

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

[Section A](#) - Description of project

[Section B](#) - Implementation of project

[Section C](#) - Description of monitoring system applied by the project

[Section D](#) - Data and parameters

[Section E](#) - Calculation of SDG Impacts

[Section F](#) - Safeguards Reporting

[Section G](#) - Stakeholder inputs and legal disputes

KEY PROJECT INFORMATION

This template has been revised to aid a consistent interpretation and to better support project developers submitting documentation for certification. Please read the accompanying guide to understand how to complete this template accurately.

[TEMPLATE GUIDE Monitoring Report v. 1.1](#)

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

GS ID of Programme	GS1247
Title of Programme	GS1247 Improved Kitchen Regimes Multi-Country PoA
Version of POA-DD applicable to this monitoring report	v15.3
Name and GS ID of fully Validated CPA/VPAs (i.e. non-compliance check)	GS1247 VPA 134 Zoba Maekel Community Boreholes (GS6235)

Key Project Information

GS ID (s) of Project (s)	GS6235
Title of the project (s) covered by monitoring report	GS1247 VPA 134 Zoba Maekel Community Boreholes
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	4
Version number of the monitoring report	5
Completion date of the monitoring report	23/07/2025
Date of project design certification	GS6235: 14/08/2019
Date of Last Annual Report	13/12/2024
Monitoring period number	MP5
Duration of this monitoring period	08/12/2022 – 31/12/2024
Project Representative	CO2balance UK Ltd
Host Country	Eritrea

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 v1.0
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
1 No Poverty	Additional number of persons with access to basic/limited services	54,703	Number of people
3 Good Health and Well-being	Reduce in household smoke	77%	Percentage
5 Gender Equality	Time saved collecting water	40.2%	Percentage
6 Clean Water and Sanitation	Number of persons having access to safe water in terms of JMP Service categories	Safely Managed – 0% Basic – 90% Limited – 10% Unimproved – 0% Surface Water – 0%	Percentage
13 Climate Action (mandatory)	Total project emissions reductions	20,392	tCO ₂ e

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VERs tCO ₂ e (uncapped value)
08/12/2022	31/12/2022	392
01/01/2023	31/12/2023	10,000 (12,937)
01/01/2024	31/12/2024	10,000 (13,187)

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The Micro Scale GS6235 GS1247 VPA 134 Zoba Maekel Community Boreholes is eligible under the Gold Standard methodology for Emission Reduction from Safe Drinking Water Supply v1.0 (SDWS). The project will support the provision of safe water using borehole technology to hundreds of households within the Maekel region in Eritrea. By providing safe water, the project will ensure that households consume less firewood during the process of water purification and as a result there shall be a reduction of carbon dioxide emissions from the combustion process.

This region is largely rural, where local people typically use wood fuel to purify their drinking, cleaning and washing water. This process results in the release of greenhouse gas emissions from the combustion of wood – this can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households.

Many existing boreholes have fallen into disrepair because maintenance programmes have been poorly managed or proven too expensive. The capacity of communities to maintain their boreholes will also be supported through the project to ensure that the water keeps flowing. The boreholes included under the project will be powered entirely by emission-free technologies such as hand or solar-powered pumps.

CO2balance UK Ltd will be working in partnership with the Irish NGO Vita, that operates in Eritrea. CO2balance UK Ltd and Vita will rehabilitate and install the boreholes and deliver the maintenance programme for all the boreholes included in the project activity to ensure that the quality of the water delivered by the boreholes is fit for human consumption for the entire length of the project, which will be a minimum of five years.

The project is funded by marketing the anticipated carbon credits from the wood savings to ethical investors, so borehole owners must agree to transfer the emissions reductions over to Vita-CO2balance UK Ltd in return for them supplying the work to renovate the boreholes. This project will be developed under the Gold Standard carbon credit body, which in addition to checking that the carbon credits from this project are real, also measures local social, environmental and economic impact.

In total 63 handpumps were rehabilitated as part of this project between 16th September 2015 – 16th December 2017, which were represented in 11 VPAs in CP1: GS4422-3, GS4518-9, GS4518-9, GS4797-8, GS5244-5 and GS6235-7. Under the impact of adopting the GS

Emission Reductions from Safe Drinking Water Supply Methodology, all of the handpumps amalgamate into one single microscale VPA to enable continuation of the project. This MR therefore covers the renewal of the crediting period (CP) to the second CP for GS6235. Following the beginning of CP2, the 10 remaining VPAs will be discontinued, and the handpumps previously contained within them shall continue under GS6235

Below lists the boreholes included under GS6235.

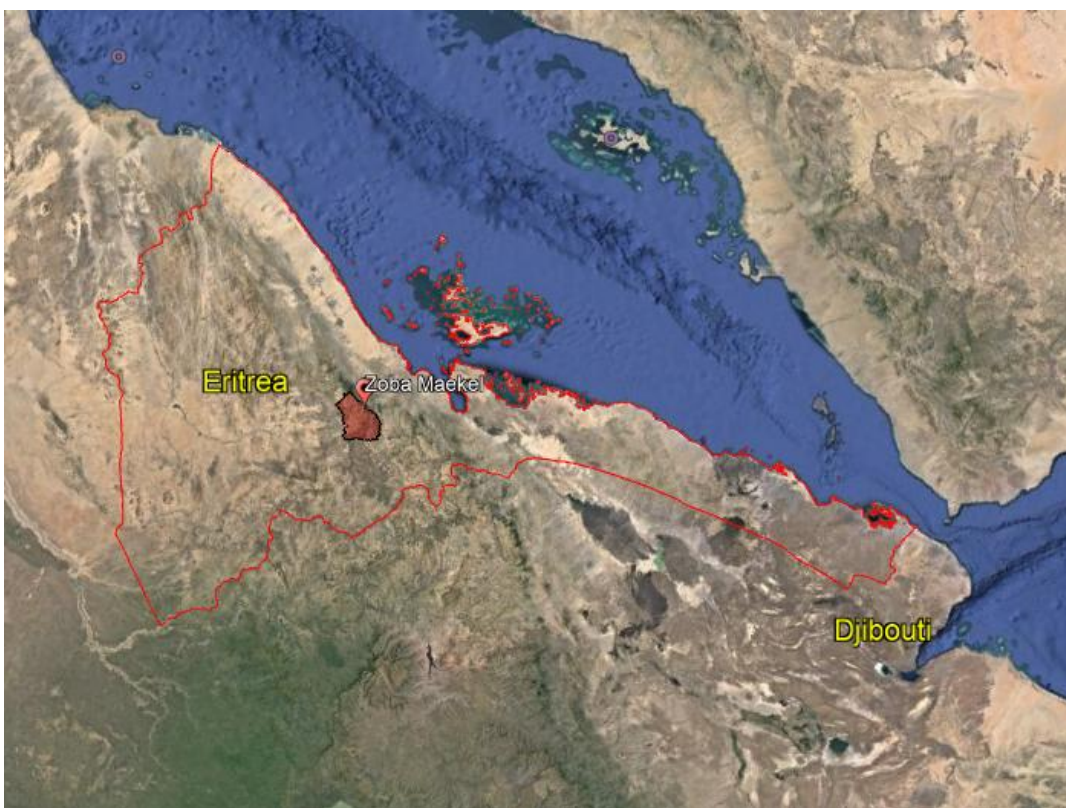
Table 1.

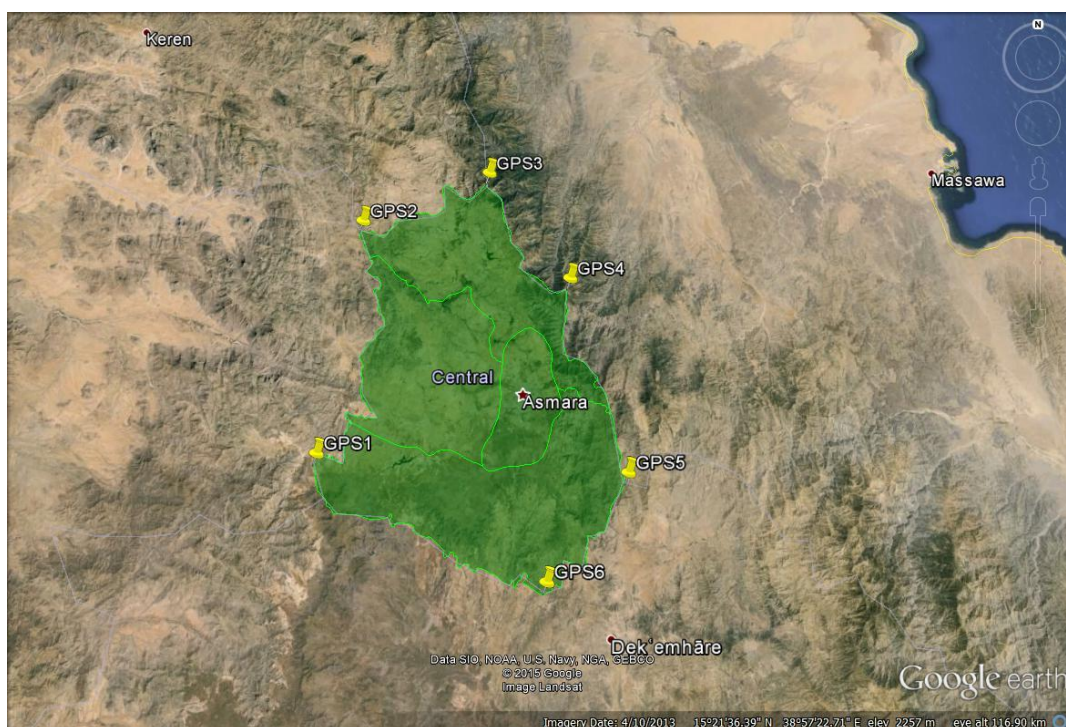
BH ID	Village	Latitude	Longitude	Rehab Date	BH Model	Mode of Use	CP1 VPA ID
ZMA 001	Arberegubue	15.19180	38.9932	16/12/2015	India Mark II	Domestic	45
ZMA 007	Adiarada	15.40794	38.97808	28/12/2015	India Mark II	Domestic	45
ZMA 023	Zagir	15.53648	38.89935	26/01/2016	India Mark II	Domestic	45
ZMA 028	Aditsenaf	15.18859	38.91432	13/02/2016	India Mark II	Domestic	45
ZMA 035	Dekipetros	15.49443	38.8829	01/03/2016	India Mark II	Domestic	45
ZMA 036	Gheremi	15.47392	38.88923	01/03/2016	India Mark II	Domestic	45
ZMA 004	Antsefet	15.31080	38.76277	18/12/2015	India Mark II	Domestic	46
ZMA 011	Embeyto	15.21171	38.95908	05/01/2016	India Mark II	Domestic	46
ZMA 034	Dekiseb	15.53221	38.8813	25/02/2016	India Mark II	Domestic	46
ZMA 037	Geshinashm	15.52944	38.82362	10/03/2016	India Mark II	Domestic	46
ZMA 041	Adi Hawesha	15.23774	38.97018	16/03/2016	India Mark II	Domestic	46
ZMA 043	Aditearishi	15.4619	38.81767	17/03/2016	India Mark II	Domestic	46
ZMA 005	Guritit	15.42190	38.99107	21/12/2015	India Mark II	Domestic	47
ZMA 008	Shinjibluk	15.4005	38.8645	29/12/2015	India Mark II	Domestic	47
ZMA 009	Wekiduba	15.37819	38.8841	30/12/2015	India Mark II	Domestic	47
ZMA 012	Defere	15.52306	38.90312	08/01/2016	India Mark II	Domestic	47
ZMA 015	Wekiduba	15.3566	38.8734	12/01/2016	India Mark II	Domestic	47
ZMA 029	Adiregit	15.48424	38.90784	16/02/2016	India Mark II	Domestic	47
ZMA 013	Tsaedaemba	15.30587	38.8594	11/01/2016	India Mark II	Domestic	48
ZMA 026	Adimngher	15.2495	38.85032	03/02/2016	India Mark II	Domestic	48
ZMA 032	Azen 1	15.49605	38.90345	19/02/2016	India Mark II	Domestic	48
ZMA 033	Azen 2	15.50845	38.90264	22/02/2016	India Mark II	Domestic	48
ZMA 040	Tseazega	15.35642	38.8006	15/03/2016	India Mark II	Domestic	48
ZMA 049	Tsaedaemba	15.3083	38.86054	10/10/2016	India Mark II	Domestic	48
ZMA 003	Aditeklay	15.31136	38.74997	17/12/2015	India Mark II	Domestic	54
ZMA 014	Adimussa	15.30658	38.83623	11/01/2016	India Mark II	Domestic	54
ZMA 025	Adimussa	15.30673	38.83623	02/02/2016	India Mark II	Domestic	54

ZMA 039	Embaderho	15.4212	38.89523	14/03/2016	India Mark II	Domestic	54
ZMA 044	Embaderho	15.43856	38.89749	21/03/2016	India Mark II	Domestic	54
ZMA 046	Beleza	15.42948	38.92373	24/03/2016	India Mark II	Domestic	54
ZMA 006	Adihamushte	15.23855	38.8378	24/12/2015	India Mark II	Domestic	55
ZMA 017	Tselot 1	15.28902	38.95801	15/01/2016	India Mark II	Domestic	55
ZMA 018	Tselot 2	15.28702	38.95519	15/01/2016	India Mark II	Domestic	55
ZMA 030	Adinegoda 1	15.47879	38.9126	18/02/2016	India Mark II	Domestic	55
ZMA 031	Adinegoda 2	15.48504	38.90693	18/02/2016	India Mark II	Domestic	55
ZMA 042	Zighib	15.21631	38.99402	16/03/2016	India Mark II	Domestic	55
ZMA 016	Quazen	15.47925	38.91652	14/01/2016	India Mark II	Domestic	84
ZMA 019	Afdeyu	15.49839	38.86352	21/01/2016	India Mark II	Domestic	84
ZMA 020	Afdeyu	15.49839	38.86352	21/01/2016	India Mark II	Domestic	84
ZMA 024	Adik	15.2534	38.9052	28/01/2016	India Mark II	Domestic	84
ZMA 045	Adighebru	15.33387	38.78326	23/03/2016	India Mark II	Domestic	84
ZMA 047	Adighebru	15.34002	38.75993	25/03/2016	India Mark II	Domestic	84
ZMA 053	Konduba	15.5122	38.8799	16/12/2016	India Mark II	Domestic	84
ZMA 010	Weki	15.54732	38.87739	31/12/2015	India Mark II	Domestic	85
ZMA 021	Tsehaflam 1	15.48909	38.85651	22/01/2016	India Mark II	Domestic	85
ZMA 022	Tsehaflam 2	15.48357	38.85218	22/01/2016	India Mark II	Domestic	85
ZMA 048	Unanalay	15.45149	38.82464	06/09/2016	India Mark II	Domestic	85
ZMA 050	Weki	15.54695	38.87683	20/10/2016	India Mark II	Domestic	85
ZMA 052	Adikuntsi	15.35527	38.83405	21/11/2016	India Mark II	Domestic	85
ZMA 054	Adibeney 1	15.40766	38.83129	07/12/2017	India Mark II	Domestic	134
ZMA 058	Adiyacob 1	15.37979	38.83118	09/12/2017	India Mark II	Domestic	134
ZMA 059	Adiyacob 2	15.38004	38.83119	09/12/2017	India Mark II	Domestic	134
ZMA 060	Tsadachristian	15.32542	38.84561	12/12/2017	India Mark II	Domestic	134
ZMA 062	Shimanguslailai	15.47377	38.85293	14/12/2017	India Mark II	Domestic	134
ZMA 055	Adibeney 2	15.40786	38.83141	07/12/2017	India Mark II	Domestic	135
ZMA 061	Tseazega	15.34555	38.79098	13/12/2017	India Mark II	Domestic	135
ZMA 063	Unaghudo	15.33312	38.8774	14/12/2017	India Mark II	Domestic	135
ZMA 064	Ametsi	15.4372	38.85865	15/12/2017	India Mark II	Domestic	135
ZMA 065	Adijin	15.5146	38.87046	15/12/2017	India Mark II	Domestic	135
ZMA 056	Hazega 1	15.39304	38.83426	08/12/2017	India Mark II	Domestic	136
ZMA 057	Hazega 2	15.28047	38.85077	08/12/2017	India Mark II	Domestic	136
ZMA 066	Mesgad	15.39329	38.83443	16/12/2017	India Mark II	Domestic	136
ZMA 067	Adiarada	15.19167	38.99166	16/12/2017	India Mark II	Domestic	136

A.2. Location of project

This project is located in the region of Maekel, Eritrea. Below is the geographic reference to allow unique identification of the project boundary. The target area and the fuel collection area are defined as being contained within project boundary, with the outer limits of the project boundary being clearly defined below. As the majority of beneficiaries collect their wood fuel locally in close proximity to their homesteads, the woodfuel collection area and target area are considered the same.





Project Area Coordinates		
	Latitude	Longitude
GPS1	15.254170°	38.691966°
GPS2	15.526661°	38.734285°
GPS3	15.458455°	38.985377°
GPS4	15.586939°	38.886742°
GPS5	15.233786°	39.051299°
GPS6	15.115250°	38.957312°

Below table listing the 63 boreholes.

Borehole ID	GS ID (CP2)	VPA ID (CP2)	Village	Latitude	Longitude	Date
ZMA 007	6235	134	Adiarada	15.19180	38.9932	28/12/2015
ZMA 001	6235	134	Arberebue	15.40794	38.97808	16/12/2015
ZMA 023	6235	134	Zagir	15.4823	38.899	26/01/2016
ZMA 028	6235	134	Aditsenaf	15.18859	38.91432	13/02/2016
ZMA 035	6235	134	Dekipetros	15.49443	38.8829	01/03/2016
ZMA 036	6235	134	Gheremi	15.47392	38.88923	01/03/2016
ZMA 004	6235	134	Antsefet	15.31080	38.76277	18/12/2015
ZMA 011	6235	134	Embeyto	15.21171	38.95908	05/01/2016
ZMA 034	6235	134	Dekiseb	15.53221	38.8813	25/02/2016
ZMA 037	6235	134	Geshinashm	15.52944	38.82362	10/03/2016
ZMA 041	6235	134	Adi Hawesha	15.23774	38.97018	16/03/2016

ZMA 043	6235	134	Aditearishi	15.4619	38.81767	17/03/2016
ZMA 005	6235	134	Guritat	15.42190	38.99107	21/12/2015
ZMA 008	6235	134	Shinjibluk	15.4005	38.8645	29/12/2015
ZMA 009	6235	134	Wekiduba	15.37819	38.8841	30/12/2015
ZMA 012	6235	134	Defere	15.52306	38.90312	08/01/2016
ZMA 015	6235	134	Wekiduba	15.3566	38.8734	12/01/2016
ZMA 029	6235	134	Adiregit	15.48424	38.90784	16/02/2016
ZMA 013	6235	134	Tsaedaemba	15.30587	38.8594	11/01/2016
ZMA 026	6235	134	Adimngher	15.2495	38.85032	03/02/2016
ZMA 032	6235	134	Azen 1	15.49605	38.90345	19/02/2016
ZMA 033	6235	134	Azen 2	15.50845	38.90264	22/02/2016
ZMA 040	6235	134	Tseazega	15.35642	38.8006	15/03/2016
ZMA 049	6235	134	Tsaedaemba	15.3083	38.86054	10/10/2016
ZMA 003	6235	134	Aditeklay	15.31136	38.74997	17/12/2015
ZMA 014	6235	134	Adimussa	15.30658	38.83623	11/01/2016
ZMA 025	6235	134	Adimussa	15.30673	38.83623	02/02/2016
ZMA 039	6235	134	Embaderho	15.4212	38.89523	14/03/2016
ZMA 044	6235	134	Embaderho	15.43856	38.89749	21/03/2016
ZMA 046	6235	134	Beleza	15.42948	38.92373	24/03/2016
ZMA 006	6235	134	Adihamushte	15.23855	38.8378	24/12/2015
ZMA 017	6235	134	Tselot 1	15.28902	38.95801	15/01/2016
ZMA 018	6235	134	Tselot 2	15.28702	38.95519	15/01/2016
ZMA 030	6235	134	Adinegoda 1	15.47879	38.9126	18/02/2016
ZMA 031	6235	134	Adinegoda 2	15.48504	38.90693	18/02/2016
ZMA 042	6235	134	Zighib	15.21631	38.99402	16/03/2016
ZMA 016	6235	134	Quazen	15.47925	38.91652	14/01/2016
ZMA 019	6235	134	Afdeyu 1	15.49839	38.86352	21/01/2016
ZMA 020	6235	134	Afdeyu 2	15.49839	38.86352	21/01/2016
ZMA 024	6235	134	Adik	15.2534	38.9052	28/01/2016
ZMA 045	6235	134	Adighebru	15.33387	38.78326	23/03/2016
ZMA 047	6235	134	Adighebru	15.34002	38.75993	25/03/2016
ZMA 053	6235	134	Konduba	15.5122	38.8799	16/12/2016
ZMA 010	6235	134	Weki	15.54732	38.87739	31/12/2015
ZMA 021	6235	134	Tsehaflam 1	15.48909	38.85651	22/01/2016
ZMA 022	6235	134	Tsehaflam 2	15.48357	38.85218	22/01/2016
ZMA 048	6235	134	Unanalay	15.45149	38.82464	06/09/2016
ZMA 050	6235	134	Weki	15.54695	38.87683	20/10/2016
ZMA 052	6235	134	Adikuntsi	15.35527	38.83405	21/11/2016
ZMA 054	6235	134	Adibeney 1	15.40766	38.83129	07/12/2017
ZMA 058	6235	134	Adiyacob 1	15.37979	38.83118	09/12/2017
ZMA 059	6235	134	Adiyacob 2	15.38004	38.83119	09/12/2017
ZMA 060	6235	134	Tsadachristian	15.32542	38.84561	12/12/2017
ZMA 062	6235	134	Shimanguslailai	15.47377	38.85293	14/12/2017
ZMA 055	6235	134	Adibeney 2	15.40786	38.83141	07/12/2017
ZMA 061	6235	134	Tseazega	15.34555	38.79098	13/12/2017
ZMA 063	6235	134	Unaghudo	15.33312	38.8774	14/12/2017
ZMA 064	6235	134	Ametsi	15.4372	38.85865	15/12/2017
ZMA 065	6235	134	Adijin	15.5146	38.87046	15/12/2017

ZMA 056	6235	134	Hazega 1	15.39304	38.83426	08/12/2017
ZMA 066	6235	134	Mesgad	15.28047	38.85077	16/12/2017
ZMA 057	6235	134	Hazega 2	15.39329	38.83443	08/12/2017
ZMA 067	6235	134	Adiarada	15.19167	38.99166	16/12/2017

A.3. Reference of applied methodology

GS Emission Reductions from Safe Drinking Water Supplies v 1.0

A.4. Crediting period of project

The VPA included in this project is in its second crediting period.

Below are reported the crediting period start and end dates:

CP1: 08/12/2017 – 07/12/2022 (5 years)

CP2: 08/12/2022 – 07/12/2027 (5 years)

CP3: 08/12/2027 – 07/12/2032 (5 years)

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

Many existing boreholes have fallen into disrepair because maintenance programmes have been poorly managed or proven too expensive. The boreholes included under the project are entirely human operated and are fitted with hand pump models that are commonly used in the area such as India Mark II pumps (see below).

A comprehensive maintenance programme is required in order to guarantee a consistent supply of pure water from the borehole pumps that have been rehabilitated and installed. Borehole pumps contain moving parts such as chains and bearings which require regular service and or replacement to prevent against failure. In addition, nuts and bolts commonly work themselves free and require regular replacement. Other, more major parts in the pump assembly have a longer lifespan and require a less frequent replacement. Items such as

handles, cylinders, top cones, riser pipes, connecting rods are checked over during the annual service and replaced if deemed necessary. The planned maintenance programme is carried out by local technicians and will endure the activity of the project.

The pumps rehabilitated in this VPA are India Mark II pump as shown below. Other hand pump models that utilize the same basic design may also be included in the project if breakdowns occur and the partner will decide to change the handpump to a different model. This includes but is not limited to the Afridev, India Mark II and the U3 modified pump. The project is not limited to any particular model of hand-pump or water scheme; installation and rehabilitation will be according to local needs.

India Mark II pump

Technical Specifications:

	Afridev	India Mark II	U3 Modified
Cylinder diameter (mm):	50	63.5	50
Maximum Stroke (mm):	225	125	125
Approx. discharge at about 75-watt input m3/h:	at 10 m head 1.4	at 10 m head 1.8	at 10 m head 1.2
	at 15 m head 1.1	at 15 m head 1.3	at 15 m head 1.0
	at 20 m head 0.9	at 20 m head 1.0	at 20 m head 0.8
	at 30 m head 0.7	at 30 m head 0.8	at 30 m head 0.6
Pumping lift (m):	10-45	10-50	10-45
Water consumption (lpcd):	15-20	15-20	15-20

The project includes 63 boreholes in this micro-scale project and all water points under the VPA are in good working order. There have been no changes to the project design that was envisaged at Design Certified PDD. Implementation dates in Table 1 in Section A.1.

B.1.1 Forward Action Requests

N/A

B.2. Post-Design Certification changes

>>

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

REC_DEV_462

The deviation was submitted by CO2balance UK Ltd as there was not suitable technology to comply with SDWS 23 requirements. As per GS feedback on the deviation:

The CME may claim emission reduction for the monitoring period until 31/12/2024 provided that:

- *Default values for water consumption per capita are applied and*

- *Monitored data confirms a minimum 1200 liter/day water discharge per water point and operational status of borehole/water pumps including any potential seasonal variations. This may be measured on a sampling basis, following the section 4.2- General requirements for sampling of the methodology.*

PD is applying the default value of 4 l/p and has conducted field testing on a sample of boreholes to confirm the minimum 1200 liter/day water discharge. The field tests (5 Minute Stroke tests) were conducted in July 2024 and November of 2024 on 35 randomly selected boreholes to monitor the yield of water the pump.

Both samples demonstrate that the minimum 1200 litres/day water discharge was reached.

The July 2024 (Wet Season) 5MST had an uncapped average of 4,619 litres of water use per day whilst the November 2024 (Dry Season) 5MST had an uncapped average water use of 4,387 litres per day, resulting in an average of 4503.7 litres per day for both seasons.

B.2.2. Corrections

>>

N/A

B.2.3. Changes to start date of crediting period

No changes have been made during this monitoring period

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardised baseline

>>

N/A

B.2.5. Changes to project design of approved project

>>

N/A

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

In accordance with the Gold Standard methodology “Emission Reductions from Safe Drinking Water Supplies v 1.0”, the survey samples are randomly selected from the borehole user record and are determined in accordance with the required confidence/precision. The size of the sample is dependent on the methodological requirements of the parameter being monitored to ensure the parameters measured satisfy minimum sample requirements as well as required confidence/precision requirements. The sample is reselected for every monitoring period to ensure the selection remains random.

A minimum number of boreholes will need to be sampled. Out of those boreholes, households will be randomly sampled, complying with the minimum sample size for the particular survey/test. Individual participants will be selected from the borehole user data base using the random selection process outlined in the monitoring plan. Sample sizes will be in line with the Gold Standard requirements. The surveys below will be monitored under the cross sampling approach;

- Project Surveys - Completed annually

The Water Consumption Field Tests will be completely biennially unless the default value will be applied.

The surveys will be conducted so as to ensure that they are within the end date of the respective monitoring periods for each VPA.

Below is a summary of the key information that has been collected and monitored as part of this project;

Borehole Database

The borehole installation/rehabilitation record includes the following information:

- Date of installation/rehabilitation
- Quantity of boreholes installed

- The total number of people obtaining their water from each borehole and their distance from it
- Model of borehole
- Geographic information of borehole
- Mode of use

The total number of households using each borehole has been determined through the lists supplied by the community group and or district water officer responsible for that borehole.

The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section D.

- **Usage Survey** – conducted twice during this Monitoring Period, from 03/10/2023 to 06/10/2023 and 14/10/2024 to 17/10/2024
- **Project Survey** – conducted twice during this Monitoring Period, from 03/10/2023 to 06/10/2023 and 14/10/2024 to 17/10/2024.
- **Household Water Quality testing (SDWS1 18)** - conducted twice during this Monitoring Period, from 14/09/2023 to 20/09/2023 and 28/10/2024 to 31/10/2024.
- **WASH reporting (SDWS 20)** –carried out among project safe water end users. The outcomes of the activities are reported in the “SDWS Hygiene Campaign Report”. The annual WASH training took place on the 29th August 2023 and 14th August 2024. The training involves sensitisation on principles of WASH, household water management and preventing pollution of the ground water. A report will be produced annually in line with SDWS 20.
- **Water consumption field test** – not conducted for this MP, the default value of 4L / person / day has been applied in the calculations.
- **Quantity of safe drinking water provided by the project (SDWS 23)** – The project will not be applying $Q_{m,y}$, as the required technology is not yet available. For this MP, the projects applies $Q_{pop,y}$.

Additional monitoring studies were conducted:

- **5 Minutes stroke tests** - conducted between 03/07/2024 and 05/07/2024 for the Wet season and between 12/11/2024 and 16/11/2024 for the Dry season, to

assess the yield of the project's boreholes. this monitored data has been collected to confirm a minimum 1200 litre/day water discharge per water point and operational status of borehole/water pumps.

- **Quality of the treated water (SDWS 3)** - The quality of the treated water will be assessed to ensure that it is fit for human consumption. The borehole water quality tests took place on 13/12/2022 and 19/11/2024. The parameters used to assess the water quality will be in line with Eritrean standards for potable water and all parameters will be shown to be within levels considered acceptable for domestic human consumption.
- **Leakage assessment** - Leakage is assessed biennially. Please refer to section E.3 of this MR.

WASH campaigns/trainings at community level are carried out alongside monitoring activities

SECTION D. DATA AND PARAMETERS

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

SDG 1, 3, 5, 6 & 13

Data/parameter	SDWS 1
Unit	Number of household/institution per CWT/CWS
Description	Coordinates of CWT/CWS – Acceptable formats for GPS coordinates include DMS (degrees, minutes and seconds), DMM (degrees and decimal minutes), and DD (decimal degrees) Number of end-user premises, quantity
Source of data	End users premises (e.g. household, institutions) within 1km distance of project water source. Recorded for each CWT/CWS installation ex-ante at the time of start of crediting period. In case of progressive installation – for new CWT/CWS units before 1 st issuance for new units.
Value(s) applied	GPS coordinates for each individual water point location Number of eligible households/institutions for each water point collected in user lists
Choice of data or Measurement methods and procedures	255
Purpose of data	HH Lists

Additional comment	Determine location of water point, number of end-users and distance from water point
	-

SDG 1, 3, 6 & 13

Parameter ID	SDWS 2
Data/parameter	Project technology description
Unit	N/A
Description	Detailed description of the planned project technology shall include as a minimum: CWT and CWS: - manufacturer name - product name (if applicable) - technology type - capacity (in case of pumps: rated flow rate, or flow-rate calculation) For all technologies, any performance certifications issued by national standard body or an appropriate certification part recognised by national standards body or recognised International Organisation agency also shall be provided. Rehabilitated technologies: In case the project technology (CWT and CWS) is rehabilitated, the following is also required as part of technology description: - Evidence of Non-operational time prior to proposed rehabilitation (at minimum with evidence letter from local representative or government, etc.); - Evidence of lack of an existing maintenance or repair plan (at minimum with evidence letter from local representative or government, etc.); - Original installation date/month (approximate month/year); and - Information/evidence to confirm the details of rehabilitation activity (e.g. parts replaced, specifications followed, personnel conducting the repairs and date of retrofitting) CTF and RCFs demonstrate evidence of such project details.
Source of data	CWT and CWS: Any of the following sources shall be used: - Manufacturer specifications - Commercial guarantee - Technical reports from the installer - Third-party certification by a qualified entity, for example recognised certification agency by National/ International Standard body

	Rehabilitated technologies: - Sources mentioned for CWT and CWS above and - Technical reports from a qualified entity that undertakes the rehabilitation Professional opinion or expert opinion is not accepted as a source for this parameter.
Value(s) applied	Handpump manufacturer specifications: https://www.rural-water-supply.net/en/implementation/public-domain-handpumps/afridev https://www.rural-water-supply.net/en/implementation/public-domain-handpumps/india-mark-ii https://www.rural-water-supply.net/en/implementation/public-domain-handpumps/india-mark-iii The project is not limited to any model of hand-pump or water scheme
Choice of data or Measurement methods and procedures	CTFs and RCFs collect required project details
Purpose of data	Outline project details
Additional comment	-

SDG 1 & 6

Parameter ID	SDWS 3
Data/parameter	Project technology performance level
Unit	N/A
Description	The water directly supplied by the water source (CWS or from the CWT) must comply with i. Microbial quality in line with (i) national standards or guideline for microbial quality of drinking water, or in their absence, (ii) the guideline values for verification of microbial quality from the Guidelines for drinking-water quality, 4th edition (Table 7.10, WHO, 2017); and ii. Chemical quality (i) national standards or guidelines on priority chemical contamination and physical and aesthetic aspects, or in the absence of such requirements, (ii) international standards or guidelines on priority chemical contamination¹⁸ and physical and aesthetic aspects.

	Once at the start of the crediting period, and microbial quality at the CWS and CWT location must be retested following an event that could lead to contamination of the source water (e.g. flooding).
Source of data	Water quality test report. The Water Resource Department (part of the Ministry of Land, Water and Environment) follows the WHO guidelines and certifies the water quality of the water supply. The National Water Quality Reference Laboratory has certified each water supply in line with national standards. Each form of data collection documentation provided by the Eritrean Ministry of Water, Land and Environment is stamped by the Water Resources Department to evidence the quality accreditation. This can be found in the HH WQT documentation.
Value(s) applied	Laboratories used for water quality testing must be approved by local health authorities and/or have quality accreditation; and The laboratory used shall have evidence to demonstrate that it has an adequate quality management plan in place which addresses both quality assurance and quality control test procedures. Table 4.6 Checklist for effective analytical quality assurance of WHO Guidelines, 1997 may be used as a guideline for laboratory compliance with quality assurance practices.
Choice of data or Measurement methods and procedures	Water quality laboratory analysis
Purpose of data	Determine water quality
Additional comment	-

SDG 1 & 6

Parameter ID	SDWS 4
Data/parameter	Regulatory framework for safe water supply
Unit	N/A
Description	The Eritrean Water Proclamation No. 162/2010 issued on 23 August 2010 stipulates that “the State shall exert all effort to ensure that every citizen exercises the right of access to basic supply of clean and safe water (article 20(1))” and “schemes shall be developed to subsidize the costs associated with the provision of basic water services for the disadvantaged segments of the society (article 20(2))”. In addition, the Eritrean Water Proclamation stipulates that “the use of water for domestic purposes shall have priority over any other water use rights (article 5(2))”. The project complies with key information throughout the policy and working collaboratively with multi-level agencies.

	Safe water supply, operation and maintenance regulations outlined in the policy have been incorporated in the project activities. Working closely with the Water Resource Department throughout the project cycle ensures that regulations are met.
Source of data	National, sub-national and local authorities
Value(s) applied	N/A
Choice of data or Measurement methods and procedures	N/A
Purpose of data	Adhere to regulatory framework for safe water supply
Additional comment	The project shall not undermine or conflict with any national, subnational and local regulations or guidance for safe drinking water supply, operation and maintenance, including any tariff requirements. Where the regulatory framework establishes any cap on parameters used by the methodology, for example number of users per borehole, this shall be accounted for in emission reduction calculations.

SDG 1 & 6

Parameter ID	SDWS 5
Data/parameter	Water sources in the project boundary
Unit	N/A
Description	PP defined 1km radius surrounding borehole. In the defined area, water source uses has been determined. Using Annex 2 from the methodology, PP determined the status of the water source (i.e 'improved' or 'unimproved').
Source of data	Baseline Study
Value(s) applied	21 – 100% unimproved
Choice of data or Measurement methods and procedures	SDWS parameter 5 Survey
Purpose of data	Determine water sources in project boundary
Additional comment	-

SDG 13

Parameter ID	SDWS 6
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Data/parameter	Stove technologies used in the project boundary
Unit	N/A
Description	Improved Woodfuel Stoves are dominant in the project area.
Source of data	Baseline survey
Value(s) applied	N/A
Choice of data or Measurement methods and procedures	Baseline survey
Purpose of data	Determine stove technology in project boundary
Additional comment	-

SDG 13

Parameter ID	SDWS 7
Data/parameter	Expected technical life of project technology
Unit	Treatment volume or operational hours or time period
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	CWS/CWT: Any one of the following sources shall be used: - Manufacturer specifications - Guarantee from the installer - Third-party certification by a qualified entity, for example recognised certification agency by National/ International Standard body If none of the required sources mentioned above are available, report of representative and robust field study results may be acceptable. Rehabilitated technologies: - Guarantee from a qualified entity that undertakes the rehabilitation Professional opinion or expert opinion is not accepted as a source for this parameter
Value(s) applied	Water Sources are designed to last for up to 20-50 years with adequate maintenance.
Choice of data or Measurement methods and procedures	N/A

Purpose of data	Determine technical life of project technology
Additional comment	The project shall ensure that the units are replaced with systems of comparable quality or retrofitted at the end of their technical life in order to continue claiming emission reductions. If no replacement or retrofitting is provided, emission reduction claims are limited to the expected technical life.

SDG 3 & 13

Parameter ID	SDWS 8
Data/parameter	X_f
Unit	Percentages of fuel f use in target population
Description	The proportion of each different cooking fuel f used in the project boundary by end-users: - % among the target population if single fuel is used for water boiling. For example, the target population either use wood or charcoal - 60% end users use wood and 40% charcoal. - Weighted average on energy basis, if multifuel situation exists within premise. For example, a household that uses 1000 kg fuelwood per year and 500 kg charcoal per year for cooking and water boiling uses 51.4% fuelwood and 48.6% charcoal on an energy basis. If the project covers different types of end-users premises (e.g. households, schools), then the fuels used in the geographical area of the project by the same types of end-users are to be determined for each end-user premises type. Undertake assessment at the start of each crediting period. SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
Source of data	Baseline survey Q34
Value(s) applied	Wood: 1
Choice of data or Measurement methods and procedures	100

Purpose of data	Determine the proportion of each different cooking fuel f used in the project boundary by end-users
Additional comment	

SDG 13

Parameter ID	SDWS 9
Data/parameter	EF_{b,f,CO_2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor from use of fuels SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
Source of data	IPCC defaults; Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5; https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf Document also shared in verification documents titled: IPCC Defaults V2_2_Ch2_Stationary_Combustion
Value(s) applied	112 tCO ₂ /TJ
Choice of data or Measurement methods and procedures	Deemed valid by methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

SDG 13

Parameter ID	SDWS 10
Data/parameter	$EF_{b,f,nonCO_2}$
Unit	tCO ₂ e/TJ

Description	Non-CO₂ emission factor from use of fuels, in case the baseline fuel is biomass or charcoal SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
Source of data	IPCC defaults: Non-CO₂ Emissions from Stationary Combustion. Annex 1, Table 2 and Table 3. https://www.ipccnggip.iges.or.jp/public/gp/bgp/2_2_Non-CO2_Stationary_Combustion.pdf Global Warming Potential: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table2-14 Also see provided IPCC defaults report: IPCC Defaults 2_2_Non-CO₂ Stationary Combustion
Value(s) applied	9.46 tCO ₂ e/TJ
Choice of data or Measurement methods and procedures	Deemed valid by methodology
Purpose of data	Calculation of baseline emissions
Additional comment	

SDG 3 & 13

Parameter ID	SDWS 11
Data/parameter	η_{wb}
Unit	Percentage
Description	Weighted average efficiency of the baseline water boiling devices. Calculate the weighted average of the water boiling efficiency in the project boundary using the proportion of different stove types used and the stove efficiencies. SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

Source of data	Analysis of baseline survey data.
Value(s) applied	0.2%
Choice of data or Measurement methods and procedures	The baseline survey shows that 100% of households cook on ICS.
Purpose of data	Determine efficiency of the baseline water boiling.
Additional comment	

SDG 1, 3, 6 & 13

Parameter ID	SDWS 12
Data/parameter	C_b
Unit	Percentage
Description	Proportion of project households who in the baseline were already using a safe water supply that did not require boiling it (%) SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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 SDG 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 SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	Baseline Survey Qs 24-25
Value(s) applied	0 %
Choice of data or Measurement methods and procedures	Established through questions in the baseline on a representative sample of the end users

Purpose of data	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comment	

SDG 13

Parameter ID	SDWS 14
Data/parameter	NCV_f
Unit	TJ/fuel units, i.e. mass or volume units
Description	Net calorific value of fossil fuel f
Source of data	IPCC defaults
Value(s) applied	0
Choice of data or Measurement methods and procedures	N/A
Purpose of data	ERs calculations
Additional comment	Applies to the calculation of project emissions. Reference Table 1.2 in linked document: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

SDG 13

Parameter ID	SDWS 15
Data/parameter	EF_f
Unit	tCO ₂ /TJ
Description	Emission factor of fossil fuel f
Source of data	IPCC defaults
Value(s) applied	0
Choice of data or Measurement methods and procedures	N/A
Purpose of data	ERs calculations

Additional comment	Applies to the calculation of project emissions
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SDG 13

Parameter ID	SDWS 16
Data/parameter	EF_{ec}
Unit	tCO ₂ /kWh
Description	Emission factor associated with the electricity use
Source of data	0
Value(s) applied	N/A
Choice of data or Measurement methods and procedures	N/A
Purpose of data	N/A
Additional comment	-

SDG 13

Parameter ID	SDWS 17
Data/parameter	TDL_{ec}
Unit	%
Description	Transmission and distribution losses associated with the electricity use
Source of data	N/A
Value(s) applied	N/A
Choice of data or Measurement methods and procedures	N/A
Purpose of data	N/A
Additional comment	-

SDG 13

Parameter ID	SDWS 19
Data/parameter	$SE_{w,b,y}$
Unit	kJ/L
Description	Specific energy required to boil water SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	N/A
Value(s) applied	1804.15
Choice of data or Measurement methods and procedures	Value calculated in line with Section 3.6.2 of SWDS Methodology: $360.83/\eta_{wb}$
Purpose of data	Calculation of baseline emissions
Additional comment	-

SDG 5

Parameter ID	SDWS 19
Data/parameter	$T_{b,y}$
Unit	Minutes
Description	Time spent collecting water per household per trip prior to project SDG 5 (Gender Equality) 5.4: Recognise and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location
Source of data	Baseline Survey
Value(s) applied	55.21 minutes
Measurement methods and procedures	Survey
Monitoring frequency	Calculating time saved by project

QA/QC procedures	-
Purpose of data	Calculate total reduction of time spent collecting water per household per day
Additional comment	-

SDG 3

Parameter ID	SDWS 19
Data/parameter	$P_{b,boil}$
Unit	Percentage
Description	Percentage of persons boiling water in the baseline SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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
Source of data	Baseline Survey
Value(s) applied	100%
Choice of data or Measurement methods and procedures	The percentage of people stating that they used to boil their water for purification in the baseline scenario, evaluated through the baseline survey.
Purpose of data	Determine number of persons boiling water in the baseline
Additional comment	-

SDG 13

Parameter ID	N/A
Data/parameter	f_{NRB}
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	Determined by:

	- CDM TOOL30, Calculation of the fraction of non-renewable biomass
Value(s) applied	0.96
Choice of data or Measurement methods and procedures	Deemed valid by methodology
Purpose of data	To calculate baseline emissions
Additional comment	-

D.2 Data and parameters monitored

SDG 3.9.1

Parameter ID	SDWS 18
Data/parameter	$M_{q,y}$
Unit	Fraction
Description	Ongoing water quality indicated as the fraction of the samples that pass microbial quality standard requirements specified in relevant microbial quality standard for drinking water of the host country. In case a national standard is not available, the water quality shall comply with WHO Guideline values for verification of microbial quality i.e., all water directly intended for drinking must not have detectable E.Coli in any 100 ml sample i.e., less than 1 Colony Forming Unit (CFU) of E.Coli /100 ml. SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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
Source of data	Water quality tests are conducted by water quality testing experts from the Water Resource Department

	using testing equipment in the field. The 2023 testing took place between 14/09/2023 to 20/09/2023. The 2024 testing took place between 28/10/2024 to 31/10/2024.
Value(s) applied	0.93 (2023) 0.91 (2024)
Measurement methods and procedures	The National Water Quality Reference Laboratory has certified each water supply in line with national standards.
Monitoring frequency	Annual sampling, and the first round of testing shall be conducted at least after six months from the start date using either: - 1 full water quality test annually OR - 3 partial water quality tests quarterly
QA/QC procedures	1. Laboratories used for water quality testing must be approved by local health authorities and/or have quality accreditation; and 2. The laboratory used must demonstrate that it has an adequate quality management plan in place which addresses both quality assurance and quality control test procedures.
Purpose of data	Determine water quality in year
Additional comment	2 full tests were conducted to cover the 2 years of this monitoring period

SDG 1.4.1, 3.9.1, 5.4.1, 6.1.1 & 13b

Parameter ID	SDWS 19
Data/parameter	SDG claims
Unit	N/A
Description	The project will transparently include information in project documents (PDD & Monitoring reports) on following two aspects to make claims on SDG 6.1.1 contributions. i. Level of Service in the baseline/project scenario: The drinking water service levels

classified in three categories: limited, basic or safely managed services. Households using improved drinking water sources which are located on premises, with water available when needed, and free from contamination*, are classified as having safely managed services. Households not meeting all of these criteria but using an improved source with water collection times of no more than 30 minutes per round trip are classified as having basic services, and those using improved sources with water collection times exceeding 30 minutes are classified as limited services.

- ii. Project contributions: The project developer shall select water service aspects i.e., Accessibility, Availability and Quality & identify the monitoring indicator(s) to monitor the project contributions. The project may use relevant monitoring indicators and information available in this methodology, for example SDWS 18 for Water Quality. The project may have contributions to one or all three aspects. The project developer shall only make claims on aspects that project is contributing to.

The project addressed point i under SDG 6 monitoring, determining the number of persons who drink from the 5 JMP Service categories (safely managed, basic, limited, unimproved, surface water).

The monitoring indicators for Accessibility, Availability and Quality are:

Accessibility – addressed in SDG 6 parameter by determining the distance of the safe water sources

Availability – addressed in non-functionality calculations in ERs

Quality – addressed in water quality testing procedures

All 3 contributions will also be addressed in a detailed Project Survey which includes JMP WASH questions regarding drinking water and hygiene. Results will be outlined in an annual hygiene report.

Source of data	Annual surveys
Value(s) applied	Please refer to SDWS 19 Parameter listed below: Tp,y TRy Py HAPRy Paccess. The parameters are monitored to determine SDGs contributions of the project
Measurement methods and procedures	Please refer to SDWS 19 Parameter listed below: Tp,y TRy Py HAPRy Paccess. The parameters are monitored to determine SDGs contributions of the project
Monitoring frequency	Annual
QA/QC procedures	Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Determine SDG claims
Additional comment	-

SDG 1.4.1 & 6.1.1

Parameter ID	SDWS 20
Data/parameter	Water hygiene education campaigns
Unit	N/A
Description	Hygiene campaigns carried out among project safe water end users. The following guidelines apply for conducting these campaigns: - Hygiene refers to access to sanitation amenities, equipment and infrastructure, as well as to the behaviour in respect to regular and correct use of such amenities. It also refers to behaviour that prevents infections from water-related diseases. - The project developer shall report the activities conducted each year in a detailed "Report of annual hygiene campaigns results" and summarize the results in the project monitoring reports. - 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 and, if relevant, a strategy put in place to address it through the subsequent hygiene campaign.

	- The detailed method used to assess hygienic handling of clean water must be provided with the PDD and verified by the VVB. - The details of the method should be adjusted to suit the circumstances of each project and also to suit learning year on year. The impacts of the hygiene campaign shall be assessed using the WHO/UNICEF Joint Monitoring Programme Core questions for drinking water and hygiene to determine the fraction of the households and institutions where Safe water and Hygiene practices are found to fulfil “safely managed” or “basic” requirements. In-person or telephone or by messaging (e.g. text, app) based survey shall be conduct covering all the JMP core questions for drinking water and core questions for hygiene. For sampling requirements, follow section 4.2 General requirements for sampling, below. The JMP core questions for households, schools and health care facilities are available at https://washdata.org/monitoring/methods/core-questions
Source of data	Report annual hygiene campaign results
Value(s) applied	N/A
Measurement methods and procedures	WASH training activities
Monitoring frequency	Annually
QA/QC procedures	The fraction of the households where Safe water and Hygiene practices are found to fulfil “safely managed” or “basic” requirements is expected to increase over time as a result of the hygiene campaigns.
Purpose of data	Determine community WASH understanding
Additional comment	Please refer to ‘SDWS Hygiene Campaign Report MP5_v1’ for further details. The 2023 annual hygiene campaign took place on the 29th August 2023 where 67 water users attended. The

event was facilitated by a water expert and the Head of the Water Resources Department of Maekel Zoba.

The 2024 annual hygiene campaign took place on the 14th August 2024 where 92 water users attended. The training was facilitated by the Water Resources Department water experts Mr. Bereket Musazghi and Mr. Ghirmai.

SDG 1.4.1, 3.9.1, 6.1.1 & 13b

Parameter ID	SDWS 22
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 in year y. SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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 SDG 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 SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	Project Survey

Value(s) applied	0
Measurement methods and procedures	Survey
Monitoring frequency	Annually 2023: 03/10/2023 – 06/10/2023 2024: 14/10/2024 – 17/10/2024
QA/QC procedures	- Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Calculation of baseline emissions
Additional comment	-

SDG 1.4.1 & 6.1.1

Parameter ID	SDWS 23
Data/parameter	$Q_{m,y}$
Unit	Litres/year
Description	Monitored quantity of safe water provided by the project in year y SDG 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
Source of data	Sensor measures water volume directly, once commercially available.
Value(s) applied	To be measured
Measurement methods and procedures	Water sensor
Monitoring frequency	Continuously
QA/QC procedures	Follow manufacturer, sector, national or international standards or guidelines for calibration and maintenance of the measurement device.
Purpose of data	Determine quantity of safe water provided by the project in year
Additional comment	The project will not be applying $Q_{m,y}$ as the required technology is not yet available. As soon as the required

technology is available and reliable it will be implemented. Until this time Qpop,y will be applied. Please refer to Rec_Dev_462

SDG 1.4.1, 3.9.1, 6.1.1 & 13b

Parameter ID	SDWS 24
Data/parameter	QPW _p
Unit	Litres/person/day
Description	Volume of drinking water per person per day for premises type p SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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 SDG 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 SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	Water Consumption Field Tests or default value (4 L)
Value(s) applied	4 L/person/day valued applied for this MP
Measurement methods and procedures	Deemed valid by methodology
Monitoring frequency	Biennial

QA/QC procedures	Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Determine volume of drinking for quantity of safe drinking water calculations
Additional comment	-

SDG 1.4.1, 3.9.1, 6.1.1 & 13b

Parameter ID	SDWS 25
Data/parameter	$HN_{p,y}$
Unit	Number
Description	Number of individuals per premises type p in the project boundary in year y SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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 SDG 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 SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	Project Survey
Value(s) applied	4.2 people per household (averaged from 2023 and 2024 Project Surveys)

Measurement methods and procedures	Household questions in survey
Monitoring frequency	Annually 2023: 03/10/2023 – 06/10/2023 2024: 14/10/2024 – 17/10/2024
QA/QC procedures	The value applied shall be cross-checked against at least one other source on the list. For cross-check purposes, sources applied may be up to 5 years old. Further, cross-check with older sources may be used provided they provide conservative results. The value has been crosschecked against several available sources, namely 'Credible published literature for project region'. These studies give similar values for number of individuals per household. The statistics range from 4.2 to 5.7 people per household. The Project Survey states 4.2 people per HH, thus is a conservative value. Sources: https://academicjournals.org/journal/JDAE/article-full-text-pdf/E68787E71571 https://www.tandfonline.com/doi/full/10.2147/RMHP.S478511#d1e263 https://www.afdb.org/sites/default/files/3tesseney_solar_pv_mini-grid_esia_final_version_08102024_final.pdf
Purpose of data	Determine number of individuals for quantity of safe drinking water calculations
Additional comment	

SDG 1.4.1, 3.9.1, 6.1.1 & 13b

Parameter ID	SDWS 26
Data/parameter	$HH_{p,y}$
Unit	Number
Description	Number of premises type p served by the project in year y SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution.

	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 SDG 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 SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	Survey of the premises (e.g. households, schools) within 1 km distance of project water source to check how often the premises used the project water source during the year. This survey may be part of the project survey and may be performed in person, by telephone, by messaging (e.g. text, app), appropriate to the context. Premises that report at least every-two-days use may be counted.
Value(s) applied	In total: 16,089 (project database – ‘HH List Maekel_2024 Confidential’) Per Water Point: 196 (255 before usage rate applied) (Per Water Point: 199 – 2023) (Per Water Point: 193 – 2024)
Measurement methods and procedures	Household questions in survey and user lists
Monitoring frequency	Annually
QA/QC procedures	Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Determine number of premises type for quantity of safe drinking water calculations
Additional comment	-

SDG 1.4.1, 3.9.1, 6.1.1 & 13b

Parameter ID	SDWS 27
Data/parameter	$DO_{p,y}$
Unit	Days

Description	Days the project technology is operational for end-users in premises p in year y SDG 3 (Good Health and Wellbeing) 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination 3.9.1: Mortality rate attributed to household and ambient air pollution. 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 SDG 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 SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.																																																																												
Source of data	In order of preference: 1. Measure directly using operation sensor, or 2. Demonstrate from log of operation and maintenance system.																																																																												
Value(s) applied	346.75 days cap <table><tr><th rowspan="2">Borehole ID</th><th colspan="3">Non-functional days for MP</th><th colspan="3">% days</th></tr><tr><th>2022</th><th>2023</th><th>2024</th><th>2022</th><th>2023</th><th>2024</th></tr><tr><td>ZMA 007</td><td>0</td><td>0</td><td>4</td><td>0.0%</td><td>0.0%</td><td>1.1%</td></tr><tr><td>ZMA 001</td><td>0</td><td>2</td><td>0</td><td>0.0%</td><td>0.5%</td><td>0.0%</td></tr><tr><td>ZMA 023</td><td>0</td><td>0</td><td>4</td><td>0.0%</td><td>0.0%</td><td>1.1%</td></tr><tr><td>ZMA 028</td><td>0</td><td>0</td><td>0</td><td>0.0%</td><td>0.0%</td><td>0.0%</td></tr><tr><td>ZMA 035</td><td>0</td><td>0</td><td>0</td><td>0.0%</td><td>0.0%</td><td>0.0%</td></tr><tr><td>ZMA 036</td><td>0</td><td>0</td><td>4</td><td>0.0%</td><td>0.0%</td><td>1.1%</td></tr><tr><td>ZMA 004</td><td>0</td><td>2</td><td>0</td><td>0.0%</td><td>0.5%</td><td>0.0%</td></tr><tr><td>ZMA 011</td><td>0</td><td>0</td><td>3</td><td>0.0%</td><td>0.0%</td><td>0.8%</td></tr><tr><td>ZMA 034</td><td>0</td><td>0</td><td>0</td><td>0.0%</td><td>0.0%</td><td>0.0%</td></tr></table>	Borehole ID	Non-functional days for MP			% days			2022	2023	2024	2022	2023	2024	ZMA 007	0	0	4	0.0%	0.0%	1.1%	ZMA 001	0	2	0	0.0%	0.5%	0.0%	ZMA 023	0	0	4	0.0%	0.0%	1.1%	ZMA 028	0	0	0	0.0%	0.0%	0.0%	ZMA 035	0	0	0	0.0%	0.0%	0.0%	ZMA 036	0	0	4	0.0%	0.0%	1.1%	ZMA 004	0	2	0	0.0%	0.5%	0.0%	ZMA 011	0	0	3	0.0%	0.0%	0.8%	ZMA 034	0	0	0	0.0%	0.0%	0.0%
Borehole ID	Non-functional days for MP			% days																																																																									
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ZMA 007	0	0	4	0.0%	0.0%	1.1%																																																																							
ZMA 001	0	2	0	0.0%	0.5%	0.0%																																																																							
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ZMA 004	0	2	0	0.0%	0.5%	0.0%																																																																							
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ZMA 034	0	0	0	0.0%	0.0%	0.0%																																																																							

ZMA 037	0	0	0	0.0%	0.0%	0.0%
ZMA 041	0	0	3	0.0%	0.0%	0.8%
ZMA 043	0	0	0	0.0%	0.0%	0.0%
ZMA 005	0	3	0	0.0%	0.8%	0.0%
ZMA 008	0	0	3	0.0%	0.0%	0.8%
ZMA 009	0	0	0	0.0%	0.0%	0.0%
ZMA 012	0	0	0	0.0%	0.0%	0.0%
ZMA 015	0	0	0	0.0%	0.0%	0.0%
ZMA 029	0	3	4	0.0%	0.8%	1.1%
ZMA 013	0	0	7	0.0%	0.0%	1.9%
ZMA 026	0	0	3	0.0%	0.0%	0.8%
ZMA 032	0	3	0	0.0%	0.8%	0.0%
ZMA 033	0	0	0	0.0%	0.0%	0.0%
ZMA 040	0	4	0	0.0%	1.1%	0.0%
ZMA 049	0	0	0	0.0%	0.0%	0.0%
ZMA 003	0	0	0	0.0%	0.0%	0.0%
ZMA 014	0	4	3	0.0%	1.1%	0.8%
ZMA 025	0	0	0	0.0%	0.0%	0.0%
ZMA 039	0	0	3	0.0%	0.0%	0.8%
ZMA 044	0	0	3	0.0%	0.0%	0.8%
ZMA 046	0	0	0	0.0%	0.0%	0.0%
ZMA 006	0	0	4	0.0%	0.0%	1.1%
ZMA 017	0	0	0	0.0%	0.0%	0.0%
ZMA 018	0	0	4	0.0%	0.0%	1.1%
ZMA 030	0	0	0	0.0%	0.0%	0.0%
ZMA 031	0	0	0	0.0%	0.0%	0.0%
ZMA 042	0	0	0	0.0%	0.0%	0.0%
ZMA 016	0	0	4	0.0%	0.0%	1.1%
ZMA 019	0	0	4	0.0%	0.0%	1.1%
ZMA 020	0	0	0	0.0%	0.0%	0.0%
ZMA 024	0	0	0	0.0%	0.0%	0.0%
ZMA 045	0	0	0	0.0%	0.0%	0.0%
ZMA 047	0	0	0	0.0%	0.0%	0.0%
ZMA 053	0	0	3	0.0%	0.0%	0.8%
ZMA 010	0	0	0	0.0%	0.0%	0.0%
ZMA 021	0	0	0	0.0%	0.0%	0.0%
ZMA 022	0	0	0	0.0%	0.0%	0.0%
ZMA 048	0	0	4	0.0%	0.0%	1.1%
ZMA 050	0	0	4	0.0%	0.0%	1.1%
ZMA 052	0	0	3	0.0%	0.0%	0.8%
ZMA 054	0	0	0	0.0%	0.0%	0.0%
ZMA 058	0	0	0	0.0%	0.0%	0.0%
ZMA 059	0	0	4	0.0%	0.0%	1.1%
ZMA 060	0	0	0	0.0%	0.0%	0.0%
ZMA 062	0	0	4	0.0%	0.0%	1.1%
ZMA 055	0	0	0	0.0%	0.0%	0.0%
ZMA 061	0	0	0	0.0%	0.0%	0.0%

	ZMA 063	0	7	0	0.0%	1.9%	0.0%
	ZMA 064	0	4	4	0.0%	1.1%	1.1%
	ZMA 065	0	3	3	0.0%	0.8%	0.8%
	ZMA 056	0	0	0	0.0%	0.0%	0.0%
	ZMA 066	0	0	4	0.0%	0.0%	1.1%
	ZMA 057	0	0	0	0.0%	0.0%	0.0%
	ZMA 067	0	3	0	0.0%	0.8%	0.0%
TOTAL:					0.00%	0.17%	0.40%
Measurement methods and procedures	Maintenance log						
Monitoring frequency	Annually						
QA/QC procedures	Values higher than 347 days may only be applied when option 1 is used. 347 days is 95% of days, in line with pump-maintenance in the literature.						
Purpose of data	Determine number of days for quantity of safe drinking water calculations						
Additional comment	The values are reported in the ERs Calcs. 2024 was a leap year and therefore the days have been capped at 347.70 instead.						

SDG 5.4.1

Parameter ID	SDWS 19
Data/parameter	$T_{p,y}$
Unit	Hours
Description	Time spent collecting water per household per trip in project SDG 5 (Gender Equality) 5.4: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate. 5.4.1: Proportion of time spent on unpaid domestic and care work, by sex, age and location
Source of data	Project Survey
Value(s) applied	0.55 hours (Average for both years) (0.60 hours 2023)

	(0.50 hours 2024)
Measurement methods and procedures	Annual Survey
Monitoring frequency	Annually
QA/QC procedures	Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	Calculate time saved for women by the project
Additional comment	Average from 2023 and 2024 project surveys

SDG 5.4.1

Parameter ID	SDWS 19
Data/parameter	TRy
Unit	Percentage
Description	Total reduction time spent collecting water for project activity in year y (%) SDG 5: Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate
Source of data	Project Survey
Value(s) applied	40.2% (Average for both years) (2023: 34.8%, 2024: 45.7%)
Measurement methods and procedures	Calculate the average amount of time saved collecting water and fuel in the project scenario and compare to the pre-project scenario
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting. Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	To quantify whether the project has contributed to a reduction in the amount of time spent collecting water compared to the pre-project scenario

Additional comment	-

SDG 1.4.1 & 6.1.1

Parameter ID	SDWS 19
Data/parameter	P_y
Unit	Number
Description	Number of persons having access to safe water in the project activity End users premises (e.g. households, institutions) within 1 km distance of project water source or a total collection time of 30 minutes or less for a round trip, including queuing, using the travel modes of walking or pedalling. Recorded for each CWT/CWS installation ex-ante at the time of start of crediting period. In case of progressive installation - for new CWT/CWS units before 1st issuance for new units. SDG 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
Source of data	Household list If there are any insurmountable barriers (e.g. river without bridge) transecting the circle defined by the 1 km radius or 30 mins distance, then end-users on the far side of the barrier shall be excluded from the count.
Value(s) applied	71,001 users (for both 2023 and 2024)
Measurement methods and procedures	Established through household user list
Monitoring frequency	Continuously
QA/QC procedures	Users lists are checked to ensure there are no duplicates and that all households reported do not exceed 1km from the CWS.

Purpose of data	Measure the number of persons having access to safe water in the project activity
Additional comment	

SDG 3.9.1

Parameter ID	SDWS 19
Data/parameter	HAPRy
Unit	%
Description	Total reduction in Household Air Pollution from boiling water for project activity in year y
Source of data	Household lists; Usage Survey
Value(s) applied	77 % (Average for both years) (2023: 78%, 2024: 76%)
Measurement methods and procedures	Review the quantity of wood fuel used to purify water in the baseline scenario compared to the project scenario and multiply by the usage rate in the project scenario. SDG 13: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting. Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	To calculate the percentage of reduction of household air pollution caused by purifying water through boiling, using biomass as fuel, in the project scenario compared to the baseline scenario.
Additional comment	-

SDG 1.4.1 & 6.1.1

Parameter ID	SDWS 19
Data/parameter	Paccess
Unit	Number
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.

	SDG 6: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
	SDG 1: End poverty in all it's forms everywhere
Source of data	Household lists; Usage Survey
Value(s) applied	54,703 (Average for both years) (2023: 55,510, 2024: 53,896)
Measurement methods and procedures	Borehole users * Usage rate.
Monitoring frequency	Annual
QA/QC procedures	Transparent data analysis and reporting. Clear guidance and training is provided to field staff and results are spot checked against the hard copy of the surveys.
Purpose of data	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario
Additional comment	-

SDG 13b

Parameter ID	SDWS 35
Data/parameter	<i>LE_y</i>
Unit	tCO ₂ e per year
Description	Leakage emissions during year y SDG 13 (Climate Action), 13B: Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.
Source of data	Sources established by following Leakage emissions section
Value(s) applied	5%
Measurement methods and procedures	Assessed every two years using baseline and monitoring surveys
Monitoring frequency	Biennial
QA/QC procedures	Compliance with the general requirements for sampling and general requirements for data and information sources
Purpose of data	Emission reduction calculations

Additional comment	As ex-ante evaluation shows that leakage emissions are less than 5% of total emission reductions, emission reductions are adjusted 5% down.
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D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
HNp,y	4.2 (Average 2023 and 2024) (2023: 4.18, 2024: 4.13)	N/A
HHp,y	196 (Average 2023 and 2024) (2023: 199, 2024: 194)	N/A
Py	71,001 (For both 2023 and 2024)	N/A
Tp,y	0.55 hours (Average 2023 and 2024) (2023: 0.60 hrs, 2024: 0.50 hrs)	N/A
TRy	40.2% (Average 2023 and 2024) (2023: 34.8%, 2024: 45.7%)	N/A
Paccess	54,703 (Average 2023 and 2024) (2023: 55,510, 2024: 53,896)	N/A
Up,y	77% (Average 2023 and 2024) (2023: 78%, 2024: 76%)	N/A
Mq,y	92% (Average 2023 and 2024) (2023: 93%, 2024: 91%)	N/A
Xcleanboil	0% (For both 2023 and 2024)	N/A
LEp,y	5% (For both 2023 and 2024)	N/A

This Monitoring period is the first in the ERSDWS methodology, thus the parameters of this monitoring period are not comparable with the previous monitoring period.

D.4. Implementation of sampling plan

In accordance with the Gold Standard ERSDWS v1.0 methodology, the number of households was randomly sampled following the 90/10 confidence/precisions. Sample sizes were chosen to meet the minimum requirements set in the methodology and to ensure full representativeness of the project area.

The surveys have been conducted to ensure that they are within the end date of the respective monitoring periods for each VPA and they satisfy the sampling requirements in the methodology, cross sampling is applied:

Project surveys were conducted twice during this MP to explore changes in the project scenario demographics, water use and purification practices, time spent on water and fuel collection:

- Between 03/10/2023 and 06/10/2023 on 110 randomly selected households.
- Between 14/10/2024 and 17/10/2024 on 110 randomly selected households.

As per methodology guidelines section 4.2.3: when the group size is above 1000, the minimum sample size is 100, both annual project surveys comply with the minimum requirement.

Usage surveys were conducted twice during this MP to explore the use of the project water point, used in SDG 1 and 3 calculations:

- Between 03/10/2023 and 06/10/2023 on 110 randomly selected households.
- Between 14/10/2024 and 17/10/2024 on 110 randomly selected households.

As per methodology guidelines section 4.2.3: when the group size is above 1000, the minimum sample size is 100, both annual usage surveys comply with the minimum requirement.

An additional check has been carried to make sure the number of surveys is statistically valid. For guidance, the "Guidelines for sampling and surveys for CDM project activities and programmes of activities" has been used:

For the 2023 Usage Survey, 110 households interviewed is sufficient to fulfil minimum sample size 90/10 precision.

Calculator to check if the precision has been met or not after a sampling survey is conducted

Input	Value	Notes
Actual sample size	110	
Sample proportion	0.7910	
Standard error of the proportion	0.0285	
Precision associated with a proportion	0.0469	
Relative precision	5.9%	

Note:
If the estimates from the actual samples fail to achieve the target minimum levels of precision (e.g. 10%), measures indicated in para. 16 of the sampling standard (ver. 4.1) shall be followed.

For the 2024 Usage Survey, 110 households interviewed is sufficient to fulfil minimum sample size 90/10 precision.

Calculator to check if the precision has been met or not after a sampling survey is conducted

Input	Value	Notes
Actual sample size	110	
Sample proportion	0.7550	
Standard error of the proportion	0.0302	
Precision associated with a proportion	0.0496	
Relative precision	6.6%	

Note:
If the estimates from the actual samples fail to achieve the target minimum levels of precision (e.g. 10%), measures indicated in para. 16 of the sampling standard (ver. 4.1) shall be followed.

Household water quality testing (Mq,y) were conducted in September 2023 and October 2024.

As per methodology requirement, the sampling results shall satisfy at minimum the 90/10 rule. The sample size and proportional result of the survey have been entered into the "Guideline: Sampling and surveys for CDM project activities and programmes of activities Version 03.1".

For the testing conducted in September 2023, a total of 42 water samples were taken fulfilling the minimum sample size 90/10 precision.

Calculator to check if the precision has been met or not after a sampling survey is conducted

Input	Value	Notes
Actual sample size	42	
Sample proportion	0.9286	
Standard error of the proportion	0.0397	
Precision associated with a proportion	0.0653	
Relative precision	7.0%	

Note:

If the estimates from the actual samples fail to achieve the target minimum levels of precision (e.g. 10%), measures indicated in para. 16 of the sampling standard (ver. 4.1) shall be followed.

For the testing conducted in October 2024, a total of 56 water samples were taken fulfilling the minimum sample size 90/10 precision.

Calculator to check if the precision has been met or not after a sampling survey is conducted

Input	Value	Notes
Actual sample size	56	
Sample proportion	0.9107	
Standard error of the proportion	0.0381	
Precision associated with a proportion	0.0627	
Relative precision	6.9%	

Note:

If the estimates from the actual samples fail to achieve the target minimum levels of precision (e.g. 10%), measures indicated in para. 16 of the sampling standard (ver. 4.1) shall be followed.

SECTION E. CALCULATION OF SDG IMPACTS

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

SDG 1 (No Poverty):

The outcome for SDG 1 is quantified as the additional number of persons having access to basic/limited safe water in the project activity compared to the baseline scenario (P_{access}). Calculations are as follows (parameters from sections B.6.3 and B.7.1 of the VPA-DD will be applied):

$$P_{\text{access}} = P_y * (1 - C_b) * U_{py}$$

$$31,577 = 35,086 * (1 - 0\%) * 90\%$$

Where:

P_{access}	Number of additional persons having access to basic/limited safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to basic/limited safe water in the project activity.
C_b	Expressed as a percentage, proportion of project households who in the baseline were already using a safe water supply that did not require boiling it.
U_{py}	Usage rate in project scenario p during year y

SDG 3 (Good Health and Well-Being):

Calculations are as follows:

$$HAPR_y = ((P_{b,y} - P_{p,y}) / P_{b,y}) * U_{p,y}$$

$$0.9\% = ((0.46 - 0) / 0.46) * 0.9\%$$

Where:

$HAPR_y$	Total reduction in Household Air Pollution for project activity in year (%)
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P _{b,y}	Quantity of fuel that is consumed in the baseline scenario b during year (kg/person-day)
P _{p,y}	Quantity of fuel that is consumed in the project scenario p during year y (kg/person-day)
U _{p,y}	Usage rate in project scenario p during year y

$$P_{b,y} = W_{b,y} * Q_{p,y}$$

$$0.46 = 0.12 * 4$$

Where:

W _{b,y}	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y
Q _{p,y}	Quantity of safe water supplied in the project scenario p during year y, using the “zero or low” emissions’ clean water supply technology

$$P_{p,y} = W_{b,y} * Q_{p, \text{cleanboil}, y}$$

$$0 = 0.12 * 0$$

Where:

W _{b,y}	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y
Q _{p, cleanboil, y}	Quantity of safe water boiled in the project scenario p during year y, after installation of the project technology

$$W_{b,y} = SE_{w,b,y} / NCV_{\text{wood}}$$

$$0.12 = 1804.15 / 15600$$

Where:

SE _{w,b,y}	Specific energy required to boil water (kJ/L), based on baseline fuel and technology use
NCV _{wood}	0.0156 (TJ/ton) IPCC Default NCV for Wood

SDG 5 (Gender Equality):

The overall percentage reduction in time spent collecting water by the project activity is calculated as follows:

$$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$$

$$45.7\% = (0.92 - 0.5) / 0.92$$

Where:

TR _y	Total reduction time spent collecting water for project activity in year y (%)
T _{b,y}	Time spent collecting water per household per trip prior to project (hours)
T _{p,y}	Time spent collecting water per household per trip in project (hours)

Outcomes for SDG 5:

SDG 6 (Clean Water and Sanitation):

The outcome for SDG 6 is quantified as the number of persons having access to safe water in terms of safely managed service, basic service, limited service, unimproved service or surface water. The number of persons is determined either in the Baseline Survey for the purpose of the PDD or in the Project Survey for monitoring reports. People (%) are separated into Joint Monitoring Programme (JMP) Service ladder categories:

Safely Managed Service – people who drink water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination

Basic Service – people who drink water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing

Limited Service – people who drink water from an improved source for which collection time exceeds 30 minutes for a round trip, including queuing

Unimproved Service – people who drink water from an unprotected dug well or unprotected spring

Surface Water – people who drink water directly from a river, dam, lake, pond, stream, canal or irrigation canal

Outcomes for SDG 6:

Safely Managed Service – 0%

Basic Service – 58%

Limited Service – 42%

Unimproved Service – 0%

Surface Water – 0%

SDG 13 (Climate Action):

CO2 emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management. This outcome is measured using the VPA's emission reductions calculations.

Baseline Emissions:

Equation 1:

$$EF_b = SE_{w,b,y} * (x_f * (EF_{b,f,co2} * fNRB_{f,y} + EF_{b,f,nonco2})) / 10^9$$

$$0.0002 = 1804.15 * (1 * (112 * 0.96 + 9.46)) / 10^9$$

$$EF_b = SE_{w,b,y} * \sum_f (x_f * (EF_{b,f,CO_2} * f_{NRB,f,y} + EF_{b,f,nonCO_2})) \div 10^9 \quad Eq. 1$$

Where:

EF_b	= Emission factor for the use of fuel to obtain safe water in the baseline (tCO ₂ e/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,CO_2}	= CO ₂ emission factor from use of fuel f (tCO ₂ /TJ)
$EF_{b,f,nonCO_2}$	= Non-CO ₂ emission factor arising from use of fuel f , when the baseline fuel f is biomass or charcoal (tCO ₂ e/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 types

Equation 2:

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

$$1804.15 = 360.83 / 0.2$$

Where:

$$SE_{w,b,y} = 360.83 / \eta_{wb} \quad Eq. 2$$

Where:

360.83	= Default amount of energy required to obtain 1 L of water after 5 minutes of boiling from a first principles approach ¹⁷ 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:

Equation 3:

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

$$6,235 = 0.0002 * (1 - 0 - 0) * 31,095,673 * 0.95$$

Where:

BE_y	=	Baseline emissions from the use of fuel to obtain safe water in the baseline (tCO ₂ e)
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 CWT and CWS, the quantity of safe drinking water provided by the project Q_y is determined as follows:

Equation 4:

$$Q_y = \min(Q_{m,y}, Q_{pop,y})$$

$$31,095,673 = \min(, 31095673)$$

Where:

$Q_{m,y}$	=	Monitored quantity of safe water provided by the project in year y (L).
$Q_{pop,y}$	=	Quantity of safe drinking water that could be consumed by project end-users in year y (L)

Quantity of safe drinking water shall be calculated as follows:

Equation 5:

$$Q_{pop,y} = HH_{p,y} * HN_p * QPW_p * D_{p,y}$$

$$31,095,673 = 8153 * 2.75 * 4 * 347$$

Where:

- $HH_{p,y}$ = Number of premises type p served by the project in year y
- $HN_{p,y}$ = Number of individuals per premises type p (e.g. household, school) in year y
- QPW_p = Volume of drinking water per person per day for premises type p (L). 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.
- $DO_{p,y}$ = Days the project technology is operational for end-users in premises p in year y

Project Scenario:

Equation 8:

$$PE_y = PE_{ff,p,y} + PE_{ec,p,y}$$

$$0 = 0 + 0$$

Where:

- PE_y = Project emissions in year y (tCO₂)
- $PE_{ff,p,y}$ = Project emissions from fossil fuel use in year y (tCO₂)
- $PE_{ec,p,y}$ = Project emissions from electricity use in year y (tCO₂)

Equation 9:

$$PE_y = PE_{ff,p,y} + PE_{ec,p,y}$$

$$0 = 0 + 0$$

Where:

- $P_{p,f,y}$ = Quantity of fossil fuel f that is consumed in the project during year y (mass or volume units)
- NCV_f = Net calorific value of fossil fuel f (TJ/fuel units)
- EF_f = Emission factor of fossil fuel f (tCO₂/TJ)

Equation 10:

$$PE_{ec,p,y} = EC_{p,y} * (1 + TDL_{ec})$$

$$0 = 0 + 0$$

Where:

$EC_{p,y}$	=	Quantity of electricity that is used by the project during year y (kWh)
EF_{ec}	=	Emission factor associated with the electricity use (tCO ₂ /kWh)
TDL_{ec}	=	Transmission and distribution losses associated with the electricity use (%)

Emission Reduction calculation:

Equation 11:

$$ER_y = BE_y - PE_y - LE_y$$

$$6,234 = 6,234 - 0 - 0$$

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

SDG 1 (No Poverty)

$$P_{access} = P_y * (1 - C_b) * U_{py}$$

$$54,703 = 71,001 * (1 - 0\%) * 77\%$$

Where:

P_{access}	Number of additional persons having access to basic/limited safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to basic/limited safe water in the project activity.
C_b	Expressed as a percentage, proportion of project households who in the baseline were already using a safe water supply that did not require boiling it.
U_{py}	Usage rate in project scenario p during year y

SDG 3 (Good Health and Wellbeing)

$$HAPR_y = ((P_{b,y} - P_{p,y}) / P_{b,y}) * U_{p,y}$$

$$77\% = ((0.46 - 0) / 0.46) * 77\%$$

Where:

HAPR _y	Total reduction in Household Air Pollution for project activity in year (%)
P _{b,y}	Quantity of fuel that is consumed in the baseline scenario b during year (kg/person-day)
P _{p,y}	Quantity of fuel that is consumed in the project scenario p during year y (kg/person-day)
U _{p,y}	Usage rate in project scenario p during year y

$$P_{b,y} = W_{b,y} * Q_{p,y}$$

$$0.46 = 0.12 * 4$$

Where:

W _{b,y}	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y
Q _{p,y}	Quantity of safe water supplied in the project scenario p during year y, using the “zero or low” emissions’ clean water supply technology

$$P_{p,y} = W_{b,y} * Q_{p, \text{cleanboil}, y}$$

$$0 = 0.12 * 0$$

Where:

W _{b,y}	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y
Q _{p, cleanboil, y}	Quantity of safe water boiled in the project scenario p during year y, after installation of the project technology

$$W_{b,y} = SE_{w,b,y} / NCV_{\text{wood}}$$

$$0.12 = 1804.15 / 15600$$

Where:

SE _{w,b,y}	Specific energy required to boil water (kJ/L), based on baseline fuel and technology use
NCV _{wood}	0.0156 (TJ/ton) IPCC Default NCV for Wood

SDG 5 (Gender Equality)

$$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$$

$$40.2\% = (0.92 - 0.55) / 0.92$$

Where:

TR_y	Total reduction time spent collecting water for project activity in year y (%)
$T_{b,y}$	Time spent collecting water per household per trip prior to project (hours)
$T_{p,y}$	Time spent collecting water per household per trip in project (hours)

SDG 6 (Clean Water and Sanitation)

SDG 6, specifically 6.1.1: Proportion of population using safely managed drinking water services, is measured in this project. Service levels measured in this monitoring period are summarised below:

Safely Managed Service: 0%

Basic Service: 90%

Limited Service: 10%

Unimproved Service: 0%

Surface Water: 0%

Where:

Safely Managed Service – people who drink water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination

Basic Service – people who drink water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing

Limited Service – people who drink water from an improved source for which collection time exceeds 30 minutes for a round trip, including queuing

Unimproved Service – people who drink water from an unprotected dug well or unprotected spring

Surface Water – people who drink water directly from a river, dam, lake, pond, stream, canal or irrigation canal

SDG 13 (Climate Action)

Project Scenario:

Equation 8:

$$PE_y = PE_{ff,p,y} + PE_{ec,p,y}$$

$$0 = 0 + 0$$

Where:

PE_y	= Project emissions in year y (tCO ₂)
$PE_{ff,p,y}$	= Project emissions from fossil fuel use in year y (tCO ₂)
$PE_{ec,p,y}$	= Project emissions from electricity use in year y (tCO ₂)

Equation 9:

$$PE_{ff,p,y} = P_{p,f,y} \times NCV_f \times EF_f$$

$$0 = 0 \times 0 \times 0$$

Where:

$P_{p,f,y}$	= Quantity of fossil fuel f that is consumed in the project during year y (mass or volume units)
NCV_f	= Net calorific value of fossil fuel f (TJ/fuel units)
EF_f	= Emission factor of fossil fuel f (tCO ₂ /TJ)

Equation 10:

$$PE_{ec,p,y} = EC_{p,y} * (1 + TDL_{ec})$$

$$0 = 0 + 0$$

$EC_{p,y}$	= Quantity of electricity that is used by the project during year y (kWh)
EF_{ec}	= Emission factor associated with the electricity use (tCO ₂ /kWh)
TDL_{ec}	= Transmission and distribution losses associated with the electricity use (%)

Emission reduction calculations:

Equation 11:

$$ER_y = BE_y - PE_y - LE_y$$

$$20,392 = (20,413 - 0) * (1 - 5\%)$$

Where:

ER_y	=	Emission reductions in year y (t CO ₂ e/yr)
BE_y	=	Baseline emissions in year y (t CO ₂ e/yr)
PE_y	=	Project emissions in year y (t CO ₂ e/yr)
LE_y	=	Leakage emissions in year y (t CO ₂ e/yr)

E.3. Calculation of leakage

Leakage Assessment: Sources of leakage detailed within the methodology relevant to this project have here been reviewed.

In line with the monitoring requirements, a leakage assessment is conducted biennially and has therefore been included in this report. 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.

In all cases the baseline technologies displaced are mainly traditional woodfuel; these have no market value and are not a product as such. There is nothing limiting the use of this cooking technologies across the country (the technology is lowest rung on the energy ladder and the price is zero), which is why this cooking method is so widespread. In any case the primary purpose of these three rocks is for cooking so they will not be replaced/displaced in their entirety as a result of this project - which means they will not be reused outside the project boundary. This leakage source can therefore be discounted.

b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

There is no evidence to suggest significant (if any) use of renewable energy for purifying water in the project region as found in the Baseline Water Surveys. Renewable energy used for purifying water would likely be animal dung or crop residues which will be used due to ease of availability/proximity to the home rather than due to a shortage of wood fuel, therefore it is an independent factor. 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.

As the majority of participants collect wood from within the project boundary, it is not expected that the NRB in other areas will be affected. There are currently no other CDM or VER projects in the project area.

d) The project 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 for purification purposes will be minimal, as the predominant use of baseline technology is for cooking. Therefore, it is highly unlikely that another technology will be used for heating when users no longer boil 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.

This project is not marketing efficient technology; it is eliminating the need for a fuel-based technology to deliver pure water. Lower emission technology substitution within households is therefore not possible and this leakage source can therefore be discounted.

The project does not result in leakage and therefore the value is 0. As leakage emissions are less than 5% of total emission reductions, emission reductions are adjusted 5% down.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
1 No Poverty	Additional number of persons with access to basic/limited services	0	71,001	54,703
3 Good Health and Wellbeing	Reduce in household smoke	0%	77%	77%
5 Gender Equality	Time saved collecting water	0.92 hours collecting water per trip	0.55 hours collecting water per trip	40.2%
6 Clean Water and Sanitation	Number of persons having access to safe water in terms of JMP Service categories	Safely Managed – 0% Basic – 0% Limited – 0%	Safely – Managed 0% Basic – 90% Limited – 10%	Safely Managed – 0% Basic – 90% Limited – 10%

		Unimproved – 100% Surface Water – 0%	Unimproved – 0% Surface Water – 0%	Unimproved – 0% Surface Water – 0%
13 Climate Action	Total project emissions reductions	20,392 tCO ₂ e	0 tCO ₂ e	20,392 tCO ₂ e (uncapped 26,517 tCO ₂ e)

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 ¹ achieved during this monitoring period
1 No Poverty	31,577 people with access to basic/limited safe water	54,703 people with access to basic/limited safe water
3 Good Health and Wellbeing	90% reduction in Household Air Pollution for project activity	77% reduction in Household Air Pollution for project activity
5 Gender Equality	45.7% reduction in time spent collecting water	40.2% reduction in time spent collecting water
	Safely Manged Service: 0% Basic Service: additional 58%	Safely Manged Service: 0% Basic Service: additional 90%
6 Clean Water and Sanitation	Limited Service: additional 42% Unimproved Service: 0% (reduced by 100%) Surface Water: 0%	Limited Service: additional 10% Unimproved Service: 0% (reduced by 100%) Surface Water: 0%
13 Climate Action	Emissions reduced by 6,234 tCO ₂ e per year. Emissions reduced by 12,878 tCO ₂ e for the monitoring period.	Emissions reduced by 10,000 tCO ₂ e per year. 20,392 tCO ₂ e total. (uncapped 26,517 tCO ₂ e)

¹ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

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

SDG 1 (No Poverty)

$$P_{\text{access}} = P_y * (1 - C_b) * U_{py}$$

$$31,577 = 35,086 * (1 - 0\%) * 90\%$$

Where:

P_{access}	Number of additional persons having access to basic/limited safe water in the project activity compared to the baseline scenario.
P_y	Number of persons having access to basic/limited safe water in the project activity.
C_b	Expressed as a percentage, proportion of project households who in the baseline were already using a safe water supply that did not require boiling it.
U_{py}	Usage rate in project scenario p during year y

SDG 3 (Good Health and Well-Being):

$$HAPR_y = ((P_{b,y} - P_{p,y}) / P_{b,y}) * U_{p,y}$$

$$90\% = ((0.46 - 0) / 0.46) * 90\%$$

Where:

$HAPR_y$	Total reduction in Household Air Pollution for project activity in year (%)
$P_{b,y}$	Quantity of fuel that is consumed in the baseline scenario b during year (kg/person-day)
$P_{p,y}$	Quantity of fuel that is consumed in the project scenario p during year y (kg/person-day)
$U_{p,y}$	Usage rate in project scenario p during year y

$$P_{b,y} = W_{b,y} * Q_{p,y}$$

$$0.46 = 0.12 * 4$$

Where:

$W_{b,y}$	Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y
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$Q_{p,y}$ Quantity of safe water supplied in the project scenario p during year y, using the “zero or low” emissions’ clean water supply technology

$$P_{p,y} = W_{b,y} * Q_{p,cleanboil,y}$$

$$0 = 0.12 * 0$$

Where:

$W_{b,y}$ Quantity of wood fuel or fossil fuel required to boil 1 litre of water using technologies representative of baseline scenario b during year y

$Q_{p,cleanboil,y}$ Quantity of safe water boiled in the project scenario p during year y, after installation of the project technology

$$W_{b,y} = SE_{w,b,y} / NCV_{wood}$$

$$0.12 = 1804.15 / 15600$$

Where:

$SE_{w,b,y}$ Specific energy required to boil water (kJ/L), based on baseline fuel and technology use
 NCV_{wood} 0.0156 (TJ/ton) IPCC Default NCV for Wood

SDG 5 (Gender Equality):

$$TR_y = (T_{b,y} - T_{p,y}) / T_{b,y}$$

$$45.7\% = (0.92 - 0.5) / 0.92$$

Where:

TR_y Total reduction time spent collecting water for project activity in year y (%)
 $T_{b,y}$ Time spent collecting water per household per trip prior to project (hours)
 $T_{p,y}$ Time spent collecting water per household per trip in project (hours)

SDG 6 (Clean Water and Sanitation):

Safely Managed Service – 0%

Basic Service – 58%

Limited Service – 42%

Unimproved Service – 0%

Surface Water – 0%

Outcomes for SDG 13 (Climate Action):

Baseline Scenario:

Equation 1:

$$EF_b = SE_{w,b,y} * (x_f * (EF_{b,f,CO2} * f_{NRB,f,y} + EF_{b,f,nonCO2})) / 10^9$$

$$0.0002 = 1804.15 * (1 * (112 * 0.96 + 9.46)) / 10^9$$

$$EF_b = SE_{w,b,y} * \sum_f (x_f * (EF_{b,f,CO2} * f_{NRB,f,y} + EF_{b,f,nonCO2})) / 10^9 \quad Eq. 1$$

Where:

EF_b	= Emission factor for the use of fuel to obtain safe water in the baseline (tCO ₂ e/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)
$EF_{b,f,CO2}$	= CO ₂ emission factor from use of fuel f (tCO ₂ /TJ)
$EF_{b,f,nonCO2}$	= Non-CO ₂ emission factor arising from use of fuel f , when the baseline fuel f is biomass or charcoal (tCO ₂ e/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 types

Equation 2:

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

$$1804.15 = 360.83 / 0.2$$

$$Q_{pop,y} = \sum_p HH_{p,y} \times HN_{p,y} \times QPW_p \times DO_{p,y} \quad Eq. 5$$

Where:

$HH_{p,y}$	= Number of premises type p served by the project in year y
$HN_{p,y}$	= Number of individuals per premises type p (e.g. household, school) in year y
QPW_p	= Volume of drinking water per person per day for premises type p (L). 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.
$DO_{p,y}$	= Days the project technology is operational for end-users in premises p in year y

Equation 3:

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

$$6,235 = 0.0002 * (1 - 0 - 0) * 31,095,673 * 0.95$$

$$Q_{pop,y} = \sum_p HH_{p,y} \times HN_{p,y} \times QPW_p \times DO_{p,y} \quad \text{Eq. 5}$$

Where:

$HH_{p,y}$ = Number of premises type p served by the project in year y

Equation 4:

$$Q_y = \min(Q_{m,y}, Q_{pop,y})$$

$$31,095,673 = \min(, 31095673)$$

$HN_{p,y}$ = Number of individuals per premises type p (e.g. household, school) in year y

QPW_p = Volume of drinking water per person per day for premises type p (L). 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.

Equation 5:

$$Q_{pop,y} = HH_{p,y} * HN_p * QPW_p * D_{p,y}$$

$$31,095,673 = 8153 * 2.75 * 4 * 347$$

Where:

$HH_{p,y}$ = Number of premises type p served by the project in year y

$HN_{p,y}$ = Number of individuals per premises type p (e.g. household, school) in year y

QPW_p = Volume of drinking water per person per day for premises type p (L). 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.

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

Project Scenario:

Equation 8:

$$PE_y = PE_{ff,p,y} + PE_{ec,p,y}$$

$$0 = 0 + 0$$

Where:

- PE_y = Project emissions in year y (tCO₂)
- $PE_{ff,p,y}$ = Project emissions from fossil fuel use in year y (tCO₂)
- $PE_{ec,p,y}$ = Project emissions from electricity use in year y (tCO₂)

Equation 9:

$$PE_y = PE_{ff,p,y} + PE_{ec,p,y}$$

$$0 = 0 + 0$$

Where:

- $P_{p,f,y}$ = Quantity of fossil fuel f that is consumed in the project during year y (mass or volume units)
- NCV_f = Net calorific value of fossil fuel f (TJ/fuel units)
- EF_f = Emission factor of fossil fuel f (tCO₂/TJ)

Equation 10:

$$PE_{ec,p,y} = EC_{p,y} * (1 + TDL_{ec})$$

$$0 = 0 + 0$$

- $EC_{p,y}$ = Quantity of electricity that is used by the project during year y (kWh)
- EF_{ec} = Emission factor associated with the electricity use (tCO₂/kWh)
- TDL_{ec} = Transmission and distribution losses associated with the electricity use (%)

Emission reduction calculations:

Equation 11:

$$ER_y = BE_y - PE_y - LE_y$$

$$6,234 = 6,234 - 0 - 0\%$$

Where:

ER_y	=	Emission reductions in year y (t CO ₂ e/yr)
BE_y	=	Baseline emissions in year y (t CO ₂ e/yr)
PE_y	=	Project emissions in year y (t CO ₂ e/yr)
LE_y	=	Leakage emissions in year y (t CO ₂ e/yr)

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

SDG 1 has increased from estimated value in VPA-DD. This is because the HH list was not finalised during Crediting Period Renewal, and a conservative estimate based on 50% of previously collected HH list was used. As the HH list was finalised this increased the value for SDG 1.

For SDG 3, in the project scenario there was a 77% reduction in exposure to Household Air pollution, and therefore a decrease from the estimated value in VPA-DD due to survey responses in the usage survey.

SDG 5 was comparable to estimated value in VPA-DD, although very slightly lower. However, question 43 of the project survey asks, "Has the borehole project saved you time?" of which 100% of respondents answered yes.

For SDG 6 there was an increase in estimated value in VPA-DD for proportion of people with access to a basic service. This was estimated at 58% in the approved VPA-DD, however it is 90% in the project scenario due to answers from the project survey.

For SDG 13, the ex-ante estimation was 6,234 emission reductions per year. The value achieved in this MP was 10,000 ERs per year. As with SDG 1, this is also because the HH list was not finalised during Crediting Period Renewal, and a conservative estimate based on 50% of previously collected HH list was used. As the HH list was finalised this increased the value for SDG 13.

SECTION F. SAFEGUARDS REPORTING

Principles	Mitigation Measures added to the Monitoring Plan
Principle 5. Corruption: 1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt projects	Water point committees have been formed, and are supported, to manage the safe water source point. They receive training through WASH workshops where any forms of corruption are discouraged. Participants are educated on the benefits of the project. Community members have lines of communication with the project developers to report any complaints or grievances. During the establishment and training of the water point committees, rules and regulations surrounding corruption are elaborated to ensure that all local community level corruption concerns are addressed.

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.

Continuous input/Grievance Expression Process log books are held at a water point level on which users can comment on. The users are informed about the grievance mechanism by the water committee who either keep the logbook at the borehole or in the possession of the head villager/water committee member, to protect it from damage, but available to all users.

Within the logbooks, there were no grievances raised during the monitoring period.

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

No stakeholder mitigations were agreed to be monitored.

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

No legal contests or disputes have arisen during the monitoring period.

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