2022	VPA02	26/11/2021	24/07/2022	VPA03	26/11/2021	24/07/2022	VPA04	09/01/2022	24/07/2022	VPA05	12/12/2021	24/07/2022	VPA06	10/01/2022	24/07/2022
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	VPA06	10/01/2022	24/07/2022																					
(Including both dates)																								

As part of the on-site visit, the verification team was able to confirm that the project implementation is in accordance with the project description contained in the registered GS4GG POA/VPA-DDS /14//2/.

The voluntary project activities GS 11098, GS 11133, GS 11134, GS 11135, GS 11136, GS 11137 aims to reduce greenhouse gas emissions, curb deforestation and improve air quality by providing the access to safe & clean drinking water. The use of non-renewable biomass such as wood in baseline scenario for water boiling, leads to the emission of greenhouses gases, deforestation and poor indoor climate. The VPA involves installation of infrastructure, thus improving the access to safe water for communities in the southern provinces of Rwanda in East Africa, under the PoA, to significantly reduce the consumption of non-renewable biomass and other greenhouse gas emitting fuels for water treatment.

The project activity is implemented in line with the registered/recent version of VPA-DDs.

There are 251 boreholes repaired in the project and verified with the database along with physically verified during site visit based on accepting sampling. In the monitoring period, the boreholes were maintained by the CME and VPA implementer, functioning well to provide enough clean water to over 190,000 local people.

The GHG offset during this monitoring period are 178,511 tCO₂e covering all the 6 VPAs in this current batch of verification/performance review. The list of beneficiaries by the VPA was submitted to VVB and based on the review of list, their agreement with CME, water quality test reports and other evidence inter alia, VVB concluded that the VPAs were implemented in line with the registered VPA-DDs and also in line with the framework of registered PoA.

Monitoring procedure of GHG data is found sufficient and in accordance with the procedures stipulated under the registered monitoring plan.

Any Project Design Change been sought and approved by GS Secretariat for the project?	☐ Yes ☒ No	NA
Any Changes in the monitoring Plan	☐ Yes ☒ No	NA
Any changes in the sustainable development monitoring plan?	☐ Yes ☒ No	NA

The timeline of the project's implementation is as follow:

Milestone of the project activity	Timeline	Assessment by the verification team																					
Crediting period: i. GS 11098: 27/11/2021-26/11/2026, ii. GS 11133: 26/11/2021-25/11/2026 iii. GS 11134: 26/11/2021-25/11/2026, iv. GS 11135: 09/01/2022-08/01/2027, v. GS 11136: 12/12/2021-11/12/2026, vi. GS 11137: 10/01/2022-09/01/2027 The VPA DDs mentioned the expected dates of the crediting periods as all the VPAs were not implemented at the time of VPA inclusions therefore expected date as per Paragraph 4.1.40 of Principles & Requirements (Version 1.2) was mentioned. During the verification the start date is mentioned actual date of rehabilitation of first borehole. The date is verified in compliance with the above cited para of the 'Principles & Requirements (Version 1.2)'. The dates were verified with the certificates of rehabilitation of first borehole in each VPA.																							
1 st monitoring period	<table border="1"> <thead> <tr> <th>VPA No.</th><th>Start date</th><th>End date</th></tr> </thead> <tbody> <tr> <td>VPA01</td><td>27/11/2021</td><td>24/07/2022</td></tr> <tr> <td>VPA02</td><td>26/11/2021</td><td>24/07/2022</td></tr> <tr> <td>VPA03</td><td>26/11/2021</td><td>24/07/2022</td></tr> <tr> <td>VPA04</td><td>09/01/2022</td><td>24/07/2022</td></tr> <tr> <td>VPA05</td><td>12/12/2021</td><td>24/07/2022</td></tr> <tr> <td>VPA06</td><td>10/01/2022</td><td>24/07/2022</td></tr> </tbody> </table>	VPA No.	Start date	End date	VPA01	27/11/2021	24/07/2022	VPA02	26/11/2021	24/07/2022	VPA03	26/11/2021	24/07/2022	VPA04	09/01/2022	24/07/2022	VPA05	12/12/2021	24/07/2022	VPA06	10/01/2022	24/07/2022	Verification team has verified the same from the monitoring report. Also, the monitoring period is within the first crediting period of respective VPAs. The crediting periods dates also verified from the GS review forms.
VPA No.	Start date	End date																					
VPA01	27/11/2021	24/07/2022																					
VPA02	26/11/2021	24/07/2022																					
VPA03	26/11/2021	24/07/2022																					
VPA04	09/01/2022	24/07/2022																					
VPA05	12/12/2021	24/07/2022																					
VPA06	10/01/2022	24/07/2022																					

The project activity was implemented, and the details of beneficiaries described in the recent version of GS4GG VPA-DDs. Based on physical site visit, interview and the reviewed project documentation along with documentary evidence, it can be confirmed that the project implementation is in accordance with realized technology. The project has been implemented and operated as described in the recent version of VPA-DDs. The monitoring and sustainable development indicators parameters are also monitored as per the recent version of VPA-DDs and GS4GG guideline and found to be appropriate.

Assessment of actual emission reductions with the estimate emission reductions in POA/VPA-DDS:

Estimated Emission Reduction as per Registered/Approved POA/VPA-DDS for the current monitoring period:	
	GS 11098 38,453 tCO ₂ e
	GS 11133 38,613 tCO ₂ e
	GS 11134 38,613 tCO ₂ e
	GS 11135 31,563 tCO ₂ e
	GS 11136 36,049 tCO ₂ e
	GS 11137 31,403 tCO ₂ e

Actual Emission Reduction for the Monitoring Period	GS 11098	tCO ₂ e
	GS 11133	34,531 tCO ₂ e
	GS 11134	34,877 tCO ₂ e
	GS 11135	22,813 tCO ₂ e
	GS 11136	33,293 tCO ₂ e
	GS 11137	22,686 tCO ₂ e
Is any increase of VER's occurred?	No	
Reason for Increase of CER's	N/A	

In summary, verification team found that the actual emission reductions are lower than to the estimate of the registered project for the current monitoring period, if the same fnrb value would have been used in baseline scenario.

Verification team considers the project description in the project activity contained in the Monitoring report to be in line with the registered POA/VPA-DDs and complete and accurate. The Monitoring report complies with the relevant methodology, tools, forms and guidance applied in the registered POA/VPA-DDS.

Sampling Plan:

During the physical verification a random sampling approach has been used by the verification team to verify the reported values of the monitored parameters as listed in the MR which are determined through sampling by PP.

Sampling approach during verification audit is conducted in accordance with "Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities", Version 04.0/23/ and the "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities, Version 09.0/23/.

The verification team followed the "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" version 09, para 29 and 33, esp. for taking samples out of the PP's sample. VT has adopted the acceptance sampling approach in order to verify the sampling result of the PP for the applied verification period.

For the determination of VVB's acceptance sample size, verification team assumed the following factors:

1. Acceptable quality level (AQL) - 0.1%
2. Unacceptable Quality Level (UQL) – 20%
3. Producer risk- 5%
4. Consumer risk- 5%

Verification team has determined acceptance sample size for all the sample survey parameters based on the "Table. Sample size and acceptance number based on AQL, UQL, and producer and consumer risks" of standard "Sampling and surveys for CDM project activities and programme of activities" version 09.0/23/. The verification team reviewed 22 sample which are over and above the minimum sample size. The supportive documents were shared by the PP during physical assessment.

The actual number of sample size where the acceptance survey was done given below:

Parameters	Total Population	PP's sample size	Acceptance sample size (n)	Acceptance Number (z)	Sampling method used
For all monitoring parameters as per the MR (Qp, clean boil, Qp, rawboil, y, Up, y)	49,057 (HHS) & 226 Boreholes	160 (Other than water quality) 35 (For water quality)	22	1	Acceptance sampling using Random sample and weighted average of each technology.

During physical assessment, verification team interviewed sample household users of project boreholes, applying the random selection technique to cross check the data reported by PP. Verification team has checked the PP samples result with the physical assessments and interview and results, monitoring forms, technical details of the project technology, households data base as per the ER sheet and found no discrepancies. The result of the survey is given below:

Parameters	VVB Sample size (n)	No of PP's record beyond unacceptable level (C)	Accepted/Rejected
Monitoring parameters as per the MR, including baseline surveys.	22	0	Accepted

PP's sampling monitoring records/data results were not found discrepant during the KBS verification physical assessment/desk review. All the physically assessed samples by verification team were showing similar result as reported by PP in its monitoring records. Physical audit results/observation is found to be in line with PP surveys and Water Quality Tests results. Further, the verification team reviewed all the primary monitoring records to assess the consistency of information in MR and ER calculation spreadsheet and found the monitoring data to be correctly transcribed. Based on that, verification team concludes that sampling results and values presented by PP in the MR and spread sheet and results of survey and Water Quality Tests are consistent with the physical assessments observation and interview with the end users.

The sample calculation was undertaken by the CME by using the CDM guidelines by using the 95/10 Confidence/Precision and the results of sampling were tested for the actual Confidence/Precision, it was observed that the results met the desired Confidence/Precision.

Hence, verification team confirms that PP's survey/sampling records to be acceptable in line with the requirements of the Sampling Standard and Guidance.

Findings: CAR#01, CL#01, CL#02 & CL#06 were raised and closed satisfactorily. Refer section 7 for details of findings.

Opinion:

- In the opinion of assessment team, the implementation and operation of the project activity is in compliance with the description in the recent version of GS4GG VPA-DDS.
- The actual emission reductions for the current monitoring period are not higher as indicated in previous section with the reasons.
- The verification team along with physical observations, objective evidence collections, data generation and recording analysis also considered the views obtained in these interviews while arriving at Verification Opinion.

3.3 Compliance of monitoring plan with the monitoring methodology including applicable tool(s)

Discussion:

The VVB verification team is able to confirm that the monitoring plan contained in the recent version of GS4GG POA/VPA-DDS/P25/ is in accordance with the approved methodology applied by the project activity “Technologies and Practices to Displace Decentralized Thermal Energy Consumption” version 3.1/6/.

The monitoring plan along with sampling & survey for baseline as well as the project case is described in the recent version of GS4GG POA/VPA-DDS.

During the verification all relevant monitoring parameters (as listed in the POA/VPA-DDS /14//2/) have been verified about the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures.

Findings:

CL#03, CL#04, CL#05 were raised and closed satisfactorily. Refer section 7 for details of findings.

Opinion:

The monitoring plan mentioned in the registered/recent version of GS4GG POA/VPA-DDS is in line with the applied methodology i.e., “Technologies and Practices to Displace Decentralized Thermal Energy Consumption” version 3.1. The monitoring mechanism is in line with the methodology and is effective and reliable.

3.4 Post registration changes, if any

NA

3.5 Compliance of monitoring activities with registered monitoring plan

Discussion:

The monitoring has been carried out in accordance with the monitoring plan contained in the registered/recent version of GS4GG VPA-DDS.

During verification, all relevant monitoring parameters have been verified with regard to the appropriateness of the applied measurement/determination method and applied QA/QC procedures. It is confirmed that the monitoring parameter has been measured / determined without material misstatements. According to the methodology, a Total beneficiary Record, Detailed Customer Database, and Project Database are maintained.

The verification team reviewed the actual monitoring during the physical assessment and from document review and compared it against the requirements of the monitoring plan in the POA/VPA-DDs and found in line with the registered monitoring plan. The sampling plan implemented by the PP, Guangzhou Iceberg Environmental Consulting Services Co., Ltd. project team in Rwanda in accordance with the applied approved monitoring methodology and recent version of GS4GG POA/VPA-DDs.

According to the recent version of GS4GG POA/VPA-DDS, the verification team summarize the findings of the monitoring approach applied.

Records of Beneficiaries:

Verification team has reviewed the agreement with user’s records /11/ which the CME has maintained in both electronic and paper records. Verification team has crosschecked randomly selected electronic records to ensure that they accurately reflected the respective paper records of each user/HH and

further verified a sample of these paper agreement with users/ carbon rights form while conducting the physical assessment.

The VPA has established 49,057 HHs, verified with the agreement and the VPA also monitors the number of persons per household, therefore the VPA are providing the access of safe water to total 196,974 persons for total 6 VPA. It is assumed that people need water every day of the year, based on the sectoral expertise of VVB, it is confirmed that the calculation is adequately reported in ER sheet.

During physical assessment and desk review, randomly names, etc. in data base cross checked with HH's agreement with CME recorded as hard/scan copies and found to be correct.

Based on above, verification team can confirm that the boreholes assessed during the physical assessment were all found to be properly labelled, and the PP has ownership right on emission reductions accrued from this project activity which was confirmed by carbon rights forms/P12/. Therefore, it is concluded that the project is not a double-counting emission reduction. VVB has undertaken the acceptance sampling to verify the HH's records, project implementation records inter alia. CME also furnished the required approval from the local statutory bodies during the onsite inspection. 'Mr David' shown all the compliances during the onsite inspection to team leader and local expert.

Data Management

The results of all Monitoring Usage Surveys/P09/, Project Technology Days, and other parameters are collated in excel spreadsheets format. The documentation procedure that CME has devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in office of CME. The data management was physically verified and discussed at the time of physical assessment and found correct.

Description of staff conducting monitoring activities

All surveys are administered by trained staffs of CME, local to the area and conversant in the local dialects to ensure that responses were consistent and not biased by any regional language barriers. Field staffs were provided with an English version of the questionnaire to provide for the greatest possible standardisation of responses. It was explained to the respondents that the answers to the survey are analysed as a group and that no individual names are used in this analysis; the reason to take peoples' names and addresses is so that they can be found again to conduct further monitoring tasks. The staff conducting the monitoring activities were interviewed at the time of physical assessment and found that staff is well versed and has proper knowledge of conducting the monitoring activities.

Maintenance of total water Beneficiaries

Accurate records were kept and stored both electronically and in paper format. The agreement signed with the end users were verified by the verification team and also the users were interviewed during the physical assessment by the VVB.

The data base in the following template as reproduced in MR was verified by the VVB during physical assessment. The users IDs were further verified through interviewing the HHs during the physical assessment undertaken.

The following details are recorded in the project database, refer the template below:

Bore hole ID
Rehabilitation Date

End date of MR1
Days out of work
Days of work
Hand Pump Type
Geographic Coordinates
Province
District
Cell
Sector
Village
Number of households
Number of persons

Filed Tests

Complying the VPA-DDS requirements, the following field studies were performed:

- a. Water Consumption Field Test (Surveyed by CME and verified by the VVB)
- b. Water quality tests by the third-party labs.

These surveys and studies have been made available to the VVB and are the verification is summarized below.

Water Quality Tests (WQTs)

The quality of the treated water is assessed to ensure that it fits human consumption. The standard used to assess the water quality meets requirements of the applied methodology. It is conducted quarterly, with the first test conducted within 6 months of the project start date. At least once every two years, the water quality test will be performed in accredited laboratories. The samples were selected by Simple Random Sampling. We used equation (1) of “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)” to calculate the sample size. The result is 18.78 ~19. Furthermore, according to paragraph 14 of “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)”, a minimum sample size of 30 shall be chosen. CME chose 35 samples out of 226 boreholes to ensure the precision. The water quality test has been made in the Water Quality Testing Laboratory of the third-party lab (IPRC Kigali Engineering Laboratory) during this monitoring period on. The detailed results of each test have been submitted to VVB and VVB found that the tests met the water quality in terms of Ecoli and other parameters. The third party was appointed by the CME to undertake the test, the samples were also drawn by the third party and carried out the tests as per the WHO standard. The labs test reports furnished by CME to VVB and VVB based on the local expertise concluded that the tests were adequately undertaken by the third party. VVB observed that the samples were taken higher than the desired samples and the sampling results met the desired Confidence/Precision as reported in the previous section. Since none of the sample tested for the WQTs failed for E_{coli} and othet parameters therefore the required Confidence/Precision was sufficiently met..

Usage Survey - The Usage Survey is included in the Project Survey, there is no individual questionnaire for Usage Survey. The Project Survey was carried out between 25/07/2022 to 25/08/2022. The result from the usage survey is 100% used to calculate emission reduction. VVB

undertaken the acceptance sampling test to verify the appropriateness of CME's survey and based on the VVB's sampling it can be concluded that the survey undertaken by the CME were adequate as no variation found between the VVB's survey and CME's survey. The user survey was considered by taking a total of 160 samples and multi stage sampling approach as per the CDM sampling guidelines, since the usage was found 100% therefore VVB concluded that the desired Confidence/Precision was adequately met.

Water Consumption Filed Tests (WCFT)

The WCFT was carried out between 25/07/2022 to 25/08/2022. The result from the survey are averaged and the capped value of 7 liter/person is applied and the same has been verified in the subsequent section under monitoring parameters. VVB undertaken the acceptance sampling test to verify the appropriateness of CME's survey and based on the VVB's sampling it can be concluded that the survey undertaken by the CME were adequate as no variation found between the VVB's survey and CME's survey. The WCFT survey was considered by taking a total of 160 samples and multi stage sampling approach as per the CDM sampling guidelines, since the capped value is applied therefore VVB concluded that the desired Confidence/Precision was adequately met.

Project Survey - Sampling according to "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" to conduct Project Survey. CME calculated that 2 was the minimum number of boreholes should be sampled to satisfy the 95/10 rule of applied methodology being a mean parameter. Hence, CME randomly chose 8 boreholes covering the all 6 VPAs to maintain the representativeness. CME also randomly chose 20 user households from each borehole, i.e. 160 user households in 8 boreholes. Data collected during the project surveys explores the following characteristics:

General information - Name, address, telephone number etc.

Household socio-demographic information.

Water use characteristics.

During this monitoring period the Project Survey has been conducted between 25/07/2022 to 25/08/2022. A more detailed description of the results is made in a separate document "2-Data Recording Form for Project Survey", and furnished to the VVB.

The project survey was considered by taking a total of 160 samples and multi stage sampling approach as per the CDM sampling guidelines, since the usage was found 100% therefore VVB concluded that the desired Confidence/Precision was adequately met.

Leakage - The PDD has described what sources of leakage were relevant to the VPA and what have been discounted.

The potential sources of leakage listed in the methodology have been investigated, and addressed below:

a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

The displaced baseline technology is three stones. It will not be reused outside the project boundary because It is reused outside the project boundary because it is still used for cooking after the implementation of the Project" and therefore, the implementation of the Project does not lead these users to boil water with wood fuel.

b) Non-project users who previously used lower emitting energy sources with NRB or fossil fuels saved under the project activity.

The costs of low emitting water purification technologies, such as filtration and chlorination, are much higher than boiling with wood fuel. Users of these technologies are not price sensitive. Therefore, the implementation of the Project will not lead these users to boil water with wood fuel, even if the price of wood fuel becomes cheaper because of the reduction of demand caused by the Project. This leakage source can therefore be discounted.

c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

Considering that the project only saves 97,059 tons (Bb,y) of biomass annually while the total amount of above-ground biomass of Rwanda is 75 million tons, the Project does not affect NRB fraction.d) The VPA population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology. The space heating effect of boiling water is negligible. Therefore it is highly unlikely that some other form of heating will be adopted for compensating the space heating effect of boiling water. e) By virtue of promotion and marketing of new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

The project did not promote any new technology with high efficiency. It will not stimulate people to boil water.

Therefore, a value of 0 is applied for leakage during this monitoring period. Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

VVB confirms based on the above mentioned justification and also verified by VVB during the site visit that no HHs are transferring to other methods of water treatment, so argument for not accounting the leakage is reasonable.

Hygiene campaign – The project runs less than one year. Hygiene campaign has not been held in this monitoring period. It will be held in next few months before the completing of one year. The justification was found adequate by the VVB being the operation of project has been started recently. It was confirmed by the representative of CME during the onsite inspection that the hygiene campaigns will be part of next verification.

Calculation of Emissions Reductions

Emissions reductions were calculated using the results of the, Usage Surveys and baseline survey, water quality test inter alia, taking into consideration values for NRB and leakage.

The monitoring has been carried out in accordance with the monitoring plan contained in the recent version of GS4GG POA/VPA-DDs/14//2/.

The verification team assessed the monitoring techniques and each monitoring value in the monitoring report; and provide a short summary on the verification of every parameter listed in the monitoring plan and used for calculation of emission reductions.

The monitored parameters of the project are in line with the recent version of GS4GG POA/VPA-DDs and the applied GS4GG methodology /6/. Brief descriptions of the monitored parameters are listed below:

Ex-Post Parameters:

3.5.1. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	Q _{p,y}
Unit	Litres/person.day
Description	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day
Source of data	Water consumption field test Means of Verification by VVB: Database was verified by the VVB and confirmed that the capped value is used in the calculation of emission reductions. VVB

	undertaken the acceptance sampling to verify the appropriateness of CME's sampling during onsite inspection and concluded that the per person water consumption was higher than the capped value.
Value(s) applied	Capped at 6.66
Measurement methods and procedures	The data obtained by WCFT through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The data obtained by WCFT through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". The WCFT was conducted by CME and ARDE from 26/07/2022-18/08/2022. The actual value is 8.96L. According to the applied methodology, the cap value for full-day premises is 7. So CME capped this value as 7 for each project borehole. As an average value for all project boreholes, the result is 6.66. VVB also verified the water consumption during onsite audit and found no significant variation in both. Moreover the capped value of water consumption is used thus it also confirms the meeting of sampling reliability.
Monitoring frequency	At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology
QA/QC procedures	Means of Verification by VVB: The trained staff of CME was deployed for the surveys and VVB interviewed the staff and found them knowledgeable and competent.
Purpose of data	Calculation of CO2e emissions reductions
Additional comment	-

3.5.2. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO2e
Data/parameter	$Q_{p,rawboil,y}$
Unit	Litres per person per day
Description	Quantity of raw or unsafe water that is still boiled after installation of the water treatment technology.
Source of data	Water consumption field test Means of Verification by VVB: Database was verified by the VVB and confirmed that the capped value is used in the calculation of emission reductions. VVB undertaken the acceptance sampling to verify the appropriateness of CME's sampling during onsite inspection and concluded that the using of raw water boiling is no more in use after the rehabilitation of project boreholes.
Value(s) applied	0

Measurement methods and procedures	Water Consumption Field Test Means of Verification by VVB: The data obtained by WCFT through sampling survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The WCFT was conducted by CME and ARDE from 26/07/2022-18/08/2022. CME considered the 160 samples to monitor the value by taking representative samples from each VPA. CME considered the 160 samples to monitor the value by taking 20 samples from each of 8 boreholes. The sampling/survey was undertaken by the trained staff of CME, the HH's selected for survey were distributed 20 liters jerrycans for water collection and then the CME's staff monitored the water consumption during WCFT. Database was verified by the VVB and confirmed that the capped value is used in the calculation of emission reductions. VVB undertaken the acceptance sampling to verify the appropriateness of CME's sampling during onsite inspection and concluded that the using of raw water boiling is no more in use after the rehabilitation of project boreholes. VVB also verified the water consumption during onsite audit and found no significant variation in both. Moreover the capped value of water consumption is used thus it also confirms the meeting of sampling reliability.
Monitoring frequency	- The WCFT was conducted by CME and ARDE from 26/07/2022-18/08/2022. - At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology
QA/QC procedures	Means of Verification by VVB: The trained staff of CME was deployed for the surveys and VVB interviewed the staff and found them knowledgeable and competent.
Purpose of data	Calculation of baseline and project emissions
Additional comment	Nil

3.5.3. Data/Parameter

Relevant SDG Indicator	SDG 13 (Climate Action), SDG 6 (Safe Water and Sanitation)
Data/parameter	Q _{p, cleanboil,y}
Unit	Liters per person per day
Description	Quantity of safe (treated, or from safe supply) water boiled in the project scenario p, after installation of project technology
Source of data	Water consumption field test Means of Verification by VVB: Database was verified by the VVB and confirmed that the capped value is used in the calculation of emission reductions. VVB undertaken the acceptance sampling to verify the appropriateness

	of CME's sampling during onsite inspection and concluded that the using of raw water boiling is no more in use after the rehabilitation of project boreholes.
Value(s) applied	0
Measurement methods and procedures	Water Consumption Field Test Means of Verification by VVB: The data obtained by WCFT through sampling survey as per the applied methodology as well as "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)" and "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)". -The WCFT was conducted by CME and ARDE (Impementation partner) from 26/07/2022-18/08/2022. -At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology Means of Verification by VVB: The trained staff of CME was deployed for the surveys and VVB interviewed the staff and found them knowledgable and competent. CME considered the 160 samples to monitor the value by taking reprentative samples from each VPA. CME considered the 160 samples to monitor the value by taking 20 samples from each of 8 boreholes. The sampling/survey was undertaken by the trained staff of CME, the HH's selected for survey were distributed 20 lietrs jerkins for water collection and then the CME's staff monitored the water consumption during the survey. Database was verified by the VVB and confirmed that the capped value is used in the calcultaion of emission reductions. VVB undertaken the acceptance sampling to verify the appropriateness of CME's sampling during onsite inspection and concluded that the using of raw water boiling is no more in use after the rehabilitation of project boreholes. VVB also verified the water consumption during onsite audit and found no significant variation in both. Moreover the capped value of water consumption is used thus it also confirms the meeting of sampling reliability.
Monitoring frequency	At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology
QA/QC procedures	Means of Verification by VVB: The trained staff of CME was deployed for the surveys and VVB interviewed the staff and found them knowledgable and competent.
Purpose of data	Calculation of project emissions
Additional comment	Nil

3.5.4. Data/Parameter

Relevant SDG Indicator	SDG 6 (Clean Water and Sanitation) Indicator 6.1.1 – Proportion of population using safely managed drinking water services
Data/parameter	Quality of the treated water
Unit	As appropriate in alignment with QA/QC procedures
Description	Performance of the treatment technology – less than 1 CFU of E.Coli / 100 ml of safe water
Source of data	Water Quality Tests
Value(s) applied	Acceptable
Measurement methods and procedures	Water Quality Test
Monitoring frequency	Quarterly lab tests undertaken by the third party lab Means of Verification by VVB: The water test results were furnished to VVB and based on the submitted evidence VVB concluded that all the tests meets the requirements of WHO. VVB would like to highlight the following requirement of applied methodology for 'Water Quality' at page 51/92: Water quality testing: <i>"Water quality must be tested every quarter, with the first test within 6 months of the stated project start date. In addition, PPs shall ensure that water quality is tested at least once during seasons where there is a high chance of contamination, for example, the rainy season. Local non-accredited laboratories can do the quarterly water quality testing. However, at least once every two years, accredited laboratories must perform the water quality testing. If accredited laboratory results differ materially from non-accredited laboratory results, testing with the aberrant non-accredited laboratory must be discontinued. If local labs conduct the testing, the testing protocol should be provided to the DOE for validation. Also, in any case where the national laws on water quality testing are more stringent, these national standards apply."</i> The para allows the CME to undertake the quarterly test in local labs and at least once in two years in accredited laboratory. Since the project has not completed the two years therefore the requirements of accredited lab is not applicable for this monitoring period. VVB observed that the tests were undertaken as per the 'WHO' standard and thus accepted it being the first verification and the period doesn't fall in 2 years requirements for accredited lab/national standards. Moreover, the methodology has the following monitoring requirements as the applied version 3.1 of TPDDTEC under monitoring parameter.

	<table border="1"> <tr> <td>Data / Parameter:</td><td>Quality of the treated water</td></tr> <tr> <td>Data unit:</td><td>As appropriate in alignment with QA/QC procedures</td></tr> <tr> <td>Description:</td><td>Performance of the treatment technology - less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml of safe water</td></tr> <tr> <td>Source of data:</td><td>Water quality test</td></tr> <tr> <td>Monitoring frequency:</td><td>Quarterly</td></tr> <tr> <td>QA/QC procedures:</td><td>Transparent data analysis and reporting</td></tr> <tr> <td>Any comment:</td><td></td></tr> </table> Therefore CME did not monitor the rest of the parameters, however CME is in agreement that the all parameters shall be monitored from the next 'Performance Review.	Data / Parameter:	Quality of the treated water	Data unit:	As appropriate in alignment with QA/QC procedures	Description:	Performance of the treatment technology - less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml of safe water	Source of data:	Water quality test	Monitoring frequency:	Quarterly	QA/QC procedures:	Transparent data analysis and reporting	Any comment:	
Data / Parameter:	Quality of the treated water														
Data unit:	As appropriate in alignment with QA/QC procedures														
Description:	Performance of the treatment technology - less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml of safe water														
Source of data:	Water quality test														
Monitoring frequency:	Quarterly														
QA/QC procedures:	Transparent data analysis and reporting														
Any comment:															
QA/QC procedures	Means of Verification by VVB: The water test results were furnished to VVB and based on the submitted evidence VVB concluded that all the tests meets WHO requirements. Verification team also confirmed that the seasonal variance is also factored into the sampling of water quality tests as quarterly samples are taken into account, which demonstrates the coverage of representative season/s. The water quality test has been made in the Water Quality Testing Laboratory of the IPRC Kigali. The lab collected the samples from the water sources. At least once every two years, the water quality test should be performed in accredited laboratories.														
Purpose of data	Criteria of methodology - To test water quality for safety of human consumption.														
Additional comment	-														

3.5.5. Data/Parameter

Relevant SDG Indicator	Value obtained in this monitoring period
Data/parameter	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p during year y
Source of data	Annual usage Surveys
Value(s) applied	100%
Measurement methods and procedures	Field Study
Monitoring frequency	Annually; the above value is valid from 26/11/2021 to no later than 25/11/2022 as per the applied methodology
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of emission reductions (SDG 13) and number of persons consuming safe water supplied by the Project (SDG 6)
Additional comment	$U_{p,y}$ is based on accumulative active connections at the end of the monitoring period, since it's first MP, no drop-off registered, hence $U_{p,y}$ is set to 1. Means of Verification by VVB:

	The survey results furnished to VVB and it was witnessed that no dropoff cases found. VVB also undertaken the acceptance sampling and found the similar trend during the onsite inspection.
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3.5.6. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e and SDG 6 / Indicator 6.1.1																
Data/parameter	N _{p,y}																
Unit	Persons.days																
Description	Number of person. days consuming water supplied by project scenario p through year y																
Source of data	D16-22 of sheet SDG13 of Excel table "1-SDG Outcomes Calculation Form-MP1st"																
Value(s) applied	<table border="1"> <thead> <tr> <th>VPA No.</th><th>Persons.days</th></tr> </thead> <tbody> <tr> <td>01</td><td>6,238,172</td></tr> <tr> <td>02</td><td>7,106,802</td></tr> <tr> <td>03</td><td>7,177,865</td></tr> <tr> <td>04</td><td>4,695,103</td></tr> <tr> <td>05</td><td>6,851,892</td></tr> <tr> <td>06</td><td>4,669,012</td></tr> <tr> <td>Total</td><td>36,738,846</td></tr> </tbody> </table>	VPA No.	Persons.days	01	6,238,172	02	7,106,802	03	7,177,865	04	4,695,103	05	6,851,892	06	4,669,012	Total	36,738,846
VPA No.	Persons.days																
01	6,238,172																
02	7,106,802																
03	7,177,865																
04	4,695,103																
05	6,851,892																
06	4,669,012																
Total	36,738,846																
Measurement methods and procedures	Calculated value based on the database records																
Monitoring frequency	At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology.																
QA/QC procedures	Transparent data analysis and reporting																
Purpose of data	Calculation of CO ₂ e Emissions																
Additional comment	Means of Verification by VVB: The data sources have been made available to the VVB. N_{p,y} determined by multiplying the number of households serviced by average number of people per household in the sell D16-22 of sheet SDG13 of Excel table "1-SDG Outcomes Calculation Form-MP1st" respectively, all evidences shared with VVB. The calculation was found adequate by the VVB.																

3.5.7. Data/Parameter

Relevant SDG Indicator	SDG 13/ Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	LE _{p,y}
Unit	tCO ₂ e per year
Description	Leakage in project scenario p during year y
Source of data	The baseline survey and other literature survey
Value(s) applied	0

Measurement methods and procedures	Means of Verification: Baseline and monitoring surveys Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements. VVB confirms based on the above mentioned justification and also verified by VVB during the site visit that no HHs are transferring to other methods of water treatment, so argument for not accounting the leakage is reasonable.
Monitoring frequency	Biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology.
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of leakage
Additional comment	No leakage

3.5.8. Data/Parameter

Relevant SDG Indicator	SDG 6 indicator 6.1.1
Data/parameter	Hygiene campaigns
Unit	Not Applicable
Description	Hygiene campaigns carried out among project technology users
Source of data	Annual hygiene campaigns results
Value(s) applied	The VPAs operate for less than one year. Hygiene campaign has not been held in this monitoring period. It will be held in next few months before the completion of one year operation after the start of the VPAs.
Measurement methods and procedures	Questionnaires and interviews are used in hygiene campaigns to assess hygienic handling of clean water.
Monitoring frequency	Annually
QA/QC procedures	
Purpose of data	Assessment of achievement of SDG 6
Additional comment	Any major changes in the health status of the water users as a result of contaminated water (e.g. an outbreak of water related disease) must be reported.

3.5.9. Data/Parameter

Relevant SDG Indicator	SDG 6 (Clean Water and Sanitation) Indicator 6.1.1 – Proportion of population using safely managed drinking water services
Data/parameter	$P_{p,y}$
Unit	Number
Description	Number of persons consuming water within the project area during year y

Source of data	Project survey																
Value(s) applied	<table> <tr> <th>VPA No.</th><th>P_{p,y}</th></tr> <tr> <td>01</td><td>33,750</td></tr> <tr> <td>02</td><td>31,855</td></tr> <tr> <td>03</td><td>32,320</td></tr> <tr> <td>04</td><td>33,221</td></tr> <tr> <td>05</td><td>33,514</td></tr> <tr> <td>06</td><td>32,314</td></tr> <tr> <td>Total</td><td>196,974</td></tr> </table>	VPA No.	P _{p,y}	01	33,750	02	31,855	03	32,320	04	33,221	05	33,514	06	32,314	Total	196,974
VPA No.	P _{p,y}																
01	33,750																
02	31,855																
03	32,320																
04	33,221																
05	33,514																
06	32,314																
Total	196,974																
Measurement methods and procedures	The data is obtained from WMC of each borehole as per Document "Sworn Statement" . Means of Verification: The records verified by the VVB and also verified with the users during the onsite assessment, the sample 'Sworn Statement' also verified as part of acceptance sampling.																
Monitoring frequency	At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology																
QA/QC procedures	Transparent data analysis and reporting																
Purpose of data	Calculation of number of persons consuming safe water supplied by the project																
Additional comment	-																

3.5.10. Data/Parameter

Relevant SDG Indicator	SDG 5
Data/parameter	T _{p,y}
Unit	Hour
Description	Time spent to fetch and purify water by women and girls per household per day in the project scenario during year y
Source of data	B128 of Excel table “2-Data Recording Form for Project Survey” Monitoring Survey
Value(s) applied	0.44
Measurement methods and procedures	The data is obtained by project survey through sampling survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The project survey was conducted by the CME and ARDE from 25/07/2022-25/08/2022 and the result is 0.44.
Monitoring frequency	At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology.
QA/QC procedures	Transparent data analysis and reporting
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	-

Relevant SDG Indicator	SDG 3
Data/parameter	I _{p,y}
Unit	Percentage
Description	Waterborne illness incidence in the project scenario during year y
Source of data	B127 of Excel table “2-Data Recording Form for Project Survey”
Value(s) applied	0
Measurement methods and procedures	The data is obtained by project survey through sampling survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The project survey was conducted by the CME and ARDE from 25/07/2022-25/08/2022 and the result is 0. Means of Verification: The records verified by the VVB and concluded that figure is correct. The VVB also verified from the onsite inspection from the sampled HHs and it was concluded that no such cases identified. Moreover all the water quality tests undertaken by the third party also substantiates it.
Monitoring frequency	At least biennially; the above value is valid from 26/11/2021 to no later than 25/11/2023 as per the applied methodology.
QA/QC procedures	Transparent data analysis and reporting

Purpose of data	Calculation of reduction of waterborne illness incidence
Additional comment	-

Opinion:

The adequacy and compliance of the monitoring plan in the Monitoring report was found as per the requirements laid by the monitoring methodology and the recent version of GS4GG POA/VPA-DDs. The information flow (from data generation, aggregation, to recording, calculation and reporting) is already included under respective parameter above.

The verification team has verified all the data and collected evidence as per the required monitoring frequency and found to be correct and appropriate meeting the requirements of the applied methodology and recent version of GS4GG POA/VPA-DDs.

3.6 Data not monitored (ex-ante or external parameters)

3.7.1. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e SDG 6 / Indicator 6.1.1
Data/parameter	Cj
Unit	Percentage
Description	Percentage of users of project technology who were already in baseline using a non-boiling safe water supply
Source of data	Baseline surveys The data is obtained through baseline survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The Baseline Survey was conducted by representative and random sampling during from 08/06/2021 to 15/06/2021. The result is 0.0083.
Value(s) applied	0.0083
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The Baseline Survey was conducted by representative and random sampling during from 08/06/2021 to 15/06/2021. The result is 0.0083.
Purpose of data	Calculation of baseline and project emissions (SDG 13) as well as number of persons consuming safe water supplied by the Project (SDG 6)
Additional comment	Also used for SDG 6

3.7.2. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	$W_{b,y}$
Unit	Tons/litre
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of baseline scenario b during year y
Source of data	Default value
Value(s) applied	0.0004 (Default)
Choice of data or Measurement methods and procedures	The default value of $W_{b,y}$ for firewood as per "Application of TPDDTEC Methodology to Safe Water Supply Projects"
Purpose of data	Calculation of baseline emissions
Additional comment	Should be updated if ongoing monitoring surveys show that baseline water boiling technologies change over time.

3.7.3. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	$W_{p,y}$
Unit	t/L
Description	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representatives of project scenario p during year y
Source of data	Default value
Value(s) applied	0.0004
Choice of data or Measurement methods and procedures	According to the baseline and project survey, the same water boiling technology is applied in the baseline and project scenarios. So $W_{b,y}$ and $W_{p,y}$ are equal
Purpose of data	Calculation of project emissions
Additional comment	Should be updated if ongoing monitoring surveys show that baseline water boiling technologies change over time.

3.7.4. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	$f_{NRB,b,y}$
Unit	Percentage
Description	Fraction of biomass used that can be established as non – renewable biomass in the baseline scenario b during year y
Source of data	As per the "TOOL30: Calculation of the fraction of non-renewable biomass, version 3.0". Please refer to registered PDD.
Value(s) applied	96.82% (Validated by the validating VVB and approved by the Sustaincert)
Choice of data or Measurement methods and procedures	As per the "TOOL30: Calculation of the fraction of non-renewable biomass, version 3.0".

Purpose of data	Calculation of baseline emissions
Additional comment	

3.7.5. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	NCV _{b,fuel}
Unit	TJ/ton
Description	Net calorific value of the fuels used in the baseline
Source of data	IPCC default value for wood IPCC (2006) "IPCC Guidelines for National Greenhouse Gas Inventories", Volume 2, Energy, Chapter 1, Introduction, Page 1.19, Table 1.2
Value(s) applied	0.0156
Choice of data or Measurement methods and procedures	According to the baseline survey, wood is the only fuel used in the baseline scenario.
Purpose of data	Calculation of baseline emissions
Additional comment	-

3.7.6. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	EF _{p,fuel,co2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor of fuels used in the project scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5
Value(s) applied	112
Choice of data or Measurement methods and procedures	According to the project survey, wood is the only fuel used in the project scenario.
Purpose of data	Calculation of project emissions
Additional comment	-

3.7.7. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	X _{boil(i)}
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary.
Source of data	Baseline survey in registered PDD
Value(s) applied	0

Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The Baseline Survey was conducted by representative and random sampling during from 08/06/2021 to 15/06/2021. The result is 0.
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3.7.8. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	GWP _{CH4}
Unit	-
Description	Global warming potential for CH4
Source of data	IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	28
Choice of data or Measurement methods and procedures	As per “IPCC Fifth Assessment Report: Climate Change 2014”, the value is 28.

3.7.9. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	GWP _{N2O}
Unit	-
Description	Global warming potential for N2O
Source of data	IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	265
Choice of data or Measurement methods and procedures	As per “IPCC Fifth Assessment Report: Climate Change 2014”, the value is 265.

3.7.10. Data/Parameter

Relevant SDG Indicator	SDG 13 / Climate Change Mitigation measured as reduced tCO ₂ e
Data/parameter	EF _{b,fuel,non co2}
Unit	tCO ₂ /TJ
Description	Non-CO2 emission factor of fuels used in the baseline scenario
Source of data	IPCC default value for Wood: IPCC 2006 Guidelines for National Greenhouse gas Inventories Chapter 2: Stationary Combustion Page 2.23 Table 2.5 IPCC Fifth Assessment Report: Climate Change 2014
Value(s) applied	9.46
Choice of data or Measurement	According to the baseline survey, wood is the only fuel used in the baseline scenario.

methods and procedures	As per “IPCC 2006 Guidelines for National Greenhouse gas Inventories”, the default emission factor of CH ₄ and N ₂ O for stationary combustion is 0.3t/TJ and 0.004t/TJ, respectively. As per “IPCC Fifth Assessment Report: Climate Change 2014”, the global warming potential for CH ₄ and N ₂ O is 28 and 265, respectively. So $EF_{b,non\ CO_2} = 0.3 \times 28 + 0.004 \times 265 = 9.46$.
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Relevant SDG Indicator	SDG 3 / Good health and well-being
Data/parameter	I _b
Unit	Percentage
Description	Waterborne illness incidence in the baseline scenario
Source of data	Baseline survey in the registered PDD
Value(s) applied	38.45%
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The Baseline Survey was conducted by representative and random sampling during from 08/06/2021 to 15/06/2021. The result is 38.45%.
Purpose of data	Calculation of reduction of waterborne illness incidence
Additional comment	-

Relevant SDG Indicator	SDG 5 / Gender equality
Data/parameter	T _b
Unit	Hour
Description	Time spent to fetch and purify water by women and girls per household per day in the baseline scenario
Source of data	Baseline survey in the registered PDD
Value(s) applied	0.90
Choice of data or Measurement methods and procedures	The data is obtained through baseline survey as per the applied methodology as well as “Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)” and “Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)”. The Baseline Survey was conducted by representative and random sampling during from 08/06/2021 to 15/06/2021. The result is 0.90.
Purpose of data	Calculation of percentage reduction of time spent to fetch and purify water by women and girls
Additional comment	-

Findings:

CAR#02, CAR#03 & CAR#04 & CAR#05 were raised and closed. Refer section 7 for details of finding raised.

Opinion:

The default values applied were found to be consistent with the recent version of GS4GG POA/VPA-DDs/14//2/, applied methodology and other relevant sources of data. The values fixed at the time of validation were from IPCC report and few were conservative values.

3.7 Assessment of Data & calculation of GHG Emission Reductions

Discussion:

The project proponent submitted all the relevant data and parameters required to be monitored to the verification team along with the monitoring report. All the parameters required to be monitored as per the recent version of GS4GG VPA DDs/PoA DD have been monitored and reported in the monitoring report. Verification team has reviewed the calculation worksheet /3/ for the emission reduction calculation for the monitoring period as indicated at the cover page (including both the days). Verification team confirms that the formulas, conversions, aggregations and factors are consistent with the monitoring plan in the POA/VPA DDs. The reported data was checked as follows:

- All the necessary data and all the parameters required to be monitored in the recent version of GS4GG VPA-DDS /2/ were reviewed to ensure accuracy.

$$B_{b,y} = (1 - X_{boil}) * (1 - C_i) * N_{p,y} * W_{b,y} * (Q_{p,y} + Q_{p,rawboil,y})$$

VPA No.	BE _{b,i,y}
01	30,311
02	34,531
03	34,877
04	22,813
05	33,293
06	22,686
Total	178,511

Parameter	Description	Unit	Value		Verification Remarks																
B _{b,i,y}	Quantity of fuel consumed in baseline scenario b during the year in tons	ton	<table><tr><td>VPA No.</td><td>B_{b,y}</td></tr><tr><td>01</td><td>16,480.56</td></tr><tr><td>02</td><td>18,775.38</td></tr><tr><td>03</td><td>18,963.12</td></tr><tr><td>04</td><td>12,403.94</td></tr><tr><td>05</td><td>18,101.94</td></tr><tr><td>06</td><td>12,335.01</td></tr><tr><td>Total</td><td>97,059.95</td></tr></table>		VPA No.	B _{b,y}	01	16,480.56	02	18,775.38	03	18,963.12	04	12,403.94	05	18,101.94	06	12,335.01	Total	97,059.95	Formula in line with TPDDTEC, V3.1 Calculated value presented in ER spreadsheet, VVB confirms that the calculaion complies with the methodology as well as the approach registered in VPA-DDs.
VPA No.	B _{b,y}																				
01	16,480.56																				
02	18,775.38																				
03	18,963.12																				
04	12,403.94																				
05	18,101.94																				
06	12,335.01																				
Total	97,059.95																				
f _{NRB,b,y}	Fraction of biomass used that can be established as non – renewable biomass in the baseline scenario b during year y	fraction	96.82%		f _{NRB} determined by complying the tool 30 of CDM, refer the assessment above regarding appropriateness of value.																
NCV _{b,fuel}	Net calorific value of the fuels used in the baseline scenario	TJ/ton	0.0156		- IPCC 2006 default for firewood - The Value is in line with PoA DD/VPA-DDS																
EF _{p,fuel,co2}	CO2 emission factor of fuels used in the project scenario	tCO2/TJ	112.00		- IPCC 2006 default for firewood - The Value is in line with PoA DD/VPA-DDS																
EF _{b,fuel,non co2}	Non-CO2 emission factor of fuels used in the baseline scenario	tCO2/TJ	9.46		- IPCC 2006 default for firewood - The Value is in line with PoA DD/VPA-DDS																

SDG 3: Good health and well-being

The outcome of SDG 3 is quantified as the reduction of waterborne illness incidence compared to baseline scenario. The waterborne illness incidence in the baseline scenario is 38.45% according to Baseline Survey.

SDG 5: Gender equality

The outcome of SDG 5 is quantified as percentage reduction of time spent to fetch and purify water by women and girls. The time spent to fetch and purify water by women and girls per household in the baseline scenario is 0.90 hour according to Baseline Survey.

SDG 6: Clean Water and Sanitation

The outcome of SDG 6 is quantified as number of persons consuming safe water supplied by the project, the direct outcome is calculated, see section E.2.

Project emission:

Project Scenario

$$PE_{p,y} = B_{p,y} * ((f_{NRB,p,y} * EF_{p,fuel, CO2}) + EF_{p,fuel, nonCO2}) * NCV_{p, fuel}$$

Project emissions are also zero because $N_{p,y}$ is 0 in the calculation of $B_{p,y}$ for the duration when the boreholes were non-operational. CME has not claimed any baseline emission outage period.

This is to be noted that non-operational days are excluded from the person days $N_{p,y}$ calculations for baseline as well as project scenario. This is verified a correct approach impact as it would equate the approach of non-considering the project emission scenario.

As per Column “E” and “F” in the “Basic Data” sheet of the ER spreadsheet sheet (Document 1), the days when the boreholes were not functional have been excluded from ER claiming.

SDG 13: Climate Action

Project Scenario Fuel Consumption Calculation

$$B_{p,y} = (1 - C_j) * N_{p,y} * W_{p,y} * (Q_{p,rawboil,y} + Q_{p,cleannoil,y}) \quad (3)$$

Where:

$B_{p,y}$ = Quantity of fuel f consumed in project scenario p during the year y in tons

C_j = Percentage of users of project technology who were already in baseline scenario using a non-boiling safe water supply; the applied value is 0 as per section D.1.

$N_{p,y}$ = Number of person.days consuming water supplied by project scenario p through year y; the applied value as per Section D.2.

$W_{p,y}$ = Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b in year y as per baseline water boiling Test; the applied value is 0.0004 as per Section D.1.

$Q_{p,rawboil,y}$ = Quantity of raw water boiled in the project scenario p per person per day; the applied value is 0 as per Section D.2.

$Q_{p,cleannoil,y}$ = Quantity of safe water boiled in the project scenario p per person per day in year y; the applied value is 0 as per Section D.2.

As a result, $B_{p,y} = 0$ t

Project Emission Reductions:

$$PE_{p,y} = B_{p,y} * ((f_{NRB,p,y} * EF_{p,fuel, CO2}) + EF_{p,fuel, non-CO2}) * NCV_{p, fuel} \quad (4)$$

Where:

$BE_{b,y}$ = Baseline emissions during year y

$PE_{p,y}$ = Project emissions during year y

$B_{p,y}$ = Quantity of fuel consumed in project scenario p during the year y in tons; the applied value is 0 as per calculation in this section above;

$f_{NRB,p,y}$ = Fraction of biomass used that can be established as non-renewable biomass in project scenario p during year y; the applied value is 0.9682 as per section D.1.

$EF_{b,fuel,non-CO_2}$ = Non-CO₂ emission factor of fuels used in the baseline scenario; the applied value is 9.46 as per section D.1.

$EF_{p,fuel,CO_2}$ = CO₂ emission factor of fuels used in the project scenario; the applied value is 112 as per section D.1.

$EF_{p,fuel,non-CO_2}$ = Non-CO₂ emission factor of fuels used in the project scenario; the applied value is 9.46 as per section D.1.

$NCV_{p,fuel}$ = Net calorific value of fuels used in the project scenario; the applied value is 0.0156 as per section D.1.

ER_y = Overall emission reductions achieved by the project activity during year y

$U_{p,y}$ = Cumulative usage rate for technologies in project scenario p during year y, based on cumulative installation rate and drop off rate; the applied value is 100% as per section D.2.

$LE_{p,y}$ = Leakage from project scenario p during year y; the applied value 0 as per section D.2.

As a result, $PE_{p,y} = 0 \text{ tCO}_2\text{e}$

SDG 3: Good health and well-being

The outcome of SDG 3 is quantified as the reduction of waterborne illness incidence compared to baseline scenario, which is calculated as follows:

$$I_{r,y} = I_b - I_{p,y} \quad (5)$$

Where:

$I_{r,y}$ = Reduction of waterborne illness incidence in year y

I_b = Waterborne illness incidence in the baseline scenario; the applied value is 38.45% as per section D.1.

$I_{p,y}$ = Waterborne illness incidence in the project scenario during year y; the applied value is 0 as per section D.2.

As a result, $I_{r,y} = 38.45\%$

SDG 5: Gender equality

The outcome of SDG 5 is quantified as percentage reduction of time spent to fetch and purify water by women and girls, which is calculated as follows:

$$T_{r,y} = (T_b - T_{p,y})/T_b \quad (6)$$

Where:

$T_{r,y}$ = Percentage reduction of time spent to fetch and purify water by women and girls in year y

T_b = Time spent to fetch and purify water by women and girls per household in the baseline scenario; the applied value is 0.90 as per section D.1.

$T_{p,y}$ = Time spent to fetch and purify water by women and girls per household in the project scenario during year y; the applied value is 0.44 as per section D.2.

As a result, $T_{r,y} = 51.11\%$

SDG 6: Clean Water and Sanitation

The outcome of SDG 6 is quantified as number of persons consuming safe water supplied by the Project, which is calculated as follows:

$$P_y = P_{p,y} * (1-C_j) * U_{p,y} \quad (7)$$

Where

- P_y = Number of additional persons consuming safe water supplied by the Project compared to the baseline scenario during year y
- $P_{p,y}$ = Number of persons consuming water within the project area during year y; the applied value as per section D.2.
- C_j = Percentage of users of project technology who were already in baseline scenario using a non-boiling safe water supply; the applied value is 0.0083 as per section D.1.
- $U_{p,y}$ = Cumulative usage rate for technologies in project scenario p during year y; the applied value is 100% as per section D.2.

As a result, P_y is shown as follows:

VPA No.	P_y
01	33,750
02	31,855
03	32,320
04	33,221
05	33,514
06	32,314
Total	196,974

Findings:

No findings raised.

Opinion:

The verification team confirms that

- The complete data set for the monitoring parameters was available as mentioned in the monitoring plan in the PoA/VPA-DDs for the duration of monitoring period.
- The cross checks were undertaken for all the parameters indicated in the respective sections and were found complying with the requirements of the monitoring plan of the registered PoA/VPA-DDs.
- Appropriate methods and formulae for calculating baseline emission, project emissions and leakage have been followed;
- The claimed emission reductions are free from material errors, omissions or misstatements, with a reasonable level of assurance.

3.8 Quality of Evidence to Determine Emission Reductions

The evidence (documents/interview/physical assessment) referred for verification of individual monitoring parameter and fixed parameters are defined section 3.5 and section 3.7 respectively. It can be confirmed by the assessment team that the reported emission reductions have been conservatively calculated. A list of referred documents for verification is also included in Section 6 of this report.

3.9 Management System and Quality Assurance

Verification team evaluated the management systems in place to implement the monitoring of the project activity. This included the organizational structure, roles and responsibilities, data collection, transfer and aggregation procedures, training of personnel, data storage and archiving and emergency procedures for the monitoring system. Based on physical onsite interview with the employee of CMEs/PP, involved in the project monitoring and data collection, inspection of data storage logbook & equipment's and document review. All surveys are administered by trained CME, local to the area and conversant in the local dialects to ensure that responses were consistent and not biased by any regional language barriers. Verification team can confirm that the responsibilities and authorities for monitoring and planning are appropriate and effective for the project type and hence in accordance with monitoring plant of the registered POA/VPA-DDs and applied monitoring methodology.

3.10 Status of Stakeholder consultation & implementation of continuous input/ Grievance mechanism & feedback received

Stakeholder consultation report (SCR) verified by the VVB which was approved by GS during project design review, stakeholders of Category A-G of "Stakeholder Consultation and Engagement Requirements". It was concluded that the relevant stakeholders have been identified and invited and validated by the validating VVB during the design certification.

According to Section B.1.1 and B.1.3 of the SCR available on the GS registry along with the validation reports of the VPAs, various inviting methods were applied for the stakeholder consultation meeting. For the convenience of villagers, an invitation letter in both English and local language was sent to them through broadcast in villages. For some local people, invitation letters were sent to them as formal invitation. Other invitees were invited by email.

According to B.1.5 of the SCR, other means and methods to provide feedback for those who are not able to join the consultation meeting are as follows:

The first way is to use the phone and they could report problems concerning the project by phone.

The following phone numbers were left to participants: 0728684787/0788684787 & 0788443155 & 0788665992. They agreed to converge all related problems they could report them to ARDE/KUBAHO team members.

The second way is to put books in the offices of villages and users could report comments in that books. The representatives of ARDE will check the books every month to see the problems reported and find solutions with users.

The third way is to visit physically the boreholes location and to discuss with their managers and users. The forth way is to report through email.

The following email addressed will be also used for inquiry or comment on the project

Iceberg: Mr. Ji BAO baoji@icebergchina.com

ARDE: Mr. David BAZIRANKENDE bazirankendebdavid@gmail.com

According to Section E of the SCR, a linkage (<http://www.icebergchina.com/contents/86/233.html>) has been created for providing feedback. An email was sent to stakeholders to invite them to provide feedback.

There is a continuous input/grievance mechanism in place for beneficiaries to be able to give feedback on the project. No grievance received during the monitoring period as confirmed by the CME during the physical assessment and also the same has been confirmed by the end users during the physical assessment.

In Section G.1 of MR, CME listed all input and grievance mechanism and verified by the VVB during the onsite assessment. Various ways to ensure representation from all the categories under each of the 6 VPAs for inputs and grievances and approved by the GS as all the 6 VPAs were design certified and included through the VVB validation. The Continuous Input Grievance Expression Process Books have been put in all the villages where the VPA has been implemented. In addition, phone No. and emails address have been left for timely connection. Section G.1 of the MR has been revised accordingly. A photo of a Continuous Input Grievance Expression Process Book has been submitted to VVB, VVB found that households are aware of the feedback mechanism and no grievance raised during the current verification.

4. RECOMMEDATIONS / FORWARD ACTION REQUEST

No FAR has been raised during this monitoring period.

5. VERIFICATION & CERTIFICATION STATEMENT

KBS Certification Services Pvt. Ltd. has been contracted by Guangzhou Iceberg Environmental Consulting Services Co., Ltd. to undertake independent verification and certification for the SDGs reported from the Guangzhou Iceberg Environmental Consulting Services Co., Ltd., GS 11098, GS 11133, GS 11134, GS 11135, GS 11136, GS 11137 for the monitoring period in the Monitoring Report Version 01 (first version):

VPA No.	Start date	End date
VPA01	27/11/2021	24/07/2022
VPA02	26/11/2021	24/07/2022
VPA03	26/11/2021	24/07/2022
VPA04	09/01/2022	24/07/2022
VPA05	12/12/2021	24/07/2022
VPA06	10/01/2022	24/07/2022

The verification is based on the registered POA/VPA-DDs and the Monitoring report for this project. Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the Gold Standard Board.

The management of the Guangzhou Iceberg Environmental Consulting Services Co., Ltd. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Final Monitoring Report Version 5 dated 20/02/2023. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the Guangzhou Iceberg Environmental Consulting Services Co., Ltd. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 5 dated 20/02/2023.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the monitoring period as stated above based on the reported emission reductions in the Final Monitoring Report Version 5 dated 20/02/2023 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, KBS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

KBS confirms the following;

Reporting period:

VPA No.	Start date	End date
VPA01	27/11/2021	24/07/2022
VPA02	26/11/2021	24/07/2022
VPA03	26/11/2021	24/07/2022
VPA04	09/01/2022	24/07/2022
VPA05	12/12/2021	24/07/2022
VPA06	10/01/2022	24/07/2022

Verified and certified SDGs in the above reporting period:

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved				Units/ Products
SDG 13 Climate Action	Emissions Reductions			Amount Achieved		VERs
		VP A No.	Start Dates	End Dates	VERs	
		VP A01	27/11/2021	31/12/2021	4,420	
			01/01/2022	24/07/2022	25,891	
		VP A02	26/11/2021	31/12/2021	5,158	
			01/01/2022	24/07/2022	29,373	

		<table><tr><td>VP A03</td><td>26/11/2021</td><td>31/12/2021</td><td>5,210</td></tr><tr><td></td><td>01/01/2022</td><td>24/07/2022</td><td>29,667</td></tr><tr><td>VP A04</td><td>09/01/2022</td><td>24/07/2022</td><td>22,813</td></tr><tr><td>VP A05</td><td>12/12/2021</td><td>31/12/2021</td><td>2,959</td></tr><tr><td></td><td>01/01/2022</td><td>24/07/2022</td><td>30,334</td></tr><tr><td>VP A06</td><td>10/01/2022</td><td>24/07/2022</td><td>22,686</td></tr><tr><td></td><td></td><td>Total</td><td>178,511</td></tr></table>	VP A03	26/11/2021	31/12/2021	5,210		01/01/2022	24/07/2022	29,667	VP A04	09/01/2022	24/07/2022	22,813	VP A05	12/12/2021	31/12/2021	2,959		01/01/2022	24/07/2022	30,334	VP A06	10/01/2022	24/07/2022	22,686			Total	178,511	
VP A03	26/11/2021	31/12/2021	5,210																												
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	01/01/2022	24/07/2022	30,334																												
VP A06	10/01/2022	24/07/2022	22,686																												
		Total	178,511																												
SDG 3 – Good Health and Well-Being	Reduce the incidence of waterborne illness within the project area	38.45%	Percentage																												
SDG 5 –Achieve gender equality and empower all women and girls	Reduce the time spent to fetch and purify water by women and girls	51.11%	Women having more time for self-empowerment																												
SDG 6 –Ensure availability and sustainable management of water and sanitation for all.	Provide safe water to local residents	<table><tr><td>VPA01</td><td>33,750</td></tr><tr><td>VPA02</td><td>31,855</td></tr><tr><td>VPA03</td><td>32,320</td></tr><tr><td>VPA04</td><td>33,221</td></tr><tr><td>VPA05</td><td>33,514</td></tr><tr><td>VPA06</td><td>32,314</td></tr><tr><td>Total</td><td>196,974</td></tr></table>	VPA01	33,750	VPA02	31,855	VPA03	32,320	VPA04	33,221	VPA05	33,514	VPA06	32,314	Total	196,974	Additional people using safe water														
VPA01	33,750																														
VPA02	31,855																														
VPA03	32,320																														
VPA04	33,221																														
VPA05	33,514																														
VPA06	32,314																														
Total	196,974																														

Location: Faridabad

Date: 28/03/2023



Kaushal Goyal

Managing Director

KBS Certification Services Pvt. Ltd.

6. REFERENCES

S. No.	Name of document
/1/	/1.1/ Initial Monitoring Report, version 02 dated 17/11/2022 /1.2/ Intermediate Monitoring Report, version 03 dated 30/11/2022 /1.3/ Monitoring Report, version 04 dated 27/12/2022 (Submitted for GS review) /1.4/ Final Monitoring Report, version 05 dated 22/02/2023
/2/	- VPA Final VPA-DDs Version 08 dated 14/03/2022 - Validated Stakeholder Consultation Reports available on GS registry
/3/	/3.1/ ER spreadsheets corresponding to initial MR /3.2/ ER spreadsheets corresponding to Final MR
/4/	- GS4GG Principles & Requirements, Version 1.2 dated October 2019 https://globalgoals.goldstandard.org/100-principles-and-requirements/ - GS4GG-Stakeholder Consultation and engagement Requirements Guidelines, v1.2'https://globalgoals.goldstandard.org/102-par-stakeholder-consultation-requirements/ - GS4GG 'Community Services Activity-Requirements', v1.2 https://globalgoals.goldstandard.org/standards/201_V1.2_AR_Community-Services-Activity-Requirements.pdf - Safeguarding Principles & Requirements, v1.2 https://globalgoals.goldstandard.org/103-par-safeguarding-principles-requirements/ - COVID 19 Interim measures - Gold Standard for Global Goals - Programme of Activity Requirements, Version 1.2. https://www.goldstandard.org/project-developers/standard-documents
/5/	Host country criteria (Rules & regulations)
/6/	1) Gold Standard Methodology: "Technologies and Practices to displace decentralized thermal energy consumption" Version 03.1 https://globalgoals.goldstandard.org/407-ee-ics-technologies-and-practices-to-displace-decentralized-thermal-energy-tpddtec-consumption/ 2) "Tool for the demonstration and assessment of additionality (Version 7)" 3) https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf 4) Updated [2018] Environment Impact Assessment and Regulations, 2005 [G.N. No 349/2005)
/7/	Declaration confirming that there is no double counting
/8/	Technical specification manual of boreholes
/9/	Project database Rwanda: VPA
/10/	Baseline surveys as part of VPA validation
/11/	Sworn Agreements signed between CME and user
/12/	Project Survey Reports/forms
/13/	Water Testing Procedures (Confirmed through Onsite Assessment)
/14/	Final PoA-DD, Version 5.0 dated 15/09/2021
/15/	Sampling and sample size sheet includes screen shot of randomizers etc
/16/	2006 IPCC Guidelines for National Greenhouse Gas Inventories volume 2, chapter 1

	https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
/17/	WASH related documents
/18/	Water Quality Test (WQT) Reports issued by, 'Water Quality Testing Laboratory' Lab IPRC KIGALI, Integrated Polytechnic Regional College, Kigali
/19/	http://onlinelibrary.wiley.com/doi/10.1002/2014WR016770/pdf 5
/20/	https://washdata.org/data
/21/	Data Log of Boreholes
/22/	Video evidence of project surveys by the surveyors
/23/	"Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities", Version 04.0 "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities", Version 09.0

7. FINDINGS DOCUMENT

Summary of findings	CL 06	CAR 05	FAR 07
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Table 1. Remaining FAR from validation and/or previous verifications (Applicable for verification)

FAR ID	01	Section no.	GS Review Form	Date:	12/12/2022
Description of FAR					
During the verification the VVB shall check that the emission reductions are not claimed for the case when the borehole water is used for any other purpose than the above stated consumption (limited to drinking, cooking and basic personal hygiene).					
CME shall elaborate how the compliance above FAR was adhered during the monitoring period.					
Project participant response			Date: 16/12/2022		
During the water consumption field test, only water from drinking, food preparation and basic hygiene were counted. The cap value for water consumption (7L/day) was also applied. So no emission reduction is claimed for other purpose than the above.					
Documentation provided by project participant					
11-Water Consumption Field Test-Rwanda borehole					
DOE assessment			Date: 17/12/2022		
VVB confirms that the CME has not claimed the water consumption for the other purpose except drinking & cooking. The same was verified from the acceptance sampling test onsite by the VVB's verification team. Based on the results of acceptance test it can be concluded that, the water consumption is related to the cooking and drinking.					
FAR is closed.					

FAR ID	02	Section no.	GS Review Form	Date: 12/12/2022
Description of FAR				
The PD shall submit all 'Carbon Transfer Form' in order to confirm on the full and uncontested legal ownership of the carbon rights produced by the project at the time of verification. CME shall elaborate how the compliance above FAR was adhered during the monitoring period.				
Project participant response		Date: 16/12/2022		
The PD has submitted all signed “Donation and Carbon Transfer Agreement” with MR during the verification. It has been confirmed on the full and uncontested legal ownership of the carbon rights produced by the project at the time of verification.				
Documentation provided by project participant				
12-Signed evidence documents				
DOE assessment		Date: 17/12/2022		
The VVB designed its acceptance field survey to capture the question raised in FAR and based on the results of acceptance sapling it was concluded that the HHs are aware of the carbon right, signing of agreement with CME and transfer of carbon right. Moreover, the sample beneficiary agreements were also verified. FAR is closed now.				

FAR ID	03	Section no.	GS Review Form	Date: 12/12/2022
Description of FAR				
The PD is requested to submit all the “Donation and carbon transfer agreements” and evidence that the people who signed the agreements were authorized by the whole communities during verification. CME shall furnish the evidence and elaborate how the compliance above FAR was adhered during the monitoring period.				
Project participant response		Date: 16/12/2022		
The PD has submitted all signed “Donation and Carbon Transfer Agreement” and “Community Authorization” with MR during the verification.				
Documentation provided by project participant				
12-Signed evidence documents				
DOE assessment		Date: 28/12/2022		
The VVB designed its acceptance field survey to capture the question raised in FAR and based on the results of acceptance sapling it was concluded that the HHs are aware of the carbon right, signing of agreement with CME and transfer of carbon right. Moreover, the sample beneficiary agreements were also verified. FAR is closed now.				

FAR ID	04	Section no.	GS Review Form	Date: 12/12/2022
Description of FAR				
The project developer shall conduct the physical stakeholder consultation meetings when the COVID-19 situation eases. CME shall furnish the evidence of physical stakeholder conducted, please also report the methodology which includes the invitation, MoM, inter alia in the MR while responding to the FAR. Kindly also furnish a updated LSC report on the GS template by making the changes pertaining to new LSC as track change.				
Project participant response		Date: 16/12/2022		

The physical stakeholder meeting was conducted on 03/09/2021 as per the registered VPA-DD. We have submitted the LSC report to GS on 06/12/2021, please re-check it.

Documentation provided by project participant

15-GS10959 VPA01 Safe Water Project in Rwanda I Stakeholder Consultation Report_20211206tc

DOE assessment

Date: 17/12/2022

The LSC report is furnished to VVB and also it was verified during the onsite assessment that physical LSC was undertaken and HHs were participated and communicated in advance.

Evidence of LSC were also furnished and verified during onsite audit by the verification team.

FAR is closed.

FAR ID	05	Section no.	GS Review Form	Date: 12/12/2022
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Description of FAR

The PP is requested to provide the evidence for monitoring of number of actual users for each borehole. The PP shall monitor the accessibility of local people to all nearby boreholes from the proposed project and other existing boreholes.

CME shall elaborate how the compliance above FAR was adhered during the monitoring period.

Project participant response

Date: 16/12/2022

The water management committees have confirmed that the number of the end users counted in the project only use the project boreholes rather than other existing boreholes. Households who use other water sources have been excluded from the number recorded in the MR. This situation is also reflected in the document "Sworn Statement" which has been submitted.

Documentation provided by project participant

12-Signed evidence documents

DOE assessment

Date: 17/12/2022

During the onsite audit, VVB observed that there are no other water sources that includes boreholes, government/municipality/corporation water lines in the project areas wherein the VVB undertaken the acceptance sampling as part of onsite assessment. The boreholes are installed for the poor communities who are residing in remote locations. VVB undertaken an acceptance sampling to confirm the query raised in FAR during the site visit also confirmed through the 'Sworn Statements' signed off by the users. CME confirmed that the HHs who are using the other source are excluded from their database, this was confirmed from the question asked to user during the onsite assessment. None of project locality was found connected with any safe water access point other than the project borehole wherein the VVB visited. **FAR is closed.**

FAR ID	06	Section no.	GS Review Form	Date: 12/12/2022
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Description of FAR

The VVB shall interview the local users to confirm that the water testing results are communicated to them regularly in line with the WQT test interval.

CME shall elaborate how the compliance above FAR was adhered during the monitoring period.

Project participant response

Date: 16/12/2022

The PD has communicated to users with water testing results regularly in line with the WQT test interval.

Documentation provided by project participant

DOE assessment

Date: 17/12/2022

The VVB designed its acceptance field survey to capture the question raised in FAR and based on the results of acceptance sampling it was concluded that the HHs are aware of the water sample collection by the Kigali based lab. VVB interviewed the village heads for the 4 villages, who are led by the women. Apart that 15 HHs (users) including the men and women were asked on the water quality tests, all were aware about the water quality communicated by the CME's representative. VVB asked the open-ended questions to the users and village heads, for example:

1. Are you aware that some personnel came to the borehole for water sample collection.
2. When he came.
3. Whether he informed the village head (Chairman of Water Committee).
4. Have you suffered from the water borne disease like Diarrhea after using the borehole water.

It was also verified that the Chairman of Water Committee's consent was mandatory for water sample collection.

Villagers also confirmed that none of them fell sick after the use of borehole water, which was not the case in baseline wherein the frequent sickness were common.

Moreover, the all-water quality tests undertaken were also verified.

FAR is closed now.

FAR ID	07	Section no.	GS Review Form	Date: 12/12/2022
Description of FAR				
The treatment capacity limits of project technology/source (lit./day), model of each pump, yield test result (litre/min), daily production is required to be monitored to ensure that the water consumption level applied for emission reductions must not be greater than the treatment capacity of the project technology/sources. PD shall also show if there is another water supply system (stream, pond, etc.) apart from hand pump for other uses of water. VVB shall also verify this. CME shall elaborate how the compliance above FAR was adhered during the monitoring period.				
Project participant response		Date: 16/12/2022		
The PD has conducted a test on capacity of project borehole. It needed about 100 seconds to fill an empty 20L bucket. So in a whole day it can supply 9,000L of water, which is in accord with the estimation in the reply to the reviewer during design review. It can meet the requirement for at least 1,000 persons as per the water consumption field test. The video has been submitted. After the implementation of the project, end users do not use other water supply system except rain water for cleaning room and stream or river water for washing clothes.				
Documentation provided by project participant				
7-Video of water capacity test				
DOE assessment		Date: 17/12/2022		
As responded by the CME the water capacity of the borehole can reach up to 9000 litre/day, the verification team reviewed the per person water consumption recorded in survey and computed it with respect to total users registered in each borehole, it was concluded that the water consumption per borehole was within the threshold level. To verify the video evidence furnished by CME, VVB also calculated the time for filling a water bucket/jerkin during onsite audit. Based on the recorded evidence and onsite audit, VVB confirms that the project didn't claim any overcapacity. Moreover, the water volume for the ex-post ERS is capped as per the GS methodology. VVB also asked the question during the HH's survey that whether they use the water from borehole for cooking and drinking only or for other purpose. The answer was only for cooking and drinking.				
FAR may be closed now.				

Table 2. CL from this validation/verification

CL ID	01	Section no.	MR Template	Date : 12/12/2022
Description of CL				
a) The date of design certification for PoA along with the CPAs covered by the monitoring report shall be reported at the cover page of MR. b) Annual report data is mentioned as N/A at the cover page, rationale shall be provided for the non-application. c) Crediting period start date and end date both shall be reported in section A.4 of MR. Refer the MR filling guideline for the same.				
Project participant response				Date: 16/12/2022
a) The dates of design certification for PoA and VPA are the same, which are reported at the cover page of MR in the latest version. b) We have not submitted the Annual report to GS yet. According to the related rule, if we can finish the verification by December, we do not need to submit it. c) Section A.4 of the MR includes all the related contents.				
Documentation provided by project participant				
Revised VPA DDs				
DOE assessment				Date: 17/12/2022
a) The dates of design certification for PoA and VPA are the same, which are reported at the cover page of MR in the latest version. b) We have not submitted the Annual report to GS yet. According to the related rule, if we can finish the verification by December, we do not need to submit it. c) The MR has been modified in section A.4. Finding is closed now.				

CL ID	02	Section no.	Section C	Date: 12/12/2022
Description of CL				
CME shall clarify how the samples were selected for each of the monitored parameter subject to sampling. While doing so CME shall also report what criteria adopted for the sampling in terms of required Confidence/Precision, expected deviation, mean in terms of sampling requirements. The entire sampling shall also report that how CME has ensured that the chosen sample size and results met the desired Confidence/Precision.				
Project participant response				Date: 16/12/2022
The samples were selected by Simple Random Sampling in water quality test. We used equation (1) of "Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0)" to calculate the sample size. The result is 18.78. Furthermore, according to paragraph 14 of "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)", a minimum sample size of 30 shall be chosen. So we chose 35 samples out of 226 boreholes (which have been implemented before May, 2022) to ensure the precision. For project survey and usage survey, we used systematic sampling. 160 user households from 8 boreholes can meet 95/10 as per Guidelines for sampling and surveys for CDM project activities and programmes of activities (Version 04.0) and "Standard: Sampling and surveys for CDM project activities and programmes of activities (Version 09.0)". This part has been added in section C of the latest version of MR.				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 17/12/2022
The criteria for the sample selection is now part of updated MR. PP had considered the adequate sample size, VVB independently verified the same with the CDM sampling calculator. Finding is closed based on the revised information provided and updated MR.				

CL ID	03	Section no.	Section C	Date:	12/12/2022
Description of CL					
It was verified during the site visit that the water quality tests were undertaken by the unaccredited lab explicitly (Polytechnic) therefore the methodology adopted for tests is not part of lab reports. CME shall furnish the methodology adopted by the third-party lab.					
Project participant response					Date: 16/12/2022
We will discuss with the lab to confirm if it can meet the related requirements. If not, we will test water quality by a lab with accreditation from competent authorities before two years from the start date according to the requirement of the applied methodology.					
Documentation provided by project participant					
Revised MR					
DOE assessment					Date: 17/12/2022
Since the tests were undertaken in third party labs, VVB during the site visit raised this query with the project implementer. Based on the information provided by MR David (CME's responsible person), regarding the appointment of third party lab, their methodology of sample collection inter alia, VVB is satisfied with the results.					
Finding is closed.					

CL ID	04	Section no.	Section C	Date:	12/12/2022
Description of CL					
The CME shall clarify how the methodology requirement was met for the usage survey of borehole: "The minimum total sample size is 100, with at least 30 samples for project technologies of each age being credited" and also report how the selected boreholes could be representative for the operational status of all boreholes. This shall be part of monitoring report.					
Project participant response					Date: 16/12/2022
There are two guidelines for usage survey of applied methodology. Annex 9 "Guidelines for carrying out usage surveys for projects implementing household water filtration technologies" and Annex 10 "Requirements and Guidelines for carrying out usage surveys for projects implementing improved cooking devices", neither of them is applicable for this parameter. How the selected user households could be representative for the operational status of all boreholes is clarified in "Project Survey" part of Section C of the MR. In addition, our local partner maintains all the boreholes continuously. If they find or are noticed by the water management committees that any borehole is out of work, they will fix it as soon as possible, which has been proved by Document 6.					
Documentation provided by project participant					
6-Boreholes maintenance logbook					
DOE assessment					Date: 17/12/2022
Based on the information provided by the CME, review of the document furnished by the VVB and the dates of rehabilitation of boreholes under the projects. It was observed that the boreholes are repaired/rehabilitated in recent time therefore they don't constitute more than one age group. The sampling for the 1 age group is adequate in view of VVB.					
Finding is closed now.					

CL ID	05	Section no.	Section C	Date: 12/12/2022
Description of CL				
CME shall submit the complete database to VVB in order to verify the monitored parameter $N_{p,y}$. SDG spreadsheet has a summary, however the complete database shall be furnished for the further verification.				
Project participant response				Date: 16/12/2022
The complete database will be submitted as document "13-Borehole information of Rwanda", please refer to it.				
Documentation provided by project participant				
13-Borehole information of Rwanda				
DOE assessment				Date: 17/12/2022
CME has submitted the complete database for the verification of VVB, based on the review of database and it's application in computing the SDGs, VVB close the finding. The database is complete and also verified through the acceptance test undertaken during onsite inspection. Finding is closed now.				

CL ID	06	Section no.	Section C	Date: 12/12/2022
Description of CL				
CME shall furnish the date of rehabilitation of the sampled borehole by VVB during the site visit, please also furnish the carbon waiver forms of the sampled HHs during the onsite inspection.				
Project participant response				Date: 16/12/2022
The document has been submitted as Document 14.				
Documentation provided by project participant				
14-Rwanda Borehole Carbon Transfer Agreement for 18 households				
DOE assessment				Date: 17/12/2022
Document furnished by the CME is reviewed and compared with the database for the compliance with the acceptance sampling. There is no discrepancy between the database and the submitted carbon waivers and rehabilitation evidence. Finding is closed now.				

Table 3. CAR from this validation/verification

CAR ID	01	Section no.	Table 1	Date: 12/12/2022
Description of CAR				
The units of the SDG#13 is mentioned as VERs in table 1 of MR, the reporting is not align with the MR filling guidelines. The units shall be in tCO _{2e} .				
Project participant response				Date: 16/12/2022
According to the Template Guide of Monitoring Report version 1.1, the units of SDG#13 is VERs. So we use VERs in table 1. Please re-check it.				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 17/12/2022
The units have been revised and now the updated MR complying with the MR filling guide pertaining to the section. CAR is closed.				

CAR ID	02	Section no.	Section D.2	Date: 12/12/2022
Description of CAR				
For the reporting of monitored parameter, 'Q _{p,y} ' default value of 7 litres/person is reported based on the conservative grounds. However, the MR doesn't include the actual value of the cited parameter monitored during the survey. The same shall be calculated and demonstrated in the SDG sheet.				
Project participant response				Date: 16/12/2022
The actual value has been calculated and demonstrated in grid L163 of latest version of document "3-Data Recording Form for WCFT_Rwanda 8 Boreholes". The data has also been added in Section D.2 of the MR.				
Documentation provided by project participant				
3-Data Recording Form for WCFT_Rwanda 8 Boreholes				
DOE assessment				Date: 17/12/2022
The revised MR now includes the comparison between actual value monitored and then capped value. The information is adequately meeting the monitoring requirement. Finding is closed now.				

CAR ID	03	Section no.	Table 2	Date: 12/12/2022
Description of CAR				

Table 2 is not filled as per the MR filling guideline, the monitoring period is falling across two vintages 2021 & 2022, the reporting is not aligned with the vintage. Moreover, CME shall report the SDG#13 corresponding to each VPA. Refer the MR filling guideline available on GS website.	
Project participant response	Date: 16/12/2022
The table 2 is filled up as per two vintages in the latest version of the MR.	
Documentation provided by project participant	
Revised MR	
DOE assessment	Date: 17/12/2022
Vintage wise breakdown of VERs are now reported in MR, the quantification is adequate with respect to the vintage falling in the monitoring period. Finding is closed now.	

CAR ID	04	Section no.	Section D.2	Date: 12/12/2022
Description of CAR				
Monitoring frequency is mentioned for the monitored parameters $Q_{p,rawboil,y}$, $Q_{p,y}$ etc. as biennial. CME shall further clarify in MR how the monitoring is complying with the biennial sampling with respect to the chosen monitoring period by each VPA. Moreover for the parameters $U_{p,y}$, $I_{p,y}$ etc the monitoring frequency is annual, CME shall also report how the annual frequency complied for the parameters which were to be monitored annually.				
Project participant response				Date: 16/12/2022
The validity period of each parameter through tests and surveys has been added in Section D.2 of the MR.				
Documentation provided by project participant				
DOE assessment				Date: 17/12/2022
The information on the biennial frequency is more transparently included in the revised MR, it has been verified the monitored frequency is within the required frequency as per the registered monitoring plan. Finding is closed now.				

CAR ID	05	Section no.	Section D.2	Date: 12/12/2022
Description of CAR				
For the monitored $T_{p,y}$ the value is mentioned as 0.44 hours, however VVB couldn't trace the calculation in the SDG sheet as found that the value is punched. VVB shall report the calculation in the SDG sheet for the further verification of VVB and link the same with the survey forms.				
Project participant response				Date: 16/12/2022
The question 4 of project survey is about the monitored value $T_{p,y}$, the result is recorded in grid B168 of document "2-Data Recording Form for Project Survey_Rwanda 8 Boreholes". The grid C8 of SDG5 sheet of document "1-SDG Outcomes Calculation Form-MP1st-Ver2" is recorded the value as 0.44 hours of $T_{p,y}$. Please refer to those documents.				
Documentation provided by project participant				
1-SDG Outcomes Calculation Form-MP1st-Ver2 and 2-Data Recording Form for Project Survey_Rwanda 8 Boreholes				
DOE assessment				Date:
Based on the review of documentary evidence the finding is closed and VVB verified that the value is coming through the project survey. Finding is closed now.				

8. CERTIFICATE OF COMPETENCE

Personnel Name:		Sanjay Kandari	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy demand	TA 3.1. Energy Demand		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal TA 13.2 Manure		
Approved by (Manager C & T)	Manager C&T		
Approval date:	11/12/2015		

Personnel Name:		David Lubanga	
Qualified to work as:			
Team Leader	☐	Technical Expert	☒
Validator/Verifier	☐	Financial Expert	☐
Technical Reviewer	☐	Local Expert (Rwanda)	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
SS 3: Energy demand	TA 3.1. Energy demand		
Approved by	Manager C & T		
Approval date:	13/02/2020		

Personnel Name:		Tushar Chaudhari	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy demand	TA 3.1. Energy Demand		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal		
Approved by	Manager Competency & Training		
Approval date:	02/09/2020		

History of the document

Version	Date	Nature of revision	Reviewed by	Approved by
4.0	14/12/2013	Guidance included/improved	Manager CDM Quality 23/12/2013	Managing Director 23/12/2013
3.1	29/10/2012	Updated for EB69 Annex6	Manager CDM Quality 29/10/2012	Managing Director 29/10/2012
3.0	31/08/2012	Revised for VVS Track	Manager CDM Quality 08/09/2012	Managing Director 10/09/2012
2.0	21/12/2011	Comprehensively revised	Manager CDM Quality 21/12/2011	Managing Director 21/12/2011