

REVISION TO AMS-II.M. METHODOLOGY ELEMENT ASSESSMENT REPORT



Document Prepared by First Environment, Inc.

Methodology Title	Revision to AMS-II.M. Energy Efficiency from installation of low-flow water devices	
Version	1.0	
Methodology Category	Methodology	
	Methodology Revision	√
	Module	
	Tool	
Sectoral Scope(s)	03 – Energy Demand	

Report Title	First Methodology Element Assessment Report Revision for Challis Water Controls
Report Version	1
Client	Challis Water Controls
Pages	16
Date of Issue	10-28-2014
Prepared By	First Environment, Inc.
Contact	91 Fulton Street Boonton, NJ 07005 www.firstenvironment.com
Approved By	James Wintergreen
Work Carried Out By	Iris Caldwell (Lead Auditor) Luca Nencetti Michael Carim

Summary:

First Environment, Inc. (First Environment) was retained to provide the first assessment in the VCS double-approval process for the proposed Methodology Element titled, “Revision to AMS-II.M. Energy Efficiency from installation of low-flow water devices.” The Methodology Element expands upon the approved Clean Development Mechanism small-scale methodology AMS-II.M. to include energy savings from low-flow water devices installed in non-residential buildings and to include inline devices which do not permanently replace baseline faucets. The methodology revision also introduces alternative procedures for monitoring parameters and quantifying emission reductions.

The methodology assessment process consists of an independent third-party review of the Methodology Element. In particular, the methodology assessment shall confirm that the Methodology Element is consistent with relevant VCS rules and procedures. The assessment of the Methodology Element is done through a double-approval process, according to the VCS Standard, and is necessary to provide assurance to stakeholders of the quality of the Methodology Element. Following the completion of the second assessment, First Environment engaged in a reconciliation process to approve the final version of the Methodology Element taking into account revisions made during the second assessment and VCS Association’s review.

The methodology assessment was conducted using the VCS Standard, v3.4 as the criteria. Additionally, First Environment followed guidance in the VCS Methodology Approval Process, v3.5 and the VCS Program Guide, v3.5 and applied its professional judgment as informed by ISO 14064-3 in assessing the proposed methodology revision.

During the methodology assessment process, First Environment issued several clarification and corrective action requests – all of which were addressed sufficiently by Challis Water Controls and its consultants. First Environment is of the opinion that the “Revision to AMS-II.M Energy Efficiency from installation of low-flow water devices” as described in the Methodology Element, Version 1.0 dated June 6, 2014, meets all relevant VCS requirements.

Table of Contents

1 Introduction..... 1

 1.1 Objective 1

 1.2 Summary Description of the Methodology 1

2 Assessment Approach 1

 2.1 Method and Criteria..... 1

 2.2 Document Review 2

 2.3 Interviews 3

 2.4 Assessment Team 3

 2.5 Resolution of Findings..... 4

3 Assessment Findings 4

 3.1 Relationship to Approved or Pending Methodologies 4

 3.2 Stakeholder Comments..... 4

 3.3 Structure and Clarity of Methodology..... 7

 3.4 Definitions..... 7

 3.5 Applicability Conditions 7

 3.6 Project Boundary..... 8

 3.7 Baseline Scenario 8

 3.8 Additionality 8

 3.9 Quantification of GHG Emission Reductions and Removals 8

 3.9.1 Baseline Emissions 8

 3.9.2 Project Emissions..... 8

 3.9.3 Leakage..... 8

 3.9.4 Net GHG Emission Reductions and Removals..... 8

 3.10 Monitoring..... 9

4 Assessment Conclusion..... 9

5 Report Reconciliation..... 10

6 Evidence of Fulfilment of VVB Eligibility Requirements..... 10

7 Signature..... 10

Appendix 11

1 INTRODUCTION

1.1 Objective

This report is provided to Challis Water Controls (Challis) as a deliverable of the Verified Carbon Standard (VCS) methodology assessment process for the proposed revisions to the Clean Development Mechanism (CDM) small-scale methodology AMS-II.M., “Demand-side energy efficiency activities for installation of low-flow hot water savings devices,” Version 2.0 (AMS-II.M.). The proposed VCS methodology element (ME) is titled, “Revision to AMS-II.M. Energy Efficiency from installation of low-flow water devices.” This report provides a description of the steps involved in conducting the first methodology assessment as part of the VCS double-approval process and summarizes the findings of the first methodology assessment.

First Environment, Inc. (First Environment) was provided an initial version of the ME dated December 18, 2012. Based on this documentation, the Audit Team performed a document review and desktop audit, which resulted in clarifications and corrective action requests (discussed later in this report) and revisions to the ME. The Audit Team also reviewed revisions to the ME resulting from the second assessment and VCS Association’s (VCSA) review during the reconciliation phase (see Section 5 below). The final version of the ME, dated June 6, 2014, serves as the basis of the final conclusions presented herewith.

1.2 Summary Description of the Methodology

The ME expands upon the approved CDM small-scale methodology AMS-II.M. to include energy savings from low-flow water devices installed in non-residential buildings and to include inline devices which do not permanently replace baseline faucets. The methodology revision also introduces alternative procedures for monitoring parameters and quantifying emission reductions. More specifically, the revision allows for the use of reputable reference data or default factors instead of direct measurement of certain parameters required to determine the volume and temperature of water consumption by project and baseline devices.

Greenhouse gas (GHG) emissions reductions are achieved through reduced fossil fuel or electricity consumption required to heat the water. The same approach is used to determine the baseline scenario, demonstrate additionality as described in the original version of AMS-II.M. The ME provides revised procedures for determining methodology applicability, establishing the project boundary, monitoring water consumption and temperature, and quantifying annual energy savings with the project water devices.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

The methodology assessment scope is defined as an independent and objective review of the proposed ME. The methodology assessment is conducted using the *VCS Standard: VCS Version 3, 8 October 2013, v3.4* (VCS Standard) as the criteria. The *VCS Methodology Approval Process, 8 October 2013, Version 3.5* (VCS Methodology Approval Process); the *VCS Program Guide, 8 October 2013, Version 3.5* (VCS Program Guide); and the ISO 14064-3 standard guided First Environment’s process.

The assessment process was utilized to evaluate whether the ME is consistent with the stated criteria. A methodology assessment checklist was developed which summarizes the criteria used to evaluate the ME, the conformance of the ME with each criterion, and the Audit Team’s assessment findings. First Environment and Challis have agreed that a reasonable level of assurance be applied to this assessment.

The assessment process consisted of the following steps, each described in further detail below:

- conflict of interest review;
- selection of assessment team;

- kick-off meeting with Challis;
- development of the validation plan;
- desktop review of the ME and other relevant documentation;
- follow-up discussions with Challis for supplemental information, as needed, as well as the corrective action cycle; and
- report development.

Conflict of Interest Review

Prior to beginning any assessment project such as this, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the project. No potential conflicts were found for this project.

Selection of Assessment Team

Members of the Audit Team were selected based on their assessment experience, as further described in Section 2.4 below.

Audit Kick-off

The assessment process was initiated with a kick-off conference call on February 6, 2013 between First Environment and the primary Challis contact, Christopher Challis, and the consultants contracted by Challis to develop the ME, Susan Wood and Carrah Bullock, ICF Marbek.

The communication focused on confirming the assessment scope, objectives, criteria, schedule, and the information required for the methodology assessment.

Development of the Validation Plan

Based on the information discussed during the kick-off conference call, the Audit Team formally documented its validation plan and provided the validation plan to Challis.

Desktop Review

The Audit Team performed a desktop review of the ME and supporting documentation, as further described in Section 2.2 below.

Corrective Actions and Supplemental Information

The Audit Team issued requests for corrective action and clarification during the methodology assessment process, as described in Section 2.5. The corrective action and clarification requests and the responses provided are summarized in the Appendix.

Assessment Reporting

This methodology assessment report documents the methodology assessment process and identifies its findings and results.

2.2 Document Review

Eligibility requirements, baseline approach, additionality, project boundary, emissions, leakage, monitoring, data and parameters, and other pertinent criteria were assessed to evaluate the ME against VCS program requirements. Discrepancies between the assessment criteria and the ME were considered material and identified for corrective action, as further described in Section 2.5.

During the desktop review, the Audit Team reviewed the following:

- public comments posted to the VCS website and Challis' written responses;
- CDM methodologies, tools, and guidelines, including clarifications and guidance issued by the small-scale working group;
- "Enhanced capital allowance scheme for water – Water Technology Criteria List," Department of Environment Food & Rural Affairs, June 2013;
- "Assessment of the performance of the M3158A Challis Water Widget," GASTEC at CRE Ltd, October 2011;
- Water Regulations Advisory Scheme letter of approval to Challis;
- sample calculator tools prepared by Challis;
- sample surveys prepared by Challis and summaries of participant responses.

2.3 Interviews

The Audit Team held teleconferences with the following individuals throughout the course of the methodology assessment:

- Christopher Challis – Challis,
- Susan Wood – Independent Consultant,
- Carrah Bullock – ICF Marbek,
- Duncan Rotherham – ICF Marbek.

2.4 Assessment Team

The Audit Team consisted of the following individuals who were selected based on their assessment experience:

Iris Caldwell, Lead Auditor: Ms. Caldwell is a Senior Engineer on First Environment's team providing climate change management services with a focus on GHG inventory development, offset project validation and verification, and other technical assistance. She has provided project validation and verification services for numerous energy demand projects under the Climate Action Reserve and VCS registries, including biogas-to-energy, waste energy recovery, and biomass fuel switch projects. Additionally, she has performed methodology assessments under VCS for at least two other methodologies in the energy demand sectoral scope, as well as three methodologies in other sectoral scopes.

Michael Carim, Auditor: Mr. Carim is a Senior Associate on First Environment's team providing climate change management services with a focus on GHG inventory development and verification, verification of methane destruction projects, and strategic GHG management. He has provided validation and verification services to over a dozen renewable power projects registered under VCS and led five methodology assessments under VCS, including three methodologies in the energy demand sectoral scope.

Luca Nencetti, Auditor: Mr. Nencetti is an Associate on First Environment's team providing climate change management services with a focus on GHG inventory projects, offset projects, and offset methodologies under VCS. He has provided validation and verification services for multiple methane destruction and energy demand projects under VCS.

James Wintergreen, Independent Internal Reviewer: Mr. Wintergreen is a Senior Associate on First Environment's team providing climate change management services with a focus on development of corporate climate change strategies and GHG management programs, technical and financial evaluations of GHG management projects, and oversight of GHG verification activities. He has developed or verified numerous GHG inventories in the oil, gas, and electricity generation sectors under The Climate Registry,

California Air Resources Board, and California Climate Action Registry. He has served as an independent internal reviewer for the majority of the offset validation and verification projects conducted by First Environment under the VCS program, including many projects and methodologies in the energy demand sectoral scope.

A VCS-approved expert was not retained for the purposes of this methodology assessment. In accordance with the VCS Standard, a VCS-approved expert is not necessary for non-AFOLU ME assessments where a standardized method is not applied.

2.5 Resolution of Findings

As described in Section 2.1, the Audit Team issued formal requests for corrective action, clarification, and supplemental information during the methodology assessment process. In particular, discrepancies between the ME and the VCS Standard were identified for corrective action. Clarification and supplemental information requests served to provide the Audit Team additional context or background information in order to complete the assessment process. Challis was given the opportunity to resolve the findings through the submittal of additional evidence or justification, revisions to the ME, and/or other means as appropriate.

The Audit Team raised a total of eight corrective action requests and five clarification requests over several rounds of assessment and revision of the ME by Challis. One of the main points of discussion raised early in the assessment was the appropriateness of proposing an entirely new methodology versus modifying the existing AMS-II.M. methodology. After an in-depth analysis and discussion of the proposed project activities and scope of the methodology, also including consultation with the VCSA, it was concluded that a revision of the existing CDM methodology was the correct approach to follow.

The key findings raised by First Environment during the methodology assessment process included:

- inadequate mechanisms in place to ensure inline devices remain in operation during the crediting period;
- lack of detail surrounding the types of devices that are eligible to be used by project proponents;
- lack of detail surrounding the reference data and/or default factors that are acceptable for use by project proponents in the quantification of emission reductions; and
- inconsistencies in the quantification methodologies given in the ME.

The specific corrective action and clarification requests issued by the Audit Team, as well as the responses provided by Challis, are summarized in the attached appendix. As indicated, Challis adequately resolved all of these requests.

3 ASSESSMENT FINDINGS

3.1 Relationship to Approved or Pending Methodologies

The CDM small-scale methodology AMS-II.M. was identified as having the closest similarity in scope as the project activities proposed by Challis. AMS-II.M. comprises activities for direct installation of low-flow hot water savings devices used in residential buildings. As summarized in Section 2.5, an in-depth analysis and discussion led to the conclusion that the proposed methodology scope by Challis could be achieved through a revision of AMS-II.M., rather than development of a new methodology.

3.2 Stakeholder Comments

The ME received several comments in the original submission as a proposed new methodology. Challis took account of the comments, and as a result, proposed a revised ME based on AMS-II.M., rather than pursuing an entirely new methodology.

The summary of the comments and Challis' response is included in the table below.

Stakeholder Comment	Summary of Developer Response	Assessment of Response
<p>1.1) Methodology fails to assure that a fully functional Flow Restrictor Aeration Device (FRAD) is in place throughout the crediting period. For e.g., how are the operational hours of each FRAD ensured. When the FRAD is detachable, how is it ensured that FRADs are not removed and reinstalled during the monitoring period claiming VERs for the period not in operation. This is precisely the reason AMS.II M. has made the device an integral and non-removable part of the shower.</p>	<p>The ME was revised to include the definition of "inline device," which specifies that the device cannot be a simple external attachment. The requirement of providing the same level of service and comfort, as included in original the AMS-II.M., is maintained and is essential to avoiding device tampering or removal during the crediting period.</p>	<p>Response is satisfactory.</p>
<p>1.2) Methodology fails to ensure the FRAD is not changed / replaced during the course of monitoring period, for maintenance or other reasons.</p>	<p>The revised ME introduces guidelines for annual sampling of device operational status. Project-specific monitoring will address how to account for maintenance and removal of devices.</p>	<p>Response is satisfactory.</p>
<p>1.3) $Q_{water,b}$ and $Q_{water,p}$ are based on sampling. Flow rates are function of each showerhead design (both in baseline and project scenarios). If the baseline showerheads have different flow-rates, flow-rate of which showerhead will be used for the computation of baseline emissions and what is the procedure for the sampling?</p>	<p>These parameters were renamed in the revised ME. Additional detail was added to the parameter boxes in Section 9.1 and the description of sampling activities in Section 9.3. This guidance ensures that conservative values are used in the quantification of emission reductions.</p>	<p>Response is satisfactory.</p>
<p>1.4) Author's assumption is duration of the shower is constant in both baseline and project conditions (service level). What is the rationale for having such an assumption linked with the time? Why is the service level not linked to the volume. If the service level is linked to the Quantity of water used for shower, there are no emission reductions.</p>	<p>The ME was revised to expand the definition of equivalent level of service. As with AMS-II.M., the revised ME requires demonstrating equivalent level of service in order to ensure that factors such as duration of shower would not change from the baseline to project scenario.</p>	<p>Response is satisfactory.</p>
<p>1.5) Equations of $V_{water,b}$ and $V_{water,p}$ are not consistent.</p>	<p>The error was corrected in the revised ME.</p>	<p>Response is satisfactory.</p>
<p>2.1) The title "Showerhead Aeration Technology" and the proponent states that this methodology is associated with flow restriction aeration device which fixes between a shower hose and a showerhead. This is mystifying in that "aeration" is the introduction of air into the water stream. This is done in tips on the ends of faucets and in showerheads</p>	<p>The ME was revised to include any low-flow water devices, not just aeration devices.</p> <p>Challis further defined "inline device" and included an additional technical standard reference for the qualification of such devices.</p>	<p>Response is satisfactory.</p>

Stakeholder Comment	Summary of Developer Response	Assessment of Response
<p>designed with this function. I'm not aware of any capability to aerate shower water before the water enters the showerhead. Most likely, this proponent speaks of an insert that restricts the diameter of the flow opening – a restrictor only.</p>		
<p>2.2) It is my understanding that VCS supports CDM methodologies where feasible. The proponent states that CDM meth AMS-II.M could not be sufficiently revised because it is restricted to (a) residential buildings and (b) low-flow devices which permanently replace baseline faucets.</p> <p>Concerning (a): The UNFCCC EB record appears to be restricted to residential buildings only because that is what the proponent for that methodology requested because that was the type of project the proponent was pursuing. There's no reason the AMS-II.M couldn't be expanded simply removing the restriction to residential buildings.</p> <p>Concerning (b): There is a UNFCCC clarification of AMS-II.M that explains the meaning of 'permanently replace baseline faucets'. Under the clarification, inline devices are allowed and faucets do not themselves need to be replaced. It is allowed that the inline device may be entirely removable, but the installed device must not be able to be disassembled and disabled so as to remove the efficiency function. The agency's point, I think, is to disallow the common faucet tips that have in them easily removable flow restrictor washers.</p>	<p>In agreement with part (a) of the comment, Challis proposed a revised ME based on AMS-II.M., rather than pursuing an entirely new methodology.</p> <p>Regarding part (b), the ME was revised to include a definition of "inline device" in accordance with the referenced UNFCCC request for clarification.</p>	<p>Response is satisfactory.</p>
<p>2.3) The greatest CDM modification with this proposal is the change in baseline and project measurements from CDM AMS-II.M. For every measurement, the proposal would provide for an alternative of using an assumption supported by geographically specific available and reputable references. The UNFCCC EB rejected this type of option, requiring metering of a statistically representative sample for all methodology parameters, such as baseline flow rate, project flow rate, water temperature, and water volume use. The agency found that "studies" were not rigorous and subject to a</p>	<p>The ME was revised to include reputable, published statistical references in addition to the physical testing of the devices included in the original AMS-II.M. References and default factors selected must comply with relevant VCS requirements in order to ensure that the values are representative and/or conservative.</p> <p>Additionally, Challis asserted that AMS-II.M. has not been implemented due to the cost constraints of requiring physical testing of installation and operation of devices. The revised ME is intended to</p>	<p>Response is satisfactory.</p>

Stakeholder Comment	Summary of Developer Response	Assessment of Response
<p>significant amount of guessing. (Who takes a watch into shower and times themselves?) The language in this proposed meth. would significantly reduce the credibility of any assumed water savings.</p> <p>Why not just address the residential restriction and leave everything else the same? This proposal would greatly weaken (water down, haha) the integrity provided by AMS-II.M.</p>	<p>be more practicable.</p>	

3.3 Structure and Clarity of Methodology

The ME is consistent with the VCS template and the structure of the existing AMS-II.M. methodology.

The Audit Team confirmed that the instructions in the VCS methodology template were followed accurately. The methodology criteria and procedures are appropriately documented in the ME or referenced to the appropriate section of the original CDM methodology. The terminology utilized in the ME is consistent with that of the VCS program and the language appropriately and unambiguously identifies the necessary level of adherence to the methodology requirements. The criteria and procedures are appropriately described and the revisions introduced to the original CDM methodology are clearly identified. The criteria and procedures are readily applicable and consistent for appropriate auditing of the project activities.

3.4 Definitions

The ME introduces definitions of key terms either not included in the existing AMS-II.M. or requiring further clarification. Specifically, the ME defines “equivalent level of service” and “inline device.” These definitions are given in alphabetical order and provide the necessary clarity to ensure the terms are used consistently throughout the ME and by project proponents.

3.5 Applicability Conditions

The ME identifies several changes to the applicability conditions given in AMS-II.M. Specifically:

- Paragraph 1 was expanded to allow projects to occur in non-residential buildings as well.
- Paragraph 2 was expanded to include removable inline devices, as further defined in the ME, as eligible technologies.
- The Enhanced Capital Allowance (ECA) Scheme for Water – Water technology criteria list was added as an acceptable standard to Annex 1.
- Paragraph 6 (d) and (e) were revised to provide more flexibility to project proponents at device installation.
- Paragraph 7 was revised to only require an explanation of the method for collection, destruction, and/or recycling of baseline devices when baseline devices are removed as part of the project activity. Further, the ME specifies that an annual survey may be used to confirm installation of low-flow devices.

These revisions expand the applicability of the original AMS-II.M. methodology to allow for the inclusion of removable, inline low-flow water devices in non-residential buildings and provide alternative methods to assess device installation and project operation. The revised applicability conditions are appropriate for the project activities anticipated by Challis, and together with the new definitions establish clear criteria for assessing whether project activities and technologies are eligible under the methodology. The revised applicability conditions are consistent with the other revisions made to AMS-II.M. and the underlying assumptions and risks inherent in the quantification and monitoring procedures. Each of the revised applicability conditions is clearly written and sufficiently accurate to ensure appropriate determination of project conformance at the time of validation. Based on these observations, the Audit Team concluded that the revised applicability requirements given in the ME are appropriate, adequate, and consistent with the VCS Standard.

3.6 Project Boundary

No changes were made to the original requirements in AMS-II.M. for describing the project boundary and identifying relevant sources, sinks, and reservoirs (SSRs). The Audit Team confirmed that the procedures given in AMS-II.M. are adequate for projects applying the methodology revision.

3.7 Baseline Scenario

No changes were made to the original procedure in AMS-II.M. for determining the baseline scenario. The Audit Team confirmed that the requirements in AMS-II.M. are adequate for projects applying the methodology revision.

3.8 Additionality

No changes were made to the original procedure in AMS-II.M. for determining the baseline scenario. The Audit Team confirmed that the requirements in AMS-II.M. are adequate for projects applying the methodology revision.

3.9 Quantification of GHG Emission Reductions and Removals

3.9.1 Baseline Emissions

Consistent with the original AMS-II.M. methodology, baseline emissions are not separately quantified. See Section 3.9.4 below for further description of the Audit Team's conclusions.

3.9.2 Project Emissions

Consistent with the original AMS-II.M. methodology, project emissions are not separately quantified. See Section 3.9.4 below for further description of the Audit Team's conclusions.

3.9.3 Leakage

No changes were made to the procedure and determination for leakage emissions as included in AMS-II.M. The Audit Team confirmed that the procedures given in AMS-II.M. are adequate for projects applying the methodology revision.

3.9.4 Net GHG Emission Reductions and Removals

The general quantification approach for GHG emission reductions follows the procedure given in the original AMS-II.M. methodology. More specifically, emission reductions are calculated on the basis of the energy savings due to the reduction in the amount of water required to be heated as a consequence of the project implementation. The methodology revision introduces the option of utilizing default factors sourced from reputable, geographically specific, temporally relevant, published reference data to establish baseline and project activity parameters necessary to establish water flow rate and temperature. The methodology revision provides an alternative set of equations to be used when default factors are utilized.

The Audit Team reviewed the quantification procedure and concluded that it covers all of the GHG SSRs included in the project boundary as identified in accordance with AMS-II.M. The Audit Team reviewed the guidelines and requirements regarding the determination and use of default factors and determined them to be appropriate and in conformance with VCS requirements. The Audit Team also reviewed all formulae for accuracy and concluded that the approach to calculate GHG emission reductions is appropriate, adequately addresses the uncertainties associated with quantification, is without errors, and consistent with the VCS Standard.

3.10 Monitoring

The monitoring requirements and guidelines generally follow those given in the original AMS-II.M. methodology. The ME introduces two new parameters, i.e., $D_{\text{calculated}}$ and $W_{\text{p,calculated}}$, which are required in the event that the project proponent opts to use default factors. Additionally, several parameters originally given in AMS-II.M. are revised to allow for the use of default factors or alternative monitoring methods. The ME adequately establishes requirements for monitoring procedures, measurement frequency, and quality control and quality assurance for all data and parameters that have been added or modified as a part of the revision.

The Audit Team reviewed each data/parameter available at validation that was added or modified with respect to the underlying methodology and determined the appropriateness and accuracy of data unit, source of data, value applied, justification of choice of data or description of measurement methods and procedures applied, and purpose of data. The Audit Team concluded that the requirements given in the ME are clear and adequately rigorous to reduce uncertainties in the quantification of emission reductions.

The Audit Team reviewed each data/parameter monitored that was added or modified with respect to the underlying methodology and determined the appropriateness and accuracy of data unit, source of data, description of measurement methods and procedures to be applied, frequency of monitoring/recording, QA/QC procedures to be applied, purpose of data, and calculation method. The Audit Team concluded that the requirements given in the ME are clear and adequately rigorous to reduce uncertainties in the quantification of emission reductions.

The monitoring plan described in the original AMS-II.M. methodology was revised in the ME as follows:

- allows for further flexibility in the documentation of initial device installation;
- the option to perform biennial inspections is no longer allowed;
- provides additional guidance on sampling;
- requires additional project tracking and recordkeeping; and
- provides additional QA/QC guidance.

The Audit Team determined that the monitoring approach described in the ME meets the relevant requirements in the VCS Standard and is appropriate and adequate for project activities applying this methodology.

4 ASSESSMENT CONCLUSION

First Environment performed the methodology assessment of the ME as part of the VCS double-approval process. First Environment used the VCS Standard as the criteria for the assessment. The assessment process was further guided by the VCS Methodology Approval Process and the VCS Program Guide.

The review of the ME and the satisfaction of corrective action and clarification requests have provided First Environment with sufficient evidence to determine the fulfillment of stated criteria.

The ME was prepared in accordance with the VCS Standard, the VCS Methodology Approval Process, and the VCS Program Guide. The proposed methodology belongs to Sectoral Scope 03 – Energy Demand.

In summary, it is First Environment’s opinion that the ME titled, “Revision to AMS-II.M Energy Efficiency from installation of low-flow water devices” and dated June 6, 2014, meets all relevant VCS requirements.

5 REPORT RECONCILIATION

The second assessment resulted in a number of revisions to the ME, including:

- the addition of several key terms in Section 3, Definitions;
- further clarification of industrial installations that are not eligible under the methodology revision;
- additional guidance for the development of the monitoring plan and the survey methods in particular; and
- formatting and other minor edits throughout the ME to provide greater clarity.

First Environment reviewed these revisions in the final ME, Version 1.0, dated June 6, 2014. Based on this review and discussion with the VCS Association and Challis representatives, First Environment concluded that these revisions do not affect our initial determination that the ME meets all relevant VCS requirements.

6 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

First Environment, Inc. holds accreditation to perform validation for projects under Group 01 (GHG emission reductions from fuel consumption), as defined by ANSI. First Environment has also completed more than 10 previous methodology and project validations in ANSI Group 01. First Environment, therefore, is eligible under the VCS program to perform assessments for the ME, which falls under Group 01.

7 SIGNATURE

Signed for on behalf of First Environment, Inc. on 28 October 2014.



Iris Caldwell, P.E.
Senior Engineer



James Wintergreen
Senior Associate

APPENDIX

Resolution of Corrective Action Requests and Clarification Requests

ID	Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
1	<p>The ME does not clearly describe areas of uncertainty and how such uncertainty will be addressed as required by Section 4.1.4 of the VCS Standard, particularly for parameters where an assumption or default value is proposed. Additionally, the ME does not clearly identify procedures for determining conservative default values as required by Section 4.1.7 of the VCS Standard.</p>	<p>The original AMS-II.M. requires a 90% confidence interval to be applied when performing annual inspections. The revised ME defaults to this requirement. Section 8.2 of the ME was revised to specify the requirements, including a reference to the VCS Standard, for reference data and default factors used in the calculations.</p>	<p>Response is acceptable.</p>
2	<p>The ME does not provide adequate mechanisms for ensuring that emission reductions are real and verifiable, i.e., specifically, that devices are functional and in use during the entire monitoring period.</p>	<p>The revised ME includes an optional survey procedure in addition to the physical inspection method given in the original AMS-II.M. to ensure operation of the devices at installation and in subsequent years. The revised ME no longer allows inspections to occur on a biennial basis in order to increase level of assurance in sampling results. Additional guidance is also provided in the ME for selecting an appropriate sampling plan. Finally, Challis does not anticipate that devices will be removed during the course of the crediting period, because they will provide an equivalent level of service as the baseline devices.</p>	<p>Response is acceptable.</p>
3	<p>Please further expand the definitions of "device" and "equivalent level of service" to include any relevant technical specifications or factors that are necessary for project proponents to consider when applying the monitoring methodology, e.g., flow rate, duration of shower, temperature, etc.</p>	<p>The revised ME includes a definition for "inline device" and expands the description of "equivalent level of service," including a requirement that shower duration is unchanged between the baseline and project condition.</p>	<p>Response is acceptable.</p>
4	<p>The ME does not provide adequate mechanisms for ensuring that shower time remains unchanged in baseline and project scenarios. Please also further justify the use of the time variable as opposed to direct flow measurement when determining actual water consumption.</p>	<p>The revised ME expanded the definition of "equivalent level of service" to address shower duration. Equivalent shower duration between the baseline and project scenarios is implicit in the original AMS-II.M methodology as well, where baseline shower duration is calculated from project water volume/flow rate. Ensuring equivalent level of service is therefore the critical requirement in the original AMS-II.M. and current ME, rather than the time variable.</p>	<p>Response is acceptable.</p>

ID	Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
5	The ME does not address how the total number of devices are monitored or accounted for in the emission reduction calculations. Please also explain how the number of devices is related to the number of showers (N_{showers}) parameter.	The revised ME eliminates the N_{showers} parameter and instead relies on the number of devices as the original AMS-II.M. methodology does in the emission reduction calculations.	Response is acceptable.
6	Please address Comment 2(b) from the second public comment. In particular, please further define what qualifies as an acceptable "removable flow restriction unit."	The comment was addressed by including an expanded definition of "inline device" in the ME.	Response is acceptable.
7	The ME does not clearly describe the monitoring methods for confirming initial installation of the low-flow devices. For instance, it is confusing to have some requirements in Section 4 (Applicability Conditions) and others under the Data Management and Data Quality subsection. Please provide a comprehensive description of monitoring requirements for the initial installation of devices under the Monitoring Plan section of the ME.	<p>The ME was revised to include specific requirements for monitoring initial device installation and separate requirements for monitoring project operation, including guidelines for sampling plan.</p> <p>Where requirements are unchanged from the original methodology, the ME references AMS-II.M.</p>	Response is acceptable.
8	The ME does not separately identify data and parameters available at validation versus data and parameters monitored. Additionally, only parameters that are added, removed, or revised as part of the methodology revision should be included in the ME.	The revised ME correctly identifies parameters available at validation and monitored. Parameters already included in AMS-II.M. and unchanged in the current ME were eliminated.	Response is acceptable.

ID	Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
1	Please clarify whether the standards given in Annex 1 of AMS-II.M. are also applicable for removable devices. If not, please expand Annex I as appropriate.	An additional standard by DEFRA was added for reference in Sections 1 and 4 of the ME.	Response is acceptable.
2	Please clarify what is meant by the following statement in Section 6 of the ME: "The tool shall be applied with baseline alternatives and project scenarios categorized by project units."	The ME was revised to directly reference the procedure indicated in AMS-II.M.	Response is acceptable.
3	Please clarify in the ME whether an investment analysis is required or optional when applying the CDM Combined tool to identify the baseline scenario and demonstrate additionality.	The ME was revised to directly reference the procedure indicated in AMS-II.M.	Response is acceptable.
4	Please clarify what is meant by "applicability project type/sector" under the project database requirements in the Monitoring Plan section of the ME.	The ME was revised to more clearly reference "Project type (residential or commercial)" in Section 9.3.	Response is acceptable.
5	Please clarify the purpose of monitoring $W_{P,measured}$ and $W_{P,calculated}$ on an annual basis, as described in the Monitoring Plan section of the ME.	This requirement was removed from Section 9.3 of the ME.	Response is acceptable.