

FIRST ASSESSMENT REPORT FOR THE REVISIONS TO AMS-III.BC TO INCLUDE MOBILE MACHINERY



Document Prepared By Stantec Consulting Ltd.

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Summary:

Stantec Consulting Ltd. was retained to assess the proposed Methodology Revision entitled “Revisions to AMS-III.BC to Include Mobile Machinery”, version 2.11 (March 13, 2013). This Methodology Revision provides the procedures for the quantification of net greenhouse gas (GHG) emission reductions from the retrofitting of vehicles and mobile machinery to increase energy efficiency. Stantec assessed the Methodology Revision against VCS program requirements found in the *VCS Methodology Approval Process* document, the *VCS Program Guide*, and the *VCS Standard*. An internal assessment document was used to conduct the assessment.

The draft first assessment report, reflected in the body of the report, was completed on version 2.4 (August 8, 2012). This final first assessment report was completed on the Methodology Revision version 2.11 (March 13, 2013).

Stantec found that the Methodology Revision, in its current form, does not contain non-conformances that affect the usability of the Methodology.

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1 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by the Carbon Offset Aggregation Cooperative (COAC) to assess the proposed Methodology Revision, hereafter referred to as the “Methodology”, entitled “Revisions to AMS III.BC to Include Mobile Machinery” (version 2.4, dated August 8, 2012, developed by Grütter Consulting (Grütter)).

It is noted that the title of the Methodology has changed following a review by the VCS. The previous title was “GHG Methodology for Efficiency Improvements of Vehicles and Mobile Machinery”.

1.1 Objective

The objective of the Methodology assessment is to compare the proposed Methodology against the requirements of the criteria documents listed below in Section 1.2 and identify any non-conformances. The findings of this assessment are described in the report presented herein.

1.2 Scope and Criteria

The proposed Methodology assessed in this report is entitled “Revisions to AMS-III.BC to Include Mobile Machinery”, version 2.4, dated August 8, 2012.

The Methodology was compared to the requirements described in the following documents:

- *VCS Methodology Approval Process* (Version 3.3, February 1, 2012);
- *VCS Methodology Template* (Version 3.0);
- *VCS Standard* (Version 3.3, May 1, 2012); and
- *VCS Program Guide* (Version 3.2, February 1, 2012).

The Methodology was also assessed for clarity, completeness, structure, and logic in the context of the VCS program and industry practice.

1.3 Summary Description of the Methodology Element

The proposed Methodology is a revision of an approved CDM methodology entitled “Emission Reductions through Improved Efficiency of Vehicle Fleets”, developed by Grütter Consulting. The methodology was approved on July 20, 2012 at Executive Board Meeting 68.

The proposed Methodology was developed to provide guidance on the quantification of greenhouse gas (GHG) emissions reductions associated with energy efficiency projects for vehicles and mobile machinery. Potential energy efficiency projects include, but are not limited to:

- Anti-idling devices;
- Eco-drive;
- Tire-rolling resistance improvement;

- Air-conditioning system improvement;
- Low viscosity oils;
- Aerodynamic drag reduction measures;
- Transmission improvements; and
- Other energy efficiency improvement measures identified by the project owner ex-ante (before) project start.

A project is defined as an activity, initiative, or program to reduce GHG emissions compared to a known baseline scenario. The baseline scenario may be the existing condition or another scenario that the project developer has identified as being representative of the conditions had the project not proceeded.

The sources of GHG emissions included in the analysis are the combustion of fossil fuels during operation of the vehicles and mobile machinery and GHG emissions from electricity use in hybrid or electric vehicles. Other upstream and downstream sources are excluded from analysis and justification for those excluded sources is provided in the underlying CDM methodology. There are no relevant GHG sinks or reservoirs associated with the proposed project activity.

The Methodology states that the procedure for determining the Baseline Scenario is identical to the underlying methodology.

Project and Baseline emissions are quantified using baseline and project emission factors, derived from the specific fuel consumption of the vehicle or mobile machinery, and the activity level monitored during the Project. The activity level indicator for mobile machinery must be identified in the project document.

For mobile machinery, the Methodology requires the proponent to monitor:

- Fuel consumption by project and for baseline units;
- Activity level indicator; and
- Methane emission factor (from published literature).

It is noted that the carbon dioxide emission factor (from published literature) is described in the underlying methodology.

For hybrid or electric vehicles, monitored data requirements and calculations are provided in a separate (referenced) CDM methodology.

Net GHG emission reductions are calculated as the difference between baseline emissions and project emissions.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

Stantec conducted an internal assessment of the Methodology and prepared this document specifically for the VCS program. Stantec reviewed the proposed Methodology against the requirements of the criteria listed in Section 1.2 above and identified any issues or non-conformances. The internal assessment document was reviewed by the Peer Reviewer and the Lead Assessor. A number of iterations of the draft first assessment report were provided to COAC for the resolution of non-conformances found during each review.

2.2 Document Review

The Stantec team reviewed the requirements of the VCS program by studying the documents listed in Section 1.2. Stantec then reviewed the proposed Methodology with consideration of the VCS program requirements.

2.3 Interviews

Stantec did not find it necessary to conduct any interviews during this assessment of the Methodology.

2.4 Use of VCS-Approved Expert

Stantec did not rely on a VCS-approved expert as part of this assessment, as this Methodology is not relevant to Agriculture, Forestry, and Land Use (AFOLU) projects.

2.5 Resolution of Any Material Discrepancy

In this assessment, material discrepancies found during the review of the Methodology are identified, where they exist. The COAC is responsible for addressing these material discrepancies, in accordance with the *VCS Methodology Approval Process*. Table 4.1 (below) contains the non-conformances identified during the assessment (from the first version onward) and the responses from COAC.

2.6 Internal Quality Control

Stantec is accredited with the American National Standards Institute (ANSI) (a member of the International Accreditation Forum) in accordance with ISO14065 (accreditation ID #0805 issued to Stantec Consulting Ltd. in February 2011 and updated July 9, 2012 for greenhouse gas (GHG) verification). As part of the accreditation, Stantec developed a Validation and Verification Standard Operating Procedure (SOP) to be followed in conducting validation and verification projects. The quality control and assurance procedures described in the SOP were applied to this methodology assessment. A summary of the relevant quality control and assurance procedures include:

- Review of internal sampling document and report by a Peer Reviewer: the Peer Reviewer is a Stantec employee knowledgeable in GHG estimation, validation, and verification, as

well as being a senior practitioner within Stantec. The person fulfilling this role remains an independent reviewer during the course of the assessment.

- Review of the internal sampling document and report by the Lead Assessor: the Lead Assessor is a Stantec employee knowledgeable in GHG estimation, validation, and verification, and is responsible for managing the assessment; and
- The Stantec team members have successfully completed the ISO 14064 Greenhouse Gas Verification Training course.

3 ASSESSMENT FINDINGS

3.1 Applicability Conditions

The applicability conditions mobile machinery are identical to the underlying methodology, except where noted in the Methodology. The changes to the applicability conditions include:

- Allow for other potential efficiency measures (determined before project start);
- Applicability condition 4 in the CDM methodology does not apply to this revision;
- Applicability condition 5 in the CDM methodology (emissions cap) refers to the activity level indicator used for mobile machinery; and
- Applicability condition 10 in the CDM methodology now includes mobile machinery.

The applicability conditions that are present in the Methodology (with respect to mobile machinery) are deemed by Stantec to be appropriate, adequate, and in conformance with VCS rules. The conditions adequately define the project activities, are appropriate for a transportation project, and conform to VCS rules by providing direct and transparent information.

3.2 Project Boundary

In the Methodology, the project boundary is identical to the underlying CDM methodology.

The project boundary has been adequately and appropriately defined in terms of geographic area, GHG sources, and GHG types. These are consistent with the VCS rules.

3.3 Procedure for Determining the Baseline Scenario

The Methodology indicates that procedure for determining the baseline scenario is identical to the underlying CDM methodology. This is appropriate, adequate, and consistent with VCS rules, as the inclusion of mobile machinery does not affect the selection of the project boundary.

3.4 Procedure for Demonstrating Additionality

The Methodology indicates that the demonstration of additionality is identical to the underlying CDM methodology.

Based on this information, Stantec considers the additionality demonstration to be adequate, appropriate, and consistent with VCS requirements.

3.5 Baseline Emissions

The calculation of baseline emissions from mobile machinery was assessed, as the calculation for emissions from vehicles is identical to the underlying methodology.

Baseline emissions for mobile machinery are based on the operation of a control group. The mobile machinery in the control group may be selected randomly or from mobile machinery with comparable usage. The project owner must select and justify an activity level indicator according to the criteria in the Methodology.

The baseline emissions approach would provide a high quality baseline emission factor provided the sampling and statistical requirements identified in the Methodology are met. Since the activity indicator used is also used for project emissions and monitored, the baseline emissions approach is considered by Stantec to be appropriate and adequate for the Methodology.

The VCS requires methodology elements, where applicable, to apply a 90% or 95% confidence interval. If these intervals are applied, and the width of the confidence interval exceeds 20% or 30% of the estimated value (for 90% and 95% confidence intervals, respectively), then the Methodology is required to include a confidence deduction. The Methodology was found to be consistent with the VCS requirements as the baseline calculation methodology requires the confidence interval width to be checked when sampling data. The Methodology indicates that a confidence deduction is required if the value is not within 30% of the confidence interval width. The Methodology requires an additional check for homogeneity with respect to the baseline emission factor.

For electric or hybrid vehicles, the baseline emission factor is determined in accordance with the latest version of the CDM methodology AMS-III.C “Emission reductions by electric and hybrid vehicles”. This methodology contains sufficient information to allow project proponents to estimate baseline emissions from electricity use.

If a gaseous fuel is to be used, the baseline calculations allow for the calculation of methane emissions.

Stantec considers the formulas used to calculate baseline emissions to be appropriate, adequate, and consistent with VCS rules.

3.6 Project Emissions

The calculation of project emissions from mobile machinery was assessed, as the calculation for vehicles is identical to the underlying methodology.

For mobile machinery, project emissions are calculated based on the activity level indicator, specific fuel combustion, and an emission factor for CO₂. If a gaseous fuel is used, the project calculations also allow for the calculation of methane emissions.

In the *VCS Standard*, the VCS requires that the units of quantified emissions be metric tonnes, and converted to tonnes carbon dioxide equivalent (t CO₂e) using the 100 year GWPs provided by the IPCC. The calculation methodology calculates emissions of CO₂e in the units of “tons”, and the Methodology defines “tons” in the glossary to be metric tonnes.

The Methodology was found to be consistent with the VCS requirements regarding the confidence interval check as the calculation methodology requires the confidence interval width to be checked when sampling data. The Methodology indicates that a confidence deduction is required if the value is not within 30% of the confidence interval width.

For electric or hybrid vehicles, the project emission factor is determined in accordance with the latest version of the CDM methodology AMS-III.C “Emission reductions by electric and hybrid vehicles”. This methodology contains sufficient information to allow project proponents to estimate project emissions from electricity use.

The *VCS Standard* requires that project emissions be calculated separately from baseline and leakage emissions. The Methodology is consistent with this requirement.

Stantec considers the formulas used to calculate project emissions to be appropriate, adequate, and consistent with VCS rules.

3.7 Leakage

The Methodology indicates that the calculation of leakage is identical to the underlying methodology. Stantec considers the calculation of leakage to be appropriate, adequate, and consistent with VCS rules.

3.8 Quantification of Net GHG Emission Reductions and/or Removals

The net GHG emission reductions are calculated as baseline emissions minus project emissions. This calculation is appropriate, adequate, and in compliance with VCS requirements.

3.9 Monitoring

With respect to mobile machinery, the monitored parameters are activity level, fuel consumption in the control group and project group, and the emission factor for methane (if gaseous fuels are used). The emission factor can be obtained from IPCC’s Guidelines for National Greenhouse Gas Inventories.

The monitoring procedures provided in the Methodology are identified for each monitored parameter, including a description of the measurement method and the frequency of monitoring. The Methodology provides adequate quality assurance or control procedures for the monitored data.

Stantec considers the monitoring procedures provided in the Methodology to be appropriate for the parameters to be monitored, adequate in description, and consistent with VCS rules.

3.10 Data and Parameters

The Methodology identifies the parameters to be monitored as part of the project. For each identified parameter, the Methodology provides a description of the parameter and a data source.

The methane emission factor may be obtained from regional or national sources, such as Environment Canada, or the IPCC default values at the lower 95% confidence interval. Environment Canada and IPCC are acceptable and adequate sources of emission factors and fuel information.

The Methodology has requirements with respect to the activity level indicator that are appropriate and adequate for use by project owners.

Based on this information, Stantec considers the monitored data, including the data sources and quality assurance information, to be appropriate, adequate for use, and consistent with VCS rules.

3.11 Use of Tools/Modules

The underlying methodology refers to the CDM “General guidelines for sampling and surveys for small-scale CDM project activities” tool with respect to sampling. This tool is from CDM, a VCS-approved program, and is therefore acceptable.

For electric and hybrid vehicles, the Methodology refers project proponents to the latest version of the CDM methodology AMS-III.C. This methodology is appropriate for the Methodology and is acceptable under the VCS rules, as the CDM is an approved GHG program.

No other tools or modules were referred to for mobile machinery.

3.12 Adherence to the Project Principles of the VCS Program

The VCS Program principles are relevance, completeness, consistency, accuracy, transparency, and conservativeness.

The Methodology demonstrated relevance by considering the emission source of fuel combustion for both baseline and project emissions.

The Methodology demonstrated completeness by referring readers to the underlying methodology for elements that are identical to the Methodology revision.

The Methodology demonstrated consistency by providing calculation methodologies that use the project activity level to calculate both the baseline emissions and the project emissions.

The Methodology demonstrated accuracy by requiring proponents to use a 95% confidence interval to determine certain parameters, and to check whether the confidence interval width is within 30% of the estimated value.

The Methodology demonstrated transparency by listing the sources that the Methodology uses.

The Methodology demonstrated conservativeness by requiring the calculated baseline emission factor to be the lower 95% confidence interval, and the project specific fuel consumption to be the upper 95% confidence interval. This procedure conservatively reduces the calculated net emission reductions calculated. The Methodology also demonstrated conservativeness by excluding emissions of CH₄ and N₂O from both the baseline and the project case for fuels other than natural gas, since these emissions are likely to be higher in the baseline than the project, due to a decrease in project fuel consumption.

Methodology Revisions of methodologies from the CDM program are subject to specific requirements in section 6.3 of the *VCS Methodology Approval Process*. Stantec found that the Methodology complies with these requirements.

3.13 Relationship to Approved or Pending Methodologies

The Methodology indicates that it is based upon the approved CDM small scale methodology AMS.III.B.C, entitled “Emission Reductions through Improved Efficiency of Vehicle Fleets” and developed by Grütter Consulting. The underlying CDM methodology is fully referenced, and the Methodology requires the use of the latest version of the CDM methodology. This methodology is available on-line from the CDM website.

The Methodology developer provided sufficient evidence to Stantec to support that the CDM methodology AMS.III.AA “Transportation energy efficiency activities using retrofit technologies” could not be reasonably revised.

Stantec considers the Methodology to adequately disclose approved or pending methodologies, and to refer proponents to the underlying CDM methodology.

3.14 Stakeholder Comments

According to the VCS website for the proposed Methodology (<http://www.v-c-s.org/methodologies/methodology-efficiency-improvements-hdv%E2%80%99s-and-mobile-machinery>), no comments were received during the comment period of March 10 to April 8, 2011.

4 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Stantec developed Corrective Action Requests and Clarification Requests relevant to Methodology version 2.0, 2.1, and 2.2. The Requests and responses by the methodology developer are provided in Table 4.1. Responses from the methodology developer are italicised.

The revision of the Methodology between version 2.3 and 2.4 were due to the release of the approved CDM methodology. Stantec had requested that the Methodology be updated in light of the changes to the approved CDM methodology.

Version 2.4 of the Methodology that was reviewed for this report includes edits made following a review by the VCS.

Table 4.1 Corrective Action and Clarification Requests

Area	Correction Action or Clarification Request	Response
<p>Compliance with VCS Methodology Revision requirements</p>	<p><u>Corrective Action:</u> Edit the Methodology to meet the VCS requirement “The methodology revision shall reference the (underlying) methodology that it is revising, including the methodology name, version number, issue date and approved GHG program. The methodology revision shall require the use of the latest version of such methodology, such that the methodology revision keeps pace with developments that may occur in the underlying methodology.”</p> <p><u>Corrective Action:</u> Edit the Methodology to meet the VCS requirement “...Where sections of the underlying methodology are not altered, this shall be stated in the relevant section of the methodology revision document.”</p> <p><u>Corrective Action:</u> Define “tons” to be metric tonnes.</p>	<p><u>Response:</u> <i>The revision is based on a pending and not yet approved methodology: CDM small scale methodology SSC-NM-0074. The SSC Panel has made a final version for approval at EB 67 in May 2012. The methodology template of the VCS refers also to pending methodologies.</i></p> <p><i>Text has been added on page 2. We have added the sentence. However we understand this sentence that we must use the latest version of the underlying meth. This has been done. Stantec is probably not aware of the latest version as this is not yet public, but will be made public next week, probably Monday on the UNFCCC website under SSC Panel meetings. (Stantec – Version 2.3 contains a reference to the underlying methodology and text requiring the latest methodology be used. The VCS requirement has been met).</i></p> <p><u>Response:</u> <i>Has been included. (Stantec – Version 2.3 addresses this VCS requirement).</i></p> <p><u>Response:</u> <i>Has been included. (Stantec – Version 2.3 includes this definition of tons).</i></p>
<p>Existing methodology demonstration</p>	<p><u>Corrective Action:</u> Add list of approved or pending methodologies in the Transportation sector.</p>	<p><u>Response:</u> <i>Has been included. (Stantec – Version 3.2 contains this list).</i></p>
<p>Additionality</p>	<p><u>Corrective Action:</u> Provide additional description on how project proponents are required to demonstrate additionality, in light of Section 4.6.1 of the VCS Standard.</p>	<p><u>Response:</u> <i>The additionality is based on an approved GHG program and the underlying methodology and the description and the approach are thus in accordance with point 4.6.2. of the VCS Standard which states: “Referencing and requiring the use of an appropriate additionality tool that has been approved under the VCS or an approved GHG program.” (Stantec – This was resolved with the addition of the regulatory surplus requirement below).</i></p>

Table 4.1 Corrective Action and Clarification Requests

Area	Correction Action or Clarification Request	Response
	<p><u>Corrective Action:</u> Section 4.6.1 of the VCS Standard requires that a Project Test for additionality include a test for regulatory surplus. The methodology does not meet this requirement.</p>	<p><u>Response:</u> <i>In chapter 7 the following sentence has been added: A test for regulatory surplus must be made in accordance with the VCS requirements on regulatory surplus. This is in accordance with the VCS Standard section 4.6.2. Note page 36. (Stantec – Version 2.3 of the methodology includes regulatory surplus requirement).</i></p>
<p>Applicability</p>	<p><u>Corrective Action:</u> Clarify within the Methodology document whether the Methodology can be applied to grouped projects, as defined in the <i>VCS Methodology Approval Process</i> document.</p> <p><u>Clarification Request:</u> Clarify how the use of a cab heater results in an increase in energy efficiency.</p>	<p><u>Response:</u> <i>Has been included. (Stantec – Version 2.3 of the methodology states that the methodology can apply to grouped projects).</i></p> <p><u>Response:</u> <i>Measure has been deleted. (Stantec – Measure has been deleted from version 2.3. Applicability conditions now reflect on fuel efficiency).</i></p>
<p>Quantification Methodologies</p>	<p><u>Corrective Action:</u> Include a requirement for project developers to check that the 95% confidence interval width is within 30% of the estimated value for the specific baseline fuel consumption when sampling and for the specific project fuel consumption.</p> <p><u>Corrective Action:</u> Clarify how baseline and project emissions from electric and hybrid vehicles are estimated, including information required for monitoring, such as electricity consumption.</p> <p><u>Corrective Action:</u> The Technology Improvement Factor is not included in the table of parameters known at validation, as it is for the underlying methodology.</p>	<p><u>Response:</u> (Stantec) The methodology was revised to version 2.3 to include this check.</p> <p><u>Response:</u> <i>As in the underlying methodology reference is made to the approved CDM methodology AMS-III.C latest version. (Stantec – Stantec determined that the latest version of this methodology contained sufficient information for project proponents).</i></p> <p><u>Response:</u> <i>No because based on UNFCCC determination you DO NOT include default parameters of the methodology under parameters known at the time of validation. They are part of the methodology itself and not a parameter the PP defines, calculates or has to proof. (Stantec – Stantec agrees with this assessment. No further action required. Note, the technology improvement factor was removed in the final version of the Methodology).</i></p>
<p>Monitoring</p>	<p><u>Corrective Action:</u> Relating to monitored parameters, move the net calorific value of fuel, CO₂ emission factor, and CH₄ emission factor entries from the monitored parameters</p>	<p><u>Response:</u> <i>This is not in compliance with the underlying methodology. These parameters are under monitored parameters</i></p>

Table 4.1 Corrective Action and Clarification Requests

Area	Correction Action or Clarification Request	Response
	<p>table to the data known at validation table.</p> <p><u>Corrective Action:</u> Provide quality assurance and control checks for the monitored parameters, including those used to develop the baseline emission factor.</p>	<p><i>as they might change over time. As the values are taken from IPCC, the practical requirement is that the latest version of the IPCC is taken during monitoring. (Stantec – Stantec agrees with this assessment, no further action necessary. Note that the final version of the methodology includes NCV and emission factors as not monitored parameters, to be consistent with the underlying methodology).</i></p> <p><u>Response:</u> <i>Has been incorporated. (Stantec – QA/QC included in version 2.3. VCS requirement has been addressed).</i></p>

5 ASSESSMENT CONCLUSION

Stantec conducted an assessment of the Methodology entitled “Revisions to AMS-III.BC to Include Mobile Machinery”, version 2.4 (released August 8, 2012), against the criteria of the VCS program identified in Section 1.2 of this first assessment report.

Following the assessment of the Methodology, it is the considered opinion of Stantec that the Methodology meets the requirements of the VCS criteria.

As discussed in Section 6, Stantec reviewed version 2.11 (March 13, 2013) of the Methodology following the second assessment. The conclusion of this review is presented in Section 6.

6 REPORT RECONCILIATION

The draft first assessment report was conducted on Methodology Revision version 2.4 (August 8, 2012). Following the issuance of the second assessment report by First Environment (version 2, dated March 8, 2013), Stantec reviewed the revised Methodology (version 2.11, March 13, 2013) to assess for consistency with VCS requirements. An issue was raised where text within the revised Methodology refers to fuel switch projects. Grütter Consulting clarified that changes in fuel type are not project activities and that if a change occurred, the vehicle or equipment is then compared to the baseline of the new fuel type *i.e.*, no credits can be generated by changes in fuel type. Following the assessment of the Methodology Revision (version 2.11), Stantec considers the Methodology Revision to be appropriate, adequate for use, and consistent with VCS rules.

7 EVIDENCE OF FULFILLMENT OF VVB ELIGIBILITY REQUIREMENTS

Stantec is accredited with the American National Standards Institute (ANSI), a member of the International Accreditation Forum (IAF), in accordance with ISO14065 (accreditation ID #0805

issued to Stantec Consulting Ltd. in February 2011 and updated July 9, 2012 for greenhouse gas (GHG) verification).

Stantec is an approved validator/verifier under the VCS program for 11 scopes, including scope 7 (Transport). Stantec has not conducted over 10 validations or protocol assessments under the VCS program.

8 SIGNATURE

Signed for and on behalf of:

Name of entity: Stantec Consulting Ltd.

Signature:



Name of signatory: Michael C. Murphy, PhD, P.Eng.

Date: March 29, 2013