




**Verification and certification report form for
CDM programme of activities
(Version 03.0)**

BASIC INFORMATION		
Title and UNFCCC reference number of the programme of activities (PoA)	Impact Carbon Global Safe Water Programme of Activities (PoA) UNFCCC Ref. No.9948	
Version number(s) of the PoA-DD(s) to which this report applies	7.0	
Version number of the verification and certification report	4.0	
Completion date of the verification and certification report	18/05/2021	
Monitoring period number and duration of this monitoring period	Monitoring Period Number: Fourth Monitoring Period: 01/01/2020-21/03/2020 (both days inclusive)	
Number and version number of the monitoring report to which this report applies	Version: 3.0 Monitoring Report Number: 3	
Coordinating/managing entity (CME)	Impact Carbon	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Rwanda	No
	Uganda	No
	Nigeria	Yes
	Kenya	No
Applied methodologies and standardized baselines	Methodology: AMS-III.AV. Low greenhouse gas emitting safe drinking water production systems (Version 4.0) Standardized Baseline: Not Applicable	
Mandatory sectoral scopes	3: Energy Demand	
Conditional sectoral scopes, if applicable	Not Applicable	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	460,355 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	128,917 tCO ₂ e	
Name and UNFCCC reference number of the	Earthood Services Private Limited	

DOE	E-0066
Name, position and signature of the approver of the verification and certification report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

The CDM PoA 9948 aims at distribution of the low carbon emissions water purification technologies to households, communities and institutions in Rwanda, Nigeria, Kenya and Uganda. Thus, PoA through the dissemination of these technologies aims to address the issue of lack of access to safe drinking water in target countries.

In absence of the PoA, boiling water using fossil fuels / non-renewable woody biomass would have been the means of availing safe drinking water. The project Water Purification Systems (WPS) provides safe drinking water without the use of non-renewable biomass/ fossil fuel, thus leading to reduction in Green-house gas (GHG) emissions attributed to boiling in the baseline. This verification covers implemented CPAs 9948-P1-0043-CP1 to 9948-P1-0077-CP1 (35 CPAs).

The verification team confirms that the total emission reductions achieved under this monitoring period from 01/01/2020 to 21/03/2020 (inclusive of both days) are 128,917 tCO_{2e}.

Scope of verification:

The verification is an independent and objective review, of ex-post determination of the monitored reductions in GHG emissions, by the DOE. The verification includes the implementation and operation of the PoA as set out in the revised accepted PoA-DD & CPA-DDs viz., 9948-P1-0043-CP1 to 9948-P1-0077-CP1 (35 CPAs) in the monitoring period.

The verification tests the data and assertions set out in the monitoring report prepared for this monitoring period by the CMEs and is based on the following:

- (i) The approved methodology AMS-III.AV. ver.4 “Low greenhouse gas emitting safe drinking water production systems” /6/ applied in the PoA-DD & CPA-DDs/1,2/
- (ii) The registered and revised accepted PoA-DD & CPA-DDs and monitoring plan/1,2/
- (iii) UNFCCC criteria referred to in the Kyoto Protocol criteria and the CDM modalities and procedures as agreed in the Bonn Agreement and the Marrakech Accords
- (iv) The CDM Validation and Verification Standard (VVS) for PoA version 2.0/9/
- (v) The CDM Project Standard (PS) /7/ and Project Cycle Procedure (PCP) for PoA version 2.0 /8/
- (vi) Relevant decisions, guidance and clarifications of the CMP and CDM Executive Board and any other information and references relevant to the project activity’s reported emission reductions

The verification has considered both quantitative and qualitative aspects on stated/reported emission reductions. The monitoring report (all versions) and corresponding supporting documentation was assessed in accordance with the rules defined by UNFCCC, as appropriate to the PoA. The verification is not meant to provide any consulting or recommendations to the CME/others. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

Verification Process:

The verification process is conducted as per internal CDM Quality Manual, which includes the following steps;

- a) Contract with CME and appointment of verification team and technical review team (refer Section B.1 and B.2 of this report)
- b) Completeness check of Monitoring Report /13/
- c) Publication of Monitoring Report at UNFCCC website
- d) Desk review (refer Section D.1 of this report) of Monitoring Report/13/ and corresponding ER sheet /4/ by verification team and planning of remote audit (including sampling approach (refer Section D.4 of this report) to be applied)
- e) Remote Audit Survey (refer Section D.2 of this report) (interview with relevant stakeholders) by verification team consistent of Team Leader and all Technical Experts, as a minimum
- f) Follow up activities e.g., interviews (refer Section D.3 of this report)
- g) Reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report (refer Section D.5 of this report)

- h) Independent technical review (refer Section F of this report) of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidence)
- i) Reporting and closure of TR comments/findings (refer Section D.5 of this report) (CARs/CLs/FARs) and final approval for the decision made (refer Section G and H of this report).
- j) Issuance of final verification report to contracted CME (or authorized representatives) and submission of request for issuance, as appropriate.

Verification Conclusion:

Based on the outcome of the verification process of the registered/revised accepted PoA “Impact Carbon Global Safe Water Programme of Activities (PoA)” and its 35 CPAs (**9948-P1-0043-CP1 to 9948-P1-0077-CP1**) for the monitoring period 01/01/2020 – 21/03/2020 (inclusive of both days) (including both dates) we confirm that the implementation of referenced registered/revised accepted PoA and CPAs is complying with applicable CDM rules and regulations as stated in the Monitoring Report (final) Version 3.0 dated 26/04/2021/13/. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodologies AMS-III.AV. ver.4 “Low greenhouse gas emitting safe drinking water production systems” /6/ and the monitoring plan contained in the revised accepted PoA-DD/1/.

Earthood Services Private Limited is able to certify that the emission reductions from the registered CDM PoA UN#9948 “Impact Carbon Global Safe Water Programme of Activities (PoA)” in Nigeria during the period 01/01/2020 – 21/03/2020 (inclusive of both days) amount to **128,917** tCO₂e. Therefore, this is being submitted for request for issuance, as per UNFCCC procedures.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection *	Interview(s)	Verification findings
1.	Team Leader	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
2.	Verifier	IR	Vatsa	Vaishali	Central Office	Y	N	Y	Y
3.	Technical Expert	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
4.	Methodology Expert	IR	Mahala	Deepika	Central Office	Y	N	Y	Y
5.	Local Expert	IR	Nanbal	Kumden	Central Office	Y	N	Y	Y

*Remote Audit Survey was conducted instead of on-site audit. Refer to section D.2 of this report for further details.

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical Reviewer	IR	Gautam	Ashok	Central Office
2.	TA to TR	IR	Gautam	Ashok	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions, or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Observational error by monitoring survey staff of CME/CPA implementer while recording the responses of users in relation to survey parameters	High	The survey is conducted for representative samples of population, which may impact the population significantly. Surveyors may be unsupervised at the site.	Verification team randomly selected the samples from CME surveyed sampled WPS. The recorded survey forms by CME were checked with DOE remote audit survey observations. The verification team also interviewed the monitoring staff and checked their training records.
2.	Calculation Errors	Med	The process is manual and therefore there is potential risk of errors / omissions/misstatements.	All calculations were checked by verification team with respect to applicable requirements under various documents viz., methodology, registered PoA DD/1/, CPA DDs/2/ etc.

C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for PoAs, Version 02.0/9/ the prescribed thresholds for materiality for CDM PoAs are as under;

Type of PoA	PoAs comprising large-scale CPAs			PoAs comprising only small-scale CPAs	PoAs comprising only micro-scale CPAs
Emission Reductions (tCO ₂ e)/year	500,000 or more	300,001 to 499,999	300,000 or less		
Materiality Threshold	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 5% as PoA comprises only small-scale CPAs.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO ₂ e) in this monitoring period	188,180	128,917*
Applicable Threshold (%) as per CDM VVS for PoAs Version 02.0	5.0%	5.0%

*The verification team has identified the impact of errors observed and those have been corrected by CME during verification for all monitoring parameter at an individual and aggregate level.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data* (Total) Total (100%)	Sample selected for verification Sample (100%)	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
9948-P1-0043-CP1 to 9948-P1-0077-CP1						
<u>For water purifier</u>						
QPW _y	Annual or at least biennial	35 calculated parameter for each CPA)	35 (100%)	There were errors in calculation	All the errors have	No extrapolation is

				which have been corrected (35).	been corrected *	required as 100% values checked and corrected.
n _{WB}	Continuously or at least biennial	1	1	None	NA	NA
Tyi	Continuous	7,268 UltraFLO 10,733 UltraTAB (18,001)	7,268 UltraFLO 10,733 UltraTAB Sales database/5/ was checked for the information. 11 WPS were checked during remote audit survey for cross check.	None	NA	NA
Nyi	Continuous	333	Entire sales database was checked for the information.	None	NA	NA
Water quality (WQ)	Annually	49	11 (based on acceptance sampling)	None	NA	NA
Operational Units _i	At least once per verification	52	11 (based on acceptance sampling)	None	NA	NA
f _{NRB}	Continuously	1	1	None	NA	NA
EF _{projected_fossilfuel}	Continuously	1	1	None	NA	NA
Existence of public distribution network of safe drinking water	Annually	49	11 (based on acceptance sampling)	None	NA	NA

*There were no errors identified during the desk review of MR, ER Sheet and other supporting documents shared by CME. Based on the request for review issues received from UNFCCC, the CME has applied a conservative approach to credit the systems for school operational days instead of the duration of the monitoring period which has led to a reduction in the total ERs significantly. CL#05 was raised and resolved to address the issue.

Based on the above table it can be confirmed that the actual individual and aggregated material error is determined for the registered PoA as per CDM VVS for PoA/09/. The applicable threshold for materiality in accordance with CDM PoA VVS Version 2 para 308(d)/9/ is 5%.

SECTION D. Means of verification

D.1. Desk/document review

A desk review was conducted by the verification team that included:

- A review of data and information provided for its completeness.
- A review of registered monitoring plan, monitoring methodologies including applicable tools, standards, and the applicable applied standardized baselines.

All the documents reviewed during the verification process are listed in the Appendix 3 of this Verification and Certification Report.

D.2. On-site inspection¹

Duration of on-site inspection: NA*				
No.	Activity performed on-site	Site location	Date	Team member
1.	Interview of the monitoring personnel and CME representative	-	04/11/2020	Deepika Mahala and Vaishali Vatsa, Nanbal Kumden
2.	Interview of the head of the institution related to the DoE sampled project devices	-	04/11/2020	Deepika Mahala and Vaishali Vatsa, Nanbal Kumden

*No physical site-visit was conducted. Alternative means were adopted, under which remote audit survey was conducted.

Mandatory Site-visit

Para 321 of VVS for PoA, version 2.0 /9/ says that It is mandatory for the DOE to conduct an on-site inspection at verification for the included CPA if:

- It is the first verification for the DOE with regard to this CPA;
- More than three years have elapsed since the last on-site inspection conducted for verification for the CPA; or
- The CPA has achieved more than 300,000 tCO_{2e} of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.

The site-visit for the current verification was mandatory as it is the first verification for the DOE with regard to these CPAs in-line to para 321 of VVS for PoA Version 2.0 /9/.

The site-visit was not conducted for this issuance due to outbreak of global pandemic Covid-19, increased risk of exposure and contraction due to travel as the case in the country is surging/48/,/50/.

UN EB decision on Mandatory DOE on-site visits:

UN EB 106 report (Para 26) mentions the decision EB took on 20th March 2020, in relation to DOE on-site visit which was applicable from 23rd March 2020 to 23rd June 2020 /46/. The Executive Board of the Clean Development Mechanism (CDM) agreed on 23 June 2020, on an exceptional basis considering the COVID-19 pandemic, to extend the period in which CDM Designated Operational Entities (DOEs) may apply alternative measures of validation/verification to mandatory on-site inspections until 31 December 2020/47/ which has been extended to 30 June 2021 in EB 108.

The issue with the postponement of Site-visit:

The key reasons not allowing the DOE team to visit the site are the remarkably high number of daily cases for COVID-19 infected people in DOE country (India) /48/, /50/. It was discussed with the CME on any possibility to postpone the on-site visit for the verification. The CME explained its inability to move forward with the postponement of the site visit, as it would delay the whole process of verification. The CME mail conversation with the buyers for its delivery commitments /34/ are shared with the DOE team, and further to that, the signed ERPA (Emission Reduction Purchase Agreement) /35/ was shared to furnish the contractual agreement.

Exemption by CDM EB

Due to the outbreak of COVID-19, CDM-EB has exempted site visits for all projects till 31/12/2020. An internal checklist with details of CPA and alternative means for site-visit exemption was submitted to the Technical Manager for approval, in accordance with the ESPL CDM QMS, before conducting the remote site visit.

Therefore, for reasons provided above, and in line with UN EB guidelines, the assessment team conducted the verification for this PoA batch using alternative means as defined in the CDM VVS-PoA, ver. 2.0/9/. DOE verification team applied standard auditing techniques while verifying the PA verification, as discussed below.

Alternative means applied

¹ This table lists down the activities conducted during the remote audit survey

In the form of alternative means to the on-site inspection, standard auditing techniques were applied by the verification team, which are:

1. Remote Audit Surveys including interviews of CME/CPA Implementer, end users and the personnel's involved in monitoring and preparation of the monitoring report and related documents via e-meeting. Random samples for eleven WPS users (details on sampling provided in section D.3) were drawn from the CME's monitoring sample survey sheet and interviewed through skype calls.
2. Photographic evidence of the water quality testing kits /30/, Installed WPS with Unique Product IDs /27/, Monitoring Survey (filled) Forms /18/.
3. Complaint Log (Scanned Samples) /36/
4. Monitoring personnel training certificates /20/
5. Review of Other Documentary evidence (ER sheet /4/, Sample Size Calculation sheet /4/, Monitoring Data sheet /4/)

These alternative methods were considered sufficient by the verification team for the current verification.

D.3. Interviews²

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Brown	Julie	Impact Carbon	04/11/2020	Sampling Surveys	Deepika Mahala, Vaishali Vatsa
2.	Neville	Tim	Impact Water	04/11/2020	Implementation	Deepika Mahala, Vaishali Vatsa
3.	Akinyemi	Zacch	Impact Water Nigeria	04/11/2020	Implementation, Sales records	Deepika Mahala, Vaishali Vatsa
4.	Odunaya	Samuel	Impact Water Nigeria	04/11/2020	Database management	Deepika Mahala, Vaishali Vatsa
5.	Huelsenbeck	Mark	Impact Water Nigeria	04/11/2020	Monitoring surveys	Deepika Mahala, Vaishali Vatsa
6.	Whisler	Carson	Impact Water	04/11/2020	Operations	Deepika Mahala, Vaishali Vatsa
7.	Lohia	Rohit	Climate Secure India Private Limited	04/11/2020	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala, Vaishali Vatsa
8.	-	Nihar	Climate Secure India Private Limited	04/11/2020	ER calculation and Sampling	Deepika Mahala, Vaishali Vatsa
9.	Kumar	Ritesh	Climate Secure India Private Limited	04/11/2020	ER calculation and Sampling	Deepika Mahala, Vaishali Vatsa
10.	Ogulande	Stephen	Principal (Ekifound College)	04/11/2020	DOE Remote audit survey #01	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
11.	Wale	Mr.	Admin (Talhat Secondary School)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden

² Interviews were conducted Via Skype Call

12.	Aruneba	Ms.	Head Teacher (Masuvic Glory Nursery & Primary School)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
13.	Olanrewaju	Ayodeji	Head Teacher (DSY Private School)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
14.	Gambo	Adamu	Head Teacher (Nagopita Primary School)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
15.	Aladegboye	G.A.	Teacher (Atidade Nomadic Government elem/middle School)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
16.	Ibrahim	Aliyu A.	Head Teacher (Ube Gabodna Pry School)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
17.	Katoh	Ndackson	Vice Principal (GSS Idon)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
18.	Ibrahim	Sa'adiya M.	Head Teacher (LGEA Fulani Road)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
19.	Funke	Ayando Beatrice	Head Teacher (Winning Heritage Schools)	04/11/2020	DOE Remote audit survey	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden
20.	Alabi	Mrs.	Head Teacher (Fomwan LGEA School Igbaja)	04/11/2020	DOE Remote audit survey #11	Deepika Mahala, Vaishali Vatsa, Nanbal Kumden

D.4. Sampling approach

CME Sampling approach

For the purpose of sampling, CME has followed the CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities version 4.0/31/ and Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8.0 /19/ which is in-line with the revised accepted PoA DD/1/. The CME has applied Stratified Random Sampling at PoA level for different monitoring parameters as per validated revised accepted/registered PoA DD /1/and registered CPA DDs/2/. 95/10 confidence precision was applied by CME in the sampling which is appropriate as per the single sampling covering 35 CPAs which are part of this batch under issuance. Thus, PoA wide single sampling plan was used by the CME.

DOE's Sampling approach

In order to meet the requirements of paragraph 28 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8.0 /19/ the verification team applied acceptance sampling in the verification (in accordance with para 28).

According to para 30 of Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 8.0 /19/, The maximum errors associated with DOE sampling are provided as below:

- (a) A 10 per cent chance that the DOE will wrongly reject the project participants' or the coordinating/managing entity's records (i.e. reject a set of records of acceptable quality);
- (b) A 10 per cent chance that the DOE will wrongly accept the project participants' or the coordinating/managing entity's records (i.e. accept a set of records which is unacceptable).

Verification team has applied following AQL and UQL level using its own judgement:

0.5% AQL- Acceptable quality level (AQL) or the level of assurance, that is the proportion of acceptable discrepancies between the project participants' or the coordinating/managing entity's sample records and the DOE sample records

20% UQL- Unacceptable quality level (UQL), that is the proportion of unacceptable discrepancies between the project participants' or the coordinating/managing entity's sample records and the DOE sample records.

The verification team selected the sample size as 11 water purification systems for the purpose of remote survey to check the acceptability of CME's sampling results or otherwise.

Sample Size:

CPA Ref No.	AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
9948-P1-0043-CP1 to 9948-P1-0077-CP1	0.5%	20%	10%	10%	11	0

The verification team selected random samples from CME's sampled units to check the acceptability (or otherwise) of the monitoring data for each such record with CME's sample records, and determine if the CME's sample records meet the requirements.

The distribution breakup from sales database is as follows:

Type of WPS	No. of units
Ultra FLO	7,829
Ultra Tab	10,955

Since, the distribution ratio between the two categories UltraFLO & UltraTab is 2:3, the DOE's sample size of 11 WPS units was also divided in a similar ratio. These 11 samples were chosen randomly (using website www.randomizer.org) out of total of 52 CME's monitored samples (as part of monitoring survey). As per plan, 11 systems (WPS) were required and DOE surveyed 5 samples of Ultra FLO type and 6 samples of Ultra Tab type. No inconsistency between the CME results and DOE's observations during the remote audit survey was identified.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General	-	-	-
Compliance of the monitoring report with the monitoring report form	-	-	-
Remaining forward action requests from validation and/or previous verifications	-	-	-
CPAs considered for verification and covered in this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	-	-	-
Implementation and operation of the management system	-	-	-
Post-registration changes	-	-	-
• Corrections	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized	-	-	-

baselines, or other methodological regulatory documents ³			
• Changes to the programme design	-	-	-
• Addition of CPA inclusion template	-	-	-
• Change of coordinating/managing entity	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Component project activities	-	-	-
Compliance of the CPA implementation with the included CPA design document	CL#06	-	-
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
• Corrections	-	-	-
• Changes to the start date-of the crediting period	-	-	-
• Inclusion of a monitoring plan	-	-	-
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	-	-	-
• Changes to the project design	-	-	-
• Changes specific to afforestation and reforestation activities	-	-	-
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	-	-	-
• Data and parameters monitored	CL#01 CL#02 CL#03 CL#04 CL#05	CAR#01	FAR#01 FAR#02
• Implementation of sampling plan	-	CAR#01	-
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	-	CAR#02	-
• Calculation of project GHG emissions or actual net GHG removals by sinks	-	-	-
• Calculation of leakage GHG emissions	-	-	-
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	-	-	-
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	-	-	-
• Remarks on difference from estimated value in included CPA	-	-	-
Assessment of reported sustainable development co-	-	-	-

³ Other standards, methodologies, methodological tools, and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

benefits			
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	06	02	02

SECTION E. Verification findings

E.1. General

E.1.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The monitoring report form used is CDM-PoA-MR-FORM version 03.0/10/ which is an appropriate form version available at the time of verification/submission for a request for issuance. All the sections of the aforesaid form were duly filled as per the instructions provided to fill it. The sections in the form are providing all the relevant details, and the template was not found altered at any place.
Findings	No finding was raised.
Conclusion	The final monitoring report /13/ is found to be in-line with the latest CDM-PoA-MR-form/10/ available and the instructions therein.

E.1.2. Remaining forward action requests from validation and/or previous verifications

No FAR was found to be raised during the validation of inclusion of CPAs/03/. Apart from this, there were no other FARs raised during the previous verifications /37/,/40/. There are two FARs from this verification that shall be addressed in the next verification. Please see Appendix 4.

E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 1, Version: 3.0, Ref No.:9948-P1-0001-CP1	No	01/05/2014	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 2, Version: 3.0, 9948-P1-0002-CP1	No	01/05/2014	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 3, Version: 1.3, 9948-P1-0003-CP1	No	08/05/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 4, Version: 01.2, 9948-P1-0004-CP1	No	02/07/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 5, Version: 5.0, 9948-P1-0005-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, Version: 5.0, 9948-P1-0006-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, Version: 5.0, 9948-P1-0007-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, Version: 5.0, 9948-P1-0008-CP1	No	04/10/2017	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, Version: 5.0, 9948-P1-0009-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, Version: 5.0, 9948-P1-0010-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, Version: 5.0, 9948-P1-0011-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, Version: 5.0, 9948-P1-0012-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, Version: 5.0, 9948-P1-0013-CP1	No	04/10/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14, Version: 1.0, 9948-P1-0014-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15, Version: 1.0, 9948-P1-0015-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 16, Version: 5.0, 9948-P1-0016-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17, Version: 5.0, 9948-P1-0017-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18, Version: 5.0, 9948-P1-0018-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19, Version: 5.0, 9948-P1-0019-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20, Version: 5.0, 9948-P1-0020-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21, Version: 5.0, 9948-P1-0021-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22, Version: 5.0, 9948-P1-0022-CP1	No	21/11/2017	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 23, Version: 4.0, 9948-P1-0023-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 24, Version: 4.0, 9948-P1-0024-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 25, Version: 4.0, 9948-P1-0025-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 26, Version: 4.0, 9948-P1-0026-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 27, Version: 4.0, 9948-P1-0027-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 28, Version: 4.0, 9948-P1-0028-CP1	No	18/11/2018	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 29, Version: 4.0, 9948-P1-0029	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 30, Version: 4.0, 9948-P1-0030-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 31, Version: 4.0, 9948-P1-0031-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 32, Version: 4.0, 9948-P1-0032-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 33, Version: 4.0, 9948-P1-0033-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 34, Version: 4.0, 9948-P1-0034-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 35, Version: 4.0, 9948-P1-0035-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 36, Version: 4.0, 9948-P1-0036-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 37, Version: 4.0, 9948-P1-0037-CP1	No	18/11/2018	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 38 supported by Republic of Korea, Version: 2.0, 9948-P1-0038-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 39 supported by Republic of Korea, Version: 2.0, 9948-P1-0039-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 40 supported by Republic of Korea, Version: 2.0, 9948-P1-0040-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 41 supported by Republic of Korea, Version: 2.0, 9948-P1-0041-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 42 supported by Republic of Korea, Version: 2.0, 9948-P1-0042-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 43 supported by Republic of Korea, Version: 1.0, 9948-P1-0043-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 44 supported by Republic of Korea, Version: 1.0, 9948-P1-0044-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 45 supported by Republic of Korea, Version: 1.0, 9948-P1-0045-CP1	Yes	26/04/2019	7.0	Yes

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 46 supported by Republic of Korea, Version: 1.0, 9948-P1-0046-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 47 supported by Republic of Korea, Version: 1.0, 9948-P1-0047-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 48 supported by Republic of Korea, Version: 1.0, 9948-P1-0048-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 49 supported by Republic of Korea, Version: 1.0, 9948-P1-0049-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 50 supported by Republic of Korea, Version: 1.0, 9948-P1-0050-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 51 supported by Republic of Korea, Version: 1.0, 9948-P1-0051-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 52 supported by Republic of Korea, Version: 1.0, 9948-P1-0052-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 53 supported by Republic of Korea, Version: 1.0, 9948-P1-0053-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 54 supported by Republic of Korea, Version: 1.0, 9948-P1-0054-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 55 supported by Republic of Korea, Version: 1.0, 9948-P1-0055-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 56 supported by Republic of Korea, Version: 1.0, 9948-P1-0056-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 57 supported by Republic of Korea, Version: 1.0, 9948-P1-0057-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 58 supported by Republic of Korea, Version: 1.0, 9948-P1-0058-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 59 supported by Republic of Korea, Version: 1.0, 9948-P1-0059-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 60 supported by Republic of Korea, Version: 1.0, 9948-P1-0060-CP1	Yes	26/04/2019	7.0	Yes

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 61 supported by Republic of Korea, Version: 1.0, 9948-P1-0061-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 62 supported by Republic of Korea, Version: 1.0, 9948-P1-0062-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 63 supported by Republic of Korea, Version: 1.0, 9948-P1-0063-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 64 supported by Republic of Korea, Version: 1.0, 9948-P1-0064-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 65 supported by Republic of Korea, Version: 1.0, 9948-P1-0065-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 66 supported by Republic of Korea, Version: 1.0, 9948-P1-0066-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 67 supported by Republic of Korea, Version: 1.0, 9948-P1-0067-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 68 supported by Republic of Korea, Version: 1.0, 9948-P1-0068-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 69 supported by Republic of Korea, Version: 1.0, 9948-P1-0069-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 70 supported by Republic of Korea, Version: 1.0, 9948-P1-0070-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 71 supported by Republic of Korea, Version: 1.0, 9948-P1-0071-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 72 supported by Republic of Korea, Version: 1.0, 9948-P1-0072-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 73 supported by Republic of Korea, Version: 1.0, 9948-P1-0073-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 74 supported by Republic of Korea, Version: 1.0, 9948-P1-0074-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 75 supported by Republic of Korea, Version: 1.0, 9948-P1-0075-CP1	Yes	26/04/2019	7.0	Yes

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 76 supported by Republic of Korea, Version: 1.0, 9948-P1-0076-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 77 supported by Republic of Korea, Version: 1.0, 9948-P1-0077-CP1	Yes	26/04/2019	7.0	Yes
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 78 supported by Republic of Korea, Version: 1.0, 9948-P1-0078-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 79 supported by Republic of Korea, Version: 1.0, 9948-P1-0079-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 80 supported by Republic of Korea, Version: 1.0, 9948-P1-0080-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 81 supported by Republic of Korea, Version: 1.0, 9948-P1-0081-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 82 supported by Republic of Korea, Version: 1.0, 9948-P1-0082-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 83 supported by Republic of Korea, Version: 1.0, 9948-P1-0083-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 84 supported by Republic of Korea, Version: 1.0, 9948-P1-0084-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 85 supported by Republic of Korea, Version: 1.0, 9948-P1-0085-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 86 supported by Republic of Korea, Version: 1.0, 9948-P1-0086-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 87 supported by Republic of Korea, Version: 1.0, 9948-P1-0087-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 88 supported by Republic of Korea, Version: 1.0, 9948-P1-0088-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 89 supported by Republic of Korea, Version: 1.0, 9948-P1-0089-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 90 supported by Republic of Korea, Version: 1.0, 9948-P1-0090-CP1	No	26/04/2019	7.0	NA

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 91 supported by Republic of Korea, Version: 1.0, 9948-P1-0091-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 92 supported by Republic of Korea, Version: 1.0, 9948-P1-0092-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 93 supported by Republic of Korea, Version: 1.0, 9948-P1-0093-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 94 supported by Republic of Korea, Version: 1.0, 9948-P1-0094-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 95 supported by Republic of Korea, Version: 1.0, 9948-P1-0095-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 96 supported by Republic of Korea, Version: 1.0, 9948-P1-0096-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 97 supported by Republic of Korea, Version: 1.0, 9948-P1-0097-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 98 supported by Republic of Korea, Version: 1.0, 9948-P1-0098-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 99 supported by Republic of Korea, Version: 1.0, 9948-P1-0099-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 100 supported By Republic of Korea, Version: 1.0, 9948-P1-0100-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 101 supported By Republic of Korea, Version: 1.0, 9948-P1-0101-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 102 supported By Republic of Korea, Version: 1.0, 9948-P1-0102-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 103 supported By Republic of Korea, Version: 1.0, 9948-P1-0103-CP1	No	11/06/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 104 supported By Republic of Korea, Version: 1.0, 9948-P1-0104-CP1	No	11/06/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 105 supported By Republic of Korea, Version: 1.0, 9948-P1-0105-CP1	No	11/06/2019	7.0	NA

E.2. Programme of activities

E.2.1. Compliance of the programme implementation with the registered programme design document

Means of verification	<p>The PoA aims at disseminating water purification systems (WPS) technologies to target countries like Rwanda, Nigeria, Uganda, and Kenya for addressing the problem of access to safe drinking water. For this monitoring period, 35 CPA's (i.e., from 9948-P1-0043-CP1 to 9948-P1-0077-CP1) of Type 2: Technologies for institutional water consumption, with no project emissions have been covered under the MR. This monitoring report includes the implementation and monitoring of 35 CPAs from 9948-P1-0043-CP1 to 9948-P1-0077-CP1 in the host country Nigeria. The coordinating and managing entity (CME) is Impact Carbon, and CERPD Co., Ltd (CERPD) is the CPA Implementer/15/ for these CPAs. CERPD has provided all implementation costs for the CPAs. CERPD has fully sponsored the WPS to make WPS affordable to beneficiary schools, as well covered the cost of operation and management of the CPAs in a financially sustainable condition. CERPD fully owns all the CERs specified in this monitoring report by virtue of an agreement with the CME. Their roles and responsibilities are defined in the signed agreement.</p> <p>In absence of the project activity, the water would have been boiled using non-renewable biomass/fossil fuels leading to release of GHG emissions in the baseline. The implementation of the technology helps in replacing the use of non-renewable biomass / fossil fuel for boiling with the WPS, reducing amount of equivalent GHG emissions.</p> <p>CPAs covered in the MR involve dissemination of two types of water purification systems:</p> <ol style="list-style-type: none">1. Ultra FLO2. Ultra Tab <p>The technical specifications of the WPS distributed under the CPAs is provided in the table below:</p>																								
	<table><tr><th>Description</th><th>Ultra FLO</th><th>Ultra Tab</th></tr><tr><td>Size / Dimensions</td><td>Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm</td><td>Strip size: ~13 cm X ~5.5 cm (100 tablets per packet, 10 strips of 10 tablets each)</td></tr><tr><td>Application</td><td>Piped water</td><td>Un-piped water</td></tr><tr><td>Flow rate</td><td>20L/min</td><td>1 tablet treats 100 L</td></tr><tr><td>Capacity/lifespan</td><td>340,000 L / 5-year expiry</td><td>10,000 L / 5-year expiry</td></tr><tr><td>Fixed or Portable</td><td>Fixed</td><td>Portable</td></tr><tr><td>Removal of E. Coli</td><td>99 (2-log)</td><td>99 (2-log)</td></tr><tr><td>Watts/Voltage</td><td>Not applicable</td><td>Not applicable</td></tr></table>	Description	Ultra FLO	Ultra Tab	Size / Dimensions	Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm	Strip size: ~13 cm X ~5.5 cm (100 tablets per packet, 10 strips of 10 tablets each)	Application	Piped water	Un-piped water	Flow rate	20L/min	1 tablet treats 100 L	Capacity/lifespan	340,000 L / 5-year expiry	10,000 L / 5-year expiry	Fixed or Portable	Fixed	Portable	Removal of E. Coli	99 (2-log)	99 (2-log)	Watts/Voltage	Not applicable	Not applicable
	Description	Ultra FLO	Ultra Tab																						
	Size / Dimensions	Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22 cm	Strip size: ~13 cm X ~5.5 cm (100 tablets per packet, 10 strips of 10 tablets each)																						
	Application	Piped water	Un-piped water																						
	Flow rate	20L/min	1 tablet treats 100 L																						
	Capacity/lifespan	340,000 L / 5-year expiry	10,000 L / 5-year expiry																						
	Fixed or Portable	Fixed	Portable																						
	Removal of E. Coli	99 (2-log)	99 (2-log)																						
	Watts/Voltage	Not applicable	Not applicable																						
<p>All the deployed systems meet the eligibility requirements of the PoA DD, page 65/1/. The details of the systems were verified from the manufacturer's specification/28/ provided by the CME.</p> <p>The Verification team assessed the following information to verify the capacity and lifetime of systems under the CPAs:</p> <ol style="list-style-type: none">I. Technical specification / expiry of UltraFLO issued by Medentech (technology supplier)II. Technical specification / expiry of UltraTAB issued by Medentech (technology supplier)III. The UltraTAB strip clearly mentions the treatment capacity of 1 tablet as 100ltrs and an UltraTAB pack is standardized at 10 strips of 10 tablets each, rendering the capacity of UltraTAB pack as 10,000 ltrs (verified physically during previous site visits as well as UltraTAB photos).																									

- IV. UltraFLO cartridges are manufactured in a standardized size as per the dimensions specified in the CPA-DDs and MR (verified physically during previous site visits as well as UltraFLO dimension declaration by CME) and pertains to the specifications issued by Medentech.
- V. The expiry of the UltraFlo/ UltraTAB was also found mentioned on the UltraFLO cartridge / UltraTAB pack respectively as 5 years (photographs of UltraFlo and UltraTAB units)

The photographs of the WPS installed by the CME were checked by the verification team and found to be in-line with the technical description provided in the registered PoA-DD/1/ and Monitoring report/13/ and manufacturer's specifications /28/.

Also, the verification team checked the implementation status of the project activity through interviewing the CME, CPA implementer, Monitoring personnel and WPS User as defined in the registered PoA DD/1/, and MR/13/.

Interview of the monitoring personnel via skype call involved in the QA/QC procedures revealed that the procedures mentioned in the PoA DD/1/ are being followed and the Training records/20/ regarding the trained personnel were checked.

The project location and coordinates shared by CME were verified using the web application "Google Maps" /41/ and found to be in-line with the registered PoA-DD/1/ and MR/13/.

Further, based on the review of sales database (presented in ER sheet)/4/, remote audit survey observations and interview conducted during the e-meeting, the verification team found that:

- The CPA(s) were implemented within the boundary of the PoA as described in the revised accepted PoA-DD/1/.
- The CME is same as that mentioned in the revised accepted PoA-DD/1/
- The implementation and operation of the project activity has been conducted in accordance with the description contained in the revised accepted PoA-DD/1/ and included CPA-DDs/2/.
- All physical features of the CPA proposed in the included CPA-DDs/2/ were in place
- The project participants/CPA implementer has operated the CPAs as per the information provided in the included CPA DDs/2/.

A remote audit survey and e-meeting was conducted by the verification team; 11 WPS (5 for Ultra FLO units and 6 for Ultra TAB units) were surveyed. The uniqueness of the system was identified from UID written on the units (either on Flo cartridges or on TAB box packs)/27/. Along with the unique ID the following details are also noted in the database:

- a) Type of system (UltraFLO / UltraTAB)
- b) Unique serial number of the units installed / distributed
- c) Date of installation / distribution
- d) Address and details of school and contact detail (if available) of representative
- e) Type of School (Boarding / Non-boarding)
- f) School population count (number of students / staff in boarding / non-boarding category)

The information of the installed device was also verified from the CME database/5/ which was cross checked for 11 WPS samples with the purchase orders/14/.

The emission reductions being claimed during this monitoring period are lesser than the estimated emission reductions in the revised or included CPA-DDs/2/, as

	<p>given in the table under section E.3.6.5. of this report for comparable ex-ante estimated ERs in the CPA DDs/2/ for the corresponding period with the actual ERs achieved.</p> <p>The CPAs are within the threshold limits of the applied methodology/6/.</p> <p>The monitoring report was compared and verified against the description provided in the revised accepted PoA-DD/1/ and found to be correct.</p>
Findings	CL#06 was raised and resolved.
Conclusion	<p>In view of the information's verified through the remote audit survey and e-meeting, the verification team is able to confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM program of activities were in place and that the CME has operated the project activity as per the registered PoA-DD/1/ during the concerned monitoring period.</p> <p>The emission reductions achieved during the current monitoring period are 128,917 tCO₂e. The verification has been conducted in-line with the CDM VVS for PoA /9/.</p>

E.2.2. Implementation and operation of the management system

Means of verification	<p>The verification team through interviewing the CME, CPA Implementer, Monitoring Personnel and WPS End-users and reviewing the selected sample videos assessed the management systems in place to implement the monitoring of the PoA. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system through remote audit survey. The roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in the MR /13/ and were verified through interviews with the CME and other people involved in the project.</p> <p>CPA implementers fill purchase order/14/ to note the details of the institution and provide delivery note/21/ at the time of installation (receipt of tablets in case of Ultra TAB). All the information is transferred to Salesforce software by the CME which was checked by interviewing the monitoring personnel to confirm that the management system is in place. The sales database was crosschecked with purchase order, delivery notes and Salesforce data /49/ to confirm that information for any system installed (unique ID) is consistent between the records. The unique ID code of WPS is combination of system type code, year code, country code and a serial number. The unique IDs of the WPS were checked for all the sampled systems surveyed during remote audit survey to ensure that no number is repeating in the database and the same system is not credited in any other CPA either, thus avoiding the double counting.</p> <p>The CME also has a customer care centre which contacts the schools to ensure if the cartridge replacement Ultra FLO or new packets of tablets (Ultra TAB) are required or not.</p> <p>For data survey, a monitoring team was organized by the CME consisting of trained monitoring staff, who conducted the Aquagenx tests (water quality tests) /18/,/30/,/43/ and Usage surveys /18/. The monitoring manager at the CME is responsible for QA/QC of the data, analysis and reporting in the monitoring report. QA/QC procedures were found being as confirmed from the CME during the interview via telephonic call. Scanned copies of purchase order /14/ and completed monitoring survey forms with test results/18/ were made available to the verification team for assessment of the information of institutions and survey and test results, in the sales data /5/ and monitoring data mentioned in ER calculator /4/. Monitoring team staff were interviewed by the verification team regarding the monitoring procedures, using the water quality testing kits and filling the monitoring questionnaires. The staff explained the complete procedure followed for Aquagenx tests and the monitoring survey form filling. The evaluation of the water quality test is done in the country office. The verification team also checked training records of the monitoring & data recording personnel/20/.</p> <p>Based on the above assessment, it can be confirmed that the Implementation and operation of the management system has been done in line with the registered PoA DD/1/ and CPA DDs/2/.</p>
Findings	No findings were raised.

Conclusion	The verification team from the desk review and remote audit survey assessment confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.
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E.2.3. Post-registration changes**E.2.3.1. Corrections**

No correction observed

E.2.3.2. Inclusion of a monitoring plan

N/A

E.2.3.3. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

N/A

E.2.3.4. Changes to the programme design

The request of approval of changes from the PoA as described in the registered PoA-DD was submitted by CME under the following request no. and approval date:

PRC request number	Approval Status	Date of Approval	Reference Link
PRC-9948-002	Approved	03/07/2017	https://cdm.unfccc.int/PRCContainer/DB/prcp445611461/view
PRC-9948-001	Approved	08/05/2017	https://cdm.unfccc.int/PRCContainer/DB/prcp266525508/view

E.2.3.5. Addition of CPA inclusion template

N/A

E.2.3.6. Change of coordination/managing entity

N/A

E.2.3.7. Changes specific to afforestation and reforestation activities

N/A

E.3. Component project activities**E.3.1. Compliance of the CPA implementation with the included CPA design document**

Means of verification	The revised accepted PoA aims to provide safe drinking water to the institutions in Nigeria, Rwanda, Uganda and Kenya. The PoA is primarily designed to replace the existing fossil fuel / non-renewable woody biomass-based means of purifying water by installing low emission / emission free Water purification systems to provide safe drinking water. CERPD is the implementer of the CPAs which are part of this verification and has fully implemented the CPAs (CPA – 9948-P1-0043 to CPA –9948-P1-0077) with the help of Sales and Distribution Partner (SDP). The same has been verified from the agreement between the CME and CPAI/15/. This monitoring period includes the implementation and monitoring of 35 CPAs - CPA 9948-P1-0043-CP1 to 9948-P1-0077-CP1 in Nigeria.						
	The table below provides details on CPA and technology specific figures for this monitoring period:						
	CPA no.	First WPS Installation date	Inclusion date	Crediting period	No. of units (Installed)		Estimated ERs
				FLO	TAB		
9948-P1-0043-CP1	23/04/2019	26/04/2019	26/04/2019-25/04/2026	306	335	13,153	4,376

	9948-P1-0044-CP1	23/04/2019	26/04/2019	26/04/2019-25/04/2026	317	447	13,153	4,922
	9948-P1-0045-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	291	406	13,153	4,874
	9948-P1-0046-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	74	645	13,153	4,812
	9948-P1-0047-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	184	524	13,153	4,196
	9948-P1-0048-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	373	322	13,153	4,325
	9948-P1-0049-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	163	427	13,153	4,580
	9948-P1-0050-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	168	291	13,153	5,374
	9948-P1-0051-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	70	345	13,153	4,820
	9948-P1-0052-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	19	391	13,153	5,498
	9948-P1-0053-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	22	462	13,153	5,015
	9948-P1-0054-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	104	388	13,153	4,711
	9948-P1-0055-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	215	361	13,153	4,326
	9948-P1-0056-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	240	337	13,153	4,570
	9948-P1-0057-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	215	484	13,153	3,891
	9948-P1-0058-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	231	293	13,153	3,861
	9948-P1-	24/04/2019	26/04/2019	26/04/2019-25/04/2026	262	347	13,153	3,774

	0059-CP1							
	9948-P1-0060-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	237	242	13,153	3,761
	9948-P1-0061-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	302	200	13,153	3,815
	9948-P1-0062-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	440	103	13,153	4,174
	9948-P1-0063-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	774	174	13,153	5,729
	9948-P1-0064-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	465	523	13,153	5,776
	9948-P1-0065-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	204	2	13,153	1,195
	9948-P1-0066-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	203	2	13,153	1,321
	9948-P1-0067-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	191	294	13,153	3,902
	9948-P1-0068-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	215	380	13,153	3,804
	9948-P1-0069-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	194	501	13,153	4,408
	9948-P1-0070-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	154	548	13,153	3,904
	9948-P1-0071-CP1	24/04/2019	26/04/2019	26/04/2019-25/04/2026	542	583	13,153	6,571
	9948-P1-0072-CP1	25/04/2019	26/04/2019	26/04/2019-25/04/2026	123	102	13,153	547
	9948-P1-0073-CP1	25/04/2019	26/04/2019	26/04/2019-25/04/2026	171	35	13,153	453
	9948-P1-0074-CP1	25/04/2019	26/04/2019	26/04/2019-25/04/2026	63	143	13,153	323

9948-P1-0075-CP1	25/04/2019	26/04/2019	26/04/2019-25/04/2026	181	24	13,153	622
9948-P1-0076-CP1	25/04/2019	26/04/2019	26/04/2019-25/04/2026	34	173	13,153	322
9948-P1-0077-CP1	25/04/2019	26/04/2019	26/04/2019-25/04/2026	82	121	13,153	365
	As checked from the delivery notes/21/	Checked from the UN website /12/	Checked from the UN website /12/	Checked from sales data base/5/	Checked from sales data base/5/	Checked from the ER sheet/4/	Checked from the ER sheet/4/

The start date of crediting period, inclusion dates of the CPAs were checked from the UN website /12/. The First WPS Installation dates were checked from the screenshots of salesforce database/49/.

The revised accepted PoA-DD page 59 says that *“products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale”*. Thus, any installation in the month of January 2020 will be eligible for crediting only in the month of February 2020. Given the current monitoring period is ending 21st March 2020, therefore only the units installed till the end of February 2020 (up to 29-February-2020) are eligible for crediting under the current monitoring period. Thus, the CME has considered 29-February-2020 as the cut-off date of installation for WPS during current monitoring period.

It has been checked by the verification team from the ER sheet/4/ that the ERs achieved for the CPAs lies between 322 tCO₂e – 5,776 tCO₂e, which is below the threshold of small-scale activity. It has been confirmed that:

1. Each of these CPAs achieves an annual emission reduction equal to or less than 60,000 tCO₂ e per year thus complying with the applied methodology SSC threshold/6/,
2. Each of the technologies installed under these CPAs achieves an annual emission reduction equal to or less than 3,000 tCO₂ e per year (5% of the SSC limit) thus fulfilling the additionality criteria stated in the CPA DD/2/ and PoA DD/1/.
3. Each of the independent subsystems/measures included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the applied methodology (i.e. not exceeding 600 tCO₂e for SSC type III methodologies) thus fulfilling the additionality criteria stated in the CPA DD/2/ and PoA DD/1/.

The implementation of the CPA as mentioned above is within the geographical boundary of PoA-DD/1/, which has been verified using the Latitude and Longitude verification through web application “Google Maps” /41/, discussed already in section E.2.1 above. Impact Carbon is the CME of the CPA and CERPD is the CPAI/15/.

The reference number and the inclusion date of CPAs have been checked and verified from the UN website/12/ and the details are found correct and consistent. The start date of CPAs was confirmed from the delivery notes/21/ shared by the PP. The WPS are installed across the institutions within the boundaries of Nigeria.

The aforesaid CPAs involve dissemination of the following WPS:

1. Chemical Disinfection/Chlorination (UltraFLO / UltraTAB)

The technical description of the systems has been verified under E.2.1 of this report.

It is noteworthy that UltraFLO systems are fixed type of water purification units and can only

	<p>be installed when water is being procured through a piped connection. This WPS type can work only when it is mounted on a piped connection and water flows through them. Hence, the CPA DDs (section A.3.) and monitoring report (section C.1) correctly mention that UltraFLO are fixed type systems and applicable on piped water.</p> <p>The ER sheet, worksheet titled 'MP4 sales database', column Q 'Source' lists the primary water source as surface water, wells etc. besides piped water. The term "piped" water under this column has been used for the schools which receive water from City Council / Government / Municipal Water Connections.</p> <p>In case of UltraFLO, it shall be noted that water is transported from primary water sources such as wells, surface water and boreholes through pipes to drinking water storage tanks in project schools. The Ultra-FLO systems are installed on these pipes.</p> <p>In the absence of a pipeline connection to the drinking water storage tanks, UltraTABs are provided to the schools, which are designed for non-piped applications. An UltraTAB pack consists of 10 strips of 10 tablets each, wherein the tablets can be directly put in drinking water storage tank (@one tablet per 100L of water), thus, is feasible for un-piped applications. In case of UltraTAB, the schools which specify "Piped" as primary water source in column Q, indicate that although water is available via government piped network, but it is not connected with the drinking water storage tank(s). Thus, in such cases, the drinking water storage tank is un-piped making the school fit only for UltraTAB units.</p> <p>During the remote site visit conducted for the current issuance request, as well as, during the physical site-visit conducted for previous batches, it was clearly noted by the verification team that UltraFLO have only been installed on pipeline connections, even when the primary water source is different from City Council / Government / Municipal water connection. Similarly, UltraTABs are administered only in un-piped applications even when the schools may have a piped connection (not connected to drinking water storage tank).</p> <p>Thus, all the systems have been implemented in line with the registered CPA DDs/2/.</p>
Findings	CL#06 was raised and resolved.
Conclusion	<p>a) The verification team is of the opinion that physical features of the CPA have been implemented in accordance with the registered CPA-DD.</p> <p>b) No specific monitoring equipment had to be installed according to the monitoring plan.</p> <p>c) It is also confirmed, through the remote audit survey and review of the supporting documentation that physical features of the component CPAs included under this monitoring report have been implemented in accordance with the CPA-DD.</p> <p>d) The CPA was also found to be completely operational in line with the CPA-DD. However, CME has sought a temporary deviation during the current MP as CME was unable to provide the replacement of the fully consumed systems/ discontinued prior to the start of the current monitoring period to the institutions. (Please refer to section E.3.2.1. of the report for details)</p> <p>e) The information provided in the relevant sections of the monitoring report appropriately describes the implementation and operational status of the PoA</p>

E.3.2. Post-registration changes

E.3.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

The CME has sought a temporary deviation during the current MP (i.e. 01/01/2020 to 21/03/2020) for the systems in the database which were fully consumed/discontinued before the start of the current monitoring period (creditable operational days=0) have not been considered for sampling and monitoring. Since CME could not provide a replacement for these systems to the institutions. Thus, conservatively, the CME has considered 0 ERs from all such systems. Please refer to PRC validation report/52/ for details.

E.3.2.2. Corrections

Not Applicable

E.3.2.3. Changes to the start-date of the crediting period

No changes to the start date of crediting period.

E.3.2.4. Inclusion of a monitoring plan

Not Applicable

E.3.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

Not Applicable

E.3.2.6. Changes to the project design

Not Applicable

E.3.2.7. Changes specific to afforestation and reforestation activities

Not Applicable

E.3.3. Compliance of the registered monitoring plan with applied methodologies and standardized baselines

Means of verification	The monitoring plan as contained in CPA-DDs/2/ were reviewed against the monitoring requirements of the applied methodology AMS-III.AV version 04 /6/ as well as PoA-DD/1/ with reference to the technology involved. Based on this review, it was found that the monitoring plan contained in the CPA DDs/2/ includes all the required parameters to be monitored in the context of the CPA design and description and allows proper determination of emission reductions in accordance with PoA DD/1/ and applied methodology AMS-III.AV version 04/6/.
Findings	No findings were raised
Conclusion	The monitoring plan is in line with the approved methodology AMS III A.V Ver.4/6/, that is included in the CPA-DDs/2/.

E.3.4. Compliance of monitoring activities with the registered monitoring plan**E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period**

Case 1 or Case 2: Project activities implemented in rural or urban areas of countries with proportion of rural or urban population using an improved drinking-water source equal to or less than 60 % (Case1) or above 60% (Case2), Case1 or Case 2

Means of verification	The CPAs located in Nigeria fall under Case 1. It was checked from CPA DDs/2/ and study report MICS 2016-2017 /23/ which states that less than 60% of the country has access to clean drinking water, hence Case 1 is applied.
Findings	No findings were raised
Conclusion	The value applied is found to be consistent with the registered CPA-DDs/2/ which is correct and justified.

Specific Heat of water, WH, Kj/L °C

Means of verification	The value of the parameter is fixed at the time of validation and the value has been sourced from Methodology A.M.S.-III.AV Ver.4/6/. The value considered is 4.186 Kj/L°C and is found to be consistent with the CPA-DD/2/.
Findings	No findings were raised
Conclusion	The value in the MR/13/ and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Final Temperature, T_f , (°C)

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-III.AV version 4.0/6/. The values as available in MR is 100°C which is found consistent with the values in CPA-DD/2/.
Findings	No findings were raised
Conclusion	The value in the MR/13/ and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Initial Temperature, T_i , (°C)

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-III.AV version 4.0/6/. The value considered is 20 °C and is found to be consistent with the CPA-DD/2/.
Findings	No findings were raised
Conclusion	The value in the MR/13/ and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Latent heat of Water Evaporation, WHE, Kj/L

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology A.M.S.III AV- version 4/6/. The value considered is 2,260 Kj/L and is found to be consistent with the CPA-DDs/2/.
Findings	No findings were raised
Conclusion	The value in the MR and ER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DDs/2/. The applied value is correct and justified.

Leakage, L

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the methodology AMS-I.E version 5.0 /25/. The value considered is 0.95 and is found to be consistent with the CPA-DDs/2/.
Findings	No findings were raised
Conclusion	The value in the MR /13/and ER sheet /4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified.

Average volume of drinking water per person per day, R_{yi} , Litres/Person/day

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the report WHO Minimum water quantity needed for domestic use in emergencies /24/. The value considered is 2 Litres/Person/day (for day schools) and 3.5 Litres/Person/day (for boarding schools, prisons) and is found to be consistent with the CPA-DD/2/.
Findings	No findings were raised
Conclusion	The value in the MR and ER sheet /13,4/ are consistent with the registered PoA-DD/1/ & CPA-DD/2/. The applied value is correct and justified.

E.3.4.2. Data and parameters monitored**Quantity of purified water in year y, QPWy (litres/year):**

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.

	<p>Monitoring equipment</p> <p>How were the values in the monitoring report verified?</p>	<p>NA</p> <p>The value applied is 500,336,827 litres/year.</p> <p>The parameter is a calculated parameter determined through following equation:</p> $QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ <p>The formula is correct and in line to the applied methodology/6/, PoA DD/1/ and CPA DDs/2/.</p> <p>The installation for CPAs under the verification has been done between 23/04/2019-29/02/2020.</p> <p>As per the page 59 of revised approved PoA DD/1/, <i>"The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1"</i></p> <p>Thus, for all the WPS installed in January 2020, ERs will be claimed in February 2020.</p> <p>The end date of the monitoring period is 21/03/2020.</p> <p>It shall be noted that the equation stated above, sourced from PoA DD, accounts for 365 days of crediting in a year (or for the duration of the monitoring period in case of shorter monitoring periods). However, the schools don't operate for 365 days in a year. Therefore, the CME has determined operational school days in the monitoring period, as per the academic school calendar issued by "Ministry of Education, Nigeria"/54/ for ER calculations, (ER sheet, Tab MP4 school days/4/). For non-boarding schools, the weekend and school holidays (public holidays, mid-term and end term holidays) have been excluded as a conservative measure. For boarding schools, weekends and short public holidays have been included but the CME has excluded mid-term and end term holidays because the boarding students/staff would still consume water during weekends and short public holidays.</p> <p>The verification team reviewed the Nigerian school academic calendars (2020-21 and 2019-20) issued by the Ministry of Education, Nigeria and found them to be presenting school opening and closure dates covering the entire monitoring period. The Verification team confirms that the calculation of school days in the ER sheet/4/ is correct, in accordance with the relevant academic calendars and results in conservative calculation of ERs.</p> <p>The ER sheet/4/ was checked to confirm that</p>
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		the formula has been applied correctly.
	If applicable, has the reported data been cross-checked with other available data?	Yes. The equation used for the calculation is correct and is sourced from the paragraph 11 of the applied methodology/6/
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#05 was raised and resolved and further FAR#02 has also been raised.	
Conclusion	<p>The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.</p> <p>FAR#02 has been raised for subsequent monitoring periods to ensure that QPW_y is determined accounting the operational school days instead of the duration of the concerned monitoring period, as applicable.</p>	

Efficiency of water boiling system being replaced, η_{wb} , fraction

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined by sourcing a default value from the applied methodology/6/ and multiplying it with the proportion of population of the institutions using different type of stoves.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that all the public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value of 0.1 for unimproved stove was applied.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of entries (11 WPS systems) were surveyed. The head/deputy head teacher of the institutions were interviewed to know the treatment method used in the absence of the WPS installation. All interviewed people replied that unsafe drinking water was used from boreholes/wells and boiling water would have been the cheapest option to get safe drinking water. No other means were deemed affordable by the institutions.
	Does the data management ensure correct transfer of data and reporting of	NA

	emission reductions and are necessary QA/QC processes in place?	
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#02 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Total distributed water purification systems, T_{y,i}, Number

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The total number of systems distributed as reported in the monitoring report are as following:</p> <p>7,829 UltraFLO</p> <p>10,955 UltraTAB</p> <p>Total: 18,784 units</p> <p>The total number of systems reported in the monitoring report on which credits are being claimed are as following:</p> <p>7,268 UltraFLO</p> <p>10,733 UltraTAB</p> <p>Total: 18,001 units</p> <p>Kindly refer section E.3.2.1 above for more details</p> <p>The CME keeps purchase order/14/, delivery notes/21/ and details of each system on salesforce /49/ as checked from the survey videos provided by CME.</p> <p>Each unit of Ultra FLO system has unique ID, which is listed in the database and has been claimed for ERs.</p> <p>For Ultra TAB system, the value of the parameter has been determined by considering each institution as a unit system. Therefore, for institutions with Ultra TAB, the number of tab systems is same as number of institutions.</p> <p>The entries in database were checked to confirm the total number presented in the MR. 11 WPS samples were remotely surveyed also, to confirm that the details of the entries in the database/5/ are correct.</p>

	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of entries (11) were checked with the purchase orders/14/ and the delivery notes/21/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Few of the distributed systems were fully consumed / discontinued before the starting of the current MP and CME was unable supply additional supplies. Thus, as this parameter has not been monitored for 01/01/2020 to 21/03/2020 as per the registered monitoring plan, temporary deviation has been proposed for the same in-line to para 228 of PS for PoA version 2.0 /7/. Please refer to PRC Validation Report /52/ for details
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

The average population serviced by water purification systems, $N_{y,i}$, Persons/equipment

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>At the time of installation, the purchase order form is filled by the CME. This form/14/ notes down the total number of students and staff in boarding/non-boarding schools.</p> <p>These numbers are mentioned for each school in the sales database. For the 11 WPS samples checked by the DOE during the remote audit survey, the same numbers were checked and found to be correct.</p> <p>The CME has also applied formula in the ER sheet/4/ to ensure that the $N_{y,i}$ multiplied by $R_{y,i}$ does not exceed the maximum output of the unit [per unit].</p> <p>An average value of all the adjusted $N_{y,i}$ has been used for ER calculation respective of each CPA. In general, the average of $N_{y,i}$ for all the CPAs was found to be 333 person/technology.</p> <p>The parameter value is noted at the time of installation by the CME and as the number of systems increases over the time, the value gets updated continuously. The institutions were checked to confirm that CME is recording this information in database and the implementation is in line with PoA DD/1/.</p> <p>As per the CPA DDs (9948-P1-0043 to 9948-</p>

		<p>P1-0077-CP1) page 15/2/, The value of $N_{y,i}$ is effectively the number of people in the institution. The number of people in the institution will be updated (at least biennially) to reflect change in the institution size over time. The value will be updated in the sales database biennially.</p> <p>For the current monitoring, the value of the parameter was verified from the sales database /5/ and purchase orders/14/. This parameter is neither prescribed nor monitored by CME on sample basis as per registered monitoring plan. The parameter is monitored on absolute basis for each of the installation.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The values in the ER sheet /4/ were checked with remote audit survey observations by the DOE which was further cross-checked with the purchase orders/14/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	No Findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Water quality measurement, Water Quality_i, Proportion

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	Aquagenx testing kits
	Calibration details	Not Applicable.
	How were the values in the monitoring report verified?	<p>The CME used Aquagenx testing kits to monitor the E.Coli value for sampled institutions.</p> <p>The Head teachers/ Deputy Head teachers of the schools interviewed by the DOE during the remote audit survey confirmed that they were visited by monitoring team for the tests.</p> <p>The monitoring forms/18/, Aquagenx testing kits photographs showing achieved results /30/ for all the institutions were checked by the verification team to confirm the monitoring parameter value. It was found that all the tests gave positive results confirming safe drinking water except three sampled schools. Hence,</p>

		the applied value of 0.96 was found acceptable.
	If applicable, has the reported data been cross-checked with other available data?	Photos of the test/30/ conducted during the monitoring were shared by the CME which confirmed the results in monitoring forms.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The staff conducting the tests were found to be trained, which was confirmed from training evidence/20/ provided by the CME. The training records /20/ confirmed that the tests are conducted and evaluated by trained staff.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#01 and CAR#01 were raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.	

Percentage of the monitoring period in which the units of each technology type are in use, Operational Units, Percentage

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Once per verification
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	<p>Yes. During the current MP and in all the previous MPs, the monitoring frequency followed is found to be adhering to the methodology requirements.</p> <p>Further, the verification team also assessed the PoA validation report CAR 07, page 80 of 106 which confirms that "atleast once per verification" is superseded by "biennial" and the methodology requirements prevails.</p> <p>However, to ensure that under no circumstances, the methodology requirement is compromised in future, FAR#01 has been raised to ensure that monitoring frequency of parameter "operational units", shall be at least biennial, in line with monitoring methodology requirements.</p>
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The sampled systems were checked by the CME's monitoring team to monitor the operational status of the WPS units installed in the institutions as checked from the monitoring survey forms/18/.</p> <p>The Head teachers/ dy. Head teachers at the schools visited by the CME representative during the monitoring</p>

		<p>survey were confirmed to the DOE through the remote audit survey that the monitoring team visited the school for the monitoring.</p> <p>94.06% of the institutions from the total institution visited by the CME representative during the monitoring survey were found to be operational.</p> <p>Thus, the applied value of 94.06% was found acceptable.</p>
	If applicable, has the reported data been cross-checked with other available data?	Results presented in the ER sheet were checked with monitoring survey forms/18/ and remote audit survey visit recordings.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The staff conducting the tests were found to be trained as confirmed from training evidence/20/ provided by the CME confirmed that the tests are conducted and evaluated by trained staff.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#03, and CL#04 were raised and resolved. FAR#01 is raised which shall be addressed in the next verification.	
Conclusion	<p>The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.</p> <p>FAR#01 has been raised to ensure that monitoring frequency of parameter “operational units”, shall be at least biennial, in line with monitoring methodology requirements</p>	

Fraction of woody bio-mass saved by the project activity in year, y, that can be established as non-renewable biomass using national or local statistics, survey results, studies, maps or other sources of information, such as remote- sensing data, f_{NRB} , Fraction

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined by sourcing a default value from UNFCCC SSC WG 37th Meeting Report for Nigeria /26/ and multiplying it with the percentage of population using non-renewable woody biomass / fossil fuel.</p> <p>“AMS-I.E: Switch from Non Renewable Biomass for Thermal Applications by the User” version 5.0 /25/, page 2, states that $f_{NRB,y}$ can be established as non-renewable biomass</p>

	<p>using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (f_{NRB}) values available on the CDM website /44/. Also, as per Clarification on monitoring the quantity of biomass and the fraction of non-renewable biomass under AMS-I.E. (submitted 17 Jun 11): SSC_543, the value of $f_{NRB,y}$ can be fixed ex ante at the beginning of each crediting period /45/.</p> <p>The CME, therefore, fixed the value of f_{NRB} for Nigeria through EB67 Annex 22 /32/ (extension SSC 37 Annex 14th, approved in EB68) /38/ as stated in the registered PoA-DD /1/ at page 69, 82, 100, and 115. However, the $f_{NRB,y}$ was listed as monitoring parameter to allow determination of a weighted average value in case a mixture of woody biomass and fossil fuels is used in the absence of the project activity in line with AMS III.AV. version 4.0, page 6 /6/.</p> <p>The PoA-DD version 7.0 (Section B.7.1.) /1/ states the $f_{NRB,y}$ as a calculated parameter which has a formula:</p> $f_{NRB,y} = [\text{Default } f_{NRB} \text{ value}] * [\% \text{ of users using NRB}] + [1.0^4] * [\% \text{ of users using fossil fuels}]$ <p>The aforesaid formula only keeps the % of users (using NRB / fossil fuel) as a variable and considers f_{NRB} values as a constant (default for NRB and 1.0 for fossil fuel). Thus, the parameter is listed as monitoring parameter only because of the variability attributed to % users using a given baseline fuel type.</p> <p>Since the default value of f_{NRB} has been considered as a constant, the expiry of f_{NRB} value is deemed not applicable to the PoA and included CPAs. Besides, no other method to determine the value f_{NRB} is found listed under section B.7.1 of the registered PoA DD /1/.</p> <p>Additionally, the CME will not apply the updated value of f_{NRB} (i.e., if the host country DNA publish a new value) within this crediting period as it is bound by the requirement stated in the PoA DD (page 69, 82 and 100,115) /1/. This also confirms that only % of users is variable in the monitored parameter.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that all the public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value 100% of users using non-renewable woody biomass / fossil fuel was multiplied with default value of 0.93 UNFCCC SSC WG 37th Meeting Report for Nigeria /26/ to the final value = 0.93, which was applied in the ER calculation sheet/4/. The applied value</p>
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⁴ In line with page 6 of AMS III.AV. - If the displaced fuel is fossil fuel use a default value of 1.0

		was found to be correct. The value has been determined is in line with the PoA DD/1/ and CPA DDs/2/.
	If applicable, has the reported data been cross-checked with other available data?	NA
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	CL#02 was raised and resolved.	
Conclusion	The values in the Monitoring Report /13/ and corresponding Emission Reduction Spreadsheet /4/ are consistent with the revised accepted PoA-DD/1/ and CPA-DDs/2/. The values applied for ER calculations/4/ in the relevant CPAs are correct and justified.	

Emission factor as per AMS-I.E. procedures when NRB is displaced or the emission factor of the fossil fuel substituted, EF projected_fossil fuel, tCO₂/TJ

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The parameter is determined by sourcing a default value from AMS-I.E /25/ and multiplying it with the % population using non-renewable woody biomass / fossil fuel.</p> <p>The GACC report for Nigeria, 2016/16/ was reviewed to confirm that the all public institutions cook with wood on traditional three stone fire.</p> <p>Therefore, a value 100% users using non-renewable woody biomass / fossil fuel was multiplied with default value of 81.6 sourced from AMS-I.E./25/ to give the final value = 81.60, which was applied in the ER calculation sheet/4/. The applied value was found to be correct.</p> <p>The value has been determined is in line with the PoA DD/1/ and CPA DDs/2/.</p>
	If applicable, has the reported data been cross-checked with other available data?	Yes. The value sourced form AMS-I.E./25/ was also cross-checked from the IPCC greenhouse gas inventories report/22/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved	NA

	by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	
Findings	CL#02 was raised and resolved.	
Conclusion	The values in the Monitoring Report /13/ and corresponding Emission Reduction Spreadsheet /4/ are consistent with the revised accepted PoA-DD/1/ and CPA-DDs/2/. The values were found consistent with IPCC default values for fossil fuels /22/. The applied values are correct and justified.	

Existence of public distribution network of safe drinking water, Fraction, Existence of public distribution network of safe drinking water in year y, Fraction

Means of verification	Criteria/Requirements	Assessment/Observations
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
	Monitoring equipment	NA
	How were the values in the monitoring report verified?	<p>The institutions of sampled WPS were visited by the CME's monitoring team to check the existence of public distribution network of safe drinking water as checked from the monitoring survey forms/18/.</p> <p>The Head teachers/ representatives of the schools visited by the CME representative during the monitoring survey were confirmed to the DOE through the telephonic interview that the monitoring team had visited the school for the monitoring.</p> <p>All the institutions of sampled WPS checked by the VT during the remote audit survey were found to not have any access to public distribution network of safe drinking water. Their source of water was found to be Borewell/Well etc. Besides, review of other monitoring survey forms and sales database indicated that safe drinking water based public distribution network was not accessible to project schools.</p> <p>Thus, the applied value of 0 was found acceptable for the current verification.</p>
	If applicable, has the reported data been cross-checked with other available data?	Results presented in the ER sheet were checked with monitoring survey forms/18/ and remote audit survey results /42/.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	The staff conducting the surveys were found to be trained as confirmed from training evidence/20/ provided by the CME. The training records confirmed that the tests are conducted and evaluated by trained staff.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA
Findings	No findings were raised.	

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan/1/ (as per measurement methods and procedures to be applied) and applied methodology/6/. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan/1/.
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E.3.4.3. Implementation of sampling plan

Means of verification	<p>The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD/1/ and CPA DDs/2/.</p> <p>Sampling Design/Target Population/Sampling Frame/Reliability:</p> <p>The CME has applied single sampling plan for all of the 35 CPAs implemented. According to the 'Sampling and Survey standards,' version 8.0 /19/, the sampling plan applied by the PP for the following CPAs are found to be appropriate. As per the sampling plan stated in the PoA DD/1/, a minimum 90% confidence interval and a 10% margin of error requirement is achieved for the sampled parameters. When a single sampling plan covers a group of CPAs or when monitoring is conducted biennially (every two years), confidence/precision of 95/10 for the sample size calculation is applicable. Since the sampling has been done across the CPAs, the CME has taken 95/10 as the confidence precision levels which is found to be in line with the registered monitoring plan/1,2/.</p> <p>The target population for the parameters stated above are Water purification systems⁵ installed / distributed in institutions and recorded in the project sales database</p> <p>Sampling Frame:</p> <p>There are two different type of units under the CPAs. 7,268 UltraFLO units and 10,733 UltraTAB units have been listed in the sales database (these are the units which are being claimed). However, the parameters for monitoring are homologous (i.e. implemented in schools). Thus, the CME has applied a common sampling for all the parameters monitored which was found acceptable.</p> <p>Sampling Method and selection:</p> <p>The CME has applied Stratified Random Sampling by dividing the population into two strata (UltraFLO, UltraTAB). The samples have been chosen randomly from these two strata as checked from the excel sheets with random numbers/33/.</p> <p>Sample Size for Parameter of Interest:</p> <p>The sampling is applied to the following monitoring parameters:</p> <ul style="list-style-type: none"> • Operational Units • Water Quality- Aquagenx Tests • Existence of public distribution network of safe drinking water <p>The sample size is chosen using the equation inline to CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities /31/.</p> <p>In this regard, sample size calculation spreadsheet /4/ was checked and found correct as per registered monitoring plan. The complete details are given in E.3 section of Monitoring Report/13/.</p> <p>Implementation of Sampling Survey and Field Test Records:</p> <p>Based on interviews with the CME and surveyors during the e-meeting of the remote audit survey, in addition to simply asking this question to the end users, the surveyors were also trained to evaluate to results of Aquagenx tests. Therefore, the implementation of CME's surveys and tests /18/ was considered reliable. The</p>
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⁵ The definition of each system considered for ER is different for Ultra FLO and Ultra TAB. Each unit of Ultra FLO having unique ID as listed in the database, is considered as individual system for CER calculations. For Ultra TAB, the value of the parameter has been determined by considering each institution as one system. Therefore, for institutions with Ultra TAB, the number of TAB systems is same as the number of institutions.

	<p>surveyors also took photos of the school name board, test results which was shared by CME /27/ and were checked during the desk-review by the verification team.</p> <p>Monitoring survey (by CME) duration:</p> <p>The monitoring survey (field survey / tests) was carried out by CME representatives between following duration for the current monitoring period.</p> <table><tr><th>CPA Ref.No.</th><th>Technology</th><th>From</th><th>To</th></tr><tr><td>9948-P1-0043-CP1 to 9948-P1-0077-CP1</td><td>Water Purification systems</td><td>04/08/2020</td><td>17/08/2020</td></tr></table> <p>Reliability and precision calculation:</p> <p>The verification team has verified the ER calculation spreadsheets /4/ with the monitored data, where the actual achieved precision is calculated against the Guidelines outlined under CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities, version 4.0 /31/ and confirms that the calculation of achieved reliability was done correctly.</p> <p>All parameters of interest are included in the ER spreadsheet for the revised approved CPAs. These were checked for the input values as well as formula applied and were found consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets /4/ corresponding to final Monitoring Report /13/, which were also found correct. Thus, the verification team confirms that required precision has been met and the results are reliable.</p>	CPA Ref.No.	Technology	From	To	9948-P1-0043-CP1 to 9948-P1-0077-CP1	Water Purification systems	04/08/2020	17/08/2020
CPA Ref.No.	Technology	From	To						
9948-P1-0043-CP1 to 9948-P1-0077-CP1	Water Purification systems	04/08/2020	17/08/2020						
Findings	CAR#01 was raised and resolved.								
Conclusion	The verification team has found out that the sampling plan applied is found to be in-line with the monitoring plan mentioned in the registered PoA-DD/1/ and CPA-DDs/2/ and Sampling and survey standards, ver.8.0 /19/								

E.3.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	No monitoring equipment is required as outline in the CPA-DDs/2/ and revised accepted PoA-DD/1/.
Findings	None.
Conclusion	The verification team has determined that no monitoring equipment has been used by the PP that requires calibration. Furthermore, there was no requirement of calibration in the CPA-DDs/2/. This was in accordance with the accepted monitoring plan and the applied monitoring methodology/6/.

E.3.6. Assessment of data and calculation of emission reductions or net removals

E.3.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>The following equations were used to determine the baseline emissions as provided in the monitoring report /13/ and applied in the corresponding ER calculations sheet /4/. The expressions used were found consistent with the revised accepted PoA DD /1/, CPA DDs /2/ and the applied methodology AMSIII.AV, version 04 /6/:</p> $BE_y = QPW_y * SEC * f_{NRBy} * EF_{\text{projected_fossilfuel}} * 10^{-9}$ <p>Where,</p> <table border="1"> <tbody> <tr> <td>BE_y</td><td>Baseline emissions during the year y in (tCO₂e)</td></tr> <tr> <td>QPW_y</td><td>Quantity of purified water in year y (Liters/yr).</td></tr> <tr> <td>SEC</td><td>Specific energy consumption required to boil one litre of water (kJ/L)</td></tr> <tr> <td>f_{NRB,y}</td><td>Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.</td></tr> <tr> <td colspan="2">For biomass, the default values of f_{NRB} shall be used from</td></tr> </tbody> </table>	BE _y	Baseline emissions during the year y in (tCO ₂ e)	QPW _y	Quantity of purified water in year y (Liters/yr).	SEC	Specific energy consumption required to boil one litre of water (kJ/L)	f _{NRB,y}	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.	For biomass, the default values of f _{NRB} shall be used from	
BE _y	Baseline emissions during the year y in (tCO ₂ e)										
QPW _y	Quantity of purified water in year y (Liters/yr).										
SEC	Specific energy consumption required to boil one litre of water (kJ/L)										
f _{NRB,y}	Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable.										
For biomass, the default values of f _{NRB} shall be used from											

	EB67. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of biomass and other fuels (e.g. fossil fuels) are used, a weighted average renewability factor shall be applied.
EF _{projected_fossilfuel}	<p>Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted</p> <p>Default emission factors from AMS-I.E as referenced in AMS-III.AV version 4 and IPCC shall be used. A survey, national, or regional data is conducted to determine the mix of fuels (% of biomass, % of other fuels) used in the baseline. If a mixture of woody biomass and fossil fuels are used in the absence of the project activity a weighted average value shall be applied, as described in parameter box in section E.2</p>

Specific energy consumption (SEC) i.e. energy required to boil one litre of water is calculated as

$$SEC = [WH \cdot (T_f - T_i) + 0.01 \cdot WHE] / n_{wb}$$

Where

WH Specific heat of water (kJ/L °C)

T_f Final temperature (°C)

T_i Initial temperature of water (°C)

WHE Latent heat of water evaporation (kJ/L)

n_{wb} Efficiency of water boiling system being replaced (fraction)

And QPW_y is calculated through following equation:

$$QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$$

The installation for CPAs under the verification has been done between 23/04/2019-28/02/2020.

As per the page 59 of revised approved PoA DD/1/, "The date of installation for each unit is used to determine the portion of the monitoring period during which the unit was active. Products deployed under the project activity are assumed be in operation as of the start of the next month following the date of sale, i.e. if the date of sale is April 1st, the start of operation is May 1"

Thus, for all the systems installed in January 2020, ERs will be claimed in February 2020. The end date of the monitoring period is 21/03/2020.

The applicable formula is:

$$QPW_y = \sum (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$$

Where:

QPW_y : Quantity of purified water for drinking for all technologies type i in year y (Liters)

N_{y,i}: The average population serviced by water purification systems (person/equipment)

T_{y,i} : Total distributed water purification systems

R_{y,i} : Average volume of drinking water per person per day (Liters/person/day)

Water Quality_i : Proportion of units that meet water quality requirements

Operational Units_i : Percent of the monitoring period in which the units are in use

N_{y,i}: The average population serviced by water purification

systems(Persons/equipment)

Operational Units: Percent of the monitoring period in which the units are in use

Number of days: The equation in CPA DDs uses 365 days (or the duration of monitoring period in case of less than annual monitoring period) for calculating QPW_y .

However, instead of using the duration of monitoring period, the CME has conservatively used operational school days determined as per academic school calendar issued by "Ministry of Education, Nigeria"/54/. For non-boarding schools, the weekends and school holidays (public holidays, mid-term and end term holidays) have been excluded as a conservative measure and for boarding schools, weekends and public holidays have been included but the CME has excluded mid-term and end term holidays because the boarding students/staff would still consume water during weekends and short public holidays as checked in the ER sheet /4/.

Residual capacity from previous MP, considered in the ER sheet:

The DOE checked the ER sheet/4/ and confirmed that the values of 'residual capacity from previous MP' in MP4 ER spreadsheet (tab: "MP4 Sales data, column AB) were verified to be correctly calculated after cross-checking with MP3 ER calculator, the verification team further confirms the following:

In the revised MP4 ER Calculator, the MP3 Sales database has been added (Tab: 'MP3 Sales data – reference only') by the CME. The verification team has verified that information in the revised ER Calculator, Tab: 'MP3 Sales data – reference only' is 100% consistent with the tab: 'Sales database' in the MP3, ER calculator available at UN webpage/53/.

Further, in the revised ER calculator, tab 'MP4 Sales database' column AB, the residual capacity from previous MP has been found to be correctly linked with 'MP3 Sales data – reference only', column AL, thus establishing complete traceability.

The verification team has independently checked MP3 ER calculator from PoA page (9948-MP3-IRP5) and cross-verified the information in the revised ER Calculator, Tab: 'MP3 Sales data – reference only' and found it to be consistent.

In the revised ER calculator, 'MP4 sales database', column AB, for all systems newly installed, the 'residual capacity from previous MP' is also found to be correctly specified as "new installation, not applicable".

Thus, 'residual capacity from previous MP' is confirmed to be calculated correctly in column AB of MP4 Sales database for all schools.

Subsequent supplies:

The total subsequent supplies to any school during the monitoring period are depicted under column AC of the worksheet titled "MP4 sales database". If the residual capacity is high and sufficient for the concerned monitoring period, then no new supplies are required to be sent to the schools.

The schools which have '0' residual capacity (see under column AB, MP4 sales database/4/) from previous MP along with 0 subsequent supplies (see under column AC, MP4 sales database/4/), were verified to have 0 crediting school days (column AO), thus substantiating that no ERs have been claimed for such cases (see column AP, MP4 sales database/4/).

The verification team has verified all corresponding calculations and found them accurate and correct. Thus, it was confirmed that the CME has followed the implementation plan stated in the CPA DDs and claimed ERs only for the systems that are rendering clean water during the current monitoring period by virtue of their residual capacity from previous MP and/or subsequent supplies and/or initial installation capacity, as applicable.

	<p><u>Lifetime of Ultra FLO and Ultra Tab units in ER sheet/4/:</u></p> <p>The verification team further confirmed that UltraFLO/UltraTAB expiry is 5 years/28/. In the CPAs covered in the verification, the first WPS system was installed in April 2019 in Nigeria, thus no device will expire before the end of the current monitoring period.</p> <p>Other Determinants</p> <p>The continuous running end date was merely a determinant to check compliance with the registered monitoring plan requirement and is not linked with lifetime of the installed devices. The same has been removed by the CME from the revised ER sheet to avoid any confusion.</p> <p>The revised ER sheet/4/ tab, 'MP4 Sales Database' ensures that $(N_{y,i} * R_{y,i})$ * operational school days in the monitoring period, do not exceed the available treatment capacity for any unit (column AH). It also confirms that the total consumed capacity (column AM) remains lower of these two in all cases. The is a better approach.</p> <p>The total consumed capacity during the monitoring period (column AM), residual capacity at the end of MP (column AN) and credited operational school days (column AO) have been correctly calculated.</p> <p>The verification team has checked all determinants (column AH:AP) and confirms them to be correctly and accurately calculated and conservative with respect to ER calculations.</p> <p>The calculations for all the CPAs were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance with the applied methodology/6/. The achieved emission reductions in the current monitoring period thus are confirmed to be conservative, accurate and credible.</p> <p>The calculations for all the CPAs (9948-P1-0043-CP1 to 9948-P1-0077-CP1) were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/01/ and in accordance to the applied methodology/6/. The achieved emission reductions in the current monitoring period thus are confirmed to be conservative, accurate and credible.</p> <p>All the parameters are assessed in detail under section E.3.4. of this report.</p>
Findings	CL#05 and CAR#02 was raised and resolved.
Conclusion	<p>The verification team confirms that</p> <ul style="list-style-type: none"> a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter above; c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed; d) Appropriate emission factors, IPCC default factors and other reference values were correctly applied. e) There is no pro-rata approach applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol.

E.3.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	The project activity involves no emissions for type 2 CPAs as it involves dissemination of water purification systems and replaces the non-renewable woody biomass/ fossil fuel way of boiling water with the transitioned way of water purification by the chlorination technologies.
Findings	None.
Conclusion	There is no project emission for Type 2 CPAs. The approach is in line with the PoA

DD/1/.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	<p>The PoA-DD/1/, CPA DDs/2/ and applied monitoring methodologies does not prescribe any leakage emissions to be considered. The remote audit survey and project design also did not reveal any potential source to be considered in this regard. However, the leakage adjustment factor that is required to adjust the baseline emissions has been duly accounted in baseline calculations.</p> <p>BE_y is multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required. Therefore, the leakage is calculated as follows:</p> <p>Leakage = BE_y * (1-95%)</p> <p>The verification team has checked that the calculation for other CPAs (9948-P1-0043-CP1 to 9948-P1-0077-CP1) have also been done in the worksheet 'ERs Summary' /4/ in the same manner.</p> <p>The calculations for all the CPAs (9948-P1-0043-CP1 to 9948-P1-0077-CP1) were checked in the ER sheet/4/ and it was found that calculations have been done inline to the PoA DD/1/ and in accordance to the applied methodology/6/.</p> <p>The cumulative verified value of Leakage for all the CPAs is 6,799 tCO_{2e}. The value is mentioned CPA wise in the table presented under the next section of this report.</p>
Findings	None.
Conclusion	No additional leakage emissions (other than what is already considered in baseline calculations) were required in accordance with the methodology AMS-III.AV, version 04 /6/.

E.3.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	<p>As elaborated above, the entire emission reductions from the PoA were based on baseline emissions. The calculations presented in this regard in the final monitoring report /13/ and corresponding ER calculations sheet /4/ were found appropriate and complying with the provisions prescribed in the registered monitoring plan of respective CPA-DDs/2/, PoA-DD/1/ and applied methodology/6/.</p> <p>The verification team confirms that from the remote audit survey where all the evidence and records that validated the stated figures were checked and found acceptable.</p>
Findings	No findings were raised.
Conclusion	<p>The verification team confirms that</p> <p>a) The complete data was available and is duly reported.</p> <p>b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.5.4 of this report).</p> <p>c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed.</p> <p>d) The total number of ERs achieved (on account of water purifiers installation) during the current monitoring period were 128,917 tCO_{2e}.</p>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO _{2e})	Project emissions or actual net GHG removals by sinks (tCO _{2e})	Leakage (tCO _{2e})	GHG emission reductions or net GHG removals by sinks (tCO _{2e})		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
9948-P1-0043-CP1	4,607	0	231	0	4,376	4,376

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9948-P1-0044-CP1	5,182	0	260	0	4,922	4,922
9948-P1-0045-CP1	5,131	0	257	0	4,874	4,874
9948-P1-0046-CP1	5,066	0	254	0	4,812	4,812
9948-P1-0047-CP1	4,417	0	221	0	4,196	4,196
9948-P1-0048-CP1	4,553	0	228	0	4,325	4,325
9948-P1-0049-CP1	4,822	0	242	0	4,580	4,580
9948-P1-0050-CP1	5,657	0	283	0	5,374	5,374
9948-P1-0051-CP1	5,074	0	254	0	4,820	4,820
9948-P1-0052-CP1	5,788	0	290	0	5,498	5,498
9948-P1-0053-CP1	5,279	0	264	0	5,015	5,015
9948-P1-0054-CP1	4,959	0	248	0	4,711	4,711
9948-P1-0055-CP1	4,554	0	228	0	4,326	4,326
9948-P1-0056-CP1	4,811	0	241	0	4,570	4,570
9948-P1-0057-CP1	4,096	0	205	0	3,891	3,891
9948-P1-0058-CP1	4,065	0	204	0	3,861	3,861
9948-P1-0059-CP1	3,973	0	199	0	3,774	3,774
9948-P1-0060-CP1	3,959	0	198	0	3,761	3,761
9948-P1-0061-CP1	4,016	0	201	0	3,815	3,815
9948-P1-0062-CP1	4,394	0	220	0	4,174	4,174
9948-P1-0063-CP1	6,031	0	302	0	5,729	5,729
9948-P1-0064-CP1	6,081	0	305	0	5,776	5,776
9948-P1-0065-CP1	1,258	0	63	0	1,195	1,195
9948-P1-0066-CP1	1,391	0	70	0	1,321	1,321
9948-P1-0067-CP1	4,108	0	206	0	3,902	3,902
9948-P1-0068-CP1	4,005	0	201	0	3,804	3,804
9948-P1-0069-CP1	4,640	0	232	0	4,408	4,408
9948-P1-0070-CP1	4,110	0	206	0	3,904	3,904
9948-P1-0071-CP1	6,917	0	346	0	6,571	6,571
9948-P1-0072-CP1	576	0	29	0	547	547
9948-P1-0073-CP1	477	0	24	0	453	453
9948-P1-0074-CP1	340	0	17	0	323	323
9948-P1-0075-CP1	655	0	33	0	622	622
9948-P1-0076-CP1	339	0	17	0	322	322
9948-P1-0077-CP1	385	0	20	0	365	365
Total	135,716	0	6,799	0	128,917	128,917

E.3.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" in Nigeria for the monitoring period 01/01/2020 – 21/03/2020 (including both days) amount to 128,917 tCO ₂ .
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	Verified and certified emission reductions as per commitment period:	
	Commitment period	Amount
	Upto 31/12/2012 (1 st commitment period)	0 tCO _{2e}
	From 01/01/2013	128,917 tCO _{2e}
Findings	No findings were raised	
Conclusion	The actual ERs achieved in included CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2/. Accordingly, it was accepted by verification team. The quantitative details of actual values of achieved ERs for the CPA and value estimated in the CPA- DDs/2/ is presented in the next table.	

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
9948-P1-0043-CP1	4,376	13,153
9948-P1-0044-CP1	4,922	13,153
9948-P1-0045-CP1	4,874	13,153
9948-P1-0046-CP1	4,812	13,153
9948-P1-0047-CP1	4,196	13,153
9948-P1-0048-CP1	4,325	13,153
9948-P1-0049-CP1	4,580	13,153
9948-P1-0050-CP1	5,374	13,153
9948-P1-0051-CP1	4,820	13,153
9948-P1-0052-CP1	5,498	13,153
9948-P1-0053-CP1	5,015	13,153
9948-P1-0054-CP1	4,711	13,153
9948-P1-0055-CP1	4,326	13,153
9948-P1-0056-CP1	4,570	13,153
9948-P1-0057-CP1	3,891	13,153
9948-P1-0058-CP1	3,861	13,153
9948-P1-0059-CP1	3,774	13,153
9948-P1-0060-CP1	3,761	13,153
9948-P1-0061-CP1	3,815	13,153
9948-P1-0062-CP1	4,174	13,153
9948-P1-0063-CP1	5,729	13,153
9948-P1-0064-CP1	5,776	13,153
9948-P1-0065-CP1	1,195	13,153
9948-P1-0066-CP1	1,321	13,153
9948-P1-0067-CP1	3,902	13,153
9948-P1-0068-CP1	3,804	13,153
9948-P1-0069-CP1	4,408	13,153
9948-P1-0070-CP1	3,904	13,153
9948-P1-0071-CP1	6,571	13,153
9948-P1-0072-CP1	547	13,153
9948-P1-0073-CP1	453	13,153
9948-P1-0074-CP1	323	13,153
9948-P1-0075-CP1	622	13,153
9948-P1-0076-CP1	322	13,153
9948-P1-0077-CP1	365	13,153
Total	128,917	460,355

E.3.6.6. Remarks on difference from estimated value in included CPA

Means of verification	As verified and evident from the Monitoring Report /13/ and corresponding ER calculations sheet /4/, the actual emission reductions achieved for Water Purification systems for the CPAs under this verification in the current monitoring period were found less than the estimated quantity in the CPA-DDs/2/ for the comparable period. This is largely due to lower number of water purifiers that were installed/distributed in the CPAs compared to that envisaged in the CPA-DDs/2/. Considering, there is no increase in ERs, no further verification effort was put in.
Findings	No findings were raised
Conclusion	The actual emission reductions achieved in any of specific CPAs are not higher than the estimated quantity of ERs in the CPA-DDs/2/. Accordingly, it was accepted by the verification team.

E.3.7. Assessment of reported sustainable development co-benefits

Means of verification	The coordinating/managing entity did not identify and establish the monitoring of the sustainable development benefits of the registered CDM PoA/1/ and no such document was developed and published on the UNFCCC CDM website/12/. Therefore, no assessment is required for the same.
Findings	No findings were raised
Conclusion	The CME is not required to monitor the sustainable development benefits of the registered CDM PoA.

E.3.8. Global stakeholder consultation

Means of verification	The global stakeholder consultation was not found applicable because period under verification is 4 th monitoring period.
Findings	No findings were raised
Conclusion	The requirement is applicable for situations when global stakeholder consultation was carried out after the publication of first monitoring report. Therefore, this was not found applicable.

SECTION F. Internal quality control

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team

During the technical review process, additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized on behalf of Earthood Services Private Limited.

SECTION G. Verification opinion

Earthood Services Private Limited (ESPL), contracted by Impact Carbon (the CME for the PoA), has performed the second independent verification of the emission reductions for the registered CDM PoA 9948 "Impact Carbon Global Safe Water Programme of Activities (PoA)" for the fourth monitoring period 01/01/2020 – 21/03/2020 (both days included) as reported in the Monitoring Report (final) Version 3.0 dated 26/04/2021 /13/. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

This verification report is for the PoA-9948 which was included at the UNFCCC webpage at the end of the current monitoring period.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. This verification report has been prepared using the latest available template/11/ specified by UNFCCC and complies with the instructions to follow of CDM VVS-PoA Version 02/9/.

The verification activities were conducted in accordance with ESPL's CDM Quality Manual System as per the steps indicated under Section A of this report. The verification process has resulted in conclusion that the

included CPAs confirm to the revised accepted PoA-DD/1/ as well as comply with applicable CDM rules and regulations and in accordance with applied monitoring methodologies, AMS III.AV (Version 04)/6/.

As a result, it is confirmed that the emission reductions from the CDM PoA 9948 “Impact Carbon Global Safe Water Programme of Activities (PoA)” are correctly reported in the Monitoring Report Version 3.0 dated 26/04/2021 and corresponding ER sheets for the monitoring period 01/01/2020 – 21/03/2020 (including both days) amount as 128,917 tCO₂e. Therefore, this will be submitted as part of request for issuance as per CDM PCP Version 02/8/.

SECTION H. Certification statement

The verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the PoA for the monitoring period 01/01/2020 – 21/03/2020 (MP 04) are fairly stated in the Monitoring Report (final) Version 3.0 dated 26/04/2021.

ESPL, based on outcome of verification activities, certify that, during the monitoring period 01/01/2020 – 21/03/2020 (including both days), the registered CDM PoA “Impact Carbon Global Safe Water Programme of Activities (PoA)” and the included CDM CPAs achieved the verified amount of 128,917 tCO₂e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPAs.

Appendix 1. Abbreviations

	Full texts
AMS	Approved Methodology for Small-scale
BE	Baseline Emission
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CH ₄	Methane
CL	Clarification Request
CME	Coordinating and Managing Entity
CO ₂	Carbon di oxide
CPA	Component Project Activity
CP	Crediting Period
DNA	Designated National Authority
DR	Desk Review
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
GW	Giga Watt
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
L/min	Litres per minute
LoA	Letter of Approval/Authorization
LSC	Local Stakeholder Consultation Process
MoC	Modalities of Communication
MoV	Means of Validation
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
N ₂ O	Nitrous Oxide
PCP	Project Cycle Procedure
PE	Project Emission
PoA DD	Programme of Activities Design Document
PP	Project Participant
PRC	Post Registration Changes
PS	Project Standard
QA/QC	Quality Assurance/Quality Control
tCO ₂ e	tonnes of Carbon di Oxide equivalent
UID	Unique Identification
UNFCCC	United Nations Framework Convention on Climate Change
V	Version
VVS	Validation and Verification Standard
WPS	Water Purification Systems

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Deepika Mahala		
Country	India		
Education	M. Sc. (Environmental Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU		
Experience	3 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2 & TA 3.1)		
Reviewed by	Shreya Garg	Date	14/09/2018
Approved by	Anshika Gupta	Date	14/09/2018

Competence Statement			
Name	Vaishali Vatsa		
Education	M.Sc. (Environmental Studies and Resource Management), TERI University		
Experience	4 months		
Field	Climate Change		
Approved Roles			
Team Leader	NO		
Validator	Yes		
Verifier	Yes		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	NO		
Reviewed by	Shreya Garg	Date	30/12/2019
Approved by	Anshika Gupta	Date	02/01/2020

Competence Statement			
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Name	Kumden Nanbal Luka		
Country	Nigeria		
Education	B.tech. in Urban and Regional Planning		
Experience	1+ years		
Field	Environment; Urban-Rural planning		
Approved Roles			
Team Leader	No		
Validator	No		
Verifier	No		
Methodology Expert	No		
Local expert	Yes (Nigeria)		
Financial Expert	No		
Technical Reviewer	No		
TA Expert	No		
Reviewed by	Shreya Garg	Date	23/11/2018
Approved by	Anshika Gupta	Date	23/11/2018

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B, ACM0003		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	Date	23/10/2019
Approved by	Anshika Gupta	Date	23/10/2019

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Impact Carbon	Registered PoA-DD Revised Approved PoA-DD (Version 6.1)	Dated:24/03/2014 Dated: 15/02/2017	CME

		Revised Approved PoA-DD Version 7.0)	Dated: 18/04/2017	
2	Impact Carbon	Registered CPA-DD-43 Registered CPA-DD-44 Registered CPA-DD-45 Registered CPA-DD-46 Registered CPA-DD-47 Registered CPA-DD-48 Registered CPA-DD-49 Registered CPA-DD-50 Registered CPA-DD-51 Registered CPA-DD-52 Registered CPA-DD-53 Registered CPA-DD-54 Registered CPA-DD-55 Registered CPA-DD-56 Registered CPA-DD-57 Registered CPA-DD-58 Registered CPA-DD-59 Registered CPA-DD-60 Registered CPA-DD-61 Registered CPA-DD-62 Registered CPA-DD-63 Registered CPA-DD-64 Registered CPA-DD-65 Registered CPA-DD-66 Registered CPA-DD-67 Registered CPA-DD-68 Registered CPA-DD-69 Registered CPA-DD-70 Registered CPA-DD-71 Registered CPA-DD-72 Registered CPA-DD-73 Registered CPA-DD-74 Registered CPA-DD-75 Registered CPA-DD-76 Registered CPA-DD-77	Version 1.0, Dated: 01/04/2019	Other
3	Carbon check India Pvt Ltd.	CPA Inclusion Report (9948- P1-0043-CP1 to 9948-P1-0077-CP1)	Version 1, Dated: 18/04/2019 Version 1, Dated: 30/05/2019	Other
4	Impact Carbon	ER sheet	Version 3.0 dated 26/04/202	CME
5	Impact Carbon	Sales Database	-	CME
6	UNFCCC	Methodology: AMS III A.V.	Version 4	Others
7	UNFCCC	PS for PoA	Version 2	Others
8	UNFCCC	PCP for PoA	Version 2	Others
9	UNFCCC	VVS for PoA	Version 2	Others
10	UNFCCC	CDM-PoA-MR-Form	Version 3	Others
11	UNFCCC	CDM-PoA-VCR-Form	Version 3	Others
12	UNFCCC	PoA UN webpage	https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5J36IFUKQVNMRA00ZPGLH9C7STED1W/viewCPAs?s=0	Others
13	Impact Carbon	Monitoring Report (Final)	Version 3.0 dated 26/04/2021	CME
14	Impact Carbon	Purchase Orders	Various	CME
15	Impact Carbon	Agreement between CME and CPA Implementer	Dated: 17/06/2017	CME

16	GACC	GACC Analysis report (The Truth About Cooking Landscape Analysis, Nigeria)	Dated:14/10/2016	CME
17	DHS	DHS Report, Nigeria 2016	2016	CME
18	Impact Carbon	Monitoring forms (Scanned and filled)	Various (August 2020)	CME
19	UNFCCC	Standards for Sampling and survey for CDM PoA	Version 8.0	Others
20	Impact Carbon	Training Records	-	CME
21	Impact Carbon	Delivery Notes	Multiple Dates: 23/04/2019-29/02/2020	CME
22	IPCC	IPCC default values for fossil fuels	https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf	Other
23	MICS	MICS 2016-2017 survey report for Nigeria	https://www.unicef.org/nigeria/reports/multiple-indicator-cluster-survey-2016-17-mics	CME
24	WHO	WHO Technical Notes on Drinking -Water sanitation and Hygiene	https://www.who.int/water_sanitation_health/emergencies/WHO_TN_10_Hygiene_promotion_in_emergencies.pdf?ua=1	CME
25	UNFCCC	AMS-I.E.	Version 5.0	Other
26	UNFCCC	UNFCCC SSC WG 37 th Meeting Report for Nigeria	http://cdm.unfccc.int/Panels/ssc_wg/meetings/037/ssc_37_an14.pdf	CME
27	Impact Carbon	UID photographs of WPS	-	CME
28	Medentech (technology supplier)	<ul style="list-style-type: none"> a. Technical specification / expiry of UltraFlo issued by Medentech b. Technical specification / expiry of UltraTAB issued by Medentech c. Photographs of UltraTAB strip and UltraTAB pack for the UltraTAB treatment capacity d. UltraFLO dimension declaration by CME e. Photographs of UltraFlo cartridge and UltraTAB pack for the expiry of the UltraFlo and UltraTAB respectively 	-	CME
29	Impact Carbon	Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO 2011)	https://www.who.int/water_sanitation_health/publications/2011/evaluating_water_treatment.pdf	CME
30	Impact Carbon	Photos of Aquagenx test (water quality tests)	-	CME
31	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 4.0	Other
32	UNFCCC	EB 67 Annex 22 https://cdm.unfccc.int/filestorage/H/2/9/H29X6EKQMJU7	11/05/2012	Other

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		RY85DIT4ZPFAL3O1GW/eb67_repan22.pdf?t=ZlZ8cHgxcXQ1fDBaKlvFqRuMIYclRR3nH_se		
33	Impact Carbon	Random number -excel sheet	-	CME
34	Impact Carbon	CME Mail conversation with buyers for delivery commitment	-	CME
35	Impact Carbon	Emission Reduction Purchase Agreement	2016-2020	CME
36	Impact Carbon	Complaint Log (Sample)	-	CME
37	ESPL	Previous Verification report (MP2)	Version 2.0; Dated 28/07/2019	Other
38	UNFCCC	EB68 - meeting report https://cdm.unfccc.int/filestore/age/8/i/KYQVI5N0ABEJX3T68ZDF1M7RCGU9SW.pdf/eb68_report%20v01.1?t=QXZ8cWgzbWZtfDB2p0F4x0TF7eAJLmYt1_yy	20/07/2012	Other
39	ESPL	QMS Manual	Version 3.5, Dated 21/10/2020	Others
40	ESPL	Previous Verification report (MP3)	Version 3.0, Dated 21/08/2020	Others
41	Google	Google Maps	-	Others
42	ESPL	Skype call recordings of the remote surveys	04/11/2020	Others
43	Aquagenx	Aquagenx test module	-	CME
44	UNFCCC	CDM Website URL: https://cdm.unfccc.int/DNA/fNRB/index.html	-	
45	UNFCCC	SSC_543 https://cdm.unfccc.int/methodologies/SSCmethodologies/clearifications/03200	07/10/2011	Other
46	UNFCCC	EB 106 Meeting report	-	Other
47	UNFCCC	EB announcement https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html	23/06/2020	Other
48	New York times	https://www.nytimes.com/interactive/2020/world/asia/india-coronavirus-cases.html	-	Other
49	CME	Salesforce database	Multiple	Other
50	NDTV	Status on Novel Coronavirus Cases in India URL: https://www.ndtv.com/india-news/coronavirus-live-updates-83-64-lakh-covid-19-recorded-in-cases-in-india-2321380	Dated 06/11/2020	Other
51	ESPL	OSV Exemption Request for UN 9948, MP-4, Batch-2.	Approved on Date 28/10/2020 (internal document)	Other
52	ESPL	CPA PRC Validation report	Dated: 18/05/2021	Others
53	CME	ER sheet for MP3-B2 https://cdm.unfccc.int/PoAIssuance/iss_db/poais95886785/view	-	Other
54	Federal	Academic school calendars	Calendar 2019-2020	CME

	Ministry of Education, Nigeria			
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Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	00	Section no.		Date : DD/MM/YYYY
Description of FAR				
Project participant response				Date : DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

There is no outstanding FAR from CPA validation or previous verification report.

Table 2. CL from this verification

CL ID	01	Section no.	E.3.4.2.	Date : 09/11/2020						
Description of CL										
The registered CPA-DDs requires that the water quality will be tested as per paragraph 2(b) of AMS III.AV ver. 4 (i.e. Laboratory test report and/or official notifications (e.g. from national authority on health)). However, the monitoring report shows that Aquagenx testing kits were used to determine the water quality. The CME shall elaborate how it has followed the registered monitoring plan in the included CPA-DDs										
Project participant response				Date : 03/12/2020						
The CPA-DD (CPA43 for instance) on page 4 states the following: “The application of technologies distributed under the CPA achieve compliance with “Interim or higher” performance target as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO 2011) or a comparable national standard or guideline, per the methodology AMS-III.AV Version 4. All technologies that are going to be distributed under this CPA, will be lab tested to ensure they adhere to these guidelines.” This has also been made an eligibility criterion (# 7, page 32 of CPA-DD) for inclusion of a technology in the CPA which states the following:										
<table><tr><td>Eligibility criterion - Required condition</td><td>Supporting evidence for inclusion</td><td>Description of this CPA in relation to the criterion and supporting evidence</td></tr><tr><td>The water purification technology/equipment must achieve compliance with either: a) A relevant national standard or b) The interim performance targets as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011)</td><td>Verifiable evidence: - Laboratory test report and/or official notifications (e.g. from national authority on health). - Technical specifications document(s)</td><td>The water purification technology/equipment are in compliance with the following: (b) The interim performance targets as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011) Supporting Evidence: - Technical specifications document(s)</td></tr></table>					Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence	The water purification technology/equipment must achieve compliance with either: a) A relevant national standard or b) The interim performance targets as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011)	Verifiable evidence: - Laboratory test report and/or official notifications (e.g. from national authority on health). - Technical specifications document(s)	The water purification technology/equipment are in compliance with the following: (b) The interim performance targets as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011) Supporting Evidence: - Technical specifications document(s)
Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence								
The water purification technology/equipment must achieve compliance with either: a) A relevant national standard or b) The interim performance targets as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011)	Verifiable evidence: - Laboratory test report and/or official notifications (e.g. from national authority on health). - Technical specifications document(s)	The water purification technology/equipment are in compliance with the following: (b) The interim performance targets as per “Evaluating household water treatment options: Health based targets and microbiological performance specifications” (WHO, 2011) Supporting Evidence: - Technical specifications document(s)								
Thus, the project technology (Ultra TAB, Ultra Flow) needs to demonstrate that they comply with WHO, 2011 interim performance targets as per aforesaid. This has already been confirmed via the technical specifications listed in CPA-DD wherein Log 2 reduction is achieved by Chlorination systems (as mentioned in CPA 43 CPA-DD on page 5). Thus, the technology’s compliance with interim measures has already been demonstrated.										

For ex-post water quality monitoring, the CPA-DD refers to the following:

“As per the World Health Organizations Guidelines⁶ it is more cost-effective and feasible to monitor indicator organisms such as E.coli. Monitoring of proxies such as E. Coli, faecal coliform counts, chlorine levels may be used to assess water quality. CPA implementer shall be responsible for conducting testing. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used. CPA implementer shall be responsible for conducting testing”.

The CME has used Aquagenx Compartment Based Test (CBT) E.Coli / Total Coliform (ECTC) testing kits to monitor E.Coli as the indicator organism to test the quality of water. Aquagenx CBT ECTC testing Kits are used extensively across the globe in low resource areas. The Aquagenx Test is very effective testing method in terms of flexibility wrt transportation, for cases involving institutional and community engagement. The test kits detect and quantify E.Coli in 100 mL samples.

The water quality assessment using Aquagenx CBT ECTC testing kit follows a standard testing procedure. Each kit includes a sample collection Whirl-Pak Thio-bag and a powder growth medium pack. The powder growth medium has a glucose substrate called X-Gluc. When E. coli metabolize this substrate in Aquagenx's growth medium, the color of the water turns blue, indicating the presence of E. coli.

The Aquagenx CBT ECTC is a laboratory-based test with provisions for sample collection in the field directly. Given the project systems are installed in institutions, thus, the water quality sample collection can only be done in the field. The portable water sample collection bags provisioned in Aquagenx CBT ECTC testing kit, renders it as a preferred and viable option for testing water quality for project devices installed in institutions and schools under the PoA.

The following standard sample collection procedure is followed:

1. At the time of sample collection in the field - the Whirl-Pak Thio-bag is labeled with the name of the institution, date and time of sample collection and the unique SF ID for that institution.
2. After labelling the bag, it is filled with 100 ml of water from the project system being monitored.
3. The powder growth medium is added to the Whirl-Pak Thio bag. The Whirl-Pak seal is rolled down and the Thio-bag is closed shut. This ensures that the sample collections remain free from any external contamination.
4. The powder medium is dissolved by gently swirling the bag.

The sealed Thio bag is then incubated in the in-house lab in the Impact Water's office. The incubation is an ambient temperature incubation for 48 hours. The incubation for 48 hours ensures that even the trace presence of E.Coli gets detected in the water sample collected. The bags are incubated in controlled environment in the lab to prevent contamination and health hazard in the Impact Water's office.

After the incubation of 48 hours the results of the water quality test are read by the qualified lab technician. A blue/green color indicates presence of E.Coli in water sample. After the test is completed, chlorine tablets are added in the Thio bag and stranded for 30 minutes to ensure decontamination. The decontaminated water sample is then discharged in the in-house lab itself.

Thus, the water sample collection and testing have been conducted by trained staff with extensive prior experience of water quality testing using Aquagenx CBT ECTC testing kits. The same was cross verified by the Verification Team via interviews with the water quality testing staff wrt testing protocol, process of sample collection, testing procedure followed, test results assessment etc. The Verification Team also reviewed photographic evidence of water quality samples and test results to confirm the accuracy to results reported by the CME.

For details, refer the testing protocol is available at the following link:

<https://www.aquagenx.com/wp-content/uploads/2020/05/PA-CBT-ECTC-Instructions-DrinkingWater-May2020.pdf>

The use of Aquagenx CBT ECTC testing kit for determining water quality is therefore in line with the registered CPA-DDs as well as monitoring methodology. The tests have been conducted by trained staff with extensive prior experience of water quality testing.

Further, various studies conducted across many locations and environments around the world by academic institutions, national government agencies, international NGOs and United Nations agencies confirm that, the Aquagenx test a Compartment Bag Test (CBT) gives results comparable with more complicated, expensive and less portable tests conducted otherwise.

A paper published in “The American Journal of Tropical Medicine and Hygiene, Volume 96, Issue 4, 5 Apr 2017, p. 970 – 975⁷ states that:

⁶ WHO 'Guidelines for Drinking-water Quality, Fourth Edition Page 41.

⁷ <http://www.ajtmh.org/content/journals/10.4269/ajtmh.15-0717>

....., and one sample using membrane filtration (MF) was analyzed by reference laboratories. There were no statistically significant differences in *E. coli* concentrations between the field and laboratory CBT results, or when compared with MF results. These results suggest that the CBT for *E. coli* is an effective method to quantify fecal bacteria in household drinking water. The CBT can be incorporated into DHS and other national household surveys as a direct measure of drinking water safety based on microbial quality to better document access to safe drinking water.

Thus, the testing technology deployed by the CME/CPAI is deemed accurate, credible and reliable.

Documentation provided by project participant

N.A.

DOE assessment

Date: 09/12/2020

The applied methodology requires the water quality to be monitored following para 2(b) of the applied methodology.

As per paragraph 2(b) of the applied methodology:

"It shall be demonstrated based on laboratory testing or official notifications (for example notifications from the national authority on health) that the application of the project technology/equipment achieves compliance either with: (i) at a minimum the performance target as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011); or (ii) an applicable national standard or guideline"

As responded by CME above, they have used Aquagenx Compartment Based Test (CBT) E.Coli / Total Coliform (ECTC) testing kits to monitor E.Coli as the indicator organism to test the quality of water. The CME has also explained clearly that the test with its protocol (<https://www.aquagenx.com/wp-content/uploads/2020/05/PA-CBT-ECTC-Instructions-DrinkingWater-May2020.pdf>) qualifies as laboratory test and meets the compliance required by applied methodology.

The monitoring team was also interviewed during the remote audit, during which they confirmed the entire process they follow for collecting each sample, handling the sample, reading results etc. and also confirmed that they have received training before conducting the test.

Thus, the results from the Aquagenx tests conducted by the monitoring team were found to be reliable and meeting the conditions of the applied methodology.

The CL stands closed.

CL ID	02	Section no.	E.3.4.2.	Date	09/11/2020
Description of CL					
For the parameters $f_{NRB,y}$, η_{wb} , and $EF_{projected_fossilfuel}$, Section B.5.2 (a) (i) mentions that the parameters will be monitored based on the default value multiplied with the national, regional data or survey. The default values are mentioned as f_{NRB} being 0.93 from UNFCCC SSC WG 37 th Meeting Report for Nigeria, η_{wb} being 0.1, and $EF_{projected_fossilfuel}$ 81.60 tCO ₂ /TJ. This data is combined with the national data, a report titled "The Truth About Cooking Landscape Analysis, Nigeria", 2016 by GACC. PP is requested to clarify the validity of a 2016 study being the most recent data.					
Project participant response					Date
The parameter $f_{NRB,y}$, η_{wb} , and $EF_{projected_fossilfuel}$ are monitoring parameters. The parameters have been determined as follows:					03/12/2020
<ul style="list-style-type: none"> The parameter $f_{NRB,y}$, is determined using "UNFCCC SSC WG 37th Meeting Report for Nigeria, an extension of EB 67 annex 22" default values for f_{NRB} for LDCs and SIDS, combined with survey, national, or regional data to determine the % of users using given fuel type (biomass / fossil fuels) as per the registered PoA-DD. The parameter η_{wb}, is determined using "Methodology AMS.III.AV - Version 4" default values combined with survey, national, or regional data to determine the % of users using given cooking technology (Unimproved biomass burning stove/ Other biomass burning stove/ Fossil fuel stove) as per the registered PoA-DD. The parameter $EF_{projected_fossilfuel}$, is determined using "AMS-I.E. as referenced by AMS-III.AV Version 4 for EF_{NRB} and IPCC default values for fossil fuels combined with survey, national, or regional data to determine the % of population using non-renewable / fossil fuel as per the registered PoA-DD. 					
The CME has used published data to determine the % of users using biomass/ fossil fuel, % of users using unimproved biomass burning stove/ other biomass burning stove/ Fossil fuel stove and % of population using					

non-renewable / fossil fuel.
No more recent national data for schools in Nigeria, providing information on % of users using biomass/ fossil fuel, % of users using unimproved biomass burning stove/ other biomass burning stove/ Fossil fuel stove and % of population using non-renewable / fossil fuel is available hence the use of the aforesaid report for is deemed appropriate. Please note that these types of studies are time taking and usually occur after 5 years or more. Lastly, please refer the registered CPA-DD which provisions for use of values established in previous monitoring period in case more recent data is not available.
Documentation provided by project participant
N.A.
DOE assessment
Date: 09/12/2020
The parameter $f_{NRB,y}$ (fraction of non-renewable biomass), source of data i.e. "UNFCCC SSC WG 37th Meeting Report for Nigeria" mentioned in the MR (Page-21) is an extension of "EB 67 annex 22, as per para 3 of UNFCCC CDM-SSC WG 37th Meeting Report Annex 14" ⁸ . The SSCWG presented an information note giving default f_{NRB} values for various countries which was approved in EB67 as Annex 22 (refer EB meeting 67 meeting report, para 92). In EB 67, The EB further requested the secretariat, in consultation with the SSC WG, to continue to determine f_{NRB} factors for Parties with 10 or less registered CDM project activities as of 31 December 2010 and recommend to the Board default values for application in these countries (EB 67 meeting report, para 93). The SSC WG published another information note in SSC WG 37 (annex 14) providing default f_{NRB} value for Nigeria which was subsequently approved in EB68 (refer EB68 meeting report, para 106). The source of data of parameter f_{NRB} , is rectified in MR and ER Sheet to be consistent with each other The revised MR and ER Sheet are being submitted.
Thus, the CL is closed.

CL ID	03	Section no.	E.3.4.2.	Date : 09/11/2020
Description of CL				
The CME shall provide clarification how it ensures the operation of the project activity and continuous availability of safe drinking water, considering that the monitoring method was based on survey questionnaire alone (e.g. the question "When was the last time, a supply of cartridges/tablets were received?") and no information is provided regarding the crosschecking of the monitored data against other sources such as quantity of chlorine/No. of cartridges used during this monitoring period.				
Project participant response				Date : 03/12/2020
<p>Firstly, the monitoring methodology para 15 states:</p> <p>"Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance as per the relevant sampling requirements of AMS-I.E".</p> <p>Para 16(b) of the methodology states:</p> <p>"The quantity of purified water in year y shall be derived from the capacity of the equipment established by manufacturers' specifications and the number of functional project appliances as per paragraph 15"</p> <p>Thus, the continuity of service (continuous availability of safe drinking water) is to be determined via ex-post sampling and if the project device is found functional during ex-post monitoring, the continuity of service is deemed being maintained over the entire monitoring period.</p> <p>However, during the ex-post monitoring, the CME has taken additional measures to ensure continuous availability of safe drinking water as follows:</p> <p>The monitoring survey form consists of the following questions:</p> <p>Question pertains to continuity/Maintenance:</p> <ul style="list-style-type: none"> Has routine supply/maintenance been conducted for the IW System? (Yes/No). When was the last time supply/maintenance was conducted? (DD-MMM-YYYY). <p>Question pertains to usage:</p> <ul style="list-style-type: none"> Is the IW unit being used for water treatment? (Yes/No) Presence of other water treatment technologies / devices in the institution 				

⁸ https://cdm.unfccc.int/Panels/ssc_wg/meetings/037/ssc_37_an14.pdf

The question pertaining to continuity /maintenance is intended to ensure that the user is receiving regular supplies / maintenance which ensures system's continuity. The date of last supply / maintenance serve as an objective evidence to cross-verify regular supplies/ maintenance being received by the user at the time of survey.

Further the date of last supply / maintenance provides the surveyor an option to check if last delivery has reached the user and have been put in use. This is achieved by physically cross verifying the product ID mentioned in the last delivery note / installation log with the system found installed on site (TAB packs available in case of UltraTAB and cartridge installed in case of UltraFLO). This also confirms that earlier supplies have been consumed, ensuring continuous availability of safe drinking water.

The questions related to usage confirms that the system is function as per para 16. Additionally, none of the monitored schools were found using any other form of water treatment technology / device. This further substantiates imperative use of project devices, given drinking water is a basic sustenance need, and continuity of use.

In addition to aforesaid the CME has the following system to ensure continuous availability of the safe drinking water in the institutions:

- At the time of installation/distribution of the water purification systems (WPS) in the institution, the CME train the institution staff on usage of the WPS to ensure that the project devices are put to use and any apprehension regarding their quality and safety is resolved.
- The CME Call Center in the country offices, regularly follow ups with the institution regarding operational status of the project system of their installed WPS as well as the expected date of next supply. The schools are supplied with reinforcements in time to ensure system's continuity.
- Additionally, the CME country office contact detail is available in the system Purchase Order and Delivery Notes available with institution and also pasted on the system tank or school wall in form of sticker. The institution can anytime call the CME office for the subsequent supply of the UltraTab pack or UltraFlo cartridge if needed, or as and when required. It has been verified by the DoE during remote assessment that schools are aware of the phone number to contact in case of needing maintenance / supplies.
- Lastly, the subsequent supply of the UltraTab packs and UltraFlo cartridges in the institution is recorded in the CME database management software (SalesForce). The information on each supply made during the monitoring period (product quantity and serial number) has been provided for each school as well as for each supply (refer ER calculator, worksheet "Sales database" column R: AA). The details of these supplies have also been cross verified against the delivery notes / installation records available at the CPAI office, by the DoE during remote assessment. Also, the DOE has cross verified the product ID reported in the last supply with the product ID found mentioned on the physical systems on site for sampled schools.

The above sales and monitoring provisions ensure as interrupted supply of safe drinking water in the institution.

Documentation provided by project participant

N.A.

DOE assessment

Date: 09/12/2020

The continuous availability of safe drinking water is ensured by confirming the operational status of sampled systems and checking the provisions put in place by the CME other than the survey questionnaire.

During the survey, the CME checks that continuous supply of cartridge/tablets, through the questions stated above as 'Question pertaining to continuity/Maintenance' and also checks the operational status through 'Question pertaining to usage' stated above.

The questions pertaining to continuity/maintenance ensures that the institution is receiving continuous supplies and questions pertaining to usage confirms that those supplies are being used. Any institution reporting the product as being functional, cannot be out of supplies.

All the institution heads of "DOE sampled systems" were interviewed by the verification team to confirm that the product installed in the school was currently in operational condition and they have been receiving continuous supply of cartridge/tablets thus, getting continuous supply of safe drinking water.

Additionally, the DOE checked the provisions in place to ensure continuous supply of safe drinking water

- The institution head confirmed during the interview that staff from the institution have received adequate training on the usage of the installed WPS. They can detect if they are running out of

supplies(cartridge/tablets) and accordingly contact the CME/CPAI for subsequent supplies to ensure continuous availability.

- The CME representatives interviewed during the remote audit confirmed that they have a Call Centre in the country offices which regularly takes follow up calls with the institutions regarding usage and headcount to gauge the expected date of next supply.
- The copies of Purchase Order and Delivery Notes and the presence of customer care number/email for supply / repair on the system's tank or school wall in form of sticker were checked to confirm that the CME country office contact detail is available to the institution staff and they can contact the CME in case they find any problem with the product or need additional tablets / cartridges. Moreover, during the remote survey calls, the institution heads confirmed to the verification team that they are aware about the contact number to which they can register their complain regarding the product or their request for supplies.
- The CME provided a detailed sales database which records the subsequent supplies with their product IDs for each institution, which is presented in the ER sheet (refer ER calculator, worksheet "Sales database" column R:AA). The CME has provided scanned copies of delivery notes available at the CPAI office to the verification team for cross verification of the subsequent supplies made to an institution. The verification team had checked it for the sampled institutions. The evidence reviewed confirmed the quantities of supplies mentioned in the ER sheet.

Thus, the verification team confirms that all the institutions (with systems claiming emission reductions) have received continuous supply and provide continuous safe drinking water during the monitoring period.

Thus, the CL stands closed.

CL ID	04	Section no.	E.3.4.2.	Date : 09/11/2020
Description of CL				
The CPA-DDs indicate the monitoring frequency for the parameter "operational units" as "At least once per verification or biennially as per the monitoring requirements in the methodology". The applied methodology (AMS-III.AV. ver. 04, paragraph 15) requires "at least once every two years (biennial)". The CME shall provide further information on how the monitoring plan complies with the applied methodology.				
Project participant response				Date : 03/12/2020
As per the applied methodology AMS-III.AV version 04.0 <i>"Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance as per the relevant sampling requirements of AMS-I.E"</i> .				
The monitoring frequency of "at least once every two years", is deemed the maximum duration over which the parameter must be monitored at least once.				
The term "per verification", on the other hand is provisioned to cover cases when the verification is being conducted for a monitoring period which is less than two years. For example, refer the following:				
MP#	Duration	Start date of Monitoring	Justification	
2	23 May 2017 – 22 May 2019	21 May 2019	--	
3	23 May 2019 – 31 Dec 2019	12 Jan 2020	MP3 is less than 2 years, still monitoring done again in Jan 2020 despite monitoring done in MP2 in Nov 2019	
4	01 Jan 2020 – 21 Mar 2020	04 Aug 2020	MP4 less than 2 years since MP3, still monitoring done again in Aug 2020 despite monitoring done in MP3 in Jan 2020.	
This approach avoids application of values established in previous monitoring period (in above example, values determined in MP3), to the current monitoring period (MP4) without monitoring the parameter (because the monitoring frequency is once every two years). Thus, the monitoring frequency of "at least once per verification" applicable to shortened MPs results in yielding more representative and accurate results of monitoring parameter rather than applying the values established in the previous monitoring period.				
Further, the "biennial" monitoring frequency supersedes "per verification" and not the other way around. Thus, in case of a verification covering more than 2-year monitoring period, the PP shall need more than a singular monitoring event to ensure "at least biennial" monitoring frequency is met.				
Lastly, the monitoring period under concern as shown in table above still remains within the "biennial" monitoring frequency.				

Thus, the monitoring plan and the concerned monitoring report is compliant with the monitoring methodology.	
Documentation provided by project participant	
-	
DOE assessment	Date: 09/12/2020
<p>The applied methodology AMS-III.A.V. version 4.0 prescribes the parameter to be monitored at least once every two years (biennial) to ensure that they are still operating or are replaced by an equivalent in service appliance.</p> <p>The word 'atleast' in the required frequency atleast biennial does not refrain the CME to conduct the monitoring with a better frequency and a higher frequency (i.e. more than once in two years) is still in line with the requirement.</p> <p>The CPA-DDs stating the monitoring frequency for the parameter "operational units" as "At least once per verification or biennially as per the monitoring requirements in the methodology" is still in line with the applied methodology AMS-III.A.V. version 4.0.</p> <p>The CME has demonstrated in the table above that the parameter is monitored at a frequency higher than the minimum required frequency. The results from the sampling surveys conducted for every verification are deemed more accurate than following a at-least biennial monitoring frequency. Thus, the approach was found to be in line with the applied methodology and was accepted by the verification team.</p> <p>Finding re-opened. - 16/04/2021</p> <p>UN Issue#2</p> <p>The CME shall demonstrate the compliance of the monitoring plan with the applied methodology, in particular the monitoring frequency of parameter "operational units", since the CPA-DDs states that the monitoring frequency for the parameter as "At least once per verification or biennially as per the monitoring requirements in the methodology", which could lead to possibilities whereby the monitoring frequency not meeting methodology requirement (i.e. at least once every two years) when the verification / monitoring period is conducted with a time gap of more than two years.</p>	
Project participant response	Date: 11/05/2021
<p>CME would like to clarify that the term "at least" is deemed binding to both "once per verification" as well as "biennially as per the monitoring requirements in the methodology" and not to "once per verification" alone. Thus, under no circumstances, the monitoring frequency will extend beyond two years and shall remain compliant with the monitoring methodology requirement always. Further, please refer to the PoA validation report, CAR 07, page 80 of 106 which states the following:</p> <p><i>"The PP revised the monitoring frequency to be "At least once per verification or biennially as per the monitoring requirements in the methodology" to ensure that the methodological requirements are met (at least biennial) and that each verification is based on relevant monitoring results."</i></p> <p>Thus, this substantiates that "at least once per verification" was provisioned in the PoA-DD to prohibit the CME apply the value established in a given MP to the following MP (without monitoring it again) for cases where the combined length of two consecutive MPs is less than two years.</p> <p>Please refer all previous monitoring periods for different batches where dedicated monitoring for each monitoring period has been conducted despite them being even less than one year duration. For example, the monitoring in MP3 was conducted in Jan-Feb 2020 and the monitoring in MP4 was conducted in Aug 2020 whereas combined duration of these two monitoring periods is less than one year.</p> <p>Also, for the first monitoring period, although the monitoring period was longer than 2 years (30/05/2014 – 22/05/2017) and was covered under single verification, the CME did not claim any ERs for the period 30/05/2014 – 21/05/2015 and followed the "at least biennially" monitoring frequency to ensure that methodology prevails over such cases.</p> <p>Hence, the CME affirms that in no case the methodology requirements with respect to monitoring frequency would be compromised.</p>	
Documentation provided by project participant	
PoA 9948_MP4_CERPD Nigeria ER Sheet_ver_3.0 26042021	
DOE assessment	Date: 18/05/2021
<p>The applied methodology AMS-III.AV. version 4.0, para 15, states that "Monitoring shall consist of checking of all appliances or a representative sample thereof, at least once every two years (biennial) to ensure that</p>	

they are still operating or are replaced by an equivalent in service appliance".

The CPA DDs mention under section B.5.1., that for the parameter 'Operational Units', the frequency is 'at least once per verification or biennially as per the monitoring requirements in the methodology'. For current issuance request, the frequency required by the applied methodology has been met.

As explained by CME and confirmed by the verification team, in the all the previous monitoring periods, the monitoring frequency followed is found to be adhering to the methodology requirements.

Further, the verification team also assessed the PoA validation report CAR 07, page 80 of 106 which confirms that "atleast once per verification" is superseded by "biennial" and the methodology requirements prevails.

Based on above, the monitoring frequency stated in the monitoring plan is deemed in compliance with the monitoring methodology.

However, to ensure that under no circumstances, the methodology requirement is compromised in future, FAR#01 has been raised to ensure that monitoring frequency of parameter "operational units", shall be at least biennial in line with monitoring methodology requirements.

CL ID	05	Section no.	E.3.4.2.	Date : 09/11/2020
Description of CL				
The CME shall provide information how it considered application of 365 days as appropriate for the calculation of the total quantity of water purified during the year y, considering that the CPA-DDs indicate that the quantity of purified water is based on the "average population serviced/system" while the systems do not service the population during periods when population (i.e. the students) are on holidays.				
Project participant response				Date : 03/12/2020
The CPAs supply safe drinking water to institutions (day schools, boarding schools, prisons etc.). The application of 365 days of operation for the project units is justified on the basis of the following:				
<ol style="list-style-type: none"> I. The number of days of operation is mentioned as 365 days in the registered PoA-DD (refer equation 1.a. on page 70 of the registered PoA-DD). Similarly, the CPA-DDs also mention 365 days of operation in the ER calculation formulae. II. Besides, the number of days of operation is neither an ex-ante parameter nor an ex-post monitoring parameter as per the monitoring methodology or the registered monitoring plan in the PoA-DD. III. The application of 365 days of operation per year for project units is also corroborated by the subsequent versions of the methodology (refer para 17 of AMS-III AV. Version 08.0). IV. Last but not the least, the applied methodology (AMS III.AV version 4.0) caps the volume of drinking water per person per day at 5.5L/capita/day. The PoA has applied a much more conservative cap of 2L/person/day (for days school) and 3.5L/person/day (for boarding schools /prison). These limits are already attributed to minimum survival levels advocated by WHO (Minimum water quantity needed for domestic uses, Technical Note No. 9, WHO/SEARO Technical Notes for Emergencies). Table 1 of the referred document mentions that minimum survival allocation for domestic use (i.e. full day service deemed equivalent to boarding schools and prisons) as 7 l/capita/day (sustainable only for few days), out of which 3-4 ltr is attributed solely for drinking. For schools, it specifies 2 ltr per student per day as the minimum requirement. Also, Water, Sanitation and Hygiene Standards for Schools in Low-cost Settings, published by WHO specified a basic water requirement of 5 l/per/day for day / non-residential schools and 20 ltr/per/day for boarding schools (Page 18, Water, Sanitation and Hygiene Standards for Schools in Low-cost Settings, Indicators for Guidelines). Thus, a consideration of 2 ltr/per/day for day schools and 3.5 ltrs/per/day for boarding schools/prisons is already referring to minimum survival levels and is overly conservative and deemed applicable to entire year. V. Lastly, the weighted average value if $R_{y,i} = 2.02$ which is much less than a default value of 3 ltrs per person per day given by AMS III.AV. version 8.0 that is also at 365 days of crediting. 				
The aforesaid approach has been discussed (via a clarification request from CDM EB) and approved by				

CDM-EB during PRC-9948-003. Please refer document DOE clarification 8 – “FVR 599 CPA 5 to 13 PRC VR Nigeria 25.03.19 clean”, page 20 of 26, CAR 01 dated 21/01/2019. (<https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view>)

Documentation provided by project participant

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DOE assessment Date: 09/12/2020

The application of 365 days as the number of days of operation for the project units, was found to be acceptable because of following justifications provided.

- I. Both PoA-DD and the CPA-DDs mention 365 days as the number of days of operation as verified from page 70 of PoA-DD and ER formulae of the CPA-DDs.
- II. Again, days of operation, was neither found to be an ex-ante parameter nor to be an ex-post monitoring parameter as verified from the registered monitoring plan.
- III. The applied methodology (AMS-III AV. Version 04.0) and subsequent versions of the applied methodology (AMS-III AV. Version 08.0) were reviewed and it was confirmed that value of 365 days for the days of operation has been applied in the applicable formulae and sample calculation shown in the methodology.
- IV. The capped volume of drinking water per person per day of 2L/person/day (for day school) and 3.5L/person/day (in boarding school) in the PoA was found to be conservative as these values were found to be meeting the minimum survival levels set by WHO. As per Technical Notes for emergencies by WHO, the minimum survival capacity has been allocated as 7 l/capita/day (sustainable only for few days), out of which 3-4 ltr is attributed solely for drinking. For schools, it specifies 2 ltr per student per day as the minimum requirement. Also, minimum requirement for day schools were found to be 5l/person/day and 20l/person/day as verified from water sanitation and Hygiene standards for Schools in Low-cost settings by WHO. Thus, following the above, the CME's approach of considering 2 ltr/per/day for day schools and 3.5 ltrs/per/day for boarding schools/prisons were found to be conservative and deemed acceptable. This, approach has already been discussed and approved by CDM-EB as verified from DOE clarification 8 “FVR 599 CPA 5 to 13 PRC VR Nigeria 25.03.19 clean”

Hence, application of 365 days of crediting for a system is deemed appropriate and in line with applied methodology and registered PoA/CPA-DD.

Finding reopened on 16/04/2021:

UN Issue# 04

The CME shall justify the appropriateness of applying the entire days covered by the monitoring period when calculating parameter QPW_y (i.e. quantity of purified water for drinking during the year y), given the facts that the systems do not service the entire population (i.e. the students) during the school holidays. Further, the CME should also check following clarifications issued by the Meth Panel in this regard.

a. SSC_795: <https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/05721>; and

b. SSC_792: <https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/57226>

Project participant response Date: 11/05/2021

The number of school days in ERs Summary tab (refer row 6), has been adjusted to correspond to only operational school days instead of complete duration of the monitoring period.

As a conservative measure, now the school academic calendar, as issued by the Federal Ministry of Education, Nigeria has been used to determine the total available operational school days within the monitoring period weighted for non-boarding and boarding population for each school.

Subsequently, the CME has considered weekdays (excluding weekends, public holidays, mid-term and end term holidays) for non-boarding users and considered days (including weekends and public holidays but excluding mid-term and end term holidays) for boarding users (as boarding students/staff will consume water during weekends and short public holidays) for determining the school days for which WPS should be credited. Please refer column AV:BC in “MP4 Sales Database” tab of ER Calculator where the school calendar for the monitoring period, school holidays list and start date and end date of school term have been presented.

The QPW_y value (row 8: ERs Summary tab) has been calculated accordingly considering credited school

days in the monitoring period (row 6: ERs Summary tab).

This results in reduction of emission reduction to 128,917 tCO₂e from 188,133 earlier.

Documentation provided by project participant

PoA 9948_MP4_MR3_CERPD Nigeria MR ver3.0_26042021

PoA 9948_MP4_CERPD Nigeria ER Sheet_ver_3.0 26042021

DOE assessment

Date: 18/05/2021

In the applied methodology / registered PoA-DD/CPA-DDs, CPAs do not have provision to account for school holidays. However, based on the UN request for review question and rationale behind the same, the CME has revised the ER calculations to account ERs only for operational school days (refer tab: MP4 Sales Database) instead of the monitoring period days, based on published and objectively verifiable government data (Academic school calendar).

The school term duration and corresponding term holidays are found to be correctly calculated as per the submitted academic school calendars for the period 2019-2020 issued by Federal Ministry of Education, Nigeria. Further, the CME's approach of considering only weekdays and excluding all weekend days, holidays, mid-term / end term breaks for non-boarding schools is deemed appropriate. Also, the approach for boarding schools to include weekdays, weekends and short holidays but excluding mid-term, end-term breaks is deemed appropriate as boarding staff and students will be serviced by the WPS systems occur during weekends and short holidays.

The calculation approach/rationale of calculating operational school days has been discussed in CAR#02 below and is found appropriate, accurate and conservative. The revised achieved emission reductions in the current monitoring period have reduced since the since the last submission request, due to revised approach.

FAR#02 has been raised to ensure that QPW_y is based on operational school days, in future verifications.

CL ID	06	Section no.	E.3.1.	Date	16/04/2021
Description of CL					
UN issue#1					
<p>The baseline water source is not mentioned in the monitoring report or emission reduction sheet – The included CPA-DDs (section A.3) and the monitoring report section C.1) mentions that UltraFlo Water Purification System will be fixed and applicable for piped water while UltraTab WPS is portable in nature and applicable for un-piped water. However, it is not clear how the implementation of the WPS is in accordance with the description provided in the included CPA-DDs and whether the installed WPS is compatible with the available water source. Therefore, the CME shall explain how the WPS is implemented in accordance with description contained in the included CPA-DDs and the installed WPS is compatible with the available water source.</p>					
Project participant response					Date
<p>The “Piped Water” cited as the application in Section A.3 of the CPA-DDs for UltraFLO Chlorination systems refers to pressurized piped water connection that is a pre-requisite for UltraFLO systems by virtue of its design. Thus, UltraFLO systems can only be installed on piped applications.</p>					11/05/2021
<p>In the emission reduction spreadsheet, tab “MP4 Sales Database” column Q has been added that indicates the primary water source from where the water is extracted in a given school. In case of UltraFLO WPS, primary water sources like the surface water, well/Borehole, rainwater etc. have a piping connection installed to transport water from these primary sources to the point of installation of UltraFLO device.</p>					
<p>Please note that schools having Primary Water Source marked as “Piped” in Column Q, refers to only City Council / Government / Municipal Water Piped Connection in the school as the Primary Water Source.</p>					
For further detail, please refer to the table below:					
Source of Water	# of UltraFLO Schools	Comments			
Well/Borehole	5,959	These wells/boreholes are connected to drinking water storage tanks via pipes. The water is pumped from wells/boreholes to these water storage tanks. The UltraFLO WPS is fitted in the tanks at the inlet to			

		ensure that any water flowing in the tank is treated and rendered safe for drinking. The outlet of the tank is connected to the taps to facilitate drinking of water by the school students and staff.
Surface Water	1	There is a private piped connection used for transporting water from the nearest surface water body source like nearby pond, canal etc. to the drinking water storage tank in the school premises. UltraFLO systems are fitted onto these piping connections same as that explained above.
Trucked Water	1	The trucked water is collected in a sump from where it is pumped, or otherwise, directly pumped to the drinking water storage tank, to which the UltraFLO systems are fitted, same as that explained above.
Others	65	Similar to above, these schools have a combination of aforesaid water sources (wells, surface water or rainwater sump), depending on the ease of access to the school to which UltraFLO WPS are connected as explained above.

On the other hand, UltraTAB systems can only be installed in case of un-piped applications. UltraTABs by virtue of its design can only cater to cases where the drinking water storage tank(s) is not connected to the primary water source via pipes. The UltraTABs are directly administered in the “un-piped” drinking water storage tank(s) @ 1 tablet per 100 litre of water. Thus, although some of the schools may have “Piped” Connections in column Q for UltraTABs, but the drinking water storage tank is un-piped making the schools fit only for UltraTABs devices in such cases.

Therefore, both the project devices have been implemented in line with the description provided in the CPA-DD / MR.

Documentation provided by project participant

PoA 9948_MP4_CERPD Nigeria ER Sheet_ver_3.0 26042021

DOE assessment

Date: 18/05/2021

UltraFLO systems are fixed type of water purification units and can only be installed when water is being procured through a piped connection. This WPS can work only when it is mounted on a piped connection and water flows through them.

Hence, the CPA DDs (section A.3.) and monitoring report (section C.1) correctly mention that UltraFLO are fixed type systems and applicable on piped water.

The ER sheet, worksheet titled ‘MP4 sales database’, column Q ‘source’ lists the source as surface water, wells etc. besides piped water. The term “piped” water under this column has been used for the schools which receive water from City Council / Government / Municipal Water Connections.

It shall be noted that water is transported from primary water sources such as wells, surface water and boreholes through pipes to drinking water storage tanks in the project schools where fixed Ultra-FLO systems are installed on these pipes.

In the absence of a pipeline connection to the drinking water storage tanks, UltraTABs are provided to the schools, UltraTAB being designed for non-piped applications. The UltraTAB pack consists of 10 strips of 10 tablets each, wherein the tablets are directly put in drinking water storage tank (@one tablet per 100L of water), feasible for un-piped applications. In case of UltraTAB, the schools which have “Piped” Connections in column Q, pertains to cases where although water is available from government piped network (like municipal water supply tap) but is not connected to the drinking water storage tank(s). Thus, in such cases the drinking water storage tank remains un-piped making the schools fit only for UltraTAB units.

This has been verified by the verification team during the on-site visit during the previous monitoring periods. This was also checked by the verification team during the remote audit in the current monitoring period. For MP4, the DOE’s audit samples included 5 UltraFLO school connected via pipe to source “Well/Borehole”. In these samples the verification team was able to verify the school to have operational UltraFLO system receiving water from the quoted primary water source and connected via pipes to the drinking water storage tank(s).

Similarly, the verification team was able to verify for one UltraTAB school samples, having operational UltraTAB system to be receiving water from the piped connection which was not directly connected with the drinking water storage tank and making the schools suitable only for UltraTABs system.

During the remote site visit conducted for the current issuance request as well as during the physical site-visit conducted for previous batches, it was clearly noted by the verification team that UltraFLO have only

been installed on pipeline connections, even when the primary water source is different from City Council / Government / Municipal water connection and UltraTABs are administered only in un-piped applications even when the schools may have a piped connection.

Thus, the verification team confirms that the WPS have been implemented in line with the description contained in the included CPA DDs.

Thus, the finding is closed.

Table 3. CAR from this verification

CAR ID	01	Section no.	E.3.4.2.	Date :	09/11/2020
Description of CAR					
<ol style="list-style-type: none"> 1. In the reliability check during sample size calculation (refer ER Sheet worksheet "Sample Size Calculation" cells D26, D47, & D67), the CME has compared margin of error obtained with the z-value (cell B7). PP is requested to revise the cells D26, D47, and D67 accordingly. 2. The value of water quality inconsistent between the ER sheet and the MR. 					
Project participant response					Date : 03/12/2020
<ol style="list-style-type: none"> 1. The formula used for reliability check given in worksheet "Sample size calculation" cell D26, D47 and D67 have been rectified. 2. The value of water quality has been made consistent between ER Sheet and MR. 					
Documentation provided by project participant					
PoA 9948_MP4_MR3_CERPD 3 Nigeria MR v1.1_04122020					
PoA 9948_MP4_CERPD 3 Nigeria ER Sheet_ver_1.1 04122020					
DOE assessment					Date: 09/12/2020
<ol style="list-style-type: none"> 1. The formula has been corrected now. 2. The value has been made consistent. 					
Thus, the CAR stands closed.					

CAR ID	02	Section no.	E.3.6.1.	Date :	16/04/2021
Description of CAR					
<p>3) Refer to paragraph: VVS-PoA ver. 02 Paragraph 304 (c).</p> <p>The continuous availability of safe drinking water and the subsequent supplies are reported in the emission reduction spreadsheet were checked. However, it is observed in the emission reduction spreadsheet that:</p> <ol style="list-style-type: none"> a. The implemented water purifier capacities (Tab "Assumptions" cells D9 and D10) of 10,000 L/unit (for UltraTab WPS) and 340,000 L/unit (for UltraFlo WPS) is not stated in the CPA DDs; b. The residual capacity (i.e. Tab "Sales Database" column AC) data is not traceable. The residual capacities from previous monitoring period i.e. MP3 (i.e. column AC of tab "Sales Database") are given without any elaboration by CME. DOE in its verification report did not provide a verification opinion on how these values are derived, and whether the residual capacity is an assumed capacity or an actual remaining capacity considering the actual volume and quality of raw water purified at CPA locations; c. The residual capacity of some purification devices indicates system continuous running until year 2073 or more (e.g. cell 'A114627' of tab 'Sales Database'), which is even beyond the device lifespan as described (i.e. 5 years) in page 15 of the monitoring report; d. Out of the 17051 schools using either UltraFLO or UltraTAB in the CPAs, 16940 schools indicate zero continuous supplies during this monitoring period (i.e. column 'AB' of tab 'Sales Database'). <p>Taking into account the above, the CME is requested to;</p> <ol style="list-style-type: none"> a. Substantiate the installed water purifier capacities of 10,000 L/unit (for UltraTab purifier) and 340,000 					

L/unit (for UltraFlo purifier);	
b. Submit a traceable emission reduction spreadsheet for the calculation of the system residual capacities;	
c. Elaborate how a system's continuous running end date can be beyond its lifespan (5 years);	
d. Substantiate continuous availability of safe drinking water to schools considering some water purifiers had no residual capacity from the previous monitoring period and received no supplies during the current monitoring period.	
Project participant response	Date : 11/05/2021
<p>i. The capacity of 340,000 L/unit (for UltraFLO) and 10,000 L/unit (for UltraTAB) stated in worksheet "Assumptions" is consistent with latest version of registered CPAs 43-77 CPA-DDs page 5 and has already been validated during CPA inclusion, based on manufacturer technical specifications, as mentioned in the CPA inclusion validation report (Appendix 3, item /05/).</p> <p>The technical specification documents have also been cross verified by the verification Team as listed in the verification report (Appendix 3, item /28/).</p> <p>ii. For MP4, the 'system's residual capacity from previous monitoring period' (MP4 Sales Database, column AB) has been sourced from "MP3 Sales Database" of MP3 ER calculator ver 3.0 dated 19/08/2021 submitted to UNFCCC as part of MP3 ER calculator (https://cdm.unfccc.int/PoAIssuance/iss_db/poais995886785/view).</p> <p>The CME extracted the above information from MP3 ER calculator (tab Sales Database, Column AL) by applying the vlookup function, using Institution SF ID as a unique identifier, to call this information in MP4 ER calculator, tab: MP4 Sales Database, column AB. Given the vlookup function does not work externally, hence the CME had to remove the external links in the MP4 Sales Database, column AB, which otherwise would have returned #Ref error in excel, once shared with DoE / UNFCCC.</p> <p>The CME has now presented MP3 Sales database under tab 'MP3 Sales Data reference only' in the revised MP4 ER calculator being submitted. The column AB of 'MP4 Sales database' has now been linked with column AL of 'MP3 Sales Data reference only' to establish full traceability of values for 'residual capacity from previous MP'. For systems that are newly installed in MP4, and don't have any residual capacity being carry forwarded from MP3, the column AB in tab 'MP4 Sales Database' now indicates, "new installation, not applicable" to avoid any confusion.</p> <p>iii. The "system's continuous running end date" was not depicting the lifetime/lifespan of the device. It was merely a determinant to check the compliance with the following requirement of the registered monitoring plan:</p> <p>$(N_{y,i} * R_{y,i})$ should not exceed the maximum output capacity of the system installed.</p> <p>The ER sheet tab, 'MP4 Sales Database' has been revised to determine the aforesaid in a better manner (refer column AM:AN). The revised functionality in the ER model ensures that $(N_{y,i} * R_{y,i})$ * operational school days in the monitoring period, does not exceed the available treatment capacity for any school and the total consumed capacity (column AM) is lower of the two as a conservative measure. Please refer below:</p> <ol style="list-style-type: none"> 1. The treatment capacity of a unit (column AH) is the sum of residual capacity from previous MP, if any, (column AB) and the supplies made during the monitoring period (column AC). For newly installed systems, it has been calculated as system's initial installation capacity (assumptions D9:D10) and the supplies made during the monitoring period (column AC), if any. 2. The total consumption of drinking water per day per unit has been calculated (column AG) and represents $(N_{y,i} * R_{y,i})$. 3. The start date of the WPS crediting (column AJ) in the monitoring period is considered as the latest of start date of MP4 or the first day of the next month of its installation (column F). 4. The end date of WPS crediting (column AK) in the monitoring period is earliest of the end date of the monitoring period or the system breakdown date (column AI), if any. 5. In case treatment capacity of a unit (column AH) is 0, no CERs are claimed (given column AJ and AK are "NA", and column AP is "No"). 6. Subsequently, the total number of available operational school days (column AL), falling 	

between the start date (column AJ) and end date (column AK) of crediting for a school, has been calculated weighted on the basis of boarding and non-boarding population (column L:O).

7. If a WPS unit has treatment capacity (column AH) less than the capacity required to run the entire available operational days in the monitoring period (i.e. $N_{y,i} * R_{y,i}$ * available operational days) the residual capacity at end of MP (column AN) is calculated as 0. Otherwise, the residual capacity is calculated as net of treatment capacity (column AH) and consumed capacity during the monitoring period (column AM).
8. Limited by the treatment capacity consumed during the monitoring period (column AM), the credited school days for each system is calculated (column AO). Hence, the credited school days (column AO) is always less than or equal to available operational school days (column AL) for a given school.

The above approach is deemed better as it removes the confusion related to “continuous running end date” as well as calculates residual capacity at the end of MP4, based on operational school days during the monitoring period instead of total duration of the monitoring period.

Lastly, in case of UltraFLO/UltraTAB, the expiry is 5 years with the earliest project device being installed in April 2019 hence no device shall end its lifetime before the end of the concerned monitoring period ending 21 Mar 2020. Besides, every-time a school receives a new supply of UltraFLO/UltraTAB, the lifetime of the system is automatically deemed renewed, the supplies being consumable.

- iv. Please note that column AB in ‘MP4 Sales Database’ show a value of 0 if there is no residual capacity from the previous monitoring period and show “new installation, not applicable” in case of new installations in the concerned MP. Please refer the following in this regard:

Description	MP4 Sales Database
1) Schools with no residual capacity from the previous monitoring period	Select value “0” in column AB in MP4 Sales Database
2) Schools with no residual capacity from previous monitoring period and received no supplies during the current monitoring period	Simultaneously Select value “0” in column AC in MP4 Sales Database
3) Total number of cases identified	388
4) Operational days for these schools	0 (refer column AO, MP4 Sales Database)

Thus, for the schools in (3) above, the operational days have been calculated as 0 because there is no residual capacity from previous MP, neither continuous supplies have been made to the school in the current monitoring period and hence no ERs have been accounted.

On the other hand, “new installation, not applicable” cells in column AB in ‘MP4 Sales Database’ indicate that these systems are newly installed and did not have any residual capacity from previous MP. This is verifiable against their installation dates. These systems provide continuous safe drinking water in the monitoring period by virtue of their initial installed capacity, even if no subsequent supplies have been made in these schools. Thus, the ER sheet is correctly ensuring that only those schools are credited that either have residual capacity from previous MP and/or, have received supplies and/or have been newly installed in the monitoring period.

Documentation provided by project participant

PoA 9948_MP4_CERPD Nigeria ER Sheet_ver_3.0 26042021

DOE assessment

Date: 18/05/2021

ER spreadsheet:

- a) The WPS capacity is found correctly stated in ER sheet (‘Assumptions’ tab, D9:D10) for UltraTab and UltraFLO as verified from the CPA DDs (section A.3.). Moreover, it was cross-checked with the manufacturer’s technical specifications viz:
 - I. Technical specification / expiry of UltraFlo issued by Medentech (technology supplier)
 - II. Technical specification / expiry of UltraTAB issued by Medentech (technology supplier)
 - III. The UltraTAB strip clearly mentions the treatment capacity of 1 tablet as 100ltrs and the UltraTAB pack is standardized at 10 strips of 10 tablets each, rendering the capacity of UltraTAB pack as 10,000 ltrs (verified physically during previous site visits as well as UltraTAB photos).
 - IV. UltraFLO cartridges are manufactured in a standardized size as per the dimensions specified in the CPA-DDs and MR (verified physically during previous site visits as well as UltraFLO dimension declaration by CME) and pertains to the specifications issued by Medentech.

- V. The expiry of the UltraFlo/UltraTAB was also found mentioned on the cartridge / tab pack respectively as 5 years (photographs of UltraFlo and UltraTAB units)

The cross-verification against aforesaid documents have been reported under serial no. 28, appendix 3 of FVR. Thus, it was accepted by the verification team.

- b) The DOE checked the revised ER sheet and confirmed that the values of 'residual capacity from previous MP' in MP4 ER spreadsheet (tab: "MP4 Sales data, column AB) were correctly calculated after cross-checking with MP3 ER calculator, the verification team further confirms the following: In the revised MP4 ER Calculator, the MP3 Sales database has been added (Tab: 'MP3 Sales data – reference only') by the CME. The verification team has verified that information in the revised ER Calculator, Tab: 'MP3 Sales data reference only' is fully consistent with the tab: 'Sales database' in the MP3, ER calculator available at UN webpage (https://cdm.unfccc.int/PoAIssuance/iss_db/poais95886785/view).

Further, in the revised ER calculator, tab 'MP4 Sales database' column AB, the residual capacity from previous MP has been found to be correctly linked with 'MP3 Sales data reference only', column AL, thus establishing complete traceability.

The verification team has independently checked MP3 ER calculator from PoA page (9948-MP3-IRP2) and cross-verified the information in the revised ER Calculator, Tab: 'MP3 Sales data – reference only' and found it to be consistent.

In the revised ER calculator, 'MP4 sales database', column AB, for all systems newly installed, the 'residual capacity from previous MP' is also found to be correctly specified as "new installation, not applicable".

Thus, 'residual capacity from previous MP' is confirmed to be calculated correctly in column AB of MP4 Sales database for all schools.

- c) The continuous running end date was merely a determinant to check compliance with the registered monitoring plan requirement and is not linked with lifetime of the installed devices. The same has been removed by the CME from the revised ER sheet to avoid any confusion.

The revised ER sheet tab, 'MP4 Sales Database' now ensures that $(N_{y,i} * R_{y,i})$ * operational school days in the monitoring period, do not exceed the available treatment capacity for any school (column AH). It also confirms that the total consumed capacity (column AM) remains lower of the two in all cases.

The total consumed capacity during the monitoring period (column AM), residual capacity at the end of MP (column AN) and credited operational school days (column AO) have been correctly and conservatively calculated.

The verification team has checked all determinants from column AJ:AP and confirms them to be correctly and accurately calculated and is conservative with respect to ER calculations.

The revised achieved emission reductions in the current monitoring period have reduced since the last submission request, thus are confirmed to be conservative, accurate and credible.

The verification team further confirmed that UltraFLO/UltraTAB expiry is 5 years. The first system was installed in April 2019 in Nigeria, thus no device will expire before the end of the current monitoring period.

- d) The subsequent supplies to any school are depicted under column AC of the worksheet titled "MP4 sales database". If the residual capacity is high enough and sufficient for the concerned monitoring period, then no new supplies are required to be sent to the schools.

The schools which have '0' residual capacity from previous MP (column AB) along with 0 subsequent supplies (column AC), were verified to have 0 treatment capacity per unit (Column AH) and 0 credited operation days under column AO substantiating that no ERs have been claimed for such cases.

For other systems the credited operational days(column AO) have been correctly calculated as total

treatment capacity consumed during monitoring period (column AM) / per day water consumption (column AG). The verification team has verified all corresponding calculations and found them accurate and correct.

Thus, it was confirmed that the CME has followed the implementation plan stated in the CPA DDs and claimed ERs only for the systems that are rendering clean water during the current monitoring period.

Based on aforesaid and review of the following information/documents:

- I. Capacity / lifespan specified in CPA-DDs / manufacturer specifications / photographs for Chlorination systems
- II. Revised MP4 ER calculator with traceable residual capacity from previous MP
- III. Conservative calculation of consumed capacity, residual days at the end of current MP and credited operational school days
- IV. Revised approach presented by CME to ensure $(N_{y,i} * R_{y,i})$ does not exceed the maximum output capacity of the system installed.

The verification team confirms that the capacity of the devices (installed actual capacity or residual capacity from previous MP3, consumed capacity, residual capacity at the end of current MP4 and credited operational school days) have been correctly determined. The installed systems are capable of continuously supplying safe drinking water over the concerned monitoring period and ERs stated in the monitoring report and ER calculator are conservative, accurate, credible and additional to any that would have occurred in the baseline.

Thus, the CAR is closed.

Table 4. FAR from this verification

FAR ID	01	Section no.	E.3.4.2.	Date :	18/05/2021
Description of FAR					
DOE involved in subsequent verifications shall ensure that monitoring frequency of parameter “operational units” is atleast, biennial, in line the with monitoring methodology requirements.					
Project participant response					Date: DD/MM/YYYY
NA					
Documentation provided by project participant					
NA					
DOE assessment					Date: DD/MM/YYYY
NA					

FAR ID	02	Section no.	E.3.4.2.	Date :	18/05/2021
Description of FAR					
DOE involved in subsequent verifications shall ensure that the parameter QPW _y is determined accounting the operational school days instead of duration of the concerned monitoring period, as applicable.					
Project participant response					Date: DD/MM/YYYY
NA					
Documentation provided by project participant					
NA					
DOE assessment					Date: DD/MM/YYYY
NA					

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); • Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		