Gold standard for the global goals
Monitoring report

June 2017, version 1

Gold Standard

Title of the project	GS1247 VPA 142 Manicaland Safe Water GS1247 VPA 143 Manicaland Safe Water GS1247 VPA 144 Manicaland Safe Water GS1247 VPA 145 Manicaland Safe Water GS1247 VPA 146 Manicaland Safe Water GS1247 VPA 147 Manicaland Safe Water
Gold Standard project id	GS6518-23
Version number of the monitoring report	6
Completion date of the monitoring report	03/02/2021
Date of project design certification	23/10/2018
Start date of crediting period	GS6518: 21/06/2018 GS6519: 10/06/2018 GS6520: 09/06/2018 GS6521: 29/06/2018 GS6522: 08/06/2018 GS6523: 21/06/2018
Duration of this monitoring period	GS6518: 08/06/2019 to 31/08/2020 GS6519: 08/06/2019 to 31/08/2020 GS6520: 08/06/2019 to 31/08/2020 GS6521: 08/06/2019 to 31/08/2020 GS6522: 08/06/2019 to 31/08/2020 GS6523: 08/06/2019 to 31/08/2020
Duration of previous monitoring period	GS6518: 21/06/2018 - 07/06/2019 GS6519: 10/06/2018 - 07/06/2019 GS6520: 09/06/2018 - 07/06/2019 GS6521: 29/06/2018 - 07/06/2019 GS6522: 08/06/2018 - 07/06/2019 GS6523: 21/06/2018 - 07/06/2019
Project representative(s)	Oscar Lozada
Host Country	Republic of Zimbabwe
Certification pathway (activity certification/impact certification)	Impact Certification
SDG Contributions targeted (as per approved PDD)	SDG 3 – Good Health and Wellbeing SDG 5 – Gender Equality SDG 6 – Clean Water and Sanitation SDG 13 – Climate Action
Gold Standard statement/product certification sought (GSVER/ADALYs/RECs etc.)	GSVER
Selected methodology(ies)	TPDDTEC v.1

Estimated amount of annual average certified SDG impact (as per approved PDD)	SDG 3 – Reduction in waterborne and smoke-related illnesses per year: 50% (applies equally to all VPAs under review) SDG 5 – 40% reduction in time spent collecting water (applies equally to all VPAs under review) SDG 6 – Number of additional persons with access to safe water: GS6518: 2,210 GS6519: 2,210 GS6520: 2,210 GS6521: 2,210 GS6522: 2,210 GS6523: 2,210 SDG 13- 60,000 tCO2e per year. GS6518: 10,000 tCO2e GS6519: 10,000 tCO2e GS6520: 10,000 tCO2e GS6521: 10,000 tCO2e GS6522: 10,000 tCO2e GS6523: 10,000 tCO2e
Total amount of certified SDG impact (as per approved methodology) achieved in this monitoring period	SDG 3 – Reduction in waterborne and smoke-related illnesses per year: 82% (applies equally to all VPAs under review) SDG 5 – 40.26% reduction in time spent collecting water (applies equally to all VPAs under review) SDG 6 – 8,084 number of additional persons with access to safe water. Breakdown: GS6518: 1,300 GS6519: 1,423 GS6520: 1,303 GS6521: 1,307 GS6522: 1,352 GS6523: 1,401 SDG 13 – 16,024 tCO2e. Breakdown: GS6518: 2,739 tCO2e GS6519: 2,757 tCO2e GS6520: 2,743 tCO2e GS6521: 2,618 tCO2e GS6522: 2,694 tCO2e GS6523: 2,473 tCO2e

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SECTION A. Description of project

A.1. Purpose and general description of project

CO2balance is implementing 6 micro-scale VPAs in Manicaland Province, Zimbabwe, under the Gold Standard methodology *Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 1*. The project activity involves rehabilitating non-functioning boreholes to provide villages with a source of safe water. This displaces the baseline method of water treatment, which involves boiling water using solid fuel. The project activity removes the need of households to rely on firewood and coal to boil water and therefore reduces CO2 emissions.

The 30 boreholes were rehabilitated between the 7th June 2018 and 20th July 2018. The crediting periods for each VPA are given in section A.4 and have a lifetime is 5 years, renewable.

All pumps fixed are the B-type Bush model which is a common pump model used in Zimbabwe. All borehole depths are below 100 meters. The technical specifications of the B-type bush model are detailed below (taken from the Rural Water Supply Network):

75 mm cylinder:	for depths from 3 - 25 m,
63.5 mm cylinder:	for depths from 20 - 45 m,
50 mm cylinder:	for depths from 40 - 80 m
Maximum Stroke:	200 - 250 mm
Approx. discharge (75 watt input m^3/hr, 63.5 mm cylinder):	at 10 m head: 1.4 m^3/hour
	at 15 m head: 1.1 m^3/hour
	at 25 m head: 0.8 m^3/hour
	at 30 m head: 0.7 m^3/hour
Pumping lift:	5 - 80 m
Population served:	~ 300 people
Households:	30 - 50 households
Water consumption:	15 - 20 l/per capita
Type of well:	borehole or dug well

The table below details the borehole IDs, names, GPS coordinates, pump type and borehole depth for every borehole in the project. A photo of each borehole has also been included:

ID	Name	Lat	Long	Pump type	Depth (m)	Pictures during maintenance December 2020
CHI006	Mujeke	-20.4359	32.29455	B-Type Bush Pump	65	
CHI008	Gezahle	-20.3669	32.7633	B-Type Bush Pump	65	

CHI012	Kubiri 3	-20.50943	32.24554	B-Type Bush Pump	65	
CHI009	Zambangoma	-20.34121	32.27131	B-Type Bush Pump	35	
MUT006	Mukuni South Primary School	-19.26193	32.10097	B-Type Bush Pump	50	
CHI004	Moodies Rest / Jopa	-20.05571	32.38597	B-Type Bush Pump	55	
CHI003	Hanganyi	-20.08009	32.37225	B-Type Bush Pump	60	
CHI007	Ngatitonge 3	-20.45566	32.25372	B-Type Bush Pump	60	
MUT005	Mutepfa	-19.32916	32.09962	B-Type Bush Pump	50	
MUT015	Gurumidzo	-19.34893	32.20642	B-Type Bush Pump	60	
CHI002	Singizi	-20.09505	32.40301	B-Type Bush Pump	60	

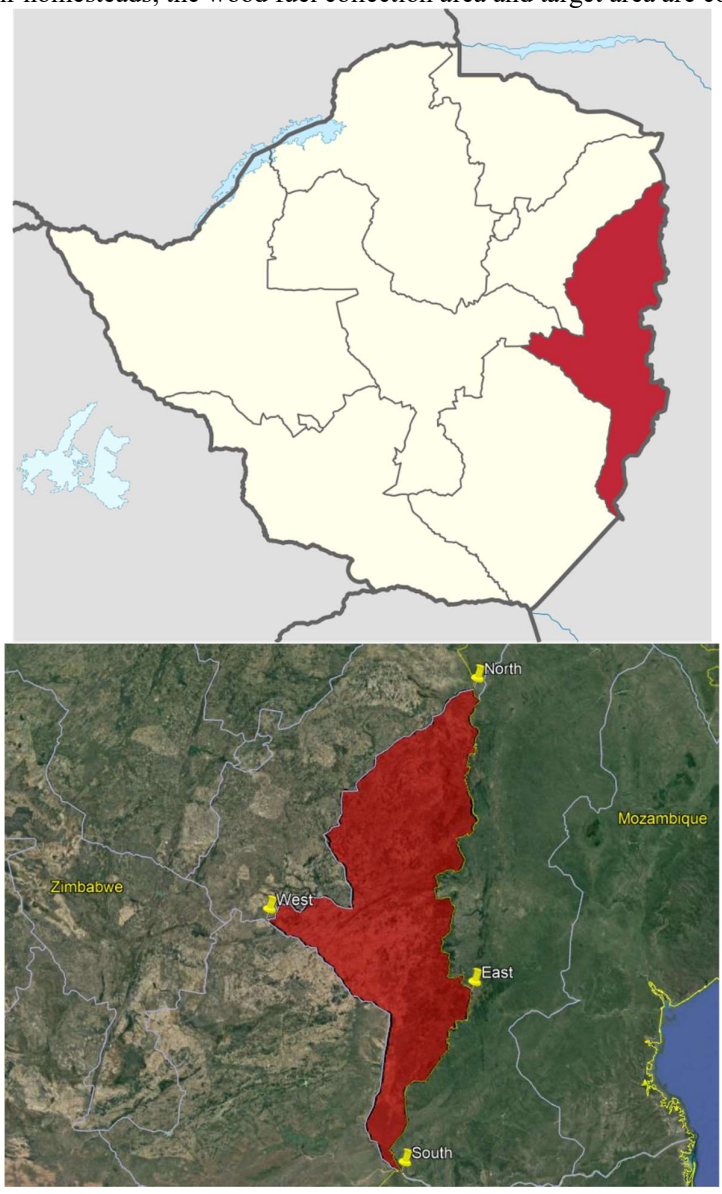
CHI005	Zamchiya	-20.42095	32.28346	B-Type Bush Pump	60	
MUT004	Chinyamagona	-19.34987	32.13127	B-Type Bush Pump	60	
MUT008	Mbabvu	-19.2618	32.11263	B-Type Bush Pump	50	
MUT003	Chinyudze	-19.4387	32.1614	B-Type Bush Pump	65	
CHI010	Mutii	-20.39429	32.25229	B-Type Bush Pump	65	
CHI011	Gogodo / Botani	-20.47646	32.25409	B-Type Bush Pump	55	
MUT012	Kwaedza Mahihii	-19.40851	32.14078	B-Type Bush Pump	40	
MUT011	Muroti Junction	-19.26213	32.10997	B-Type Bush Pump	60	
MUT009	Musara Diptank	-19.26953	32.05493	B-Type Bush Pump	40	

MUT013	Warehouse Mahihii	-19.4117	32.1443	B-Type Bush Pump	60	
CHI001	Mbire Borehole Chikwanda	-20.1113	32.3382	B-Type Bush Pump	70	
MUT016	Mutandati	-19.36048	32.21465	B-Type Bush Pump	65	
MUT007	Mukuni South Secondary School	-19.29666	32.10882	B-Type Bush Pump	40	
MUT002	Masinga	-19.43871	32.16143	B-Type Bush Pump	60	
MUT010	Zvebocha	-19.2639	32.07301	B-Type Bush Pump	40	
CHI014	Rukangare 1	-20.47181	32.23446	B-Type Bush Pump	65	
CHI013	Matosi	-20.51349	32.25815	B-Type Bush Pump	60	
MUT014	Mudzere	-19.40369	32.13617	B-Type Bush Pump	40	

MUT001	Chitora	-19.4493	32.16885	B-Type Bush Pump	35	

A.2. Location of project

This project is located in Manicaland Province, the easternmost province of Zimbabwe. 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 wood fuel collection area and target area are considered the same.



Map 1 - Provincial map of Manicaland

Province,
Zimbabwe

Project Area Coordinates		
	Latitude	Longitude
North	17°14'47.24"S	32°59'39.30"E
South	21°19'41.42"S	32°28'47.67"E
East	19°47'49.71"S	33° 3'15.79"E
West	19°14'8.05"S	31°12'55.35"E

A.3. Reference of applied methodology

The applied methodology is Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1 (TPDDTEC v1).

A.4. Crediting period of project

The start date of the crediting periods for each VPA are:

GS6518: 21/06/2018
GS6519: 10/06/2018
GS6520: 09/06/2018
GS6521: 29/06/2018
GS6522: 08/06/2018
GS6523: 21/06/2018

Each crediting period has a length of 5 years, as approved in the PDDs.

The PoA for this project is: 'GS1247 Improved Kitchen Regimes Multi-Country PoA'. The first crediting period of the PoA was from 01/05/2013 until 30/04/2020. The latest PoA-DD covers CP2 from 01/05/2020 to 30/04/2027. The crediting period for these VPAs are within the CP2 of the PoA.

SECTION B. Implementation of project

B.1. Description of implemented project

CO2balance and DOMCCP (CO2balance in-country project partner) rehabilitated 30 boreholes between the 7th June 2018 and 20th July 2018 as part of these six VPAs. The date of rehabilitation was confirmed by a Repair Confirmation Form for each borehole, which was signed by the mechanic employed by DOMCCP, along with an elected representative of the community group owners of the borehole. The date of rehabilitation was used as the start date of operation and crediting for each borehole; we have conservatively assumed that the first day of crediting is not counted.

The project ID, location and number of people served by each borehole is given in the table below, which forms the project database:

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Borehole Database									
Borehole ID	**BH Name**	**Village**	**Ward**	**District**	**Latitude**	**Longitude**	**Mode of use**	**Repair Confirmation Form Date**	**Crediting start date per BH**
CHI006	Mujeke	Zamchiya	23	Chipinge	-20.4359	32.29455	Domestic	20/06/2018	21/06/2018
CHI008	Gezahle	Mubuyayi	23	Chipinge	-20.3669	32.7633	Domestic	07/07/2018	08/07/2018
CHI012	Kubiri 3	Vadzimu	23	Chipinge	-20.50943	32.24554	Domestic	19/07/2018	20/07/2018
CHI009	Zambangoma	Takunda B	23	Chipinge	-20.34121	32.27131	Domestic	08/07/2018	09/07/2018
MUT006	Mukuni South Primary School	Mvurachena	8	Mutare	-19.26193	32.10097	Domestic	27/06/2018	28/06/2018
CHI004	Moodies Rest / Jopa	Jopa / Moodies Res	6	Chipinge	-20.05571	32.38597	Domestic	09/06/2018	10/06/2018
CHI003	Hanganyi	Hanganyi / Glenviev	6	Chipinge	-20.08009	32.37225	Domestic	09/06/2018	10/06/2018
CHI007	Ngatitonge 3	Ngatitonge	25	Chipinge	-20.45566	32.25372	Domestic	20/06/2018	21/06/2018
MUT005	Mutepfa	Mvurachena	8	Mutare	-19.32916	32.09962	Domestic	26/06/2018	27/06/2018
MUT015	Gurumidzo	Machira	16	Mutare	-19.34893	32.20642	Domestic	09/07/2018	10/07/2018
CHI002	Singizi	Singizi	6	Chipinge	-20.09505	32.40301	Domestic	08/06/2018	09/06/2018
CHI005	Zamchiya	Zamchiya	23	Chipinge	-20.42095	32.28346	Domestic	19/06/2018	20/06/2018
MUT004	Chinyamagona	Nyangani	16	Mutare	-19.34987	32.13127	Domestic	22/06/2018	23/06/2018
MUT008	Mbabvu	Zvirongohwe	8	Mutare	-19.2618	32.11263	Domestic	28/06/2018	29/06/2018
MUT003	Chinyudze	Mvurachena	8	Mutare	-19.4387	32.1614	Domestic	21/06/2018	22/06/2018
CHI010	Mutii	Bako	25	Chipinge	-20.39429	32.25229	Domestic	10/07/2018	11/07/2018
CHI011	Gogodo / Botani	Muheji B	25	Chipinge	-20.47646	32.25409	Domestic	17/07/2018	18/07/2018
MUT012	Kwaedza Mahihii	Nyamadzawo	16	Mutare	-19.40851	32.14078	Domestic	06/07/2018	07/07/2018
MUT011	Muroti Junction	Chipiro	16	Mutare	-19.26213	32.10997	Domestic	05/07/2018	06/07/2018
MUT009	Musara Diptank	Zvirongohwe	8	Mutare	-19.26953	32.05493	Domestic	28/06/2018	29/06/2018
MUT013	Warehouse Mahihii	Nyamadzawo	16	Mutare	-19.4117	32.1443	Domestic	06/07/2018	07/07/2018
CHI001	Mbire Borehole Chikwanda	Mbire	6	Chipinge	-20.1113	32.3382	Domestic	07/06/2018	08/06/2018
MUT016	Mutandati	Torera	16	Mutare	-19.36048	32.21465	Domestic	18/07/2018	19/07/2018
MUT007	Mukuni South Secondary School	Mvurachena	8	Mutare	-19.29666	32.10882	Domestic	27/06/2018	28/06/2018
MUT002	Masinga	Nyangani	16	Mutare	-19.43871	32.16143	Domestic	21/06/2018	22/06/2018
MUT010	Zvebocha	Chipiro	16	Mutare	-19.2639	32.07301	Domestic	05/07/2018	06/07/2018
CHI014	Rukangare 1	Rukangare	25	Chipinge	-20.47181	32.23446	Domestic	20/07/2018	21/07/2018
CHI013	Matosi	Muheji	25	Chipinge	-20.51349	32.25815	Domestic	19/07/2018	20/07/2018
MUT014	Mudzere	Machira	16	Mutare	-19.40369	32.13617	Domestic	09/07/2018	10/07/2018
MUT001	Chitora	Nyangani	16	Mutare	-19.4493	32.16885	Domestic	20/06/2018	21/06/2018

Most boreholes were functional throughout monitoring period two due to the ongoing preventative maintenance conducted by our in-country partner DOMCCP. However, several boreholes have experienced technical problems or failed water quality tests and did not produce safe water for a certain period. Non-functional days associated with these borehole breakdowns or from a failed Water Quality Tests have been discounted from the emission reductions calculations.

The following boreholes experienced non-functional days during monitoring period 2:

MP2							
Borehole ID	**VPA**	**GS ID**	**BH Name**	**First day non-functional**	**Last day non-functional**	**Total Days Not Crediting**	**Details**
CHI004	VPA 143	GS6519	Moodies Rest / Jopa	10/03/2020	31/08/2020	174	1) WQT failed - chlorination delayed to outside of the MP due to COVID-19.
CHI005	VPA 144	GS6520	Zamchiya	04/06/2020	04/06/2020	1	1) Leather cups replaced
MUT012	VPA 145	GS6521	Kwaedza Mahihii	25/02/2020	02/06/2020	98	1) WQT failed, chlorinated.
CHI001	VPA 146	GS6522	Mbire Borehole Chikwanda	24/04/2020	24/04/2020	1	1) Leather cups replaced
MUT016	VPA 146	GS6522	Mutandati	25/02/2020	06/06/2020	102	1) WQT failed, chlorinated. 2) Reconnected pipes
MUT007	VPA 146	GS6522	Mukuni South Secondary School	30/05/2020	08/06/2020	9	1) Reconnected pipes
CHI014	VPA 147	GS6523	Rukangare 1	11/03/2020	31/08/2020	173	1) WQT failed - chlorination delayed to outside of the MP due to COVID-19.
CHI013	VPA 147	GS6523	Matosi	11/03/2020	31/08/2020	173	1) WQT failed - chlorination delayed to outside of the MP due to COVID-19. 2) Cattle trophy erected.

B.2. Post-registration changes

B.2.1. Temporary deviations from Certified Key Project Information, Project Design Document, Monitoring & Reporting Plan, applied methodology or applied standardized baseline

Under the monitoring plan, and the applied methodology, the annual monitoring studies were intended to be conducted during the monitoring period under review; planned for April-May 2020 (well within the monitoring period of initially 08/06/2019 – 07/06/2020, later extended to 31/08/2020). However, due to coronavirus-related restrictions, this monitoring had to be delayed until August-October, so was conducted between 21st August – 12th October 2020. A deviation request was submitted to the Gold Standard for this delay on 14th September 2020, and was approved on 29th September 2020.

No other deviations have been made during this monitoring period.

B.2.2. Corrections

Under the ongoing SWS Grievance review between GS and CO2balance, a temporary cap has been implemented to fixed ex-ante parameters (Wb,y), as well as to parameters monitored throughout the crediting period. The temporary caps are as follows:

- Wb,y - 0.0004T/L
- Wp,y - 0.0004T/L
- Project usage rate, Up,y – 90%
- Project user numbers - 300 users.

PP applied these caps to the ER calculations and MR as the means of presentation agreed between GS and the PP for the duration of the BAMG review.

B.2.3. Changes to start date of crediting period

Complete information on crediting period start dates was not available at the time of registration, but these can now be confirmed as follows:

GS6518: 21/06/2018 – 20/06/2023
GS6519: 10/06/2018 – 09/06/2023
GS6520: 09/06/2018 – 08/06/2023
GS6521: 29/06/2018 – 28/06/2023
GS6522: 08/06/2018 – 07/06/2023
GS6523: 21/06/2018 – 20/06/2023

B.2.4. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

No permanent changes have been made for this monitoring period.

B.2.5. Changes to project design of approved project

>> (Indicate whether any changes to the design of the project have been approved by GS-TAC that is relevant for this monitoring period.)

No changes have been made to the project design.

SECTION C. Description of monitoring system applied by the project

All surveys are administered by trained CO2balance staff and partner NGOs that are local to the area and conversant in the local dialects to ensure that the responses are consistent and not biased by any regional language barriers. Each participant is provided with a briefing on the purpose of the survey and is assured that no individual names are used in the analysis.

The results of the surveys are collated in Excel spreadsheets and stored on a central server in an electronic format then is sent to the UK head office for data analysis. The documentation procedure devised ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in the Mutare office and are available scanned upon request of the UK team.

In accordance with the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption Version 1, the survey samples are randomly selected from the borehole user record. Each borehole user is assigned a unique random number which is then sorted in order from lowest to highest; the first nth HHs are selected for the survey. The size of the RSG is dependent on the methodological requirements and variance of the parameter being monitored to ensure the parameters measured satisfy 90/30 precision (90% confidence interval and 30% margin of error). The RSG is reselected for every monitoring period to ensure the selection remains random.

In the case of this monitoring, 7 of the 30 homogenous boreholes were selected for inclusion in the random sample as per 90/30 precision, and then a random sample was run on the user lists of those boreholes. The first 100 of the random sample list were selected to be targeted for the project survey and usage survey, while a further 20 were selected as a buffer, in order to ensure that a minimum of 100 households could be reached. The same process was conducted in 2019, with the first 40 selected for the to ensure that the minimum of 30 households could be reached (required biennially so not conducted in 2020).

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
- GPS location of the borehole
- Model of the borehole
- Quantity of boreholes installed
- The total number of people obtaining their water from each borehole
- Mode of use: commercial/domestic

The total number of households using each borehole has been determined through the lists supplied by the community group and district officials. DOMCCP further conducts studies to screen and determine the exact number of people the rehabilitated boreholes. Using this method, the total number of people using each borehole has been fixed and hence a figure for person days can be calculated.

Ongoing Monitoring Studies
The following ongoing monitoring studies were conducted; the results are given in the parameter boxes tables in Section 6.

- **Water consumption field test** (Equation parameters Qp,y and Qp,rawboil,y) – In total, the WCFT was conducted on 38 households between 13th May and 1st June 2019 (required biennially so not conducted in 2020).

- **Quality of the treated water** - The quality of the treated water is assessed in each MP to ensure that it is fit for human consumption. The parameters used to assess the water quality are in line with Zimbabwean standards for potable water and all parameters must be shown to be within levels considered acceptable for domestic human consumption as per the WHO guidelines. The submitted WQT certificates for each VPA show that the water delivered by each borehole meets the standards required.

- **Usage Survey** - In total, 101 usage surveys were conducted between 21st August and 12th October 2020 (the delay was due to coronavirus-related restrictions, for which a deviation request was submitted to, and approved by, the Gold Standard).

- **Project Survey** – The PS surveys end users currently using project technologies to explore changes in project scenario over time. In total, 101 project surveys were conducted between 21st August and 12th October 2020 (the delay was due to coronavirus-related restrictions, for which a deviation request was submitted to, and approved by, the Gold Standard).

- **Leakage assessment -** Sources of leakage detailed within the methodology relevant to this project have been reviewed.

Individual participants were selected from the borehole user data base using the random sampling process outlined in the monitoring plan. Sample sizes are in line with the Gold Standard requirements.

Leakage Assessment

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 three stones; these have no market value and are not a product as such. There is nothing limiting the use of three stone cooking 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.

SECTION D. Data and parameters

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

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator	**SDG 6 & 13**
Data/parameter:	C_j
Unit	Percentage
Description	Portion of users of project safe water supply who were already in baseline using a non- boiling safe water supply.
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	1.76%
Choice of data or measurement methods and procedures	The portion of safe water users is determined though the baseline project survey and refers to the number of users that already use safe water from water sources such as boreholes.
Purpose of data	Calculate ERs
Additional comments	-

Relevant SDG Indicator	**SDG 13**
Data/parameter:	$EF_{b,co2}$
Unit	tco_2/TJ
Description	co_2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	112

Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	-

Relevant SDG Indicator	**SDG 13**
Data/parameter:	$EF_{b,non\ co2}$
Unit	tco_2/TJ
Description	Non-co_2 emission factor arising from use of fuels in baseline scenario
Source of data	IPCC default value
Value(s) applied)	8.692
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	-

Relevant SDG Indicator	**SDG 13**
Data/parameter:	NCV_b /NCV_p
Unit	TJ/ton
Description	Net calorific value of the fuels used in the project
Source of data	IPCC default value
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	**SDG 13**
Data/parameter:	$f_{NRB,i,y}$
Unit	Fractional non-renewability
Description	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data	CDM Default National Figure
Value(s) applied)	0.97
Choice of data or measurement methods and procedures	$f_{NRB,i,y}$
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	**SDG 3 &13**
Data/parameter:	$W_{p,y}$
Unit	T/litre

Description	Quantity of fuel that is used to treat 1 litre of water in the project scenario p during year y
Source of data	Baseline Water Boiling Test
Value(s) applied)	0.0004 (CAPPED)
Choice of data or measurement methods and procedures	Capped value from GS grievance review
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	**SDG 13**
Data/parameter:	Non Suppressed demand (X_{boil})
Unit	Percentage
Description	Percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies like chlorine treatment techniques (if available) in the project boundary,
Source of data	Baseline study. Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	0
Choice of data or measurement methods and procedures	Suppressed demand will be determined through a set of questions in the project survey that establish the method households use to purify their water, if any, and how they would choose to purify if they were not subject to monetary and access barriers. This is in line with the Gold Standard principles of suppressed demand outline in annex 2. A fixed suppressed demand baseline has been opted for.
Purpose of data	Calculate ERs
Additional comments	

Relevant SDG Indicator	**SDG 5**
Data/parameter:	Tb,y
Unit	Hours/minutes
Description	Time spent collecting water per household per day prior to project
Source of data	Baseline Survey, question 15
Value(s) applied)	1.2 hours/72 minutes
Choice of data or measurement methods and procedures	Measured by question 15 in the baseline survey
Purpose of data	Calculate time saved in water collection in the project
Additional comments	

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter)

Relevant SDG Indicator/Safeguarding Principle	SDG 5
Data / Parameter	TRy

Unit	Percentage
Description	Total reduction time spent collecting water for project activity in year y (%)
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	40.26% (All VPAs)
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Calculate the average amount of time spent collecting water in the project scenario and compare to the pre-project scenario
QA/QC procedures:	-
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 comments:	

Relevant SDG Indicator/Safeguarding Principle	SDG 5
Data / Parameter	Usage of time saved on water collection
Unit	Percentage
Description	Uses of time saved which was previously spent on water collection
Measured/calculated/default	Measured
Source of data	Project Survey
Value(s) of monitored parameter	1. (Unpaid) Domestic work (includes cooking and caring for family members): 46% 2. Income generating activities: 36% 3. Religious activities: 13% 4. Social and leisure activities: 0% 5. Voluntary activities: 2% 6. Education and training: 0% 7. Other (Specify): 0%
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Ask users how time saved on water collection in the project scenario, as opposed to the baseline scenario, is now being used.
QA/QC procedures:	-
Purpose of data	To quantify how time which was previously spent on water collection is now being used
Additional comments:	

Relevant SDG Indicator	SDG 6
Data/parameter:	P_y
Unit	Number
Description	Number of persons consuming safe water
Source of data	Household lists
Value(s) applied)	GS6518: 1,323 GS6519: 1,448 GS6520: 1,326 GS6521: 1,330 GS6522: 1,376 GS6523: 1,426
Choice of data or measurement methods and procedures	Sum of the total number of people using each borehole in the project. The total number of households using each borehole will be established through lists supplied by the water resource committee and/or community group and/or district officer responsible for that borehole. Using this method, the total number of people using each borehole will be known.
Purpose of data	Determination of number of persons using safe water.
Additional comments	-

Relevant SDG Indicator/Safeguarding Principle	SDG 6
Data / Parameter	P_{access}
Unit	Number
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario.
Measured/calculated/default	Measured
Source of data	Household lists; Usage Survey
Value(s) of monitored parameter	GS6518: 1,300 GS6519: 1,423 GS6520: 1,303 GS6521: 1,307 GS6522: 1,352 GS6523: 1,401
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Borehole users * Usage rate
QA/QC procedures:	-
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 comments:	

Relevant SDG Indicator	**SDG 13**
Data/parameter:	Np,y
Unit	Project Technology Days
Description	Number of persons consuming water supplied by project scenario p through year y
Measured/calculated/default	Measured
Source of data	Borehole Project Database
Value(s) of monitored parameter	GS6518: 564,326 GS6519: 568,054 GS6520: 565,320 GS6521: 539,382 GS6522: 555,013 GS6523: 509,650
Monitoring equipment	Borehole Project Database
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Borehole users * Total crediting days
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	**SDG 3, 6 & 13**
Data/parameter:	Up,y
Unit	Percentage
Description	Usage rate in project scenario p through year y
Measured/calculated/default	Measured
Source of data	Annual Usage Survey
Value(s) of monitored parameter	90% (CAPPED – due to ongoing grievance review)
Monitoring equipment	The usage survey has been carried out by staff trained by CO2balance and local in-country partner DOMCCP to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	CAPPED – due to ongoing grievance review 97% is the unapplied non-capped value from the Usage Survey (included for reference)

Relevant SDG Indicator	SDG 3 & 13
Data/parameter:	Qp,y
Unit	Liters per household per day
Description	Quantity of safe water supplied in the project scenario p during the year y using the zero or low emissions clean water supply technology
Measured/calculated/default	Measured
Source of data	Water Consumption Field Test (WCFT)
Value(s) of monitored parameter	7.5 (CAPPED)
Monitoring equipment	-
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT is carried out by staff trained by CO2balance and local in- country partner DOMCCP to meet the specific requirements of the methodology. All data presented in Excel is subject to checking and cross referencing of a sample of the raw data by the project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	Value capped at 7.5 10 (UNCAPPED and not used in calculations)

Relevant SDG Indicator	SDG 3 & 13
Data/parameter:	Qp,cleanboil,y
Unit	Litres per person per day
Description	Quantity of safe water boiled in the project scenario p during the year y using the zero or low emissions clean water supply technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner FAPDR to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	SDG 3 & 13
Data/parameter:	Qp,rawboil,y
Unit	Litres per person per day
Description	The raw of unsafe water that is still boiled after installation of the water treatment technology
Measured/calculated/default	Measured
Source of data	WCFT
Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Method used similar to Kitchen Performance Test in which the volume of water consumed in each household is averaged over 3 days. The WCFT has been carried out by staff trained by CO2balance and local in-country partner FAPDR to meet the specific requirements of the methodology. All data presented in excel is subject to checking and cross referencing of a sample of the raw data by project developers.
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

Relevant SDG Indicator	SDG 6
Data/parameter:	Quality of Treated Water
Unit	Parameters as per national standards
Description	Laboratory Tests
Measured/calculated/default	Measured
Source of data	Water quality tests
Value(s) of monitored parameter	Pass
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	
QA/QC procedures:	
Purpose of data:	Ensure water is safe for human consumption without treatment using the baseline technology
Additional comments:	The Kigali based recognised laboratory has certified each water supply in line with national standards which also adheres to the WHO guidelines.

Relevant SDG Indicator	SDG 13
Data/parameter:	LEp,y
Unit	tCO2e per year
Description	Leakage in project scenario p during year y
Measured/calculated/default	Measured
Source of data	Baseline and monitoring surveys

Value(s) of monitored parameter	0
Monitoring equipment	-
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculate ERs
Additional comments:	-

D.3. Implementation of sampling plan

The project proponent has elected to cross-sample technologies across all its homogenous borehole VPAs located within Manicaland Province. The samples for the surveys analysed below are randomly selected from the borehole information databases using the RSG procedure previously explained in line with the minimum sample size requirements as defined by the methodology, and cover VPA, borehole and household levels. The random sampling procedure is as follows. Following 90/30 precision, achieved using Raosoft Sample Size Calculator, it was found that 7 of the 30 boreholes in Manicaland Province would need to be selected for inclusion in the surveys. 7 boreholes were selected by generating a random list of numbers on the Research Randomizer online resource. An aggregate list was then generated of the users of the 7 selected boreholes, and these were ordered according to a new random list of numbers, again generated using Research Randomizer. The aggregate list was then reordered according to random number and the first 100 users selected for the Project Survey and Usage Survey, with a further 20 selected as buffer households. These Project and Usage surveys were then conducted between 21st August 2020 and 12th October 2020 (the delay was due to coronavirus-related restrictions, for which a deviation request was submitted to, and approved by, the Gold Standard). The same process was conducted in 2019, with the first 40 selected for the WCFT (required biennially so not conducted in 2020), between 13th May and 1st June 2019.

The surveys have been conducted so as to ensure that they are within the end date of the respective monitoring periods for the VPAs.

SECTION E. Calculation of SDG outcomes

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

SDG 3 (Good Health and Wellbeing)

$I_{b,y}$ = 88%

$I_{b,y}$ = Percentage of the population experiencing water-related illnesses in the baseline scenario.

To establish $I_{b,y}$ the Baseline Survey asked the following:

17	Do you or your family ever suffer from stomach related illnesses and how often does this occur?	**1.** Never	**2.** Once every few months
		3. Once per month	**4.** Several times per month
		5. Weekly	**6.** Everyday

SDG 5 (Gender Equality)

$T_{b,y}$ = 72 minutes

$T_{b,y}$ = Time spent collecting water per household per day prior to project (hours)

To establish $T_{b,y}$ the Baseline Survey asked the following:

13	Who usually goes to this source to collect water for your household?	1. Male Adult	2. Female Adult
		3. Male Child	4. Female Child
15	How long do you spend collecting water per day (if applicable)?	1. 0-30min	2. 31-60min
		3. 1-2hrs	4. 2-3hrs
		5. 3-4hrs	6. >4hrs
16	How many days per week do you spend collecting water on average?	*Please specify on answer sheet*	

SDG 6 (Clean Water and Sanitation)

C_j = 1.76%

C_j = Expressed as a percentage, the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it.

X_{boil} = 0%

X_{boil} = The percentage of premises that in the absence of the project activity would have used non-GHG emitting technologies (like chlorine treatment techniques) in the project boundary.

SDG 13 (Climate Action)
Baseline Emissions ($BE_{b,y}$)

GS6518 $BE_{b,y}$: 3,204 tCO2e
GS6519 $BE_{b,y}$: 3,226 tCO2e
GS6520 $BE_{b,y}$: 3,210 tCO2e
GS6521 $BE_{b,y}$: 3,063 tCO2e
GS6522 $BE_{b,y}$: 3,152 tCO2e
GS6523 $BE_{b,y}$: 2,894 tCO2e

$$BE_{b,y} = B_{b,y} * \left(\left(NRB * EF_{b,fuel,co2} \right) + EF_{b,fuel,nonco2} \right) * NCV_{b,fuel}$$

Where:

$B_{b,y}$ = Quantity fuel consumed in the baseline scenario.

NRB = Country-specific default value for the fraction of non-renewable biomass.

$EF_{b,fuel,co2}$ = Emissions factor of fuel consumed in the baseline scenario (CO_2).

$EF_{b,fuel,nonco2}$ = Emissions factor of fuel consumed in the baseline scenario (non- CO_2).

$NCV_{b,fuel}$ = Net calorific value of fuel consumed in the baseline scenario.

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

>> (*Provide details of equations and approaches used to calculate/estimate project values.)*

SDG 3 (Good Health and Wellbeing)

$I_{p,y}$ = 11%
$I_{p,y}$ = Percentage of the population experiencing water-related illnesses in the project scenario

To establish $I_{p,y}$ the Project Survey asked the following:

23	Since the borehole was rehabilitated do you or your family ever suffer from stomach related illnesses/water-bourne diseases and how often does this occur?	**1.** Never	**2.** Once every few months
		3. Once per month	**4.** Several times per month
		5. Weekly	**6.** Everyday

$SI_{p,y}$ = 77%
$SI_{p,y}$ = Reduction in smoke-related illnesses noticed in the project scenario

To establish $SI_{p,y}$ the Project Survey asked the following:

35	Have you noticed a reduction in smoke related illnesses such as breathing problems and chest pains?	**1**. Yes	**2**.No

SDG 5 (Gender Equality)

$T_{p,y}$ = 43.01 minutes
$T_{p,y}$ = Time spent collecting water per household per day in project (hours)

The project survey asks the following questions to establish $T_{p,y}$ and to show what use is made of the time saved:

14	Who usually goes to this source to collect water for your household?	**1.** Male Adult	**2.** Female Adult
		3. Male Child	**4.** Female Child
16	How long do you spend collecting water per day (minutes)?	*Please specify on answer sheet*	
17	How many days per week do you spend collecting water on average?	*Please specify on answer sheet*	
18	Has the borehole project saved you time?	1. Yes	2. No (skip to question 22)
19	In which of these activities has the borehole project saved you the most time?	1. Less distance to walk to the water source	2. Less time waiting at the water source
		3. Less time spent boiling/purifying water	4. Less time spent collecting wood to boil water

		5. Other (Specify)	
20	How much time do you think the borehole project has saved you on average per day?	*Please specify on answer sheet*	
21	What do you do with the time saved from the project?	1. (Unpaid) Domestic work (*includes cooking and caring for family members*)	2. Income generating activities
		3. Religious activities	4. Social and leisure activities
		5. Voluntary activities	6. Education and training
		7. Other (Specify)	

SDG 6 (Clean Water and Sanitation)

GS6518 P_y: 1,323
GS6519 P_y: 1,448
GS6520 P_y: 1,326
GS6521 P_y: 1,330
GS6522 P_y: 1,376
GS6523 P_y: 1,426

P_y Number of persons having access to safe water in the project activity.

SDG 13 (Climate Action)
Project Emissions ($PE_{b,y}$)

GS6518 $PE_{p,y}$: 0 tCO2e
GS6519 $PE_{p,y}$: 0 tCO2e
GS6520 $PE_{p,y}$: 0 tCO2e
GS6521 $PE_{p,y}$: 0 tCO2e
GS6522 $PE_{p,y}$: 0 tCO2e
GS6523 $PE_{p,y}$: 0 tCO2e

$$PE_{p,y} = B_{p,y} * \left(\left(NRB * EF_{p,fuel,co2} \right) + EF_{p,fuel,nonc} \right) * NCV_{p,fuel}$$

Where:

$B_{p,y}$ = Quantity fuel consumed in project scenario.

NRB = Country-specific default value for the fraction of non-renewable biomass.

$EF_{p,fuel,co2}$ = Emissions factor of fuel used in the project scenario (CO_2).

$EF_{p,fuel,nonco2}$ = Emissions factor of fuel used in the project scenario (non- CO_2).

$NCV_{p,fuel}$ = Net calorific value of fuel used in the project scenario.

E.3. Calculation of net benefits as difference of baseline and project values or direct calculation for each SDG outcome

>>

SDG 3 (Good Health and Wellbeing)
P_{safe} = 0.82 = (((0.88 – 0.11) / 0.88) + 0.77)/2

Where:
$P_{safe} = (((I_{b,y} - I_{p,y}) / I_{b,y}) + SI_{p,y})/2$

P_{safe}	Total reduction in negative health effects for the project activity in year y (%)
$I_{b,y}$	Percentage of the population experiencing water-related illnesses in the baseline scenario
$I_{p,y}$	Percentage of the population experiencing water-related illnesses in the project scenario
$SI_{p,y}$	Reduction in water-related illnesses noticed in the project scenario

The project has reduced the incidence of waterborne illnesses by 82% by removing the need to boil water to make it safe to consume.

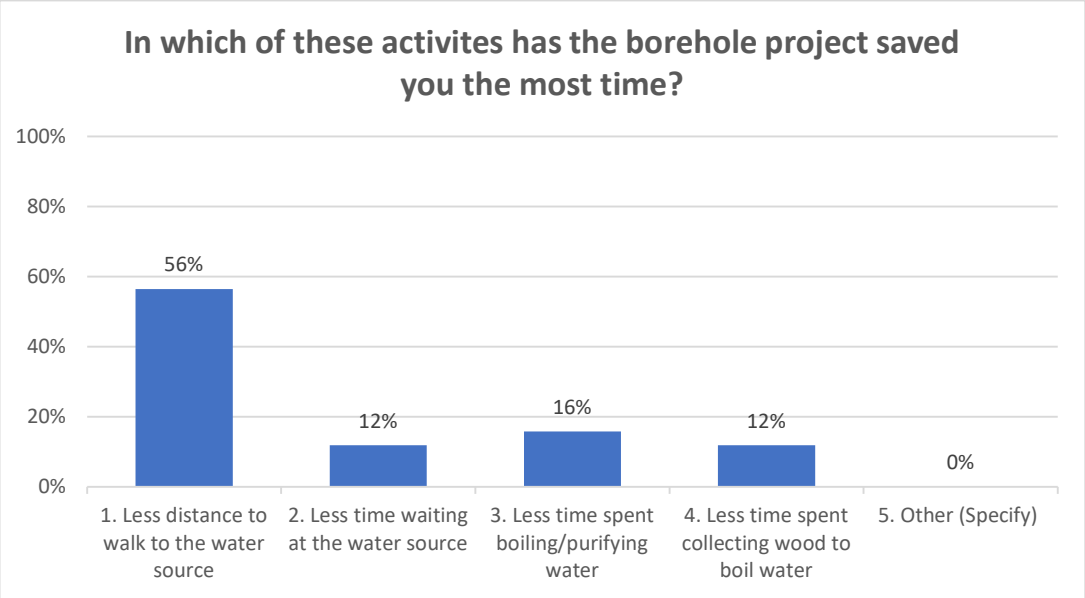
SDG 5 (Gender Equality)

$TR_{y} = 40.26\% = (72.00 - 43.01) / 72.00$
$TR_{y} = (T_{b,y}) - (T_{p,y}) / (T_{b,y})$

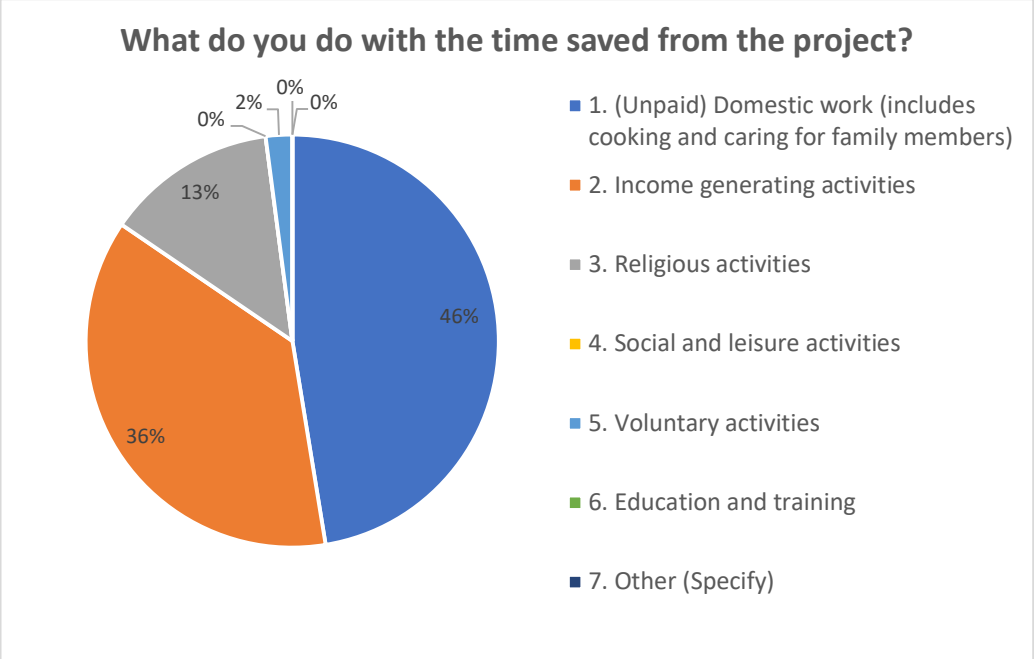
Where:

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

The project has saved households an average 175.48 minutes (from Q20 in Project Survey) per day by reducing the distance needed to walk to the water source (56%), reducing the time waiting at the water source (12%), removing the need to treat the water (16%) and collect firewood (12%).



The reduction in time spent collecting and treating water is used in the following ways:



SDG 6 (Clean Water and Sanitation)

P_{access} = 8,084 = 8,229 * (1 – 0.0176) * (1-0)

Where:

$P_{access} = P_y * (1 - C_j) * (1 - X_{boil})$

Using the above values for parameters Cj and Xboil, the contribution towards SDG 6 was calculated for each VPA. The total number of additional persons having access to safe water in the project activity compared to the baseline scenario is 8,084.

SDG 6 Impacts	
GS ID	Paccess
GS6518	1300
GS6519	1423
GS6520	1303
GS6521	1307
GS6522	1352
GS6523	1401
Total	8084

SDG 13 and emission reductions

In MP2 the project achieved a total capped ERs of 16,869 tCO2e. Below is a summary of the ERs by VPA:

Gold Standard

SDG 13 Emission Reductions:		
GS ID	PTD Total	ERs CAPPED (WBT 0.0004T/l, 90% usage rate, 300 Users and 95% PTD cap):
GS6518	564,326	2,739.00
GS6519	568,054	2,757.00
GS6520	565,320	2,743.00
GS6521	539,382	2,618.00
GS6522	555,013	2,694.00
GS6523	509,650	2,473.00
TOTAL	**3,301,745**	**16,024.00**

GS6518

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		564325.65
Fuel to treat 1 litre of water using baseline tech (CAPPED)	Wb,y	T/L	0.000400
Quantity safe water litres consumed in project scenario supplied by project technology (CAPPED at 7.5 under TPDDTEC v1.0)	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	1663

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		564325.65
Fossil fuel required to treat 1 litre for water in project scenario (CAPPED)	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.97
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	3,044
Project emissions per year	PEp,y	tCO2/y	0
Usage rate (CAPPED at 90%)	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**2739.83**
	Total ERs claimed for GS6518 MP2		**2739.00**

GS6519

Gold Standard

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		568054.4
Fuel to treat 1 litre of water using baseline tech (CAPPED)	Wb,y	T/L	0.000400
Quantity safe water litres consumed in project scenario supplied by project technology (CAPPED at 7.5 under TPDDTEC v1.0)	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	1674

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		568054.4
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.97
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	3,064
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**2757.93**
	Total ERs claimed for GS6519 MP2		**2757.00**

GS6520

Gold Standard

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		565320.3
Fuel to treat 1 litre of water using baseline tech (CAPPED)	Wb,y	T/L	0.000400
Quantity safe water litres consumed in project scenario supplied by project technology (CAPPED at 7.5 under TPDDTEC v1.0)	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	1666

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		565320.3
Fossil fuel required to treat 1 litre for water in project scenario	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.97
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	3,050
Project emissions per year	PEp,y	tCO2/y	0
Usage rate	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**2744.66**
	Total ERs claimed for GS6520 MP2		**2743.00**

GS6521

Gold Standard

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		539381.5
Fuel to treat 1 litre of water using baseline tech (CAPPED)	Wb,y	T/L	0.000400
Quantity safe water litres consumed in project scenario supplied by project technology (CAPPED at 7.5 under TPDDTEC v1.0)	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	1590

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		539381.5
Fossil fuel required to treat 1 litre for water in project scenario (CAPPED)	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.97
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	2,910
Project emissions per year	PEp,y	tCO2/y	0
Usage rate (CAPPED at 90%)	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**2618.72**
	Total ERs claimed for GS6521 MP2		**2618.00**

GS6522

Gold Standard

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		555012.8
Fuel to treat 1 litre of water using baseline tech (CAPPED)	Wb,y	T/L	0.000400
Quantity safe water litres consumed in project scenario supplied by project technology (CAPPED at 7.5 under TPDDTEC v1.0)	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	1636

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		555012.8
Fossil fuel required to treat 1 litre for water in project scenario (CAPPED)	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.97
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	2,994
Project emissions per year	PEp,y	tCO2/y	0
Usage rate (CAPPED at 90%)	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**2694.61**
	Total ERs claimed for GS6522 MP2		**2694.00**

Gold Standard

GS6523

Total Emission Reductions for Monitoring Period 2			
Baseline Fuel Use (Bby)			
Portion using safe water	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		509650.3
Fuel to treat 1 litre of water using baseline tech (CAPPED)	Wb,y	T/L	0.000400
Quantity safe water litres consumed in project scenario supplied by project technology (CAPPED at 7.5 under TPDDTEC v1.0)	Qp,y	L/pd	7.5
Quantity of raw water boiled in addition to project technology water	Qp, raw, y	L/pd	0
Quantity fuel consumed in baseline scenario	Bb,y	T	1502

Project Fuel Use (Pby)			
Portion of safe users	Cj	fraction	1.76%
Person Days (CAPPED at 95%)	Njy		509650.3
Fossil fuel required to treat 1 litre for water in project scenario (CAPPED)	Wp,y	T/L	0.000400
Quantity of raw water boiled in addition to project tech water	Qp, raw, y	L/pd	0
Quantity of safe water boiled	Qp, cleanboil, y	L/pd	0
Quantity of fuel consumed in project scenario per HH	Bp,y	T	0

Constants			
NRB	NRB	Fraction	0.97
Emissions factor fuel (co2)	EFb,fuel,co2	tCO2/TJ	112
Emissions factor fuel (non-co2)	EFb, fuel, non-co2	TCO2/TJ	8.692
Net calorific value of fuel	NCV,b,fuel	TJ/T	0.0156

Emissions Reductions			
Baseline emissions per year	BEb,y	tCO2/y	2,749
Project emissions per year	PEp,y	tCO2/y	0
Usage rate (CAPPED at 90%)	Up,y	fraction	0.9
Leakage	LEp,y	tCO2/y	0
Emission Reductions	**Ery**	**tCO2/y**	**2474**
	Total ERs claimed for GS6523 MP2		**2473.00**

E.4. Summary of ex-post values of each SDG outcome for the current monitoring period

Item	Baseline estimate	Project estimate	Net benefit
SDG 3	88% experiencing negative water-related health effects (applies equally to all VPAs)	11% experiencing negative water-related health effects. 77% fewer experiencing smoke-related health effects (applies equally to all VPAs)	82% reduction in waterborne and smoke-related illnesses per year (weighted reduction) (applies equally to all VPAs)
SDG 5	72.00 minutes collecting water (applies equally to all VPAs)	43.01 minutes collecting water (applies equally to all VPAs)	22.99 minutes / 40.26% time saved (applies equally to all VPAs)
SDG 6	Persons with access to safe water: GS6518: 23 GS6519: 25 GS6520: 23 GS6521: 23 GS6522: 24 GS6523: 25	Persons with access to safe water (Py): GS6518: 1,323 GS6519: 1,448 GS6520: 1,326 GS6521: 1,330 GS6522: 1,376 GS6523: 1,426	Additional persons with access to safe water (Paccess): GS6518: 1300 GS6519: 1423 GS6520: 1303 GS6521: 1307 GS6522: 1352 GS6523: 1401
SDG 13	Total emissions: GS6518: 2,739 tCO2e GS6519: 2,757 tCO2e GS6520: 2,743 tCO2e GS6521: 2,618 tCO2e GS6522: 2,694 tCO2e GS6523: 2,473 tCO2e	Total emissions: GS6518: 0 tCO2e GS6519: 0 tCO2e GS6520: 0 tCO2e GS6521: 0 tCO2e GS6522: 0 tCO2e GS6523: 0 tCO2e	Emissions reductions: GS6518: 2,739 tCO2e GS6519: 2,757 tCO2e GS6520: 2,743 tCO2e GS6521: 2,618 tCO2e GS6522: 2,694 tCO2e GS6523: 2,473 tCO2e

E.5. Comparison of actual value of outcomes with estimates in approved PDD

- SDG 3: A 82% reduction in illnesses was experienced in all VPAs, compared to a 50% decrease expected in the PDD. This demonstrates that the health benefits of the boreholes have exceeded expectations and that communities have done very well to ensure that the water is safe for consumption.
- SDG 5: There has been an 40.26% time saving on water collection compared to 40% estimated in the PDD. This demonstrates that there has been a significant time saving, matching expectations, and the time can now be dedicated to other activities.
- SDG 6: The number of people accessing safe water is significantly less per VPA than the 2,210 people per VPA estimated in the PDD. This is due to the temporary cap of 300 users per borehole and a 90% usage rate cap placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 6 may change.
- SDG 13: All VPAs have fallen significantly short of the expected 10,000 ERs. This is due to the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
SDG 3	50% reduction in waterborne and smoke-related illnesses per year (applies equally to all VPAs)	82% reduction in waterborne and smoke-related illnesses per year (applies equally to all VPAs)
SDG 5	40% reduction in time spent collecting water (applies equally to all VPAs)	40.26% reduction in time spent collecting water (applies equally to all VPAs)
SDG 6	Estimated number of persons with access to safe water: GS6518: 2,210 GS6519: 2,210 GS6520: 2,210 GS6521: 2,210 GS6522: 2,210 GS6523: 2,210	Actual persons with access to safe water: GS6518: 1,323 GS6519: 1,448 GS6520: 1,326 GS6521: 1,330 GS6522: 1,376 GS6523: 1,426
SDG 13	Estimated emissions reductions: GS6518: 10,000 tCO2e GS6519: 10,000 tCO2e GS6520: 10,000 tCO2e GS6521: 10,000 tCO2e GS6522: 10,000 tCO2e GS6523: 10,000 tCO2e	Actual emissions reductions: GS6518: 2,739 tCO2e GS6519: 2,757 tCO2e GS6520: 2,743 tCO2e GS6521: 2,618 tCO2e GS6522: 2,694 tCO2e GS6523: 2,473 tCO2e

E.6. Remarks on difference from estimated value in approved PDD

The difference between estimated and actual values for SDG 13 are as follows:

VPA ID	Estimated value (tCO2e)	Actual value (tCO2e)	Comment
GS6518	10,000	2,739	Significantly lower value is a result of the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.
GS6519	10,000	2,757	Significantly lower value is a result of the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.
GS6520	10,000	2,743	Significantly lower value is a result of the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.
GS6521	10,000	2,618	Significantly lower value is a result of the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.
GS6522	10,000	2,694	Significantly lower value is a result of the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.

GS6523	10,000	2,473	Significantly lower value is a result of the temporary cap of 0.0004T/L for the Wb,y/Wp,y value placed by the Gold Standard during the ongoing grievance review. It is possible that, once the review is finalized, the final monitored outcome of SDG 13 may change.

SECTION F. Stakeholder inputs and legal disputes

F.1. List all inputs/grievances which have been received for the project during the monitoring period together with their respective answers/actions

No inputs or grievances were received during the monitoring period.

F.2. List all inputs/grievances from previous monitoring period where follow up action is to be verified in this monitoring period

No inputs or grievances were received during the previous monitoring period.

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

No legal contests or disputes arose during the monitoring period.