Mexico Livestock Protocol Version 2.0

ERRATA AND CLARIFICATIONS

The Climate Action Reserve (Reserve) published its Mexico Livestock Protocol Version 2.0 (MXLSP V2.0) in September 2010. While the Reserve intends for the MXLSP V2.0 to be a complete, transparent document, it recognizes that correction of errors and clarifications will be necessary as the protocol is implemented and issues are identified. This document is an official record of all errata and clarifications applicable to the MXLSP V2.0.[1]

Per the Reserve Offset Program Manual, both errata and clarifications are considered effective on the date they are first posted on the Reserve website. The effective date of each erratum or clarification is clearly designated below. All listed and registered MXLSP projects must incorporate and adhere to these errata and clarifications when they undergo verification. The Reserve will incorporate both errata and clarifications into future versions of the MXLSP.

All project developers and verification bodies must refer to this document to ensure that the most current guidance is adhered to in project design and verification. Verification bodies shall refer to this document immediately prior to uploading any Verification Statement to assure all issues are properly addressed and incorporated into verification activities.

If you have any questions about the updates or clarifications in this document, please contact the Reserve at policy@climateactionreserve.org or (213) 891-1444 x3.

[1] See Section 4.3.4 of the Reserve Offset Program Manual for an explanation of the Reserve's policies on protocol errata and clarifications. "Errata" are issued to correct typographical errors. "Clarifications" are issued to ensure consistent interpretation and application of the protocol. For document management and program implementation purposes, both errata and clarifications are contained in this single document.

Errata and Clarifications (arranged by protocol section)

Section 3

1. Regulatory Compliance for Centralized Digesters (CLARIFICATION – April 29, 2022)

Section: 3.6 (Regulatory Compliance)

Context: This section states that projects that do not comply with air and water quality regulations are not eligible to register greenhouse gas (GHG) reductions with the Reserve. The guidance in this section does not specify how to address regulatory compliance for projects where manure is received from multiple farms and managed in a centralized biogas control system (BCS).

It is unclear whether a violation with respect to one manure source facility would jeopardize the ability of the project to receive credit from emission reductions related to manure from other source facilities. It may be possible for an offset project at a centralized digester to have CRTs issued to it for manure from compliant manure source facilities during a period of time when one or more manure source facilities are materially noncompliant with a regulation.

Clarification: The following text shall be inserted on page 7, at the end of Section 3.6:

"With respect to projects that accept and manage manure from multiple, discrete source facilities (separate from the project BCS in both physical location and management), it may be possible for a project developer to demonstrate that a regulatory violation at one source facility does not affect the eligibility of the entire project under this section. Project developers should contact the Reserve to discuss potential regulatory non-compliance issues."

Section 5

2. Calculating the van't Hoff-Arrhenius Factor (ERRATUM – March 28, 2012)

Section: 5.1 (Modeling Baseline Methane Emissions)

Context: The first step involved in Equation 5.3 (pages 16-17) is the calculation of the van't Hoff-Arrhenius factor (*f*). This factor estimates the percentage of volatile solids (VS) that will be biologically available for degradation in the baseline lagoon, depending on the ambient temperature. The equation is set up with a base temperature of 30°C, based on the assumption that this is the point at which biological availability will reach its maximum. One resultant outcome is that if a temperature of greater than 30°C is input for T_2, the calculated value of *f* will be greater than 100%, which is physically impossible.

Additionally, the reference source for this equation states that, under actual field conditions, the value of *f* is not likely to exceed 95% (Mangino et al., 2001). Thus, the user-calculated value for *f* should never exceed 0.95 (95%), which occurs when $T_2 > 29.5$°C. The current calculation is taken from this specific reference, but the limit of 95% was erroneously omitted.

Correction: The following text shall be added to the definition of T_2 in Equation 5.3 on page 17:

> "If T_2 > 29.5°C then f = 0.95."

3. Service Providers for Site-Specific Destruction Efficiency Testing (CLARIFICATION – April 29, 2022)

Section: 5.2 (Calculating Project Methane Emissions)

Context: Footnote 30 on page 22 states that service providers used to determine site-specific values for methane destruction efficiency must be "state or local agency accredited." It is not clear what specific options are available and permissible to projects located in a state or locality which does not have an accreditation program for source test service providers.

Clarification: The intent of this requirement is to ensure that any source testing conducted for the determination of a site-specific value for methane destruction efficiency is of a quality that would be acceptable for compliance by a regulatory body. The following text shall be added to the end of footnote 30 on page 22:

> "If neither the state nor locality relevant to the project site offer accreditation for source testing service providers, projects may use an accredited service provider from another state or domestic locality. Alternatively, projects may choose a non-accredited service provider, under the following conditions: 1) the service provider must provide verifiable evidence of prior testing which was accepted for compliance by a domestic regulatory agency, and 2) the prior testing procedures must be substantially similar to the procedures used for determining methane destruction efficiency for the project destruction device(s)."

4. MCF Value for a Covered Liquid Effluent Storage System (CLARIFICATION – April 29, 2022)

Section: 5.2 (Calculating Project Methane Emissions)

Context: Equation 5.8 on page 23 is used to calculate the methane emissions released from the treatment of the effluent upon leaving the anaerobic digester. To complete this calculation, the project developer must select the appropriate value for the methane conversion factor (MCF) based on the type of treatment system (usually an open effluent pond). Table B.4 in Appendix B is the source for the MCF values to be used in this equation.

In the case of a project which installs an impermeable cover on the effluent pond, effectively creating a second anaerobic digester, it is not clear how to determine the correct MCF value. Table B.4 lists the MCF value for an anaerobic digester as a range, from 0 percent to 100 percent, and directs the reader to use Formula 1 to determine the correct MCF. This formula, which was included as a footnote to the table in the original IPCC source, was omitted from the Mexico Livestock Protocol. In addition, it is not clear how to apply this formula for use in determining the MCF of a covered effluent pond. In the original source document, Formula 1 is not intended for determining the MCF of a covered effluent storage pond, but rather for determining the MCF of an entire digester system. Thus, the terms are not defined appropriately for this purpose.

Clarification: If the project elects to install an impermeable cover over its liquid effluent storage system, and to collect the methane gas from this covered storage and connect it to the biogas control system (BCS), it may be considered to be part of the project digester system, rather than a separate effluent treatment system. The fate of the effluent from this covered storage would then need to be quantified using Equation 5.8.

If the effluent from the project digester is directed to a covered liquid effluent storage system, and the biogas from this storage system is not collected and destroyed, then the following scenarios apply:

1) If the effluent from this system is applied directly to land, the value of $PE_{CH4,EP}$ shall be equal to the quantity of methane released directly from this storage system, divided by the biogas collection efficiency (BCE). The monitoring of biogas flow and methane concentration shall follow the requirements of Section 6. For any periods where biogas data from this system are missing or not in conformance with Section 6, Equation 5.8 shall be used to determine the quantity of methane for those periods, applying a value of 1.0 for MCF_{ep}.

2) If the effluent from the covered liquid effluent storage system is directed to another treatment system (i.e., not land-applied), the additional methane released from this further treatment must be quantified. The following adapted version of Formula 1 shall be applied to determine the MCF value for a covered liquid effluent storage system in this case. Use of this formula requires that the biogas production of the covered liquid effluent storage system be metered. If the biogas from this system is not metered, the value of MCF_{ep} shall be 1.0. For any periods when biogas from this system is not metered, the value of MCF_{ep} shall be 1.0, and these periods shall be quantified separately from the formula below.

Formula 1: MCF value for a covered liquid effluent storage system with additional effluent treatment

$$MCF_{ep} = \frac{\frac{CH_{4,meter,ep}}{BCE} + (MCF_{add} \times B_{0,ep} \times 0.3 \times VS_{ep} \times 0.717 \times d)}{B_{0,ep} \times VS_{ep} \times 0.717 \times d}$$

Where,

			Units
MCF_{ep}	=	Methane conversion factor for a covered liquid effluent storage system	fraction
$CH_{4,meter,ep}$	=	Total quantity of methane released (uncombusted) from the effluent storage system. Biogas flow and methane concentration must be metered according to the requirements of Section 6	kg CH_4
BCE	=	Biogas collection efficiency (BCE) (see guidance in Equation 5.8)	fraction
MCF_{add}	=	Methane conversion factor for the additional treatment of effluent after the covered liquid effluent storage system. Project developers shall use the MCF value that corresponds to the treatment system.	fraction
$B_{0,ep}$	=	Maximum methane producing capacity (of VS dry matter) (see guidance in Equation 5.9)	$m^3 CH_4$/kg VS
0.3	=	Default value representing the amount of VS that exits the covered liquid effluent storage system as a percentage of the VS entering the covered liquid effluent storage system	fraction
VS_{ep}	=	Volatile solid to covered liquid effluent storage system (see guidance in Equation 5.9)	kg/day
0.717	=	Density of methane (1 atm, 0°C)	kg/m^3
d	=	Number of days in reporting period	days

5. Calculating VS for Projects with No Effluent Ponds (ERRATUM – April 29, 2022)

Section: 5.2 (Calculating Project Methane Emissions)

Context: Footnote 32 on page 23 states, "if no effluent pond exists and project developers send digester effluent (VS) to compost piles or apply directly to land, for example, then the VS for these cases should also be tracked using equation 3b." This footnote references the equation in the US Livestock v2.1 Protocol.

Correction: The footnote should instead read: "if no effluent pond exists and project developers send digester effluent (VS) to compost piles or apply directly to land, for example, then the VS for these cases should also be tracked using equation 5.9."

6. Emissions from Land Application (ERRATUM – April 29, 2022)

Section: 5.2 (Calculating Project Methane Emissions)

Context: Equation 5.8 on page 23 is used to quantify the methane emissions associated with the effluent pond that receives and stores the effluent from the anaerobic digester. Though the title of the equation implies that it is only to be used for quantifying the methane from an effluent pond, footnote 32 clarifies that this same equation is to be used to quantify the methane emissions from an alternative form of effluent storage or treatment. However, this footnote erroneously includes land application as a form of treatment that shall be quantified as a source of project emissions.

Methane emissions from the disposal of manure by land application are excluded from the greenhouse gas assessment boundary for livestock projects.

Correction: Methane emissions from the disposal of manure by land application are not included within the greenhouse gas assessment boundary for livestock projects, either in the baseline or the project scenario. However, if the effluent is transported off-site for land application elsewhere, the fossil fuel emissions associated with this transportation must be quantified as project emissions (Equation 5.11).

Section 6

7. Adjustments to Metered Biogas Flow Data (ERRATUM – March 28, 2012)

Section: 6.2 (Biogas Measurement Instrument QA/QC)

Context: On page 30 of MXLSP V2.0, the protocol provides two requirements that govern how metered flow data is scaled in the event that a meter has been confirmed during a calibration event to be outside the allowable +/- 5% accuracy threshold. These two requirements for scaling the data are not intended for livestock project GHG accounting, and are not conservative.

Correction: The requirements on page 30 of the MXLSP V2.0 shall be replaced with the following requirement:

1. For calibrations that indicate the flow meter was outside the +/- 5% accuracy threshold, the project developer shall estimate total emission reductions using i) the metered values without correction, and ii) the metered values adjusted based on the greatest calibration drift recorded at the time of calibration. The lower of the two emission reduction estimates shall be reported as the scaled emission reduction estimate.

Section 7

8. Initial Reporting and Verification Period (ERRATUM – March 28, 2012)

Section: 7.3.1 (Initial Reporting Period and Verification)

Context: On page 38 of MXLSP V2.0, the protocol states that "[o]nce a project is registered and has had at least 6 months of emission reductions verified, the project developer may choose one of the verification options below." The 6-month requirement is inconsistent with the original intent of the protocol, which was to maximize the flexibility of reporting periods and verification schedules. To remain consistent with the original intent of the verification options, the 6-month reporting period requirement shall be changed to a "one quarter" or 3-month reporting period requirement.

Correction: The protocol shall be corrected to read "[o]nce a project is registered and has had at least 3 months of emission reductions verified, the project developer may choose one of the verification options below."

9. Reporting and Verification Cycle – Option 2 (CLARIFICATION – March 28, 2012)

Section: 7.3.3 (Option 2: Twelve-Month Verification Period with Desktop Verification)

Context: On page 39 of MXLSP V2.0, the protocol states that under Option 2, "[d]esktop verifications are allowed only for a single 12-month verification period in between 12-month verification periods that are verified by a site visit. Sub-annual verification periods are not allowed under this option." This verification option is intended to provide greater flexibility and ease verification costs for livestock projects. However, the disallowance of sub-annual (i.e., less than 12-month) verification periods, in particular for the initial verification, is inconsistent with the intent of the requirements in Section 7.3.1 (p.38) of the protocol.

Clarification: The protocol shall be clarified to read "[f]or projects using this option, the initial verification in this cycle shall be a full verification, including a site visit, and shall cover a minimum of 3 months and maximum 12 months of project data. All subsequent reporting periods under this option shall be 12-month reporting periods."

10. Reporting and Verification Cycle – Option 3: Monitoring Report (CLARIFICATION – March 28, 2012)

Section: 7.3.4 (Option 3: Twenty-Four Month Maximum Verification Period)

Context: On page 40 of MXLSP V2.0, the protocol states that "[u]nder this option, the verification period cannot exceed 24 months and the project's monitoring plan and a project monitoring report must be submitted to the Reserve for the interim 12-month reporting period. The project monitoring plan and monitoring report must be submitted for projects that choose Option 3 to meet the annual documentation requirement of the Reserve program. They are meant to provide the Reserve with information and documentation on a project's operations and performance. They also demonstrate how the project's monitoring plan was met over the course of the first half of the verification period." In this context, it is unclear what information is to be provided in the monitoring plan, and what is to be provided in the monitoring report, and where any overlap may exist. For clarity and ease of use, the Reserve will require only one document, hereafter referred to as "monitoring report" to meet the interim documentation requirement under this option. The template available online provides guidance on what is expected from a monitoring report.

Clarification: The protocol shall be clarified to read "[u]nder this option, the verification period cannot exceed 24 months and the project's monitoring report must be submitted to the Reserve for the interim 12-month reporting period. The project monitoring report must be submitted for projects that choose Option 3 to meet the annual documentation requirement of the Reserve program. They are meant to provide the Reserve with information and documentation on a project's operations and performance, and adherence to the project's monitoring plan."

11. Reporting and Verification Cycle – Option 3: Interim Reporting Period (CLARIFICATION – March 28, 2012)

Section: 7.3.4 (Option 3: Twenty-Four Month Maximum Verification Period)

Context: On page 40 of MXLSP V2.0, the protocol states that "[t]he monitoring report shall be submitted within 30 days of the end of the reporting period." While the terms "reporting period" and "verification period" are defined in the protocol glossary, with verification period referring to a period that may cover multiple reporting periods under Section 7.3.4, the language regarding when the monitoring report is to be submitted is potentially unclear.

Clarification: The protocol shall be clarified to read "[t]he monitoring report shall be submitted within 30 days of the end of the *interim* reporting period."

Appendix B

12. Default Destruction Efficiency for Upgrade and Injection into Natural Gas Pipeline (CLARIFICATION – March 28, 2012)

Section: Table B.7 (Biogas Destruction Efficiency Default Values by Destruction Device)

Context: On page 62 of MXLSP V2.0, the protocol provides a table with default values for approved destruction devices that may be used by project developers. The last destruction device listed, described as: "Upgrade and injection into natural gas pipeline," has a listed default destruction efficiency of 98% (0.98). This default destruction efficiency is derived as an average value appropriate for scenarios where the methane component of the biogas is injected into a transmission/distribution system and ultimately distributed to unknown end-users in the residential or commercial sector, or to unknown industrial plants or power stations. This default factor is not intended to be used for scenarios where biogas is destroyed by a third party under a direct-use agreement. Under such a scenario, the destruction efficiency should correspond to the type of destruction device that is used by the third party.

Clarification: The entry in the last row of the first column of Table B.7 on page 62 shall be clarified to read “Upgrade and injection into natural gas *transmission and distribution* pipeline.”

13. Default Destruction Efficiency Footnote References (ERRATUM – March 28, 2012)

Section: Table B.7 (Biogas Destruction Efficiency Default Values by Destruction Device)

Context: On page 62 of MXLSP V2.0, the protocol provides a table with default values for approved destruction devices that may be used by project developers. The footnote citations provided in Table B.7 are not correct for many of the destruction device efficiencies.

Correction: The following table containing the correct footnote references for each destruction device should replace Table B.7 on page 62.

Biogas Destruction Device	Biogas Destruction Efficiency (BDE)
Open Flare	0.96[1]
Enclosed Flare	0.995[2]
Lean-Burn Internal Combustion Engine	0.936[2]
Rich-Burn Internal Combustion Engine	0.995[2]
Boiler	0.98[2]
Microturbine or Large Gas Turbine	0.995[2]
Upgrade and Use of Gas as CNG/LNG Fuel	0.95[2]
Upgrade and Injection into Natural Gas Pipeline	0.98[3]

Source:
[1] Seebold, J.G., et al., Reaction Efficiency of Industrial Flares, 2003
[2] The default destruction efficiencies for this source are based on a preliminary set of actual source test data provided by the Bay Area Air Quality Management District. The default destruction efficiency values are the lesser of the twenty fifth percentile of the data provided or 0.995. These default destruction efficiencies may be updated as more source test data is made available to the Reserve.
[3] The Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories gives a standard value for the fraction of carbon oxidized for gas destroyed of 99.5% (Reference Manual, Table 1.6, page 1.29). It also gives a value for emissions from processing, transmission and distribution of gas which would be a very conservative estimate for losses in the pipeline and for leakage at the end user (Reference Manual, Table 1.58, page 1.121). These emissions are given as 118,000kgCH_4/PJ on the basis of gas consumption, which is 0.6%. Leakage in the residential and commercial sectors is stated to be 0 to 87,000kgCH_4/PJ, which equates to 0.4%, and in industrial plants and power station the losses are 0 to 175,000kg/CH_4/PJ, which is 0.8%. These leakage estimates are compounded and multiplied. The methane destruction efficiency for landfill gas injected into the natural gas transmission and distribution system can now be calculated as the product of these three efficiency factors, giving a total efficiency of (99.5% * 99.4% * 99.6%) 98.5% for residential and commercial sector users, and (99.5% * 99.4% * 99.2%) 98.1% for industrial plants and power stations.[2]

[2] GE AES Greenhouse Gas Services, Landfill Gas Methodology, Version 1.0 (July 2007).