Gold Standard Methodology for Accreditation of Water Benefit Certificates

Water Access and Water, Sanitation and Hygiene (WASH) Projects V 1.0

Contents

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1 Background

This methodology quantifies the impact of projects which provide access to clean and safe water, particularly in developing countries using The Gold Standard Foundation's Water Benefit Standard. There are two project types covered by this methodology. The first type (Water Access) focuses on clean water access for human ingestion, and is limited to the quantification of water which is protected from contamination and used by beneficiaries for drinking and food preparation and cleaning of food utensils. A project proponent is expected to conduct a hygiene[1] campaign, although in this case hygiene levels are not monitored.

The second project type (WASH) focuses on both clean water access with protection from contamination, and improvement of sanitation and hygiene conditions. It applies to hygienic use of water for a range of purposes: drinking, food preparation/clean-up, bathing/personal hygiene, and laundry. Improvements in hygiene levels are monitored in these projects.

Both types of project are measured and assessed in quantitative and qualitative terms, and the combined impact is evaluated and expressed in terms of Water Benefit Certificates (WBCs).

Target water users for these two project types are domestic households, and non-domestic premises (commercial and institutional) such as schools.

[1] The word "hygiene" is used generically in this document to capture sanitation infrastructure and amenities, in addition to hygienic behaviour and correct and regular use of amenities.

2 Definitions

Clean Water: Clean Water is water flowing from a technology or source which qualifies as having low risk of contamination according to the drinking/ingestion water standard defined in the Section Monitoring: Quantitative Parameters.

Acceptable Water. Acceptable Water is water flowing from a technology or source which qualifies as being of acceptable quality for use for bathing and laundry according to the criterion in the sections Eligibility Criteria and Monitoring: Quantitative Parameters.

Hygiene: Hygiene refers to access to sanitation amenities, equipment and infrastructure, as well as to behaviour in respect to regular and correct use of such amenities, and behaviour which prevents infections from water-related diseases.

Sanitation: Sanitation refers to the disposal of excreta, solid waste management, drainage and vector control. The term "hygiene" is used throughout in this document to include sanitation, following the definition of hygiene above.

Ingested Water: Water which is used for drinking, cleaning of eating and drinking utensils, and for food preparation

Improved Source: As defined by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation[2], Improved Sources include piped water entering a building, piped water entering a yard/plot, public taps and standpipes, tube-wells, boreholes, protected dug wells, protected springs, rain-water collection. Transport of water by truck to a delivery point is legitimate as long as the practice is environmentally sustainable as per the Standard's sustainability assessment and meets quality standards, and the quality testing point is the point of delivery.

Improved Sanitation Source: As defined by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation,[3] Improved Sanitation Sources include flush toilets, piped sewer systems, septic tanks, flush/pour pit latrines, ventilated improved pit latrines, pit latrines with slab and composting toilets.

Point of use sources: These include sources used in the building directly from the outlet at the point of consumption. These include piped water which has entered the building, point-of-consumption filters, and containers from which water is drawn directly for use. In buildings with multiple interior outlets, testing shall occur at the outlet furthest from the inlet to the building.

Shared (common) point source: These include collection points shared by members of a community requiring water to be transported within walking distance to point of consumption, such as shared boreholes, protected springs, protected dug wells, public taps, public tube wells.

Safe Water: Safe Water is defined as water which is both Clean (as defined here) and consumed hygienically. Hygienic consumption is assessed following the guidelines provided in the section Hygiene Assessment Guidelines.

Clean Water Access Project: A project that supplies clean water to project beneficiaries for ingestion purposes only, including for drinking and water used in the preparation of food. Water access interventions include the installation or maintenance of an improved source as well as the purification of water dispensed from existing sources.

[2] http://www.wssinfo.org/definitions-methods/watsan-categories/
[3] http://www.wssinfo.org/definitions-methods/watsan-categories/

WASH Project: Water Access, Sanitation, and Hygiene (WASH) projects are those that not only supply clean water to beneficiaries, but that also monitor and improve local hygiene and sanitation conditions through introducing improved amenities and practices over time. They are divided into two Phases, as described in Section 5.3.2: Governing Equations.

Water Benefit Certificates (WBCs): A WBC represents a cubic metre of water that has been supplied, purified and/or conserved by a project, and which has been validated and verified by the Gold Standard Foundation.

Treatment Systems: These include, but are not limited to, water filters (e.g. membrane, activated carbon, ceramic filters), solar energy powered ultraviolet (UV) disinfection, solar disinfection, photo-catalytic disinfection, pasteurization, chemical disinfection (e.g. chlorination), combined treatment approaches (e.g. flocculation plus disinfection).

3 Eligibility criteria

Projects must comply with the following criteria for eligibility:

a) Drinking water and water used for food preparation[4] must (if untreated):
   i. come from an Improved Source and
   ii. be tested regularly at point of use[5] to meet the Quality Standard specified in Section 6.2: Quantitative Parameters
b) Water used for laundry and washing[6] must either come from an Improved Source or must be treated and qualify to an appropriate standard specified in the Section 6.2: Quantitative Parameters.
c) Water for all human uses listed above, must be available from an Improved Source within a distance defined by national standards or in absence of national standards, within 1km of the user.[7] Following Definitions above, transportation of water to a delivery point within the above distance is permitted if quality is maintained (see Section 6.2 Parameter QD).
d) Projects must make Clean Water available to all users for drinking. WBCs may also be claimed for non-drinking uses of water, however WBCs for non-drinking cannot be claimed independently of WBCs for drinking (no individual project beneficiaries can generate WBCs unless they are using drinking sources provided by the project). Schools are exempt from this rule in cases where the project developer can demonstrate the need to address sanitation before improving access to clean water.
e) Water Access projects are eligible for certification for a maximum of seven years. Subsequently they may choose to qualify as Phase 2 WASH projects.
f) Water sourced from Treatment Systems must also meet the quality test schedule and standard specified in this methodology.
g) Projects must comply with other requirements of this methodology and the Gold Standard Water Benefits Requirements Document[8].

[4] In this context food preparation refers to food preparation in the kitchen where the cooking takes place. In general, drinking and food preparation water is "Ingested Water" as defined above.
[5] Point-of-use testing includes testing of drinking shared water storage containers from which water is drawn directly for use
[6] Water for flushing toilets is only eligible for certification in non-domestic premises significantly larger than households, such as schools
[7] "Domestic water quantity, service level and health" WHO, 2003
[8] http://www.goldstandard.org/resources/water-requirements

4 Projects and Programmes

Most Water Access and WASH projects are typically submitted to the Gold Standard Foundation (GSF) as Programmes of Activities (PoAs). The rules governing Programmes of Activities (PoA) may be found in the GSF's Standards and Requirements documents.

A Programme of Activities (PoA) is composed of a several Component Projects (CPs). The PoA developer can decide when and how to divide the programme into CPs. The decision may be to start a new CP in a new geographic area, for example to reflect differing conditions between that area and other CPs, or alternatively the choice of starting a new CP may be in order to allocate a new start date to different beneficiaries from those included in an earlier activity. The decision could also be made to differentiate activity using one technology/measure from activity using another technology/measure. However, a single CP may include more than one technology/measure and different geographical areas if the underlying baseline studies and stakeholder consultations are relevant to all the areas and technologies/measures.

The total number of WBCs generated by a PoA is the sum of the WBCs generated by each CP. The governing equations presented below include the subscript "c" in order to express that each monitored or calculated value used to calculate WBCs, is specific to a particular Component Project. If the WASH project is not a PoA but an individual Project, the "c" subscript may be ignored.

Once a specified group of beneficiaries have been included in a CP, they cannot later be included in another CP. The inclusion of each CP requires approval of a fresh baseline study and stakeholder consultation, although previous baselines and consultations may be referred to in cases where similar conditions are justified.

Please refer to **ANNEX A:** Example for examples of a WASH PoA and Water Access PoAs.

In cases where a project developer wishes to register a Water Access or WASH intervention as an individual project rather than as a PoA, the project follows this methodology exactly as if it were an individual CP. The term "CP" or "project" throughout this document can therefore both be taken to mean either a Component Project of a PoA, or an individual project.

5 Calculation of Water Benefit Certificates

5.1 Economy of Scale

As Water Access and WASH projects in rural areas may not become more economic as their scale increases CPs may qualify for Water Benefit Certificates on the basis of WBCs accruing in linear proportion to the number of WBCs generated, without a requirement to reduce the volume of WBCs based on the scale of the project. All projects using this methodology will maintain a ratio of $1m^3$ = 1WBC. To qualify for this linear scaling of WBCs, a justification must be provided to demonstrate that the project/programme does not benefit from significant economy of scale as it expands in size (see 3.2 Calculating WBCs in the Requirements Document).

5.2 Baseline and eligibility

Each CP will require the baseline parameters shown in the table below, to be presented in its first performance monitoring report. Baseline data provides a basis for the quantification of WBCs, and eligibility data provides a basis for the decision as to whether proposed project activity is valid for inclusion.

Parameter	Description
Access distance	Distances of existing Improved Sources or Treatment Systems from users. A proposed new source or treatment system is eligible if there is no improved source or Treatment System within the specified distance. If improved sources already exist within range, access limitations should be considered.
Access limitations	Analysis of the access limitations of existing Improved Sources or treatment systems including quality of operation and service level, technical reliability, social limitations (over-crowding, discrimination, affordability), water quality, and other factors relevant to specific project circumstances. The analysis must show the need for the proposed project intervention.
Capacity	Credible analysis of projected Capacity of existing Improved Sources and proposed project sources (including Treatment Systems) in relation to water consumption needs of community and volumes of water supply projected by the project.
Hygiene	A qualitative assessment of hygiene conditions at the start of each project component, is required for both Water Access and WASH Projects, while a quantitative assessment is required for WASH projects. WASH projects must include an evaluation of parameter H_b(baseline hygiene level) as stipulated in section 5.5.2 Water Access projects should describe their strategy for consistent and continuous hygiene advice, guidance, training to water users.

5.3 Governing equations

WBCs are calculated as the sum (in a specified year y) of volumes generated by all CPs: The equations for Clean Water Access and WASH projects are summarised separately below followed by an explanation of default values in section 5.4.

5.3.1 Clean Water Access

Clean Water Access projects supply Clean Water to persons who are otherwise not able to access Clean Water without the project intervention. WBCs generated from this project type are quantified purely on the basis of water volumes. They are eligible for certification for the period defined in the Eligibility section above, after which they must either come to an end or become Phase 2 WASH projects.

1) $WBC_y = \sum WA_{t,x,c,y}$

2) $WA_{t,x,c,y} = P_{t,x,c,y} * OD_{t,x,c,y} * ((D_{t,x,c,y} + F_{t,x,c,y})/1000)$

Where:

Parameter	Description	Unit	Note
$WA_{t,x,c,y}$	Total volume of water supplied for drinking and food preparation purposes	m^3	Clean water delivered using technology x during time t during the course of year y
$P_{t,x,c,y}$	Number of persons	Average number of individuals during t	Monitored
$OD_{t,x,c,y}$	Average operational days	Days	Monitored
$D_{t,x,c,y}$	Clean drinking water	Average litres/person/day during t	See derivation below (5.3.3)
$F_{t,x,c,y}$	Water used in food preparation and clean-up	Average litres/person/day during t	See derivation below (5.3.4)

5.3.2 WASH

In addition to the quantity of clean water supplied to beneficiaries, the numbers of WBCs generated from WASH projects also takes into account the monitored hygiene levels. These projects are composed of two phases. In Phase 1, the number of WBCs generated is calculated according to the quantity of clean water consumed and also according to the degree of hygiene improvement in order to accommodate the cost of hygiene amenities and promotion during the early years of operation of any one WASH project component. Subsequently in Phase 2, WBCs are generated according to the hygiene level attained.

Phase 1 (first certification period[9] of each component):

1) $WBC_y = \sum WASH_{t,x,c,y}$

2) $WASH_{t,x,c,y} = P_{t,x,c,y} * OD_{t,x,c,y} * (((1+ BL_{t,x,c,y} + AL_{t,x,c,y}) * W_{t,x,c,y}) + T_{t,x,c,y})/1000$

3) $BL_{t,x,c,y} = BHI * (H_{t,x,c,y} - H_b)$

4) $AL_{t,x,c,y} = AHI * (H_{t,x,c,y} - H_{t,x,c,y-1})$

5) $W_{t,x,c,y} = D_{t,x,c,y} + F_{t,x,c,y} + B_{t,x,c,y} + L_{t,x,c,y}$

Phase 2 (subsequent years):

1) $WBC_y = \sum WASH_{t,x,c,y}$

2) $WASH_{t,x,c,y} = P_{t,x,c,y} * OD_{t,x,c,y} * H_{t,x,c,y} * \{(D_{t,x,c,y} + F_{t,x,c,y} + B_{t,x,c,y} + L_{t,x,c,y} + T_{t,x,c,y})/1000\}$

Where:

Parameter	Description	Unit	Note
$WASH_{t,x,c,y}$	Total volume of water supplied for drinking, food preparation, washing, laundry or toilet purposes	m^3	Safe water delivered by technology x during time t during the course of year y
$P_{t,x,c,y}$	Number of persons	Number of consumers	Monitored
$OD_{t,x,c,y}$	Average operational days	Days	Monitored
$BL_{t,x,c,y}$	Baseline Hygiene Lift	Fraction	Monitored
$AL_{t,x,c,y}$	Annual Hygiene Lift	Fraction	Monitored
$W_{t,x,c,y}$	Water Volumes	Average litres/person/day	See derivation below
$T_{t,x,c,y}$	Toilet flush water	Average litres/person/day	See derivation below
BHI	Baseline Hygiene Incentive	Factor	See Section 5.4
AHI	Annual Hygiene Incentive	Factor	See Section 5.4

[9] Certification periods are defined in the Gold Standard Foundation Standards and Requirements documentation.

$H_{t,x,c,y}$	Hygienic percentage monitored	Fraction	Monitored
H_b	Hygienic percentage in the baseline	Fraction	Baseline study for each component
$D_{t,x,c,y}$	Clean drinking water	Average litres/person / day	See derivation below
$F_{t,x,c,y}$	Water used in food preparation and clean-up	Average litres/person / day	See derivation below
$B_{t,x,c,y}$	Personal bathing water	Average litres/person / day	See derivation below
$L_{t,x,c,y}$	Laundry water	Average litres/person / day	See derivation below

Evaluation of each of these parameters is undertaken below and in Section 6. Hygiene parameters, however, are discussed in Sections 5.5 and 6.

Determining $D_{t,x,c,y}$ Clean drinking water

$$D_{t,x,c,y} = QD_{t,x,c,y} * WD_{t,x,c,y} * UD_{t,x,c,y}$$

$QD_{t,x,v,y}$ Fraction[10] of point-of-use drinking water sources providing water which qualifies as Clean[11] in an appropriate time period t within the year y, limited to operating sources that are being used or partially used[12]

$WD_{t,x,v,y}$ Litres of water provided for drinking per person per day in an appropriate time period t in year y, which are subject to quality test, usage and capacity assessment (see Section 5.4).

$UD_{t,x,v,y}$ Fraction of daily drinking water from project source when operational[13] in year y, in time period t.

Determining $F_{t,x,c,y}$ Clean Water used in food preparation and clean-up

$$F_{t,x,c,y} = QF_{t,x,c,y} * WF_{t,x,c,y} * UF_{t,x,c,y}$$

$QF_{t,x,c,y}$ Fraction of food preparation or clean-up point-of-use water sources providing water which qualifies as Clean in an appropriate time period t within the year y, limited to operating sources that are being used or partially used.

$WF_{t,x,v,y}$ Litres of water provided for food preparation and clean-up per person per day in an appropriate time period t in year y, which are subject to quality test, usage and capacity assessment (see Section 5.4).

$UF_{t,x,v,y}$ Fraction of daily food water from project source when operational in year y, in time period t.

[10] The fraction or percentage of drinking sources or technologies passing the quality test.

[11] For a source to qualify as Clean for the duration of a time-period t, it must be tested during that time period and pass the standard specified in Section 6.2: Quantitative parameters.

[12] Operating sources partially used refers for example to sources that supply insufficient water. Sources not used are instances where some project members choose not to use them (possibly because they are using another source which is not in this CP or is outside the project). This is explained further in respect of Usage factor U below.

[13] An operating source may have insufficient capacity to provide water for all homes/premises. For example, a school source may not provide enough water for all the students or a community source not enough for all the member households. Equally, a portion of students or portion of homes may choose not to use the source. In both these cases, technical capacity and user choice, the value of U is determined by the monitoring protocol. Technical capacity limits of sources are also monitored by a capacity check on the value of WD. In the case of a project providing homes with one filter each, either or both approaches to monitoring may be used.

Determining $W_{t,x,c,y}$ Personal bathing water

$B_{t,x,c,y} = QB_{t,x,c,y} * WB_{t,x,c,y} * UB_{t,x,c,y}$

$QB_{t,x,c,y}$	Fraction of washing / bathing water sources providing water which qualifies as Acceptable[14] in an appropriate time period t within the year y, limited to operating sources that are being used or partially used.
$WB_{t,x,v,y}$	Litres of water provided for washing / bathing per person per day in an appropriate time period t in year y, which are subject to quality test, usage and capacity assessment (see Section 5.4).
$UB_{t,x,v,y}$	Fraction of daily washing / bathing water from project source when operational in year y, in time period t.

Determining $L_{t,x,c,y}$ Laundry water

$L_{t,x,c,y} = QL_{t,x,c,y} * WL_{t,x,c,y} * UL_{t,x,c,y}$

$QL_{t,x,v,y}$	Fraction of laundry water sources providing water which qualifies as Acceptable in an appropriate time period t within the year y, limited to operating sources that are being used or partially used.
$WL_{t,x,v,y}$	Litres of water provided for laundry per person per day in an appropriate time period t in year y, which are subject to quality test, usage and capacity assessment (see Section 5.4).
$UL_{t,x,v,y}$	Fraction of daily laundry water from project source when operational in year y, in time period t.

Determining $T_{t,x,c,y}$ Toilet water

$T_{t,x,c,y} = WT_{t,x,c,y} * UT_{t,x,c,y}$

$WT_{t,x,c,y}$	Litres of water provided for toilet flushing per person per day in an appropriate time period t in year y, , usage and capacity assessment (see Section 5.4).
$UT_{t,x,c,y}$	Fraction of daily toilet flushing water from project source when operational in year y, in time period t.

[14] Water for washing and laundry qualifies as Acceptable if it comes from an Improved Source (see Section 2: Definitions and Section 3: Eligibility) or if it passes quality tests as defined in the section Monitoring: Quantitative parameters

5.4 Defaults, Caps and Derivations of Variables

If the project proponent does not wish to conduct direct monitoring of water volumes consumed, default values may be used. If values higher than the default are claimed, they must be justified based on monitoring and cannot exceed certain capped values. Default values and caps are specified in the table below.

Parameter	Default	Cap	Applicability	Reference
BHI	n/a	3 in year 1. 1 in subsequent years. See also cap in footnote[15].	Applies to premises qualifying as having no access or basic service levels as defined by Reference	"Domestic water quantity, service level and health" WHO, 2003
AHI	n/a	0 in year 1. 10 in subsequent years. See also cap in footnote[16],	Applies to premises qualifying as having no access or basic service levels as defined by Reference	"Domestic water quantity, service level and health" WHO, 2003
$WD_{t,x,c,y}$	3 lpd	4 lpd	Full-time premises. Default or Monitor (+ Test Capacity)	WHO Technical Notes for Emergencies, Technical Note No. 9, Minimum Water Quantity Needed
	4 lpd	4 lpd	Boarding School[17]. Default or Monitor (+ Test Capacity)	WHO WASH standards schools[18]
	2 lpd	4 lpd	Half- time premises (e.g. Day schools). Default or Monitor (+ Test Capacity)	Half[19] WHO reference above & WHO WASH standards schools
$WF_{t,x,c,y}$	1 lpd	3 lpd	Full-time premises. Default or Monitor (+ Test Capacity)	WHO Technical Notes for Emergencies, technical Note No. 9, Minimum Water Quantity Needed
	3 lpd	3 lpd	Boarding School. Default or Monitor (+ Test Capacity)	WHO WASH standards schools
	1 lpd	1.5 lpd	Half- time premises (e.g. Day schools). Default or Monitor (+ Test Capacity)	Half WHO reference above & WHO WASH standards schools

[15] Annual WBCs earned from hygiene lifts are capped at the value of WBCs earned from improved water volumes.
[16] As above: the number of WBCs earned from hygiene lifts in any one year cannot exceed the number of WBCs earned from improved water volumes. In other words the value of $(BL_{t,x,c,y} + AL_{t,x,c,y}) * W_{t,x,c,y}$ cannot exceed the value of $W_{t,x,c,y}$
[17] If school is mixed boarding and day then boarding pupils may use higher defaults but day pupils will use lower rates.
[18] The reference "WHO WASH standard schools " may be found at http://www.who.int/water_sanitation_health/publications/wash_standards_school.pdf
[19] "Half" means that half the value given in the reference is taken

$WB_{t,x,c,y}$	5 lpd	7 lpd	Full-time premises. Default or Monitor (+ Test Capacity)	WHO Technical Notes for Emergencies, technical Note No. 9, Minimum Water Quantity Needed
	7 lpd	7 lpd	Boarding School. Default or Monitor (+ Test Capacity)	WHO WASH standards schools
	2lpd	3.5 lpd	Half- time premises (e.g. Day schools). Default or Monitor (+ Test Capacity)	Mid-range WHO reference above & WHO WASH standards schools
$WL_{t,x,c,y}$	4 lpd	6 lpd	Full-time premises. Default or Monitor (+ Test Capacity)	WHO Technical Notes for Emergencies, technical Note No. 9, Minimum Water Quantity Needed
	6 lpd	6 lpd	Boarding School. Default or Monitor (+ Test Capacity)	WHO WASH standards schools
	2 lpd	3 lpd	Half- time premises (e.g. Day schools). Default or Monitor (+ Test Capacity)	Mid-range WHO reference above & WHO WASH standards schools
$WT_{t,x,c,y}$	10 lpd if not less than 1 toilet per 25 people	16 lpd if not less than 1 toilet per 25 people	Full-time (24 hour occupation) premises. Default or Monitor (+ Test Capacity)	Double WHO reference below
	3 lpd for pour flush toilets, 10 for flushing toilets; if not less than 1 toilet per 25 people	20 lpd if not less than 1 toilet per 25 people	Boarding School. Default or Monitor (+ Test Capacity)	WHO WASH standards schools
	5 lpd if not less than 1 toilet per 25 people	8 lpd if not less than 1 toilet per 25 people	Half- time premises (e.g. Day schools). Default or Monitor (+ Test Capacity)	WHO Technical Notes for Emergencies, technical Note No. 9, Minimum Water Quantity Needed

5.5 Hygiene Assessment Guidelines

5.5.1 Clean Water Access Projects

For clean water access CPs, for water volumes to be certified as WBCs, the project proponent must demonstrate that they have conducted a hygiene campaign targeting the users of the improved source water to ensure that they use water safely and in a manner that minimises the spread of water related diseases. The project proponent shall outline detailed plans for this campaign, the activities involved and the scope of these activities.

The project proponent shall report on the activities conducted each year in the annual monitoring report. Any major changes in the health status of the water users as a result of contaminated water (e.g. an outbreak of water related disease) must be reported and a strategy put in place to address it through the hygiene campaign if relevant. The list of parameters in Section 5.5.2 shall guide the efforts of the hygiene campaign.

5.5.2 WASH Projects

The detailed method used by each CP to assess hygienic handling of Clean Water must be provided with the CP design document (CPDD) to qualify for inclusion. Annex B provides an example of how a hygiene survey may be designed on the basis of published literature.

Guidance on hygiene technologies, training, and surveys appropriate for rural communities and institutions in low-income areas can be found in many publications. Some examples are:

"Water, Sanitation, and Hygiene Improvement, Training Package for the Prevention of Diarrheal Disease, Guide for Training Outreach Workers" USAID Hygiene Improvement Project, 2009

"A manual on hygiene promotion", Water, Environment and Sanitation Technical Guidelines Series No. 6, United Nations Children's Fund (UNICEF). The London School of Hygiene and Tropical Medicine (LSHTM), 1999

"Water, sanitation and hygiene standards for schools in low-cost settings", edited by John Adams, Jamie Bartram, Yves Chartier, Jackie Sims, World Health Organization 2009

"Safe Water Storage", Centres for Disease Control and Prevention, 2012

The details of the method should be adjusted to suit the circumstances of each project and also to suit learning from year to year. Adjustments will involve the relative weighting of the indicators (for example, it may or may not be the case that regular hand-washing has more influence on eradication of water-borne disease than does regular washing of water containers; findings on this question would be one aspect of an annual analysis of the survey approach). The approach, including such weightings, must be regularly updated and improved in respect of local circumstances.

The method must reflect the categories of indicators in the list below. The Project Proponent is required to develop a set of indicators to populate each category, and to use a census approach or randomized sampling approach to generate a value for percentage hygiene achieved which is then justified as a reasonable assessment in the annual monitoring report. In the case of water sales premises or other premises handling water, and in the case of transport undertaken by the user or not by the user (such as pipes or tankers) these guidelines apply to the handling premises and transport facilities as well as to the premises and activities of the water users.

Hygiene transformation (aiming to raise hygiene levels to above 95%) will involve effective strategies as well as the effective design of indicator lists and their application. The Project Proponent must show evidence of an effective strategy. The baseline assessment method for hygienic percentage of users must be consistent with the project assessment method.

The following are the parameters of hygiene relevant for this methodology:

1. General hygienic organization. Premises must be kept clean and potential health risks, such as those posed by waste disposal and inadequate methods of food and utensils storage, must be minimized. This will involve for instance regular safe disposal of waste, storage of food in a way that vermin are discouraged, cleaning and storage of food preparation and eating utensils that avoids risk of contamination.

2. Freedom from open defecation in the zone of the premises, in particular in respect of children, and in particular in respect of contamination of sources and of arrangements for transport of water.

3. Habituation with, and evidence of, regular use of latrines and latrine accessories and availability of sufficient numbers of latrines and opportunities for usage. These include, for example, accessories that prevent contamination by flies, allowing for easy use by the young and the elderly, privacy and shelter in all weather conditions, protection from disturbance, sufficient availability of latrines to avoid queuing and adequate siting of latrines and adequate latrine design to prevent contamination of water sources.

4. Habituation with, and evidence of, regular use of hand-washing facilities and soap, in particular before meals and after latrine use, especially for children. Availability of sufficient numbers of hand-washing facilities and opportunities for usage.

5. Evidence that all containers and devices used for drinking water and food preparation, whether for carrying water or storing water, are kept in a safe condition, and that the methods employed to transfer water to and from containers or to the user (such as pipes, funnels, and stoppers) are safe.

6 Monitoring Guidelines

Monitoring reports must be submitted as a requirement for performance verification. The project developer may choose either a biennial or annual basis for verification. The monitoring report must address the qualitative parameters table below, and also contain a section in which the WBCs are calculated, with separate sections describing the monitoring approach taken and findings in respect of all quantitative parameters.[20]

In the case of PoAs, sampling of one or more parameters can be undertaken across Component Projects[21], where suitable justification is provided.

6.1 Qualitative parameters and controls

The table below lists parameters with values which are not used to calculate the number of WBCs generated, but which are nevertheless required for verification of WBCs. The table indicates the mode of monitoring required, and provides the heading required in the annual monitoring report.

Qualitative Parameters	Description	Monitoring mode
Hygiene[22]	Clean Water must be handled hygienically, and hygiene amenities and habituation must be adequate, to a degree that minimises risk of infection by water borne disease	Conduct an annual assessment of the level of continuous advice, guidance, training, appropriate to need for hygiene improvements; annual assessment of adequacy of hygiene intervention to minimise risk of infection by water related disease. Annual update of the hygiene assessment method used by the project. In Water Access projects, refer to Section 5.5.1.
Human right to access clean water	Projects must not run counter the principle of human right to access to clean water.	The project must demonstrate that it generates no net decrease in reliable daily access to clean water by the poorest segment of the population of the project area of influence, in comparison to the baseline scenario as outlined in the WRA of the Requirements doc. The assessment should be made on basis of credible testimonies, outcomes of stakeholder consultations, or of studies referring to people living on less than USD2 per day (or relevant poverty threshold local to project area) living within the project's area of influence. In the case of adverse situations, evidence may be shown that effective social welfare mechanisms assist this population and ameliorate the situation sufficiently; and that the sum of the project impact and the impact of such mechanisms together generates no net decrease in access.
Capacity	Capacity of Project Sources and Technologies/Measures must be sufficient for the volumes used to calculate WBC's.	The water volume values used in the calculations of WBCs must be justified in terms of capacity of the Improved Sources. For example, filter specification and chlorine

[20] Sampling within Projects and Components Projects must demonstrate confidence/precision levels of 90%/15%.
[21] In the case of cross-component sampling, confidence/precision levels of 90%/10% must be achieved.
[22] A qualitative parameter for all projects, and in addition a quantitative parameter for WASH projects.

		supplies must be shown to match consumption, and usage rates of groundwater sources must be shown to match evidence that yield is sufficient.
Baseline	Major changes to baseline assumptions must be reported.	Report every year on significant changes to the project certification calculation assumptions caused by major interventions (for example introduction of piped water systems in a point-source project area, undertaken without project involvement)
Impact monitoring	Developmental, social and environmental impacts must be monitored as per Gold Standard requirements.	Monitoring must follow the procedures for sustainable development, and do-no-harm impact assessment specified in the Gold Standard Foundations Requirements documents. Particular attention should be paid to ensuring the project does not conflict with the human right to access to clean water; also to maximization of equitable benefit without large disparities in WBCs generated by project population sub-groups.

6.2 Quantitative parameters

The table lists parameters with values used in the calculation section presented above, together with the mode of monitoring required. Where specified in the table, default values may be used in place of measurement, and where specified, research may be used in place of measurement. Where research is applied, reference must be given to credible studies, and the appropriateness of the figure in terms of distinguishing features of the specific project area must be justified (the value may be adjusted to account for distinguishing features[23]).

Quantitative Parameters	Description	Monitoring Mode	Minimum Monitoring Frequency
$P_{t,x,c,y}$	Number of persons registered / using project sources	The value may be derived from average household size figures which are referenced and justified. The value is determined by continuous tracking or by sampling. Justification must be given as to why the monitoring method and frequency chosen is the most appropriate. The value of P must be appropriate in terms of time period t, by calculation of person-days[24]	Continuous tracking (for example tracking sales of filters) or sampling at least every 3 months
$OD_{t,x,c,y}$	Average operational days of the Sources	The parameter is monitored either by continuous recording or through surveys. In projects disseminating point-of-use technologies (such as household water filters), sampling surveys may be used.	3 months
$H_{t,x,c,y}$	Degree to which the premises and the users handle Clean Water hygienically, expressed as a fraction	This parameter is determined through surveying which may involve sampling. Frequent monitoring in the order of monthly or 3 monthly is recommended in order that monitoring acts as a driver of change. For the same reason it is recommended that all communities are included in samples.	12 months

[23] For example the average number of persons living in a rural domestic home may be treated as a constant for each year of the project, if a credible source such as a national census is referenced; if the unique characteristics of the project area necessitate an adjustment or weighting to a generalised figure of this sort, this adjustment must be provided with justification.
[24] For example a community of 500 people included in the project half of the way through a 3 month period t would count as 500 * 45days/90days = 250 people over period t.

H_b	No quantitative value is needed for Water Access projects unless Access projects intend to become WASH projects in the second phase. For WASH projects, H_b is the percentage satisfaction of hygiene indicators within each project component, at time of inclusion, following hygiene monitoring guidelines specified in this methodology.	The Baseline hygiene level is assessed using the same hygiene parameters and assessment protocol that is used during the project. H_b is determined in respect of each project component as a condition of launch of inclusion of each project component. Reference to studies and values found in other components may be used if no evidence of change is provided.	n/a
$QD_{t,x,c,y}$	Fraction of point-of-use drinking water Sources which pass the Quality test. Bacterial quality must be <1 cfu/100ml subsequent to the first seven years of any one project component. In the first seven years tests must show compliance with the WHO low-risk standard[25] of <10cfu/100ml.	Water quality is the primary determinant for defining the length of time period t which must be no more than three months. Within this restriction, the frequency adopted must be justified, as the correct frequency depends on type of technology, local and seasonal conditions, and must comply with either international or national standards (or evidence provided to the verifier of government no-objection which may be verbal). In the case of point-of-use technologies, sampling may be used. In the case of shared point sources, all sources must be tested. [26] In the case of water transported by lorry or other vehicle, water quality tested at the source must be assured by a "certificate of delivery" assuring that quality standards have been	3 months

[25] The Stockholm framework issued by WHO states that 'tolerable health based targets' must be 'realistic and achievable', and 'should consider cost-effectiveness'. This intermediate standard is therefore adopted in order that progress at scale toward the desired standard of <1 cfu is achievable. The WHO publish this low risk limit in "A toolkit for monitoring and evaluating household water treatment and safe storage programmes, WHO 2012". The WHO Guidelines for Drinking Water Quality, Fourth Edition, state: "In many developing and developed countries, a high proportion of household and small community drinking-water systems, in particular, fail to meet requirements for water safety, including the absence of E. coli. In such circumstances, it is important that realistic goals for progressive improvement are agreed upon and implemented".

[26] Where project developers conduct their own water quality testing, minimum laboratory standards must be met. Developers must demonstrate the following:

1. Laboratories used for water quality testing must be approved by local health authorities; and
2. The laboratory used must demonstrate that it has an adequate quality management plan in place which addresses both quality assurance and quality control test procedures.

		met. Where this is not available, water must be tested at all points of delivery.	
$WD_{t,x,c,y}$	Litres of water provided for drinking per person per day	If a default value is chosen then no monitoring is required. Otherwise this value must be determined by surveying (sampling may be used). The measurement method must be shown to be conservative. The value derived must not be greater than the capacity of the sources.	NA if default used. 12 months if monitored
$UD_{,t,x,c,y}$	Fraction of daily drinking water from project source when operational in year y	This parameter must be determined by surveying, and justified as appropriate for the circumstances and technology/measure. Sampling may be used. The survey must determine what percentage of drinking water consumed by project beneficiaries comes from the project source when operational.	3 months
$WF_{t,x,c,y}$	Litres of water provided for food prep/clean-up per person per day	As for drinking sources	As for drinking sources
$UF_{,t,x,c,y}$	Fraction of daily food prep water from project source when operational in year y	As for drinking sources	As for drinking sources
$QF_{t,x,c,y}$	Fraction of food preparation water Sources which pass the Quality test. Bacterial quality must be <1 cfu/100ml subsequent to the first seven years of any one project component. In the first seven years tests must show compliance with the WHO low-risk standard[27] of <10cfu/100ml.	Water quality is the primary determinant for defining the length of time period t which must be no more than three months. Within this restriction, the frequency adopted must be justified, as the correct frequency depends on type of technology, local and seasonal conditions, and must comply with either international or national standards (or evidence provided to the verifier of government no-objection	3 months

[27] The Stockholm framework issued by WHO states that 'tolerable health based targets' must be 'realistic and achievable', and 'should consider cost-effectiveness'. This intermediate standard is therefore adopted in order that progress at scale toward the desired standard of <1 cfu is achievable. The WHO publish this low risk limit in "A toolkit for monitoring and evaluating household water treatment and safe storage programmes, WHO 2012". The WHO Guidelines for Drinking Water Quality, Fourth Edition, state: "In many developing and developed countries, a high proportion of household and small community drinking-water systems, in particular, fail to meet requirements for water safety, including the absence of E. coli. In such circumstances, it is important that realistic goals for progressive improvement are agreed upon and implemented".

		which may be verbal). In the case of point-of-use technologies, sampling may be used. In the case of shared point sources, all sources must be tested.	
$WB_{t,x,c,y}$	Litres of improved water provided for bathing[28] per person per day	As for drinking sources	As for drinking sources
$UB_{.t,x,c,y}$	Fraction of daily bathing water from project source when operational in year y	As for drinking sources	As for drinking sources
$QB_{t,x,c,y}$	Fraction of bathing water Sources which pass the Quality test. Bacterial quality must be <1 cfu/2000ml	Water quality is the primary determinant for defining the length of time period t which must be no more than three months. Within this restriction, the frequency adopted must be justified, as the correct frequency depends on type of technology, local and seasonal conditions, and must comply with either international or national standards (or evidence provided to the verifier of government no-objection which may be verbal). In the case of point-of-use technologies, sampling may be used. In the case of shared point sources, all sources must be tested.	Annually
$WL_{t,x,c,y}$	Litres of improved water provided for laundry[29] per person per day	As for drinking sources	As for drinking sources
$UL_{,t,x,c,y}$	Fraction of daily laundry water from project source when operational in year y	As for drinking sources	As for drinking sources
$QL_{t,x,c,y}$	Fraction of laundry water Sources which pass the Quality test. Bacterial quality must be <1 cfu/2000ml	Water quality is the primary determinant for defining the length of time period t which must be no more than three months. Within	Annually

[28] If bathing and/or laundry water does not come from an Improved Source, it must be treated and demonstrated that it complies with the EC bathing directive 76/160/EEC which requires <2000 cfu/100ml. The tests must be undertaken at least once a year for each source. Water not treated or not from an improved source is not eligible for certification, in accordance with eligibility requirements set out above.
[29] As for bathing water

		this restriction, the frequency adopted must be justified, as the correct frequency depends on type of technology, local and seasonal conditions, and must comply with either international or national standards (or evidence provided to the verifier of government no-objection which may be verbal). In the case of point-of-use technologies, sampling may be used. In the case of shared point sources, all sources must be tested.	
$WT_{t,x,c,y}$	Litres of improved water provided for flushing toilets per person per day	As for drinking sources	As for drinking sources
$UT_{,t,x,c,y}$	Fraction of daily toilet flushing water from project source when operational in year y. Applies only to non-domestic premises. Value is zero for domestic premises.	As for drinking sources	As for drinking sources

6.2.1 Individual Sources

Each source and application must be monitored separately. For example, if drinking water in a community is drawn from filters while food preparation water is drawn from rain water harvesting installations, separate monitoring is required for the filters and the rain water Sources, to determine the water quality of each type of source (Q), fraction of members using each type of source (U), and operational days (OD).

6.2.2 Frequencies

The project proponent may monitor parameters over different time periods, although they must then be resolved to a single time period t. Time period t is defined by the shortest period chosen, which for example may be water quality testing, or hygiene assessment (some projects may choose the hygiene parameter to have the highest monitoring frequency, if it is found that frequent monitoring improves hygiene rapidly). For example, if sources are quality-tested each month while usage is tested each two months, then one month is set as the time period t and the value found for usage for the two month period is applied as the value for both of the one-month t periods.

The frequency may be different in different CPs due to varied circumstances. Within one CP, it may alter during the project duration to suit changes that occur over time. For example, some project areas may require monthly hygiene monitoring in early years, and then progressively move to less frequent intervals due to improvements in hygiene amenities and their usage. Justification must be provided annually to determine the appropriateness of the frequencies selected.

Annex A: Examples of PoAs

WASH PoA
As an example, a WASH PoA consists initially of a chlorination campaign in 10 communities. These communities belong to the first Component Project (CP). During the course of the first year it becomes clear that the adoption rate for chlorine is very low in in four communities and investigations are made of alternative options for clean water sources. An investment is made in groundwater pumping, and tests show that the ground water quality is acceptable. At the start of the second year hand-pumps are commissioned in four of the original 10 communities. The CP now comprises two technologies, 6 communities using chlorination and 4 communities using hand-pumps. The option of chlorinating hand-pumped water is also a possibility, should tests show an inadequate quality of hand-pumped water.

Monitoring is undertaken for hygiene levels in all communities both to quantify baseline levels and to quantify project levels. Monitoring of all parameters is undertaken separately for the two technologies and each monitoring procedure must separately achieve the required confidence/precision level. If hand-pump water is chlorinated, the technology monitored is the combined chlorination/hand-pump supply and purification system.

In the third year the PoA expands to a new geographic area. The PoA developer decides to include 30 communities in this new area as a second CP in the PoA, and decides to install hand-pumps in all the communities.

The PoA now comprises two CPs, one of which has two technologies/measures. In any one year, the total number of WBCs generated is calculated as the sum of the WBCs generated by each component and each technology/measure as expressed here:

$$WBC_y = WBC_{component1,\ technology(a),y} + WBC_{component1,\ technology(b),y} + WBC_{component2,\ technology(a),y}$$

Water Access PoA
As a first example, a project proponent wishes to sell uncontaminated water in peri-urban areas which have no immediate prospect of municipal piped water. It initially builds three water purification plants in one geographic area, and sells from these three plants through numerous outlet kiosks. The number of kiosks grows over time, but nevertheless the customers using the growing number of kiosks are deemed to be the same population, and to belong to the same CP, as they are mobile and can use any kiosks in the area. However the project starts a replication activity in a second town, and this is deemed to be a second CP with a second start date, since a different water consumer group is involved.

As a second example, a project proponent commences a project identical to the WASH PoA example described above but with two key differences: firstly, hygiene is not monitored (although a hygiene educational campaign is conducted), and secondly, no WBCs are claimed for non-drinking uses of water.

Annex B: Hygiene Surveys – Guidelines

Hygiene is assessed according to the following parameters. These parameters are described in more detail in the main text of the methodology.

1. General hygienic organization
2. Freedom from open defecation
3. Habituation with, and evidence of, regular use of latrines and latrine accessories and availability of sufficient numbers of clean, operational latrines and opportunities for usage.
4. Habituation with, and evidence of, regular use of hand-washing facilities and soap, in particular before meals and after latrine use, especially for children. Availability of sufficient numbers of hand-washing facilities and opportunities for usage.
5. Evidence that all containers and devices used for drinking water and food preparation, whether for carrying water or storing water, are kept in a safe condition, and that the methods employed to transfer water to and from containers (such as pipes, funnels, and stoppers) are safe.

A WASH WBC Project must monitor these parameters by application of an observation survey, that is, a series of observations must be made by well-trained surveyors. In order to ensure accurate results, spot-checking of surveyors' work by expert survey auditors is recommended, and accuracy is rewarded through appropriate measures (for example bonus payments, prizes, commendations, payments of fees on a performance basis).

The appropriate series of observation-indicators will vary depending on circumstances in the particular geographic and demographic area, and the types of water users (for example, schools have a different type of water user than do domestic homes).

However in many developing countries in rural communities, the essential requirements for hygiene and sanitation improvement are often the same, and it is therefore possible here to give an example of observation-indicators which may be adapted to be appropriate for many typical rural communities.

The example observation-survey table below shows a set observation-indicators which could be used in some rural communities. It assumes that people in the communities use clay pots or jerry cans for the drinking water, that they carry, and that chlorination or other treatment methods are not used; in another area or another project people may use another type of drinking water storage and may treat their water, and the project proponent is expected to vary the survey form accordingly.

Training must be given to the surveyors and auditors so that they understand how to use the survey form effectively. Each project must develop effective surveyor training practices and prepare a training manual linked to the specific observation survey table it uses. The table includes notes on application; it many cases the project developer should weight the individual indicators appropriately to circumstances.

1. General Cleanliness and Orderliness									
Compound clean /orderly?		Inside house clean and orderly?		Food storage clean?		Food storage protected?			
Good drying rack present?		Drying rack in use?		Good bath shelter present?		Bath shelter in use?		Clean kitchen?	
Observation notes:									

2. Freedom from Open Defecation					
No signs of open defecation?		No evidence of open defecation by adults?		No evidence of open defecation by children?	
Observation notes:					

3. Latrines																
Pit present?		Latrine in use?		Walls ?		Roof?		Clean ?		Lid present?	Cleansing?	Lid in use?		Latrine door?		
Observation notes:																

4. Hand Washing (HW) – engage in a polite conversation including this topic, to learn what is really happening. Ask to see water and soap for HW. Ask to see a demonstration of hand-washing, for example from a child.							
Soap/ash in use (is it wet)?		Tip tap or equivalent in working condition?		Water in tip tap or equivalent?		Hand Washing seen?	
HW before eating?		HW after toilet?		Water showing under HW area?		Correct HW technique seen?	
Observation notes:							

5. Containers – for water storage and transport					
Type of container	Regularly cleaned inside?	Cover(s) present?	Scoop clean, correctly stored & used properly?	Tap used for all drinking water & used properly?	All drinking water pots stored off ground?
Jerry cans					
Clay pots					
Observation notes:					

Explanatory Notes (see also refer to published literature on these topics)	
1. Cleanliness	These indicators are a good indication of habituation to good practice. The presence and usage of drying racks for utensils, food kept away vermin, and actively-used arrangements for bathing privately, suggest that the health conditions in this household are god, and that other hygienic practices are likely to be followed
2. Open Defecation	The presence of open defecation implies risk of infection from transmission by flies and by feet and hands. Open defecation includes defecation hidden by basic "cut and cover" techniques which also carry similar risks.
3. Latrine	Latrines tend not to be used if they are not private. Therefore, the presence of a functioning door is important (a cloth hanging across the opening is inadequate), also a roof and walls. Cleansing accessories are needed. A lid is necessary to prevent transmission by flies.
4. Hand-Washing	Regular and correct hand-washing is known to dramatically reduce transmission. The use of soap enhances this effect. Where soap is difficult to promote, ash can be used as a temporary equivalent. The best way to assess hand-washing, is to ask to see demonstrations; also to check if water is available and if there are signs of wetness indicating usage of facilities.
5. Containers	Contamination occurs when containers (for carrying and for storage) are allowed to become dirty. To check on regular cleaning, it is sufficient to inspect the containers, and also possible to ask to see a demonstration of cleaning method. In the case of clay drinking water pots, it is possible to promote designs which have narrow necks and taps – although where this is very difficult and scooping is used, it is possible to ask for a demonstration of how scooping is done. If scooping cannot be avoided, the scoop must be kept clean and used carefully so that fingers do not dip into the water.

Application	
The form is designed to be filled in for each of a sample of households. The size of the sample must be sufficient for statistical validity. Each tick box above invites a YES or NO result. The results must be recorded quantitatively (Yes=1, No= 0) and then extrapolated to a general result for the baseline or project. Extrapolation may be by simple summing or weighting may be inserted into the extrapolation calculation as considered appropriate. An example of weighting of the 5 categories is given here. It is possible to also weight the individual observation-indicators, within each category, appropriately for circumstances.	
Weighting example:	
Cleanliness	0.5
Open Defecation	0.5
Latrine	1.5
Hand-Washing	1.5
Containers	1
Total	5