Gold Standard
for the Global Goals

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**
VERSION **v. 1.1**
RELATED SUPPORT **- TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

KEY PROJECT INFORMATION

Programme of Activity Information – (delete below table if N/A)

GS ID of Programme	GS11189
Title of Programme	Improved Cookstove and Safe Water Programme
Version of POA-DD applicable to this monitoring report	5.0 dated 25/05/2022
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	GS11289: Improved Cookstove and Safe Water Programme – Kenya - VPA 31. GS11290: Improved Cookstove and Safe Water Programme – Kenya - VPA 32. GS11291: Improved Cookstove and Safe Water Programme – Kenya - VPA 33. GS11292: Improved Cookstove and Safe Water Programme – Kenya - VPA 34. GS11293: Improved Cookstove and Safe Water Programme – Kenya - VPA 35. GS11294: Improved Cookstove and Safe Water Programme – Kenya - VPA 36. GS11295: Improved Cookstove and Safe Water Programme – Kenya - VPA 37. GS11296: Improved Cookstove and Safe Water Programme – Kenya - VPA 38. GS11297: Improved Cookstove and Safe Water Programme – Kenya - VPA 39. GS11298: Improved Cookstove and Safe Water Programme – Kenya - VPA 40. GS11299: Improved Cookstove and Safe Water Programme – Kenya - VPA 41. GS11300: Improved Cookstove and Safe Water Programme – Kenya - VPA 42. GS11301: Improved Cookstove and Safe Water Programme – Kenya - VPA 43. GS11302: Improved Cookstove and Safe Water Programme – Kenya - VPA 44. GS11303: Improved Cookstove and Safe Water Programme – Kenya - VPA 45. GS11304: Improved Cookstove and Safe Water Programme – Kenya - VPA 46. GS11305: Improved Cookstove and Safe Water Programme – Kenya - VPA 47. GS 12251: Improved Cookstove and Safe Water Programme – Kenya – VPA 49. GS 12252: Improved Cookstove and Safe Water Programme – Kenya – VPA 50. GS 12253: Improved Cookstove and Safe Water Programme – Kenya – VPA 51. GS 12254: Improved Cookstove and Safe Water Programme – Kenya – VPA 52. GS 12255: Improved Cookstove and Safe Water Programme – Kenya – VPA 53. GS 12256: Improved Cookstove and Safe Water Programme – Kenya – VPA 54. GS 12257: Improved Cookstove and Safe Water Programme – Kenya – VPA 55.

	GS 12258: Improved Cookstove and Safe Water Programme – Kenya – VPA 56. GS 12259: Improved Cookstove and Safe Water Programme – Kenya – VPA 57. GS 12260: Improved Cookstove and Safe Water Programme – Kenya – VPA 58. GS 12261: Improved Cookstove and Safe Water Programme – Kenya – VPA 59. GS 12262: Improved Cookstove and Safe Water Programme – Kenya – VPA 60. GS 12263: Improved Cookstove and Safe Water Programme – Kenya – VPA 61.

Key Project Information

GS ID (s) of Project (s)	PoA ID: GS11189 VPA ID: GS11289, GS11290, GS11291, GS11292, GS11293, GS11294, GS11295, GS11296, GS11297, GS11298, GS11299, GS11300, GS11301, GS11302, GS11303, GS11304, GS11305, GS12251, GS12252, GS12253, GS12254, GS12255, GS12256, GS12257, GS12258, GS12259, GS12260, GS12261, GS12262, GS12263
Title of the project (s) covered by monitoring report	PoA: Improved Cookstove and Safe Water Programme VPA: Improved Cookstove and Safe Water Programme – Kenya- VPA 31. Improved Cookstove and Safe Water Programme – Kenya - VPA 32. Improved Cookstove and Safe Water Programme – Kenya - VPA 33. Improved Cookstove and Safe Water Programme – Kenya - VPA 34. Improved Cookstove and Safe Water Programme – Kenya - VPA 35. Improved Cookstove and Safe Water Programme – Kenya - VPA 36. Improved Cookstove and Safe Water Programme – Kenya - VPA 37. Improved Cookstove and Safe Water Programme – Kenya - VPA 38. Improved Cookstove and Safe Water Programme – Kenya - VPA 39. Improved Cookstove and Safe Water Programme – Kenya - VPA 40. Improved Cookstove and Safe Water Programme – Kenya - VPA 41. Improved Cookstove and Safe Water Programme – Kenya - VPA 42. Improved Cookstove and Safe Water Programme – Kenya - VPA 43. Improved Cookstove and Safe Water Programme – Kenya - VPA 44. Improved Cookstove and Safe Water Programme – Kenya - VPA 45.

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Improved Cookstove and Safe Water Programme – Kenya – VPA 50.
Improved Cookstove and Safe Water Programme – Kenya – VPA 51.
Improved Cookstove and Safe Water Programme – Kenya – VPA 52.
Improved Cookstove and Safe Water Programme – Kenya – VPA 53.
Improved Cookstove and Safe Water Programme – Kenya – VPA 54.
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<tr><td>Version number of the monitoring report</td><td>5.0</td></tr>
<tr><td>Completion date of the monitoring report</td><td>19/09/2024</td></tr>
<tr><td>Date of project design certification</td><td>VPA 31-47: 02/02/2022
VPA 49-61: 29/12/2023</td></tr>
</table>

Date of Last Annual Report	Not applicable
Monitoring period number	4th for VPA 31 to VPA 47 1st for VPA 49 to VPA 61
Duration of this monitoring period	01/01/2023– 30/11/2023 (both days inclusive)
Project Representative	Impact Carbon LLC Impact Water LLC
Host Country	Kenya
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	"Emission reductions from Safe Drinking Water Supply" Version 1.0 – 03/5/2021.
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units or Products
SDG:13 Climate Action (mandatory) 13.2 Integrate climate change measures into national policies, strategies and planning	13.2.1 Amount of CO2e emissions reduced by the project per year	1,023,164 [1]	tCO_2e (VER)
SDG: 1 No Poverty 1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.1 Proportion of population living in households with access to basic services Indicator: Indicator: Total number of premises (Schools / institutions) with at least one WPS distributed / installed under the project	19,950 [1]	Number

[1] Refer Appendix:3

SDG:3 Good Health and Well Being 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services Indicator: % sampled Schools / institutions reporting reduction in incidence of diarrhoea and water borne diseases etc. after shifting to the project WPS	90.46%	Percentage
6 Clean Water and sanitation 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services Indicator: % of WPS distributed/installed providing safe drinking water quality	86.02%	Percentage
7 Affordable and Clean Energy 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.2 Proportion of population with primary reliance on clean fuels and technology Indicator: % Schools / institutions reporting an operational WPS in project	96.25%	Percentage
8 Decent Work and Economic Growth 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	8.5.1Average hourly earnings of female and male employees, by occupation, age and persons with disabilities Indicator: Number of male / females employment created by project	44 (24- Female and 20- Male)	Number

Table 2 – Product Vintages

		Amount Achieved					
Start Dates	**End Dates**	**VERs (tCO_2e)**	**ABS (SDG1)**	**IH (SDG3)**	**SWQ (SDG6)**	**AACS (SDG7)**	**QE IG (SDG8)**
01/01/2023	30/11/2023	1,023,164 [1]	19,950 [1]	90.46%	86.02%	96.25%	44 (24-Female and 20-Male)

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

>>

The stated goal of VPAs is widespread dissemination of water purification systems (WPS) to schools and other institutions in Kenya. The VPAs use carbon finance to

support local partners engaged in the production, distribution, and maintenance of various WPS technologies.

The VPAs' reduce GHG emissions by reducing or replacing the use of non-renewable biomass / fossil fuel, for boiling water to purify it for drinking purposes, in the baseline.

In Kenya, only 36.8% of the population have access to piped water, with only 22.8% population having access to piped water within their homes. Nationwide 54.6% and 14.6% of Kenya's household population utilize firewood and charcoal for cooking respectively, thereby exerting enormous pressure on the environment[2]. 84.3% of rural and 16.1% of urban households use firewood for cooking[3]. On the other hand, 8.9% of rural and 21.9 % of urban households use charcoal for cooking[4]. Thus, cooking/water boiling using solid biomass fuel over traditional inefficient stoves remains the prominent cooking practice. As per the baseline study conducted to assess the baseline scenario in schools and institutions in Kenya, only 4.44% of school/institutions in the baseline were already using safe water, either from an improved water source, or from a water treatment method other than boiling. Out of the total population who were using boiling for treating water, approximately 98.8% school/institutions were using woodfuel and 1.2% of users were using charcoal for water boiling and almost all were using traditional/3-stone fire as the stove technology for boiling water.

The project WPSs result in elimination/reduction of non-renewable biomass / fossil fuels usage for water boiling. This results in significant reduction in indoor air pollution associated with use of solid biomass / fossil fuel based inefficient stoves which has a direct correlation with respiratory illness and mortality rates, especially among school children in the project beneficiaries.

In these VPAs, the VPA implementer is Impact Water LLC, and the CME is Impact Carbon LLC. The VPA Implementer operates the VPAs as per the CME management system and provides the CME with information required to perform monitoring and verification of the activity, besides other responsibilities.

Beneficiaries receiving the project technologies under the VPAs have agreed to the terms of the PoA and have ceded all rights to any VERs resulting from the VPA to CME (Impact Carbon) or VPA Implementer (Impact Water), as applicable.

A.2. Location of project

>>
Host Country: Kenya

Region/State/Province etc.: All regions of Kenya

City/Town/Community etc.: All cities and towns in Kenya

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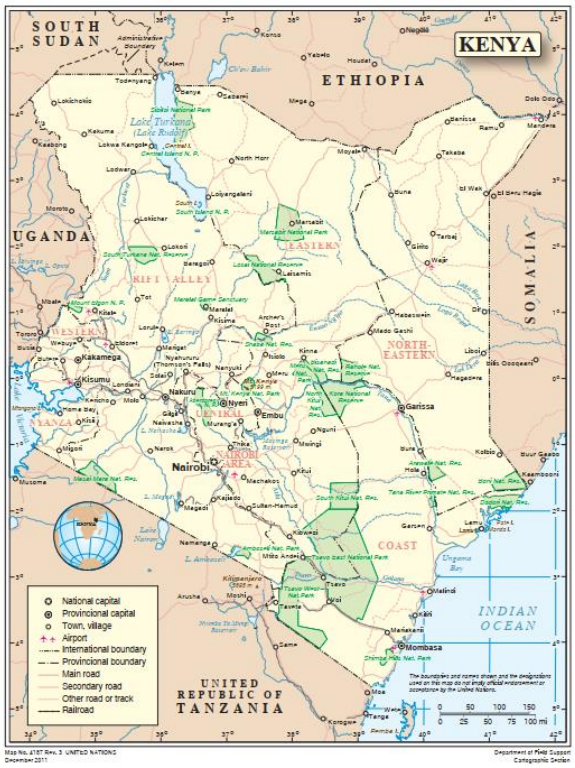
[2] Table 3.18 Basic Report Based on 2015/16 Kenya Integrated Household Budget Survey published in March 2018
[2] Table 3.18 Basic Report Based on 2015/16 Kenya Integrated Household Budget Survey published in March 2018
[4] Table 3.18 Basic Report Based on 2015/16 Kenya Integrated Household Budget Survey published in March 2018

PoA Title: Improved Cookstove and Safe Water Programme
VPA Title: Improved Cookstove and Safe Water Programme – Kenya – VPA 31 to Improved Cookstove and Safe Water Programme – Kenya – VPA 47 and Improved Cookstove and Safe Water Programme – Kenya – VPA 49 to Improved Cookstove and Safe Water Programme – Kenya – VPA 61
PoA GS ID: 11189
VPA GS ID: 11289 to 11305 and 12251 to 12263

Physical/Geographical location:

Kenya is spread from 5.03⁰ N to -4.65⁰ N latitude, while the longitude spread is between 34.03⁰ E to 41.9⁰ E. With the land area of 581,309 km². The capital of Kenya is Nairobi and its geographic coordinates are 1⁰16'S latitude and 36⁰48'E longitude.

The map of Kenya, for reference purpose, is as follows:



A.3. Reference of applied methodology

>>
Methodology Applied:
"Emission reductions from Safe Drinking Water Supply" Version 1.0 – 03/5/2021 for baseline and monitoring requirements.
The applied methodology can be access at the following link:
https://www.goldstandard.org/project-developers/standard-documents

Methodological Tools:
CDM Tool 30: Calculation of the fraction of non-renewable biomass
Standardized baseline:
Not applicable

A.4. Crediting period of project

>>

GS Ref ID	Crediting Period Start Date	Length of Crediting Period
GS11289	01/01/2021 to 31/12/2025	5 years
GS11290		
GS11291		
GS11292		
GS11293		
GS11294		
GS11295		
GS11296		
GS11297		
GS11298		
GS11299		
GS11300		
GS11301		
GS11302		
GS11303		
GS11304		
GS11305		
GS12251	30/01/2023 to 29/01/2028	
GS12252	08/03/2023 to 07/03/2028	
GS12253	11/04/2023 to 10/04/2028	
GS12254	14/04/2023 to 13/04/2028	
GS12255	09/05/2023 to 08/05/2028	
GS12256	19/05/2023 to 18/05/2028	
GS12257	31/05/2023 to 30/05/2028	
GS12258	21/06/2023 to 20/06/2028	
GS12259	07/07/2023 to 06/07/2028	
GS12260	21/07/2023 to 20/07/2028	
GS12261	04/08/2023 to 03/08/2028	
GS12262	30/08/2023 to 29/08/2028	
GS12263	15/09/2023 to 14/09/2028	

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

>>

a) **Purpose of the specific-case VPA(s) and the measures taken for GHG emission reductions or net GHG removals by sinks;**

The VPAs involve distribution of water purification systems to institutions/schools in Kenya. The implementer of the VPAs is Impact Water. The VPAs reduce GHG emissions by replacing the use of non-renewable biomass or fossil fuel to boil water, to purify it for drinking purposes in the baseline.

b) **Description of the technology employed and installed equipment and/or infrastructure, including information requested by the eligibility criteria;**

Only water purification technology has been distributed under the VPA till the end of the concerned monitoring period. The technology distributed offer two kinds of product type:
(a) UltraFlo
(b) UltraTab

The detail of technology distributed under the two categories under the VPA till the end of the monitoring period is as follows:

Type of installed technology (Service level)	Technology / operating concept	Technology	Implementation level (Cumulative Number of units installed)
Institution/School	**Chlorination:** This uses activated chlorine to kill pathogens in water	UltraFlo	2023- 2,466
		UltraTab	2023- 17,484

c) **Water Purification Technology Specifications**

WPS Models	Technology Type	Lifetime[5]	Fixed or Portable	Removal of E. coli	Minimum Watt / Voltage
UltraFLO	Chemical	Expiry: 5 year Capacity: Flo: 340,000 ltrs Inline: 720,000 ltrs	Fixed	99 (2-log)	Not applicable
UltraTAB	Chemical	Expiry: 5 years Capacity: Big pack: 48,000 ltrs Small pack: 10,000 ltrs	Portable	99 (2-log)	Not applicable

[5] Estimated lifetime from manufacturer specification sheet. This expiry is the valid lifetime of the chlorine tablet / cartridge within which it is deemed to be effective. The system lifetime is deemed greater than 20 years as other than the tablet, cartridge it consists on tanks and piped connections (for UltraFLO) which are highly durable and long lasting and can be easily replaced.

d) Relevant dates for the specific-case VPA(s) (e.g. construction, commissioning, continued operation periods, etc.);

GS Ref ID of the VPAs	Start Date
GS 11289 to GS11305	01/01/2021
GS12251	30/01/2023
GS12252	08/03/2023
GS12253	11/04/2023
GS12254	14/04/2023
GS12255	09/05/2023
GS12256	19/05/2023
GS12257	31/05/2023
GS12258	21/06/2023
GS12259	07/07/2023
GS12260	21/07/2023
GS12261	04/08/2023
GS12262	30/08/2023
GS12263	15/09/2023

e) Total GHG emission reductions or net GHG removals by sinks achieved in this monitoring period for the specific-case VPA(s), including information on how double counting is avoided

Year	Emission Reductions[6] tCO_2e
2023	1,023,164
Total	**1,023,164**

B.1.1 Forward Action Requests
>>
FAR from Deviation 184:

FAR#1

1. The stratified random sampling approach applied for sample size calculation for the monitoring survey must meet all the requirements under Appendix 3 of Guideline: Sampling and surveys for CDM project activities and programmes of activities.
2. Continuity in the project's monitoring activities is maintained, and PD can justify that no monitoring gaps exist (especially for SDG parameters) within the Monitoring Period(s). However, if gap(s) exist, the project shall justify that conservative approach(es) have been applied in line with section 3 of the Deviation Approval Requirements and Procedures (version 1.1) and overarching GS principles (as applicable).

[6] For VPA wise ERs refer section E.5

Response:

1. Appendix 3 pertains to reliability / precision achievement of the sampled data. Please note the appropriate reliability calculations have already been provided in the Monitoring Report (section D.4(e)) as well as ER sheet (Tab: Sample Size Calculation).
2. The following table provides the schedule of monitoring for:

MP #	Monitoring period Duration	Monitoring Schedule
1	01/01/2021-31/12/2021	13/09/2021 - 22/09/2021
2	01/01/2022-30/06/2022	12/07/2022 - 02/08/2022
3	01/07/2022-31/12/2022	30/01/2023 - 23/02/2023
4	01/01/2023-30/11/2023	Refer section D.4(c)

   Thus, the continuity in the project's monitoring activities is maintained by virtue of registered monitoring plan which stipulates annual monitoring frequency for monitoring parameters.

FAR#2

The PD shall ensure that no systemic bias exists in the usage of chlorine tablets which might be leading to an overestimation of emission reduction. If a bias is identified, the PD must apply a conservative approach and shall also propose a revision to the monitoring plan to ensure a continuous supply of UltraTAB. The verifying VVB (through the end-user database and onsite verification) ensure that the PD meets the mentioned requirement and is following a conservative approach.

Response:

The programme does not include any systemic bias wrt to usage of chlorine tablets. For each beneficiary school / institution, the number of UltraTAB packs supplied during a monitoring period is monitored with their product IDs to accurately determine the total treatment capacity supplied. Further, the Impact Water customer care team at regular intervals check with the beneficiary schools / institutions regarding the supply status to ensure continuity. The schools also have access to the Impact Water contact details which are used in case reinforcements are needed thereby ensuring continuity.

Further, the ER calculation approach adopted in the project ensures that credits are claimed only for the period for which the school / institution is operational and has treatment supplies available. As a conservative measure, if there is a supply shortfall in a school / institution, the VERs calculated are limited by the available treatment capacity. This ensures that any period affected by dis-continuity in the supplies is not accounted for in the emission reductions. Hence PD has ensured that no systemic bias exists in the usage of chlorine tablets/cartridges and there is no over-estimation of ERs.

FAR from GS4GG Performance review MP#2

FAR#1
In the next monitoring period and subsequent monitoring periods, the PD shall ensure that each school or college or institution uses actual days the unit is in operation. The computation of exact number of days applied for each category shall transparently be shown and be supported with relevant evidence. Verifying VVB shall confirm the days during verification.

Response:
All project premises in Kenya are Primary and/or secondary school (except one) and thus follow the academic calendar published by the ministry of education. The same has been used to determine the number of actual days of operation within the monitoring period. The singular exception referred above (Mt Zion Teachers College), is a teacher's training college for which the calendar specific to teachers training college published by ministry of education has been used for ER calculation. Thus, the PP has applied the actual number of operational days depending on the type of institution for ER calculation. For Institution (Premise) type, refer column D of the Tab: "Installation Database" of the ER calculator.

FAR#2
PD shall at each school calendar year, collect signed student and staff population confirmation letter from each institution. The letters can be collected whenever the PD makes regular UltraFlo and UltraTab supplies deliveries to schools and institutions, or each school or institution can send student population confirmation letter whenever they are making requisitions. The letters shall be archived and made available to verifying VVB to be used to counter check the project database and confirm student population.

Response:
School population confirmation letter from each institution is being submitted.

B.2. Post-Design Certification changes

>>
B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline
>>
Refer Appendix 2
B.2.2. Corrections
>>
Not Applicable
B.2.3. Changes to start date of crediting period
>>
Not Applicable

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline
>>
Not Applicable

B.2.5. Changes to project design of approved project
>>
Not Applicable

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

>>
The CME uses a management system to ensure all VPA Implementers under the PoA implement, operate, and monitor their respective VPAs in an effective and verifiable manner. The PoA follows the following management and operational System:

1. The Program Manager is responsible for keeping records and implement a documentation control process for each VPA under the PoA.

2. CME ensured that end users are aware of, and have agreed, that their unit (ICS/WPS) is being subscribed to the PoA. Awareness and agreement are secured through informational material / trainings / social media or in contractual agreements.

3. Each VPA implementer collected and reported the required data as much as possible to effectively monitor the emission reductions of each VPA in accordance with the monitoring plan in the VPA-DD.

4. The CME provided guidance/training/instructions to customer engagement staff to collect requisite data at the point of delivery. Records of trainings are being maintained by the Program Manager. The customer engagement staff compiled the list of units installed/distributed along with required end user / baseline information and transferred the same to the electronic database management system at regular intervals, which was managed at CME/VPA Implementer office by Program Manager.

5. **Total Sales Record**: The total sales record documents information of the WPS (UltraFLO / UltraTAB) implemented in the beneficiary institution. The total sales record is kept electronically with supporting evidence in form of paper records and/or SMS tracking records. The Total Sales Record contains information related to WPS system, including the following, but not limited to:
    a. Type of system (UltraFLO / UltraTAB)
    b. Unique serial number of the units installed / distributed
    c. Date of installation / distribution
    d. Address and details of school and contact detail (if available) of representative
    e. Type of School (Boarding / Non-boarding)
    f. Number of project technology installed/distributed in an institution
    g. School population count (number of students / staff in boarding / non-boarding category)

The CME ensured that there is no double counting of any unit in the electronic database by means of the unique ID that will be uniquely associated with each unit. The CME coordinated all ex-post monitoring activities in the PoA. The CME checked and reviewed the monitoring data and calculated the emission reductions based on precision/reliability levels achieved for the monitored parameters supported by external experts/consultant.

Please refer section B.1.1 above for FARs related to monitoring (during design certification or last MP) and their corresponding resolution.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period >>

SDG Indicator	**SDG 1: No Poverty**
Data/parameter	$ABS_{Baseline}$
Unit	Number
Description	Access to Basic Services (number of premises with at least one WPS distributed / installed under the baseline)
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 1 Impact calculation
Additional comment	--

SDG Indicator	**SDG 3: Good Health and Well Being**
Data/parameter	$IH_{Baseline}$
Unit	%
Description	% Of users reporting reduction in incidence of diarrhoea and water borne diseases etc. in baseline (improved health)
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 3 Impact calculation
Additional comment	--

SDG Indicator	**SDG 6: Clean Water and sanitation**
Data/parameter	$SWQ_{Baseline}$
Unit	%
Description	% Users reporting safe water quality in baseline
Source of data	--
Value(s) applied	4.44
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 6 Impact calculation
Additional comment	--

SDG Indicator	**SDG 7: Affordable and Clean Energy**
Data/parameter	$AAC_{Baseline}$
Unit	%
Description	Access to affordable and clean energy (% of operating WPS units under Baseline)
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 7 Impact calculation
Additional comment	-

SDG Indicator	**SDG 8: Decent Work and Economic Growth**
Data/parameter	QE $IG_{Baseline}$
Unit	number
Description	Quantitative Employment and income generation (Number of person (male and female) hired under Baseline)
Source of data	--
Value(s) applied	0
Choice of data or Measurement methods and procedures	--
Purpose of data	SDG 8 Impact calculation
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	Project technology description
Unit	NA
Description	The detailed description of the planned project technology
Source of data	- Manufacturer specifications - Third-party certification by a qualified entity, for example recognized certification agency by National/ International Standard body
Value(s) applied	

Description	UltraFLO	Ultra TAB
Manufacturer	Medentech	Medentech
Product Name	FLO Inline	Big Pack, Small Pack
Technology type	Chlorination	Chlorination

	Performance classification | Complies with National standard | Complies with National standard
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	--
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	Regulatory framework for safe water supply
Unit	NA
Description	National, sub-national and local regulations or guidance for safe drinking water supply, operation and maintenance, including any tariff requirements in host country Kenya.
Source of data	National, sub-national and local authorities
Value(s) applied	Kenya environmental sanitation and hygiene policy 2016-2030 recognizes that unsafe drinking water, along with inadequate hygiene and sanitation contributes much of the disease burden in Kenya. This policy therefore recommends development and implementation of sanitation and hygiene interventions that address fecal contamination and vector breeding in household/school water storage and promoting appropriate technology options for household/school water treatment and safety in tandem with sanitation and hygiene interventions at household/School/ community levels. The implementation of the project is fully in line with the relevant water resources policies/framework of Kenya. The project does not undermine or conflict with any national, sub-national and local regulations or guidance for safe drinking water supply, operation and maintenance, including any tariff requirements. Further, the national standards and local regulations for safe drinking water supply do not impose any cap on parameters used by the methodology and therefore have no implications on emission reduction calculations.
Choice of data or Measurement methods and procedures	--
Purpose of data	Related to water quality
Additional comment	--

<table>
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<tr><td>Data/parameter</td><td>Water sources in the project boundary</td></tr>
<tr><td>Unit</td><td>NA</td></tr>
<tr><td>Description</td><td>Improved and Unimproved drinking water sources in Kenya</td></tr>
<tr><td>Source of data</td><td>Kenya Schools and Institutions:
Baseline survey</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><td>S.No</td><td>Drinking water source</td><td>School/Institutions (%)</td></tr>
<tr><td>1.</td><td>Government/ Private piped connection</td><td>22.78</td></tr>
<tr><td>2.</td><td>Surface water</td><td>10.56</td></tr>
<tr><td>3.</td><td>Well, /Borehole</td><td>42.22</td></tr>
<tr><td>4.</td><td>Rainwater</td><td>20.00</td></tr>
<tr><td>5.</td><td>Trucked Water</td><td>3.33</td></tr>
<tr><td>6.</td><td>Others</td><td>1.11</td></tr>
</table>

As per Annex 2 of the applied GS methodology, piped water,
rainwater, packed or delivered water (ex-Trucked water) and water from boreholes or protected wells belong to improved sources of drinking water. For the remaining, the water source has been considered as unimproved.
<table>
<tr><td>S.No</td><td>Source of drinking water</td><td>% Premises</td></tr>
<tr><td>1.</td><td>Improved sources</td><td>88.33</td></tr>
<tr><td>2.</td><td>Unimproved Sources</td><td>11.67</td></tr>
</table>
</td></tr>
<tr><td>Choice of data or Measurement methods and procedures</td><td>--</td></tr>
<tr><td>Purpose of data</td><td>--</td></tr>
<tr><td>Additional comment</td><td>--</td></tr>
</table>

<table>
<tr><td>SDG Indicator</td><td>SDG 13: Climate Change</td></tr>
<tr><td>Data/parameter</td><td>Stove technologies used in the project boundary</td></tr>
<tr><td>Unit</td><td>NA</td></tr>
<tr><td>Description</td><td>The proportion of different stove types used in premises in the geographical area of the project. If the project covers different types of end-users premises (e.g. households, institutions), then the stoves technologies should be determined for each premises type.</td></tr>
<tr><td>Source of data</td><td>Kenya-Schools and Institutions:</td></tr>
</table>

	Baseline survey
Value(s) applied	<table><tr><th>S.no</th><th>Stove Technology</th><th>School/Institutions (%)</th></tr><tr><td>1</td><td>Traditional / 3 Stone Fire</td><td>98.84</td></tr><tr><td>2</td><td>Traditional Charcoal Pot</td><td>1.16</td></tr></table>
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Determination of baseline emissions
Additional comment	-

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	Expected technical life of project technology
Unit	Treatment volume or operational hours or time period (e.g. "eight years")
Description	The expected technical life of an individual project technology shall be defined in the PDD. The details include both technology/device life and filter life, if a filter is used and it is replaceable.
Source of data	Manufacturer specifications
Value(s) applied	<table><tr><th>Description</th><th>UltraFLO</th><th>UltraTAB</th></tr><tr><td>Treatment Volume (Ltrs)</td><td>Flo: 340,000 Inline: 720,000</td><td>Big Pack: 48,000 Small Pack: 10,000</td></tr><tr><td>Life Span / Expiry-filter</td><td>5 years</td><td>5 years</td></tr><tr><td>Life Span / Expiry - system</td><td>20 years</td><td>20 years</td></tr></table>
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and manufacturer specifications
Purpose of data	Determination of baseline emissions
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	x_f
Unit	Percentage of fuel f use in target population
Description	The proportion of each different cooking fuel f used in the project boundary by end-users:
Source of data	Kenya-School/institution: Baseline Survey

Value(s) applied	<table><tr><th>S.no</th><th>Baseline Fuel Usage</th><th>School/Institutions (%)</th></tr><tr><td>1.</td><td>Woodfuel</td><td>98.84</td></tr><tr><td>2.</td><td>Charcoal</td><td>1.16</td></tr></table>
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Determination of baseline emissions
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	$EF_{b,\,f,CO2}$
Unit	tCO_2/TJ
Description	CO2 emission factor from use of fuels
Source of data	IPCC defaults
Value(s) applied	Wood = 112 tCO_2/TJ Charcoal = 165.22 tCO_2/TJ (includes charcoal production emissions)
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Calculation of baseline emissions
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	$EF_{b,\,f,\,nonCO2}$
Unit	tCO_{2e}/TJ
Description	Non-CO_2 emission factor from use of fuels, in case the baseline fuel is biomass or charcoal
Source of data	IPCC defaults
Value(s) applied	AR5 GWP - Wood: 9.46 tCO_2e/TJ - Charcoal: 44.83 tCO2e/TJ (includes production emissions of CH_4 and N_2O)
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Determination of baseline emissions
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	η_{wb}

<table>
<tr><td>Unit</td><td>Percentage</td></tr>
<tr><td>Description</td><td>Weighted average efficiency of the baseline water boiling devices.</td></tr>
<tr><td>Source of data</td><td>Kenya-Schools/Institutions:
Baseline Survey
methodology default value</td></tr>
<tr><td>Value(s) applied</td><td>Stove Technology Usage:
<table><tr><th>S.no</th><th>Stove Technology</th><th>School/ Institutions (%)</th></tr><tr><td>1</td><td>Traditional / 3 Stone Fire</td><td>98.84</td></tr><tr><td>2</td><td>Traditional Charcoal Pot</td><td>1.16</td></tr></table>
Stove Efficiency:
<table><tr><th>S.no</th><th>Stove Technology</th><th>% Efficiency</th></tr><tr><td>1</td><td>Traditional / 3 Stone Fire</td><td>10</td></tr><tr><td>2</td><td>Traditional Charcoal Pot</td><td>20</td></tr></table>
Thus, η_{wb} = 98.84%* 0.1+1.16%*0.20 = 10.12%</td></tr>
<tr><td>Choice of data or Measurement methods and procedures</td><td>Fixed Ex-ante as per methodology and VPA-DD</td></tr>
<tr><td>Purpose of data</td><td>Determination of baseline emissions</td></tr>
<tr><td>Additional comment</td><td>--</td></tr>
</table>

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	C_b
Unit	Percentage
Description	Proportion of project end-users who in the baseline were already using safe water, either from an improved water source, or from a water treatment method other than boiling.
Source of data	Baseline Survey
Value(s) applied	4.44%
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Determination of baseline emissions
Additional comment	-

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	q_i
Unit	Liters/cartridge or Liters/Tab Pack
Description	Capacity of the household or institutional water treatment technology

Source of data	Manufacturer specifications
Value(s) applied	<table><tr><td>Description</td><td>UltraFLO</td><td>UltraTAB</td></tr><tr><td>Dosage rate (Treatment Capacity)</td><td>Flo: 340,000L/Cartridge Inline: 720,000L/Cartridge</td><td>Big Pack: 48,000 L/Tab Pack Small Pack: 10,000 L/Tab Pack</td></tr></table>
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and manufacturer specifications
Purpose of data	Determination of baseline emissions
Additional comment	An alternative approach is being used given the project technologies does not have a standard flow rate.

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	$f_{nrb,f,y}$
Unit	Percentage
Description	Fractional non-renewability status of woody biomass fuel during year *y*, in case the baseline fuel is biomass or charcoal
Source of data	registered VPA-DDs
Value(s) applied	93.51 (VPA 31-47) 71.82 (VPA 49-61)
Choice of data or Measurement methods and procedures	Calculated using Tool 30 of CDM Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Determination of baseline emissions
Additional comment	-

SDG Indicator	**SDG 13: Climate Change**
Data/parameter	QPW_p
Unit	Litres per person per day
Description	Volume of drinking water per person per day for premises type p
Source of data	Parameter table SWDS 24 of methodology
Value(s) applied	

	<table><tr><th>Type of Premises</th><th>Default value</th><th>Applicability</th></tr><tr><td>Full-day premises</td><td>4 L /person / day</td><td>Premises like households etc.</td></tr><tr><td>Boarding school</td><td>4 L /person / day</td><td>-</td></tr><tr><td>Half time premises</td><td>3 L /person / day</td><td>Premises like day schools, offices etc.</td></tr></table>
Choice of data or Measurement methods and procedures	Fixed Ex-ante as per methodology and VPA-DD
Purpose of data	Baseline emission calculations
Additional comment	-

D.2 Data and parameters monitored

>>

SDG Indicator	**SDG 1: No Poverty**
Data / Parameter	$ABS_{Project}$
Unit	Number
Description	Access to Basic Services (number of premises with at least one WPS distributed / installed under the project)
Source of data	Sales / Installation records
Value(s) applied	19,950
Measurement methods and procedures	Not applicable
Monitoring frequency	Continuous
QA/QC procedures	--
Purpose of data	SDG 1 contribution
Additional comment	--

SDG Indicator	**SDG 3: Good Health and Well Being**
Data / Parameter	$IH_{Project}$
Unit	%
Description	% of users reporting reduce in incidence of diarrhoea and water borne diseases etc. (improved health) in project
Source of data	Ex-post monitoring surveys
Value(s) applied	90.46
Measurement methods and procedures	Not applicable
Monitoring frequency	Annual
QA/QC procedures	--
Purpose of data	SDG 3 contribution

Additional comment	--

SDG Indicator	**SDG 6: Clean Water and sanitation**
Data / Parameter	$SWQ_{Project}$
Unit	%
Description	% WPS distributed / installed providing safe drinking water to beneficiaries in project
Source of data	Ex-post water quality tests
Value(s) applied	90.46
Measurement methods and procedures	Not applicable
Monitoring frequency	Annual
QA/QC procedures	--
Purpose of data	SDG 6 contribution
Additional comment	--

SDG Indicator	**SDG 7: Affordable and Clean Energy**
Data / Parameter	$AAC_{Project}$
Unit	%
Description	Access to affordable and clean energy (% of operating WPS units under Project)
Source of data	Ex-post monitoring surveys
Value(s) applied	96.25
Measurement methods and procedures	Not applicable
Monitoring frequency	Annual
QA/QC procedures	--
Purpose of data	SDG 7 contribution
Additional comment	--

SDG Indicator	**SDG 8: Decent Work and Economic Growth**
Data / Parameter	$QE\ IG_{project}$
Unit	number
Description	Quantitative Employment and income generation (Number of person (male and female) hired under project)
Source of data	HR records/ Sales and marketing records
Value(s) applied	44 (24- Female and 20- Male)
Measurement methods and procedures	Not applicable
Monitoring frequency	Annual
QA/QC procedures	--

Purpose of data	SDG 8 contribution
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$M_{q,y}$
Unit	fraction
Description	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard
Source of data	WQT performed using Field Test kits
Value(s) applied	0.9398
Measurement methods and procedures	Water quality testing of the project devices was conducted on sampling basis. The samples of treated water collected from project devices, and tested using field testing kits.
Monitoring frequency	Annually
QA/QC procedures	Field testing kits have been used, e.g. based on Colony Forming Unit method or Most Probable Number method.
Purpose of data	Determination of baseline emissions
Additional comment	If the proportion of samples not meeting Safe Drinking Water Quality Standards exceeds a threshold, no emission reductions can be claimed for the corresponding monitoring period. Thresholds: - Project or VPA year 1: 20% - Project or VPA year 2: 15% - Project or VPA year 3 or above: 10% Since proportion of samples not meeting Safe Drinking Water Quality Standards in 3rd year of VPA (VPA 31 to VPA 47) is less than 10% and proportion of samples not meeting Safe Drinking Water Quality Standards in 1st year of VPA(VPA 49 to VPA 61) is less than 20% hence no adjustments are required

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	Water hygiene education campaigns
Unit	NA
Description	Hygiene campaigns carried out among project safe water end users
Source of data	Annual hygiene campaigns records
Value(s) applied	139 schools, selected for project monitoring, were physically visited by enumerators and hygiene awareness was propagated to the school

	representatives. The questionnaire used for project monitoring also has questions related to hygiene. As part of project monitoring, none of the schools reported any increase in diarrhoea or any other water borne disease. For detail refer "Hygiene Awareness Campaign Report".
Measurement methods and procedures	Usage Survey (in person) A questionnaire-based survey has been used to assess hygienic handling of clean water as per CME knowledge and experience and WHO/UNICEF JMP core questions on drinking and hygiene.
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting.
Purpose of data	--
Additional comment	--

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$X_{cleanboil,y}$
Unit	Percentage
Description	Proportion of project end-users that boil safe (treated, or from safe supply) water after installation of project technology
Source of data	Project survey
Value(s) applied	0
Measurement methods and procedures	This survey was performed in person
Monitoring frequency	Annually
QA/QC procedures	Transparent data analysis and reporting is ensured through the use of personnel extensively trained in conducting Project Surveys.
Purpose of data	Determination of baseline emissions
Additional comment	-

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$HN_{p,y}$
Unit	Number
Description	Number of individuals per premises type p in the project boundary in year y
Source of data	Sales/distribution database

Value(s) applied	444[7]
Measurement methods and procedures	The total number of individuals for each project premise type in each specific VPA is tracked in the Sales or distribution records
Monitoring frequency	Annual
QA/QC procedures	Actual school population data for each of the 19,950 has been used for ER calculations, deem the most relevant (geographical and temporal) in line with para 3.11.2 of the methodology.
Purpose of data	Determination of baseline emissions
Additional comment	-

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$N_{p,y}$
Unit	Number
Description	Accumulated number of premises type p with at least one individual project technology in year y
Source of data	Sales or distribution records
Value(s) applied	19,950
Measurement methods and procedures	The total number of premises with at least one individual technology type is tracked in the Sales or distribution database.
Monitoring frequency	Annually
QA/QC procedures	Sales or distribution record includes: i. Date of sale/distribution ii. Geographic area of sale iii. Model/type of project technology sold iv. Quantity of project technologies sold Name and telephone number, and address (if available) or other traceable indicator of premises identity
Purpose of data	Determination of baseline emissions
Additional comment	--

[7] This value is the average value across all the VPAs covered in this monitoring report. However, the ERs for each VPA have been calculated separately as mentioned in section F below. Thus, for each VPA, the corresponding $HN_{p,y}$ value has been used for ER calculations. Refer ER Calculator (tab 'Assumptions & ER Values) for details.

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$U_{p,y}$
Unit	percentage
Description	Usage rate of the project technology by premises type p during year y
Source of data	Project Surveys
Value(s) applied	96.25
Measurement methods and procedures	PP has conducted in person survey of project premises
Monitoring frequency	Annually
QA/QC procedures	--
Purpose of data	Determination of baseline emissions
Additional comment	The usage survey provides a single usage parameter that is representative for project technologies in the total sales record.

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$DP_{p,y}$
Unit	Days
Description	Average days the project technology is present for end-users in the premises p in year y
Source of data	Sales and distribution records and School Academic Calendar
Value(s) applied	136
Measurement methods and procedures	For schools and other institutions, the days has been calculated based on the number of operational school days in the monitoring period, excluding weekends, holidays and term-breaks, as applicable for boarding and non-boarding premises. Refer ER calculator, tab Assumptions & ER Values, cell E20:AH20 for more details.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Determination of baseline emissions
Additional comment	

SDG Indicator	**SDG 13: Climate Change**
Data / Parameter	$DN_{p,y}$
Unit	Number
Description	Average number of individual project technologies in each project premises type p in year y
Source of data	Sales or distribution records

Value(s) applied	Refer tab "Installation database" column Q of the ER sheet
Measurement methods and procedures	The total number of individual project units by each project premise type in each specific VPA is tracked in the Sales or distribution records
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Determination of baseline emissions
Additional comment	-

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
$ABS_{Project}$	19,950	9,971
$IH_{Project}$	90.46	92.33
$SWQ_{Project}$	90.46	92.33
$AAC_{Project}$	96.25	96.51
QE $IG_{project}$	44	17
$M_{q,y}$	0.9398	0.9567
Water hygiene education campaigns	139 samples monitored	117 samples monitored
$X_{cleanboil,y}$	0%	0%
$HN_{p,y}$	444	481
$N_{p,y}$	19,950	9,971
$U_{p,y}$	96.25	96.51
$DP_{p,y}$	136	93
$DN_{p,y}$	1.0	1.0

D.4. Implementation of sampling plan

>>

A single sampling plan was carried out for GS11289 (VPA31) to GS11305 (VPA47) and GS12251 (VPA49) to GS12263 (VPA61) (covered in this monitoring report).

a) Description of implemented single sampling design

(i) Sampling design

Due to the large number of units projected to be distributed in the VPA, coupled with the difficulties with monitoring in some regions, it is not economically feasible to monitor each unit distributed in the VPA. Therefore, the project will employ representative sampling in line with the requirements of the applied methodology.

(ii) Objectives and Reliability Requirements

The objective was to obtain an unbiased and reliable estimate of the proportion value of the following parameters over the course of the monitoring period, and with 95/10 confidence/precision for annual sampling across VPAs.

Sl. No.	Parameter	Description of parameter

1	$M_{q,y}$	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard
2	$U_{p,y}$	Usage rate of the project technology by premises type p during year y

(iii) Target Design

The target population for the parameters stated above are premises where WPS Units installed / distributed and recorded in the project sales database.

(iv) Sampling Frame

PP has determined the annual monitoring sample size for relevant parameters, based on a 95/10 confidence/precision level as outlined in the registered monitoring plan, considering the projected total number of project premises at the end of the concerned monitoring period. Subsequently, as per the registered monitored plan, the sample size determined was spread across 4 quarterly periods. Thus, monitoring surveys/tests were conducted quarterly, with each quarter covering minimum 25% of the total required number of samples, as per clarification request CL_146 dated 10/01/2023.
The sampling frame for identification of samples for each quarterly monitoring period included the total number of project premises until the previous quarter.

The parameters for monitoring are homogeneous (i.e., implemented in Institutional premises), hence a common sampling was followed for all the parameters monitored.

b) Sampling Method

The required sample sizes were derived using para 14 of the "Standard: Sampling and surveys for CDM project activities and programmes of activities", version 9.0 and equations (1), (2), (3), (4) and (9) of Appendix 3 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 for proportion-based parameter as follows:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of WPS to be sampled
N = Total number of WPS in the population
z = Constant referring to level of confidence (1.96 for 95 % confidence)
Precision = Required precision (e.g. 10% = 0.1)

Where:

$$V = SD^2 / p^2$$

$$SD^2 = \frac{\sum_{i=1}^{k} g_i * p_i * (1 - p_i)}{N}$$

$$\overline{p} = \frac{\sum_{i=1}^{k} g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population
p_i = expected proportion of strata i in the population
k = total number of strata in the populaton

Stratified random sampling has been applied for determining the usage rate and water quality of units distributed. The expected parameter values (proportion) were determined as per para 12(a)(iii), 13(b),13(c) of the "Standard: Sampling and surveys for CDM project activities and programmes of activities", version 9.0. The units in the population has been categorized (based on technology deemed appropriate) and sample size has been determined based on expected usage rate in each category using stratified random sampling approach as per the Guideline: Sampling and surveys for CDM project activities and programmes of activities and Standard "Sampling and surveys for CDM project activities and programmes of activities". The sample size determined has been distributed within each category based on percentage of units in corresponding category. A deviation (from monitoring methodology) on the sampling approach has been approved by GS4GG for the first crediting period. Please refer Appendix 5 of the VPA-DDs.
Detail of approved deviation:
Reference: Dev_184
Title: Deviation from ageing-based survey for WPS
Date of approval: 07/12/2021
Link:https://globalgoals.goldstandard.org/standards/DEV_184-Deviation-Request.pdf

Sample Size - $U_{p,y}$			
WPS Type (Sampling Frame)	Anticipated Sales (Sampling Frame Size)	expected operational rate (%)	Calculated Sample Size (n)
UltraFlo	3000	90%	30
UltraTab	20000	90%	87
Sample size determination			
Estimated Operation Unitsi (p)			90%
Estimated Standard Deviation of Operational Unitsi (SD)			30.0%
$V = (SD/p)^2$			0.11
Sample Size required (Operational Unitsi)			100
Sample Size - $M_{q,y}$			
WPS Type (Sampling Frame)	Total Sales (Sampling Frame Size)	expected water quality (Fraction)	Calculated Sample Size (n)
UltraFLO	3000	0.90	30
UltraTAB	20000	0.90	87
Sample size determination			
Estimated Water Qualityi (p)			0.90
Estimated Standard Deviation of Water Qualityi (SD)			0.300
$V = (SD/p)^2$			0.11
Sample Size required (Water Qualityi)			100

The determined sample sizes were 30 for UltraFlo and 87 for UltraTab. PP identified a slightly higher number of samples than that determined, i.e. 40 samples for UltraFlo and 120 samples for UltraTab instead, accounting for non-response. These samples were evenly distributed across all four quarters, resulting in 10 samples for UltraFlo each quarter and 30 samples for UltraTab each quarter being identified from their respective sampling frames.

c) Collected Data

Data was collected by the Impact Water team. The team is well trained for the usage related surveys and water quality tests given prior experience of monitoring WPS devices. Surveyors visited the school premises, did visual inspections, communicated the hygiene awareness message mentioned on the monitoring questionnaire and interviewed school representatives to assess usage (operational status) and necessary aspects related to hygiene via a monitoring

questionnaire. The Monitoring team also collected water samples for water quality testing using Aquagenx test kits. The monitoring (Surveys Hygiene awareness campaign and Water Quality Tests on same set of samples) was conducted from as per schedule mentioned below:

Quater	Duration
1st Quarter(Q1)	28/03/2023 to 05/04/2023
2nd Quarter(Q2)	26/06/2023 to 29/06/2023
3rd Quarter(Q3)	31/07/2023 to 07/08/2023
4th Quarter(Q4)	09/10/2023 to 12/10/2023

d) Analysis of the collected data

Data obtained from the surveys / tests were used to estimate proportions values for the parameters described above. The values were then being factored into the emissions reduction calculations.

Sample Size - $U_{p,y}$			
Monitoring Results			
WPS Type (Sampling Frame)	Actual Sales (Sampling Frame Size)	Monitored Sample Size (n)	Monitored Operational Rate (%)
UltraFlo	2466	36	97.22%
UltraTab	17484	103	96.12%
Reliability Check			
Samples Monitored			139
Monitored Operational Unitsi (p)			96.25%
Sample Size - $M_{q,y}$			
Monitoring Results			
WPS Type (Sampling Frame)	Total Sales (Sampling Frame Size)	Monitored Sample Size (n)	Monitored Water Quality (Fraction)
UltraFLO	2466	35	0.9429
UltraTab	17484	99	0.9394
Reliability Check			
Samples Monitored			134
Monitored Water Qualityi (p)			0.9398

e) Demonstration of whether the required confidence/precision has been met

The following tables demonstrate the status of precision/confidence for each of the monitored parameters.

Sampling Constants	Values
Monitoring period start	1-Jan-23
Monitoring period end	30-Nov-23
Level of sampling	PoA
Confidence (%) (90 or 95)	95%
Margin of Error (%)	10%
Z value	1.96

Sample Size - $U_{p,y}$	
Monitoring Results	
Standard Error of Operational Unitsi	1.70%
Relative precision (Margin of error)	3.46%
Result	Ok, acceptable
Lower Bound confidence value	not applicable
Sample Size - $M_{q,y}$	
Standard Error of Water Qualityi	0.02
Relative precision (Margin of error)	4.48%
Result	Ok, acceptable
Lower Bound confidence value	not applicable

f) Demonstration of whether the samples were randomly selected and are representative of the population

Premises were selected randomly from each stratum, after arranging them in chronological order by date of sale and assigning a serial number to each premises. Random numbers were used to identify the samples to the monitored. This approach ensured that the entire population had an equal chance of being selected, and hence samples picked are representative of the population.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

>>

SDG	SDG Impact	Baseline estimate
1	No Poverty	0

SDG	SDG Impact	Baseline estimate
3	Good Health and Well-Being	0

SDG	SDG Impact	Baseline estimate
6	Clean Water and Sanitation	4.44%

SDG	SDG Impact	Baseline estimate
7	Affordable and Clean Energy	0

SDG	SDG Impact	Baseline estimate
8	Decent Work and Economic Growth	0

For SDG13: Climate Change, baseline emissions are calculated as:
The baseline emission factor shall be calculated as follows:

$$EF_{b} = SE_{w,b,y} * \sum(x_{f} * (EF_{b,f,CO2} * f_{NRB,f,y} + EF_{b,f,nonCO2})) \div 10^{9}$$

Where:

EF_{b} = Emission factor for the use of fuel to obtain safe water in the baseline (tCO2e/L)

$SE_{w,b,y}$ = Specific energy required to boil water (kJ/L), to be calculated as per the paragraph below

x_{f} = Proportion of fuel f used in the baseline (fraction determined based on an energy basis)

$EF_{b,f,CO2}$ = CO2 emission factor from use of fuel f (tCO2/TJ)

$EF_{b,f,nonCO2}$ = Non-CO2 emission factor arising from use of fuel f, when the baseline fuel f is biomass or charcoal (tCO2e/TJ). This parameter is omitted when f is a fossil fuel.

$f_{NRB,f,y}$ = Fractional non-renewability status of woody biomass fuel during year y (fraction). For biomass, it is the fraction of woody biomass that can be established as non-renewable. This parameter is omitted when f is a fossil fuel.

f = Index for baseline fuel

The specific energy required to boil water using the baseline technology ($SE_{w,b,y}$) is determined as follows, by calculating the energy input required to obtain L of boiling water, including boiling and vaporization losses[8], taking into account default or measured stove efficiency

$SE_{w,b,y}$ = $360.83/\eta_{wb}$

Where:

360.83 = Default amount of energy required to obtain 1 L of water after 5 minutes of boiling from a first principles approach kJ/l

η_{wb} = Efficiency of the stoves for baseline water boiling (%). Weighted average of baseline stove types.

The baseline emissions shall be calculated as follows:

$$BE_y = EF_b \times (1 - C_b - X_{cleanboil,y}) \times Q_y \times M_{q,y}$$

Where:

BE_y = Baseline emissions from the use of fuel to obtain safe water in the baseline (tCO2e)

C_b = Proportion of project end-users who in the baseline were already using a safe water supply that did not require boiling (%)

$X_{cleanboil,y}$ = Proportion of project end-users that boil safe water in the project year y (%)

Q_y = Quantity of safe drinking water provided by the project in year y (L)

$M_{q,y}$ = Modifier for the water quality in year y

In the case of IWT, the quantity of safe drinking water provided by the project Q_y is determined as follows

$$Q_y = \sum N_{p,y} \times U_{p,y} \times QPW_{hh,p,y} \times DP_{p,y}$$

Where:

$N_{p.y}$ = Number of premises type p with at least one project technology in year y

$U_{p,y}$ = Usage rate of the project technology by premises type p during year y (%)

$QPW_{hh,p,y}$ = Volume of drinking water per premises p per day in year y (L)

$DP_{p,y}$ = Days the project technology is present for end-users in the premises p in year y

[8] The previous version of TPDDTEC Annex 3 assumed that purifying water by boiling would require boiling water for 10 minutes. This assumption is revised to 5 minutes, following WHO technical information that less than 5 minutes of boiling is sufficient for inactivation of enteric bacteria (Technical Brief WHO/FWC/WSH/15.02, 2015).

The volume of drinking water per premises is determined by considering whether the capacity of the project device is sufficient to provide at least the default amount of drinking water, as follows:

$QPW_{hh,p,y}$ = min ((q_i × $DN_{p,y}$), (QPW_p × $HN_{p,y}$))
Where:

q_i	= Capacity of the HWT or IWT individual project technology (L)
$DN_{p,y}$	= Average number of individual project technologies in each project premises type p in year y
$HN_{p,y}$	= Number of individuals per premises type p (e.g. household, school) inyear y
QPW_p	= Volume of drinking water per person per day for premises type p (L) * average number of operational days in the year

Apply the default value or monitored value through water consumption field tests in the project scenario, capped at 5.5 L per person per day

SDG	SDG Impact	Baseline estimate
13	Climate Action	1,023,164

E.2. Calculation of project value or estimation of project situation of each SDG Impact

>>

SDG	SDG Impact	Project estimate
1	No Poverty	19,950

SDG	SDG Impact	Project estimate
3	Good Health and Well-Being	90.46%

SDG	SDG Impact	Project estimate
6	Clean Water and Sanitation	90.46%

SDG	SDG Impact	Project estimate
7	Affordable and Clean Energy	96.25%

SDG	SDG Impact	Project estimate
8	Decent Work and Economic Growth	44 (24- Female and 20-Male)

For SDG13: Project emissions are not envisaged in the VPA as chlorination does not require any fuel/ electricity use.

SDG	SDG Impact	Project estimate
13	Climate Action	0

E.3. Calculation of leakage

>>

Leakage has already been assessed in the VPA-DDs and as per VPA-DD (GS11289 to GS11305) no potential leakage has been identified, Refer section B.6.1 of the VPA-DD. Since the monitoring frequency for leakage is "Every two year" therefore next leakage assessment is deemed due after the end of second year of crediting period

E.4. Calculation of net benefits or direct calculation for each SDG Impact

>>

For SDG 1: No Poverty

Net Benefit (SDG 1) = $ABS_{Project} - ABS_{Baseline}$

Where:

$ABS_{Baseline}$	Access to basic services (number of premises with at least one WPS distributed / installed under the project in baseline)
$ABS_{Project}$	Access to basic services (number of premises with at least one WPS distributed / installed under the project in Project)

For SDG 3: Good Health and Well Being

Net Benefit (SDG 3) = $IH_{,Project} - IH_{,Baseline}$

Where:

$IH_{Baseline}$	% of users reporting reduction in incidence of diarrhoea and water borne diseases etc. in baseline
$IH_{Project}$	% of users reporting reduction in incidence of diarrhoea and water borne diseases etc. after shifting to the project WPS

For SDG 6: Clean water and Sanitation

Net Benefit (SDG 6) = $SWQ_{Project} - SWQ_{Baseline}$

Where:

$SWQ_{Baseline}$	% users reporting safe water quality in baseline
$SWQ_{Project}$	% users reporting safe water quality in project

For SDG 7: Affordable and Clean Energy

Net Benefit (SDG 7) = $AAC_{Project} - AAC_{Baseline}$

Where:

$AAC_{Baseline}$	Access to affordable and clean energy (% of operating WPS units under Baseline)
$AAC_{Project}$	Access to affordable and clean energy (% of operating WPS units under Project)

For SDG 8: Decent Work and Economic Growth

Net Benefit (SDG 8) = $QE\ IG_{Project} - QE\ IG_{Baseline}$

Where:

$QE\ IG_{Baseline}$	Quantitative Employment and income generation (Number of person (male and female) hired under Baseline)
$QE\ IG_{Project}$	Quantitative Employment and income generation (Number of person (male and female) hired under Project)

For SDG 13: Climate Action

The emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y	= Emission reductions in year y (t CO2e/yr)
BE_y	= Baseline emissions in year y (t CO2e/yr)
PE_y	= Project emissions in year y (t CO2e/yr)
LE_y	= Leakage emissions in year y (t CO2e/yr)

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit

1	No Poverty	0	19,950	19,950

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
3	Good Health and Well Being	0	90.46%	90.46%

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
6	Clean Water and Sanitation	4.44	90.46%	86.02%

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
7	Affordable and Clean Energy	0	96.25%	96.25%

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
8	Decent Work and Economic Growth	0	44 (24- Female and 20- Male)	44 (24- Female and 20- Male)

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action	1,023,164	0	1,023,164

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

>>

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values[6] achieved during this monitoring period
13-GS11289	54,810	38,203
13-GS11290	54,810	43,488
13-GS11291	54,810	47,295
13-GS11292	54,810	51,197
13-GS11293	54,810	44,924
13-GS11294	54,810	47,567
13-GS11295	54,810	49,857
13-GS11296	54,810	49,734
13-GS11297	54,810	49,253
13-GS11298	54,810	46,533
13-GS11299	54,810	47,137
13-GS11300	54,810	49,287
13-GS11301	54,810	41,532
13-GS11302	54,810	41,620
13-GS11303	54,810	40,275
13-GS11304	54,810	18,850
13-GS11305	54,810	15,312

13-GS12251	49,065	37,828
13-GS12252	43,113	31,810
13-GS12253	37,643	34,723
13-GS12254	37,161	32,199
13-GS12255	33,139	31,857
13-GS12256	31,530	32,759
13-GS12257	29,600	25,710
13-GS12258	26,222	16,029
13-GS12259	23,648	14,584
13-GS12260	21,395	15,706
13-GS12261	19,143	11,822
13-GS12262	14,961	10,729
13-GS12263	12,387	5,344
Total	**1,310,779**	**1,023,164**

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

>>

The ex-ante estimate for the monitoring period has been calculated as follows:

For Ex-ante ERs for VPA 31 to VPA 47
= Ex-ante ER as per VPA-DD (= 59,898) x duration of monitoring period / days in a year (=365)
= 59,898[9]* 334[10]/365[11]
= 54,810

For Ex-ante ERs for VPA 49 to VPA 61
= Ex-ante ER as per VPA-DD (=58,718) x duration of monitoring period / days in a year (=365)

VPA No.	Start date of crediting under current MP	Monitoring Days in the current MP	Ex - Ante ERs for current MP
VPA 49	30/01/23	305	49,065
VPA 50	08/03/23	268	43,113
VPA 51	11/04/23	234	37,643
VPA 52	14/04/23	231	37,161
VPA 53	09/05/23	206	33,139
VPA 54	19/05/23	196	31,530
VPA 55	31/05/23	184	29,600
VPA 56	21/06/23	163	26,222

[9] Refer section B.6.4 of the VPA-DD
[10] Total number of days in the monitoring period.
[11] Total number of days in a year.

VPA 57	07/07/23	147	23,648
VPA 58	21/07/23	133	21,395
VPA 59	04/08/23	119	19,143
VPA 60	30/08/23	93	14,961
VPA 61	15/09/23	77	12,387

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

>>
The actual emission reductions are lower as compared to ex-ante calculation in the registered PDD.

SECTION F. SAFEGUARDS REPORTING

>>
Not applicable, Refer VPA-DD appendix 1

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

>>
The grievance mechanism is in place as per the table shown below. No negative comments that would require adjustments of the PoA were identified. Impact Carbon/ Impact Water engages office-based staff to complete feedback collection phone calls on a regular basis. This was found to be the most effective input/grievance mechanism. Comment books have been made available for written comments at Head Office and sales people's also carries with them.

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.	Justification
Continuous Input / Grievance Expression Process Book (mandatory)	Continuous input / Grievance Expression process book is available at the office at the following address: **Impact Water** PO Box 1903-00606, Nairobi House #44, Muthithi Road Westlands, Nairobi	In line with section 2.1 of the Annex W Expression book has been placed at office of **Impact Water** in Kenya. Stakeholders are free to voice their concerns via the Grievance Expression Book. By maintaining feedback book at the local office, it is ensured that stakeholders that don't have access to electronic media for expressing concerns / grievances are also able to share their concerns / feedback. Additionally, the end users always have an option to revert to the salesperson (representative of distribution/retail partners etc.) in case of any feedback / complaints with the product post distribution.
GS Contact (mandatory)	help@goldstandard.org	--

Other	Contact number: +256 790 911 934	As the project is spread across a huge area hence telephone access has also been provisioned for in line with Annex W, section 2.3 of Gold Standard.
	Email: info@impactcarbon.org	As per para 2.4 of Annex W of GS, the stakeholders with internet access have an option of contacting Impact Carbon through the email id provided.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

>>
Not Applicable

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

>>
Not Applicable, project is in compliance with the Host Country's legal, environmental, ecological, and social regulations and has not been legally challenged in the concerned monitoring period.

Appendix 1: Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Person/entity responsible for completing the GS-MR-FORM
Organization name	Impact Carbon
Street/P.O. Box	47 Kearny Street
Building	Suite 600
City	San Francisco
State/region	California
Postcode	94108
Country	United States
Telephone	+1 415 968 9087
Fax	-
E-mail	ehaigler@impactcarbon.org
Website	www.impactcarbon.org
Contact person	Evan Haigler
Title	Director
Salutation	Mr.
Last name	Haigler
Middle name	-
First name	Evan
Department	-

Project participant and/or responsible person/ entity	☐ Project participant ☒ Person/entity responsible for completing the GS-MR FORM

Organization name	Climate Secure India Pvt. Ltd.
Street/P.O. Box	Club Road
Building	Pragati Apartments
City	West Delhi
State/Region	Delhi
Postcode	110063
Country	India
Telephone	+91 11 2521 3080
Fax	--
E-mail	info@climate-secure.com
Website	www.climate-secure.com
Contact person	Rohit Lohia
Title	Director

Appendix 2: Deviation from the monitoring methodology
Reference: Dev_184

Date of approval: 07/12/2021

Validity: first crediting period of the VPA

Description:

Methodological requirement:

1. *Parameter table SDWS 29 - The minimum sample size for IWT – for individual technology age group shall be determined considering the project technology type and in line with the sampling approach applied*

2. *Also, page 51 of the applied methodology, for parameter SDWS29, refers a minimum sample size of 30 per technology age.*

3. *Para 4.2.2. of the applied methodology prohibits grouping more than 10 VPAs together.*

Deviation proposed:
Conduct the project surveys for WPS stratifying each technology irrespective of their age, and by grouping more than 10 small scale VPAs together.

Justification:
WPS technologies are not affected by ageing, and are resupplied, maintained, and/or replaced on an ongoing basis. The water purification technologies operate on consumable modules basis i.e., once their treatment capacity (cartridge / tablets / filters) is fully consumed, their consumables (cartridges / tablets / filters) are replaced making them revive their useful lifetime (age) again. Also, WPS operate on binary performance rather than reducing performance i.e., a WPS irrespective of its age will either provide safe water or unsafe water. Thus, the requirement to monitor the systems per technology age is deemed superfluous and only the monitoring of each WPS technology, irrespective of age shall be applicable for WPS devices.

The VPAs in each country are identical as they follow same management plan, operational plan and technologies. The limit on grouping by number of VPAs (maximum 10) is not a correct parameter to determine the limits for sampling.

GS Decision:

The deviation request is approved for the first crediting period of the VPAs GS11259 to GS11305. However, the PD must ensure that:

1. The stratified random sampling approach applied for sample size calculation for the monitoring survey must meet all the requirements under Appendix 3 of Guideline: Sampling and surveys for CDM project activities and programmes of activities.

2. Continuity in the project's monitoring activities is maintained, and PD can justify that no monitoring gaps exist (especially for SDG parameters) within the Monitoring Period(s). However, if gap(s) exist, the project shall justify that conservative approach(es) have been applied in line with section 3 of the Deviation Approval Requirements and Procedures (version 1.1) and overarching GS principles (as applicable).

Appendix 3: SDG 13 and SDG 1 value for each VPA
SDG 13:

SDG	VPA	MP Start Date	MP End Date	Actual values achieved during this monitoring period
13	GS11289	01/01/2023	30/11/2023	38,203
	GS11290			43,488
	GS11291			47,295
	GS11292			51,197
	GS11293			44,924
	GS11294			47,567
	GS11295			49,857
	GS11296			49,734
	GS11297			49,253
	GS11298			46,533
	GS11299			47,137
	GS11300			49,287
	GS11301			41,532
	GS11302			41,620
	GS11303			40,275
	GS11304			18,850
	GS11305			15,312
	GS12251			37,828
	GS12252			31,810
	GS12253			34,723
	GS12254			32,199
	GS12255			31,857
	GS12256			32,759
	GS12257			25,710

	GS12258			16,029	
	GS12259			14,584	
	GS12260			15,706	
	GS12261			11,822	
	GS12262			10,729	
	GS12263			5,344	
	Total			**1,023,164**	

SDG 1:

SDG	VPA	MP Start Date	MP End Date	Number of premises with at least one WPS distributed / installed under the project
1	GS11289	01/01/2023	30/11/2023	648
	GS11290			647
	GS11291			644
	GS11292			646
	GS11293			634
	GS11294			608
	GS11295			639
	GS11296			641
	GS11297			606
	GS11298			602
	GS11299			526
	GS11300			637
	GS11301			644
	GS11302			641
	GS11303			638
	GS11304			361
	GS11305			293
	GS12251			775
	GS12252			775
	GS12253			775
	GS12254			775
	GS12255			775
	GS12256			775
	GS12257			775
	GS12258			775
	GS12259			710
	GS12260			775
	GS12261			775
	GS12262			775
	GS12263			660
	Total			**19,950**

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption