Verification and certification report form for CDM programme of activities

(Version 04.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION			
Title and UNFCCC reference number of the programme of activities (PoA)	Title: 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	2.0		
Completion date of the verification and certification report	08/07/2021		
Monitoring period number and duration of this morning period	Monitoring Period Number: Fifth Monitoring Period: 22/03/2020-31/12/2020 (both days inclusive)		
Number and version number of the monitoring report to which this report applies	Monitoring Report Number: 4 Version: 2.1		
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	444,852 tCO_2e		
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included 2020**CPAs covered in this report**	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December	Amount from 1 January 2021
	0 tCO2e	18,805 tCO2e	NA

Name and UNFCCC reference number of the DOE	Earthood Services Private Limited 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 emission 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 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-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1 (10 CPAs).

The verification team confirms that the total emission reductions achieved under this monitoring period from 22/03/2020-31/12/2020 (inclusive of both days) are 18,805 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-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1 (10 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.4.0: 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
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 survey (including sampling approach (refer Section D.4 of this report) to be applied)
e) Remote Audit Survey (refer Section D.2 of this report) (assessment of implementation of CPAs and 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 current verification process of the registered/revised accepted PoA **"**Impact Carbon Global Safe Water Programme of Activities (PoA)**"** and its 10 CPAs (**9948-P1-0003-CP1,9948-P1-0005-CP1 to 9948-P1-0013-CP1**) for the monitoring period **22/03/2020 – 31/12/2020** (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 2.1 dated 14/06/2021**/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 **22/03/2020-31/12/2020** (including both days) amount to **18,805** tCO_2e. 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	Luka	Kumden	Central Office	Y	N	Y	N

***** Remote audit survey was conducted instead of on-site inspection. 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	Garg	Shreya	Central Office
2.	TA to TR	IR	Garg	Shreya	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	High	The survey is conducted for	Verification team randomly

	monitoring survey staff of CME/CPA implementer while recording the responses of users in relation to survey parameters		representative samples of population, which may impact the population significantly. Surveyors may be unsupervised at the site.	selected the samples from CME surveyed WPS. The recorded survey forms by CME were checked with DOE remote audit survey observations. The verification team interviewed the monitoring staff and checked their training records.
2.	Calculation Error	Med	The process in 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 (tCO2e)/year	**500,000 or more**	**300,000 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 (tCO2e) in this monitoring period	34,513	18,805*
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 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-P1-0003-CP1, 9948-P1-0005 – 9948-P1-0013-CP1						
<u>For water purifier</u>						
QPW_y	Annually	10(calculated parameter for each CPA)	10(100%)	This is a calculated parameter and there were errors in calculation which have been corrected (10).	All the errors have been corrected*	No extrapolation is required as 100% values checked and corrected.
n_{WB}	Continuously	1	1	None	NA	NA
$T_{y,i}$	Continuously	2,489 systems (Ultra FLO)	2,489 systems,	None	NA	NA

			Sales database/5/ was checked for the information. 11 WPS were checked during remote survey for cross check.			
$N_{y,i}$	Continuously	10 values (average value for each CPAs)	Entire sales database was checked for the information and calculations of average values were checked.	None	NA	NA
Water quality (WQ)	Annually	50	11 (based on acceptance sampling)	None	NA	NA
Operational $Units_i$	At least once per verification	54	11 (based on acceptance sampling)	None	NA	NA
f_{NRB}	Continuously	1	1	None	NA	NA
$EF_{projected\_fossil\ fuel}$	Continuously	1	1	None	NA	NA
Existence of public distribution network of safe drinking water	Annually	50	11 (based on acceptance sampling)	None	NA	NA
$EG_{PJ,j,y}$	Annually	1	1	None	NA	NA

*There was an error identified related to the school operational days in the MP during the desk review of MR, ER Sheet and other supporting documents shared by CME. In response to that CME has applied a conservative approach to credit the systems for school operational days only instead of duration of the monitoring period which has led to reduction in the total ERs significantly. CAR#08 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) A review of data and information provided for its completeness.
b) 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 Appendix 3 of VCR.

D.2. On-site inspection

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	-	-	Deepika Mahala and Vaishali Vatsa, Nanbal Kumden
2.	Interview of the head institutions of the school related to the deployed project devices	-	-	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:

a) It is the first verification for the DOE with regard to this CPA;
b) More than three years have elapsed since the last on-site inspection conducted for verification for the CPA; or
c) 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 no physical site visit has been conducted for any of the CPAs under the verification.

At the time of verification, the country where DOE office is based, India is witnessing the second highest number of COVID-19 infected people in the world, and total number of infected cases reaching at 29 million /44/. Under such circumstances, the verification team is avoiding the risk of contracting the virus by not doing the on-site visit. Therefore, 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 cases in the country are spurting/43/.
Also, it was duly assessed if the site visit can be postponed /34/. The delays to site visit would mean that the verification would have to be postponed. The communications on this topic were made with CME, and evidence were provided by CME that delay to the verification site visit would lead to a delayed issuance. This would result in a contractual breach of (and termination/rescission of) underlying Emissions Reductions Purchase Agreement and loss of all future revenue for the CME as verified from ERPA /35/ by the verification team. On the basis of above, the verification team decided to follow the UN EB 106 Para 26 decision, and adopted an alternative approach for site visit, which is discussed in the below paragraphs.

UN EB decision on Mandatory DOE on-site visits:

UN EB 106 report (Para 26) mentions the decision EB took on 20th March, in relation to DOE on-site visit which was applicable from 23rd March 2020 to 23rd June 2020/41/. 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 2020/42/ which was extended till 30/06/2021 in EB 108/45/ when the decision for RSV was taken and has now been extended till 31/12/2021 in EB 110/51/

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 PoA verification, as discussed below.

Alternative means applied:

Following alternative means have been used to verify the project details:

1. Remote Audit Survey 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 skype meeting. Random samples for eleven WPS users (details on sampling provided in section D.3) were drawn from the sample survey sheet and interviewed through skype video / audio calls (recorded).
2. Photographic evidence of the Aquagenx testing kits /30/, WPS with Unique Product IDs/27/, Water Quality Test Photographs /36/, Monitoring Survey (filled) Forms/18/.
3. Complaint Log (Scanned Sample) /37/
4. Monitoring personnel certificates/20/

5. Review of Other Documentary evidence (ER sheet/4/, Sample Size Calculation sheet /4/, Monitoring Data sheet /4/ amongst others)
6. Remote audit survey of the 11 selected samples of WPS confirming the WPS installed along with the basic information related to the installation (Purchase order/14/, Delivery Notes/21/) and the interview of the respective school representative.

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Turgesen	Mark	Impact Water	12/05/2021	Sampling Surveys	Deepika Mahala, Vaishali Vatsa
2.	Kibagendi	Everline	Impact Water	12/05/2021	Implementation	Deepika Mahala, Vaishali Vatsa
3.	Brown	Julie	Impact Carbon	12/05/2021	Implementation, Sales records	Deepika Mahala, Vaishali Vatsa
4.	Neville	Tim	Impact Carbon	12/05/2021	Database management	Deepika Mahala, Vaishali Vatsa
5.	Lohia	Rohit	CSIPL	12/05/2021	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala, Vaishali Vatsa
6.	-	Nihar	CSIPL	12/05/2021	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala, Vaishali Vatsa
7.	Kumar	Ritesh	CSIPL	12/05/2021	Monitoring surveys	Deepika Mahala, Vaishali Vatsa
8.	Huelsenbeck	Mark	Impact Water	12/05/2021	Monitoring Report, Sampling methodology, ER calculations	Deepika Mahala, Vaishali Vatsa
9.	D.A.	Edebor	Head of School (N1832538)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
10.	-	Odunlami	Vice-Principal (N1828270)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
11.	Taiwo	T.A.	Head Teacher (N1833724)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
12.	-	Celestine	Head Mistress (N1832571)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
13.	Quadri	B.	Proprietress (N1833771)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
14.	-	Bello	Proprietress	12/05/2021	DOE Remote survey	Deepika

			(N1829812)		sample	Mahala, Vaishali Vatsa
15.	-	Olutayo	Principal (N1832710)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
16.	Eneobonge	Danilola	Head of School (N1831878)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
17.	Dauda	Gbadamosi	Principal (N1832576)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
18.	Ruth	Tadese	Proprietress (N1827935)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa
19.	-	Osilonya	Head Of School (N1834270)	12/05/2021	DOE Remote survey sample	Deepika Mahala, Vaishali Vatsa

* Interviews were conducted via skype (audio call).

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 all the CPAs[1] which are part of this batch under issuance. The CME applied stratified random sampling at the unit level, giving an equal chance of selection to each unit in the sampling frame. Thus, a PoA wide single sampling plan was used by the CME.

DOE 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 8/19/ 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 8/19/, The maximum errors associated with the determination have been kept at following level:

(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.

[1] CPA 9948-P1-0003-CP1 has not been monitored by the CME for this monitoring period. Refer section E.3.2.1 of this report for further details

The verification team selected the sample size as 11 WPS 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-P1-0005 to 9948-P1-0013-CP1	0.5%	20%	10%	10%	11	0

The verification team selected the random samples of 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 installed/distributed
Ultra FLO	6,706
Ultra Tab	738
Multi-Barrier UV	273

However, CME has claimed for only Ultra FLO units as monitoring has been done for only these units. Thus, the acceptance sampling was only applied to the monitoring results of Ultra FLO.

The CME during the current monitoring period was unable to conduct the monitoring of Multi-Barrier UV units and has considered a temporary deviation (discussed in detail under section E.3.2.1 of this report). Thus, samples of Ultra-Flo units were chosen randomly (using website www.randomizer.org). As per plan 11 systems were required to be audit by the DOE. The DOE surveyed 11 samples of Ultra FLO type. No inconsistency between the CME results and DOE's observations during the remote survey were found.

It shall be noted that the latest version of the sampling standard is version 9.0/19/ available at time of preparation of the final version of this report. However, the DOE sampling plan was prepared before the release date of latest version of the standard (i.e., version 09.0 published on 27/05/2021) and the remote audit inspection was done on 12/05/2021 as stated under the previous section of this report which is before the release date of the latest standard. Thus, version 8.0 was applied/19/. Nevertheless, the verification team has checked the latest version of the sampling standard and found that there is no new guideline/requirement added in the latest version of the standard with regard to the DOE sampling plan and the sampling plan applied by the verification team complies with version 9.0 of the standard tool/19/.

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	-	-	FAR#01 FAR#02
CPAs considered for verification and covered in this report	-	-	-
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	CL#05	-	-
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[2]			
• 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#03 CL#05 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		CAR#09	FAR#01 FAR#02 FAR#10 FAR#11
• Implementation of sampling plan	CL#07	-	-
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	-	-	-
• 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	-	CAR#08	-
• 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-benefits	-	-	-

[2] 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).

Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	05	02	04

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 04.0/10/ which is the latest and appropriate form at the time of verification/submission for request for issuance. All the sections of the aforesaid form were duly filled as per the guidelines and provided all the relevant details.
Findings	No findings were 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/. Two FARs were raised during previous verification/40/ and two FARs have been raised during current monitoring period to be addressed in subsequent verifications. Please refer 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, 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	Yes	08/05/2017	7.0	Yes/52/
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	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, Version: 5.0, 9948-P1-0006-CP1	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, Version: 5.0, 9948-P1-0007-CP1	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, Version: 5.0, 9948-P1-	Yes	04/10/2017	7.0	Yes/52/

0008-CP1				
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, Version: 5.0, 9948-P1-0009-CP1	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, Version: 5.0, 9948-P1-0010-CP1	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, Version: 5.0, 9948-P1-0011-CP1	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, Version: 5.0, 9948-P1-0012-CP1	Yes	04/10/2017	7.0	Yes/52/
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, Version: 5.0, 9948-P1-0013-CP1	Yes	04/10/2017	7.0	Yes/52/
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	No	18/11/2018	7.0	NA

Programme of Activities (PoA): CPA 24, Version: 4.0, 9948-P1-0024-CP1				
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):	No	26/04/2019	7.0	NA

CPA 39 supported by Republic of Korea, Version: 2.0, 9948-P1-0039-CP1				
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	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 44 supported by Republic of Korea, Version: 1.0, 9948-P1-0044-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 45 supported by Republic of Korea, Version: 1.0, 9948-P1-0045-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 46 supported by Republic of Korea, Version: 1.0, 9948-P1-0046-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 47 supported by Republic of Korea, Version: 1.0, 9948-P1-0047-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 48 supported by Republic of Korea, Version: 1.0, 9948-P1-0048-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 49 supported by Republic of Korea, Version: 1.0, 9948-P1-0049-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 50 supported by Republic of Korea, Version: 1.0, 9948-P1-0050-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 51 supported by Republic of Korea, Version: 1.0, 9948-P1-	No	26/04/2019	7.0	NA

0051-CP1				
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 52 supported by Republic of Korea, Version: 1.0, 9948-P1-0052-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 53 supported by Republic of Korea, Version: 1.0, 9948-P1-0053-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 54 supported by Republic of Korea, Version: 1.0, 9948-P1-0054-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 55 supported by Republic of Korea, Version: 1.0, 9948-P1-0055-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 56 supported by Republic of Korea, Version: 1.0, 9948-P1-0056-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 57 supported by Republic of Korea, Version: 1.0, 9948-P1-0057-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 58 supported by Republic of Korea, Version: 1.0, 9948-P1-0058-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 59 supported by Republic of Korea, Version: 1.0, 9948-P1-0059-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 60 supported by Republic of Korea, Version: 1.0, 9948-P1-0060-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 61 supported by Republic of Korea, Version: 1.0, 9948-P1-0061-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 62 supported by Republic of Korea, Version: 1.0, 9948-P1-0062-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 63 supported by Republic of Korea, Version: 1.0, 9948-P1-0063-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water	No	26/04/2019	7.0	NA

Programme of Activities (PoA): CPA 64 supported by Republic of Korea, Version: 1.0, 9948-P1-0064-CP1				
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 65 supported by Republic of Korea, Version: 1.0, 9948-P1-0065-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 66 supported by Republic of Korea, Version: 1.0, 9948-P1-0066-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 67 supported by Republic of Korea, Version: 1.0, 9948-P1-0067-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 68 supported by Republic of Korea, Version: 1.0, 9948-P1-0068-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 69 supported by Republic of Korea, Version: 1.0, 9948-P1-0069-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 70 supported by Republic of Korea, Version: 1.0, 9948-P1-0070-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 71 supported by Republic of Korea, Version: 1.0, 9948-P1-0071-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 72 supported by Republic of Korea, Version: 1.0, 9948-P1-0072-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 73 supported by Republic of Korea, Version: 1.0, 9948-P1-0073-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 74 supported by Republic of Korea, Version: 1.0, 9948-P1-0074-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 75 supported by Republic of Korea, Version: 1.0, 9948-P1-0075-CP1	No	26/04/2019	7.0	NA
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 76 supported by Republic of	No	26/04/2019	7.0	NA

Korea, Version: 1.0, 9948-P1-0076-CP1				
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 77 supported by Republic of Korea, Version: 1.0, 9948-P1-0077-CP1	No	26/04/2019	7.0	NA
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):	No	26/04/2019	7.0	NA

CPA 101 supported By Republic of Korea, Version: 1.0, 9948-P1-0101-CP1				
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

The PoA aims at disseminating water purification systems (WPS) technologies to target countries like Rwanda, Nigeria, Uganda, and Kenya for addressing the problem of safe drinking water. The PoA has 5 Generic CPAs as defined under section A.2. of the PoA DD/1/. During this monitoring period, 9 CPAs of Type 2: Technologies for institutional water consumption, with no project emissions and 1 CPA of Type 3: Technologies for institutional water consumption with project emissions were considered. This monitoring report includes the implementation and monitoring of 10 CPAs from 9948-P1-0003-CP1,9948-P1-0005-CP1 to 9948-P1-0013-CP1 in Nigeria. The coordinating and managing entity (CME) is Impact Carbon, and Impact Water is the CPA Implementer of these CPAs/15/. Their roles and responsibilities are defined in the signed agreement.

In absence of the project activity, the drinking water would have been boiled by the institution using non-renewable biomass/fossil fuels leading to release of equivalent GHG emissions in the baseline. The implementation of the technology helps in replacing the use of non-renewable biomass / fossil fuel for boiling water with the WPS, thus reducing amount of equivalent GHG emissions.

The aforesaid CPAs involve dissemination of two types of water purification systems:

I. Chlorination (UltraFLO/UltraTab)

II. Multi-Barrier UV

The technical specifications of the WPS distributed under the CPAs is provided in the table below:

Description	**UltraFLO**	**UltraTab**	**Multi-UV Barrier**
Size / Dimensions	Cartridge Length: ~12 cm Cartridge height: ~10 cm Cartridge circumference: ~22	Strip size: ~13 cm X ~5.5 cm (100 tablets per packet)	System Height: ~44cm System Length: ~36 cm System Width:

	cm		~19 cm
Application	Piped water	Un-piped water	Piped water
Flow rate	20L/min	1 tablet treats 100 L	5-12 L/min
Capacity/lifespan	340,000 L / 5-year expiry	Small Pack 10,000 L / 5-year expiry	4,088,232 L / 7 years
Fixed or Portable	Fixed	Portable	Fixed
Removal of E. Coli	99 (2-log)	99 (2-log)	99 (4-log)
Watts/Voltage	Not applicable	Not applicable	14 W

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.

Through the remote survey videos/38/ the installation of WPS claimed by the CME were checked and found to be in-line with the technical description provided in the registered PoA-DD/1/ and Monitoring report/13/.

The Verification team assessed the following information to verify the capacity and lifetime of systems under the CPAs:

1. Technical specification including capacity/ expiry of UltraFLO issued by Medentech (technology supplier)
2. Technical specification including capacity/ expiry of UltraTAB issued by Medentech (technology supplier)
3. The UltraTAB strip clearly mentions the treatment capacity of 1 tablet as 100ltrs and an Small Pack UltraTAB pack is standardized at 10 strips of 10 tablets each, rendering the capacity of Small Pack UltraTAB pack as 10,000 ltrs (verified physically during previous site visits as well as UltraTAB photos
4. 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.
5. 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).
6. Multi-Barrier UV - Technical Specification from Supplier (Rotek) for UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.)
7. Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek)
8. Photographs of Multi barrier UV systems
9. Installation Logs for Multi-Barrier UV confirming piped applications

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, the 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 "Google Map app"/53/ 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 remote audit survey, 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 have 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 included CPA DDs/2/. A remote audit survey was conducted by the verification team; 11 WPS (11 for Ultra FLO) were surveyed. The uniqueness of the system was identified from UID written on the units (on UltraFLO cartridges)/27/. Along with the unique ID the following details are also noted in the database: a) Type of system (UltraFLO / UltraTAB / Multi-Barrier UV) b) Unique serial number of the units installed / distributed c) Date of installation / distribution d) Address of institution e) Type of institution (Boarding / Non-boarding) f) Institution population count (number of students / staff in boarding / non-boarding category) The information of the installed WPS was also verified from the CME database/5/ which was cross checked for 11 WPS samples with their corresponding 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 given in the table under section E.3.6.5. for comparing ex-ante estimated ERs in the CPA DDs/2/ for the corresponding period with the actual ERs achieved. The CPAs are within the threshold limits of the applied methodology/6/. The monitoring report was compared and verified against the description provided in the revised accepted PoA-DD/1/ and found to be correct
Findings	CL#05 was raised and resolved.
Conclusion	In view of the information's verified through the remote audit survey and interviews, the verification team is able to confirm that all physical features (technology, project equipment (as applicable), 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. The emission reductions achieved during the current monitoring period are 18,805 tCO_2e. Justification for this has been assessed in further sections of report.

E.2.2. Implementation and operation of the management system

Means of verification	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 review of 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. 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/14/, delivery notes/21/ and Salesforce data/48/ to confirm that information for any system installed/distributed (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 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. The CME also has a customer care centre which contacts the institutions on a regular basis to ensure if the cartridge replacement (Ultra FLO) or new packets of tablets (Ultra TAB) are required or not. The country office was visited during the previous verification of other batches as well as CME representatives were interviewed during the remote audit for the current monitoring period to confirm that the customer care centre is in place and is active. Moreover, all the institution heads interviewed during the remote audit confirmed that they are aware about the customer support system and the contact number is printed on the system installed at their schools. For monitoring survey, a monitoring team was organized by the CME consisting of trained monitoring staff/20/, who conducted the Aquagenx tests (water quality tests)/18/,/30/,/36/ 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 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 and monitoring data mentioned in ER calculator /4/, /5/ respectively. 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/. 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/.
Findings	No findings were raised.
Conclusion	The verification team from the desk review and remote survey assessment confirms that the monitoring management system of the PoA is in place with the responsibilities properly identified and established.

E.2.3. Post-registration changes

E.2.3.1. Corrections

No correction observed.

E.2.3.2. Inclusion of a monitoring plan

NA

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

NA

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

NA

E.2.3.6. Change of coordination/managing entity

NA

E.2.3.7. Changes specific to afforestation and reforestation activities

NA

E.3. Component project activities

E.3.1. Compliance of the CPA implementation with the included CPA design document

Means of verification

The registered 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. Impact Water is the implementer of the CPAs and has fully implemented the CPAs with the help of Sales and Distribution Partners (SDP). The same has been verified from the agreement between the CME and CPAI/15/. This monitoring report includes the implementation and monitoring of 10 CPAs- CPA 9948-P1-0003-CP1,9948-P1-0005-CP1 to 9948-P1-0013-CP1 in Nigeria.

The table below provides details on CPA and technology specific figures for this monitoring period:

CPA no.	First WPS Installation date	Crediting period	No. of units (installed)			Estimated ERs	ERs achieved
			FLO	TAB	Multi-barrier UV		
9948-P1-0003-CP1	01/04/2017	23/05/2017-22/05/2024	0	0	273	25,110	-40
9948-P1-0005-CP1	11/01/2018	04/10/2017-03/10/2024	1,179	0	0	46,638	1,959
9948-P1-0006-CP1	12/07/2018	04/10/2017-03/10/2024	852	0	0	46,638	958
9948-P1-	30/08/2018	04/10/2017-	809	0	0	46,638	2,470

0007-CP1		03/10/2024					
9948-P1-0008-CP1	09/10/2018	04/10/2017-03/10/2024	764	0	0	46,638	2,049
9948-P1-0009-CP1	09/11/2018	04/10/2017-03/10/2024	690	0	0	46,638	2,423
9948-P1-00010-CP1	07/12/2018	04/10/2017-03/10/2024	564	0	0	46,638	1,767
9948-P1-0011-CP1	11/01/2019	04/10/2017-03/10/2024	721	0	0	46,638	2,942
9948-P1-0012-CP1	13/02/2019	04/10/2017-03/10/2024	639	262	0	46,638	2,455
9948-P1-0013-CP1	19/03/2019	04/10/2017-03/10/2024	488	476	0	46,638	1,822
	As checked from the delivery notes/21/	Checked from the UN website /12/	Check-ed from sales data base/5/	Check-ed 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/48/.

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 November 2020 will be eligible for crediting only in the month of December 2020.

Given, the current monitoring period is ending in 31/12/2020, therefore only the units installed till Nov 2020 (up to 30-11-2020) are eligible for crediting under the concerned monitoring period. Thus, the CME has considered 30-11-2020 as the cut-off date of installation covered for this monitoring period.

It has been checked by the verification team from the ER sheet/4/ that the ERs achieved for the CPAs lies between -40 tCO_2e to 2,942 tCO_2e, which is below the threshold of type III 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 tCO_2 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 tCO_2 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 600tCO_2e 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 through review of lat-long data /53/, discussed already in Section E.2.1 above. Impact Carbon is the CME of the CPA and Impact water 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/. The WPS are installed across Nigeria.

The aforesaid CPAs involve dissemination of two types of water purification systems:

	1. Chlorination (UltraFLO / UltraTab) 2. Multi-Barrier UV The technical description of the systems has been verified under E.2.1 of this report. It is noteworthy, Multi-Barrier UV and UltraFLO systems are fixed type of water purification units and can only be installed when water is being procured through piped connection. These two WPS types can work only when they are 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 Multi-barrier UV and UltraFLO are fixed type systems and applicable on piped water. The ER sheet, worksheet titled 'MP5 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 In case of UltraFLO and Multi Barrier UV systems, 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 and the Multi Barrier UV systems are installed on these pipes which was found to be in-line to requirement set under section A3. of the included CPA-DDs/2/. 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. During the remote site audit survey conducted for the current issuance request, as well as, during the remote audit survey conducted for previous batches, it was clearly noted by the verification team that UltraFLO and Multi Barrier UV systems 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). It shall be noted that ERs for only Ultra FLO systems have been claimed under the current verification. Please refer the PRC validation report for the details/47/. Thus, all the systems have been implemented in line with the registered CPA DDs/2/.
Findings	CL#03, CL#04 and CL#05 was raised and resolved
Conclusion	a) The verification team is of the opinion that physical features of the CPA have been implemented in accordance with the registered CPA-DDs /2/. b) No specific monitoring equipment had to be installed according to the monitoring plan. c) It is also confirmed, through the remote audit survey and review of the supporting documentation that physical features of the component CPA have been implemented in accordance with the CPA-DDs /2/. d) The CPA was also found to be completely operational in line with the CPA-DDs /2/. However, CME has sought a temporary deviation during the current MP for the systems that were fully consumed/ discontinued prior to the start of the current monitoring period. Also, temporary deviation has been sought as CME was unable to conduct the monitoring for the Multi-Barrier UV systems (Please refer to section E.3.2.1. of the report for details). e) The information provided in the relevant sections of the monitoring report appropriately describes the implementation and operational status of the PoA

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

Following temporary deviations are proposed as part of this verification:

For 9948-P1-0003-CP1:

1. The CME has sought a temporary deviation during the current MP (i.e., 22/03/2020 to 31/12/2020) for the baseline emission calculation of Multi-Barrier UV systems as CME could not monitor the Multi-Barrier UV systems. Thus, conservatively, the CME has considered baseline emissions as 0 tCO2e for all Multi-barrier UV systems. Please refer to PRC validation report/47/ for details.

2. The CME has sought a temporary deviation during the current MP (i.e., 22/03/2020 to 31/12/2020) for the project emission calculation of Multi-Barrier UV systems. Thus, conservatively, the CME has considered applying maximum values of project emissions from all Multi-Barrier UV systems due to consumption of electricity. Please refer to PRC validation report/47/ for details.

For 9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1:

3. The CME has sought a temporary deviation during the current MP (i.e. 22/03/2020 to 31/12/2020) for the systems in the database which were fully consumed/discontinued before the start of the current monitoring period (operational days=0) have not been considered for sampling and monitoring. Thus, conservatively, the CME has considered 0 ERs for all such systems. Please refer to PRC validation report/47/ for details.

The aforesaid approach is deemed correct as any service level not been provided by these systems being not being functional is not considered for sampling and monitoring. Conservatively, the CME has considered 0 ERs from all such systems. The PRC is being submitted along with this issuance request.

E.3.2.2. Corrections

Corrections were identified in CPA 9948-P1-0005-CP1 to CPA 9948-P1-0013-CP1. The corrections were approved on 02/05/2019. The PRC reference number is PRC 9948-0003/54/.

https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view

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

>>NA

E.3.2.4. Inclusion of a monitoring plan

>>NA

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

>>NA

E.3.2.6. Changes to the project design

>> Changes to the project design were identified in 9948-P1-0005-CP1 to CPA 9948-P1-0013-CP1. The changes were approved on 02/05/2019. The PRC reference number is PRC 9948-0003/54/.

https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view

E.3.2.7. Changes specific to afforestation and reforestation activities

>>NA

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 only 22.7% of the Nigerian population 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 ^{o}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 ^{o}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, (^{o}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 ^{o}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

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 ^{o}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, Ryi, 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 (for day schools) and 3.5 (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.

Emission Factor for electricity generation for source j in year y, $EF_{EL,j,y}$, tCO_2/MWh

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the "Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, Version 1.0"/39/. The value considered is 1.3 tCO_2/MWh and was 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.

Average technical transmission and distribution losses for providing electricity to source j in year, TDLj,y, Fraction

Means of verification	The value of the parameter is fixed at the time of validation and the value is sourced from the "Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, Version 1.0"/39/. The value considered is 20% which is a default value sourced from Tool 05 and was 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 (liters/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.
	Monitoring equipment	NA

		How were the values in the monitoring report verified?	The value applied is 73,160,340 litres/years The parameter is a calculated parameter determined through following equation: $QPW_y = \Sigma (T_{y,i} \times N_{y,i} \times R_{y,i} \times 365 \times \text{Water Quality}_i \times \text{Operational Units}_i)$ The formula is correct and in line to the applied methodology/6/, PoA DD/1/ and CPA DDs/2/. The WPS installation for CPAs under the verification has been done between 01/04/2017-30/11/2019. 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 November 2020, ERs will be claimed in December 2020. The end date of the monitoring period is 31/12/2020. 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 "Federal Ministry of Education, Nigeria"/50/ for ER calculations, excluding weekend and school holidays, as a conservative measure (ER sheet, Tab MP5 school days). 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 consideration of operational school days. 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. The verification reviewed the Nigeria school academic calendars (2020-21) issued by the Federal Ministry of Education 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.

		The ER sheet/4/ was checked to confirm that the formula has been applied correctly. The equation used for the calculation is correct and is sourced from paragraph 11 of the applied methodology /6/
	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?	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	CAR#09 and FAR#02 were raised and resolved. FAR#11 has been raised which needs to be addressed in subsequent verifications.	
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/. FAR#11 has been raised for subsequent monitoring periods to ensure that QPW_y is determined accounting the operational school days (excluding holidays) instead of duration of the concerned monitoring period, as applicable.	

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?	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 different type of stove. The GACC report for Nigeria, 2016/16/ was reviewed to confirm that all institutions cook with wood on traditional three stone fire. Therefore, a value of efficiency of 0.10 for unimproved stove was applied. Default value of 10% thermal efficiency for traditional stoves As per GACC report, all public institutions cook with wood on traditional three stone fire. Thus, η_{wb} = 100% * 0.10
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of WPS (11) were surveyed. The head/deputy head 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 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	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/.	

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?	The total number of systems reported in the monitoring report are as following: 6706 UltraFLO 738 UltraTAB 273 Multi-Barrier UV Total: 7,717 These are the total number of UltraFlo, UltraTAB and Multi_UV Barrier systems distributed/installed across various CPAs covered in this monitoring report. The total number of systems on which credits are being claimed are 2,489 (UltraFlo) ,0 (UltraTab) and 0 (Multi-UV). Kindly refer section E.3.2.1 above for more details The CME keeps purchase order/14/, delivery notes/21/ and details of each system on salesforce as checked by the verification team with the help of documents provided by CME. Each unit of Ultra FLO system has unique ID, which is listed in the database and has been claimed for ERs. For Ultra TAB system, the value of the parameter has been determined by considering each institution as a system. Therefore, for institutions with Ultra TAB, the number of tab systems is same as number of

		institutions. Again, each unit of Multi-UV Barrier has a UID, each of which has been listed in the database and project emissions have been calculated. 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. The total number of Ultra Tab and Multi UV systems was checked in the database. It was observed that there has been no distribution since the last verification/40/. Thus, no further evidence was sought to verify the total number of Ultra-tab and multi barrier UV systems used in the ER calculation.
	If applicable, has the reported data been cross-checked with other available data?	Yes. Sampled number of WPS (11) were checked with the installation invoices/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 to replace those systems. Thus, as this parameter has not been monitored for 22/03/2020 to 31/12/2020 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 /47/ for details. The PRC is applicable to all CPAs under verification.
Findings	CAR#09 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/.	

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?	As per the CPA DDs page 15 /2/, the value of $N_{y,i}$ is effectively the number of people in the institution. 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. 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. It was confirmed during the Remote audit inspection, that 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. These numbers are mentioned for each institution in the sales database. Later the number is updated for all the institutions on the salesforce based on the updated number checked by the customer care support team of Impact Water. For the 11 WPS samples checked by the DOE during the remote audit survey, the same numbers were checked and found to be correct. 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]. 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 355 person/technology. 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.
	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	CAR#09 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/.	

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	Yes

	accordance with the monitoring plan and monitoring methodology? (Yes / No)	
	Monitoring equipment	Aquagenx testing kits
	How were the values in the monitoring report verified?	The CME conducted water quality test using Aquagenx testing kits to monitor the E.Coli value for sampled WPS. The Head teachers/ Deputy Head teachers of the schools interviewed by the DOE during the remote survey confirmed that they were visited by monitoring team for the tests. 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 negative results confirming absence of E.coli, thus safe drinking water except three sampled schools. Hence, the applied value of 0.9400 was found acceptable as 47 samples out of 50 tested were negative or found to not have E.coli(47/50=0.9400).
	If applicable, has the reported data been cross-checked with other available data?	Photos of the tests /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 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?	During the current monitoring period CME was unable to monitor the baseline emissions of Multi-UV Barrier System under CPA-9948-P1-0003-CP1.Thus, as this parameter has not been monitored for 22/03/2020 to 31/12/2020 as per the registered monitoring plan, temporary deviation has been proposed for the same in-line to para 228(b) i of PS for PoA version 2.0 /7/. Please refer to PRC Validation Report /47/ 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/.	

Percent of the monitoring period in which the units are in use, Operational Units$_i$, Percentage

Means of verification	**Criteria/Requirements**	Assessment/Observations
	Measuring /Reading /Recording frequency	At least once per verification
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. During the current MP, 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.

		However, to ensure that under no circumstances, the methodology requirement is compromised in future, FAR#10 has been raised to ensure that monitoring frequency of parameter "operational units$_i$", shall be at least biennial, in line with monitoring methodology requirements.
	Monitoring equipment	Sampling Survey has been done to determine the number of water purification system still in operation by field survey by a dedicated team of the CME.
	How were the values in the monitoring report verified?	The sampled systems were checked by the CME's monitoring team to monitor the operational status of the WPS units installed/distributed in the institutions as checked from the monitoring survey forms/18/. The Head teachers/ dy. Head teachers of the schools visited by the CME representative during the monitoring survey were confirmed to the DOE through the remote audit survey that the monitoring team visited the school for the monitoring and the system is operational as reported in the monitoring result. Results presented in the ER sheet were checked with monitoring survey forms /18/ and remote audit survey visit video recordings. 92.59% of WPS from the total systems(Ultra FLO) visited by the CME representative during the monitoring survey were found to be operational. Thus, the applied value of 92.59% was found acceptable.
	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 video 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?	During the current monitoring period CME was unable to monitor the baseline emissions of Multi-UV Barrier System under CPA-9948-P1-0003-CP1.Thus, as this parameter has not been monitored for 22/03/2020 to 31/12/2020 as per the registered monitoring plan, temporary deviation has been proposed for the same in-line to para 228(b) i of PS for PoA version 2.0 /7/. Please refer to PRC Validation Report /47/ for details
Findings	FAR#01 was raised and resolved. FAR#10 has been raised in the current verification and will be addressed in the subsequent verification.	
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/.	

	FAR#10 has been raised to ensure that monitoring frequency of parameter "operational units$_i$", shall be at least biennial, in line with monitoring methodology requirements.

Fraction of woody bio-mass saved by the project activity in Year, fNRB, 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?	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. "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 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 /55/. 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 /56/. The CME, therefore, fixed the value of f_{NRB} for Nigeria through EB67 Annex 22 /57/ (extension SSC 37 Annex 14th, approved in EB68) /58/ 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/. The PoA-DD version 7.0 (Section B.7.1.) /1/ states the $f_{NRB,y}$ as a calculated parameter which has a formula: $f_{NRB,y}$ = [Default f_{NRB} value] * [% of users using NRB] + [1.0[3]] * [% of users using fossil fuels] 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. 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/.

[3] In line with page 6 of AMS III.AV. - If the displaced fuel is fossil fuel use a default value of 1.0

		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. The GACC report for Nigeria, 2016/16/ was reviewed to confirm that all the public institutions cook with wood on traditional three stone fire. 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 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	No findings were raised	
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?	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. The value of % users in the previous MP was established through the review of The GACC report for Nigeria, 2016/16/ which confirmed that all public institutions cook with wood on traditional three stone fire. 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 = 81.6, which was applied in the ER calculation sheet/4/. The applied value 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?	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 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 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?	The institutions of sampled WPS were visited by the CME's monitoring team to check the existing public distribution network with safe drinking water as checked from the monitoring survey forms/18/. Results presented in the ER sheet were checked with monitoring survey forms /18/ The DOE checked 11 samples from CME's samples to confirm the survey results. The Head teachers/ dy. Head teachers of the schools were interviewed by the DOE through the telephonic interview and confirmed that the monitoring team visited the school for the monitoring. All the institutions of sampled WPS checked by the CME representative during the remote audit inspection 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. Thus, the applied value of 0 was found acceptable for the current verification.
	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 DOE remote audit survey.
	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 test/surveys were interviewed during the remote audit survey and 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?	During the current monitoring period CME was unable to monitor the baseline emissions of Multi-UV Barrier System under CPA-9948-P1-0003-CP1.Thus, as this parameter has not been monitored for 22/03/2020 to 31/12/2020 as per the registered monitoring plan, temporary deviation has been proposed for the same in-line to para 228(b) i of PS for PoA version 2.0 /7/. Please refer to PRC Validation Report /47/ 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/.	

Quantity of electricity consumed by the project electricity consumption source j in year y, EG $_{PJ,j,y}$, MWh/yr

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?	The rated power capacity of Multi-barrier UV unit was found to be 14 watts as checked from the WPS manufacturer specification for Multi-barrier UV/28/. Thus, taking an assumption that the technology was considered to be operational for 24 hours a day and 285 days during the current monitoring period. Thus, the applied value of 0.096 was found to be conservative and acceptable for the current verification.
	If applicable, has the reported data been cross-checked with other available data?	Results presented in the ER sheet were checked with DOE remote survey end-users' interviews.
	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	For 9948-P1-0003-CP1, temporary deviation has been sought. Please refer to section E.3.2.1 of the report for details and PRC validation report for the validation opinion/47/.

	the CDM Project Standard?	
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/.	

E.3.4.3. Implementation of sampling plan

Means of verification	The monitoring has been carried out in accordance with the monitoring plan contained in the revised approved PoA DD/1/ and CPA DDs/2/. **Sampling Design/Target Population/Sampling Frame/Reliability**: The CME has applied single sampling plan for all the CPAs monitored under the current monitoring period. 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/. The target population for the parameters stated above are Water purification systems[4] installed / distributed in institutions and recorded in the project sales database. There are three different type of units under the CPAs, UltraFLO units, UltraTAB units and Multi-barrier UV have been listed in the sales database. 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. **Sampling Frame:** The systems that were fully consumed/discontinued before the start of monitoring period or have not received subsequent supplies during the monitoring period, have not been considered for sampling and have been excluded from sampling frame. The systems considered for sampling consists UltraFLO units only. **Sampling Method and selection:** The CME has applied Stratified Random Sampling by dividing the population into the strata (UltraFLO). The samples have been chosen randomly from the strata as checked from the excel sheets with random numbers/33/. **Sample Size for Parameter of Interest:** The sampling is applied to the following monitoring parameters: • Water Quality- Aquagenx Tests • Operational Units • Existence of public distribution network of safe drinking water The sample size is chosen using the equation inline to CDM guidelines for Sampling and surveys for CDM project activities and programmes of activities. 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/.

[4] 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.

Implementation of Sampling Survey and Field Test Records:

Based on interviews with the CME and surveyors during the the remote audit survey, in addition to simply asking this question to the end users, it was confirmed that the surveyors were also trained to evaluate to results of Aqua-genix tests. Therefore, the implementation of surveys and tests was considered reliable. The surveyors also took photos of the school name board , test results which was shared by CME and were checked during the desk-review by the verification team.

Monitoring survey (by CME) duration:

The monitoring survey (field survey / tests) was carried out by CME representatives between following duration for the current monitoring period.

CPA Ref.No.	Technology	From	To
9948-P1-0005-CP1 to 9948-P1-0013-CP1*	Water Purification systems	19/01/2021	28/01/2021

9948-P1-0003-CP1 had only Multi Barrier UV systems which have not been monitored.

Reliability and precision calculation:

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 “Standard for sampling and surveys for CDM project activities and Programme of Activities” /19/ and confirms that the calculation of achieved reliability was done correctly.

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.

Version of sampling standard applied:

The survey for this MP was conducted between the dates stated in the table above. Thus, the planning for sampling for the concerned monitoring period (including samples size determination) was conducted on 15/12/2020 (as checked from online random sample generator snapshots submitted by CME/33/).

The latest version available at the time of sampling and monitoring was Standard: “Sampling and surveys for CDM project activities and programmes of activities”, was version 08.0/19/ which was applied by the CME. The latest version of standard is “Sampling and surveys for CDM project activities and programmes of activities”, Version 09.0/19/ which was published on 27/05/2021. Thus, the CME could not apply version 09.0 of the Sampling Standard at the time of sampling, for planning sampling, monitoring, data calculation and reporting as all these activities were completed before its publication.

However, it was observed that the new standard has added a condition to keep the proportion scale to less than/equal to 1.0. It was checked in the ER sheet that, even if the expected value of the proportion for monitoring parameters is reduced to 0.9 (0r 90%) to keep the proportional scale less than 1.0 for the monitoring parameters to meet compliance with footnote 10 of version 09.0 of the Standard: “Sampling and surveys for CDM project activities and programmes of activities” /19/, the calculated sample size still remains less than the number of samples actually monitored by the CME for each of the monitoring parameter (and strata within). The CME has provided a separate sample size calculation sheet/59/ to demonstrate sample size calculation compliance with version 9.0 of the standard.

	Thus, it was concluded that the sampling conducted by the CME is in compliance with both the versions of Standard: "Sampling and surveys for CDM project activities and programmes of activities"/19,59/. CDM Executive Board decision and documentation framework Version 5.1 para 13 /60/, states that the version containing substantive changes, with the exception of forms, will be recorded in and annexed to the meeting report of the Board, and published on the UNFCCC CDM website and the latest version of the document becomes effective, unless otherwise stated in the meeting report or in the document itself, on the date of publication of the meeting report in which the document was revised. Thus, it could not be applied to an activity conducted before the effective date of the new standard.
Findings	CL#07 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.8/19/

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

Means of verification	No monitoring equipment are used 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

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/:

$BE_y = QPW_y * SEC * f_{NRBy} * EF_{projected\_fossilfuel} * 10^{-9}$

Where,

BE_y	Baseline emissions during the year y in (tCO_2e)
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.
$EF_{projected\_fossilfuel}$	Emission factor when NRB is displaced or the emission factor of the fossil fuel substituted 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

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

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

Where

WH	Specific heat of water (kJ/L ^oC)
T_f	Final temperature (^oC)
T_i	Initial temperature of water (^oC)
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:

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

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 November 2020, ERs will be claimed in December 2020. The end date of the monitoring period is 31/12/2020.

The applicable formula is:

$QPW_y = \Sigma (T_{y,i} \times N_{y,i} \times R_{y,i} \times \mathbf{365} \times \text{Water Quality}_i \times \text{Operational Units}_i)$ for CPA 9948-P1-0005-CP1

Where:

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

$T_{y,i}$: Total distributed water purification system

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

Water Quality_i: Proportion of units that meet water quality requirements

$\text{Operational Units}_i$: 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)

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 "Federal Ministry of Education, Nigeria"/50/, discounting weekend and school holidays, as a conservative measure/4/.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 considered in the ER sheet:

In the revised MP5 ER Calculator, the MP4 Sales database has been added (Tab: 'MP4 Sales data – reference only') by the CME. The verification team has verified that information in the revised ER Calculator, Tab: 'MP4 Sales data – reference

only' is 100% consistent with the tab: 'Sales database' in the MP4 ER calculator submitted with the previous issuance request/49/.

Further, in the revised ER calculator, tab 'MP5 Sales database' column AB, the residual capacity from previous MP has been found to be correctly linked with 'MP4 Sales data – reference only', column AN, thus establishing complete traceability.

The verification team has independently checked MP4 ER calculator from PoA page (9948-MP4-IRP4) and cross-verified the information in the revised ER Calculator, Tab: 'MP4 Sales data – reference only' and found it to be consistent.

In the ER calculator, 'MP5 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 MP5 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 "MP5 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, MP5 sales database/4/) from previous MP along with 0 subsequent supplies (see under column AC, MP5 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/).

For other systems the operational days have been calculated accounting initial / residual capacity and subsequent supplies as applicable

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.

Lifetime of Ultra FLO, Multi Barrier UV systems and Ultra Tab units in ER sheet/4/):

The verification team further confirmed that UltraFLO/UltraTAB expiry is 5 years/28/ Multi-Barrier UV lifetime is 7 years/28/. In the CPAs covered in the verification, the first WPS system was installed in April 2017 in Nigeria, thus no device will expire before the end of the current monitoring period.

Other Determinants

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/4/ tab, 'MP5 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 treatment capacity (column AM) remains lower of these two in all cases. This is better approach .

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.

	The verification team has checked all determinants (column AC:AP) and confirms them to be correctly and accurately calculated and conservative with respect to ER calculations. The effective duration of monitoring period is from 12/10/2020 to 31/12/2020 as from 22/03/2020 till 11/10/2020 schools were closed due to COVID-19; the same could be verified from the academic calendar of the school mentioned in the sales database in the ER sheet. Thus, CME has claimed conservatively the ERs only from 12/10/2020 to 31/12/2020. 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. 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 to the applied methodology/6/. The achieved emission reductions in the current monitoring period thus are confirmed to be conservative, accurate and credible. All the parameters are assessed in detail under section E.3.4. of this report.
Findings	CL#06 was raised and resolved
Conclusion	The verification team confirms that 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. The project emissions for type 3 CPAs were found to be calculated as follows: $PE_y = T_{y,i} \times EC_{PJ,j,y}\ x\ EF_{EL,j,y}\ x\ (1 + TDL_{j,y})$ For CPA 9948-P1-0003-CP1, PEy= 262*0.096*1.3*(1+0.20) = 40 tCO2e
Findings	None.
Conclusion	The project emissions are not applicable for Type 2 CPAs but have been considered for Type 3 CPAs as applicable. The approach is in line with the PoA DD/1/.

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	The PoA-DD/1/, CPA DDs/2/ and applied monitoring methodologies does not prescribe any leakage emissions to be considered. The remote 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.

	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: Leakage = BE_y * (1-95%) The verification team has checked that the calculation for all the CPAs have also been done in the worksheet 'ERs Summary' /4/ in the same manner. The calculations for all the CPAs (9948-P1-0003-CP1,9948-P1-0005-CP1 to 9948-P1-0003-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 cumulative verified value of Leakage for all the CPAs is 996 tCO2e. The value is mentioned CPA wise in the table presented under the next section.
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	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/. The verification team confirms that from the remote survey where all the evidence and records that validated the stated figures were checked and found acceptable.
Findings	CAR#08 was raised and resolved
Conclusion	The verification team confirms that 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 (refer Section E.5.4 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed; d) The total number of ERs achieved (on account of water purifiers installation/distribution) during the current monitoring period were 18,805 tCO2e.

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-P1-0003-CP1	0	40	0	0	-40	-40
9948-P1-0005-CP1	2,063	0	104	0	1,959	1,959
9948-P1-0006-CP1	1,009	0	51	0	958	958
9948-P1-0007-CP1	2,600	0	130	0	2,470	2,470
9948-P1-0008-CP1	2,157	0	108	0	2,049	2,049
9948-P1-0009-CP1	2,551	0	128	0	2,423	2,423
9948-P1-0010-CP1	1,861	0	94	0	1,767	1,767

9948-P1-0011-CP1	3,097	0	155	0	2,942	2,942
9948-P1-0012-CP1	2,585	0	130	0	2,455	2,455
9948-P1-0013-CP1	1,918	0	96	0	1,822	1,822
Total	**19,841**	**40**	**996**	**0**	**18,805**	**18,805**

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 22/03/2020-31/12/2020 (including both days) amount to 18,805 tCO_2. **Verified and certified emission reductions as per commitment period:** **Commitment period** — **Amount** Upto 31/12/2012 (1st commitment period) — 0 tCO_2e From 01/01/2013 — 18,805 tCO_2 01/01/2021 onwards — 0 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.

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)
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 3, 9948-P1-0003-CP1	-40	25,110
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 5, 9948-P1-0005-CP1	1,959	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, 9948-P1-0006-CP1	958	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, 9948-P1-0007-CP1	2,470	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, 9948-P1-0008-CP1	2,049	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, 9948-P1-0009-CP1	2,423	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, 9948-P1-0010-CP1	1,767	46,638

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, 9948-P1-0011-CP1	2,942	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, 9948-P1-0012-CP1	2,455	46,638
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, 9948-P1-0013-CP1	1,822	46,638
Total	**18,805**	444,852

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. The quantitative details of actual values of achieved ERs for the CPA and value estimated in the CPA- DDs/2/ is presented in the above table.
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, assessment is not required.
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 5th 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 5th 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 **22/03/2020-31/12/2020** (both days included) as reported in the Monitoring Report (final) Version 2.1 dated 14/06/2021 /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 2.1 dated 14/06/2021 and corresponding ER sheets for the monitoring period **22/03/2020-31/12/2020** (including both days) amount as 18,805 tCO_2e. 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 **22/03/2020-31/12/2020** (MP 05) are fairly stated in the Monitoring Report (final) Version 2.1 dated 14/06/2021.

ESPL, based on outcome of verification activities, certify in writing that, during the monitoring period **22/03/2020-31/12/2020** (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 **18,805** tCO_2e reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CPAs.

Appendix 1. Abbreviations

Abbreviations	Full texts
AMS	Approved Methodology for Small-scale
BE	Baseline Emission
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CH4	Methane
CL	Clarification Request
CME	Coordinating and Managing Entity
CO2	Carbon di oxide
CPA	Component Project Activity
CPAI	CPA implementer
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
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
tCO2e	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	5 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**	15/04/2021
Approved by	Anshika Gupta	**Date**	15/04/2021

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	
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

Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

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) Revised Approved PoA-DD Version 7.0)	Dated:24/03/2014 Dated: 15/02/2017 Dated: 18/04/2017	CME
2	Impact Carbon	Registered CPA-DD-03 Registered CPA-DD-05 Registered CPA-DD-06	Version 1.3, Dated: 17/02/2017 Version 5, Dated: 22/03/2019	Other

		Registered CPA-DD-07 Registered CPA-DD-08 Registered CPA-DD-09 Registered CPA-DD-10 Registered CPA-DD-11 Registered CPA-DD-12 Registered CPA-DD-13		
3	Carbon check India Pvt Ltd.	CPA Inclusion Report (9948-P1-0003-CP1, 9948-P1-0005-CP1 to 9948-P1-0013-CP1)	Version 3, Dated: 06/03/2017, Version 2, Dated: 22/09/2017	Other
4	Impact Carbon	ER sheet (Version 1.1)	Corresponding to the current monitoring period	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 4	Others
11	UNFCCC	CDM-PoA-VCR-Form	Version 4	Others
12	UNFCCC	PoA UN webpage	https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5J36IFUKQVNMRA0OZPGLH9C7STED1W/viewCPAs?s=0	Others
13	Impact Carbon	Monitoring Report (Final)	Version 2.1 dated 14/06/2021	CME
14	Impact Carbon	Purchase Orders	Various	CME
15	Impact Carbon	Agreement between CME and CPA Implementer	Dated: 09/06/2017	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 survey forms + water quality test (Scanned and filled)	Various 19/01/2021 to 28/01/2021)	CME
19	UNFCCC	Standards for Sampling and survey for CDM PoA	Version 8.0 and Version 9.0	Others
20	Impact Carbon	Training Records	-	CME
21	Impact Carbon	Delivery Notes	Multiple Dates	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 37th 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	a. Technical specification confirming capacity /	-	CME

	(technology supplier for UltraFLO and UltraTAB) Rotex (technology supplier for Multi-Barrier UV)	expiry of UltraFlo issued by Medentech b. Technical specification confirming capacity / expiry of UltraTAB issued by Medentech c. Photographs of UltraTAB strip and UltraTAB pack for the UltraTAB treatment capacity d. UltraFLO Installation Manual (specifying inlet port size, pressure rating etc.) e. UltraFLO dimension declaration by CME f. Photographs of UltraFlo cartridge and UltraTAB pack for the expiry of the UltraFlo and UltraTAB respectively g. Installation Logs for UltraFLO confirming piped applications. a. Multi-Barrier UV - Technical Specification from Supplier (Rotek) for UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.) b. Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek) c. Photographs of Multi barrier UV systems d. Installation Logs for Multi-Barrier UV confirming piped applications.		
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	Aquagenx Testing Kit specifications Photos of Aquagenix test results	-	CME
31	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 4.0	Other
32	Stat Trek	Screenshot- Stat trek	-	CME

33	Impact Carbon	Random number -excel sheet	-	CME
34	Impact Carbon	Site-exemption request form	07/05/2021	CME
35	Impact Carbon	Emission Reduction Purchase Agreement	2016-2020	CME
36	Impact Carbon	Water Quality test Photographs	-	CME
37	Impact Carbon	Complaint Log (Sample)	-	CME
38	Impact Carbon	Remote Survey Files Selected Sample Videos, Interview video of the school representative	12/05/2021	CME
39	UNFCCC	Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	Version 1.0	Others
40	ESPL	Verification report for MP 4	Version 3.0	Other
41	UNFCCC	EB 106 Meeting report	-	Other
42	UNFCCC	EB announcement https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html	23/06/2020	Other
43	New York times	https://www.nytimes.com/interactive/2020/world/asia/india-coronavirus-cases.html	-	Other
44	India.com	Status of Novel coronavirus in India Link: https://www.india.com/news/india/coronavirus-cases-in-india-may-19-2021-live-tracker-news-covid-19-vaccine-latest-update-black-fungus-vaccination-karnat	Dated 20/05/2021	Other
45	UNFCCC	EB-108 Meeting report Link: https://cdm.unfccc.int/filestorage/X/B/L/XBL3H024J87AVRZP19YUO6IGEDSMQT/eb108%20meeting%20report.pdf?t=OE98cW5hMXJvfDC4g05i0cKrSB7AoSVcati0	-	Others
46	UNFCCC	EB-106 Meeting report	-	Others
47	ESPL	PRC Validation opinion	Version 2.0 Dated 08/07/2021	Others
48	Impact Carbon	Sales force database	-	CME
49	CME	ER sheet for MP4 https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss893188262/view	-	Other
50	Federal Ministry of Education, Nigeria	Academic school calendars	Calendar for 2020-21	CME
51	UNFCCC	EB 110 Meeting report	-	Others
52	UNFCCC	PoA issuance webpage:	-	Others

		CPA 9948-P1-0003-CP1, CPA 9948-P1-0005-CP1 to CPA 9948-P1-0013-CP1 https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss893188262/view		
53	Google	Google Maps	-	Others
54	UNFCCC	PRC-9948-003 https://cdm.unfccc.int/PRCContainer/DB/prcp52130222/view	-	Other
55	UNFCCC	CDM Website URL: https://cdm.unfccc.int/DNA/fNRB/index.html	-	
56	UNFCCC	SSC_543 https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/03200	07/10/2011	Other
57	UNFCCC	EB 67 Annex 22 https://cdm.unfccc.int/filestorage/H/2/9/H29X6EKQMJU7RY85DIT4ZPFAL3O1GW/eb67_repan22.pdf?t=ZlZ8cHgxcXQ1fDBaKlvFqRuMIYclRR3nH_se	11/05/2012	Other
58	UNFCCC	EB68 - meeting report https://cdm.unfccc.int/filestorage/8/i/KYQVI5N0ABEJX3T68ZDF1M7RCGU9SW.pdf/eb68_report%20v01.1?t=QXZ8cWgzbWZtfDB2p0F4x0TF7eAJLmYt1_yy	20/07/2012	Other
59	CME	Sample size calculation sheet with version 9.0 applied	-	CME
60	UNFCCC	CDM Executive Board Decision and documentation Framework	Version 5.1	Others

Appendix 4. Clarification requests, corrective action requests and forward action requests

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

FAR ID	01	**Section no.**	E.3.4.2.	**Date :** 21/05/2021
Description of FAR				
DOE involved in subsequent verifications shall ensure that monitoring frequency of parameter “operational unitsi” is atleast, biennial, in line the with monitoring methodology requirements.				
Project participant response				**Date :** 24/05/2021
The monitoring activity in MP4 was conducted in Aug 2020 and the monitoring activity in MP5 was conducted in Jan 2021. Thus, for the current monitoring period, the monitoring frequency is in compliance with the monitoring methodology in addition to being compliant with the registered monitoring plan as well (once per verification).				
Documentation provided by project participant				
N/A				
DOE assessment				**Date :** 02/06/2021
The verification team confirmed from the MR and VCR of the previous MP(MP4B4) that the monitoring activity was conducted in August 2020 whereas for MP5, the monitoring activity was conducted in January 2021 as checked from the monitoring survey sheet, thereby meeting the methodology requirement of once in two years as well as the requirement set in the registered monitoring plan of conducting the monitoring once				

per verification. The gap between the last monitoring and the current monitoring is even less than one year.

Thus, for the current verification, the frequency required by the applied methodology has been met. However, for next verification FAR#01 has been raised.

Thus, the FAR is closed.

FAR ID	02	**Section no.**	E.3.4.2.	**Date :** 21/05/2021
Description of FAR				
DOE involved in subsequent verifications shall ensure that the parameter QPWy is determined accounting the operational school days instead of duration of the concerned monitoring period, as applicable.				
Project participant response				**Date :** 24/05/2021
The number of credited operational school days in ERs Summary tab (refer row 6), has been calculated to correspond to only operational school days during the monitoring period instead of complete duration of the monitoring period. As a conservative measure, 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 and end term holidays) for non-boarding users and considered days (including weekends and public holidays but excluding 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. Also, COVID school closure days have also been excluded and no CERs are being claimed for that period. Please refer column AW:BD in “MP5 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).				
Documentation provided by project participant				
PoA 9948_MP5_MR4 Nigeria Norway MR ver 2.0 _24052021 PoA 9948_MP5_Nigeria_Norway ER Sheet_ver 1.0_12042021				
DOE assessment				**Date :** 02/06/2021
In the applied methodology / registered PoA-DD/CPA-DDs, CPAs do not have provision to account for school holidays. However, the CME has claimed ERs only for operational school days (refer tab: MP5 Sales Database) instead of the monitoring period days, on the basis of 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 2020-21 issued by 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. Therefore, the QPWy has been calculated correctly considering school operational days. Moreover, FAR#02 has been raised to ensure that QPWy is based on operational school days (discounting holidays), in future verifications. Thus, the FAR is closed.				

Table 2. CLs from this verification

CL ID	03	**Section no.**	E.3.1.	**Date :** 21/05/2021
Description of CL				
Out of the 6,312 schools using either UltraFLO or UltraTAB or Multi Barrier UV in the CPAs, 3,911 schools indicate zero continuous supplies during this monitoring period (i.e., column ‘AB’ of tab ‘Sales Database’). CME is requested to 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 :** 24/05/2021

Please note that column AA in 'MP5 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. Please refer the following in this regard:

Description	MP5 Sales Database
1) Schools with no residual capacity from the previous monitoring period	Select value "0" in column AB in MP5 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 MP5 Sales Database
3) Total number of cases identified	3,911
4) Operational days for these schools	0 (refer column AP, MP5 Sales Database)

Thus, for the schools in (3) above, the operational school 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 AA in 'MP5 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.

Documentation provided by project participant

PoA 9948_MP5_Nigeria_Norway_ER Sheet_ver 1.0_12042021

DOE assessment | **Date :** 02/06/2021

The subsequent supplies to any school are depicted under column AC of the worksheet titled "MP5 sales database". The subsequent supplies are required in cases where the residual capacity from the previous period is 0. 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 in the current MP along with 0 subsequent supplies, were verified to have 0 operation days under column AO (cases for which both column AB and AC are '0' in MP5 sales database sheet), thus substantiating that no ERs have been claimed for such cases.

Thus, CL stands closed.

CL ID	04	Section No.	E.3.1	Date: 21/05/2021

Description of CL

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 Multi-Barrier UV and 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.

CME response | **Date:** 24/05/2021

The source of primary water is already included in column Q, tab "MP5 Sales data" of the submitted the ER calculator.

Multi-Barrier UV and UltraFLO

As mentioned in the CPA-DDs and MR, Multi-Barrier UV and UltraFLO Chlorination water purification systems (WPS) are fixed type water purification systems requiring pressurized piping connection to operate. The relevant information / specifications of these WPS (Refer Table 1 given below) confirm that both these

two system types require a piping connection to operate.

Table 1: System Specification

WPS Type	Model	Port size inlet	Pressure (psi)	Rated capacity (L)	Lifespan (year)	Reference
Multi Barrier UV	2 GPM	¼ inch	125	4,088,232	7	Technical Specification from Supplier (Rotek) for Large and Small UV Multi-Barrier UV Lifespan confirmation from Supplier (Rotek)
UltraFlo	UltraFlo	20mm	As per line pressure	340,0000	5	Technical specification / expiry of UltraFlo by Medentech (technology supplier) UltraFLO Installation Manual

Thus, the Port size inlet rating and pressure rating mentioned in the manufacturer specifications / installation manual confirm that these systems require piping connection at their inlet ports for water purification. Thus, it is confirmed that a water connection is pre-requisite for these two types of systems by virtue of their design.

Additionally, the photographs of the WPS installations, CME installation logs further confirm that these WPS are installed on pressurized piping connection and are designed to operate exclusively for piped applications only. Please refer below:

1. **Sample photographs:**
   The photographs confirm these systems being installed on piped applications only

Picture 1: Multi-Barrier UV Installation

Picture 2: UltraFlo Installation

2. **Installation Logs:**
   The Installation Logs of both Multi Barrier UV and UltraFlo systems report the length of ppr (poly-propylene random copolymer plastic) pipe used to complete the installations, further confirming that these systems can be and were installed on piped applications only.

Thus, in case of Multi-Barrier UV and UltraFLO Chlorination 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 Multi-Barrier UV and UltraFLO device. For example, the wells/boreholes are connected to drinking water storage tanks via pipes. The water is pumped from wells/boreholes to these water storage tanks. The Multi-Barrier UV or UltraFLO Chlorination 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 the drinking of water by the school students and staff. 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.

UltraTABs

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 litres of water. Thus, although some of the schools may have "Piped"

Connections in column Q for UltraTABs, the drinking water storage tank is un-piped making the schools fit only for UltraTABs devices in such cases.

Thus, the statements under the included CPA-DDs (section A.3) and the monitoring report (section C.1) are verified and deemed correct and both the WPS type have been implemented in line with the description provided in the CPA-DD / MR.

Documentation provided by the CME

PoA 9948_MP5_MR4 Nigeria Norway MR ver 2.0 _24052021
PoA 9948_MP5_Nigeria_Norway ER Sheet_ver 1.0_12042021

DOE assessment | **Date:** 02/06/2020

Multi-Barrier UV and UltraFLO systems are fixed type of water purification units and can only be installed when water is being procured through piped connection. These two WPS types can work only when they are 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 Multi-barrier UV and UltraFLO are fixed type systems and applicable on piped water

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

The ER sheet, worksheet titled 'MP5 sales database', column R 'Primary water 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 MP5, the DOE's audit samples included 11 UltraFLO school connected via pipe to source "Well/Borehole". In these samples the verification team was able to verify that the respective schools have operational UltraFLO systems receiving water from the quoted primary water source and connected via pipes to the drinking water storage tank(s).

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. Moreover, fixed nature of Multi Barrier UV systems and portable nature of Ultra Tab systems were also confirmed through physical observations done for other batches.

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.

CL ID	05	**Section No.**	E.2.1 and E.3.1	**Date:** 02/06/2021
Description of CL				

The registered PoA-DD and the included CPAs mention that the sales database will include information on the address and contact details (name and phone number if available) of the end user. However, no information is provided on the name of the user (institution) where the water purification systems have been implemented. The CME shall explain how the implementation and operation of the registered CDM PoA and the included CPAs in accordance with the description contained in the registered PoA-DD and included CPA-DDs. (Open)
CME response **Date:** 14/06/2021
CME has now submitted a master database having information related to the End user (institution) where the WPS have been implemented. The same can be reviewed by the verification team. However due to privacy concerns, this information shall not be made public and must remain confidential. Further, the end user (institution) information was also cross verified by the DOE during the remote audit assessment. Thus, the PoA and the CPAs have been implemented in accordance with the description contained in the registered PoA-DD and included CPA-DDs.
Documentation provided by the CME
PoA 9948_MP5_Nigeria_Norway Master Database_ver 1.0_12042021
DOE assessment **Date:** 18/06/2021
The Sales database in the ER sheet provided, was cross-checked with the master Sales database including institution details. The school SF ID, address and product ID were confirmed to be correctly stated in the Sales database worksheet in ER Calculator. Further, the institutional details were then verified with the purchase order form for the sampled schools interviewed by the verification team during the remote survey and were found to be correct. Thus, the verification team confirms that the PoA and the CPAs have been implemented in accordance with the description contained in the registered PoA-DD and included CPA-DDs. Thus, the CL stands closed.

CL ID	06	**Section No.**	E.3.6.1	**Date:** 02/06/2021
Description of CL				
The monitoring period on the first page of MR is mentioned as 22/03/2020. However, as per MP5 Sales database sheet (Cell:AS6) the effective start date is mentioned as 12/10/2020. CME shall clarify the reason. (Open)				
CME response **Date:** 14/06/2021				
The monitoring report submitted pertains to the fifth monitoring period of the PoA. The start date of the fifth monitoring period is 22/03/2020 and end date is 31/12/2020 which is in continuation with the previous monitoring period. However, due to COVID 19, the schools were closed on 22/03/2021 and were reopened on 12/10/2020. Thus, the effective start date of the monitoring period has been considered as 12/10/2020 for ER calculations as a conservative measure accounting only operation school days in the monitoring period. CME is not claiming any CERs for the covid affected school closure days (22/03/2020 to 11/10/2020). Please refer column AV:BC in "MP5 Sales Database" tab of ER Calculator where the school calendar listing covid closure days, holidays list and start date / end date of school term have been presented. The school academic calendar, as issued by the Federal Ministry of Education, Nigeria has already been submitted as a supporting document. The revised ER sheet and MR are being submitted.				
Documentation provided by the CME				
PoA 9948_MP5_Nigeria_Norway ER Sheet_ver 1.1_14062021 PoA 9948_MP5_MR4 Nigeria Norway MR ver 2.1 _14062021				
DOE assessment **Date:** 18/06/2021				
The start date of the 5th MP is from 22/03/2020 and end date is 31/12/2020. However, the effective date of the monitoring period is from 12/10/2020 as the schools were closed from 22/03/2020 to 11/10/2020 due to COVID-19 as confirmed from the school calendar list mentioned in the MP5 Sales database sheet. It was confirmed from the ER sheet that the CME has claimed ERs from 12/10/2020 onwards thus the effective monitoring period from 12/10/2020 to 31/12/2020 was found to be acceptable by the assessment team. Thus, CL stands closed.				

CL ID	07	**Section No.**	E.3.6.1.	**Date:** 29/06/2021

Description of CL	
Under section E.3 of the MR it was observed that CME has determined expected value for proportional parameters. However, the expected value of precision for the proportional parameters were not found to be in-line with guidance stated under footnote 10 of the Sampling and surveys for CDM project activities and programmes of activities, Version 09.0. Also, the version of sampling standard applied by the CME (version 08.0) is not the latest version available on the UN webpage. CME shall clarify how the use of older version of standard is found to be appropriate.	
CME response	**Date:** 30/06/2021
The sampling for the concerned monitoring period was conducted on 15/12/2020 (please refer online random sample generator snapshots submitted by CME). The monitoring activities (Surveys and Water Quality Tests) were conducted during the period 19 – 28 Jan 2021. Thus, at the time of sampling and monitoring, the latest and valid version of the Standard: "Sampling and surveys for CDM project activities and programmes of activities", was version 08.0 only. Please note that the standard for "Sampling and surveys for CDM project activities and programmes of activities", Version 09.0 was published on 27/05/2021 which is even after the date of remote audit assessment by the DoE (12/05/2021). Thus, it is not possible for the CME to apply version 09.0 of the Sampling Standard at the time of sampling, monitoring, data calculation and reporting as all these activities were completed before its publication. Hence, the latest version of sampling standard is not deemed applicable for the concerned monitoring period. Lastly, even if the expected value of the proportion for monitoring parameters is reduced to 0.9 (or 90%) for the monitoring parameters to meet compliance with footnote 10 of version 09.0 of the Standard: "Sampling and surveys for CDM project activities and programmes of activities", the calculated sample size still remains less than the number of samples actually monitored by the CME for each of the monitoring parameter (and strata within). So, the monitoring conducted by CME is in compliance with both version 08.0 and 09.0 of the Standard: "Sampling and surveys for CDM project activities and programmes of activities". The sample size calculator as per Standard: "Sampling and surveys for CDM project activities and programmes of activities" ver 09.0 is being submitted.	
Documentation provided by the CME	
PoA 9948 MP5 Nigeria Norway Sample Size Cal as per Standard version 09.0	
DOE assessment	**Date:**
The application of Sampling and Survey standard for PA and PoA version 8.0 was found to be acceptable by the team as: 1. The random sample generator screenshots shared by CME as a supportive for sampling was reviewed and it was confirmed that the sampling was conducted on 15/12/2020. 2. It was confirmed from the monitoring survey records that the monitoring activities (Monitoring Survey and WQT) were conducted during the period 19/01/2021 to 28/01/2021. 3. Also, the remote audit inspection was conducted by DOE on 12/05/2021. Thus, the applicable and valid version of the Standard: "Sampling and surveys for CDM project activities and programmes of activities", for the current monitoring period was version 08.0 only as Version 9.0 of the Standard published on 27/05/2021. CDM Executive Board decision and documentation framework Version 5.1 para 13, states that the version containing substantive changes, with the exception of forms, will be recorded in and annexed to the meeting report of the Board, and published on the UNFCCC CDM website and the latest version of the document becomes effective, unless otherwise stated in the meeting report or in the document itself, on the date of publication of the meeting report in which the document was revised. Thus, it could not be applied to an activity conducted before the effective date of the new standard. Moreover, It was confirmed from the monitoring survey sheet and sample size calculation sheet that the number of samples monitored by CME is more than the number of samples that will be calculated when the expected value of the proportion for monitoring parameters is reduced to 0.9 (0r 90%) for the monitoring parameters in order to meet the compliance with footnote 10 of version 09.0 of the Standard: "Sampling and surveys for CDM project activities and programmes of activities". The CME has provided a separate sample size calculation sheet to demonstrate that compliance with version 9.0 of the standard. The assessment team is of the opinion that the expected value of precision of proportional parameters determined by CME was found to be in compliance with footnote 10 of Version 8.0 and Version 9.0 of the	

sampling standard.

Thus, CL stands closed.

Table 3. CARs from this verification

CAR ID	08	**Section No.**	E.3.6.4	**Date:** 21/05/2021
Description of CAR				
Following inconsistencies were observed in the MR version 1.0: 1. The achieved ERs mentioned in the MR version 1.0 was found to be inconsistent with the ER sheet (Tab: ER summary, Cell: O21). Also, as the ERs mentioned in the published MR was found to be 34,513 tCO2e and the ER's mentioned in the ER sheet (Version 1.0) was found to be 18,805 tCO2e. CME shall clarify the reason of difference in the achieved ER values mentioned in the public MR and ER sheet version 1.0. 2. Section C.1 of the MR mentions the total number of systems for each of the CPAs inconsistently with the number of systems mentioned for each CPA in the ER sheet (Tab: ER summary, Row: 2) 3. Under section C.1 (d) of MR, the emission reduction for CPAs 9948-P1-0005-CP1 to 9948-P1-0013-CP1 were found to be inconsistently mentioned with the ER values mentioned for each of the CPAs in ER sheet (Tab: ER summary, Row: 21)				
CME response				**Date:** 24/05/2021
1. The achieved ERs mentioned in the MR has now been made consistent with the ER Sheet (Tab: ER summary, Cell: O21). The ERs were wrongly mentioned in the MR as a matter of oversight and calculation error in ER calculator. After submitting the MR to the verification team, the CME spotted the error in the ER calculator. Thus, the calculation error in the ER sheet (accounting operational school days instead of duration of monitoring period) was rectified by CME before submission to the verification team. The MR has now been updated to be consisted with the ER sheet. 2. The section C.1 of the MR specified the "**total no. of systems installed/distributed under each CPA**" (kindly refer cell AR22:AU34 of "MP5 Sales Database" tab of ER Sheet for no. of systems installed/distributed under each CPA), while the row:2, of "ER Summary" tab of ER sheet specified the "**total number of systems on which credits are being claimed**" (kindly refer section C.3.1 of MR and additional comments section of monitoring parameter $T_{y,i}$ of MR, where it has been clarified now). 3. The emission reduction for each of the CPAs under section C.1 (d) of the MR has now been made consistent with the ERs values mentioned for each of the CPAs in ER sheet (Tab: ER summary, Row: 21). Revised MR and ER Sheet are being submitted.				
Documentation provided by the CME				
PoA 9948_MP5_MR4 Nigeria Norway MR ver 2.0 _24052021 PoA 9948_MP5_Nigeria_Norway ER Sheet_ver 1.0_12042021				
DOE assessment				**Date:** 02/06/2021
1. The MR (version 2.0) now mentions the achieved ERs consistently. 2. The number of systems distributed/installed under each of the CPAs were found to be listed under section C.1 of the MR. However, the total number systems for which the CME was claiming the CERs were found to be listed under section C.3.1 and simultaneously in row 2 of the ERs summary sheet. Thus, both the sections of MR version 2.0 refer to two different columns which have correct values. 3. CME has now consistently mentioned the ERs for each CPAs under section C.1 of the MR (Version 2.0). Thus, CAR stands closed.				

CAR ID	09	**Section No.**	E.3.4.2.	**Date:** 21/05/2021

Description of CAR	
1. Value for monitored parameter QPWy was found to be mentioned as 134,098,851 in the MR version 1.0 which was found to be inconsistent with the value mentioned in the ER sheet (Tab: ER summary, Cell: O8). 2. The total distributed WPS was found to be mentioned as 7,717 in MR version 1.0 which was found to be inconsistent with the value mentioned in the ER sheet (Tab: ERs Summary, Cell: O2) 3. The value for parameter Nyi was found to be mentioned as 386 in the MR version 1.0. However, in the ER sheet the value of the parameter was found to be mentioned as 355 (Tab: ERs Summary, Cell:O5)	
CME response	**Date:** 24/05/2021
1. Value of monitored parameter "QPW_y" has now been made consistent in MR with the value mentioned in the ER sheet (Tab: ER summary, Cell: O8). 2. The value (7,717) mentioned under "Value(s) of monitored parameter" of monitoring parameter $T_{y,i}$ is the "**total number of systems distributed/installed across various CPAs covered in this monitoring report"** (kindly refer cell AR22:AU34 of "MP5 Sales Database" tab of ER Sheet for, total no. of systems installed/distributed under each CPA), On the other hand, the total no. of water purification systems (2,751) mentioned in cell: O2 of "ERs Summary" tab of ER sheet is "**total number of systems eligible for crediting**". Kindly refer section C.3.1 of MR and additional comments section of monitoring parameter Ty,i in MR, where it has been clarified now. 3. Value of monitored parameter "Nyi" has now been made consistent in MR with the value mentioned in the ER sheet (Tab: ER summary, Cell: O5). Revised MR and ER Sheet are being submitted.	
Documentation provided by the CME	
PoA 9948_MP5_MR4 Nigeria Norway MR ver 2.0 _24052021 PoA 9948_MP5_Nigeria_Norway_ER Sheet_ver 1.0_12042021	
DOE assessment	**Date:** 02/06/2021
1. CME has now consistently mentioned the value of 'QPWy' in MR (version 2.0) under section E.2. 2. The number of systems distributed/installed under each of the CPAs were found to be listed under section C.1 of the MR. However, the total number systems for which the CME was claiming the CERs were found to be listed under section C.3.1 and simultaneously in row 2 of the ERs summary sheet. Thus, both the sections of MR version 2.0 refer to two different columns which depict correct values. 3. CME has now consistently mentioned the value of 'Ny,i' in MR (version 2.0) under section E.2. Thus,CAR stands closed.	

Table 4. FARs from this verification

FAR ID	10	**Section No.**	E.3.4.2	**Date:** 02/06/2020
Description of FAR				
DOE involved in subsequent verifications shall ensure that monitoring frequency of parameter "operational unitsi" is atleast, biennial, in line the with monitoring methodology requirements.				
CME response				**Date:** DD/MM/YYYY
NA				
Documentation provided by the CME				
NA				
DOE assessment				**Date:** DD/MM/YYYY
NA				

FAR ID	11	**Section No.**	NA	**Date: 02/06/2020**
Description of FAR				
DOE involved in subsequent verifications shall ensure that the parameter QPWy is determined accounting the operational school days instead of duration of the concerned monitoring period, as applicable.				
CME response				**Date:** DD/MM/YYYY

NA	
Documentation provided by the CME	
NA	
DOE assessment	**Date:** DD/MM/YYYY
NA	

Document information

Version	Date	Description
04.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: • 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.

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