

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

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KEY PROJECT INFORMATION

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

GS ID of Programme	GS1247
Title of Programme	Improved Kitchen Regimes Multi-Country PoA (GS1247)
Version of POA-DD applicable to this monitoring report	Version 9
Name and GS ID of fully Validated CPA/VPAs (i.e. non compliance check)	VPA 122 – GS 5951 VPA 123 – GS 5952 VPA 124 – GS 5953 VPA 125 – GS 5954 VPA 126 – GS 5955 VPA 129 – GS 6041 VPA 130 – GS 6042

Key Project Information

GS ID (s) of Project (s)	VPA 122 – GS 5951 VPA 123 – GS 5952 VPA 124 – GS 5953 VPA 125 – GS 5954 VPA 126 – GS 5955 VPA 129 – GS 6041 VPA 130 – GS 6042
Title of the project (s) covered by monitoring report	GS1247 VPA 122 Zoba Anseba Community Safe Water (GS5951) GS1247 VPA 123 Zoba Anseba Community Safe Water (GS5952) GS1247 VPA 124 Zoba Anseba Community Safe Water (GS5953) GS1247 VPA 125 Zoba Anseba Community Safe Water (GS5954) GS1247 VPA 126 Zoba Anseba Community Safe Water (GS5955) GS1247 VPA 129 Zoba Anseba Community Safe Water (GS6041) GS1247 VPA 130 Zoba Anseba Community Safe Water (GS6042)
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	Version 2 (All VPAs)
Version number of the monitoring report	Version 5

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Completion date of the monitoring report	20/09/2024
Date of project design certification	04/04/2018
Date of Last Annual Report	13/12/2023
Monitoring period number	MP6, MP4
Duration of this monitoring period	GS5951: (01/12/2022) to (30/11/2023) MP6 GS5952: (01/12/2022) to (30/11/2023) MP6 GS5953: (01/12/2022) to (30/11/2023) MP6 GS5954: (01/12/2022) to (30/11/2023) MP6 GS5955: (01/12/2022) to (30/11/2023) MP6 GS 6041: (01/12/2022) to (30/11/2023) MP4 GS 6042: (01/12/2022) to (30/11/2023) MP4
Project Representative	Johanna Grosssteinbeck Rebecca Barton (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	TPDDTEC v.1 Technologies and Practices to Displace Decentralized Thermal Energy Consumption v.1
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

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For all VPAs

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 3 Good Health	Variation in household	95.00% decrease in Percentage and Well-being smoke (All VPAs) household smoke (All VPAs)	Percentage
SDG 5 Gender Equality	Variation of time spent on firewood collection	0.47 decrease in hours spent collecting firewood per household per day (All VPAs)	Hours
SDG 6 Clean Water and Sanitation	People gain access to safe water	Additional people gain access to safe water:	Number of people
		GS 5951: 2,382 GS 5952: 2,074 GS 5953: 1,938 GS 5954: 2,106 GS 5955: 1,794 GS 6041: 4,180 GS 6042: 3,694 Total: 18,168	
SDG 13 Climate Action	Emission Reductions	SDG 13: tCO2e/y per VPA	VERs
		GS5951: 4,227 GS5952: 3,681 GS5953: 3,439 GS5954: 3,735 GS5955: 3,183 GS6041: 7,418 GS6042: 6,555 Total: 32,238	

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VERS
01/12/2022	31/12/2022	GS5951: 358 tCO ₂ e GS5952: 311 tCO ₂ e GS5953: 291 tCO ₂ e GS5954: 316 tCO ₂ e GS5955: 269 tCO ₂ e GS6041: 629 tCO ₂ e GS6042: 554 tCO ₂ e Total: 2,728
01/01/2023	30/11/2023	GS5951: 3,869 tCO ₂ e GS5952: 3,370 tCO ₂ e GS5953: 3,148 tCO ₂ e GS5954: 3,419 tCO ₂ e GS5955: 2,914 tCO ₂ e GS6041: 6,789 tCO ₂ e GS6042: 6,001 tCO ₂ e Total: 29,510

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

>> In Eritrea over 45% of the rural population do not have access to safe water and rely exclusively on unprotected wells, lakes and other open water sources that are highly susceptible to contamination. Annexed from Ethiopia in 1962, the country has experienced periodic conflict and continuing tensions in the region.

Armed conflict, mandatory military service and external migration, takes men away from their villages and means that many rural families are headed by women, often widows. Female headed households in Eritrea face several disadvantages and as a result they cultivate less land and have fewer assets. These women then bear the burden of producing food as well as providing care for their families, including travelling to collect firewood and water.

Many existing boreholes in Eritrea have fallen into disrepair because maintenance programmes have been poorly managed, or proven too expensive leaving community members without access to clean water. CO₂balance's project partner Vita has worked to identify broken down boreholes, renovate them and supply a maintenance programme to ensure that clean, safe water is delivered as a result of this project. The boreholes included under the project are entirely human operated and fitted with hand pump models that are commonly used in the area such as Afridev, U3 Modified and India Mark II pumps.

Zoba Anseba is a largely rural district in which many households typically use wood fuel on inefficient three stone fires to purify their drinking, cleaning and washing water. This

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process results in the release of greenhouse gas emissions from the combustion of wood which can be avoided if a technology that does not require fuel (wood or fossil) supplies clean water desired by households. By providing safe water this project ensures that households consume less firewood during the process of water purification and therefore reduce greenhouse gas emissions from the combustion process.

In total 66 boreholes were rehabilitated as part of this project between the 2nd November 2017 and 17th March 2020, however borehole ZA017 has been removed in this monitoring period due to non-functionality, bringing the total number of boreholes that are currently in the project to 65. The date, location and number of end users served by each borehole are given in the table below, which forms the project database.

VP A ID	GS ID	Borehole ID	Borehole Model	Village name	Latitude	Longitude	Date of rehab	Number of end users	Cappe d numbe rs of users
12 2	595 1	ZA00 2	Mark II	Etharewyata t	16.2603 3	38.405 42	02/11/20 17	310	310
12 2	595 1	ZA00 3	Mark II	Kedhat	16.1703 0	38.421 63	03/11/20 17	318	318
12 2	595 1	ZA01 2	Mark II	Balwa	15.6737 4	38.698 65	10/11/20 17	541	400
12 2	595 1	ZA02 0	Mark II	Bekushemn uk	15.5946 2	38.645 77	18/11/20 17	196	196
12 2	595 1	ZA02 1	Mark II	Wasdemba 1	15.6596 3	38.578 62	21/11/20 17	242	242

12 2	595 1	ZA03 5	Mark II	Kush	16.1495 0	38.053 49	08/12/20 17	104	104
12 2	595 1	ZA03 7	Mark II	Orota	16.1762 4	37.955 90	12/12/20 17	369	369
12 2	595 1	ZA03 9	Mark II	Shirara 2	15.8178 6	38.863 57	16/12/20 17	282	282
12 2	595 1	ZA04 1	Mark II	Weledteshi m	16.1575 0	38.072 94	19/12/20 17	287	287
12 3	595 2	ZA00 5	Mark II	Karibosa	15.8071 6	38.383 65	04/11/20 17	210	210
12 3	595 2	ZA01 0	Mark II	Jertem	15.6812 9	38.614 30	09/11/20 17	276	276

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12 3	595 2	ZA02 7	Mark II	Ghergher	15.7742 7	38.683 05	26/11/20 17	588	400
12 3	595 2	ZA03 0	Mark II	Deghedeg	15.5826 8	38.770 90	28/11/20 17	103	103
12 3	595 2	ZA03 1	Mark II	Glass	15.7186 0	38.313 57	30/11/20 17	232	232
12 3	595 2	ZA03 3	Mark II	Asmat	16.1572 5	38.072 92	08/12/20 17	319	319
12 3	595 2	ZA03 8	Mark II	Shirara 1	15.8180 0	38.863 59	16/12/20 17	304	304
12 3	595 2	ZA04 2	Mark II	Dighi	15.7536 9	38.489 91	21/12/20 17	340	340
12 4	595 3	ZA00 4	Mark II	Guluy	16.1903 0	38.415 42	03/11/20 17	241	241
12 4	595 3	ZA00 6	Mark II	Robto	15.7402 9	38.663 24	07/11/20 17	134	134
12 4	595 3	ZA00 7	Mark II	Garalebu	15.7306 2	38.676 74	07/11/20 17	135	135
12 4	595 3	ZA00 9	Mark II	Jemberek	15.7528 4	38.662 17	08/11/20 17	198	198
12 4	595 3	ZA01 5	Mark II	Hamrehama reb 1	15.6231 8	38.622 06	17/11/20 17	1349	400
12 4	595 3	ZA01 9	Mark II	Firkutu	15.628	38.654 69	18/11/20 17	271	271

12 4	595 3	ZA02 9	Mark II	Marat	15.8681 2	38.671 13	27/11/20 17	199	199
12 4	595 3	ZA03 6	Mark II	Embelday	16.3393 5	37.787 53	09/12/20 17	109	109
12 4	595 3	ZA04 0	Mark II	Shindwa	15.6152 8	38.713 35	18/12/20 17	360	354
12 5	595 4	ZA01 3	Mark II	Haddishadi 1	15.6493 7	38.576 20	11/11/20 17	729	360

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12 5	595 4	ZA01 8	Mark II	Tuumkofa	15.6277 3	38.624 45	17/11/20 17	322	322
12 5	595 4	ZA02 4	Mark II	Iratahtai 2	15.6922	38.734 72	22/11/20 17	144	144
12 5	595 4	ZA02 5	Mark III	Hashishay 1	15.7861 2	38.142 42	24/11/20 17	259	259
12 5	595 4	ZA02 8	Mark II	Gherbet	15.8353 1	38.742 89	27/11/20 17	370	370
12 5	595 4	ZA03 2	Mark II	Golagul	15.5788 1	38.794 42	05/12/20 17	451	400
12 5	595 4	ZA03 4	Mark II	Hawish	16.1993 7	38.067 88	08/12/20 17	362	362
12 6	595 5	ZA00 8	Mark II	Adkom	15.7530 6	38.646 42	08/11/20 17	334	334
12 6	595 5	ZA01 1	Mark II	Habrenkeka	15.6480 8	38.709 81	09/11/20 17	110	110
12 6	595 5	ZA01 4	Mark II	Haddishadi 2	15.6499 2	38.623 21	13/11/20 17	618	360
12 6	595 5	ZA01 6	Mark II	Hamrehama reb 2	15.6240 1	38.622 31	17/11/20 17	1339	400
12 6	595 5	ZA02 2	Mark II	Wasdamba 2	15.6661 5	38.577 17	21/11/20 17	248	248
12 6	595 5	ZA02 3	Mark II	Iratahtai 1	15.6923 1	38.735 12	22/11/20 17	149	149
12 6	595 5	ZA02 6	Mark II	Hashishay 2	15.7860 1	38.135 48	24/11/20 17	288	288
12 9	604 1	ZA04 4	Mark II	Kerecha	15.6956 5	38.708 27	17/02/20 20	1400	400
12 9	604 1	ZA04 5	Mark II	Derkunoq	15.6742 2	38.471 46	19/02/20 20	486	400
12 9	604 1	ZA04 6	Mark II	Libena	15.8816	38.369 62	20/02/20 20	248	248

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12 9	604 1	ZA04 7	Mark II	Shirarwa	15.8631	38.378 06	20/02/20 20	1968	400
12 9	604 1	ZA04 8	Mark II	Habena	15.8259	38.753 15	25/02/20 20	713	400
12 9	604 1	ZA04 9	Mark II	Bosa-Begu	15.7287 8	38.464 33	26/02/20 20	229	229
12 9	604 1	ZA05 0	Mark III	Ferhen	15.8018 8	38.561 08	26/02/20 20	434	354
12 9	604 1	ZA05 3	Mark II	Enchinaq	15.7332 4	38.326 82	28/02/20 20	696	400
12 9	604 1	ZA05 9	Mark II	Jengenait	15.9387 7	38.279 81	05/03/20 20	613	400
12 9	604 1	ZA06 4	Mark II	Yigar	15.7326 4	38.607 12	11/03/20 20	1444	400
12 9	604 1	ZA06 5	Mark II	Jufa	15.7523 7	38.468 88	14/03/20 20	185	185
12 9	604 1	ZA06 6	Mark II	Abdura	15.8613 4	38.384 72	16/03/20 20	312	312
12 9	604 1	ZA06 7	Mark II	Caedakirak	15.8613 3	38.384 85	17/03/20 20	272	272
13 0	604 2	ZA04 3	Mark II	Habrenkeka	15.6488 7	38.711 66	17/02/20 20	126	126
13 0	604 2	ZA05 1	Mark II	Dobiat	15.7067 7	38.324 15	27/02/20 20	304	304
13 0	604 2	ZA05 2	Mark II	Adialemin	15.7292 5	38.464 41	27/02/20 20	341	341
13 0	604 2	ZA05 4	Mark II	Hawatsi	16.1394 1	38.135 91	01/03/20 20	357	357
13 0	604 2	ZA05 5	Mark II	Embelday	16.3504 4	37.967 32	01/03/20 20	118	118
13 0	604 2	ZA05 6	Mark III	Forto	15.7523 7	38.468 88	03/03/20 20	334	334
13 0	604 2	ZA05 7	Mark II	Kertset	16.1273	38.223 51	03/03/20 20	2297	400
13 0	604 2	ZA05 8	Mark II	Gebeyalebu	15.9463	38.217 62	05/03/20 20	1405	370
13 0	604 2	ZA06 0	Mark II	Gerbet	16.0040 2	38.258 26	05/03/20 20	1270	400
13 0	604 2	ZA06 1	Mark II	Hilet	16.0143 3	38.219 15	05/03/20 20	1500	400
13 0	604 2	ZA06 2	Mark II	Gam	15.9110 61	38.496 87	09/03/20 20	1028	339
13 0	604 2	ZA06 3	Mark II	Bambi	15.7877 2	38.486 68	11/03/20 20	449	400

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ZA002

16.26033

38.40542



ZA003

16.17030

38.42163



ZA004

16.19030

38.41542



ZA005

15.80716

38.38365



ZA006

15.74029

38.66324



ZA007

15.73062

38.67674



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ZA008 <table> <tr> <td>15.75306</td><td>38.64642</td></tr> </table> 	15.75306	38.64642	ZA009 <table> <tr> <td>15.75284</td><td>38.66217</td></tr> </table> 	15.75284	38.66217
15.75306	38.64642				
15.75284	38.66217				
ZA010 <table> <tr> <td>15.68129</td><td>38.61430</td></tr> </table> 	15.68129	38.61430	ZA011 <table> <tr> <td>15.64808</td><td>38.70981</td></tr> </table> 	15.64808	38.70981
15.68129	38.61430				
15.64808	38.70981				
ZA012 <table> <tr> <td>15.67374</td><td>38.69865</td></tr> </table> 	15.67374	38.69865	ZA013 <table> <tr> <td>15.64937</td><td>38.57620</td></tr> </table> 	15.64937	38.57620
15.67374	38.69865				
15.64937	38.57620				
ZA014 <table> <tr> <td>15.64992</td><td>38.62321</td></tr> </table>	15.64992	38.62321	ZA015 <table> <tr> <td>15.62318</td><td>38.62206</td></tr> </table>	15.62318	38.62206
15.64992	38.62321				
15.62318	38.62206				

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ZA016

15.62401	38.62231
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ZA018

15.62773	38.62445
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ZA019

15.628	38.65469
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ZA020

15.59462	38.64577
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ZA021

15.65963	38.57862
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ZA022

15.66615	38.57717
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ZA023

15.69231	38.73512
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ZA024

15.6922	38.73472
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ZA025

15.78612	38.14242
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ZA026

15.78601	38.13548
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ZA027

15.77427	38.68305
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ZA028

15.83531	38.74289
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ZA029

15.86812	38.67113
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ZA030

15.58268	38.77090
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ZA031

15.71860	38.31357
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ZA032

15.57881	38.79442
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ZA033

16.15725	38.07292
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ZA034

16.19937	38.06788
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ZA035

16.14950	38.05349
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ZA036

16.33935	37.78753
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ZA037

16.17624	37.95590
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ZA038

15.81800	38.86359
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ZA039

15.81786	38.86357
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ZA040

15.61528	38.71335
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ZA041

16.15750	38.07294
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ZA042

15.75369	38.48991
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ZA043

15.64887	38.71166
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ZA044

15.69565	38.70827
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ZA045

15.67422	38.47146
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ZA046

15.8816	38.36962
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ZA048

15.8259	38.75315
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ZA050

15.80188	38.56108
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ZA047

15.8631	38.37806
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ZA049

15.72878	38.46433
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ZA051

15.70677	38.32415
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ZA052

15.72925	38.46441
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ZA053

15.73324	38.32682
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ZA054

16.13941	38.13591
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ZA055

16.35044	37.96732
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ZA056

15.88159	38.36962
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ZA057

16.1273	38.22351
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ZA058

15.9463	38.21762
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ZA059

15.93877	38.27981
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ZA060

16.00402	38.25826
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ZA061

16.01433	38.21915
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ZA062

15.911061	38.49687
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ZA063

15.78772	38.48668
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ZA064

15.73264	38.60712
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ZA065

15.75237	38.46888
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ZA066

15.86134	38.38472
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ZA067

15.86133	38.38485
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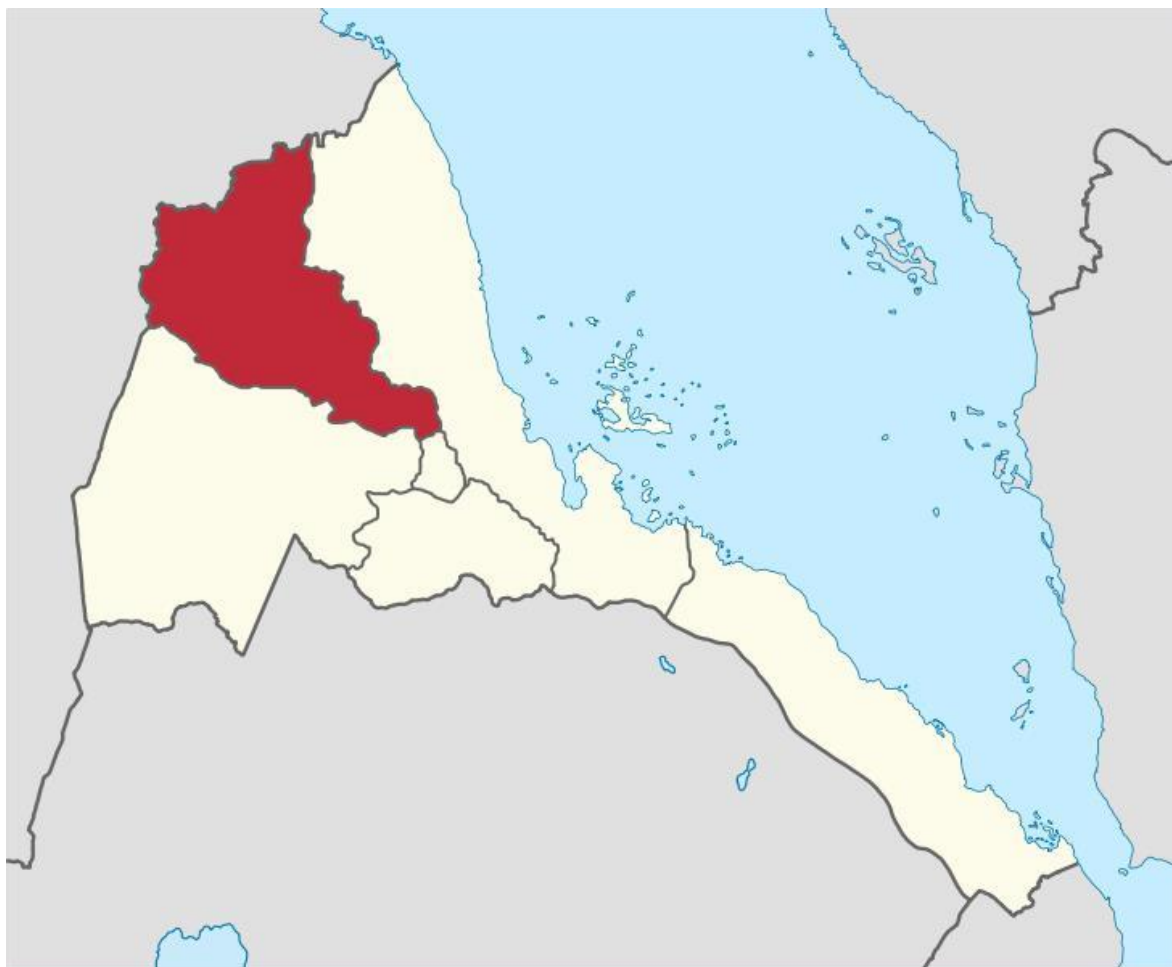
The date of rehabilitation was confirmed by a Repair Confirmation Form which was signed by the mechanic carrying out the repair along with a village administrator from the local community. The date of rehabilitation was used as the start date of operation and crediting for each borehole; we have conservatively assumed that the first day of crediting is not counted.

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The number of days each borehole credited for in this monitoring period was multiplied by the number of end users using the borehole to give the total number of project technology days for that borehole. The individual project technology days for each borehole were totaled to give the total number of project technology days for this monitoring period.

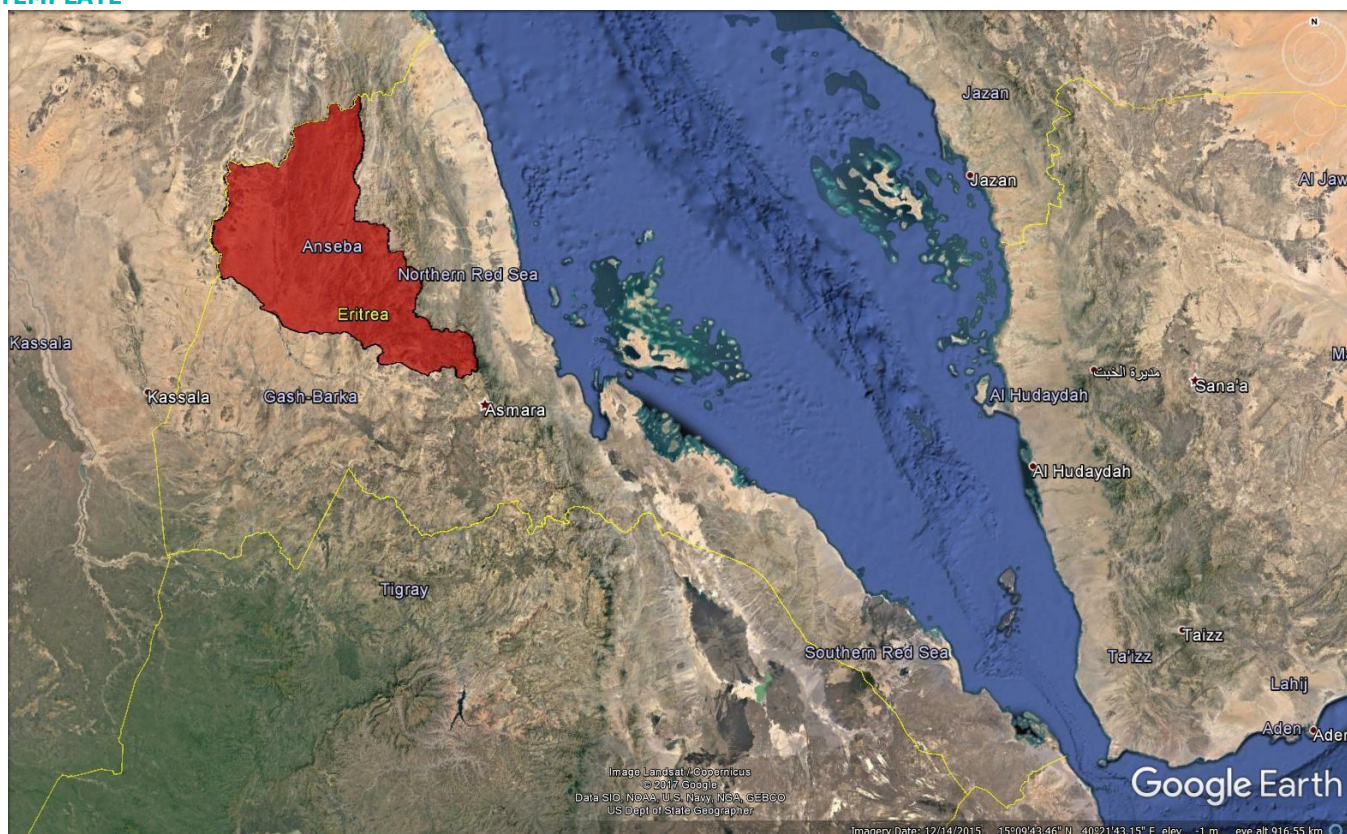
A.2. Location of project

>> Below is the geographic reference to allow unique identification of the project boundary for the project. The district Zoba Anseba, Eritrea is marked in red on the Google Earth images. 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.

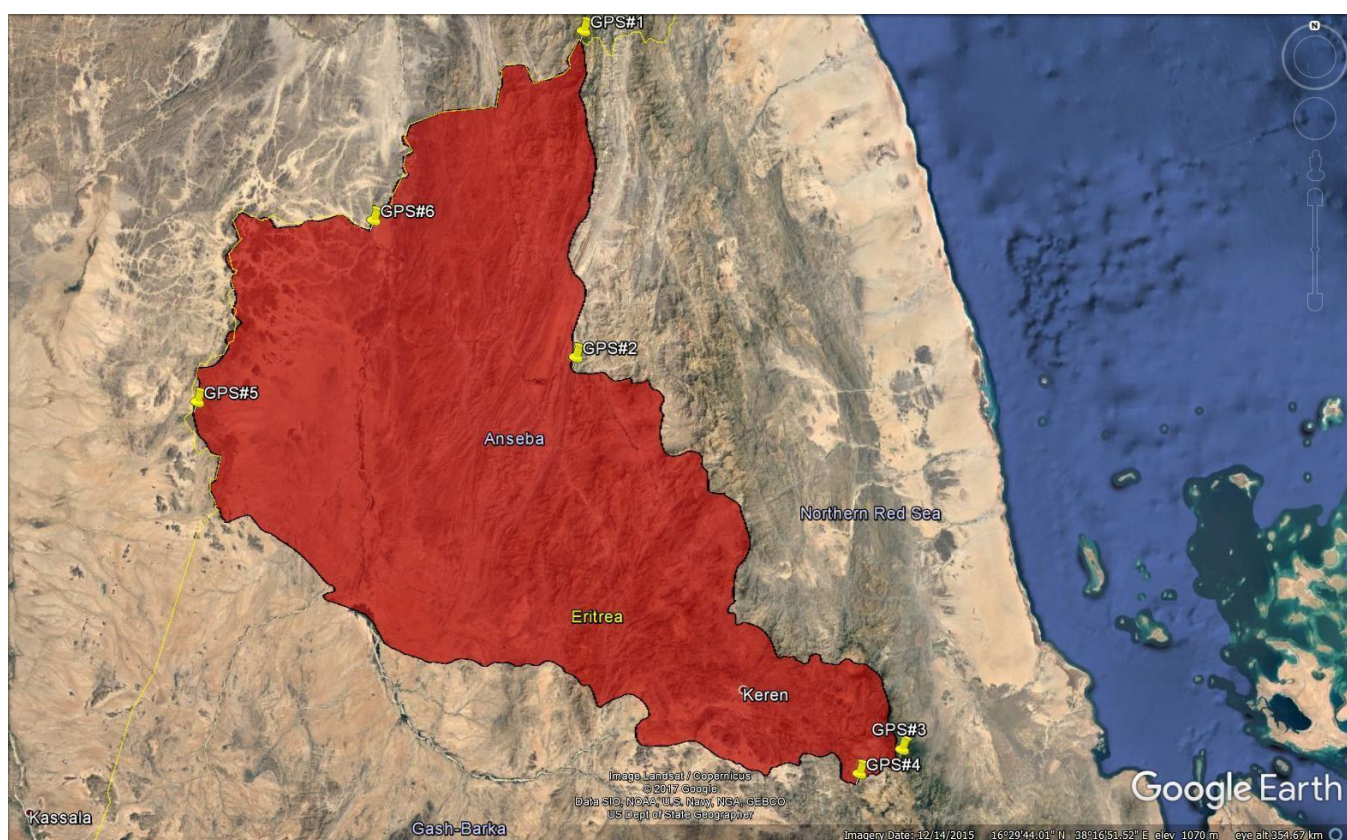


Map 1 showing in red the district of Zoba Anseba, Eritrea.

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Map 2 showing in red the district of Zoba Anseba, Eritrea



Map 3 showing in red the district of Zoba Anseba, Eritrea and the GPS coordinates of the project boundary.

Project Area Coordinates

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	Latitude	Longitude
GPS1	17°33'14.79"N	38° 0'28.27"E
GPS2	16°39'54.06"N	37°58'31.30"E
GPS3	15°35'2.36"N	38°53'15.55"E
GPS4	15°31'10.73"N	38°45'57.03"E
GPS5	16°33'6.39"N	36°53'18.85"E
GPS6	17° 2'46.75"N	37°23'56.05"E

A.3. Reference of applied methodology

>> This project utilises the Gold Standard Methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption V.01'.

A.4. Crediting period of project

>> The date of rehabilitation was used as the start date of operation. It was conservatively assumed that the first day of crediting is not counted and the crediting period begins the following day after the borehole is rehabilitated. The length of the crediting period is to be 7 years, twice renewable totaling 21 years as per the approved PDD.

Please find the start dates for the projects below (crediting period begins the following day):

Project ID	Start Date	Crediting period start date	Crediting period end date
5951	02/11/2017	03/11/2017	02/11/2024
5952	04/11/2017	05/11/2017	04/11/2024
5953	03/11/2017	04/11/2017	03/11/2024
5954	11/11/2017	12/11/2017	11/11/2024
5955	08/11/2017	09/11/2017	08/11/2024

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6041	17/02/2020	18/02/2020	17/02/2027
6042	17/02/2020	18/02/2020	17/02/2027

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

Vita has rehabilitated 66 Mark II boreholes as part of these projects. With the exception of borehole ZA017, which has been removed from this monitoring period, all boreholes under the VPAs are in good working order. The implementation of the project is in line with the approved PDD and all boreholes are fully operational as per design to ensure water demand is met for end users. For boreholes that went through technical problems and that were not functional during this entire monitoring period, the non-functional days have been discounted from the ERs. The table below summarises the maintenance and breakdown details for when the boreholes were not operational in this monitoring period.

GS ID	VPA	BH ID	Breakdown Start Date	Breakdown End Date	Days	Description
GS5951	122	ZA039	27/02/2023	02/03/2023	4	Pipe and Chain were replaced
GS5955	126	ZA011	19/02/2023	21/02/2023	3	Chain and Rod were damaged
GS6041	129	ZA046	22/01/2023	25/01/2023	4	Pipes, chain and rod were damaged
GS6041	129	ZA049	11/02/2023	14/02/2023	4	Cylinder and Bearing house were damaged
GS5953	124	ZA004	03/09/2023	05/09/2023	3	Chain and rubber were damaged
GS6041	129	ZA059	29/07/2023	31/07/2023	3	Rod was broken
GS6042	130	ZA043	21/07/2023	23/07/2023	3	Head and rod were broken
GS5954	125	ZA032	22/11/2023	25/11/2023	4	Chain and rod broken
GS6041	129	ZA046	19/11/2023	21/11/2023	3	Rod was broken and replaced
GS6041	129	ZA067	17/05/2023	19/05/2023	3	Chain and rod were broken

All boreholes undergo annual water quality testing to ensure the water is safe for human consumption as WHO drinking water standards. The water quality is approved by the Ministry of Land, Water and Environment in Zoba Anseba. Monitoring surveys are conducted in compliance with the latest available sampling and monitoring guidelines, according to TPDDTEC v1 methodology.

Requirements within TPDDTEC v1 methodology for monitoring surveys are as follows:

Relevant Section	Requirement(s)	Compliance
3.1.C	Monitoring surveys are completed annually, beginning 1 year after project registration	Monitoring Surveys have been completed annually, beginning 1 year
after project registration in the first monitoring period.		
3.1.C – Monitoring Survey Representativeness	End users from a given project scenario are selected using representative sampling techniques to ensure adequate representation of users with technologies of different ages. Common sampling	A random sampling approach was used to select representative users for the monitoring surveys. Surveys are conducted through
approaches such as clustered use of a Random	random sampling are allowed and geographic distribution should be factored into selection criteria. End users can be surveyed at any time(s) throughout the year with care taken to collect	Sample Group (RSG) generated from all boreholes that are being cross-sampled during this monitoring period. The size of the sample group is

information pertaining to seasonal variations in technology and fuel use patterns.

selected so the number of boreholes samples satisfies 90/30 precision.

Using a sample size calculator, it was determined that a sample of 6 boreholes aged 3-4 years and 7 boreholes aged 5-6 years were required. The households are then randomly selected (through a random number generator process) from the RSG of boreholes to comply with minimum sample size requirements for each survey.

PP has uploaded an Excel document displaying the Random Sample Process. This document displays the locations identified for sampling. Screenshots of the age-wise sampling are below.

All monitoring surveys took place between 17/07/23 and 19/07/23, the specific date and location of each survey is included in the monitoring result spreadsheets submitted to GS.

3.1.C – Monitoring
Survey sample sizing and data collection

The monitoring survey is only conducted with end users representative of the project scenario and currently using the project technology.

The monitoring surveys include questions which determine if the respondent is representative of the project scenario. If not, then the respondent is not included in the survey results.

The minimum total sample size is 100, with at least 30 samples for project technologies of each age being credited.

The sample size for the monitoring period was 120, satisfying sample size requirements.

TEMPLATE-

For the WCFT, TPDDTEC v1 guidance on representativeness, sample sizing and variability from section II.4 is applicable:

Relevant Section	Requirement(s)	Compliance
2.7 – Representativeness	The [WCFT] must be designed to ensure monitoring is representative of typical technology and [water] use practices. Households must behave and consume [water] normally. [WCFTs] are always required so as to capture the potential use of the baseline technologies as backup, or potential introduction of an emitting backup technology introduced in parallel.	The WCFT survey introduction stresses the importance of normal household activity being maintained throughout the survey. The WCFT contains survey questions designed to capture any continued baseline practices, such as boiling water or collecting from unsafe sources.
2.7 – Sample Sizing and Statistical Estimate of the Fuel or Emission Savings	Sample sizes must be greater than 20. The 90/30 rule is to be complied with when sample sizes are large enough.	The sample size for the WCFT was 40 meaning the 90/30 rule was used.

TEMPLATE-

Annex 4	Applicable sections to WCFT within steps 1-8.	1. A random sampling method determined survey participants. 2. This survey was carried out between (15/08/2022 – 18/08/2022). This was an appropriate time of
		year where normal practices could be observed. 3. The WCFT survey introduction stresses the importance of normal household activity being maintained throughout the survey. 7. The WCFT results contain an outlier analysis

Furthermore, grievance expression process books placed at all boreholes have received only positive feedback and Vita field staff have not received any other feedback during this monitoring period from the borehole users on damage or breaking of boreholes therefore it can be assumed that the project is running as planned.

B.1.1 Forward Action Requests

>> NA

B.2. Post-Design Certification changes

>> NA

TEMPLATE-

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

Deviation request, Dev_242, was approved by GS on 13/06/2022, and allows PP to claim for up to 400 users per borehole.

B.2.3. Changes to start date of crediting period

N/A

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

NA

B.2.5. Changes to project design of approved project

>> NA

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

All surveys are administered by trained staff 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 by a minimum of two Eritrea Vita staff involved in typing up the monitoring data into excel and crosschecking the data. The excel data is then stored on a central server in an electronic format and sent to the UK head office for data analysis. The documentation procedure ensures a minimum chance of original data being lost – all original copies of our project documentation are retained in the Eritrean office and are available scanned upon request of the UK team. UK staff use scanned copies to check data input and quality control before submitting for verification.

In accordance with the Gold Standard methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, 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 and variance of the parameter being monitored to ensure the parameters measured satisfy 90/30 precision (90% confidence interval and 30% precision). The sample is reselected for every monitoring period to ensure the selection remains random.

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

Borehole database

TEMPLATE-

The borehole installation/rehabilitation record includes the following information:

- Date of installation/rehabilitation
- Quantity of boreholes installed
- The total number of end users obtaining their water from each borehole

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. Using this method, the total number of end users using each borehole has been determined 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 $Q_{p,y}$ and $Q_{p,rawboil,y}$) – Completed prior to first verification and then biennially after first verification.
- **Quality of the treated water** – The quality of the treated water will be assessed to ensure that it is fit for human consumption. 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. The Water Resource Department from the Ministry of Land, Water & Environment has certified each water supply as in line with national standards. The Eritrean standards are based on the WHO standards.
- **Usage Survey** – As all boreholes have been installed within 1 year of the start of the crediting period and are expected to last the lifetime of the project, minimum samples of 30 for different aged technologies will not be necessary. Therefore, the annual usage survey will be conducted using a minimum sample size of 100. The results from the usage survey are used to determine the proportion of beneficiaries that use the borehole which is factored into the emission reduction calculations.
- **Project Survey** – Conducted on 120 households, surveying end users currently using project technologies to explore changes in project scenario over time. Data collected during the project surveys explores the following characteristics:
 - General information – Name, address, telephone number etc.
 - Household socio-demographic information.
 - Water use and purification characteristics. - Sources and availability of fuel.

TEMPLATE-

- **Leakage Assessment** – The PDD has described which sources of leakage detailed within the methodology are relevant to this project and which have been discounted.

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

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

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. As solar purification devices are not used, 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.

TEMPLATE-

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. Therefore, a value of 0 is applied for leakage.

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.

Cross Sampling

The project proponent has elected to cross-sample technologies across all its homogenous borehole VPAs located within Zoba Anseba (GS 5951-55, 6041-42). The samples for the survey listed below are randomly selected from the borehole information databases using the RSG procedure in line with the minimum sample size requirements as defined by the methodology. Cross sampling will be applied to the following surveys;

- Project Surveys- Completed annually,
- Usage Surveys- Completed annually,
- Water Consumption Field Tests- Completed biennially

Hygiene Campaigns

Two hygiene campaigns were carried out in this monitoring period. One took place on 8th and 9th December 2022 with an attendance of 72 people, and another was carried out on 7th September 2023 with an attendance of 65 people. Over these two WASH trainings there were representatives from all project areas in attendance. The men and women who

TEMPLATE-

participated include community and water committee members who are selected from their respective communities to pass on the information to the wider community.

Topics covered in the WASH meetings include, Hygiene and sanitation, sanitation facilities, safe water chain, financial management, minor borehole maintenance, establishment and role of water committees, rules and regulations of WASH facilities).

The project survey asks questions about WASH practices and confirms that participants are implementing good WASH practices such as using covered containers for water storage and regular hand washing.

SECTION D. DATA AND PARAMETERS

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

Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 6.1.1 (Clean Water and Sanitation)
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.
Value(s) applied)	0.00%
Choice of data or measurement methods and procedures	The portion of safe water users is determined through the baseline project survey and refers to the number of users that already use safe water from water sources such as boreholes. Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions and SDG 6 impact.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
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

TEMPLATE-

Choice of data or measurement methods and procedures	Deemed valid by Methodology.
Purpose of data	Calculation of baseline emissions.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	EF _{p,co2}
Unit	tCO ₂ /TJ
Description	CO ₂ emission factor arising from use of wood fuel in project scenario
Source of data	Volume 2: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.5
Value(s) applied)	112
Choice of data or measurement methods and procedures	Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	EF _{p,non co2}
Unit	tCO _{2e} /TJ
Description	Non-CO ₂ (CH ₄ and N ₂ O) emission factor arising from use of wood fuel in baseline scenario

TEMPLATE-

Source of data	Default emissions factor: https://www.ipccnggip.iges.or.jp/public/gp/bgp/2_2_NonCO2_Stationary_Combustion.pdf 1. https://ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf 2. Global Warming Potential: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html#table-2-14																								
Value(s) applied)	9.46																								
Choice of data or measurement methods and procedures	Deemed valid by Methodology <table><tr><th>Gas</th><th>Default Emissions factor (kg_gas/TJ_{NCV})</th><th>GWP of gas</th><th>Default Emissions factor (kg_CO₂e/TJ_{NCV})</th><th>Default Emissions factor (t_CO₂e/TJ_{NCV})</th></tr><tr><td>CH₄</td><td>300</td><td>28</td><td>8400</td><td>8.4000</td></tr><tr><td>N₂O</td><td>4</td><td>265</td><td>1,060</td><td>1.060</td></tr><tr><td></td><td></td><td></td><td>Total</td><td>9.46</td></tr></table>					Gas	Default Emissions factor (kg_gas/TJ _{NCV})	GWP of gas	Default Emissions factor (kg_CO ₂ e/TJ _{NCV})	Default Emissions factor (t_CO ₂ e/TJ _{NCV})	CH ₄	300	28	8400	8.4000	N ₂ O	4	265	1,060	1.060				Total	9.46
Gas	Default Emissions factor (kg_gas/TJ _{NCV})	GWP of gas	Default Emissions factor (kg_CO ₂ e/TJ _{NCV})	Default Emissions factor (t_CO ₂ e/TJ _{NCV})																					
CH ₄	300	28	8400	8.4000																					
N ₂ O	4	265	1,060	1.060																					
			Total	9.46																					
Purpose of data	Calculation of emission reductions.																								
Additional comments	This value corresponds with updated AR5 GWP value. AR5 - https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf																								

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	NCV _b
Unit	TJ/ton
Description	Net calorific value of the wood fuel used in the baseline
Source of data	IPCC default Table 1.2: https://www.ipccnggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf IPCC Default emissions factor
Value(s) applied)	0.0156
Choice of data or measurement	Deemed valid by Methodology.

TEMPLATE-

methods and procedures	
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	NCV _p
Unit	TJ/ton
Description	Net calorific value of the wood fuel used in the project
Source of data	IPCC Default emissions factor: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value(s) applied)	0.0156
Choice of data or measurement methods and procedures	Deemed valid by Methodology.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
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 stated in following document: https://cdm.unfccc.int/Panels/ssc_wg/meetings/035/ssc_035_an20.pdf
Value(s) applied)	0.97
Choice of data or measurement methods and procedures	Default values of fraction of non-renewable biomass as outlined by the UNFCCC CDM.

TEMPLATE-

Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	$W_{b,y}$
Unit	T/litre
Description	Quantity of wood fuel that is used to treat 1 litre of water in the baseline scenario b during year y
Source of data	Baseline Water Boiling Test (Baseline Water Boiling Test_v1), BAMG report
Value(s) applied)	0.0004 (0.000577 original)
Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: <i>Technologies and Practices to Displace Decentralized Thermal Energy Consumption</i> Version 1, <i>Draft General Guidelines On Sampling And Surveys</i> ; EB37 Annex 27; and <i>Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities</i> (Version 02); EB65 Annex 2. The value applied was derived from the BWBT was 0.000577, as referenced in the PDD, but it has since been capped at 0.0004 in line with GS requirements of the BAMG report.
Purpose of data	Calculation of emission reductions and impact on SDG 3.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	$W_{p,y}$
Unit	T/litre
Description	Quantity of wood 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 (Baseline Water Boiling Test_v1), BAMG report
Value(s) applied)	0.0004 (0.000577 original)

TEMPLATE-

Choice of data or measurement methods and procedures	The baseline water boiling test is used to determine the amount of wood used to purify 1 litre of water by boiling. This data is gathered according to: <i>Technologies and Practices to Displace Decentralized Thermal Energy Consumption</i> Version 1, <i>Draft General Guidelines On Sampling And Surveys</i> ; EB37 Annex 27; and <i>Standard For Sampling And Surveys For CDM Project Activities and Programme of Activities</i> (Version 02); EB65 Annex 2. The value applied was derived from the WBT but has been capped at 0.0004 in line with GS requirements.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	Xboil Non Suppressed Demand
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 (Zoba Anseba Baseline Survey Final). Credible literature, studies, survey, reports, relevant to the project target area
Value(s) applied)	2%
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, however, in the event the project surveys show a substantial change in fuel use characteristics, a new baseline shall be conducted.
Purpose of data	Calculation of emission reductions.
Additional comments	-

Relevant SDG Indicator	SDG 5.4.1 (Gender Equality)
Data/parameter:	T _{b,y}
Unit	Hours

TEMPLATE-

Description	Baseline time spent collecting firewood per household per day
Source of data	Baseline survey (Zoba Anseba Baseline Survey Final)
Value(s) applied)	2.26
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 measure the % decrease in hours spent collecting firewood, a responsibility falling disproportionately on women, as an indicator of reduced time poverty of women. For SDG 5 target.
Additional comments	-

Relevant SDG Indicator	SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	Pb,y
Unit	Kg/person
Description	Quantity of fuel that is consumed in the baseline scenario b during year y (kg/person-day)
Source of data	Baseline Survey
Value(s) applied)	2.8
Choice of data or measurement methods and procedures	Baseline Water Boiling Test Result.
Purpose of data	Calculating quantity of fuel used in the baseline scenario.
Additional comments	-

D.2 Data and parameters monitored

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Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 6.1.1 (Clean Water and Sanitation)
Data/parameter:	$N_{p,y}$
Unit	Project Technology Days, 5 Minute Stroke Test
Description	Number of persons consuming water supplied by project scenario p through year y

TEMPLATE-

Measured/calculated/default	calculated
Source of data	Borehole Project Database (GS5951-55 6041-42_ERs_calcs_v3) (Sales_Record_Confidential_2023_v2)
Value(s) of monitored parameter	GS 5951: 869,649 (Downdays: 4 days, 0.12%) (uncapped 918,541) GS 5952: 757,302 (Downdays: 0 days, 0.00%) (uncapped 822,491) GS 5953: 707,717 (Downdays: 3 days, 0.09%) (uncapped 1,038,863) GS 5954: 768,745 (Downdays: 4 days, 0.16%) (uncapped 914,380) GS 5955: 655,011 (Downdays: 3 days, 0.12%) (uncapped 1,070,071) GS 6041: 1,525,700 (Downdays: 17 days, 0.36%) (uncapped 3,120,750) GS 6042: 1,348,511 (Downdays: 3 days, 0.07%) (uncapped 3,304,181)
Monitoring equipment	Project Database
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Sum of the total number of end users using each borehole in the project multiplied by the number of days crediting each borehole earns in a given monitoring period. A further reduction is applied through applying a cap of 400 users or less as per the 5 Minute Stroke Test. The non-functional days are discounted before calculating the number of crediting days and a functionality cap of 95% is applied for conservativeness.
QA/QC procedures:	If a borehole does not pass the water quality tests, the borehole is discounted from the project numbers. During this monitoring period there was no incident of this.
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 6.1.1 (Clean Water and Sanitation), SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	$U_{p,y}$
Unit	Percentage
Description	Usage rate in project scenario p through year y
Measured/calculated/default	calculated

TEMPLATE-

Source of data	Usage Survey (Anseba_US_23_v1)
Value(s) of monitored parameter	95.00% (100% usage rate as per the Usage Survey, however, a self-imposed cap of 95% is applied for conservativeness)
Monitoring equipment	Usage Survey
Measuring/reading/recording frequency:	Annual (conducted 17/07/2023 – 19/07/2023)
Calculation method (if applicable):	The usage survey has been carried out by trained local staff to meet the specific requirements of the methodology. The training took place on 15/07/2023. Details can be seen in pdf 'Anseba Staff Training 2023'.
QA/QC procedures:	All data presented in excel is subject to checking and cross referencing of a sample of the raw data by CO2balance UK Ltd.
Purpose of data:	Calculation of usage.
Additional comments:	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	$Q_{p,y}$
Unit	Litres per person 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) (WCFT_Anseba_BHs_22_Final)
Value(s) of monitored parameter	7.09
Monitoring equipment	WCFT Survey
Measuring/reading/recording frequency:	Biennial (last conducted 15/08/2022 – 18/08/2022)
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. Volume would be capped at a maximum of 7.5 litres per person per day as per the methodology, however, a cap was not needed as the value is below this number. The WCFT was carried out by trained local staff to meet the specific requirements of the methodology.

TEMPLATE-

QA/QC procedures:	All data presented in excel is subject to checking and cross referencing of a sample of the raw data by CO2balance UK Ltd.
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action), SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	$Q_{p, \text{cleanboil}, y}$
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	Water Consumption Field Test (WCFT) (WCFT_Anseba_BHs_22_Final)
Value(s) of monitored parameter	0
Monitoring equipment	WCFT Survey
Measuring/reading/recording frequency:	Biennial (last conducted 15/08/2022 – 18/08/2022)
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 trained local staff to meet the specific requirements of the methodology.
QA/QC procedures:	All data presented in excel is subject to checking and cross referencing of a sample of the raw data by CO2balance UK Ltd.
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	$Q_{p, \text{rawboil}, y}$
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

TEMPLATE-

Source of data	Water Consumption Field Test (WCFT) (WCFT_Anseba_BHs_22_Final)
Value(s) of monitored parameter	0
Monitoring equipment	WCFT Survey
Measuring/reading/recording frequency:	Biennial (last conducted 15/08/2022 – 18/08/2022)
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 trained local staff to meet the specific requirements of the methodology.
QA/QC procedures:	All data presented in excel is subject to checking and cross referencing of a sample of the raw data by CO2balance UK Ltd.
Purpose of data:	Calculation of emission reductions.
Additional comments:	-

Relevant SDG Indicator	SDG 6.1.1 (Clean Water and Sanitation)
Data/parameter:	Quality of Treated Water
Unit	Parameters as per national standards
Description	Performance of the treatment technology
Measured/calculated/default	Measured
Source of data	Laboratory Tests (ZA_WQT_ 2023_checked)
Value(s) of monitored parameter	All boreholes were tested with a 100% Pass rate. Date of final report is 18/07/2023.
Monitoring equipment	Laboratory equipment
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	The Water Resource Department from the Ministry of Land, Water & Environment has certified each water supply as in line with national standards.
QA/QC procedures:	The tests results are approved by the Water Resource Department from the Ministry of Land, Water & Environment . The results are checked against the national standards. (Water quality Standards - Eritrea 2004)
Purpose of data:	To test water quality for safety of human consumption.
Additional comments:	-

TEMPLATE-

Relevant SDG Indicator	SDG 13.B.1 (Climate Action)
Data/parameter:	LE _{p,y}
Unit	tCO ₂ e per year
Description	Leakage in project scenario p during year y
Measured/calculated/default	0
Source of data	Baseline and Monitoring surveys
Value(s) of monitored parameter	0
Monitoring equipment	Desk based research
Measuring/reading/recording frequency:	Biennial
Calculation method (if applicable):	Assessed every two years using baseline and monitoring surveys.
QA/QC procedures:	N/A
Purpose of data:	Calculation of leakage.
Additional comments:	-

Relevant SDG Indicator	SDG 5.4.1 (Gender Equality)
Data/parameter:	T _{p,y}
Unit	hours
Description	Project time spent collecting firewood per household per day (hours)
Measured/calculated/default	Measured
Source of data	Project Survey (Anseba_PS_23_v1)
Value(s) of monitored parameter	1.79
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Annual (conducted 17/07/2023 – 19/07/2023)
Calculation method (if applicable):	Assessed every year using Project Survey
QA/QC procedures:	N/A
Purpose of data:	Calculation of SDG 5.
Additional comments:	-

Relevant SDG Indicator	SDG 5.4.1 (Gender Equality)
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TEMPLATE-

Data/parameter:	TR _y
Unit	hours
Description	Total reduction in time spent collecting firewood per day for project activity in year y (hours)
Measured/calculated/default	Calculated
Source of data	Project Survey (Anseba_PS_23_v1) and baseline survey (Zoba Anseba Baseline Survey Final)
Value(s) of monitored parameter	0.47
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Assessed every year using Project Survey. Calculate the average amount of time spent collecting firewood in the project scenario and compare to the preproject scenario
QA/QC procedures:	N/A
Purpose of data:	To quantify whether the project has contributed to a reduction in the amount of time spent collecting firewood compared to the pre-project scenario towards SDG 5 target.
Additional comments:	-

Relevant SDG Indicator	SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	HAPR _y
Unit	percentage
Description	Total reduction in Household Air Pollution for project activity in year y (%)
Measured/calculated/default	Calculated
Source of data	Project Survey (Anseba_PS_23_v1) and baseline survey (Zoba Anseba Baseline Survey Final)
Value(s) of monitored parameter	95.00%
Monitoring equipment	Project Survey
Measuring/reading/recording frequency:	Annual

TEMPLATE-

Calculation method (if applicable):	Review the number of end users using the borehole according to the household lists for each VPA and multiply by the usage rate to calculate the number of end users now using a safe water source in order to calculate the amount of biomass that would have been burnt to purify the water in the baseline scenario. Deduct from this any individuals that still boil water in the project scenario.
QA/QC procedures:	The user lists are obtained through the local administration and transferred to an excel by the partner. These are then checked by CO2balance UK Ltd, and any households further than 1km away from the boreholes are removed. Duplicate checks are also run, and duplicate households are removed.
Purpose of data:	To calculate the additional number of persons who have access to safe water in the project activity compared to the baseline scenario and to calculate from that the percentage decrease in biomass used to purify water through boiling for SDG 3 target.
Additional comments:	-

Relevant SDG Indicator	SDG 3.9.1 (Good Health and Well-Being)
Data/parameter:	Pp,y
Unit	Kg/person
Description	Quantity of fuel that is consumed in the project scenario p during year y (kg/person-day)
Measured/calculated/default	Calculated
Source of data	Baseline (Baseline Water Boiling Test_v1) and Project Survey (Anseba_PS_23_v1)
Value(s) of monitored parameter	0
Monitoring equipment	Baseline Water Boiling Test, Project Survey
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Assessed every year using usage survey determining the number of people boiling water in the project scenario.
QA/QC procedures:	N/A
Purpose of data:	Calculation of SDG 3
Additional comments:	Monitoring date was 17/07/2023 - 19/07/2023.

TEMPLATE-

Relevant SDG Indicator	SDG 6.1.1 (Clean Water and Sanitation)
Data/parameter:	P _{access}
Unit	Number of people
Description	Number of additional persons having access to safe water in the project activity compared to the baseline scenario
Measured/calculated/default	Calculated
Source of data	Project Survey (Anseba_PS_23_v1), and usage survey (Anseba_US_23_v1), Household list (Sales record), (Sales_Record_Confidential_2023_v1), and 5 Minute Stroke Test
Value(s) of monitored parameter	GS 5951: 2,382 GS 5952: 2,074 GS 5953: 1,938 GS 5954: 2,106 GS 5955: 1,794 GS 6041: 4,180 GS 6042: 3,694
Monitoring equipment	Project Survey, Usage Survey and Household list (Sales record)
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Assessed every year using Project Survey, Usage Survey and Household list. Review the number of end users using the borehole according to the household lists for each VPA and multiply by the usage rate to calculate the number of end users now using a safe water source. The usage rate in this monitoring period was 100% but has been capped at 95%.
QA/QC procedures:	The user lists are obtained through the local administration and transferred to an excel by the partner. These are then checked by CO2balance UK Ltd, and any households further than 1km away from the boreholes are removed. Duplicate checks are also run, and duplicate households are removed.
Purpose of data:	To calculate the additional number of persons having access to safe water in the project activity compared to the baseline scenario for SDG 6 target.
Additional comments:	-

Relevant SDG Indicator	SDG 6.1.1 (Clean Water and Sanitation)
Data/parameter:	P,y

TEMPLATE-

Unit	Number of people
Description	Number of persons having access to safe water in the project activity
Measured/calculated/default	Measured
Source of data	Usage Survey (Anseba_US_23_v1) and Household List (Sales record) (Sales_Record_Confidential_2023_v1), 5 Minute Stroke Test
Value(s) of monitored parameter	GS 5951: 2,508 GS 5952: 2,184 GS 5953: 2,041 GS 5954: 2,217 GS 5955: 1,889 GS 6041: 4,400 GS 6042: 3,889
Monitoring equipment	Usage Survey and Household list (Sales record)
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Assessed every year using Project Survey, Usage Survey and Household list (Sales record)
QA/QC procedures:	The user lists are obtained through the local administration and transferred to an excel by the partner. These are then checked by CO2balance UK Ltd, and any households further than 1km away from the boreholes are removed. Duplicate checks are also run, and duplicate households are removed.
Purpose of data:	Calculation of SDG 6 and SDG 13
Additional comments:	-

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

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
N _{p,y}	GS5951: 869,649 GS5952: 757,302 GS5953: 707,717 GS5954: 768,745 GS5955: 655,011 GS6041: 1,525,700 GS6042: 1,348,511	GS5951: 876,584 GS5952: 700,782 GS5953: 654,317 GS5954: 659,865 GS5955: 587,741 GS6041: 1,260,090 GS6042: 1,124,857
U _{p,y}	95.00%	95.00%
Q _{p,y}	7.09L	7.09L

TEMPLATE-

$Q_{p, \text{cleanboil}, y}$	0	0
$Q_{p, \text{rawboil}, y}$	0	0
Quality of Treated Water	Pass	Pass
$LE_{p, y}$	0	0
$T_{p, y}$	1.79h	1.65h
$TR_{p, y}$	0.47h	0.61h
$HAPR_{p, y}$	95.00%	95.00%
$P_{p, y}$	0	0
P_{access}	GS 5951: 2,382	GS 5951: 2,402
	GS 5952: 2,074	GS 5952: 1,920
	GS 5953: 1,938	GS 5953: 1,793
	GS 5954: 2,106	GS 5954: 1,808
	GS 5955: 1,794	GS 5955: 1,610
	GS 6041: 4,180	GS 6041: 3,452
	GS 6042: 3,694	GS 6042: 3,082
$P_{p, y}$	GS5951: 2,508	GS5951: 2,528
	GS5952: 2,184	GS5952: 2,021
	GS5953: 2,041	GS5953: 1,887
	GS5954: 2,217	GS5954: 1,903
	GS5955: 1,889	GS5955: 1,695
	GS6041: 4,400	GS6041: 3,634
	GS6042: 3,889	GS6042: 3,244

D.4. Implementation of sampling plan

For the surveys, households were selected at random from the household lists. First, the hand pumps were randomly selected for monitoring; secondly, households served by those hand pumps were randomly selected for surveying. See excel file 'RS_AM_2023' for screenshots of the process.

Sample sizes are chosen to meet the minimum requirements set in the methodology requirements. As per usage survey requirements, the random sample contains a minimum of 30 samples for each age group of the technology and there are a minimum of 100 samples in total.

WATER CONSUMPTION FIELD TEST

The Water Consumption Field Test is carried out every two years. The last Water Consumption Field Test was conducted in the previous Monitoring Period in August 2022.

Please see the excel 'WCFT_Anseba_BHs_22_Final', sheet 'Borehole H2O Results Sheet'.

The Water Consumption Field Test was carried out on a randomly selected sample of 40 households from the borehole user list. This complied with the recommended minimum sample size of 30 in the Gold Standard requirements. Furthermore, the sample confidence interval is within 10% of the mean. The test over a period of four days (1 day preparation and 3 days measurement) following a similar method as the Kitchen Performance Test, and all tests were conducted between 15/08/2022 – 18/08/2022. The total litres of water consumed each day was measured and divided by the number of end users consuming water in that day – this measurement was repeated over 3 consecutive days and an overall average per household was calculated. The results showed that on average 7.09 litres of non-boiled clean water used only for drinking, hand washing and food preparation and 0 litres of boiled clean water is consumed per person per day. The total amount of water credited for in this monitoring period is equal to the average amount of clean non-boiled water consumed per person per day (7.09l), minus the average amount of boiled clean water consumed per person per day (0).

USAGE SURVEY

The usage survey establishes the proportion of beneficiaries that use the boreholes, a key parameter in the emission reduction calculations. Age-wise sampling was used to meet the methodological requirements of a minimum of 30 samples for each age group of technologies included within these VPAs. 45 households using 3-4 year aged technologies and 75 households using 5-6 year old technologies were randomly selected. Therefore, the annual usage survey has been conducted using a minimum sample size of 120. Please see excel (Anseba_US_23_v1), and 'Analysis sheet'.

The usage surveys in this monitoring period were carried out by field staff between 17/07/2023 – 19/07/2023. The households that participated in the survey were randomly selected from the borehole user lists. The results confirmed that the Usage Rate is 95.00%, and it's calculated as an average between the Dry and Wet season.

PROJECT SURVEY ANALYSIS

Project surveys were conducted 17/07/2023 – 19/07/2023 on 120 randomly selected households from across the homogenous VPAs in Zoba Anseba to explore changes in the project scenario (demographics, water use and purification practices etc) over time. Please see 'Anseba_PS_v1'

Data collected during the project surveys includes the following:

- General information - Name, address, telephone number etc.
- Household socio-demographic information.
- Water use and purification characteristics.
- Sources and availability of fuel.

5 MINUTE STROKE TEST

As per the deviation request, Dev_242, approved on 13/06/2022, PP introduced a 5 Minute Stroke Test for this monitoring period. The test and method were created by UPGro Hidden Crisis Research Project and approved by GS. The Deviation request and field methodology have been included with the verification documents.

The test requires four people for the different roles. One person is responsible for ensuring a steady pump rate of 40 strokes per minute, one is responsible for counting the number of strokes using a tally counter, one is ready to change the buckets collecting water, and one is responsible for recording the results and keeping time.

A metronome placed at the top of the pump head ensures a steady pump rate of 40 strokes per minute. The pump handle is then pumped at 40 strokes per minute and the observer counts the number of strokes before water is released. Once the flow is consistent and continuous two stop watches are started simultaneously. With a constant pump rate of 40 strokes per minute, using full length strokes, water is collected into empty buckets and when the volume reaches 10 litres the time is recorded. For the last 5 seconds of each minute, a countdown is begun and the person responsible for counting the number of strokes says what the count is. This is recorded. The test continues for 5 minutes with a consistent stroke rate.

The key indicators used to determine if 400 users can use the borehole are:

- A minimum of 50 litres of water is collected in the five-minute duration of the test.
- A flow rate of 10 litres per minute or more is achieved throughout the whole five minutes of the test.

If these indicators are met then it satisfies the requirements of obtaining 600 litres per hour, allowing a cap of 400 users per borehole to be applied.

As per the Deviation request and using CDM sampling, the test is required to be conducted for each season. This test was done during the rainy season on the dates 20/09/2023 – 22/09/2023, and during the dry season on the dates 01/03/2023-07/03/2023. The total sample size was 50, with 15 in the rainy season and 35 in the dry season. There were no outliers in the results.

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	Average				
	L/day	L/hour	L/ 5 mins	Flow rate L/min	Users
Rainy Season	6123.9	765.5	63.8	12.8	408.3
Dry Season	5917.5	739.7	61.6	12.3	394.5
Both seasons	6020.7	752.6	62.7	12.6	401.4

The results showed an average of 63.8 litres of water is collected per five minutes for the rainy season and an average of 61.6 litres per five minutes for the dry season. This satisfies the key indicator that a minimum of 50 litres of water is collected during the five-minute duration of the test. All test results showed more than 50 litres of water collected per 5 minutes.

The second key indicator requires a flow rate of a minimum of 10 litres per minute throughout the test. Results show that this requirement has been met with an average flow rate of 12.8 litres per minute for the rainy season and an average of 12.3 litres per minute for the dry season. These results therefore satisfy the requirements of obtaining 600 litres per hour, and a cap of 400 users per borehole has been applied. Where appropriate a lower cap has been applied.

As per Deviation request, a self-imposed minimum cap of 15 L/pp/day monitored total water consumption has been applied for conservativeness, well above the value of 7.09 L/pp/day obtained from the WCFT. To calculate the litres per day from the results, it was assumed that the borehole would be in use for 8 hours per day.

SECTION E. CALCULATION OF SDG IMPACTS

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

Details of equations used to estimate baseline values for SDG outcomes appear below. Calculation is provided in the corresponding Emission Reductions calculations in the 'SDG Calculations' Sheet.

Outcomes for SDG 3 (Good Health and Wellbeing):

Providing access to safe water and removing the need to boil, reduces the amount of non-renewable biomass burned. Therefore, the amount of safe water provided can be taken as a proxy indicator of how these VPAs contribute towards the SDG 3 target of substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

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The quantity of biomass used in the baseline is calculated as follows:

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

$$2.8 = 0.4 * 7.09$$

Where:

$P_{b,y}$ Quantity of fuel that is consumed in the baseline scenario b during year y (kg/person-day)

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

$Q_{p,y}$ Quantity of safe water supplied in the project scenario p during year y, using the “zero or low” emissions’ clean water supply technology. Please see Excel file WCFT_Anseba_BHs_22_V3 (Borehole H2O Results Sheet).

Outcome for SDG 5 (Gender Equality):

The average time spent gathering firewood ($T_{b,y}$) per household in hours will be taken as a proxy contribution towards the SDG target. The baseline parameter for time spent collecting firewood per household per day is monitored in the baseline project survey.

$$T_{b,y} = 2.26 \text{ (Baseline survey) (Zoba Anseba Baseline Survey Final)}$$

Outcomes for SDG 6 (Clean Water and Sanitation):

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario. The baseline parameter for this SDG includes C_j which is the portion of users of the project technology j who in the baseline were already consuming safe water without boiling it (expressed as a percentage).

$$C_j = 0 \text{ (Baseline survey)}$$

Outcomes for 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 emission reduction calculations. The baseline indicators are detailed in Section D.1 and are as follows:

Baseline Emissions:

$$BE_{b,y} = B_{b,y} * ((fNRB_y * EF_{b,fuel,co2}) + EF_{b,fuel,nonco2}) * NCV_{b,fuel}$$

$$GS5951: 4,543 = 2,466 * ((0.97 * 112) + 9.46) * 0.0156$$

$$GS5952: 3,955 = 2,147 * ((0.97 * 112) + 9.46) * 0.0156$$

$$GS5953: 3,697 = 2,007 * ((0.97 * 112) + 9.46) * 0.0156$$

$$GS5954: 4,016 = 2,180 * ((0.97 * 112) + 9.46) * 0.0156$$

$$GS5955: 3,421 = 1,857 * ((0.97 * 112) + 9.46) * 0.0156$$

$$GS6401: 7,970 = 4,326 * ((0.97 * 112) + 9.46) * 0.0156$$

$$GS6402: 7,045 = 3,824 * ((0.97 * 112) + 9.46) * 0.0156$$

Where:

$$B_{b,y} = (1 - C_j) * N_{j,y} * W_{b,y} * (Q_{p,y} + Q_{p,rawboil,y})$$

$$GS5951: 2,466 = (1 - 0) * 869,649 * 0.0004 * (7.09 + 0)$$

$$GS5952: 2,147 = (1 - 0) * 757,302 * 0.0004 * (7.09 + 0)$$

$$GS5953: 2,007 = (1 - 0) * 707,717 * 0.0004 * (7.09 + 0)$$

$$GS5954: 2,180 = (1 - 0) * 768,745 * 0.0004 * (7.09 + 0)$$

$$GS5955: 1,857 = (1 - 0) * 655,011 * 0.0004 * (7.09 + 0)$$

$$GS6401: 4,326 = (1 - 0) * 1,525,700 * 0.0004 * (7.09 + 0)$$

$$GS6402: 3,824 = (1 - 0) * 1,348,511 * 0.0004 * (7.09 + 0)$$

Where:

$N_{j,y}$ Number of person days consuming water supplied by project scenario p through year y. Please see Excel GS5951-55 6041-42_ERs_calcs_v4

TEMPLATE-

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. See Excel Zoba Anseba Baseline Survey Final.
$B_{b,y}$	Quantity of fuel consumed in baseline scenario b during the year y in tons. Please see Excel GS5951-55 6041-42_ERs_calcs_v4
$Q_{p,y}$	Quantity of safe water in litres consumed in the project scenario p and supplied by project technology per person per day. Please see Excel file WCFT_Anseba_BHs_22_V3 (Borehole H2O Results Sheet).
$Q_{p,rawboil,y}$	Quantity of raw water boiled in the project scenario p per person per day. Please see Excel 'Anseba_PS_23_v4', sheet labelled 'Report'.
$W_{b,y}$	Quantity of fuel in tons required to treat 1 litre of water using technologies representative of baseline scenario b during the project year y , as per Baseline Water Boiling Test. See 'Baseline Water Boiling Test_v1'

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

Details of equations used to calculate project value for SDG outcomes appear below. Calculation is provided in the corresponding Emission Reductions calculations in the 'SDG Calculations' Sheet.

Outcomes for SDG 3 (Good Health and Wellbeing):

Providing access to safe water and removing the need to boil, reduces the amount of non-renewable biomass burned. Therefore, the amount of safe water provided can be taken as a proxy indicator of how these VPAs contribute towards the SDG 3 target of substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. Calculations are as follows:

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

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$$95.00\% = ((2.8 - 0) / 2.8) * 95\%$$

Where:

HAPR_y Total reduction in Household Air Pollution for project activity in year y (%)

P_{b,y} Quantity of fuel that is consumed in the baseline scenario b during year y (kg/person-day). See 'Baseline Water Boiling Test_v1'.

P_{p,y} Quantity of fuel that is consumed in the project scenario p during year y (kg/person-day), (Anseba_PS_23_v1)

U_{p,y} Usage rate in project scenario p during year y. (Anseba_US_23_v1)

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

$$2.8 = 0.4 * 7.09$$

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. See 'Baseline Water Boiling Test_v1'.

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. See Excel file WCFT_Anseba_BHs_22_V3, (Borehole H2O Results Sheet).

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

$$0 = 0.4 * 0$$

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. See 'Baseline Water Boiling Test_v1'.

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$Q_{p, \text{cleanboil}, y}$ Quantity of safe water boiled in the project scenario p during year y, after installation of the project technology. See 'Anseba_PS_23_v1', sheet labelled 'Report'.

Outcome for SDG 5 (Gender Equality):

The overall reduction in time spent collecting firewood in the project activity is calculated as follows:

$$TR_y = T_{b,y} - T_{p,y}$$

$$0.47 = 2.26 - 1.79$$

Where:

TR_y Total reduction time spent collecting firewood per day for project activity in year y (hours)

$T_{b,y}$ Baseline time spent collecting firewood per household per day (hours). See 'Zoba Anseba Baseline Survey Final.'

$T_{p,y}$ Project time spent collecting firewood per household per day (hours). Anseba_PS_23_v2, sheet labelled 'Report'.

Outcomes for SDG 6 (Clean Water and Sanitation):

The outcome for SDG 6 is quantified as the additional number of persons having access to safe water in the project activity compared to the baseline scenario. Calculations are as follows:

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

$$\text{GS5951: } 2,382 = 2,508 * (1 - 0) * 0.95$$

$$\text{GS5952: } 2,074 = 2,184 * (1 - 0) * 0.95$$

$$\text{GS5953: } 1,938 = 2,041 * (1 - 0) * 0.95$$

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$$\text{GS5954: } 2,106 = 2,217 * (1 - 0) * 0.95$$

$$\text{GS5955: } 1,794 = 1,889 * (1 - 0) * 0.95$$

$$\text{GS6401: } 4,180 = 4,400 * (1 - 0) * 0.95$$

$$\text{GS6402: } 3,694 = 3,889 * (1 - 0) * 0.95$$

Where:

P_{access} Number of additional persons having access to safe water in the project activity compared to the baseline scenario. Sales_Record_Confidential_2023_v1

P_y Number of persons having access to safe water in the project activity. GS5951-55 6041-42_ERs_calcs_v4.

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. Zoba Anseba Baseline Survey Final.

$U_{p,y}$ Usage rate in project scenario p during year y . (Anseba_US_23_v1) (Analysis Sheet)

Outcome for SDG 13 (Climate Action):

CO₂e emission reductions are the indicator to demonstrate that the project has raised capacity for effective climate change-related planning and management contributing to SDG 13. The emissions reductions for the current monitoring period can be found in the corresponding Emission reductions excel document and in section E.3 below.

E.3. Calculation of leakage

The project does not result in leakage and therefore the value is 0 as can be seen in the assessment on pg. 32 – 33.

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

TEMPLATE-

SDG	SDG Impact	Baseline Estimate	Project estimate	Net benefit
SDG 3 Good health and well-being	Variation in household smoke(All VPAs)	0% reduction in exposure to household air pollution due to boiling water	95% reduction in exposure to household air pollution due to boiling water	95% reduction in exposure to household air pollution due to boiling water
SDG 5 Gender Equality	Variation of time spent in firewood collection	2.26 hours spent collecting firewood per household per day	1.79 hours spent collecting firewood per household per day	0.47 decrease in hours spent collecting firewood per household per day (All VPAs)
SDG 6 Clean water and sanitation	People gain access to safe water	0 people with access to safe water	People with access to safe water: GS 5951: 2,508 GS 5952: 2,184 GS 5953: 2,041 GS 5954: 2,217 GS 5955: 1,889 GS 6041: 4,400 GS 6042: 3,889	Additional with access to safe water: GS 5951: 2,382 GS 5952: 2,074 GS 5953: 1,938 GS 5954: 2,106 GS 5955: 1,794 GS 6041: 4,180 GS 6042: 3,694
SDG 13 Climate Action	Emission Reductions	GS 5951: 0 GS 5952: 0 GS 5953: 0 GS 5954: 0 GS 5955: 0 GS 6041: 0 GS 6042:0	GS 5951: 4,227 tCO2-e/y GS 5952: 3,681 tCO2-e/y GS 5953: 3,439 tCO2-e/y GS 5954: 3,735 tCO2-e/y GS 5955: 3,183 tCO2-e/y GS 6041: 7,418 tCO2-e/y GS 6042:6,555 tCO2-e/y	GS 5951: 4,227 tCO2-e/y GS 5952: 3,681 tCO2-e/y GS 5953: 3,439 tCO2-e/y GS 5954: 3,735 tCO2-e/y GS 5955: 3,183 tCO2-e/y GS 6041: 7,418 tCO2-e/y GS 6042:6,555 tCO2-e/y

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
SDG 3 Good Health and Well-being	80% reduction in exposure to Household Air Pollution due to boiling water	95.00% reduction in exposure to Household Air Pollution due to water
SDG 5 Gender Equality	At least 0.5 hours per trip per household time saved	Time saved collecting firewood during this monitoring period is 0.47 hours per day.
SDG 6 Clean Water and Sanitation	GS5951: 1,919 GS5952: 1,543 GS5953: 1,481 GS5954: 1,538 GS5955: 1,478 GS 6041: 2,932 GS 6042: 2,855 Total: 13,746 end users	GS 5951: 2,382 GS 5952: 2,074 GS 5953: 1,938 GS 5954: 2,106 GS 5955: 1,794 GS 6041: 4,180 GS 6042: 3,694 Total: 18,374
SDG 13 Climate Action	GS5951: 10,000 tCO2-e GS5952: 10,000 tCO2-e GS5953: 10,000 tCO2-e GS5954: 10,000 tCO2-e GS5955: 10,000 tCO2-e GS6041: 10,000 tCO2-e GS6042: 10,000 tCO2-e	GS5951: 4,227 tCO2-e GS5952: 3,681 tCO2-e GS5953: 3,439 tCO2-e GS5954: 3,735 tCO2-e GS5955: 3,183 tCO2-e GS6041: 7,418 tCO2-e GS6042: 6,555 tCO2-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

The Ex-ante estimations for SDGs 3,5 and 6 are taken from the transition Annex (101.5-Transition-Annex-Eritrea_Boreholes_20180403_v.3_CLEAN.pdf). The project started before GS4GG was implemented so the SDGs calculations for each single VPA were not included at that time. In the transition Annex, the values estimated for each SDG are reported as such:

SDG 3 = 80% reduction in exposure to Household Air Pollution due to boiling water

SDG 5 = 0.5 hours per trip per household time saved

SDG 6 = 13,746 number of additional persons with access to safe water

Regarding SDG 13, the ex-ante Emission Reductions can be found in the approved VPA-DD are capped at 10,000 tCO₂e

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

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These projects were design certified prior to transition to Gold Standard for the Global Goals, hence all ex-ante estimates of SDG outcomes are derived from the relevant transition annex. All SDG targets were either met or exceeded and had positive SDG impacts.

SDG 3

For SDG 3, in the project scenario there was a 95.00% reduction in exposure to Household Air pollution arising from smoke emitted from boiling water. This is due to no one boiling the borehole water in the project because it is safe for human consumption as determined by annual water quality tests. This not only frees up time

TEMPLATE-

spent previously boiling water but also reduces the negative health implications of smoke related illnesses which are disproportionately suffered by women and children. This impacts positively towards SDG 3 good health and wellbeing.

SDG 5

Time spent collecting firewood decreased by 0.47 hours which is similar to the ex-ante estimate of 0.5 hours' time saving. The projects SDG 5 target - 'to reduce the time spent collecting water and firewood for the purpose of water purification' has been achieved.

SDG 6

All project participants now have access to safe water in the project. In the baseline, all participants collected water from unsafe sources such as rivers, streams and open wells, and had to boil their water in order to make it safe to drink. In the project, 100% of participants now collect their water from a rehabilitated borehole, no longer requiring them to boil water for purification and positively contributing towards SDG 6 clean water and sanitation. However, the Usage Rate is 95.00%.

SDG 13

For SDG 13, the ex-ante estimation was 10,000 emission reductions per year per VPA. However, the number of users per borehole has been capped at 400 or less and is lower than expected, and also the Wby has been capped at 0.0004 hence there are less than 10,000 tCO₂-e/y per VPA. Although this does not meet the target of 10,000 tCO₂-e/y, the projects are still achieving a large number of emission reductions during this monitoring period which would not be possible without the project contributing positively to SDG 13 climate action.

SECTION F. SAFEGUARDS REPORTING

Safeguarding principles	Assessment questions	Assessment of relevance	Justification	Monitoring
		e to the project (Yes/potentially/no)		
1 Human Rights	a. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. b. The Project shall not discriminate with regards to participation and inclusion.	No	The project will adhere to all human rights requirements including respecting internationally proclaimed human rights and Universal Declaration of Human Rights and will not discriminate in any way.	During all trainings, it will be emphasised that project beneficiaries should support vulnerable or less mobile community members to access water

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2 Gender Equality and Women's Rights	The Project shall not directly or indirectly reinforce gender-based discrimination and shall not lead to/contribute to adverse impacts on gender equality and/or the situation of women. Specifically, this shall include (not exhaustive):			SDG 5 Tp,y TR,y The time spent collecting wood fuel is monitored in the project survey. The project aims to reduce the burden on the whole community of traveling far to collect wood and in particular to women who perform the majority of
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	(a) Sexual harassment and/or any forms of violence against women – address the multiple risks of gender-based violence, including sexual exploitation or human trafficking.	No	The burden on the whole community of travelling far to collect water and gather firewood for water purification will be reduced. This will also mitigate the social isolation of spending a long time collecting these resources	unpaid domestic work.
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	(b) Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls.	No	The project will decrease the drudgery by reducing time spent on water and firewood collection	
	(c) Restriction of women's rights or access to resources (natural or economic).	No	The project will increase women's access to resources such as water by making safe water available in the community. The project will increase women's ability to use, develop and protect natural resources by making safe water available in the community. The project will increase women's ability to use, develop and protect natural resources by making safe water more readily available and enabling women to participate in project decision-making.	

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	(d) Recognise women's ownership rights regardless of marital status – adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work, specifically:	No	The project will decrease the workload of women in collecting water and firewood, thereby allowing more time to engage in other activities.	
	(a) Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities.	Yes	Equal participation of women and men in decision making will be encouraged by promoting their equal membership on water point committees (WPCs). These WPCs will be trained to facilitate the participation of members depending on their specific circumstances. They will also assist all communities members to	

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				provide feedback on the project, regardless of their situation.	
	(b)	Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status	Yes	The project aims to benefit the whole community equally and women's equal participation in the LSC and water point committees is encouraged.	
	(c)	Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits.	Yes	The project will encourage equal participation of men and women.	

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	3.2.3 The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.	Yes	The analysis of the project is in line with the country gender strategy is in section A.8. of the PDD	
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3 Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	Yes	The project will reduce the community exposure to water borne illness through the provision of a safe water source, and will reduce the risk of household air pollution by removing the need for households to boil water for purification.	SDG 3, 6 and 13 Np,y Qp,y Qp,cleanboil,y Quality of Treated Water HAPR,y Paccess P,y Pp,y Incidences of water borne illnesses are monitored through the annual Monitoring Project Survey. A WASH programme is carried out by the project including WASH training at the beginning of the project, as well as subsequent WASH follow-up training
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4.1 Sites of Cultural and Historical Heritage	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g.,	No	The project area does not include sites or structures of historic and cultural value. Project activities do not compromise historic, cultural	N/A
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	knowledge, innovations, or practices)?		or religious practices.	
4.2 Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	The project will not impact the physical or economic relocation of peoples. The focus of the project is rehabilitating and installing water point infrastructure only.	N/A
4.3 Land Tenure and Other Rights	Does the Project require any change to land tenure arrangements and/or other rights?	No	The project will not impact on land tenure arrangements or rights.	N/A

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4.4 Indigenous Peoples	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	The project will take place on land owned either by the county government or by local people for which their permission will first be sought.	N/A
5 Corruption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	The project shall ensure that all forms of corruption are avoided. Project beneficiaries are able to contact the project developer and implementer through the continuous	N/A
			grievance mechanism to report any form of corruption.	

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6.1 Labour Rights	The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions. Where these are contradictory and a breach of one or other cannot be avoided, then guidance shall be sought from Gold Standard.	No	The project will adhere to labour laws and requirements	N/A
	Child labour, as defined by the ILO Minimum Age convention is not allowed. The Project Developer shall use adequate and verifiable mechanisms for age verification in recruitment procedures.	No	The projects will not use child labour	N/A

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	Exceptions are children for work on their families' property as long as: (a) Their compulsory schooling (minimum of 6 schooling years) is not hindered, AND (b) The tasks they perform do not harm their physical and mental development, AND (c) The opinions and recommendations of an Expert Stakeholder shall be sought and demonstrated as being included in the project design.			
6.2 Negative Economic Consequences	Does the project cause negative economic consequences during and after project implementation, e.g., for vulnerable and marginalised social groups in targeted communities?	No	The project is not expected to have any negative economic impacts or cause any risks.	To ensure long term sustainability of the water points, and avoid unexpected breakdowns and spending, training was conducted at the beginning of the project on conducting minor maintenance. The project is expected to benefit all

				members of the community
7.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The project will reduce greenhouse gas emissions compared to the baseline scenario.	SDG 13 The ERs are monitored during the MP. During this MP a large number of emission reductions were achieved
7.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	Only hand pumped boreholes that use no electricity are included in the project. The project will reduce fuel use due to reducing the need for water purification by boiling	N/A
8.1 Impact on natural water patterns/flows	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	There will be no significant change in the volume of water consumed by the households.	N/A

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8.2 Erosion and/or water body instability	Could the Project directly or indirectly cause additional erosion and/or water body	No	The water is taken from boreholes at household usage levels. Therefore	N/A
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	instability or disrupt the natural pattern of erosion?		it is extremely unlikely that there will be additional erosion and/or water body instability or disruption of the natural pattern of erosion.	
9.1 Landscape modification and soil	Does the Project involve the use of land and soil for production of crops or other products?	No	No crops or other products will be produced in the project.	N/A
9.2 Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	There will be no impact by the project to natural disasters.	N/A
9.3 Genetic Resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	No GMOs will be used in the project and the boreholes would not be affected by GMOs as they are all protected.	N/A

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9.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	As safe ground water is used, there is no risk or releasing pollutants to the environment.	N/A
9.5 Hazardous and Non-	Will the Project involve the	No	The project does not deal with	N/A

hazardous Waste	manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?		hazardous or non-hazardous chemicals and/or materials.	
9.6 Pesticides and fertilizers	Will the Project involve the application of pesticides and/or fertilisers?	No	No pesticides and/or fertilisers will be used in the project.	N/A
9.7 Harvesting of forests	Will the Project involve the harvesting of forests?	No	As the project reduces the consumption of firewood, there is a positive impact on forests.	N/A
9.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project has no impact on the quantity or nutritional quality of food.	N/A
9.9 Animal Husbandry	Will the Project involve animal husbandry?	No	The project will not involve animal husbandry.	N/A

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9.10 High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The project rehabilitates water points and decreases the consumption of firewood, having a positive impact on conserving forest ecosystems.	N/A
	Are there any endangered species	No	The project is not envisaged to	N/A
9.11 Endangered Species	identified as potentially being present within the Project boundary (including those that may route through the area)? Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No	have any impact on their habitat as it only affects borehole infrastructure. The project only impacts borehole infrastructure and does not impact other areas where endangered species are present.	

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.

Comments from users of four local communities which borehole is part of the project have been reported during this monitoring period. The comments are positive towards the project: the users expressed their satisfaction on the management of the

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boreholes and on the continuous follow ups of the project team. Even though there were breakdowns, these were resolved. The boreholes maintained by the project provide safe water to the communities preventing them walking long distances to fetch water.

One comment suggested to implement solar pumps, our partner has started looking into this option.

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

>>NA

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

No legal challenges arose during this 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