CDM: Recommendation form for Small Scale Methodologies (Version 01.1)

(To be used for presenting questions/proposals/amendments to the simplified methodologies for small-scale CDM project activity categories)

Date of SSC WG meeting:	20−23 August 2012, SSC WG 38
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Revision of III.AV to include alternative water quality standard and expand the applicability to different household water treatment technologies
Indicative methodology to which your submission relates *(refer the items of Appendix B of the Simplified Modalities and Procedures)*, **if applicable:**	AMS-III.AV “Low greenhouse gas emitting water purification systems”
Name of the authors of the query:	Roman Schibli Institution: South Pole Carbon Asset Management Ltd. r.schibli@southpolecarbon.com

Summary of the query:

Please use the space below to summarize the query related to SSC methodologies/categories SSC Modalities and Procedures provide recommendation/analysis of the SSC WG.

Original text from PP:

We feel that AMS-III.AV version 2 is overly restrictive with regards to the accepted technologies by imposing an unduly strict water quality standard. The water quality standard is suitable for developed countries, but unsuitable for developing countries which lack a fully developed water and sanitation infrastructure. We propose to use an alternative water quality standard, also endorsed by the World Health Organization (WHO), which was designed to take the conditions in developing countries into account (the so called “interim” standard). We also expanded the list of eligible technologies with a view to clarifying the applicability of the methodology to different household water treatment technologies.

The water quality monitoring provisions contained in version 2 of the methodology are unworkable in the context of developing countries, which don’t possess the laboratories/equipment required for it. As a result, a large number of household water purification projects which provide households with clean drinking water are effectively excluded from the methodology. This limits the impact that carbon markets can have in providing poor households with access to clean water, and therefore results in millions of households being denied access to clean water.

Finally, we feel that AMS-III.AV version 2 contains several inconsistencies and ambiguities. We have tried to correct the inconsistencies, reduce ambiguities (by adding examples or adding formulas instead of text) and, wherever possible, simplify the methodology. All of this was done without compromising the environmental integrity of the methodology.

The following list explains all the suggested changes in the methodology in greater detail.

Paragraph	Changes	Motivation
1	Deleted reference to specific water quality standard. Replaced by statement of the overall objective of the methodology, ie. to provide households with safe drinking water.	The water quality to be achieved by the project activity is already defined in paragraph 3(b). The existing definition in para 1 is not fully consistent with the definition in para 3(b), since footnote 1 from paragraph 1 makes reference to US EPA standard which is absent in para 3(b). To avoid redundancies which might lead to confusion and contradictions we suggest to delete the specific reference to the water quality standard from para 1, but clearly state the objective of projects implemented under the

		methodology.
2	- Clarify that POE also applies to water kiosks, community water taps and water centres - Clarify that eligible POU devices include solar & chemical disinfection techniques	- Water Kiosks are among the most promising initiatives to bring clean drinking water to communities. They sell clean drinking water to the communities. They are typically operated by micro entrepreneurs and run as for-profit enterprises. The model has been pioneered in India, where private water kiosks provide safe drinking water to the rural population. The water kiosk model is seen as easier to scale, and more sustainable in the mid to long term due to the underlying for profit business model. However, such models have not yet been widely rolled-out, demonstrating the substantial barriers they still face, but which could be alleviated by carbon finance. See http://www.hystra.com/opensource/Access_to_Safe_Water_for_the_BoP_ExSum.pdf p.17- 20 for a discussion of water kiosks. In case of water kiosks and other models which involve water distribution from centrally located points, the project boundary will be defined explicitly with regards to the water distribution point (eg. within 5km radius of the water distribution point) and only households consuming drinking water from that water distribution point and living within the project boundary will be included in the emission reduction calculation. The fraction of eligible households in the case of POE treatment points will be monitored as per para 8(b). - The list of eligible POU devices has been enlarged to include (virtually) all low greenhouse emitting water purification systems which provide households with access to clean drinking water. Solar disinfection, chlorination and combined flocculation/disinfection systems, which were added to the list, are all included in a list of “Existing low-cost technologies [that] can save lives today” by the WHO (http://www.who.int/water_sanitation_health/publications/combating_diseasepart3lowres.pdf). In addition, numerous peer reviewed studies have demonstrated the efficiency of solar disinfection method (http://www.sodis.ch/methode/forschung/publikationen/index_EN), chlorination (http://www.who.int/water_sanitation_health/dwq/en/watreatpath3.pdf) and combined flocculation/disinfection systems (http://www.who.int/water_sanitation_health/dwq/en/watreatpath3.pdf). In the following section the **upstream greenhouse gas emissions due to chlorine production** are further investigated. In order to ensure the conservativeness of the emission reduction estimates also for projects using chlorine, the upstream emissions due to the production of chlorine are calculated, and converted to GHG emissions per litre of drinking water. Throughout this process very conservative assumptions will be used. This is then compared to typical emission reductions achieved due to avoided boiling of drinking water, based on the first registered project using AMS-III.AV. In line with paragraph 87 of the Clean Development Mechanism Validation and Verification Standard Version 02.2 (http://cdm.unfccc.int/Reference/Standards/accr_stan02.pdf), if the upstream emission due to the production of chlorine are less than 1% of the expected emission reductions it can be concluded that a project boundary excluding upstream emissions associated with chlorine production is appropriate. As stated by EuroChlor on page 1 (http://www.eurochlor.org/media/13650/infosheet-public-01-chlorineuniverse.pdf) “There are no direct greenhouse gas emissions in the chlorine manufacturing process, but depending on the fuel used there are CO2 emissions related to the generation of electricity”.

		The electricity consumption to produce 1t of Chlorine in Europe in 2001 was less than 3650kWh/t Chlorine (http://www.eurochlor.org/media/10677/annualreview-2010-hd.pdf, p.8). This has since been reduced to about 3350kWh/t in 2010. Allowing for less efficient production in developing countries, we assume *triple* the electricity required in Europe in 2001, ie. 10,950 kWh/t chlorine. Using an emission factor of 1.5 tCO2e/MWh (which is equivalent to a coal power plant burning lignite and operating at 25% efficiency), 10,950 kWh are equivalent to 16.425 tCO2e/t chlorine. According to WHO guidelines, the guideline value of chlorine is 5mg/liter (http://www.who.int/water_sanitation_health/dwq/GDWQ2004web.pdf, p. 325). Therefore, 1 ton of chlorine can disinfect 200 million litres of drinking water, and the upstream emissions due to electricity consumption per litre of water are equal to 0.082 grams of CO2e/litre of drinking water. According to the first registered PoA using AMS-III.AV (http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/7A8Q3W9JCU02S56EMZFROHLTPVNY1B/view, CPA Design Document page 10), expected emission reductions for 16,800,000 litres of purified water are equal to 5,184 tCO2e. This is equivalent to emission reductions of 324.762 grams of CO2e/l of drinking water. Therefore, the emissions associated with the generation of the amount of electricity that is needed to produce the quantity of chlorine that is required to produce one litre of drinking water is less than 1% of the emissions reductions that are achieved by the project to produce that same quantity of drinking water (ie 0.025%). Based on the above it can be concluded that in all practical situations, the upstream emissions from chlorine for the disinfection of drinking water under AMS-III.AV does NOT need to be included in the project boundary in line with the VVS Version 02.2.
	- Clarified what qualifies as a public distribution network of safe drinking water - Clarified what the total project area is	- The definition of “public distribution network of safe drinking water” is not entirely clear. For example, it is not clear whether a distribution network installed in a village from a borehole would qualify as such a public distribution network, and hence rule out projects in that said village. By adding the criteria that a public distribution network needs to have a central treatment system it becomes clear that informal networks are not to be regarded as public distribution networks. - The use of project boundary in case of total project area clarifies which area is to be assessed and is in line with clause 5.
3(b)	- Clarify how compliance of the technology with the required drinking water standard shall be determined - Changed WHO drinking water standard	- The revised methodology clearly explains how the DOE can validate whether a technology achieves compliance with the required drinking water standard. The suggested validation approaches ensure that the drinking water standard is met, but keeps transaction costs manageable for project developers. - The current version of AMS-III.AV makes reference to the “protective” drinking water standard by the WHO (Figure 10, p. 4 http://www.who.int/water_sanitation_health/publications/2011/evaluating_water_treatment.pdf). While this standard guarantees drinking water of excellent quality, it is also very restrictive for Household Water Treatment and Storage (HWTS) projects. According to the WHO (table 7.6a, page 141d-141f

		http://www.who.int/water_sanitation_health/dwq/fulltext.pdf) only membrane ultrafiltration, thermal heat technologies and combined flocculation/disinfection systems achieve the required reductions in bacteria (log 2), viruses (log 3) and protozoa (log 2). All the other technologies, such as free chlorine, ceramic and carbon filtration, solar disinfection and UV irradiation, fail to reach the reductions in pathogens required by the “protective” target. A survey conducted by UNICEF covering 45 countries (ie. most relevant countries for HWTS projects) showed that the most prevalent HWTS technologies available were chlorine disinfection (available in more than 80% of countries), filters (*excluding* ultrafiltration membrane filters – in about 80% of countries), combined flocculation/disinfection (70% of countries), solar disinfection methods (40% of countries) and others (less than 40% of countries) (http://web.mit.edu/watsan/Docs/Student%20Theses/Global/Thesis%20FINAL%20Mehul%20Jain%2012-31-09.pdf, p. 137). Therefore, with the exception of combined flocculation/disinfection, all the most popular HWTS methods are excluded by the water standard used in AMS-III.AV. This shows how restrictive the “protective” water quality standard is in the context of HWTS projects. Besides the “protective” target, the WHO also defines an “interim” target (Figure 10, p. 4 http://www.who.int/water_sanitation_health/publications/2011/evaluating_water_treatment.pdf). It is defined as using “protective” removal for two classes of pathogens, and having a proven health impact. The WHO has developed this interim standard because it recognizes that the “**protective targets are conservative and that achievement of these targets may not be [..] achievable option in some situations**” (p. 3). The WHO specifies the situations where the protective target may not be reached as “countries with a high disease burden where drinking-water quality is poor” (p. 19) ie. the typical situation where POU or POE systems are employed. The WHO cites a study which demonstrates that ceramic filters which reach the interim, but not the “protective” target, are associated with measurable health gains (http://www.wsp.org/wsp/sites/wsp.org/files/publications/926200724252_eap_cambodia_filter.pdf). Country action plans for Household Water Treatment and Safe Storage, published on the WHO website, have also endorsed the interim standard (for example on Vietnam, see: http://www.wpro.who.int/environmental_health/documents/docs/DevelopingaNationalPlanforHWTS_Final_.pdf, p. 3) The “interim” target can also be reached by free chlorine, ceramic and carbon filtration, solar disinfection and UV irradiation (table 7.6a, page 141d-141f http://www.who.int/water_sanitation_health/dwq/fulltext.pdf), which is in line with the definition of the eligible technologies in para 2. To conclude, it follows from the above that for HWTS projects the appropriate water quality standard is the “interim” standard defined by the WHO. Using the “protective” standard as is currently the case is overly restrictive in that it excludes the most widely used HWTS technologies, which have brought proven health benefits to numerous households. Keeping the reference to the “protective” standard in the methodology would therefore curtail its reach, and limit the role the carbon markets can play in brining clean and safe drinking water to households. - The wording *comparable* national standard is unclear insofar as it is not clear when a national standard is comparable and when not. Replacing comparable with applicable removes this ambiguity.

	- Clarified that any *applicable* national standard or guideline can be used	
3(c)	Clarified how the DOE can validate that access to replacement purification systems is ensured	Providing households with the contact details of suppliers of purification systems or demonstrating plans how additional chemical treatment supply will be made available are concrete examples which will help a DOE understand how to validate this point. Para 12 still requires a regular monitoring of the devices operating.
5	Clarified project boundary in case of POE treatment systems	For POU systems the project boundary is clear (the physical site where the technologies are installed), but in case of POE treatment systems the situation is less clear. In the case of water kiosks for example, households living in different villages might procure their drinking water from the kiosk. In order to clarify the project boundary in such situations, an explicit definition in the case of POE systems is now required. The example given (radius around POE system) serves to illustrate how the project boundary can be defined. The fraction of eligible households residing within the project boundary in the case of POE treatment points will be monitored as per para 8(b).
6	Deleted discussions of case 1 & 2, but clarified that only purified water consumed for drinking purposes can be used in the baseline calculation.	The Version 2 of AMS-III.AV introduced the requirement in para 6 that only treated water *used as drinking water* can be accounted for in case 1. However, the same requirement was already included for case 2 in para 14. To improve the readability, the discussion of case 1 and case 2 is removed here, but the principle that "only purified water consumed for drinking purposes can be used in the baseline calculation" is introduced.
7 QPW_y	- Consolidated approaches for Case 1 & Case 2 - Clarified additional requirements for Case 2	- Because of the new requirement in Version 2 of AMS-III.AV that only treated water used as drinking water can be accounted for in case 1, the wording for QPW has been consolidated and streamlined. It now starts with a general statement that only water treated and consumed for drinking purposes can be used, which is applicable to both cases. - The only remaining difference between Case 1 & Case 2 with regards to QPW is the requirement for a baseline survey in line with para 14(a) of Version 2 of AMS-III.AV. This difference is now clearly mentioned in the text.
7 f_{NRB}	Clarified how to calculate the f_{NRB} in case both fossil fuel and woody biomass stoves are used in the baseline	In Version 2 of AMS-III.AV it is currently unclear how the f_{NRB} should be calculated in case the baseline includes both fossil fuel stoves (with an f_{NRB} default value of 1) and woody biomass stoves. To clarify this situation, it is suggested to use a weighted average f_{NRB} factor, reflecting the prevalence of fossil fuel and woody biomass stoves in the baseline. To give an example: should 10% of the stoves be fossil fuel stoves (with an f_{NRB} of 1) and the remaining 90% of woody biomass stoves have an f_{NRB} of 0.5, the weighted average f_{NRB} for the project would be equal to 0.1*1+0.9*0.5=0.1+0.45=0.55. Calculating a weighted average is in line with the provisions on how to establish the efficiency of the water boiling systems being replaced (see paragraph 8 n_{wb} (1) in version 2 of AMS-III.AV)
7 $EF_{Projected\_fossil fuel}$	Clarified how to calculate the $EF_{Projected\_fossilfuel}$ in case both fossil fuel and woody biomass stoves are used in the baseline	The proposed procedure, ie. to calculated a weighted average, is analogous to the procedure outlined above for the calculation of the f_{NRB} and is also in line with the provisions on how to establish the efficiency of the water boiling systems being replaced (see paragraph 8 n_{wb} (1) in version 2 of AMS-III.AV)
8	- Consolidates and codifies information contained in different sections in Version 2	- In Version 2 of the methodology the exact way how QPWy shall be established is slightly confusing, and information is contained in several different paragraphs (para 6,7,12). The

		new version consolidates this information in two new formula, which cover situations where POU devices are distributed to families and where families obtain water from POE installations (such as community centres or water kiosks). It also clarifies how QPWy shall be established when chemical or combined flocculation/disinfection treatments are distributed.
	- Formula 2 to calculate QPWy for situations where POU systems are distributed to households	- This way of calculating QPWy is very important for POU devices distributed to households where direct monitoring of the overall water purified would not be possible. Formula 2 codifies the approach contained in para 6 of Version 2 of AMS-III.AV. For consistency reasons, it is now used for both case 1 & case 2. A clarification is added that the average family size could be used to estimate the population serviced. A default value for the average drinking water per person per day of 3.5 litres is suggested, based on official WHO estimates (http://www.who.or.id/eng/contents/aceh/wsh/water-quantity.pdf), alongside the possibility to determine this value by survey, official data, peer reviewed literature or local expert opinion as in Version 2 of AMS-III.AV. The default value reduces transaction costs for project developers, while ensuring conservativeness by using a conservative WHO default value (the document specifies that the *minimum* requirement is between 3 and 4 litres, of which the average is taken). An additional cap based on the capacity of the device per manufacturer's specifications is added, again to ensure the conservativeness of the approach. Finally, the formula now also links to the results of the water quality tests, which have to be conducted during the monitoring (para 16 in AMS-III.AV.). It is now clarified that only the fraction of water which passes the quality test will count towards the quantity of purified water and consumed for drinking purposes only.
	- Formula 3 to calculate QPWy for situations where purified water is provided centrally (community water centre, water kiosks,..)	- This section clarifies how QPWy can be established in cases where the drinking water is provided centrally, such as in community water centres or water kiosks. In this case, the total quantity of water purified can be monitored on sample basis, while the population serviced by the project equipment might change over time. Therefore the fraction of purified water used for drinking purposes only shall be calculated based on a weighted average of the actual monitored withdrawals by users (on sample basis), subject to a cap of drinking water requirements calculated using information on the actual water usage obtained by interview (on sample basis). To implement this approach, the following information needs to be monitored for different users on sample basis: - How much water do they withdraw (QPW_i)? - How many people will drink from this water ($POP_{Serviced,i}$)? - How many days will the water be used for drinking ($DAYS_{Serviced,i}$)? - Does the user live within the project boundary? Based on this, and using the drinking water per person per day, the fraction of purified water used for drinking purposes only can be calculated. This shall be multiplied by the fraction of purified water which passes the water quality test as per monitoring requirement contained in para 18 (para 16 of AMS-III.AV Version 2). This fraction can be used to convert the total quantity of purified water (which is monitored on sample basis) into the quantity of purified water consumed for drinking purposes only (QPWy). In cases such as water kiosks where such information might already be available, the information contained in the log-

	- Clarified how QPW shall be calculated for projects involving the distribution of chemical and combined flocculation/disinfection treatments	books can be used. This is detailed in the monitoring section (para 13). This approach allows for a rigorous way to assess the quantity of purified water actually used for drinking purposes in POE systems, while keeping the monitoring requirements manageable. - In case of projects distributing chemical treatments or combined flocculation/disinfection treatments, the overall quantity of treatments distributed can be monitored. This can be converted into the total quantity of purified water by using the dosage suggested by the manufacturer. Therefore the situation is similar to the situation described in Formula 3, ie. in POE systems where the total water quantity can be monitored directly on sample basis. The number of people and the amount of days they are served by each treatment can be established by survey. With this information the fraction of purified water used for drinking purpose only can be calculated.
9	Option to use a Controlled Cooking Test besides default values for the specific energy consumption	The option to perform a Controlled Cooking Test (CCT) (http://www.pciaonline.org/files/CCT_Version_2.0_0.pdf) is added, so that project developers have the option to either use the default values or measure the specific energy consumption directly. The CCT is chosen because it allows for a standardized assessment of the required energy consumption for boiling 1liter of drinking water under field conditions.
9 WHE	- 10 instead of 5 minutes of boiling required - Evaporation of 4% instead of 1% for 10 minutes boiling	- The WHO guidelines for Emergency Treatment of drinking water at point of use (http://www.searo.who.int/LinkFiles/List_of_Guidelines_for_Health_Emergency_Emergency_treatment_of_drinking_water.pdf, p.4) specifies that water should be boiled for *at least* five minutes, but *preferably up to a period of twenty minutes*. Since this guideline strongly recommends boiling longer than five minutes, it seems overly restrictive to use a boiling time of only five minutes in the methodology. It is suggested to increase this amount to 10 minutes, which is still conservative (the WHO recommends 20 minutes) but more in line with WHO recommendations. - As is mentioned by Mr. Sharma in his report on the technical inputs for the water purification methodology, submitted to the SSC WG in April 2011, "there is no literature stating that 1% of water is lost when water is boiled for 5 minutes" (p. 10). Different numbers can be approximated, based on the actual boiling practices (vigorous or gentle boiling) and different studies. In this situation, it is important to find a default value which is closely aligned with actual values measured in the field, yet remains conservative. Probably the best publicly available data which has been cross-checked, are the results of the water boiling tests performed by Vestergaard Frandsen for its GS VER project "Sustanable Deployment of the LifeStraw Family in rural Kenya". For this project, a Kitchen Performance Test for boiling water for five minutes for 30 different stoves was performed. Critically, their tests were conducted under field conditions, similar to the requirements of the Controlled Cooking Test (CCT). On page 48 of the PDD (https://gs2.apx.com/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=6251&IDKEY=a98klasmf8jflkasf8098afnasfkj98f0a9sfsakjflsakjf8dj8620129), the results are reported that the average fuel consumption per litre is equal to 360g of wood. Their boiling test was conducted only on three stone fireplaces. Using the IPCC default net calorific value for wood (equal to 15,600 KJ/l) the specific energy consumption for boiling 1l of water is equal to 5,616 KJ/l. This is *more than 57% higher* than the default specific energy consumption value

		used in AMS-III.AV, when assuming a default efficiency of 10% for a three stone fire place. This strongly indicates that the default values are severely underestimating the specific energy required for 1l of water. In order to remain conservative, and to remain in line with the recommendations of the technical inputs for the water purification methodology, *it is suggested to double the expected evaporation rate to 2% for 5 minutes of boiling* (which is consistent with medium heat transfer from stove to pot, according to the technical inputs report). Intuitively also a medium heat transfer seems to be reasonable, since unimproved stoves (such as three stone fire places) cannot be adjusted precisely so it is unlikely that the water would be barely simmering, as would be the case on a fully adjustable gas stove. Using a boiling time of 10 minutes (see above), the overall evaporation rate is now assumed to be 4%, ie. the specific energy consumption for one litre of water on a three stone fire is equal to 4,253 KJ/l, ie. 19% higher than the value used in Version 2 of the methodology, but still 24% lower than the actual values measured during field tests by Vestargaard Frandsen. This shows that even with the new approach, the default value for the specific energy consumption remains highly conservative.
9 Option 2 SCE	- Introduced option to determine specific energy consumption by Controlled Cooking Test (CCT) - Weighted average specific energy consumption	- The Controlled Cooking Test (CCT) is a widely used protocol to establish the fuel consumption of stoves under field conditions for a specific task (http://www.pciaonline.org/files/CCT_Version_2.0_0.pdf). It is also used in AMS-II.G for establishing the quantity of biomass used in the baseline situation. The precise task to be carried out by the CCT is specified in the methodology, ie. to boil one litre of water for 10 minutes. The fuel consumption can be converted into the specific energy consumption by using IPCC default values for the net calorific value of different fuels. Introducing this option will give project developers the option to measure the specific energy consumption directly, based on a standardized procedure which has been accepted in the CDM previously. - A clarification is added in case several different water boiling systems are replaced by the project activity. Taking a weighted average value is in line with the approach used for the default values, where also a weighted average value of the efficiencies of the water boiling systems being replaced is taken.
12	Clarified that para 12 is only applicable for Option 1 according to para 8(a)	For Option 1 according to para 8(a), ie. POU systems distributed to households, the quantity of purified water used for drinking purposes can be calculated based on the number of functioning project equipments. For POE systems this is not possible anymore, since the population serviced by them is more difficult to establish and can change over time. Para 12, together with para 13, replaces the para 12 in Version 2 of AMS-III.AV, which was less specific on how to establish the quantity of drinking water in year y.
13	Clarified monitored parameters required for Option 2 according to para 8(b)	For Option 2 according to para 8(b), ie. POE systems such as water kiosks, the monitoring procedures for determining the quantity of purified water used for drinking purposes only has been clarified. The listed monitoring parameters are required in order to calculate the emission reductions according to para 8(b). All the parameters shall be monitored on sampling basis. It is also clarified that if log books already contain the required information, they can be used for monitoring purposes. Para 13, together with para 12, replaces the para 12 in Version 2 of AMS-III.AV, which was less specific on how to establish the quantity of drinking water in year y.

14	List of ex-ante surveys	AMS-III.AV Version 2 contained an incomplete list of ex-ante surveys in para 14. This list has been expanded to cover all the required ex-ante surveys. In case the ex-ante survey is only required in specific situations (eg. Case 1 para 4(a)), this clarification has been added.
15	Definition of public distribution network	For consistency reason, the same definition of a public distribution network (ie. with centrally treated safe drinking water) was added in para 15 as contained in para 3(a).
16	- Added "within the project boundary" - Corrected typo - Deleted reference to baseline campaign for average volume of drinking water per person per day	- By adding a reference to the project boundary, the meaning of total population is clarified - Corrected typo water boiling to water purification - The average volume of drinking water per day is required in both Case 1 (para 4(a)) or Case 2 (para 4(b)) for Version 2 of AMS-III.AV, since the requirement to demonstrate that all the water is used for drinking purposes only was also introduced for Case 1 (see para 6 of Version 2 of AMS-III.AV). In order to make the monitoring more consistent and clear, the requirement for such a survey is moved to para 14(c) which is applicable regardless of whether the project is a Case 1 or a Case 2 project. Para 14(c) also clarifies that this survey is only required should the drinking water per person per day not be established by the default value, an official report or peer reviewed literature values.
17	Changed reference to Option1	The number of persons supplied with purified water is only required for Option 1 according to para 8(a). Also, Version 3 gives the option to use official statistics, such as the average family size, instead of actual surveys. It is therefore clarified in which situations this survey is actually required.
18	- Changed water quality monitoring to approach using E.coli as microbiological indicator.	- HWTS technologies are used to treat water from microbiological contamination (ie. bacteria, protozoa, viruses,..). A routine water quality testing for viruses and protozoa does not exist (http://www.rdic.org/CAWST-Intro-to-Drinking-Water-Quality-Testing.pdf, p. 73). This means that a direct test for viruses or protozoa can only be carried out in specialized laboratories, which in developing countries are only available in large cities (if at all). Therefore field tests are recommended for such situations (http://www.who.int/water_sanitation_health/dwq/gdwqvol32ed.pdf, p. 20). The Centers for Disease Control and Prevention (http://www.cdc.gov/), a US government body, has developed a fact sheet for microbiological indicator testing in developing countries, particularly aimed at field practitioners (http://sanitationupdates.files.wordpress.com/2010/11/microbiology2020.pdf). One of the most common microbiological indictors used is E.coli. The CDC fact sheet states that "E. coli an ideal indicator for human health risk" (p.5), since it indicates the presence of other disease creating microorganisms. Several field tests exist to determine the presence of E.coli CFU (see Section 5 of http://sanitationupdates.files.wordpress.com/2010/11/microbiology2020.pdf). The most commonly used tests are presence/absence tests, which indicate whether E.coli CFU are presence in the water sample or not. These tests are reliable and have been widely used in the field by relief agencies such as Medecins Sans Frontieres (http://www.rdic.org/CAWST-Intro-to-Drinking-Water-Quality-Testing.pdf, p. 73). - The WHO classifies 10 E.coli CFU per 100ml sample as low risk (http://www.who.int/water_sanitation_health/dwq/gdwqvol32ed.pdf, p. 78), and Medecins Sans Frontieres recommends

	- A maximum of 10 E.coli CFU per 100ml sample - Fraction of measurements with insufficient water quality	drinking water with an E.coli concentration of less than 10 CFU/100ml (http://www.lboro.ac.uk/well/resources/fact-sheets/fact-sheets-htm/WQ%20in%20emergencies.htm). Therefore it is adequate to define safe water as having less than 10 E.coli CFU/100 ml. To simplify the monitoring, a contamination of less than 10 E.coli CFU/100ml shall be established by a presence/absence test in a 10ml water sample. - It is now clarified that the fraction of water which fails the water quality test (ie. the fraction that shows contamination with E.coli in excess of 10 E.coli CFU/100ml) should be excluded from the quantity of purified water used for drinking purposes. This clarifies how to deal with situations where certain samples might fail the water quality tests, and ensures that only water safe for consumption is used in the calculation of emission reductions.

Recommendation by the SSC WG:

Please use the space below to provide amendments / change (in your expert view, if necessary).

Please refer to paragraph 10 of the meeting report of the SSC WG 38 <http://cdm.unfccc.int/Panels/ssc_wg>.

Answer to authors of query by the SSC WG:

Please use the space below to provide answer to the authors of the above query.

The small-scale working group of the CDM Executive Board would like to thank the author for the submission.

The SSC WG agreed to recommend the revision of AMS-III.AV, as contained in annex 1 of the meeting report of the SSC WG 38. The proposed revision broadens the applicability to include project technologies that comply with the interim performance target for household water treatment as per WHO guidelines, or an applicable national standard or guidelines. The SSC WG noted that an expert opinion has indicated that the quality of water defined by the Interim Target is equivalent to the quality of boiled water, which is the baseline in AMS-III.AV. Several aspects of the methodology (e.g. emission factors for fossil fuel and non-renewable biomass) are clarified in the proposed revision.

However, the SSC WG agreed not to recommend the inclusion of some of the proposed technologies/measures for the following reasons:

Regarding water kiosks, expert inputs indicated that there have been no health impact studies of water kiosks to date, and no rigorous, published evaluations of the impact on household drinking water quality. Although the authors correctly note that this is a compelling business model, it has not yet been shown to protect health, as water may be subject to recontamination at the household level before consumption. Therefore, the SSC WG is of the opinion that it may not be possible to conclude with certainty that the quality of the drinking water from water kiosks at the site/time of its use would be equivalent with the quality of boiled water (baseline).

Similarly, with regard to community taps, the SSC WG noted that there is considerable evidence that safe water external to the household does not translate to safe water at the point of use, in the household. Thus, the SSC WG is of the opinion that these treatment options cannot be considered equivalent alternative to replace and/or to avoid boiling.

With regard to the boiling time, according to expert inputs boiling water for longer than five minutes is not required for making it safe to drink, and this is especially true if we are comparing the microbial reductions to mean reductions from other technologies (which are far lower than that obtained by boiling for even a shorter time). Therefore, the SSC WG believes that assuming a “hypothetical boiling time” of 10 minutes does not seem plausible.

Regarding the monitoring of water quality, the SSC WG clarifies that the current version of the methodology does not prescribe the selection of a testing approach. Project participants should design it according to the applicable national or international standard or guidelines.

Signature of SSC WG Chair: Mr. Peer Stiansen Date: 23/08/2012 Signature of SSC WG Vice-Chair: Ms. Fatou Gaye Date: 23/08/2012

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