Verification and certification report form for CDM programme of activities

(Version 4.0)

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)	Impact Carbon Global Safe Water Programme of Activities (PoA) UNFCCC ID: 9948
Version number(s) of the PoA-DD(s) to which this report applies	7.0
Version number of the verification and certification report	1.0
Completion date of the verification and certification report	05/07/2021
Monitoring period number and duration of this morning period	Fourth Monitoring Period 01/01/2020 – 21/03/2020 (both days inclusive)
Number and version number of the monitoring report to which this report applies	Monitoring report number: 5 Monitoring report version: 4.1
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	Yes
Nigeria	No
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	-
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	108,583 tCO_2e

Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report

Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
-	7,847 tCO_2e	-

Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH E-0022
Name, position and signature of the approver of the verification and certification report	Final Approver Alexandra Nuske

SECTION A. Executive summary

Impact Carbon has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 4th periodic verification of the CDM Programme of Activities (CDM-PoA-9948/PoA-DD/):

"Impact Carbon Global Safe Water Programme of Activities (PoA)"

with regard to the relevant requirements for CDM PoAs.

This verification covers the monitoring period from 01/01/2020 – 21/03/2020 (including both days).

The PoA involves distribution of low greenhouse gas emitting, safe drinking water purification systems (WPS) across the identified host countries. The safe portable water is delivered to the end users after treatment from an Ultraviolet or Chemical (Chlorination) disinfection technology. The CPAs under consideration (CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to CPA 9948-P1-0022-CP1, 10 CPAs)/CPA-DD/ have been implemented in Uganda and result in reduction in consumption and/or replacement of the non-renewable biomass or fossil fuels which would have been used for boiling water to make it suitable for drinking, in the baseline. Thus, in absence of CPAs under the PoA, the usage of fuel wood and other fossil fuel would have continued for boiling water to make it suitable for drinking purposes and resulting in GHG emissions.

Details of the PoA location are given in table A-1 below:

Table A-1: **Project Location** 9948-P1-0002-CP1and 9948-P1-0014-CP1 to CPA 9948-P1-0022-CP1/CPA-DD/

No.	Project Location
Host Country	Uganda
Region:	Entire country
Latitude	4°N and 2°S
Longitude	29° and 35° E

This Programme of Activities consists of a total of 105 CPAs (at time of MR submissions) of which 10 are considered as part of this monitoring period. The CPAs are described shortly below:

Basic technical details of the PoA are summarized in table A-2.

Table - A-2: Technical data/TS/ of the CPA 9948-P1-0002-CP1and 9948-P1-0014-CP1 to 9948-P1-0022-CP1/CPA-DD/

CPAs	**CPA 9948-P1-0016-CP1 to CPA 9948-P1-0022-CP1**	**CPA 9948-P1-0002-CP1, CPA 9948-P1-0014-CP1, CPA 9948-P1-0015-CP1**
Name of models	UltraFLO	Multi-barrier UV
Water Source	Piped	Piped
Flow rate	20 L/min	Small UV: 2-4 L/min Large UV: 6-8 L/min
Capacity/lifespan	340,000 L / 5-year expiry	Small UV: 2,044,116 L / 7 years Large UV: 4,088,232 L / 7 years
Fixed or Portable	Fixed	Fixed
Removal of E. Coli	99 (2-log)	>99 (4-log)

As a result of this verification, the verifier confirms that:

- all operations of the CPAs assessed under this verification report (CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to 9948-P1-0022-CP1) are implemented and installed as planned and described in the included component project activities design documents.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-III.AV ver. 4.0
- the equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately (as applicable),
- the monitoring system/DB/, /REC/, /CBT/, /USAGE/,/RC/ is in place and functional. The CPAs have generated GHG emission reductions/XLS/, /MR/.

As the result of the 4th periodic verification of the (CPA 9948-P1-0002-CP1 and 9948-P1-0014-CP1 to 9948-P1-0022-CP1) under PoA, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Emission reductions: **7,847 tCO_2e**

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+ Technical Expert	EI	Mishra	Prakash Kumar	TÜV NORD CERT	x	x	x	x

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	EI	Lubanga	David	-
2.	Technical reviewer	IR	Winter	Stefan	TÜV NORD CERT
3.	Approver	IR	Nuske	Alexandra	TÜV NORD CERT

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.
Various tools have been established in order to ensure an effective verification planning.

Materiality Threshold
The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
☐	**0.5 %**	**Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year[1];**
☐	**1 %**	**Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;**
☐	**2 %**	**Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;**
☒	**5 %**	**Emission reductions or removals for registered small-scale CDM PoA other than registered CDM PoA covered under next category below;**
☐	**10 %**	**Emission reductions or removals for the type of registered small-scale CDM PoA referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).**

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

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.	Analysis and transfer of data from: • Sales records (supported by Sales receipts, Installation forms)/PO/, • Water Quality Testing Reports/CBT/, • Sampling Surveys/USAGE/ (for each technology type), international reports (with traceability) which are utilized for determination of the parameter $f_{NRB,y}$, • Biennial/ Annual sampling results/RC/, • Sales database/PO/, • Sampling surveys/USAGE/, /XLS/ • Surveys Records/PO/, /USAGE/, /XLS/ • UNHS, Household Survey Report 2016/17[2] for Transcription of monitored values from monitoring records to MR and excel ER spreadsheet.	Low	Human error during transfer of data from, Sales record, monitoring Sampling Survey records, Water Quality Testing, reports/sheet etc (manual operations) for BE, PE, LE and ER calculations	Thorough cross-check and assessment required on the generation and transfer of data to the ER spreadsheet. Assessment of data generation, collection and recording for all monitoring parameters and appropriateness of sampling plan etc. Assessment of information flow processes, data reporting, aggregation, management, and QA/QC procedures in place by CME to ensure the sales / installation database is accurate

[1] A year refers to a period of 12 consecutive months.
[2] https://www.ubos.org/wp-content/uploads/publications/03_20182016_UNHS_FINAL_REPORT.pdf

On the basis of the risk analysis, the verification has been planned. A detailed audit / verification plan (remote assessment) has been prepared and submitted to the project participant(s) in due time before the remote assessment.

C.2. Consideration of materiality in conducting the verification

Based on the verification planning, verification process is carried out. The concept of materiality considered during the verification process. A breakdown of the chosen approaches is included in the following table.

Parameter	*Approach+*	*Errors* detected*	*Findings reference*	*Corrected*	*Remaining verification risk*
QPW_y (Quantity of purified water in year *y* (liters))	SPL	☒	CL 01, CAR 01, FAR 02	☒	Not material
$T_{y,i}$ (Total distributed water purification systems)	CDC	☒	CAR 01, CAR 02	☒	-
$N_{y,i}$ (The average population serviced by water purification systems)	CDC	☒	CL 01, CAR 01, FAR 01	☒	Not material
Water $Quality_i$ (Water quality measurement)	SPL	☒	CL02, CL03	☒	Not material
Operational $Units_i$ (percent of monitoring period in which the units are in use	SPL	☒	CL 01, CL03, CAR 03, FAR 01	☒	Not material
$f_{NRB,y}$ (Fraction of woody biomass saved by project activity in year, y, that can be established as non-renewable biomass)	CDC	☒	CL01, CL02	☒	Not material
η_{wb} (Efficiency of water boiling system being replaced)	CDC	☒	CL 02	☒	Not material
$EF_{projected\_fossilfuel}$ (Emission factor as per AMS-I.E procedures when NRB is displaced or the emission factor of the fossil fuel substituted)	CDC	☒	CL 02	☒	Not material

Existence of public distribution network of safe drinking water (Existence of public distribution network of safe drinking water in year y)	SPL	☐	-	☐	-
$EC_{pJ,j,y}$ (Quantity of electricity consumed by the project electricity consumption source j in year y)	CDC	☐	-	☐	-
Aggregate					Materiality threshold not exceeded

**) incl. omissions and misstatements*

+) Verification Approaches:

CDC: Complete data check of data including all data aggregation steps
NDC: Non-complete data check – omissions not material
SPL: Sampling approach (all data available)
ASP: Acceptance Sampling
COM: Data check at higher data aggregation levels and sampling at original data levels

For risk mentioned in section C.1 above, the verification team has conducted a thorough crosscheck and verification as follows:

Analysis and transfer of data from, sales records, usage Survey, water quality testing report to MR and excel ER spreadsheet:

Total sales record presented in ER calculation spreadsheet/XLS/ and MR/MR/ were assessed and verified as all the evidences/DB/,/CBT/,/USAGE/,/RC/ submitted by CME at the time of desk review and during remote audit assessment[3]. The CME conducted the sampling surveys/USAGE/, /PO/ in accordance with registered monitoring plan/PoA-DD/,/CPA-DD/.

Verification team assessed the monitoring data collected by the CME for different sampling-based monitoring parameters. This was to determine the parameters under monitoring i.e. proportion of WPS operational units in use over the monitoring period, proportion of WPS installed providing safe water quality and the existence of a public distribution network providing safe drinking water in accordance with registered monitoring plan (Annual monitoring) and found them to be acceptable. Other parameters used for determining QPW_y i.e. number of people served by the distributed water purification systems and the distribution of non-boarding and boarding persons were verified by assessing the submitted worksheets containing records of project sampling survey/USAGE/, /SAMPLE/ and sales database/PO/,/XLS/, /DB/ with original records. The desk review assessment/ remote audit assessment observation and subsequent closure of the raised findings (refer Appendix-4 and Appendix-5 of this report) confirm that the values presented in the ER calculation worksheet are deemed as accurate, appropriate and consistent with the MR.

In addition to this, the verification team has assessed the value of different monitoring parameters under monitoring in CME's records and verified /compared the same with observations and interview responses by the project technology users during remote audit assessment. During the course of verification, findings were raised and were subsequently closed based on appropriate clarifications or justifications provided by the PP and submission of revised MR and ER sheet. For more detail please refer Appendix-4 of this report.

[3] Refer section D.2 for details of Remote audit assessment

SECTION D. Means of verification

D.1. Desk/document review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- The last revision of the PoA-DD including the monitoring plan/PoA-DD/
- PoA Validation Report/VAL/the last revisions of the CPA-DDs
- The last revision of the CPA validation reports/VAL/,
- The monitoring report, including the claimed emission reductions for the PoA/MR/,
- Sales Receipts/PO/
- Project/ Sales database in chronological order/PO/
- Questioner for undertaking the Sampling Survey Records and related work sheets/USAGE/
- Technical Specification of the Aquagenx Water Testing kit/TS/,/ELIG/
- Water Quality Testing Report/CBT/
- The emission reduction calculation spreadsheet/XLS/,
- Sample size calculation spreadsheet for Project Survey/XLS/
- Training Procedures/TRG/
- Survey report for determination of the fraction of the woody biomass saved by the project activity/CBT/, /USAGE/
- Technical Specification of project devices/TS/
- Previous verification documents

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

D.2. On-site inspection

A remote audit was conducted using other means of verification due to Pandemic of COVID-19 and related lockdown in the host country of Uganda. Detailed explanation on remote audit is provided under D.4.2 below.

Duration of Remote-site Assessment: 19/11/2020, 20/11/2020				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	• Assessment of the installation database • Assessment of sample end-user/customer's agreements/receipt/installation record (Sales Force Enterprise Edition) • Comparison of end-user/customer's agreements / installation record/ School Installation Records with the Sales Database • PO (Tax Invoice with the name of the name of Institution, date of invoice, Type of technology) • Sales Force Enterprise Edition with information in the database (date of installation, technology implemented, SF ID number, Contact number, name of the institution, type of institution (boarding, non-boarding, both), etc.) • Assessment of data management system, QA/QC procedures • Interviews with CME, CPA implementer management • Interviews with CME/CPA	Remote/skype/telephonic	19/11/2020 20/11/2020	Prakash Kumar Mishra (PKM)

	representative • Discussion of emission reductions and supporting documentation • Telephonic/ Skype based interview with representatives of CME and enumerators; • Video / Telephonic interview with randomly selected sampled users from total database and also to further cross verify if the samples taken are representative of the entire population			
2.	Remote verification of randomly selected principal and school Management representatives	Remote/skype/telephonic	19/11/2020 20/11/2020	Prakash Kumar Mishra
3.	• Data collection, aggregation and processing • Discussion on MR and supporting documents and final closing meeting	CME/CPA Implementer/consultant	19/11/2020 20/11/2020	Prakash Kumar Mishra

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Brown	Julie	Impact Carbon, Director (Operations)	19/11/2020 - 20/11/2020	Implementation schedule, justification on not postponing onsite visit dates upto, delivery deadlines, schedules etc. Trainings, Information flow, data Management, record keeping, Financial Management, staff training, sales database CPA development, QM, Organisational structure, QA/QC, raw data, sales database	PKM
2.	Kalcic	Katrina	Impact Water Uganda, Country Director	19/11/2020 - 20/11/2020	CPA development, QM, Organisational structure, QA/QC, raw data, sales database Sales database, raw data, QA/ QC	PKM
3.	Lohia	Rohit	CSIPL (Carbon Consultant)	19/11/2020 - 20/11/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey analysis	
4.	Akankunda	Moreen	Impact Carbon Uganda, Operation Installation Manager	19/11/2020 - 20/11/2020	Data management, including data check/verification, transcription of data from survey form to excel file survey protocol, survey related trainings, experience etc.	

5	Neville	Timothy B.	Impact Carbon, COO	19/11/2020 - 20/11/2020	Survey designing, survey team trainings, appointment process, survey protocol, survey questions and appropriateness, survey related point check e.g., operation status verification, check and recording of the details through interview of survey respondents	
6	Kankwiine	Joan	Impact Carbon, Representative	19/11/2020 - 20/11/2020	Recording template, training, equipment used, calibration etc.	
7	Shrivastava	Nihar	CSIPL (Carbon Consultant)	19/11/2020 - 20/11/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey analysis QA/QC, raw data, sales database	
8	Kumar	Ritesh	CSIPL (Carbon Consultant)	19/11/2020 - 20/11/2020	MR development, ER calculation and monitoring aspects including Sampling & Survey analysis QA/QC, raw data, sales database	
9	S Kiwanuka	Fr. Achilles	Head of School, Sacred Heart Seminary, Multi-barrier UV(U151242)	19/11/2020 - 20/11/2020	Usage of the water filtration devices, baseline water source for drinking purposes, date of installation, operation and maintenance survey, verification of below parameters • Parameters including application of days for the calculation of the total quantity of water purified during the year y • Water quality tested as per paragraph 2(b) of AMS III.AV ver. 4 (i.e. Laboratory test report and/or official notifications (e.g. from national authority on health)) • the monitoring frequency for the parameter “operational units” • operation of the project activity and continuous availability of safe drinking water	
10	Tumuhimbise	John	Director, Mother Care Primary, Multi-barrier UV(U151362-B)	19/11/2020		
11	Muwonge	Joseph	Head of School, St Noa's Secondary School, Multi-barrier UV(U140384)	19/11/2020		
12.	Asegah	Godfrey	Assistant Head of School, Joy Centre For Education, Multi-barrier UV(U1804469)	19/11/2020		
13.	Tugume	Jonah	Head of School, Prime Junior School, Multi-barrier UV(U1804244)	19/11/2020		
14	Muhabuzi	Joshua	Vice Principal, Ihunga Polytechnic Institute, Multi-barrier UV(U1809129)	19/11/2020		

15.	Ntono	Margaret	Head Teacher, St. Andrew's Day and Boarding Primary School, Multi-barrier UV(U1831551)	19/11/2020		
16.	Olivia	Mary Nangoma	Burser, St Antonio Kindergarten &Day Care, Multi-barrier UV(U1805367)	19/11/2020		

D.4. Sampling approach

D.4.1 Sampling during monitoring

The monitoring followed the monitoring frequency as per stipulations of the registered monitoring plan. The concerned monitoring period is 01/01/2020 – 21/03/2020 (both days inclusive). Thus, the CME has conducted monitoring representing monitoring period i.e. 01/01/2020 – 21/03/2020.

☐	No sampling approach has been used by the PP to determine the monitored parameters
☒	A sampling approach has been taken for the following monitored parameter(s):

Sr. No	Parameter	Sampling approach [1)]	Sampling Type [2)]	Population[4]	Sample Size
(MP4): 01/01/2020 to 21/03/2020					
1.	Water quality (Multi barrier UV)[5]	*SiRS*	PS	886	44[6]
2.	Operational units (Multi barrier UV)	*SiRS*	PS	886	48
3.	Existence of public distribution network of safe drinking water (Multi barrier UV)	*SiRS*	PS	886	44

[1)] *Sampling Approaches:*

SiRS: *Simple Random Sampling*
StRS: *Stratified Random Sampling*
SS: *Systematic Sampling*
CS: *Cluster Sampling*
MSS: *Multi-stage Sampling*

[2)] *Sampling Types:*

PS: *Parameter Sampling*

During interviews with the CME it was noted that only 78 UltraFLO units were installed in Uganda and 17 systems were eligible for sampling and subsequent ER Calculation under MP4. Considering the fact that the ER generated from these 17 UltraFLO systems were negligible compared to monitoring efforts, CME decided not to monitor UltraFLO systems during this monitoring period and applied for a temporary deviation. The assessment of the temporary deviation is part of the section E.3.2.1 of this FVR. Since the UltraFLO was taken out of monitoring, the stratified random sampling was reduced to requirements of simple random sampling involving single strata. The simple random

[4] Total 1032 Multi-barrier UV systems have been installed. Out of 1032 Multi-barrier UV systems installed, only 886 systems are eligible for Sampling and ER Calculation because other systems have been either reported as breakdown by the user or else have been fully consumed prior to start of the monitoring period. Including these systems in sampling would have resulted in overestimation of ERs. The VT has accordingly accepted this approach and assessed 886 samples.

[5] The CME has not monitored the UltraFlo systems for the concerned monitoring period, hence In line with para 228(b)(i) of PS for PoA version 2.0, the baseline emissions for UltraFlo Systems for the requested monitoring period (01/01/2020 to 21/03/2020) are considered as 0 tCO_2e.

[6] The VT assessed and confirms that PP has monitored 48 Multi-barrier UV systems. Out of 48 samples monitored, 44 samples found operational and the usage rate has been calculated as 91.67% which has been applied to 886 systems.

sampling was carried out across all CPAs covered in this monitoring report for Multi-barrier UV systems.

i. Sampling overview
Representative sampling has been undertaken as part of SSC-PoA-wide Sampling Plan (by grouping and sampling across CPAs). The Sampling is based on 95/10 confidence/precision.

ii. Objectives and Reliability Requirements
The objective was to obtain an unbiased and reliable estimate of the proportion value of the following parameters over the course of the monitoring period, and with 95/10 confidence/precision for sampling across CPAs.
1. Water quality
2. Operational units
3. Existence of public distribution network of safe drinking water

iii. Target Population
The target population for the three parameters stated above are all WPS units (Multi-Barrier UV only) that were installed/ distributed in institutions and recorded in the project sales database.

iv. Sampling Frame
The sampling frame is the WPS (Multi-Barrier UV only) units that were installed/ distributed in institutions and recorded in the project sales database. Since all parameters under monitoring are homologous (i.e. implemented in institution), which justifies the application of the common sampling for all the parameters is justified.

v. Sampling Method
Simple random sampling was applied across the WPS (Multi-Barrier UV only) population. Random numbers were generated using the random number generator function. The WPSdistribution data was arranged by date of distribution, and the samples corresponding to the random numbers obtained via the online random number generator were picked for sampling.

The required sample sizes were derived using below stated equation (1), (2), (3), (4) and (9) of Appendix 3 of the Guideline: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0 for proportion-based parameter as follows:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of WPS to be sampled

N = Total number of WPS in the population

z = Constant referring to level of confidence (1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \frac{SD^2}{\overline{p}^2}$$

Where:

$$SD^2 = \frac{\sum_{i=1}^{k} g_i * p_i * (1 - p_i)}{N}$$

$$\bar{p} = \frac{\sum_{i=1}^{k} g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

Simple Random Sampling was applied to the only stratum (Multi-barrier UV given no CERs are being claimed for UltraFlo systems for the monitoring period). The expected parameter values (proportion) were determined based on project developer's knowledge and experience as per para 13(b) and 13(c) of the "Standard: Sampling and surveys for CDM project activities and programmes of activities" version 8.0 (The version 09 of "Standard: Sampling and surveys for CDM project activities and programmes of activities" was released on May 27, 2021. The assessment was performed utilizing the Version 08 which was the valid and applicable at time of the sampling).

The CPA sub-group population was arranged chronologically for the given stratum. The WPS were selected by randomly assigning, a number to each WPS and sorting in increasing order from lower to higher number. Random numbers were generated using online random number generator for given stratum and the numbers obtained were used to identify the samples from the sampling frame. A slightly higher number of samples were identified than that required to cover for outliers / non-response and ensure that the desired precision / confidence is achieved.

Based on the registered monitoring plan, 95/10 reliability level is selected for CPA wide sampling for all the parameters listed above at monitoring frequency prescribed in PoA - DD and CPA-DD. The target population for the parameters stated above are total and all Installed/distributed WPS as included in the sales database covered under the monitoring period.

Sample size calculation is assessed to be in accordance with registered sampling plan in PoA-DD/CPA-DD and the guideline "Sampling and surveys for CDM project activities and programme of activities ", version 04.0/SAMPLE/.

The CME/PP has submitted sample sizes calculation spreadsheet including reliability worksheet and the random number generator where it is demonstrated that samples are drawn randomly using simple random sampling technique. The verification team further has cross-checked the sampling approach by CME as per MR section E.3 against related PoA-DD and CPA-DD requirements. Besides, the sample sizes have been checked with corresponding supporting documents. Input parameters for the sampling calculation have been checked whether consistent with the stated approach and against PoA-DD, CPA-DD and sampling guidance. Further, verification team has recalculated the required confidence/precision and can confirm that the same are in line and appropriate with applied sampling requirements.

D.4.2 Sampling approaches during verification

☐	No sampling approach has been used by the VT to verify the monitored parameters
☒	A sampling approach has been applied by the VT for the following monitored parameter(s):

Sr. No	Parameter	Sampling approach 1)	Sampling Type 2)	Population	Sample Size[7]
(MP4): 01/01/2020 to 21/03/2020 (both days inclusive)					
1.	Water quality (Multi barrier UV)	*StRS*	PS	44	(with mixed type schools i.e. Boarding/non-boarding/both) = 08
2.	Operational units (Multi barrier UV)	*StRS*	PS	48	(with mixed type schools i.e. Boarding/non-boarding/both) = 08
3.	Existence of public distribution network of safe drinking water (Multi barrier UV)	*StRS*	PS	44	(mixed type schools i.e. Boarding/non-boarding/both) = 08

1)*Sampling Approaches:*

SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling

2)Sampling Types:
PS: Parameter Sampling

Remote audit assessment:

Due to COVID-19 pandemic there was a complete lockdown in the Host Country of Uganda where movement in the field was not permitted and hence, Verification Team, in line with UNFCCC INQ-09667 (email reply from Secretary to The CDM Executive Board, dated 20/03/2020 where agreement to relax mandatory site visit by DOE for period of 03 months which was further extended up to December 2020[8]). The CDM Executive Board agreed to relax mandatory site visits by DOEs for a period up to 30 June 2021 because of COVID-19, vide CDM EB 108 report[9], Agenda item 4.1. Standard/ tools para 28. The extension was conditionally permitted to apply alternative and credible means of verification).

In addition, as per EB 108 Meeting Report, para 28, page 8 of 16, confirms and rather extends the alternative measures of validation/verification to mandatory on-site inspections until 30 June 2021. The Verification Team has presented the reasoning to demonstrate the fulfilment of conditions to initiate the Remove Audit Assessment:

Sr. No	Condition	Applicable (Y/N)	Justification
1	Para 321 of VVS-PS It is mandatory for the DOE to conduct an on-site inspection at verification for	Y	(a) The CPAs 14 to 22 are undergoing the third periodic verification.

7 Please refer section D.3 of this report for technology and institution type (boarding/non-boarding/both)
8 https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html
9 Meeting report (version 01.0)

	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 t CO_2 e.q. of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.		The CPA 002 is undergoing the fourth periodic verification. So mandatory site visit is not applicable as per 321 (a). (b) The site visit was conducted for CPA-002 during the First Periodic Verification (Site Visit date 28/11/2017 to 02/12/2017). The end date of the applied monitoring period i.e., 21/03/2020 is within the 03 years from the last periodic verification. For other CPA's, the CME is not availing verification where more than three years have elapsed since the last on-site inspection conducted for verification. Thus, the site visit is not mandatory as per § 321 (b). c) The CPA's have not achieved more than 300,000 tCO_2 e.q. of GHG emission reductions or net anthropogenic GHG removals since the last verification. Remote Assessment was performed for second periodic verification/VERIF/ and Third Periodic Verification, assessment is tabulated as below **Periodic Verification** / **ER's** (t CO2) Third Periodic / 31,278 Fourth Periodic (requesting issuance) / 7,847 **Total** / **39,125** Thus, the site visit is not mandatory as per § 321 (c). Justification of alternative, credible and sufficient means for the purpose of verification of on-ground information is provided in detail below under para "Applied Other Credible means of verification"
Justification to avail temporary measures as per agreement to relax mandatory site visit by DOE			
2	Can the site visits be postponed	N	Client has the delivery deadlines of CER's so postponing site visit will cause negative impact on CER delivery commitment by CME. Thus, site visit cannot be postponed.
3	Is it possible to travel to host country Uganda and undertake site visits	N	Global Travel Ban is not allowing the VT to visit to Host country Uganda.
4	Onsite conducted for previous verification?	N	No onsite visit was conducted for previous verification. However, the same DOE and the Team Leader performed the remote assessment for second and third periodic verification is performing the assessment.

Applied Other Credible means of verification:

The credible other means of verification is applied to cross check on-ground information as described below:

Photographs and other documentary evidence: These include the photo records of the water purification systems with clear depiction of type of system, unique serial number, name of school etc. to confirm the implementation of the project as described in the PoA-DD/CPA-DD. Other records e.g. usage survey records and water quality field test results/records, which are assessed to verify their operational status and water quality tests performed over the applied monitoring period. The audit records (remote audit are audio/video recorded wherever possible) are stored in the QMS system of DOE; these records are retrievable and assessable.

Telephonic Call: Telephonic assessment was made by interviewing randomly selected samples to verify the information in the records submitted by PP. The telephonic calls are recorded, stored and maintained so that the assessments of the Verification Team are traceable and reproducible if required.

Skype Calls: This tool has allowed to connect multiple stakeholders such as CME, project developer/ consultant, relevant personnel from monitoring survey/test team, all other relevant persons as per the organogram of the PoA/ CPA including QA/ QC key personnel. The VT could virtually verify the implementation of the project against the requirements in the registered CPAs. The interviews with all the above-mentioned parties including sampled end users were conducted using this tool.

Furthermore, the data collected during the above steps are utilized for assessments which is described in relevant parts of the Verification Report.

The sampling approach conducted is in accordance with "Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" version 04.0 and the "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities version 08.0". As the population is relatively homogeneous with respect to the object of the sampling effort, simple random sampling method is adopted for verification of the parameters.

Since the CPAs included in the PoA implement technologies/measures with high degree of standardization and technological capacities i.e. Water Purification System in terms of emission reductions per year in the CPAs are smaller than 1% of small scale CDM thresholds, the verification team decided to draw samples mainly from the project samples selected by PP. i.e. the acceptance sampling approach has been applied.

The verification team followed the "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" version 08, para 29 to 32 and 39, esp. for taking sample out of the CME's sample. Verification team has adopted the acceptance sampling approach (AS) in accordance with § 29, 30, 31 to 32 and 39 of the Sampling Standard. The verification team checked provisions of the para 39 of the applied standard to apply the producer risk and consumer risk following the provision of para 39 as assessed below:

Statement of para 39:
A DOE may select a different sample size than the one indicated in paragraph 32 above, either by choosing a different value for the consumer risk and producer risk (e.g. 20 per cent for the consumer risk) when applying acceptance sampling or by using another approach, if any of the following conditions apply:)

Sr. No.	Requirement of para	DOE Assessment
1.	The estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 t CO_2 eq.;	Applicable. the estimated emissions are 108,583 tCO_2eq
2.	The security conditions in the project region prevents inspection of many samples (e.g. conflict zones); or	The COVID-19 was declared pandemic WHO which has created a health situation which was tangible and globally apparent. Thus, the DOE has availed the sampling size accordingly.

3.	The project activity or the PoA is located in a least developed country or a host Party with 10 or fewer registered CDM project activities at the end of the monitoring period being verified	The CPA under PoA are located in the LDC i.e. Host Country Uganda as per https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/ldc-country-information

Thus, Verification team has adopted the acceptance sampling approach in accordance with § 29, 30, 31 and 32 of the Sampling Standard by considering AQL 0.5 % and UQL 20%). Producer risk of 10 % and consumer risk of 20%. Considering the above § under applied sampling standard, DOE has verified 08 samples (the current monitoring period is from 01/01/2020 to 21/03/2020 where monitoring frequency stipulated under PoA is annual. The monitoring frequency stipulated under PoA is annual. Applying the acceptance sampling approach with acceptance number (c) as 0 (randomly picked from CME's samples covering usage related surveys and water quality test results). Therefore, a total of 08 samples (Multi-Barrier UV) and population type (boarding/non-boarding and both) have been verified remotely by verification team. These samples were randomly selected (from PP's samples). The list of these samples verified using remote assessment techniques are presented under section D.3 of this report above.

Table 7: Applied sampling standard

AQL	0.5%
UQL	20%
Producer risk	10 %
Consumer risk	20%
Sample size	8
Acceptance Number	0

No CME sampling-based monitoring records/data results were found discrepant during the DOE verification remote assessment. All the 08 samples under the applied Monitoring Period were found to be operational, Water Quality tested during remote assessment and interview/verification and in line with PP/CME's survey and WFT results.

Furthermore, the verification team interviewed the representatives of schools (sampled) and confirm the presence of public distribution network providing safe drinking water. Details on each sample verified through remote assessment are presented under Section D.3 above. Based on the assessment of 08 remotely assessed samples observing photos and other records of each sample prepared and submitted by CME before onsite remote assessment, together with telephonic interview of end users/representatives, it could be confirmed that the result presented for all the monitored parameters are reproducible and thus, sampling/monitoring results are deemed acceptable. Further, the verification team reviewed all the primary monitoring records before and during remote audit assessment to assess the consistency of information with ER calculation spreadsheet and found the monitoring data to be correctly transcribed into the ER sheet and MR. Therefore, verification team concludes that sampling results and values presented by CME in the MR and ER calculation spread sheet and results of survey and WFT records are consistent with the onsite observation and interview with the end users.

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	0	0	0
Remaining forward action requests from validation and/or previous verifications	0	0	0
CPAs considered for verification and covered in this report	0	0	0
Programme of activities	-	-	-
Compliance of the programme implementation with the registered PoA-DD	0	0	0
Implementation and operation of the management system	0	0	0
Post-registration changes	-	-	-
• Corrections	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents[10]	0	0	0
• Changes to the programme design	0	0	0
• Addition of CPA inclusion template	0	0	0
• Change of coordinating/managing entity			
• Changes specific to afforestation and reforestation activities	0	0	0
Component project activities	-	-	-
Compliance of the CPA implementation with the included CPA design document	0	0	0
Post-registration changes	-	-	-
• Temporary deviations from registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	0	1	0
• Corrections	0	0	0
• Changes to the start date-of the crediting period	0	0	0
• Inclusion of a monitoring plan	0	0	0
• Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	0	0	0
• Changes to the project design	0	0	0
• Changes specific to afforestation and reforestation activities	0	0	0
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	0	0	0
Compliance of monitoring activities with the registered monitoring plan	-	-	-
• Data and parameters fixed ex ante or at renewal of crediting period	0	0	0
• Data and parameters monitored	3	0	1
• Implementation of sampling plan	0	0	1
Compliance with the calibration frequency requirements for measuring instruments	0	0	0

[10] 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).

Assessment of data and calculation of emission reductions or net removals	1	1	0
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	0	0	0
• Calculation of project GHG emissions or actual net GHG removals by sinks	0	0	0
• Calculation of leakage GHG emissions	0	0	0
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	0	0	0
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	0	0	0
• Remarks on difference from estimated value in included CPA	0	0	0
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	0	0	0
Others (please specify) pending documents	0	1	0
Total	**04**	**03**	**2**

SECTION E. Verification findings

E.1. General

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

Means of verification	An initial monitoring report was submitted to the verification team by the CME. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received. By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-PoA-MR-FORM has been used. Further, it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance. The following sources of information have been used in this context: • /MR/ • /MRT/ • /unfccc/	
Findings	☒	The latest reporting template CDM-PoA-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	☒	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	☒	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		CAR 01
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	During the verification, a remote assessment using video/ skype/ telephonic modes were utilized to verify onsite information, considering travel restrictions due to the global COVID-19 Pandemic. On the basis of observations made during remote assessment and the project documentation reviewed, it can be confirmed that the project has been implemented as described in the registered CPA-DDs and the latest instructions for filling out the MR template (Version 04.0) have been followed adequately in the MR.	

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

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose, FARs might have been raised. Likewise, FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the last issued MR/MR/ and the PoA Verification report/VER/, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

☒	There were no open issues which have been addressed in the latest version of the validation report.
☐	All open issues from the validation have been appropriately addressed in the context of previous verifications.
☐	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the validation have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

☐	N/A – as this is the first monitoring period for this CDM project activity.
☐	There were no open issues which have been addressed in the previous verification report
☒	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
☐	The following issues related to the previous verification have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

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

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

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 4, Version: 01.2, 9948-P1-0004-CP1	No	02/07/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 5, Version: 5.0, 9948-P1-0005-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 6, Version: 5.0, 9948-P1-0006-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 7, Version: 5.0, 9948-P1-0007-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 8, Version: 5.0, 9948-P1-0008-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 9, Version: 5.0, 9948-P1-0009-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 10, Version: 5.0, 9948-P1-0010-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 11, Version: 5.0, 9948-P1-0011-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 12, Version: 5.0, 9948-P1-0012-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 13, Version: 5.0, 9948-P1-0013-CP1	No	04/10/2017	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14, Version: 1.0, 9948-P1-0014-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15, Version: 1.0, 9948-P1-0015-CP1	Yes	21/11/2017	7.0	Y

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 16, Version: 5.0, 9948-P1-0016-CP1	Yes	21/11/2017	7.0	Y[11]
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17, Version: 5.0, 9948-P1-0017-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18, Version: 5.0, 9948-P1-0018-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19, Version: 5.0, 9948-P1-0019-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20, Version: 5.0, 9948-P1-0020-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21, Version: 5.0, 9948-P1-0021-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22, Version: 5.0, 9948-P1-0022-CP1	Yes	21/11/2017	7.0	Y
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 23, Version: 4.0, 9948-P1-0023-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 24, Version: 4.0, 9948-P1-0024-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 25, Version: 4.0, 9948-P1-0025-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 26, Version: 4.0, 9948-P1-0026-CP1	No	18/11/2018	7.0	N

[11] The CPAs cover Ultra Flo and Multi-barrier UV systems. However, the CERs for the UltraFlo are being claimed in accordance with para 228(b)(i) of PS for PoA version 2.0 considering baseline emissions as 0 for this period in the absence of monitoring of UltraFLo systems as per the sampling/monitoring plan.

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 27, Version: 4.0, 9948-P1-0027-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 28, Version: 4.0, 9948-P1-0028-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 29, Version: 4.0, 9948-P1-0029-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 30, Version: 4.0, 9948-P1-0030-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 31, Version: 4.0, 9948-P1-0031-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 32, Version: 4.0, 9948-P1-0032-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 33, Version: 4.0, 9948-P1-0033-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 34, Version: 4.0, 9948-P1-0034-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 35, Version: 4.0, 9948-P1-0035-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 36, Version: 4.0, 9948-P1-0036-CP1	No	18/11/2018	7.0	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 37, Version: 4.0, 9948-P1-0037-CP1	No	18/11/2018	7.0	N
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	N

Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 39 supported by Republic of Korea, Version: 2.0, 9948-P1-0039-CP1	No	26/04/2019	7.0	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N

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	N
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	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 51 supported by Republic of Korea, Version: 1.0, 9948-P1-0051-CP1	No	26/04/2019	7.0	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N

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	N
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	N
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	N
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	N
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	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 64 supported by Republic of Korea, Version: 1.0, 9948-P1-0064-CP1	No	26/04/2019	7.0	N
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	N
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	N
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	N
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	N

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	N
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	N
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	N
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	N
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	N
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	N
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	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 76 supported by Republic of Korea, Version: 1.0, 9948-P1-0076-CP1	No	26/04/2019	7.0	N
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	N
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	N

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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N

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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N
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	N

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	N
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	N
Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 101 supported By Republic of Korea, Version: 1.0, 9948-P1-0101-CP1	No	26/04/2019	7.0	N
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	N
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	N
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	N
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	N

E.2. Programme of activities

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

Means of verification	By means of an in-depth review of the latest PoA-DD – as downloaded from the UNFCCC project site - and checks carried out during the remote audit assessment, it has been assessed if the project has been implemented and operated in line with the latest approved version of the PoA-DD and whether all physical features of the project are in place. The following has been checked against the PoA-DD and corresponding CPA-DDs and found appropriate: • implemented technology i.e. low GHG emitting water purification technologies • implemented monitoring plan in line with approved monitoring plan. • exchange or modification of the relevant technical equipment of the project activity, if any. • consistent notations of key equipment (product IDs etc.) in PoA-DD, MR and calculation spreadsheet. Interviews with, CME, CPA implementer and operational personnel have been

	carried out. QMS records, maintenance records, instruments specifications were also checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred. Further, it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRC. In absence of the project activity, the water would have been boiled using non-renewable biomass/fossil fuels leading to release of GHG emissions in the baseline. The implementation of the technology helps in replacing the non-renewable biomass / fossil fuel for boiling with the Water Purification System reducing amount of equivalent GHG emissions. The verification team assessed the CPAs covered in this MR involve dissemination of two types of water purification systems: 1. Ultra FLO 2. Multi-barrier UV The Verification Team checked and confirms that all the deployed systems meet the eligibility requirements of the PoA-DD, Version 7.0, and respective CPA-DDs. The technical specifications (refer section A of this report) along with the interview with the end users (refer section C of this report) ascertained that the deployed systems met the CPA eligibility criteria. During the course of the Verification the VT has assessed the documentation pertaining to the technical specifications, lifetime and performance characteristics to ascertain the performance of the WPS as per stipulations of the PoA-DD and the CPA-DDs. The Verification Team also assessed the evidence of physical implementation with the help of photographs/TS/ to verify the WPS characteristics. The following documents were reviewed and verified: • Multi-Barrier UV - Technical Specification from Supplier (Rotek) for Large and Small UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.) • Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek) • Multi-Barrier UV - Certificate from Supplier (Rotek) on WHO compliance • UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier) • UltraFlo Installation Manual • UltraFlo - Device Dimensions Declaration by CME • 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 from UltraFLO dimension declaration by CME) and pertains to the specifications issued by Medentech (Technology supplier) • The expiry of the UltraFlo was also found mentioned on the cartridge as 5 years (verified physically during previous site visits and photographs of UltraFlo units). • Installation Logs for Multi-Barrier UV and UltraFlo systems Please also refer closure of CL 04. The project location was compared from the submitted sales database/PO/, survey/USAGE/ forms and compared with the boundaries of the host country/BOUND/ and deems the same within the host country boundaries. The Verification checked the data management and date coverage as per requirements. It is noted that below information was verified/USAGE/, /XLS/: a) Type of system (UltraFLO / Multi-barrier UV) b) Unique serial number of the units c) Date of installation / distribution d) Address and details of school and contact detail (if available) of representative

	e) Type of School (Boarding / Non-boarding) f) School population count (number of students / staff in boarding / non-boarding category) The training requirements were also verified and deemed as in line with the registered PoA-DD and CPA-DD/TRG/. The Verification Team has assessed the deviation requests (allocating "0" emission reduction for all UltraFlo units). The deviation request has been approved, without further additional assessment as most conservative approach of availed following the provisions of para 252, 253, 255 of VVS and para 228 (b) (i) of PS. Please refer closure of CAR 02. The section F.7 of the MR ands the ER worksheet were checked and the Verification Team confirms that the emissions were with the threshold of the small scale limits. The following sources of information have been used in this context: • /PoA-DD/ • /CPA-DD/ • /MR/ • /VVS/ • /TS/ • /DB/ • /REC/ • /XLS/ • /unfccc/	
Findings	☒	The project has been implemented as described in the latest version of the PoA-DD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	☐	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): -N/A
	☒	In this context the following CARs, CLs have been raised:
		CL 04, CAR 02
	In case of phased implementation:	
	☒	N/A
	☐	The phased implementation has correctly and in sufficient detail been described in the latest version of the PoA-DD.
	☐	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PoA-DD. However, the description in the MR is correct and reflects the situation during the site inspection.
	☐	The project description in the PoA-DD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A or add as appropriate
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.

E.2.2. Implementation and operation of the management system

Means of verification	The verification team carried out remote audit assessment for all the CPAs covered in the monitoring report for this monitoring period i.e. CPA 9948-P1-0002-CP1 and CPA 9948-P1-0014-CP1 to 9948-P1-0022-CP1 and interviewed key personnel to assess the implementation of the management system. The water purification systems included in the CPAs include 02 technologies i.e. Multi-barrier UV and UltraFLO. The sampled school representatives were

	interviewed to check the physical implementation of the project. Interviewees also included the CME and project developer. Other means of Verification as explained section D.4.2 of FVR were employed. However, it should be noted that emission reductions from UltraFlo system are not part of the emission reductions calculations (Refer closure of CAR 02). It was established that the programme management system has been implemented and operated as described. • /PoA-DD/ • /PO/ • /QA/ • /IM/ • /VAL/ • /CPA-DD/
Findings	CAR 02
Conclusion	The CDM PoA is managed by Impact Carbon as the CME. The management structure is comprised of operational staff, monitoring officer and CDM advisor. The entities responsible for monitoring are: • Project Development Director • Programme Manager • CPA Implementer • Programme Associate • Field measurement personnel • External QA/QC Below important functions are undertaken • Arrangements for training and capacity development for local sales and distribution partner personnel by CME and CPA implementer, • System/procedure to avoid double counting (by aggregating the unique database like Product Serial numbers, date of installation, address, contact details, type of institution, population (students, staff [boarding/non-boarding]) • Provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA (Informational material, training social media and contractual agreements as applicable) • Measures for continuous improvement of the PoA management • Ex-post monitoring and maintaining record system for each CPA under the PoA (currently 105 at time of Verification) • Conduct on the ground monitoring of end users. Sample size determination, monitoring of samples, development of suitable template to capture the data, develop the working sheets to analyze the results of monitoring (Operational status, output water quality, presence of safe public water distribution network) • Verify the monitoring work done to ensure accuracy before submission; review protocols, interview enumerators, spot check data • Assist with the completion of monitoring reports with input • Coordination and communication with the verifier and the UNFCCC Below data checks were undertaken by the Verification Team: • The Sales Force Edition Report was verified to check the details of the institution, the time of installation (which captured the name of the institution, type, population, SF ID and other details) /DB/, /REC/ • Consistency check was performed between the sales database and sample purchase orders, installation logs and Salesforce data to confirm that information for any system installed (SF ID, type of technology, unique serial number, name of institution etc) were internally consistent/DB/, /REC/ • Check on the avoidance of double counting was initiated by checking the unique IDs of the installed water purification devices and it is confirmed that the all the numbers are unique. • The Verification Team checked and confirms that School's SF ID are rightly

	defined for each water purification device (for example U150695) which is covering system type code, year code, country code and a serial number. • The training requirements were verified and deemed as acceptable and in line with the requirements of PoA-DD and CPA-DD/TRG/. • The Organogram was checked and it is noted that Programme Manager at the CME is responsible for QA/QC of the data/IM01/, analysis and subsequent reporting in the monitoring report. The Verification Team confirms that QA/QC procedures were found being followed. • The Verification Team interviewed the CME team responsible for monitoring for sampling techniques, data formats, trainings, competence, application of the water quality testing kits and undertaking the surveys/USAGE/, /TRG/, /ELIG/, /CBT/. The Verification Team confirms that appropriate provisions in line with the requirement for the PoA-DD and CPA-DD are being followed. Based on the detailed remote assessments and desk review and web-based as well as telephonic interviews; DOE representative found that the system is in place, appropriate and effective. The management system is implemented as per the registered PoA-DD & CPA-DDs.

E.2.3. Post-registration changes

E.2.3.1. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During this verification of the current MP no need for corrections has been identified.
☐	The following corrections have been applied:
	Corrections in the PoA-DD and CPA-DD were made and approved by the CDM EB.
	☐ A related post registration change has been submitted prior to the issuance request. ☐ No related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.

E.2.3.2. Inclusion of a monitoring plan

☒	N/A - as this monitoring plan was part of the registered PoA-DD /CPA-DD
☐	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
☐	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number

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

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been

approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☐	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Approval	
		Ref. No.	
☒	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following PCfrMP, PCfMM or PCfSB for which appendix of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.2.3.4. Changes to the programme design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☐	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
☒	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	Expansion of PoA Boundary to include Host Country Nigeria
		Status	☐under approval; ☒ approved
		Appr.date	03/07/2017
		Ref. No.	PRC-9948-002
	2	Title	Changes have an impact on: Include additional host Parties
		Status	☐under approval; ☒ approved
		Appr.date	08/05/2017
		Ref.No.	PRC-9948-001
	3	Title	
		Status	☐under approval; ☐ approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of		

	the project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.2.3.5. Addition of CPA inclusion template

N/A

E.2.3.6. Change of coordination/managing entity

N/A

E.2.3.7. Changes specific to afforestation and reforestation activities

☒	N/A - as this monitoring plan was part of the registered CPA-DD

E.3. Component project activities

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

Means of verification	By means of an in-depth review of the latest CPA-DDs – as downloaded from the UNFCCC project site - and checks carried out during the remote audit assessment, it has been assessed if the project has been implemented and operated in line with the latest approved version of the CPA-DDs and whether all physical features of the project are in place. The following has been checked against the PoA-DD and corresponding CPA-DDs and found appropriate: • implemented technology i.e. low GHG emitting water purification technologies • implemented monitoring plan in line with approved monitoring plan. • Exchange or modification of the relevant technical equipment of the project activity, if any. • consistent notations of key equipment (product IDs etc.) in PoA-DD, MR and calculation spreadsheet. Interviews with, CME, CPA implementer and operational personnel have been carried out. QMS records, maintenance records, instruments specifications were also checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred. The CPA's covered in the MR involve dissemination of low greenhouse gas emitting safe drinking water production systems across Uganda. The CPAs under the PoA result in reduction and/or replacement of non-renewable biomass or fossil fuels used for boiling water to make it suitable for drinking purposes. Multi-Barrier UV and UltraFLO Chlorination water purification systems (WPS) are fixed type water purification systems requiring pressurized piping connection to operate. The VT has reviewed the relevant information / specifications of these WPS (given below) to confirm that they 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	Small UV (1 GPM)	¼ inch	125	2,044,116	7	Technical Specification from Supplier (Rotek) for Large and Small UV/TS/ Multi-Barrier UV Lifespan confirmation from Supplier (Rotek) /TS/
Multi Barrier UV	Large UV (2 GPM)	¼ inch	125	4,088,232	7	
UltraFlo	UltraFlo	20mm	As per line pressure	340,0000	5	Technical specification / expiry of UltraFlo by Medentech (technology supplier) /TS/ UltraFLO Installation Manual/TS/

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 VT also secured photographs/DB/,/REC/ of the WPS installations during the physical site visits conducted previously, reviewed CME installation logs/DB/,/REC/ and monitoring survey records/usage/ and observations made during remote site visit interviews/DB,REC/ to confirm that these WPS are installed on pressurized piping connection and are designed to operate exclusively for piped applications only.

All monitoring parameters are assessed to be monitored as per the registered monitoring plan included in the respective CPA-DDs and registered PoA-DD version 7.0.

Further, it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs.

The Verification Team has assessed the deviation requests (allocating “0” emission reduction for all UltraFLO units). The deviation request has been approved, without further additional assessment as most conservative approach of availed following the provisions of para 252,253, 255 of VVS and para 228 (b) (i) of PS. Please refer closure of CAR 02.

The following sources of information have been used in this context:

- /CPA-DD/
- /MR/
- /VVS/
- /XLS/
- /ELIG/
- /IPCC/
- /unfccc/

	• /TS/ • /DB/,/REC/
Findings	CL 04
Conclusion	The verification team confirms that the CPAs under this MP are implemented and operated in line with the provisions of the PoA-DD and the latest approved versions of CPA-DDs. And all physical features of the component project activities are in place. The implementation of the WPS was verified based on the submitted technical specifications, remote assessments. Photographs, installation manuals, observation of previous verifications and the review of the requirements under CPA-DD. However, during course of verification findings were raised and closed successfully. Please refer Appendix-4 of this report.

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

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

☒	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
☐	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved (approval No.:)
		Appr.date	
		Ref.No.	
☐	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix of the PoA project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
☒	The following TDfrMP or TDfMM for which appendix of the PoA-PS is applicable have been applied:		
	1	Issue:	In line with para. 228(b)(i) of PS for PoA version 2.0, the baseline emissions for UltraFlo Systems for the requested monitoring period (01/01/2020 to 21/03/2020) are considered as 0 tCO_2e. a. Nature of temporary deviation: Monitoring data not available to calculate baseline emissions b. Applicability: 01/01/2020 to 21/03/2020 c. CPAs: 9948-P1-0016-CP1 to CPAs: 9948-P1-0022-CP1 **DOE Assessment:** The sales for UltraFlo system are found listed in the ER worksheet, under tab: "MP4

			Sales Database". • The justification is deemed appropriate. It is understood that UltraFLO systems are eligible for sampling and ER calculations by virtue of their available treatment capacity (Column AI), but haven't been sampled /monitored hence ER are not being claimed. • The Verification Team has assessed the deviation request 01 (allocating "0" emission reduction for all UltraFLO units). The deviation request has been approved, without further additional assessment as most conservative approach of availed following the provisions of para 252,253, 255 of VVS and para 228 (b) (i) of PS. Please also refer closure of CAR 02 for details.
	2	Issue:	Systems that were consumed fully/discontinued prior to the start of monitoring period (operational days = 0) have not been considered for sampling and ER calculations and their ERs have been considered as 0 tCO_2e. a. No service level as systems deemed not functional b. Applicability: 01/01/2020 to 21/03/2020 c. CPAs: 9948-P1-0002-CP1, 9948-P1-0014-CP1 to 9948-P1-0022-CP1 **DOE Assessment:** The technical lifetime of the systems has been verified in CL 04 above and systems are confirmed to have not exhausted in the concerned monitoring period. It is understood that the number of school operational days as 0 do not denote end of technical lifetime but the end of existing supplies / treatment capacity which can be replenished with more supplies. Please also refer closure of CAR 02 for details. The above changes also assessed under the PRC Opinion/PRC/ which is submitted in parallel to this Verification Report.

E.3.2.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	During the verification of the current MP no need for corrections has been identified.		
☐	The following corrections have been applied:		
	1	Issue:	
	2	Issue:	
	☐ A related post registration change has been submitted prior to the issuance request. ☐ A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

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

N/A

E.3.2.4. Inclusion of a monitoring plan

☒	N/A - as this monitoring plan was part of the included CPA-DD

☐	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
☐	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

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

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☒	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
☐	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	☐ under approval; ☐ approved
		Appr.date	
		Ref. No.	
☒	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix of the PoA project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following PCfrMP, PCfMM or PCfSB for which appendix of the PoA-PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.3.2.6. Changes to the project design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☐	No CoPD has been submitted to the UNFCCC prior to the current monitoring period

☒	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	Addition or change of technologies/measures with or without addition or change of applied methodologies (Change in the water purification technology from Ultraviolet disinfection devices to Chemical disinfection). CPA05-CPA13 and CPA16-CPA22 are included under this PRC.
		Status	☐under approval; ☒approved
		Appr.date	Effective approval date 02/05/2019 and approved on 03/05/2019
		Ref. No.	PRC-9948-003
	2	Title	
		Status	☐under approval; ☐approved
		Appr.date	
		Ref.No.	
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD is to be requested from the EB for the current MP as appendix of the PoA project standard does not apply.		
	1	Issue:	
	2	Issue:	
☐	The following CoPD for which appendix of the PoA-PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.3.2.7. Changes specific to afforestation and reforestation activities

☒	N/A - as this registered PoA is not an afforestation and reforestation activity

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

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: • /MR/ • /AMS-III.AV/ • /IPCC/ • /unfccc/			
Findings	☒	The MP is completely in accordance with the approved methodology applied by the CDM PoA project (last registered/approved version of the PoA-DD)		
	☒	The breakdown of MP accordance of the referenced guidelines is as follows:		
		1	Title (of the guideline)	Guidelines for Sampling and Survey for CDM Project activities and Programme of activity, version 04.0
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A (for MP)

		2	Title (of the tool)	Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation
			Version	Version 01.0
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A
	☐	The breakdown of MP accordance of the applicable SB is as follows:		
		1	Title (of the SB)	n.a.
			Version	-
			MP compliance	-
	☐	In this context the following CARs, CLs, FARs have been raised:		
		-		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.		
	-			

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

Means of verification

By means of comparison of the MR and the ER calculation with the latest version of the registered CPA-DD, the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly.

Parameters which are fixed ex-ante are listed as below have been found to be adequately provided in the section E.1 of the MR. Corresponding values in the ER sheet are also verified to be correct.

No	Parameter	Description	Applied Value
1.	Case1 or Case 2	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 % (Case 1) or above 60% (Case 2).	Case 1
2.	WH	Specific Heat of Water	4.186 kJ/L°C
3.	T_f	Final Temperature	100 °C
4.	T_i	Initial Temperature	20 °C
5.	WHE	Latent Heat of Water Evaporation	2,260 kJ/L
6.	L	Leakage	0.95
7.	$R_{y,i}$	Average volume of drinking water per person per day	3.5 (for boarding schools, prisons) and 2 (for day schools). (l/ person / day)
8.	$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year *y* (tCO_2/MWh)	1.3 tCO_2/MWh
9.	$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y	20%

	The following sources of information have been used in this context: • /MR/ • /XLS/ • /PoA-DD/ • /CPA-DD/ • /PS/ • /VVS/ • /unfccc/	
Findings	☒	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.
	☐	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A
	☐	In this context the following CARs, CLs, FARs have been raised: - -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out.
	The fixed ex-ante parameters corresponding with the provisions of CPA-DD are appropriately applied for the ER calculation.	

E.3.4.2. Data and parameters monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in the PoA-DD) have been verified with regard to the (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).	
Findings	CL 01, CL 02, CL 03, CL 04, CAR 01, CAR 02, CAR 03	
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	During the verification all relevant monitoring parameters (as listed in chapter B.5.1 of the registered CPA-DDs) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5). The CME sought deviation, for details please refer PRC-Assessment Opinion – Deviation request under MP4 for CPA 2, CPA 14-22, Version 01, dated 05/07/2021. After appropriate corrections were carried out by the CME it can be confirmed that all monitoring parameters have been measured / determined in accordance with the registered monitoring plan, without material mis-statements and in line with all applicable standards and relevant requirements.	

E.3.4.3. Implementation of sampling plan

Means of verification	The verification team checked whether the PP applied a sampling approach to determine the monitored values. Further it has been checked whether the PP correctly applied the implemented sampling plan including (i) description of the implemented sampling design (ii) collected data

(iii) analysis of collected data
(iv) demonstration on whether the required confidence/precision has been met.

The following sources of information have been used in this context:

- /MR/
- /RC/
- /XLS/
- /PoA-DD/
- /CPA-DD/

Findings

The PPs have applied sampling approaches for the following parameters monitored.

Parameter	
Name:	Water Quality$_i$
Description on how the sampling efforts and survey comply with the validated sampling plan:	A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities. A sample size was calculated from the installed Water Purification System as:

Particular	Total population (N)[12]	Reli-ability	Sample Size (n) required	Samples covered during monitoring
		MP4		
Water quality (Multi barrier UV)	886	95/10	30	44

The sample size has been calculated according to the following equations:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of WPS to be sampled

N = Total number of WPS in the population

z = Constant referring to level of confidence (1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \frac{SD^2}{\overline{p}^2}$$

Where:

$$SD^2 = \frac{\sum_{i=1}^{k} g_i * p_i * (1 - p_i)}{N}$$

[12]These are rounded figures of total strata population for calculating sample size only.

$$\overline{p} = \frac{\sum_{i=1}^{k} g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

k = total number of strata in the population

Procedures for sampling have been duly articulated in the field monitoring excel report and spreadsheet, and a sample of survey questionnaires has been furnished to verification team.

The samples (randomly selected, simple sampling) were visited by surveyor/s on behalf of CME/CPA Implementer. During visit, the existence and functionality of the project WPS was confirmed through visual assessment of the appliance with the unique ID clearly visible and Water Quality Test was conducted using Aquagenx Test kit. The monitoring (Surveys and Water Quality Tests) was conducted from 07/09-2020 to 18/09/2020.

During remote audit assessment conducted by the DOE representative, a total of 08 samples were surveyed covering entire monitoring period across all the concerned water purification systems and Institution type (Boarding/ non-boarding/ Both schools) as illustrated above under section D.4 of this verification report.

During course of verification, relevant findings were raised and same can be referred in detail in Appendix 4 of this report

Name	Operational units

Description on how the sampling efforts and survey comply with the validated sampling plan:

A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.

A sample size was calculated from the installed Water Purification System as:

Particular	Total population (N)[13]	Reli-ability	Sample Size (n) required	Samples covered during monitoring
MP4				
Operational units (Multi barrier UV)	886	95/10	30	48

The sample size has been calculated according to the following equations:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of WPS to be sampled

N = Total number of WPS in the population

[13] These are rounded figures of total strata population for calculating sample size only.

		z = Constant referring to level of confidence (1.96 for 95 % confidence) Precision = Required precision (e.g. 10% = 0.1) $$V = \frac{SD^2}{\overline{p}^2}$$ Where: $$SD^2 = \frac{\sum_{i=1}^{k} g_i * p_i * (1 - p_i)}{N}$$ $$\overline{p} = \frac{\sum_{i=1}^{k} g_i * p_i}{N}$$ Where, g_i = weight of strata i in the population p_i = expected proportion of strata i in the population k = total number of strata in the population The random samples were visited by surveyor/s on behalf of CME/CPA Implementer. During the remote assessments, the existence and functionality of the project WPS was confirmed through visual assessment of the appliance with the unique ID clearly visible and Usage Surveys were conducted. The monitoring (Surveys and Water Quality Tests) was conducted from 07/09/2020 to 18/09/2020. During remote audit assessment conducted by Verification Team, a total of 08 samples were surveyed covering entire monitoring period across all the concerned water purification systems and Institution type (Boarding/ non-boarding/ both schools) as illustrated above under section D.4 of this report.
	Name	Existence of public distribution network of safe drinking water
	Description on how the sampling efforts and survey comply with the validated sampling plan:	The Assessment Team assessed the monitoring survey forms submitted by the CME. The Verification Team (during the remote audits) reconfirmed the below particulars with the end users to confirm the credibility of the monitoring data: • **Confirmation that all appliances are in continued operation based on traceable maintenance schedules confirming** continuous supply of cartridge/tablets, through the 'Question pertaining to continuity/Maintenance' and also checks on the operational status through 'Question pertaining to usage'. The response to these questions confirms that there were routine supply/ maintenance of filters / cartridges, as well as usage. Based on the review of the all the submitted monitoring survey forms, read with the observation during remote assessment and interviews with the representatives of sampled end users, it can be concluded that all appliances are in continued operation and delivering optimum level of services. • **Assessment of the continued availability of the drinking water-** The above questions pertaining to

continuity/maintenance ensures that the institution is receiving continuous supplies and hence have remained under continued use during the monitoring period. The questions pertaining to usage confirm that these supplies are being uninterrupted. The response to these questions confirms that the WT unit was used for the water treatment; the end users did not avail boiling/ unsafe drinking water during the applied monitoring period. Based on the review of the all the submitted monitoring survey forms read with the observation during remote assessment with the representatives of sampled end users, it can be concluded that there was continued availability of the safe drinking water.

Additional checks by the VT:
All the interviewed institution heads of "randomly sampled systems" were interviewed by the VT to confirm that

- the product installed in the school was currently in operational condition and
- they have been receiving continuous supply of cartridge/tablets thus, getting continuous supply of safe drinking water. Any institution reporting the product as being functional, cannot be out of supplies.

The Verification Team has assessed all the above data points while interviewing, the sampled school representatives. As stated above this data is already part of the submitted ER worksheet

Additionally, during the remote assessment the VT checked if there are provisions in place to ensure continuous supply of safe drinking water

- **Call Centers:** The CME representatives confirmed that follow up calls with the institutions regarding usage, users are performed to gauge the expected date of next supply next supply of (cartridge/tablets). This fact was also confirmed by the verification team with the school representatives.
- **Other Evidences (Purchase Order, delivery notes etc):** The objective evidences delivery notes, delivery notes, installation records, maintenance records and the traceability of customer care number/email for supply / repair on the system's tank or school wall in form of sticker were checked to confirm that the CME country office contact detail is available to the institution staff and they can contact the CME in case they find any issue with the performance, breakdown, problem with the product or need additional tablets / cartridge. The VT during the remote assessment (telephone call and video calls) with the institution heads confirmed about the availability and use of contact number to register their complaints regarding the product or their request for supplies.
- The VT is already in receipt of the sales database which captures the supplies with their product IDs for each institution, which is presented in the ER sheet (refer ER calculator, worksheet tabs "MP4 Sales Database", "Monitored samples"). The VT has also assessed the scanned copies of delivery notes made available for cross verification of the subsequent supplies made to an institution. The verification team had checked it for the sampled institutions. The evidence reviewed confirmed the quantities of supplies mentioned in the ER sheet.

Thus, the above monitoring provisions ensure as uninterrupted supply of safe drinking water in the institution.

A sample size was calculated based on estimated proportion values based on project developer's knowledge and experience in line with para 13(b) and 13(c) of the Sampling and surveys for CDM project activities and programmes of activities.

A sample size was calculated from the installed Water Purification System as:

Particular	Total population (N)[14]	Reli-ability	Sample Size (n) required	Samples covered during monitoring
MP4				
Existence of public distribution network of safe drinking water (Multi barrier UV)	886	95/10	30	44

The sample size has been calculated according to the following equations:

$$n \geq \frac{z^2 * N * V}{(N-1) * precision^2 + z^2 * V}$$

Where,

n = number of WPS to be sampled

N = Total number of WPS in the population

z = Constant referring to level of confidence (1.96 for 95 % confidence)

Precision = Required precision (e.g. 10% = 0.1)

$$V = \frac{SD^2}{\bar{p}^2}$$

Where:

$$SD^2 = \frac{\sum_{i=1}^{k} g_i * p_i * (1-p_i)}{N}$$

$$\bar{p} = \frac{\sum_{i=1}^{k} g_i * p_i}{N}$$

Where,

g_i = weight of strata i in the population

p_i = expected proportion of strata i in the population

[14] These are rounded figures of total strata population for calculating sample size only.

		k = total number of strata in the population The samples selected by CME were visited by surveyor/s on behalf of CME/CPA Implementer. During visit, the existence and functionality of the project WPS was confirmed through visual assessment of the appliance with the unique ID clearly visible. The CME's monitoring team checked the existence of any public distribution network with safe drinking water in sampled schools. The monitoring (Surveys and Water Quality Tests) were conducted from 07/09/2020 to 18/09/2020. During remote audit assessment conducted by verification team and, a total of 08 samples were surveyed covering entire monitoring period across all the concerned water purification systems and Institution type (Boarding/ non-boarding/ Both schools) as illustrated above under section D.4 of this FVR.
	☒	In this context the following CARs, CLs, FARs have been raised: CL 01, CAR 02 and CAR 03
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	Based on the assessment of sampling records, monitoring survey records/USAGE/ and WQT/CBT/ records, the data analysis sheets for the related parameters, it is concluded that all the parameters have been monitored correctly in accordance with registered monitoring plan and the applied methodology. The verification team concludes that all sampled parameters values have been calculated correctly in line with the registered corresponding CPA-DDs and the sampling standard. For all the parameters, the achieved relative precision of 10 % and 95% confidence level is demonstrated to be met. Based on above, along with the Remote Assessment observations and interview and assessment of the project Water Purification System installations (via supporting documents for sampled Institutions with photographs showing product type, unique serial numbers verifiable against the sales database), the verification team concludes that the approach applied and result achieved/accrued are deemed appropriate and acceptable.	

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

Means of verification	During the verification, the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated CPA-DD and/or the applicable calibration standards. The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6). The following sources of information have been used in this context: • /MR/ • /XLS/ • /PoA-DD/ • /CPA-DD/ • AMS-III. AV/	
Findings	☒	Calibration is not under the purview of the CME; however, third party WBT agency has provided the complete calibration detail of the equipment in the report which were also checked during onsite inspection by the verification team and found to be appropriate. Thus, the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.

	☐	Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration. From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions. For details, please refer to appendix 6
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	The CPAs do not involve installation of monitoring equipment which requires calibration. Based on assessment of documents, sampling survey records, Aquagenx testing kit specifications, report and data maintenance and recording procedures, it can be concluded that the recording of all data related to monitoring is appropriate and accurate.	

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

During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:

- *Transparency:* It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.
- *Parameter* consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.
- *Correctness*: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.
- *Completeness*: It has been checked whether all calculations are complete and without omissions.

Note: As per the registered PoA-DD/PoA-DD/ *"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 Feb 2021 will be eligible for crediting only in the month of March 2021.

Given, the current monitoring period is starting in 01/01/2020 and ending on 21/03/2020, therefore only the units installed till Feb 2020 (up to 29/02/2020) are eligible for crediting under the concerned monitoring period. Thus, the CME has considered 29/02/2020 as the cut-off date of installation for this monitoring period.

Baseline emission is determined using the following equation as per applied methodology:

$BE_y = QPW_y \times SEC \times f_{NRB,y} \times EF_{projected\_fossilfuel} \times 10^{-9}$

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 4.0, 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

Calculation of emission reductions is performed during the applied monitoring period as follows:

Step 1: Calculation of quantity of purified water in year y (QPWy)

$QPW_y = \Sigma(T_{y,i} \times N_{y,i} \times R_{y,i} \times actual\ operational\ school\ days^{15} \times Water\ Quality_i \times Operational\ Units_i)$

Where,

QPW_y	Quantity of purified water for drinking for all technologies type i in year y (Liters)
$N_{y,I}$	The average population serviced by water purification systems (person /equipment)
$T_{y,i}$	Total distributed water purification systems
$R_{y,i}$	Average volume of drinking water per person per day (Liters /person /day)
$Water\ Quality_i$	Percent of units that meet water quality requirements
$Operational\ Units_i$	Percent of the monitoring period in which the units are in use

Step 2: Calculation of specific energy consumption [SEC] required to boil one litre of water.

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

Where,

WH	Specific heat of water (kJ/L °C)
T_f	Final temperature (°C)
T_i	Initial temperature of water (°C)
WHE	Latent heat of water evaporation (kJ/L)
n_{wb}	Efficiency of water boiling system being replaced (fraction)

MP4 (data is reported for CPA which claimed ERs):

Data/Parameter	Data Unit	9948-P1-0002-CP1	9948-P1-0014-CP1	9948-P1-0015-CP1	9948-P1-0016-CP1	9948-P1-0017-CP1
Ty,i	Number	445	216	225	4	3
Operational rate	percentage	91.67	91.67	91.67	Not monitored	Not monitored
Ry,i	L/person/day	2.61	2.64	2.61	2.15	2.20
Ny,i	persons/technology	473	498	513	384	367
Days	number	40	41	40	27	28
Water Qualityi	Fraction	0.9773	0.9773	0.9773	Not monitored	Not monitored
QPWy	L/year	19,770,000	10,351,818	10,794,962	-	-
ηwb	Fraction	0.1172	0.1172	0.1172	0.1172	0.1172
Tf	C	100	100	100	100	100
Ti	C	20	20	20	20	20

[15] Instead of 81 days 40 days have been applied for CPA 9948-P1-0002-CP1 (due to progressive sales).

WH	kJ/L °C	4.186	4.186	4.186	4.186	4.186
WHE	kJ/L	2260	2260	2260	2260	2260
SEC	kJ/L	3050.17	3050.17	3050.17	3050.17	3050.17
fNRB	Fraction	0.8304	0.8304	0.8304	0.8304	0.8304
EFprojected_fossil fuel	tCO_2e/TJ	80.12	80.12	80.12	80.12	80.12
Systems having access to public distribution system providing safe drinking water	Fraction	0.00	0.00	0.00	Not monitored	Not monitored
BEy	tCO_2e	4,012	2,100	2,190	-	-
PEy	tCO_2e	19	10	10		
L	tCO_2e	201	105	110	-	-
ERy	tCO_2e	3,792	1,985	2,070	-	-

Data/Parameter	Data Unit	9948-P1-0018-CP1	9948-P1-0019-CP1	9948-P1-0020-CP1	9948-P1-0021-CP1	9948-P1-0022-CP1
$Ty_{,i}$	Number	5	4	3	3	5
Operational rate	percentage	Not monitored	Not monitored	Not monitored	Not monitored	Not monitored
$Ry_{,i}$	L/person/day	2.23	2.04	2.01	2.02	2.60
$Ny_{,i}$	persons/technology	227	349	296	391	406
Days	number	37	35	35	35	31
Water $Quality_i$	Fraction	Not monitored	Not monitored	Not monitored	Not monitored	Not monitored
QPWy	L/year	-	-	-	-	-
ηw b	Fraction	0.1172	0.1172	0.1172	0.1172	0.1172
Tf	C	100	100	100	100	100
Ti	C	20	20	20	20	20
WH	kJ/L - C	4.186	4.186	4.186	4.186	4.186
WHE	kJ/L	2260	2260	2260	2260	2260
SEC	kJ/L	3050.17	3050.17	3050.17	3050.17	3050.17
fNRB	Fraction	0.8304	0.8304	0.8304	0.8304	0.8304
$EF_{projected\_fossilfuel}$	tCO2e/TJ	80.12	80.12	80.12	80.12	80.12
Systems having access to public distribution system providing safe drinking w ater	Fraction	Not monitored	Not monitored	Not monitored	Not monitored	Not monitored
BE_y	tCO_2e	-	-	-	-	-
PE_y	tCO_2e					
L	tCO_2e	-	-	-	-	-
ER_y	**tCO_2e**	**-**	**-**	**-**	**-**	**-**

The calculation of emission reductions is stated under section E.3.6.3 below.

The following sources of information have been used in this context:

- /MR/
- /PoA-DD/
- /CPA-DD/
- /XLS/
- /USAGE/
- / AMS-III.AV/

Findings	☐	The calculation of the baseline emissions was found to be fully compliant with the above stated principles. The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.

		No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☒	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	☒	In this context the following CARs, CLs, FARs have been raised:
		CL 01, CAR 01, CAR 02, CAR 03, FAR 01 and FAR 02 has been raised
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 5.

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 applied operational school days determined as per academic school calendar issued by "School and Other Institutions Calendar-2019", "School and Other Institutions Calendar-2020" issued by the Ministry of Education and Sports Embassy, Uganda". 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/XLS/. Please refer the closure of CL 02.

Residual capacity from previous MP:
The Verification Team has reviewed the revised ER sheet/XLS/ and confirms that the values of 'residual capacity from previous MP' (ER worksheet, tab: "MP3 Sales Data Reference Only"), are accurately linked with the MP3 ER worksheet values 2/MP3/.

In the revised MP4 ER Calculator, the MP3 Sales database has been added (Tab: 'MP3 Sales Data Reference Only') by the CME. The VT has verified that information in the revised MP4 ER Calculator, Tab: 'MP3 Sales Data Reference Only' is fully consistent MP3 ER calculator/MP3/, available at UN webpage/MP3/.

The VT confirmed that the residual capacity from previous MP in column AC, in tab MP4 Sales database, is correctly linked with 'MP3 Sales Data Reference Only, column AO, thus establishing complete traceability of these values.

It is further confirmed that the MP4 sales database, in column AC, correctly reflects, "new installation, not applicable" for systems that are not being carry forwarded from MP3.

The assessment of the residual capacity from previous MP is assessed in detail under the CL 04).

Subsequent supplies:

No subsequent supplies have been made to the institutions in the concerned MP (ER worksheet, tab "MP4 Sales Database", column AD). The schools which have '0' residual capacity from previous MP along with 0 subsequent supplies), were verified to have 0 credited operational school days (column AP), thus substantiating that no ERs have been claimed for such cases/XLS/.

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. Please refer the closure of CL 04.

Lifetime of Multi-Barrier UV and UltraFlo WPS:

	In case of Multi-barrier UV, the lifespan has been verified as 7 year by the VT as per supplier certificates/specifications/TS/. Further, the review of MP4 sales database/DB/, /REC/ confirms that the earliest Multi-Barrier UV WPS was installed in June 2014 (ER worksheet, tab "MP4 Sales Database", column G). Thus, it is confirmed that no Multi-Barrier UV WPS shall exhaust its useful lifetime before 21/03/2020. Besides, the UV bulb can be replaced to further extend the device lifetime after 7 years, if desired. Similarly, in case of UltraFLO, the 5-year lifespan/expiry has been verified by the VT as per supplier certificates/specifications/TS/. Further, the review of MP4 sales database/DB/, /REC confirms that the earliest UltraFlo was installed in June 2018. Thus, it is confirmed that no UltraFlo WPS shall exhaust its useful lifetime before 21/03/2020. Besides, every-time a school receives a new supply UltraFLO cartridge, the lifetime of the system is automatically deemed extended. However, no emission reductions are claimed for UltraFLO during this monitoring period. Please refer to CAR 02. **Other Determinants** The ER sheet/XLS/ tab, 'MP4 Sales Database' ensures that ($N_{y,i}$*$R_{y,i}$) * operational school days in the monitoring period, do not exceed the available treatment capacity for any unit (column AI). It also confirms that the total consumed capacity (column AN) remains lower of these two in all cases. The verification team has checked all determinants (columns AK:AP) and confirms them to be correctly and accurately calculated and conservative with respect to ER calculations. Please refer the closure of CL 04. The verification team has verified all corresponding calculations and found them accurate and correct. Based on above and verification of all input values (including fixed ex-ante), it can be concluded by verification team that, baseline GHG emissions calculation presented in the MR and corresponding ER sheet is deemed as appropriate.

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

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. Project emissions are calculated as per the applied methodology for the registered PoA. PEy = 0, for type 2 CPAs For type 3 CPAs, PE_y is calculated as follows: $PE_y = T_{y,i} \times EC_{PJ,j,y}\ x\ EF_{EL,j,y}\ x\ (1 + TDL_{j,y})$ The following sources of information have been used in this context: • /MR/ • /CPA-DD/ • /XLS/ • / AMS-III.AV/

Data/ Parameter	Data Unit	9948-P1-0002-CP1	9948-P1-0014-CP1	9948-P1-0015-CP1	9948-P1-0016-CP1	9948-P1-0017-CP1	9948-P1-0018-CP1	9948-P1-0019-CP1	9948-P1-0020-CP1	9948-P1-0021-CP1	9948-P1-0022-CP1
$Ty_{,i}$	-	445	216	225	4	3	5	4	3	3	5
$EC_{PJ,j,y}$	MWh/yr	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027
$EF_{EL,j,y}$	tCO_2/MWh	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
$TDL_{j,y}$	%	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
PE_y	**tCO_2e**	**19**	**10**	**10**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Findings	☒	The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	Project emissions are accurately determined.	

E.3.6.3. Calculation of leakage GHG emissions

Means of verification	During the verification the calculation of leakage has been checked. In detail the following has been verified: • Transparency: It has been checked whether the calculation of leakage is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. Leakage has been calculated using a default 95% leakage adjustment factor to baseline emissions as per applied methodology. PP has applied related default factor correctly to the baseline emissions. *Ly*= BE_y * (1-0.95) The following sources of information have been used in this context: • /MR/

	• /CPA-DD/ • /XLS/ • / AMS-III.AV/	
Findings	☒	The calculation of the leakage was found to be fully compliant with the above stated principles. The calculations of leakage GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	Therefore, no further leakage emission result is separately indicated in monitoring report or this report.	

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

Means of verification

The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately.

- Total baseline emissions,
- Total project emissions,
- Total leakage,
- Total emission reductions

The MR demonstrate the summary of GHG emission reductions for the monitoring period and calculated according to the applied methodology AMS-III.AV as follows:

$ER_y = BE_y - (PE_y + L_y)$

CPA	BE_y tCO_{2e}	PE_y tCO_{2e}	L_y tCO_{2e}	ER_y tCO_{2e}
9948-P1-0002-CP1	4,012	19	201	3,792
9948-P1-0014-CP1	2,100	10	105	1,985
9948-P1-0015-CP1	2,190	10	110	2,070
9948-P1-0016-CP1	-	-	-	-
9948-P1-0017-CP1	-	-	-	-
9948-P1-0018-CP1	-	-	-	-
9948-P1-0019-CP1	-	-	-	-
9948-P1-0020-CP1	-	-	-	-
9948-P1-0021-CP1	-	-	-	-
9948-P1-0022-CP1	-	-	-	-
Total	**8,302**	**39**	**416**	**7,847**

It has been assessed whether the values are correct or need to be revised as a consequence of issues identified during the desktop reviews and onsite assessments. Findings have been raised and all monitored parameters have been duly verified.

	The following sources of information have been used in this context: • /MR/ • /XLS/ • /CPA-DD/ • /PoA-DD/ • /AMS-III.AV/ • /USAGE/	
Findings	☒	Section F.4 of the MR includes in a summary table of the emission reductions calculation.
	☐	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	☐	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	☒	During the verification issues with impact on the ER calculation have been identified.
		CL 01, CAR 01, CAR 02 and CAR 03
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	The summary table in MR has been filled correctly and the values are in line with related emission reduction calculation spreadsheet.	

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-P1-0002-CP1	4,012	19	201	0	3,792	3,792
9948-P1-0014-CP1	2,100	10	105	0	1,985	1,985
9948-P1-0015-CP1	2,190	10	110	0	2,070	2,070
9948-P1-0016-CP1	-	-	-	0	-	-
9948-P1-0017-CP1	-	-	-	0	-	-
9948-P1-0018-CP1	-	-	-	0	-	-
9948-P1-0019-CP1	-	-	-	0	-	-
9948-P1-0020-CP1	-	-	-	0	-	-
9948-P1-0021-CP1	-	-	-	0	-	-
9948-P1-0022-CP1	-	-	-	0	-	-
Total	**8,302**	**39**	**416**	**0**	**7,847**	**7,847**

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

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the included CPA-DD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	☒	*Case 1:* The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.

	☐	*Case 2:* The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	☒	*Case 3:* The ex-ante estimated value was found to be proportionally lower than the ex-post determined value (for CPA 002).
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	The detailed assessment for the increase in the actual emission reduction for CPA 002 compared to estimated emission reductions is provided under MR. The CME has provided detailed assessment for the variation in the data parameters and justified the change.	

Title and UNFCCC reference number of the CPA	Actual values achieved by the CPAs during this monitoring period	Value estimated in ex ante calculation in the included CPA-DD(s)
9948-P1-0002-CP1	3,792 tCO_{2e}	3,400 tCO_{2e}
9948-P1-0014-CP1	1,985 tCO_{2e}	6,437 tCO_{2e}
9948-P1-0015-CP1	2,070 tCO_{2e}	6,437 tCO_{2e}
9948-P1-0016-CP1	-	13,187 tCO_{2e}
9948-P1-0017-CP1	-	13,187 tCO_{2e}
9948-P1-0018-CP1	-	13,187 tCO_{2e}
9948-P1-0019-CP1	-	13,187 tCO_{2e}
9948-P1-0020-CP1	-	13,187 tCO_{2e}
9948-P1-0021-CP1	-	13,187 tCO_{2e}
9948-P1-0022-CP1	-	13,187 tCO_{2e}
Total	**7,847** tCO_{2e}	**108,583** tCO_{2e}

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

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered CPA-DD (for CPA 002) and section F.5 of the MR, the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	☒	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	☒	*For case 3:* The PP has provided a related justification in the MR. The reasons for the increase are as follows: The higher ex-post emission reductions in the current monitoring period is due to higher value of the parameters $Ry_{,i,}$ $Ny_{,i}$ (not in control of the CME) as well as other monitoring parameters (refer section F.6 of MR)
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	Emissions reductions achieved during the monitoring period are higher (for CPA 0002) than the values estimated in the ex-ante calculation of registered CPA-DD. Appropriate explanation is provided in the MR and assessed to be acceptable. However, for CPA 014-015, the achieved emissions reductions are lower than envisaged. The ER's are '0' tCO_2 for CPA 016-022.	

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

Means of verification	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	☐	The project participants have monitored the sustainable development co-benefits of the registered CDM project activity and requested the DOE to verify them. The following sources of information have been used in this context: • /MR/ • /PoA-DD/ • /CPA-DD/ • /unfccc/.
Findings	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	☐	Therefore, the DOE has assessed and confirms that: (a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the "CDM project standard for project activities"; (b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.
	☐	In this context the following CARs, CLs, FARs have been raised:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	☒	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	-	

E.3.8. Global stakeholder consultation

Means of verification	In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage. The monitoring report has been published for the period of three weeks before remote assessment. The following sources of information have been used in this context: • /MR/ • /unfccc/.	
Findings	☒	No comments have been received on the published monitoring report for this monitoring period.
	☐	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	☐	Comments have been received. The DOE has - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity, - assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below),

		- used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.
	☐	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details, please refer to Appendix 4.
	☒	No comments received during the stakeholder consultation process.

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors where at least one is being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision-making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore, reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

Impact Carbon has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 4th periodic verification of the CDM PoA: "***Impact Carbon Global Safe Water Programme of Activities (PoA)***", with regard to the relevant requirements for CDM Programme of Activities. The PoA reduces GHG emissions by avoiding usage of fuel wood and other fossil fuel for boiling water to make it suitable for drinking purposes. This verification covers the period from 01/01/2020 – 21/03/2020 (both days included)

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design documents,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., AMS-III.AV ver. 4.0,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above-mentioned reporting period as follows:

Emission reductions: **7,847 tCO_2e**

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the CDM PoA

"Impact Carbon Global Safe Water Programme of Activities (PoA)"

registered under

UNFCCC-No.: 9948

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 4

from: 01/01/2020

to: 21/03/2020

(including both days) as follows:

Emission reductions: **7,847 tCO_2e**

New Delhi, 05/07/2021

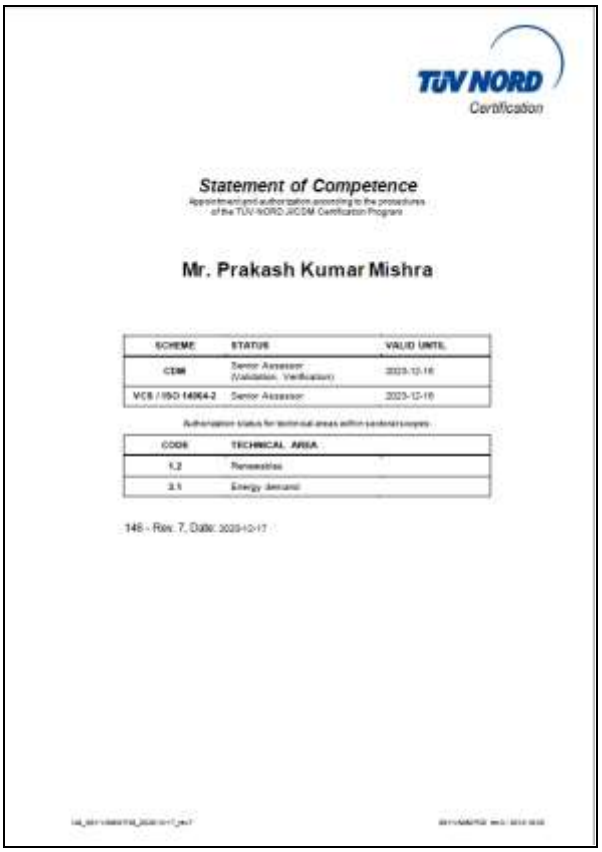
Prakash

Prakash Kumar Mishra
Team Leader
TÜV NORD JI/CDM Certification Program

Appendix 1. Abbreviations

Abbreviations	Full texts
CAF	Customer Agreement Forms
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating/Managing Entity
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CPA-DD	Component Project Activities Design Document
DOE	Designated Operational Entity
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
OSVEJ	On-site Visit Exemption Justification
PA	Project Activity
POA-DD	Project of Activities Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
RC	Reliability check work sheets for WPS
SD	Standard deviation
UNFCCC	United Nations Framework Convention on Climate Change
VT	Verification Team
VVS	Validation and Verification Standard
WFT	Water Quality Field Test
WPS	Water Purification System
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

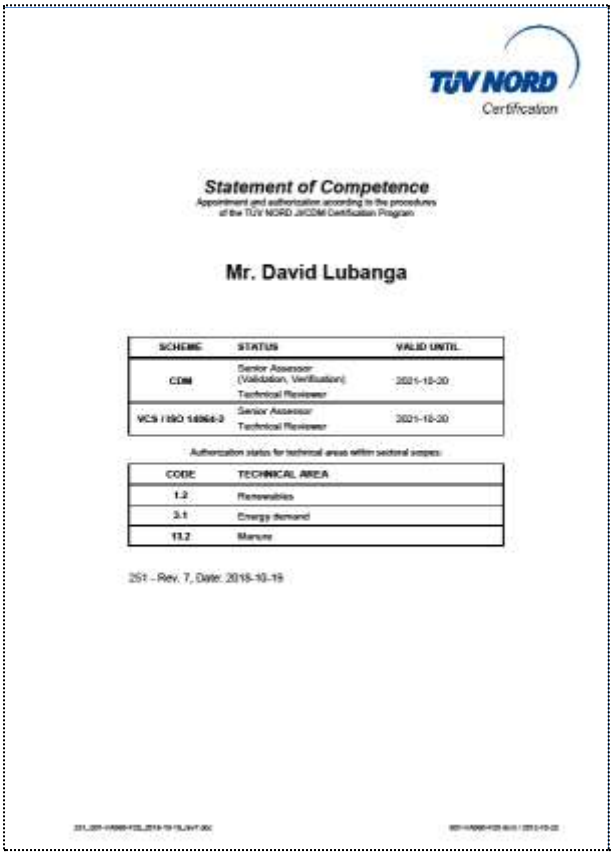
Mr. Prakash Kumar Mishra

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2023-12-16
VCS / ISO 14064-2	Senior Assessor	2023-12-16

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand

148 - Rev. 7, Date: 2023-12-17



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

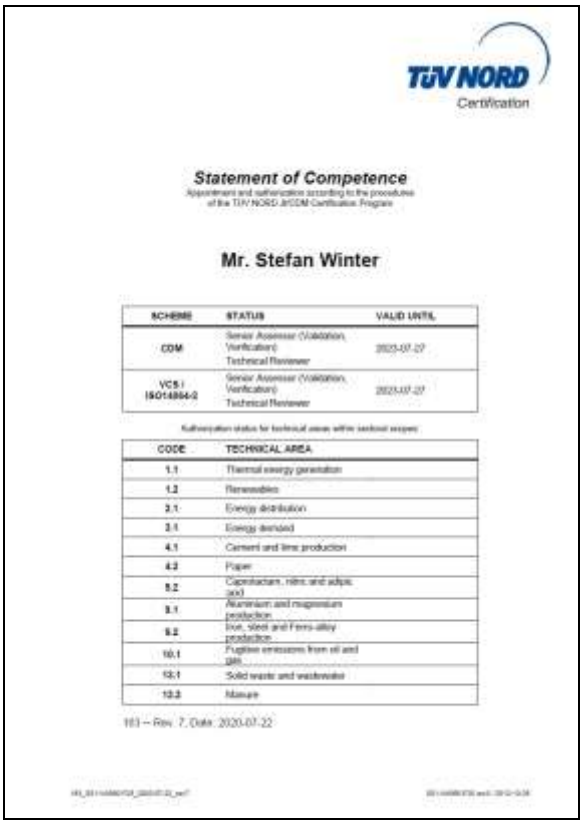
Mr. David Lubanga

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2021-12-20
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2021-12-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 7, Date: 2018-10-15



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2023-07-27
VCS / ISO14064-2	Senior Assessor (Validation, Verification) Technical Reviewer	2023-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
3.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
5.1	Aluminium and magnesium production
5.2	Iron, steel and Ferro-alloy production
10.1	Fugitive emissions from oil and gas
13.1	Solid waste and wastewater
13.2	Manure

183 – Rev. 7, Date: 2020-07-22

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1.	UNFCCC	**/AMS-III.AV/**	• AMS-III.AV Low greenhouse gas emitting safe drinking water production systems (Version 4.0)		Other
2.	PP	**/CPA-DD/, /BOUND/**	• CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 2', Version 3.0, dated 24/03/2014 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 14', Version 1.0, dated 26/10/2017 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 15', Version 1.0, dated 26/10/2017 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 16', Version 5.0, dated 22/03/2019 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 17', Version 5.0, dated 22/03/2019 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 18', Version 5.0, dated 22/03/2019 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 19', Version 5.0, dated 22/03/2019 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 20', Version 5.0, dated 22/03/2019 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 21', Version 5.0, dated 22/03/2019 • CPA-DD titled 'Impact Carbon Global Safe Water Programme of Activities (PoA): CPA 22', Version 5.0, dated 22/03/2019		Other

No.	Author	Reference	Title	References to the document	Provider
3.	PP	**/DB/, / REC/**	• Sales Force Edition report (capturing the name of school, SF ID number, type of school (Boarding/ Non-Boarding), Number of students and teachers, type of system installed (Multi-barrier UV / UltraFlo etc as applicable), date of installation). • Installation logs/ Records by Impact water • Photographs of remotely assessed samples- SF ID, type of technology, unique serial number, name of institution. • Maintenance Confirmation in form of the Maintenance Records • Finance Agreement between school and Impact Carbon for supply, implementation, maintenance, payment plan, • Telephonic/ skype call records • Academic school calendar issued by "School and Other Institutions Calendar-2019" issued by the Ministry of Education and Sports Embassy, Uganda • Academic school calendar issued by "School and Other Institutions Calendar-2020" issued by the Ministry of Education and Sports Embassy, Uganda		Other
4.	DOE	**/CPM/**	• TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
5.	PP	**/USAGE/**	• Monitoring forms by Impact Water for survey carried out at different institutions (Scanned copies) • PoA 9948_MP4 Uganda Sampling Database.xlsx • Evidence of Random number generator - MP4 Uganda Multi barrier UV.pdf • Citizens-Survey-on-Uganda-Vision-2040.pdf		Other
6.	IPCC	**/IPCC/**	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: workbook 2. 2006 IPCC Guidelines for	www.ipcc-nggip.iges.or.jp	Other

No.	Author	Reference	Title	References to the document	Provider
			National Greenhouse Gas Inventories: work book		
7.	UNFCCC	**/KP/**	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
8.	UNFCCC	**/MA/**	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
9.	UNFCCC	**/VERIF/** **/MP1/** **/MP2/** **/MP3/**	/MP1/ (Issued) MP1 Verification Documentation • PoA9948_MP1_MRP1_ Verification report_final_26102018.pdf • PoA9948_MP1 ER Calculator v4.0 24102018.xlsx • PoA 9948 - MP1 MR v4.0 24102018 clean.pdf MP2 Verification Documentation /MP2/ (Issued) • PoA9948_MP2_Uganda _MR_ver 4.0_19032021 Clean.pdf • PoA 9948_MP2_Uganda ER Sheet_ver 4.0_19032021.xlsx • FVR- MP2 Impact Carbon MP2_RFR_clean.pdf MP3 Verification Documentation /MP3/ (Review Documentation) • 9948 MP3 Uganda MR4_Clean.pdf • 9948 MP3 Uganda MR4_Track.pdf • 9948 MP3 Uganda ER Sheet ver 4.0 26042021.xlsx 9948 Uganda_FVR-MP3_Final_clean.pdf MP4 - Requesting Issuance • Final Verification for MP4 encompassing CPA 2, CPA 14-22, Version 01, dated 05/07/2021	https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss757932161/view https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss884778545/view https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss874238742/view	
10.	UNFCCC	**/MR/**	Monitoring Report titled `Impact Carbon Global Safe Water Programme of Activities (PoA)', • Version 1.0, dated 09/10/2020 • Version 4.0, dated 26/04/2021 • Version 4.1, dated	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other

No.	Author	Reference	Title	References to the document	Provider
			22/06/2021		
11.	UNFCCC	**/MRT/**	• Monitoring Report Form (CDM-PoA-MR-FORM), Version 04.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
12.	UNFCCC	**/PoA-DD/**	• Registered Project Design Document for CDM PoA: "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 03.0, dated 24/03/2014 • Revised Project Design Document for CDM PoA: "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 6.1, dated 15/02/2017 • Revised Project Design Document for CDM PoA: "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 7.0, dated 18/04/2017	https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/YNXCPIJ5ZO7DTRGMV0F2AKEU486LQS	Other
13.	PP	**/PRC/**	• PRC-9948-003 Impact Carbon Global Safe Water Programme of Activities (PoA) approved on date 03 May 19 • PRC-9948-002 Impact Carbon Global Safe Water Programme of Activities (PoA) approved on date 03 Jul 17 • PRC-9948-001 Impact Carbon Global Safe Water Programme of Activities (PoA) approved on date 08 May 17 • PRC-Assessment Opinion – Deviation request under MP4 for CPA 2, CPA 14-22, Version 01, dated 05/07/2021	-	Other
14.	UNFCCC	**/PS/**	CDM Project Standard for Programme of activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
15.	PP	**/PO/**	• PoA 9948_MP4 Uganda Sampling Database.xlsx • Sales Receipt in the form of Purchase order including SF ID		Other
16.	PP	**/VAL/**	Validation Report for CDM PoA project "Impact Carbon Global Safe Water Programme of Activities (PoA)" version 02.0, dated 30/04/2014	https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/5J36IFUKQVNMRA0OZPGLH9C7STED1W/view https://cdm.unfccc.int/Progr	Other

No.	Author	Reference	Title	References to the document	Provider
			Validation Reports of the CPA's under the Monitoring Report	ammeOfActivities/poa_db/5J36IFUKQVNMRA0OZPGLH9C7STED1W/viewCPAs	
17.	UNFCCC	**/VVS/**	CDM validation and verification standard for programmes of activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
18.	PP	**/CBT/**	**Water Quality Test** • CBT Instructions for_DrinkingWater_Sobsey • IP Water Testing Certificate • Aquagenx New Test Kits		Other
19.	PP	**/ELIG/**	Applied Technology: • Technical Specification of Multi-barrier UV System • Technical specification of UltraFlo and Ultra Tab System Location of CPA • Verifiable evidence – Address to confirm that the CPA is not located in regions of Uganda where a public distribution network supplying safe drinking water exists. • Operations Manual from Impact Water		Other
20.	PP	**/TS/**	• Multi-Barrier UV - Technical Specification Supplier (Rotek) for Large and Small UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.) • Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek) • Multi-Barrier UV - Certificate from Supplier (Rotek) on WHO compliance • UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier) • UltraFlo Installation Manual • UltraFlo - Device Dimensions Declaration by CME		Other
21.	UNFCCC	**/SAMPLE/**	• "Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" (Version 04.0) • "Standard for Sampling and	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other

No.	Author	Reference	Title	References to the document	Provider
			Surveys for CDM Project Activities and Programme Activities" (version 09.0)		
22.	UNFCCC	**/GOT/**	• Glossary "CDM terms" (version 10.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
23.	PP	**/XLS/**	01 - PoA 9948_MP4_MR5_Uganda ER Sheet_ver 1.0_09102020.xlsx PoA 9948_MP4_MR5_Uganda ER Sheet_ver 4.0_26042021.xlsx	-	PP
24.	PP	**/RC/**	Reliability Check integrated into ER sheet • Random number generator for selection of samples from the population by Stat Trek • Sample size and Reliability check for Operational Units, Water quality and Safe water distribution network	-	PP
25.	UNFCCC	**/unfccc/**	UNFCCC	http://cdm.unfccc.int	Other
26.	IPCC	**/ipcc/**	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
27.	PP	**/TRG/**	• Certificate of Training for Surveys • Certificate of Training for Tests • Survey Training Module • Aquagenix Test Training Module		Other
28.	PP	**/OSVEJ/**	Justification to UN interim exemption clause by CME for not postponing mandatory onsite visit: 1. Letter/declaration for the reason 2. Delivery deadline related justification evidence inter alia ERPA/Term sheets 3. Contractual obligation on timeline with DOE 4. Undertaking that CME and on ground preparation is compatible and equipped with infrastructure to conduct remote assessment		
29.	UNFCCC	**/REFD/**	Procedure CDM project cycle procedure for programmes of activities Version 02.0	https://cdm.unfccc.int/Reference/Procedures/index.html	Other

No.	Author	Reference	Title	References to the document	Provider
			Checklist for Requests for Post-Registration Changes to Programmes of Activities (Version 02.0) Checklist for notifications of post-registration changes to component project activities (Ver01.0)		
30.	DoE	**/IM01/ /IM02/ /IM03/**	• PP's/CME's representative • Consultant management representative • Stakeholders	-	Other

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

Table 3. Remaining FARs from validation and/or previous verification

FAR ID	01	**Section no.**	E.3.4.2	**Date:** 22/04/2021
Description of FAR				
The Verifying DOE shall confirm the provisions of the applied methodology AMS-III.AV, version 04 para 16, pertaining to monitoring frequency of parameter "operational units$_i$" as atleast once every two years (atleast biennial) are complied.				
CME response				**Date:** 26/05/2021
The monitoring activity in MP3 was conducted in Feb 2020 and the monitoring activity in MP4 was conducted in Sep 2020. 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 (once per verification).				
Documentation provided by the CME				
N/A				
DOE assessment				**Date:** 07/06/2021
The monitoring frequency of parameter "operational units$_i$" as at least once every two years (at least biennial) is complied. The above justification is verified and deemed as appropriate.				
Conclusion *Tick the appropriate checkbox*	☒ The FAR is closed			

FAR ID	02	**Section no.**	E.3.4.2	**Date:** 22/04/2021
Description of FAR				
The Verifying 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 (refer: SSC_795: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/05721 and SSC_792: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/57226)				
CME response				**Date:** 26/05/2021
The number of credited operational school days in ERs Summary tab (refer row 6), has been calculated to correspond to the 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 Ministry of Sports and				

Education, Uganda 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) as operational school days for non-boarding users. For boarding users, the CME has considered days (including weekends and short public holidays) but excluding mid-term, end term holidays as boarding students/staff will consume water during weekends and short public holidays for determining the operational school days within the monitoring period. Please refer column AW:BD in "MP4 Sales Database" tab of ER Calculator where the school calendar for the monitoring period, school holidays list and start date and end date of school term have been presented.
Documentation provided by the CME
PoA 9948_MP4_MR5_Uganda ER Sheet_ver 4.0_26042021 PoA 9948_MP4_MR5_Uganda MR_ver 4.0_26042021
DOE assessment **Date:** 07/06/2021
The applied school days are calculated based on the • Academic school calendar issued by "School and Other Institutions Calendar-2019" issued by the Ministry of Education and Sports Embassy, Uganda • Academic school calendar issued by "School and Other Institutions Calendar-2020" issued by the Ministry of Education and Sports Embassy, Uganda The ER worksheet under tab "MP4 Sales Database", has been verified. The VT confirms that the actual working days applicable to the monitoring period have been applied for the determination of the parameter.

Conclusion *Tick the appropriate checkbox*	☒ The FAR is closed

Table 4. CLs from this verification

CL ID	01	**Section no.**	Section A.1.2, B.1	**Date:** 16/11/2020
Description of CL				
1. As per section A.1.2 footnote 13 which states that *"The monitoring period covers Ultra Flo and Multi-barrier UV systems. However, the CERs for the UltraFlo are being claimed in accordance with para 228(b)(i) of PS for PoA version 2.0 considering baseline emissions as 0 for this period in the absence of monitoring of monitoring parameters as per the sampling plan."* However, section B.1 of MR under point 5 states "as per sampling plan and identified the samples to be monitored (a single sampling plan has been applied to CPA 9948-P1-0002-CP1, 9948- P1-0014-CP1 to 9948-P1-0016-CP1". Justification is requested over appropriateness of the statement. Clarification is requested on calculation of "Residual capacity from previous MP" under tab: Sales Database. 2. The f_{NRB} value for CPA 14, 15, 16, 17, 18, 19, 20 and 21 are 0.7867. Clarification is requested how the applied value of f_{NRB} is deemed as conservative and hence appropriate.				
CME response				**Date:** 21/01/2021
1. This is a typographical error in the MR. The MR has been corrected to mention CPA 02, 14 **and** 15 only with respect to sampling plan. The revised MR is being submitted. Please refer CL The monitoring period begins on 01/01/2020, however there are significant number of units that are in continued use from previous monitoring period. For such systems, the residual (un-utilized) capacity of the system (at the end of the previous monitoring period) has been determined and has been used as the starting capacity, at the beginning of the current monitoring period. For new systems installed in current monitoring period and not getting carry forwarded from previous monitoring period, the residual capacity from previous MP has been not been considered. 2. The value stated in the CPA-DDs is merely for use in ex-ante estimations of the ERs. CME wishes to draw the Verification Team's attention to the following: 1. Page 69 (for CPA type 2) and page 100 (for CPA type 3) of the registered PoA-DD dated 18/04/2017 states the following:				

$f_{NRB,y}$	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.

2. Also, page 82 (for CPA type 2) and page 115 (for CPA type 3) of the registered PoA-DD dated 18/04/2017 states the following in parameter table for $f_{NRB,y}$

Data/Parameter	$f_{NRB,y}$
Source of data	**EB 67 Annex 22 Default Values for Fraction of Non-Renewable Biomass** for Least Developed Countries and Small Island Developing States, combined with survey, national, or regional data to determine the percent of users using woody biomass and fossil fuel in the baseline scenario. **If the displaced fuel is fossil fuel use the default value of 1.0.** If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value should be used, using surveys or national data.
Measurement methods and procedures	The type of baseline fuel(s) used by target population will be determined via survey, national, or regional data. **Parameter will be determined using the default values from EB67 Annex 22 for woody biomass and from the methodology for fossil fuels:** If a mixture of woody biomass and fossil fuels is used in the absence of the project activity a weighted average value shall be applied, calculated through the following formula: fNRB,y **= [Default f_{NRB} value]** * [% of users using NRB] + **[1.0]** * [% of users using fossil fuels]

a) Thus, from the aforesaid it is confirmed that the registered PoA-DD and its monitoring plan mandate the CME to use the default value of f_{NRB} as approved by EB67, Annex 22. The continuous or at least biennial monitoring of this parameter, as per PoA-DD, only requires monitoring the % of users using NRB and % of users using fossil fuels to update the weighted average value of f_{NRB}. The default value of f_{NRB} stated in the PoA-DD (EB67, annex 22) or biomass can only be changed at the time of renewal of the PoA and will be valid for the CPAs included subsequently. Thus, in line with registered PoA/CPA-DDs, in the monitoring report, the % of users using non-renewable biomass and % of users using fossil fuel in Uganda has been updated as the per national data and a weighted average value has been applied to determine $f_{NRB,y}$. Thus, no change in the MR is deemed required, given it is fully compliant with registered PoA-DD with respect to parameter f_{NRB}.

b) Paragraph 19 of AMS-I.E., ver. 5, applicable specifically to PoA, states the following:
"19. The following further conditions apply for the value of fraction of non-renewable (fNRB) applied in a component project activity (CPA) of a POA. The choice between (a) conduct own studies to determine the local fNRB value and then apply those values in the CPAs; and (b) use default national values approved by the Board; shall be made ex ante. A switch from national value i.e. choice (b) to sub-national values i.e. choice (a) is permitted, under the condition that the selected approach is consistently applied to all CPAs."

Page 69 (for CPA type 2) and page 100 (for CPA type 3) of the registered PoA-DD dated 18/04/2017, thus, in line with option (b) of para 19 of AMS I.E. states the following:

*"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"*

Thus, Default value of f_{NRB} from EB 67 annex 22 has been combined with national data (UNHS report dated 2018) to determine the weighted average. No more recent national data, providing information on % population using different fuel types is available.

Documentation provided by the CME	
N/A	
DOE assessment	**Date: 11/02/2021**

1. The description is corrected and inline with the CPA-DD. Finding has been CLOSED/

   Explanation is accepted. The CME has appropriately updated the residual capacity from previous MP in line with the previous monitoring period. The CME has appropriately allotted '0' residual capacity from previous MP to the newly inducted water purifiers.

2. $f_{NRB,y,}$ is a monitoring parameter which is determined using "EB 67 Annex 22" Default Values for f_{NRB} for LDCs and SIDS combined with survey, national, or regional data to determine the % of users using given fuel type (biomass / fossil fuels) as per the PoA-DD. The CME has used national data to determine the % users using biomass/ fossil fuel. The data source used for determining $f_{NRB,y}$ is UNHS report dated 2018. No more recent national data, providing information on % population using different fuel types is available. The DOE has assessed the publicly available database/information and confirms that the applied reference is credible and recent one. Finding has been CLOSED. Hence, the value remains unchanged compared to last issuance i.e. MP3.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	02	**Section no.**	Section E.2	**Date:** 16/11/2020

Description of CL

The following parameters have consistent values as per last MR though they are monitored. Clarification is requested.

1. η_{wb}
2. Water Quality$_i$
3. $f_{NRB,y}$
4. $EF_{projected\_fossilfuel}$

CME response **Date:** 21/01/2021

1. η_{wb} : The parameter η_{wb} is a monitoring parameter that is determined using "Methodology AMS.III.AV-version 4.0" Default Efficiency Values for different types of water boiling systems combined with survey, national, or regional data to determine the % of users using given water boiling system type (UBBS,OBBS / FSS) as per the PoA-DD. The CME has used national data to determine the % of users using given water boiling system type (UBBS, OBBS / FSS). The data source used for determining the % users using water boiling system type (UBBS, OBBS / FSS) is CITIZENS' SURVEY ON UGANDA VISION 2040. No more recent national data, providing information on % population using different types of water boiling system is available. Therefore, value applied for is η_{wb} same as the value used in last MP.

2. Water Quality$_i$: Value of Monitoring parameter Water Quality$_i$ calculated in last MP and current MP is different. Please compare the value by increasing it to 4 decimal point.

3. $f_{NRB,y}$: The parameter $f_{NRB,y,}$ is a monitoring parameter that is determined using "EB 67 Annex 22" Default Values for f_{NRB} for LDCs and SIDS combined with survey, national, or regional data to determine the % of users using given fuel type (biomass / fossil fuels) as per the PoA-DD. The CME has used national data to determine the % users using biomass/ fossil fuel. The data source used for determining $f_{NRB,y}$ is UNHS report dated 2018. No more recent national data, providing information on % population using different fuel types is available. Therefore value applied for $f_{NRB,y}$ is same as the value used in last MP.

4. $EF_{projected\_fossilfuel}$: The parameter $EF_{projected\_fossilfuel}$ is a monitoring parameter that is determined using "AMS I.E" Default Values for EF_{NRB} and "IPCC" default value for $EF_{natural\ gas}$ combined with survey, national, or regional data to determine the % of users using given fuel type (biomass / fossil fuels) as per the PoA-DD. The CME has used national data to determine the % users using biomass/ fossil fuel. The data source used for determining the % users using biomass/ fossil fuel is UNHS report dated 2018. No more recent national data, providing information on % population using different fuel types is available. Therefore, value applied for $EF_{projected\_fossilfuel}$ is same as the value used in last MP.

Documentation provided by the CME

N/A

DOE assessment **Date: 11/02/2021**

1. The verification team has assessed the publicly available data and confirms that the applied

reference is credible and recent one.
2. Accepted.
3. Accepted, please refer the assessment under point 2 of CL 02
4. Accepted, The most recent data i.e. UNHS report dated 2018 is applied. The provision is in line with the MP. Since the newer database is not launched.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	03	**Section no.**	Section A.1.2, B.1	**Date:** 16/01/2021

Description of CL

The registered CPA-DDs require that the water quality be tested as per paragraph 2(b) of AMS III.AV ver. 4 (i.e., Laboratory test report and/or official notifications (e.g. from national authority on health)). However, the monitoring report shows that Aquagenx testing kits were used to determine the water quality. The PP shall elaborate how it complied with the registered monitoring plan.

CME response **Date:** 21/01/2021

The CPA-DDs on page 3 states the following:
"The application of technologies distributed under the CPA achieve compliance with "Interim or higher" performance target as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO 2011) or a comparable national standard or guideline, per the methodology AMS-III.AV Version 4." All technologies that are going to be distributed under this CPA, will be lab tested to ensure they adhere to these guidelines.

This has also been made an eligibility criterion (# 7, page 32 of CPA-DD) for inclusion of a technology in the CPA which states the following:

Eligibility criterion - Required condition	Supporting evidence for inclusion	Description of this CPA in relation to the criterion and supporting evidence
The water purification technology/equipment must achieve compliance with either: a) A relevant national standard or b) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011)	Verifiable evidence: – Laboratory test report and/or official notifications (e.g. from national authority on health). – Technical specifications document(s)	The water purification technology/equipment are in compliance with the following: (b) The interim performance targets as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011) Supporting Evidence: – – Technical specifications document(s)

Thus, the project technology (Ultra TAB, Ultra Flow or UV) needs to demonstrate that they comply with WHO, 2011 interim performance targets. This has already been confirmed via the technical specifications listed in CPA-DD wherein Log 4 reduction is achieved by UV systems and Log 2 reduction is achieved by Chlorination systems (as mentioned in CPA 02 CPA-DD on page 4 and CPA 16 CPA-DD on page 5, respectively). Thus, the technology's compliance with interim performance targets has already been demonstrated.

For ex-post water quality monitoring, the CPA-DD on page 18, refers to the following:
"As per the World Health Organizations Guidelines [16] it is more cost-effective and feasible to monitor indicator organisms such as E.Coli. Monitoring of proxies such as E. Coli, faecal coliform counts, chlorine levels may be used to assess water quality. CPA implementer shall be responsible for conducting testing. Enumerators will be trained on proper testing procedures and the appropriate testing technology will be used. CPA implementer shall be responsible for conducting testing".

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

[16] WHO 'Guidelines for Drinking-water Quality, Fourth Edition Page 41.

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

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

The following standard sample collection procedure is followed:

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

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

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

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

For details, refer the testing protocol is available at the following link:
https://www.aquagenx.com/wp-content/uploads/2020/05/PA-CBT-ECTC-Instructions-DrinkingWater-May2020.pdf

The use of Aquagenx CBT ECTC testing kit for determining water quality is therefore in line with the registered CPA-DDs as well as monitoring methodology. The tests have been conducted by trained staff with extensive prior experience of water quality testing.
Further, various studies conducted across many locations and environments around the world by academic institutions, national government agencies, international NGOs and United Nations agencies confirm that, the Aquagenx test a Compartment Bag Test (CBT) gives results comparable with more complicated, expensive and less portable tests conducted otherwise.

A paper published in "The American Journal of Tropical Medicine and Hygiene, Volume 96, Issue 4, 5 Apr 2017, p. 970 – 975[17] states that:

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

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

Documentation provided by the CME

[17] http://www.ajtmh.org/content/journals/10.4269/ajtmh.15-0717

N/A	
DOE assessment	**Date: 11/02/2021**
1. As per paragraph 2(b) of the applied methodology: "*It shall be demonstrated based on laboratory testing or official notifications (for example notifications from the national authority on health) that the application of the project technology/equipment achieves compliance either with: (i) at a minimum the performance target as per "Evaluating household water treatment options: Health based targets and microbiological performance specifications" (WHO, 2011); or (ii) an applicable national standard or guideline"* The CME used Aquagenx Compartment Based Test (CBT) E.Coli / Total Coliform (ECTC) testing kits to monitor E.Coli as the indicator organism to test the quality of water. The CME has also explained clearly that the test with its protocol (https://www.aquagenx.com/wp-content/uploads/2020/05/PA-CBT-ECTC-Instructions-DrinkingWater-May2020.pdf) qualifies as laboratory test and meets the compliance required by applied methodology. The Verification Team has verified that the Aquagenix Water Testing kit meets the requirements of registered monitoring plan and conformance to WHO guidelines via "Aquagenix Testing Kit Specifications". Even during the concerned Verification, the conformance was verified. The Verification Team also took due account of the above explanation of eligibility criteria. The Verification Team assessed the competency of the trained staff, their prior experience of testing via interviews on the process of collecting samples, handling the samples, protocol followed for testing, lab incubation requirements, test results assessment etc to confirm that they had received training before conducting the test. In addition, during the remote-site interviews, the Verification Team requested the CME to submit the evidences of water quality test reports, training procedure, training records, experience of enumerators' (refer CAR 04 under FVR and its resolution) and found the submitted evidences appropriate and confirming the testing to be conducted by experienced staff and under standard conditions. Thus, the results from the Aquagenx tests conducted by the monitoring team were found to be reliable and meeting the conditions of the applied methodology.	
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	04	**Section no.**		**Date:** 01/03/2021
Description of CL				
1. Refer to paragraph: VVS-PoA ver. 02 paragraph 340(a): The included CPA-DDs (Section A.3) and the monitoring report (Section C.1) indicate that the implemented water purification devices, i.e. UltraFlo and Multi-barrier UV, are fixed and applicable to piped water. However, the emission reduction (Tab "MP4 Sales Database", column R) indicates the primary water source for some institutions other than piped water, i.e. surface water, wells/boreholes, rainwater and others. Therefore, the PP shall demonstrate how it determined that the water purifiers are implemented in accordance with description contained in the included CPA-DDs, in particular with regard to the piped water application. 2. *Refer to paragraph: VVS-PoA ver. 02 Paragraph 304 (c), the CME shall:* *(a) substantiate the installed water purifier capacities of 340,000 L/unit (for UltraFLO purifier), 2,044,116 L/unit (for Multi-barrier UV Small) and , 4,088,232 L/unit (for Multi-barrier UV Large) WPS.* *(b) submit a traceable emission reduction spreadsheet for the calculation of the system residual capacities from previous MP stated in MP4 Sales Database,* *(c) elaborate the system's lifespan and how residual capacity at the end of MP has been determined,* (d) *substantiate continuous availability of safe drinking water to schools considering some water purifiers had no residual capacity from the previous monitoring period and received no supplies during the current monitoring period.*				
CME response				**Date:** 21/05/2021

1. 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	Small (1 GPM) Large (2 GPM)	¼ inch	125	Small – 2,044,116 Large - 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:

a) Sample photographs:

The photographs confirm these systems being installed on piped applications only

Picture 1: Multi-Barrier UV Installation

Picture 2: UltraFlo Installation

b) 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 i.e. drinking water storage tank. For example, the wells/boreholes, rainwater sumps, surface water bodies are connected to drinking water storage tanks via pipes. The water is pumped from primary water sources to these drinking 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 R, refers to only City Council / Government / Municipal Water Piped Connection in the school as the Primary Water Source.

2. Please refer the following in this regard:

a) The capacity of 340,000L/unit (for UltraFLO) stated in worksheet "Assumptions" is consistent with latest version of CPAs 16-22 CPA-DDs page 4 and has already been validated during CPA PRC (PRC-9948-003, refer document "DOE clarification 8"), based on manufacturer technical specification issued by Medentech, as mentioned in the CPA PRC validation report (Appendix 3, item /03/). UltraFLO Installation Manual also confirms its capacity as 340,000L/unit

The capacity of 4,088,232 L/unit (for Multi-barrier UV Large (2GPM)) and 2,044,116L/unit (for Multi barrier UV Small (1GPM)) is based on Manufacturer technical specifications issed by Rotek.

The CME accepts oversight in ER spreadsheet assumption tab where the reference for the Multi-Barrier UV system capacity is mentioned as CPA-DD. Revised ER sheet is being submitted.

b) For MP4, the 'system's residual capacity from previous monitoring period' (MP4 Sales Database, column AC) has been sourced from MP3 sales database of MP3 ER Calculator ver 4.0 26/04/2021 submitted to UNFCCC as part of RfR documentation, available at: (https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss874238742/view).

The CME extracted the above information from MP3 ER calculator (tab MP3 Sales database, Column AO) by applying the vlookup function, using institution SF ID as a unique identifier, to call this information in MP4 ER calculator, tab: MP4 Sales database, column AC. Given the vlookup function does not work externally, hence the CME had to remove the external links in the MP4 Sales Database, column AC, which otherwise would have returned #Ref error in excel, once shared with DoE / UNFCCC.

The CME has now presented original MP3 Sales Database submitted to UNFCCC as part of RfR documentation under the tab "MP3 Sales Data Reference Only' in the revised MP4 ER calculator being submitted. The column AC of 'MP4 Sales database' has now been linked with column AO of 'MP3 Sales Data Reference Only' to establish full traceability of values for 'residual capacity from previous MP' in MP4. For systems that are newly installed in MP4, and don't have any residual capacity being carry forwarded from MP3, the column AC in tab 'MP4 Sales Database' now indicates, "**new installation, not applicable**" to avoid any confusion.

c) The residual capacity of a systems at the end of MP has been determined ensuring compliance with the following requirement of the registered monitoring plan:

(***Ny,i * Ry,i) should not exceed the maximum output capacity of the system installed.***

The ER sheet tab, 'MP4 Sales Database' presents the same in a transparent manner (refer column AN:AO). The functionality in the ER model ensures that (Ny,i*Ry,i) * operational school days in the monitoring period, does not exceed the available treatment capacity for any school and the total consumed capacity (column AN) remains lower of the two as a conservative measure. Please refer below:

a. The treatment capacity of a unit (column AI) is the sum of residual capacity from the previous MP, if any, (column AC) and the supplies made during the monitoring period (column AD). For newly installed systems, it has been calculated as system's initial installation capacity (assumptions D9:D11) and the supplies made during the monitoring period (column AD), if any.
b. The total consumption of drinking water per day per unit has been calculated (column AH) and represents ($Ny,_i * Ry,_i$).
c. The start date of the WPS crediting (column AK) in the monitoring period is considered as the latest of start date of MP4 or first day of the next month of its installation (column G).
d. The end date of WPS crediting (column AL) in the monitoring period is earliest of the end date of the monitoring period or the system breakdown date (column AJ), if any.
e. In case treatment capacity of a unit (column AI) is 0, no CERs are claimed (given column AK and AL are "NA", and column AP is "0").
f. Subsequently, the total number of available operational school days (column AM), falling between the start date (column AK) and end date (column AL) of crediting for a school, has been calculated weighted on the basis of boarding and non-boarding population (column M:P).
g. If a WPS unit has treatment capacity (column AI) less than the capacity required to run the entire available operational days in the monitoring period (i.e. $Ny,_i * Ry,_i$ * available operational days) the residual capacity at end of MP (column AO) is calculated as 0. Otherwise, the residual capacity is calculated as net of treatment capacity (column AI) and consumed capacity during the monitoring period (column AN).
h. Limited by the treatment capacity consumed during the monitoring period (column AN), the credited school days for each system is calculated (column AP). Hence, the credited school days (column AP) is always less than or equal to available operational school days (column AM) for a given school.

The above approach calculates residual capacity at the end of MP4, based on operational school

days during the monitoring period instead of the total duration of monitoring period.

In case of Multi-barrier UV, the expiry is 7 years with the earliest project device being installed in June 2014 hence no device shall end its lifetime before the end of the concerned monitoring period ending 21 Mar 2020. Besides, the UV bulb can be replaced to further extend the device lifetime further after 7 years.

Similarly, in case of UltraFLO, the expiry is 5 years with the earliest project device being installed in June 2018 hence no device shall end its lifetime before the end of the concerned monitoring period ending 21 Mar 2020. Besides, every-time a school receives a new supply of UltraFLO cartridge, the lifetime of the system is automatically deemed renewed, the supplies being a consumable.

d) Please note that column AC in 'MP4 Sales Database' show a value of 0 if there is no residual capacity from the previous monitoring period and show "**new installation, not applicable**" in case of new installations in the concerned MP. Please refer the following in this regard:

Description	MP4 Sales Database
1) Schools with no residual capacity from the previous monitoring period	Select value "0" in column AC in MP4 Sales Database
2) Schools with no residual capacity from the previous monitoring period and received no supplies during the current monitoring period	Simultaneously Select value "0" in column AD in MP4 Sales Database
3) Total number of cases identified (Institutions)	183
4) Operational days for these schools	0 (refer column AP, MP4 Sales Database)

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

On the other hand, "new installation, not applicable" cells in column AC in 'MP4 Sales Database' indicate that these systems are newly installed and hence do 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 treatment capacity from previous MP and/or, have received supplies and/or have been newly installed in the monitoring period.

Documentation provided by the CME

- PoA 9948_MP4_MR5_Uganda MR_ver 4.0_26042021
- PoA 9948_MP4_MR5_Uganda ER Sheet_ver 4.0_26042021
- 2019 School Calendar by Federal Ministry of Education and Sports, Uganda
- Multi-Barrier UV - Technical Specification from Supplier (Rotek) for Large and Small UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.)
- Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek)
- Multi-Barrier UV - Certificate from Supplier (Rotek) on WHO compliance
- UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier)
- UltraFlo Installation Manual
- UltraFlo - Device Dimensions Declaration by CME
- 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 from UltraFLO dimension declaration by CME) and pertains to the specifications issued by Medentech (Technology supplier)
- The expiry of the UltraFlo was also found mentioned on the cartridge as 5 years (verified physically during previous site visits and photographs of UltraFlo units).
- Installation Logs for Multi-Barrier UV and UltraFlo system

DOE assessment **Date:** 21/05/2021

1. 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 VT has reviewed the relevant information / specifications of these WPS including capacity, lifespan/expiry and confirm that they require a piping connection to operate.

Based on the review of Port size inlet rating and pressure rating mentioned in the manufacturer specifications / installation manual the VT further confirmed that a water connection is pre-requisite for these two types of systems by virtue of their design.

The Verification Team assessed the ER worksheet column R, and corresponding sampled end user forms to verify that "Piped" in column R refers only to the City Council / Government / Municipal Water Piped Connection in the school as the Primary Water Source.

Additionally, The VT also secured photographs of the WPS installations during the physical site visits conducted previously, reviewed CME installation logs and observations made during remote site visit interviews to confirm that these WPS are installed on pressurized piping connection and are designed to operate exclusively for piped applications only. Please refer below:

Table 1: List of samples audited (Acceptance sampling)

MP#	WPS Type	Source	# Samples observed via acceptance sampling	Installation confirmed as piped application
MP2 MS1	Multi Barrier UV	Piped	6	Yes
MP2 MS1	Multi Barrier UV	Surface Water	1	Yes
MP2 MS1	Multi Barrier UV	Others	1	Yes
MP2 MS2	Multi Barrier UV	Piped	4	Yes
MP2 MS2	UltraFlo	Piped	2	Yes
MP2 MS2	Multi Barrier UV	Surface Water	1	Yes
MP2 MS2	Multi Barrier UV	Well/Borehole	1	Yes
MP3	Multi Barrier UV	Piped	6	Yes
MP3	UltraFlo	Piped	2	Yes
MP4	Multi Barrier UV	Piped	6	Yes
MP4	Multi Barrier UV	Well/Borehole	2	Yes

Thus, all Multi-Barrier UV and UltraFlo systems are confirmed to have been installed on piped applications (connecting the primary water source to the drinking water storage tank) in all cases (including those where the primary water source is other than the City Council / Government / Municipal Water).

Therefore, 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. This, assessment is also included under the FVR section E.3.1, to enhance the clarity of reporting.

2. Please refer below detailed assessment of issued identified

   a. The Verification Team has reviewed the below listed documentary evidence:
      - Multi-Barrier UV - Technical Specification Supplier (Rotek) for Large and Small UV systems confirming treatment capacity and other parameters (inlet port size, pressure rating, wattage etc.)
      - Multi-Barrier UV - Lifespan confirmation from Supplier (Rotek)
      - UltraFlo - Technical specification confirming capacity / expiry by Medentech (Technology Supplier)
      - UltraFlo Installation Manual confirming capacity.
      - The expiry of the UltraFlo was also found mentioned on the cartridge as 5 years (verified physically during previous site visits and photographs of UltraFlo units.

      Based on the aforesaid, and review of the concerned CPA-DDs, the PRC validation report, the VT confirmed that the capacity of the systems has been correctly stated in the ER sheet and MR and the assessment is included under section E.3.1 of FVR.

   b. The Verification Team has reviewed the revised ER sheet (version 04) and confirms that the values of 'residual capacity from previous MP' in column AC, are accurately linked with the MP3 ER worksheet values (PoA 9948_MP4_MR5_Uganda ER Sheet_ver 4.0_26042021, Tab MP3 Sales Data Reference Only in particular) submitted against RfR response to MP3.

      In the revised MP4 ER Calculator, the MP3 Sales database has been added (Tab: 'MP3 Sales Data Reference Only) by the CME. The VT has verified that information in the revised MP4 ER

Calculator, Tab: 'MP3 Sales Data Reference Only' is fully consistent MP3 ER calculator version 4.0 dated 26042021, available at UN webpage: (https://cdm.unfccc.int/PoAIssuance/iss_db/poaiss874238742/view).

The CME has utilized vlookup function of excel to call the residual capacity values under tab "MP4 Sales Database" column AC. The VT confirmed that the residual capacity from previous MP in column AC, in tab MP4 Sales database, is correctly linked with 'MP3 Sales Data Reference Only', column AO, thus establishing complete traceability of these values.

It is further confirmed that the MP4 sales database, in column AC, correctly reflects, "new installation, not applicable" for systems that are not being carry forwarded from MP3.

c. The lifespan/expiry has already been verified as explained above in 1. It is confirmed that no Multi-Barrier UV / UltraFLO WPS shall exhaust its useful lifetime before the end of the concerned monitoring period ending 21 Mar 2020. The VT reviewed 'MP4 Sales database' tab to check the calculations therein and has assessed the following:

Table 2: Assessment of MP4 Sales database tab, ER calculator version 4.0

Parameter	Approach	Assessment
Treatment capacity of a unit (Ltrs)	The treatment capacity depends on summation of the "residual or installation capacity + subsequent supplied capacity". The parameter has been presented in column AI.	Existing WPS: The existing WPS are the one which are continuing from previous MP. Thus, for such systems the treatment capacity of a unit has been calculated as residual capacity from previous MP (column AC) + subsequent supplied capacity, if any. New WPS: For new WPS, there is not residual capacity from previous MP. The treatment capacity for such systems is sum of the initial installed capacity as per technical specification of WPS, fetched from the worksheet 'Assumptions' + subsequent supplied capacity, if any.
"Start date of WPS crediting in the monitoring period" Column AK	The "start date WPS of crediting in the monitoring period" has been determined as the start date of MP4 or first day of the next month of WPS installation (column G) whichever is later. Further, start date of WPS crediting has been calculated only for WPS that have non-zero value for Treatment capacity in column AI.	Deemed ok. These two parameters define the time boundaries within which the operational school days for a given system has been determined
"End date of WPS crediting in the monitoring period" Column AL	The "End date WPS of crediting in the monitoring period" is determined as the earlier cut-off date between the "System Breakdown Date reported by User" in column AJ and the end date of the applied monitoring period (21/01/2020). Further, End date of WPS crediting has been calculated only for WPS that have a valid start date of crediting reported in column AK.	
"Available Operational School	The CME has listed the available operational school days in Cells	The VT noted that the schools are not operating for 365 days in a year.

Days during the monitoring period (Days)" Column AM	AW5:BD85. The operational days and the holidays in AW5:AZ85 are verified from the submitted "School and Other Institutions Calendar-2020" issued by the Ministry of Education and Sports, Uganda. The reported operational days for boarding and non-boarding institutions are deemed as appropriate. The available operational School Days during the monitoring are calculated as weighted average operational school days (considering boarding and non-boarding school population) falling between the "Start date of WPS crediting in the monitoring period" and "End date of WPS crediting in the monitoring period".	For non-boarding schools, the weekend and school holidays (public holidays and end term holidays) have been excluded from available operational days as a conservative measure. For boarding schools, weekends and short public holidays have been included but the CME has excluded end term holidays because the boarding students/staff would still consume water during weekends and short public holidays. The approach is deemed appropriate and conservative relative to considering the duration of monitoring period for crediting.
Treatment Capacity consumed during the Monitoring Period (Ltrs) Column AN	The determinant "Treatment Capacity consumed during the Monitoring Period (Ltrs)" Column AN ensures compliance with monitoring plan requirement i.e. the consumed capacity (ltrs) remains lower of the following: • Treatment capacity of a unit • Ny,i * Ry,i * Operational school day	The calculation of consumed capacity is appropriate and in line with the registered monitoring plan. The revised approach ensures that (Ny,i*Ry,i) * operational school days in the monitoring period, do not exceed the available treatment capacity for any unit (column AI). In case the treatment capacity (column AI) is enough to last for the available operational days (column AM), the consumed capacity (column AN) has been calculated as a product of Available operational school days (column AM) and Total daily water consumption per day (column AH). The surplus capacity left is reported as residual capacity (column AO) However, in case the treatment capacity in column AI is not enough to last for the available operational days, then the consumed capacity is same as the treatment capacity (column AI) because the system will get fully consumed during the monitoring period and residual capacity (column AO) would be 0.
Residual Capacity at the end of monitoring period (Ltrs)	The residual capacity has been determined based on available capacity and consumed capacity considering the credited operational school days instead of duration of the monitoring period	The residual capacity at the end of the MP is based on the difference between the Treatment capacity of a unit (column AI) and the treatment capacity exhausted during the concerned MP.

The total consumed capacity during the monitoring period (column AN), residual capacity at the end of MP (column AO) and credited operational school days (column AP) have been found to be correctly calculated. The verification team has checked all determinants (column AD:AP) and confirms them to be correctly and accurately calculated and conservative with respect to ER

calculations.

d. The reported WPS can be categorized into 03 categories:
   - The WPS with Zero residual capacity from previous MP – These WPS are identified based on their 0-residual capacity at the end of previous MP (i.e. MP3). The number of such cases have been verified as 185 (value in column AC = 0, tab "MP4 Sales Database").
   - Subsequent supplies to installed WPS – In the current MP, only 02 systems were provided with additional supplies. Thus, for the aforesaid 185 cases with 0 residual capacity from previous MP, 183 have received no supplies during the monitoring period (value in column AD = 0, tab "MP4 Sales Database").
   - Available treatment capacity – for the aforesaid 183 cases, Available treatment capacity (column AI) is therefore 0. Accordingly, values in column AM:AP have been calculated as 0, thus confirming that no ERs have been claimed for such cases. This has been evaluated by the VT for all the 183 institutions and found correct. The column AP "Credited School Day during the monitoring period considering capacity consumed (Days)" is confirmed as 0 for each of these 183 cases.

Thus, the VT confirms that ERs are being claimed only for systems that have residual capacity from previous MP and/or, have received supplies and/or have been newly installed in the monitoring period.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 5. CARs from this verification

CAR ID	01	**Section no.**	ER worksheet, Various Sections, C.1, E.2, F.1, F.2, F.3, F.4	**Date:** 18/01/2021
Description of CAR				
Below findings/ inconsistencies are raised based on the comparison between the ER worksheet and MR • Front page – The ex-ante and the actual emission reductions are inconsistent with submitted ER worksheet • Under section C.1, para d) stated CPA wise emissions reductions are inconsistent with the submitted ER worksheet. • The parameters as reported under section E.2 of MR "Quantity of purified water in year y (litres)", "Total distributed water purification systems", "The average population serviced by water purification systems" are inconsistent with the submitted ER worksheet • The sampled details as stated under section E.3, para d) of MR are inconsistent with the submitted ER, tab: "Sample Size Calculation". • Section F.1, sample calculation states the inconsistent values of the applied parameters as observed in above findings. Same also applied of the section F.2, F.3. • The outcome of ex-ante and actual emissions reductions are inconsistent with the submitted ER worksheet for section F.4, F.5 and F.6.				
CME response				**Date:** 21/01/2021
• Front page – The ex-ante and the actual emission reductions have been made consistent with revised ER worksheet. • Under section C.1, para d) stated CPA wise emissions reductions stated under section C.1, para d) have been made consistent with the revised ER worksheet. • The parameters as reported under section E.2 of MR "Quantity of purified water in year y (litres)", "Total distributed water purification systems", "The average population serviced by water purification systems" have been made consistent with the submitted ER worksheet • The sampled details as stated under section E.3, para d) of MR have been made consistent with the submitted ER, tab: "Sample Size Calculation". • Values of the applied parameters used for sampled calculation in section F.1, F.2 and F.3 have been made consistent with revised MR. • Ex-ante and actual emissions reductions have been made consistent with the revised ER worksheet for section F.4, F.5 and F.6 of MR. Revised MR and ER sheet is being submitted.				
Documentation provided by the CME				
1. PoA 9948_MP4_MR5_Uganda ER Sheet_ver 2.0_27012021 2. PoA 9948_MP4_MR5_Uganda MR_ver 2.0_27012021				

DOE assessment	Date: 11/02/2021

- The ex-ante and the actual emission reductions on front page are found consistent with revised ER worksheet.
- CPA wise emissions reductions stated under section C.1, para d) are found consistent with the revised ER worksheet.
- The parameters under section E.2 of MR "Quantity of purified water in year y (litres)", "Total distributed water purification systems", "The average population serviced by water purification systems" are found consistent with the submitted ER worksheet
- The sampled details as stated under section E.3, para d) of MR are found consistent with the submitted ER, tab: "Sample Size Calculation
- Values of the applied parameters used for sampled calculation in section F.1, F.2 and F.3 are found consistent with revised MR.
- Ex-ante and actual emissions reductions are found consistent with the revised ER worksheet for section F.4, F.5 and F.6 of MR.

Additional issue

- The Monitoring report form for CDM programme of activities has been updated. The submitted MR does not follow the latest MR Template version 04

CME response	Date: 22/06/2021

The MR is submitted by adopting the latest MR template

Documentation provided by the CME

- PoA 9948_MP4_MR5_Uganda MR_ver 4.1_22062021_TR1

DOE assessment	Date: 23/06/2021

- The MR is submitted by adopting the latest Monitoring report form for CDM programme of activities and associated guidelines. The VT confirms that no material changes were made by the CME in the process of adoption of MR form version 04.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	02	Section no.	C.3.1	16/11/2020

Description of CAR

Deviation Request 01:

- As per the requested deviation under C.3.1 of MR, ".. the baseline emissions for UltraFlo system for the requested monitoring period 01/01/2020 to 21/03/2020 are considered as 0.", however as per the submitted ER worksheet, under tab: "Sales Database", there is no sales of the UltraFlo system.
- Furthermore, the Verification Team has assessed the column BG < Considered for sampling and ER calculations>, which confirms that UltraFlo are considered for the emission reduction calculation. The statements and therefore contradictory.

Deviation Request 02:

- It is unclear why a deviation is requested for systems which have completed the technical life span. Such systems automatically exit the CPA monitoring regimes.

CME response	Date: 21/01/2021

Deviation Request 01:

- The sales for UltraFlo system are already listed in the ER worksheet, under tab: "MP4 Sales Database. Please refer column D of the Tab "MP4 Sales Database" in the ER workbook.
- Header of column BG has been revised to <Eligible for sampling and ER calculations>. Systems which have operational days more than 0 are eligible for sampling and ER calculation in the current monitoring period and have been marked as "Yes" in column BG of Tab "MP4 Sales Database". Subsequently, for the CPAs (9948-P1-0016-CP1 to 9948-P1-0022-CP1), covering UltraFlo systems, no sample-based monitoring has been conducted (as reflected in the Tab "ERs Summary" of ER worksheet). Hence no ERs have been claimed for UltraFlo systems and these CPAs.

Deviation Request 02:

- The systems have not completed their technical lifetime till the end of the monitoring period. These are consumables and their continuity is dependent on regular supplies being made. The number of operational days as 0 do not denote end of technical lifetime but the end of existing

supplies. Once these systems are supplied with additional UltraTABS or UltraFLO cartridges then they can recontinue the crediting.
Documentation provided by the CME
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DOE assessment **Date:** 21/05/2021
Deviation Request 01: • The sales for UltraFlo system are found listed in the ER worksheet, under tab: "MP4 Sales Database. OK • The justification is deemed appropriate. It is understood that UltraFLO systems are eligible for sampling and ER calculations by virtue of their available treatment capacity (Column AI), but haven't been sampled /monitored hence ER are not being claimed. **Deviation Request 02:** • The technical lifetime of the systems has been verified in CL 04 above and are confirmed to not exhaust in the concerned monitoring period. It is understood that the number of school operational days as 0 do not denote end of technical lifetime but the end of existing supplies / treatment capacity which can be replenished with more supplies. • The Verification Team has assessed the deviation request 01 (allocating "0" emission reduction for all UltraFLO units). The deviation request has been approved, without further additional assessment as most conservative approach of availed following the provisions of para 252, 253, 255 of VVS and para 228 (b) (i) of PS. The above changes also assessed under the PRC Opinion/PRC/ which is submitted in parallel with this Verification Report.
Conclusion *Tick the appropriate checkbox* ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	03	**Section no.**	Various sections	16/11/2020
Description of CAR				

List of documents Requested:

1. Random number generator
2. Supportive documents for determination of the % of UBBS users, % of OBBS users, % of FFS users
3. Technical specifications of all the technologies involved
4. Sample Sales receipt to cross check the Sales Record submitted in form of "Sample Sales Receipt" and "Sample Installation forms" together with "Sample Salesforce Reports"
5. Monitoring records of complete samples monitored during MP#4
6. Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of registered monitoring plan in form of "Aquagenx Testing Kit Specifications", the conformance to WHO guidelines
7. Water Quality Testing Report on filtered water from the project technology under applied monitoring report in form of "Sample Monitoring Records", section Water Quality
8. Competence check of with evidence (Training certificates) of the Enumerators who were employed for water testing
9. Training procedure included in the "Aquagenx Test Training Module"
10. Sampling Surveys (for each technology type)
11. Sample training certificates of the Enumerators who were employed for survey of Operational Units - Training Cert for Survey and Test belong to person conducted testing and survey as per the initial sample records provided for interviewed
12. Delivery Notes / Maintenance visit records of filtration device including sample evidence that filters/cartridges have been replaced at stipulated interval
13. Latest version of the Operations Manual for allocation of unique serial number to water purification system
14. The life span of water treatment technologies supported by Sales Receipts / Technical Specification
15. Evidence of the electrical load (in Wattage) for the water purification systems which are part of the monitoring report with the help of Technical Specifications

CME response	**Date:** 21/01/2021
The requested documents have been submitted	
Documentation provided by the CME	
DOE assessment	**Date:** 11/02/2021

1. Random number generator- Provided
2. Supportive documents for determination of the % of UBBS users, % of OBBS users, % of FFS users. Assessed and found OK
3. Technical specifications of all the technologies involved - Provided
4. Sample Sales receipt to cross check the Sales Record submitted in form of “Sample Sales Receipt” and “Sample Installation forms” together with “Sample Salesforce Reports” – OK
5. Monitoring records of complete samples monitored during MP#4- OK
6. Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of registered monitoring plan in form of “Aquagenx Testing Kit Specifications”, the conformance to WHO guidelines- Provided.
7. Water Quality Testing Report on filtered water from the project technology under applied monitoring report in form of “Sample Monitoring Records”, section Water Quality. Provided
8. Competence check of with evidence (Training certificates) of the Enumerators who were employed for water testing. Provided.
9. Training procedure included in the “Aquagenx Test Training Module” Provided.
10. Sampling Surveys (for each technology type). Provided.
11. Sample training certificates of the Enumerators who were employed for survey of Operational Units - Training Cert for Survey and Test belong to person conducted testing and survey as per the initial sample records provided for interviewed. Provided
12. Delivery Notes / Maintenance visit records including sample evidence that filters/cartridges have been replaced at stipulated interval are dubmitted reviewed and deemed as OK.
13. Latest version of the Operations Manual for allocation of unique serial number to water purification system Provided.
14. The life span of water treatment technologies supported by Sales Receipts / Technical Specification. Provided.
15. Evidence of the electrical load (in Wattage) for the water purification systems which are part of the monitoring report with the help of Technical Specifications. Provided.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 6. FARs from this verification

FAR ID	01	**Section No.**	E.3.4.2.	**Date:** 22/04/2021
Description of FAR				
The Verifying DOE shall confirm the provisions of the applied methodology AMS-III.AV, version 04 para 16, pertaining to monitoring frequency of parameter "operational units i" as at least once every two years (at least biennial) are complied.				
CME response				**Date:** DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				**Date:** DD/MM/YYYY

FAR ID	02	**Section No.**	E.3.4.2.	**Date:** 22/04/2021
Description of FAR				
The Verifying 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 (refer: SSC_795: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/05721 and SSC_792: https://cdm.unfccc.int/methodologies/SSCmethodologies/clarifications/57226.)				
CME response				**Date:** DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				**Date:** DD/MM/YYYY

Appendix 5. Monitored Parameters

Table A-5: **Periodic Verification Checklist – Monitored Parameters**

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
1. QPW_y		Quantity of purified water in year *y* (litres)		
a) Measurement / Determination method ***(VVS, §§ 389-393)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PoA-DD/ /AMS-III. AV/ /USAGE/ /XLS/ /SAMPLE/ /MR/	Description: This is a calculated parameter. The value depends on the product of parameters "The average population serviced by water purification systems" ($N_{y,i}$) X "Total distributed water purification systems" ($T_{y,i}$) X "Average volume of drinking water per person per day" ($R_{y,i}$) X days per year (365)[18] X "Water quality measurement" (Water Quality$_i$) X "Monitoring to check the percentage of the monitoring period which technologies are in use"(Operational Units$_i$). The PP has stated the annual calculated values for the parameter "QPW_y". However, please refer Appendix 4 for related findings. Verifier´s action: In addition to the remote assessment review, pending documentation was requested (e.g. Usage Survey Records, Water Quality records corresponding to applied monitoring session, sales database to cross verify the number of filtration devices being credited for each monitoring session) pertaining to the dependent parameters. Conclusion: Findings CL 01, CAR 01, FAR 01 were raised.	~~CL 01, CAR 01, FAR 01~~	OK
b) Accuracy and QA/QC Procedure ***(VVS, §§ 394-400)*** *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/DB/ /WC/ /MR/ /XLS/	Description: It is calculated value. Additional QA/QC measures are not applicable. Verifier´s action: Dependent parameters were assessed. Pending documents were requested. Sampling data of related parameters under	~~CL 01, CAR 01, FAR 01~~	OK

[18] Instead of all the days under monitoring period, actual days by deducting holidays have been applied

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		monitoring was assessed. Conclusion: Findings CL 01, CAR 01, FAR 01 were raised.		
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /DB/ /WC/ /XLS/	☐ Correct ☒ Not correct (initial assessment) Description: In absence of confirmation on the related parameters at draft verification stage, the calculated value of this parameter cannot be confirmed or considered correct. Verifier´s action: In addition to the remote audit review observations, pending documentation pertaining to related parameters was requested, please refer above assessments. Conclusion: Findings CL 01, CAR 01, FAR 01 were raised.	~~CL 01, CAR 01, FAR 01~~	OK
2. η_{wb}		Efficiency of water boiling system being replaced		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM01/ /PoA-DD/ /MR/ /XLS/	Description: The parameter is utilized to determine the baseline emissions. Default values from AMS III.V are utilized along with the national data for use of the different baseline technologies in the host country Uganda to arrive at a weighted value, which is more representative. Verifier´s action: Applied methodology and the national data was reviewed. Conclusion: The parameter is determined in line with the method is in the registered monitoring plan. CL 02 was raised.	~~CL 02~~	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have*	/DB/ /WC/ /MR/ /XLS/	Description: It is calculated value. Additional QA/QC measures are not applicable. Verifier´s action: Applied methodology and the national data were reviewed.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met.* *Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		Conclusion: The verification team deemed the reported values as appropriate.		
c) Correctness (VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ / AMS-III. AV/ /XLS/	☐ Correct ☒ Not correct (initial assessment) Description: No Pending issues were identified. Verifier´s action: MR, applied methodology and the national data was reviewed. Conclusion: The verification team deemed the reported value as appropriate subjected to closure of CL 02.	~~CL 02~~	OK
3. $T_{y,i}$		Total distributed water purification systems		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ / AMS-III. AV/ /CBT/ /XLS/ /TRG/	Description: The parameter represents the total number of units that are distributed till the applied monitoring period. The distributed units are included under the sales database. The paper records of sales invoices are the means of cross verification of the sales database. As per the provisions of the monitoring plan of CPA-DD, the parameter is reported based on the Sales receipts/purchase orders. During the remote assessment and interviews, the CPA Implementer confirmed that the units that are not part of the Project/ Sales Database are not considered for the calculation of the emission reductions been analysed. Please refer to Appendix-4 for details. Verifier´s action: $T_{y,i}$ covering this monitoring period was verified by requesting the sales receipts / database applicable to the monitoring period. This Sales database was verified. The monitoring management was also cross verified during the remote assessment and interview with the CME, CPA implementer, consultant and verification of database system maintained by the CME	~~CAR 01,~~ ~~CAR 02~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Conclusion: CAR 01, CAR 02 were raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/IM03/ /DB/ /WC/ /MR/ /XLS/	Description: The Sales Database was cross-checked with scanned copy of paper records to ensure transparent and robust data reporting. The CME also confirmed that the units that are not functional or replaced are captured in monitoring parameter Operational Units. However, at time of desk review, all the supporting documents were not submitted, thus findings are raised by the Verification Team. Verifier´s action: Project personnel were remotely interviewed. CME and CPA Implementer QA/ QC measures were assessed. Pending documents for undertaking the implementation of QA/ QC measures was requested Conclusion: CAR 03 was raised.	~~CAR 03~~	OK
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/	☐ Correct ☒ Not correct (initial assessment) Description: In absence of requested supporting documents and closure of raised issues the reported data cannot be assessed. Verifier´s action: In addition to the remote assessment review, sales receipts / database applicable to the monitoring period and QA/ QC measures were assessed. Conclusion: CAR 01, CAR 02 and CAR 03 were raised.	~~CAR 01, CAR 02 , CAR 03~~	OK
4. $N_{y,i}$		The average population serviced by water purification systems		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in*	/MR/ / AMS-III. AV/ /XLS/	Description: The parameter represents the average population serviced by water purification systems. The number of person/ equipment depends on the technical specification / design capacity of the equipment. The Verification Team requested the Technical specification of the actually installed water purification systems and verified them with the sales receipts / database. During the	~~CL 01, CAR 01, CAR 03, FAR~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		remote audit assessment and interviews the PP confirmed that at the time of sale, the number of people using the unit is recorded in the sales receipt/purchase orders. Further this information is checked afterwards as well by CPA Implementer. The Verification Team requested the technical specification of the water purification systems to PP. The data is taken as the input for the ER calculations meaning it is the basis for determining of the CPA baseline emission reductions. The values of $N_{y,i}$ are not consistently reported under ER and MR. CAR 01 has been raised. However, for submission of the supportive data CAR 03 has been raised. Closure for FAR 01 was addressed by complying with monitoring frequency as per applied methodology AMS-III.AV, version 04 para 16. Please refer to Appendix-4 for details. Verifier´s action: The $N_{y,i}$ covering this monitoring period was verified by verification team by requesting the technical specification / design duty and other database applicable to the monitoring period. The monitoring management was also cross verified by the remote assessments observation and interview with the CME, CPA implementer, consultant and verification on database system maintained by the CME Conclusion: CL 01, CAR 01, CAR 03, FAR 01 were raised.	~~01~~	
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/DB/ /WC/ /MR/ /XLS/	Description: As per the interviews with the CPA Implementer and the CME the "The average population serviced by water purification systems" is recorded at the time of sale, the number of people using the unit is recorded in the sales receipt. The data of the water purification unit is entered into the sales database. This Sales database is verified from the hard copy of the sales receipt. In addition, the parameter can also be verified from the Sales force report of the Institutions where this number is also updated for a water purification unit. However, the document submission is still pending from the CME. Verifier´s action:	~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Project personnel were interviewed. CME and CPA Implementer QA/ QC measures were assessed. Pending documents for undertaking the implementation of QA/ QC measures was requested Conclusion: CAR 03 was raised.		
c) Correctness ***(VVS, §§ 389-393)*** *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/	☐ Correct ☒ Not correct (initial assessment) Description: In absence of documentary evidence the reported data cannot be assessed as correct. Verifier´s action: In addition to the onsite review, pending documentation was requested, please refer above assessments. Conclusion: CL 01, CAR 01, CAR 03, FAR 01 were raised.	~~CL 01, CAR 01, CAR 03, FAR 01~~	OK
***5.* Water Quality**[i]		**Water quality measurement**		
a) Measurement / Determination method ***(VVS, §§ 389-393)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/ /CBT/	This parameter is crucial as it allows counting of only those purification units which meet the required water quality standards. According to MR, Aquagenx Water Testing kit was utilized for the water quality testing. Also, the CPA implementer is responsible to undertake the water testing with the help of the trained enumerators. During the desk review, the Verification team has requested below documents: • Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of applied monitoring plan • Technical Specification of the Aquagenx Water Testing kit • Water Quality Testing Report on filtered water from the project technology under applied monitoring report (minimum requirement E.coli, TC Coliform, faeceal coliform counts, chlorine levels) • Training certificates of the Enumerators who were employed for water testing • Copy of the training procedure • Copy of water testing procedure Refer CAR 03 for further details.	~~CL 02, CL 03, CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Verifier´s action: The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology. The results of Water Quality measurement (especially as per requirements of the monitoring plan was assessed) has been also verified by means of remote assessment and interview (sample based). Technical Specification of the Aquagenx Water Testing kit was assessed with respect to the requirements of the monitoring plan Conclusion: Please refer to closure of CL 02 , CL 03 and CAR 03.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/PoA-DD/ /CPA-DD/ /USAGE/ /CBT/	Description: During the remote assessment and interviews, the CPA Implementer and CME confirmed that cost-effective and feasible water quality indicators like E. Coli, faecal coliform counts, chlorine levels was utilized to assess water quality. CPA implementer conducted testing. CPA Implementer has trained enumerators with respect to standard testing procedures and the appropriate testing technology Aquagenx Water Testing kit was employed. However, documentary evidence for the same is requested by the Verification Team. Please refer CAR 03. Verifier´s action: Enumerators undertaking testing were also interviewed. The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology. Conclusion: Please refer to CAR 03.	~~CAR 03~~	OK
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/PoA-DD/ /CPA-DD/ /USAGE/ /CBT/	☐ Correct ☒ Not correct (initial assessment) Description: During the remote assessment, the Verification Team checked • Conformance Certificate that the Aquagenx Water Testing kit meets the requirements of applied monitoring plan • Technical Specification of the Aquagenx Water Testing	~~CL 02,~~ ~~CL 03,~~ ~~CAR 03~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		kit • Water Quality Testing Report on filtered water from the project technology under applied monitoring report (minimum requirement E. coli, TC Coliform, faeceal coliform counts, chlorine levels) • Training certificates of the Enumerators who were employed for water testing • Copy of the training procedure • Copy of water testing procedure Refer CAR 04 for further details. Verifier´s action: Enumerators undertaking testing were interviewed. The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology. Conclusion: Please refer to CL 02, CL 03 and CAR 03.		
6. Operational Units[i]		Percent of the monitoring period in which the units are in use		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: This parameter is determined based on surveys conducted on the sample units (per each technology type) to determine the percentage of days of monitoring period when the unit is in use by the end user. At the time of desk review, the Verification Team was not in receipt of the Survey records, thus appropriateness of conducted survey and the value of the parameter as applied in the emission reduction worksheet and monitoring cannot be confirmed. The Verification Team has requested below documents from the CPA-Operator: • Sampling Surveys (for each technology type) • Training certificates of the Enumerators who were employed for survey of Operational Units Copy of the training procedure for survey of Operational Units • Copy of Questioner for undertaking the Sampling Survey Please refer to Appendix-4 for details. Verifier´s action: The sampling plan has been cross checked by verification team	~~CL 01, CL03, CAR 03, FAR 01~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		according to EB sampling guideline and applied methodology. The results of technologies are in use has also been verified by means of remote assessment and interview (sample based). Conclusion: Please refer CL 01, CL03, CAR 03, FAR 01 for further details.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/PoA-DD/ /CPA-DD/ /USAGE/ /CBT/	Description: During the remote assessment and interviews, it is noted that the CPA Implementer employs enumerators to conduct the surveys with the help of the sales data which provides the unique identity of the water purification unit. The Enumerators also confirmed that the units are discarded from the survey if the unique serial number is no longer visible and date of purchase of the unit is not confirmed or if unit is replaced. However, the appropriate implementation is subjected to the submission of appropriate supportive evidence. Verifier´s action: Enumerators undertaking testing were also interviewed. The sampling plan has been cross checked by verification team according to EB sampling guideline and applied methodology. Conclusion: CAR 03 was raised.	~~CAR 03~~	OK
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/ /USAGE/ /CBT/	☐ Correct ☒ Not correct (initial assessment) Description: The value indicated could not be confirmed at draft verification stage. During the remote assessment, the Verification Team checked • Sampling Surveys (for each technology type) • Training certificates of the Enumerators who were employed for survey of Operational Units • Copy of the training procedure for survey of Operational Units Copy of Questioner for undertaking the Sampling Survey. Verifier´s action: In addition to the onsite review, surveys conducted on the	~~CL 01, CL03, CAR 03, FAR 01~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		sample units (per each technology type) to determine the if the unit is in use were checked. Enumerators were interviewed. Conclusion: Refer CL 01, CL03, CAR 03, FAR 01 for further details.		
7. $f_{NRB,y}$		Fraction of woody biomass saved by the project activity in year, y, that can be established as non-renewable biomass using national or local statistics, survey results, studies, maps or other sources of information, such as remote-sensing data.		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is utilized to determine the baseline emissions. Below documents were assessed from the CPA Implementer: • Survey report for determination of the fraction of the woody biomass saved by the project activity (CITIZENS' SURVEY ON UGANDA VISION 2040) • Applied international reports (with traceability) which are utilized for determination of the parameter $f_{NRB,y}$ • Training procedures for enumerator for determination of the parameter $f_{NRB,y}$ Please refer to Appendix-4 for details. Verifier´s action: The verification team has verified the survey reports (as stated above) to evaluate the parameters "% of users using NRB" and "% of users using fossil fuels" evaluated its applicability and appropriateness. Conclusion: CL 01 and CL 02 were raised.	~~CL 01, CL 02~~	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment*	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: This is calculated value. Additional QA/ QC measures are not applicable. Verifier´s action: The additional QA/ QC measures are not applicable as the applied values are based on the publicly available data.	OK	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		Conclusion: The verification team confirms that the parameter is monitored appropriately.		
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	☐ Correct ☒ Not correct (initial assessment) Description: In absence of • Survey report for determination of the fraction of the woody biomass saved by the project activity • Applied international reports (with traceability) which are utilized for determination of the parameter $f_{NRB,y}$ • Training procedures for enumerator for determination of the parameter $f_{NRB,y}$ parameter cannot be considered as OK. Verifier´s action: In addition to the remote assessment, pending documentation pertaining to parameter was requested, please refer above assessments. Conclusion: CL 01 and CL 02 were raised	~~CL 01, CL 02~~	OK
8. $EF_{projected\_fossilfuel}$		Emission factor as per AMS-I.E. procedures when NRB is displaced or the emission factor of the fossil fuel substituted		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is used to determine the baseline emissions. Default emission factors as defined by the applied methodology AMS-III.AV and the national data base are utilized to derive the parameter. The parameters $EF_{projected\_fossilfuel}$ = $[EF_{NRB}]$*[% of users using NRB] + $[EF_{Natural\ Gas}]$*[% of users using Natural Gas] + $[EF_{Kerosene}]$*[% of users using Kerosene] + $[EF_{LPG}]$*[% of users using LPG] The parameters, "% of users using NRB" (94.2%) and "% of users using fossil fuels" (5.8%) are sourced from publicly traceable database table 9.7 of UNHS, Household Survey Report 2016/17 https://www.ubos.org/wp-content/uploads/publications/03_20182016_UNHS_FINAL_REPORT.pdf. The Verification Team acknowledge that all fossil	~~CL02~~	OK

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		fuel used is assumed to be Natural Gas and the emission factors of NG - 56.1 tCO_2/TJ is utilized. The emission factor for EF_{NRB} is taken from AMS I.E as 81.6 tCO_2/TJ. The Verification Team confirms that the parameter has been appropriately determined as below: $EF_{projected\_fossilfuel} = (81.6*0.942 + 56.1*0.058) = 80.12\ tCO_2/TJ$ Verifier´s action: CPA-DD, PoA-DD, applied methodology and host country household surveys were utilized. Conclusion: The determination method of $EF_{projected\_fossilfuel}$ is in line with the registered monitoring plan and the applied methodology Value is correctly reported. Please refer CL 02.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/DB/ /WC/ /MR/ /XLS/	Description: It is a default value. Additional QA/ QC measures are not applicable. Verifier´s action: Applied default value and national data base was reviewed. Conclusion: The reported value is accurate	OK	OK
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/	☒ Correct ☐ Not correct (initial assessment) Description: Applied value is correct. Verifier´s action: MR was reviewed. Conclusion: The value given in the monitoring report is correct.	OK	OK
9. Existence of public distribution network of safe		Existence of public distribution network of safe drinking water in		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
drinking water		year y		
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is utilized to determine the eligibility conditions. The value is based on survey records. The stated value between the ER and MR is consistent with the survey records. Verifier´s action: Survey report was reviewed. Conclusion: The survey was reviewed and reporting deemed as appropriate.	OK	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/DB/ /WC/ /MR/ /XLS/ /USAGE/	Description: It is a survey-based value. Additional QA/ QC measures are not applicable. Verifier´s action: Survey report was reviewed. Conclusion: The reported value is deemed as appropriate.	OK	OK
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/	☒ Correct ☐ Not correct (initial assessment) Description: It is a survey-based value. Verifier´s action: MR and survey were reviewed. Conclusion: The reported value is appropriately determined based on survey results.	OK	OK
10. $EC_{PJ,j,y}$		Quantity of electricity consumed by the project electricity consumption source j in year y		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
a) Measurement / Determination method (VVS, §§ 389-393) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/IM03/ /PoA-DD/ /CPA-DD/ /USAGE/	Description: The parameter is utilized to determine the project emissions for Type 3 CPAs. The value of parameter is based on manufacturer's specification. It is also noted that there is provision for application of default value of 14 Watt for 24 hours a day. However, actual power rating (in a conservative manner is applied. Assumption of 14-watt hour capacity is backed by credible substantiation. Verifier´s action: CPA-DD, PoA-DD and MR were reviewed. Conclusion: Applied assumptions are appropriate.	OK	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MR/ /PDD/	Description: It is technical specification or default value. Additional QA/ QC measures are not applicable. Verifier´s action: Manufacturer's specification and default value were reviewed. Conclusion: The QA/ QC measures are not applicable as the parameter is depend on the technical specification.	OK	OK
c) Correctness (VVS, §§ 389-393) *Determine whether the value given in the monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MR/ /IM03/	☒ Correct ☐ Not correct (initial assessment) Description: Pending closure of the raised findings, the correctness of project emission calculations are reasonably confirmed. The technical specifications have been requested Verifier´s action: Manufacturer's specification and default value were reviewed. Conclusion: Parameter is addressed appropriately.	OK	OK

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
N/A	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	☐ No ☐ Yes	From: To:
-	-	-	-	-	-	-	-	☐ No ☐ Yes	From: To:

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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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