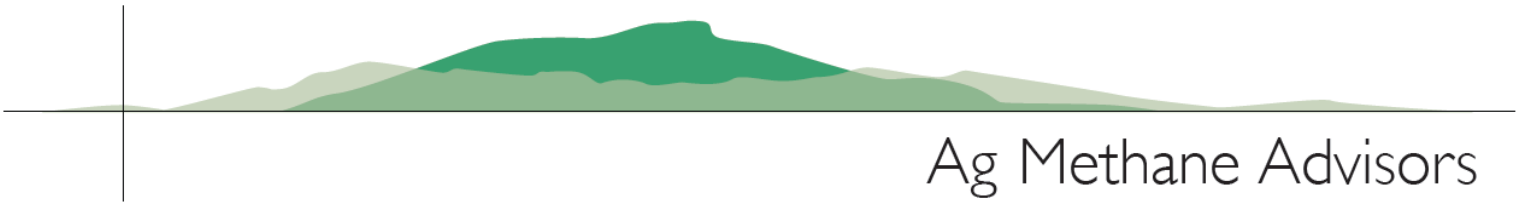


# Comments regarding October 2, 2014 draft of CARB Compliance Offset Protocol Livestock Projects

Thank you to the staff of the California Air Resources Board (CARB) for undertaking an update to the Compliance Offset Protocol Livestock Projects (COP Protocol) and for the opportunity to comments on the October, 2014 draft. The document is a follow-up to comments submitted previously regarding previous drafts. In reviewing the October draft it is clear that CARB reviewed previous comments and implemented many of them in the protocol. Thank you! This is very much appreciated and will make using and implementing the protocol more efficient for project developers, verifiers and CARB.

However, substantial points of confusion mentioned in previous comments remain, along with some apparently new issues. This document will begin my listing the new issues, then the previously stated comments in order of perceived importance. We understand that CARB many include further guidance in FAQs, but since no draft FAQs have been published for review, we feel it is important to continue to submit these comments in the official record. Guidance and FAQs published outside the Protocol may be appropriate, however, given that all market participants look to the Protocol as the final word when interpreting each section, we recommend including as much guidance as possible within the Protocol itself. This provides for ease of use and efficiency of administration for all projects. If FAQs are utilized to address certain sections we recommend that FAQs be updated monthly, as new issues arise and new/modified interpretations are determined. If FAQs are only published semi-annually for example, then more than half of a projects reporting period may have passed before information about a change in guidance is available. This delay can have a serious adverse impact on a projects ability to conduct monitoring in accordance with evolving guidance.

Ag Methane Advisors is an Authorized Project Designee representing more than ten livestock anaerobic digestion projects located in California and across the US that participate in CARB's Compliance Offset Program. Please direct any questions to Patrick Wood, General Manager via email at patrick@agmethaneadvisors.com.

**New comments on the October 2, 2014 draft:**

1. Section 3.4.1. (pg. 12): If legal requirements change in during a projects crediting period, will it be able to continue to generate credits during the remainder of the crediting period, given that the project was initiated before the legal requirements took affect?

2. Eq. 5.8 (pg. 26): The equation was modified to account for multiple effluent ponds. It is common for projects to use the anaerobic lagoons present before installation of the BCS to store post digestion effluent. It is not necessary to make any physical changes to the structure of the lagoons, but in the protocol the lagoons would now be called effluent ponds. The most common arrangement of these ponds is a multi-stage system. Manure flows into one, when that is full it flows into the next, and so on in series for 2, 3 or sometimes 4 separate ponds/lagoons. However the change in Eq. 5.8 presents substantial questions particularly regarding the quantity of VS in each pond. There is no practical way to measure the quantity of VS in each pond. In addition it varies throughout the year based on the volume of manure in each pond. Since all ponds are > 1 meter in depth and function the same way with the same MCF values it seems they can be considered one pond, and it is possible to calculate the VS to that one pond based on the digester effluent. This is how the protocol has operated until this proposed change to Eq. 5.8. Guidance on whether this method can continue and how project developers should estimate the VS in each pond would be helpful.

3. Section 6.2(b), (pg. 34), states, "The Offset Project Operator or, if applicable, Authorized Project Designee must maintain documentation of efforts to calibrate the equipment within 30 days of the failed field check or a biogas destruction efficiency of zero must be assigned to all destruction devices monitored by the equipment from date of discovery until calibration." Clarification about what efforts are required to calibrate the equipment within 30 days would be helpful. Does this mean that as long as they start the process of getting the equipment calibrated within 30 days, even if the calibration doesn't happen within 30 days that they do not need to take a BDE of zero? This would be helpful given that sometimes there is a long wait for a project to obtain a spare meter and then wait again for the manufacturer to perform the calibration. These delays are frequently beyond the control of the project. In addition, it seems that recording flow with known documented drift which can be accounted for per the protocol is better than having no meter present to record the flow. Depending on how

this section is implemented farms may be forced to send meters to the manufacturer with no spare in place.

4. Section 5.2(k), (pg. 24) states, "The number of days for each uncontrolled venting (tk) must date back to the last field check date without any uncontrolled venting events." It is unclear what this means and how it fits into the calculations, and why it is necessary. If the issue is documenting when a venting event began, then operational data should suffice. Requiring a venting event to date back to the last successful field check might include several months or more of project operations. If the start of the venting event can be documented then such a drastic and penalizing measure should not be necessary.

5. Section 5.2(o), (pg. 25). The statement is redundant, defining a term with itself resulting in confusion. Suggest revising.

6. Section 6.4(d), (pg. 34). The section states, "If a portable instrument is used (such as a handheld methane analyzer), the portable instrument must be calibrated per manufacturer's specifications or at least once during each reporting period, ***whichever is more frequent, by the manufacturer or at an ISO 17025 certified laboratory."*** The final two clauses of the sentence appear to not belong and may be a type. Suggest revising.

7. Section 6.4, Table 6.1, Parameter: $VS_{r,EP}$ (pg. 40). The table says this is a calculated value. However per the protocol in Eq. 5.8 the value is 30% therefore it should be a reference value not calculated.

**Previously submitted comments on issues that persist in the October 2, 2014 draft:**

8. Appendix B (pg.59-61): Regarding Table B.1, it is common for data gaps to be near each other, and for the period before and after the gap to overlap. For example an electrical short can cause sporadic data gaps over a period of time. Assume there is a gap on June 26, 2015 from 1:00 to 13:00, then there is a period of good quality data until 16:00, but a second gap from 16:00 to 23:00. The first gap lasted 13 hours, the second gap lasted 7 hours. Both can be filled using the 90% lower or upper confidence limit of the 24 hours prior to and after the outage, except that the 24 hours periods overlap. Clarification about how to handle this common situation would be helpful. One suggestion is to consider both gaps as one gap, which is 23 hours in length.

9. Section 6.2(b) (pg. 32). Assessing calibration drift after cleaning of a biogas flow meter will result in a measure of drift that is not necessarily representative of the drift recorded by the meter before the cleaning, and may result in un-conservative crediting. Frequently, the probes on flow meters accumulate H2S build-up. This can impact the accuracy of biogas flow readings and cause under or over reporting of biogas flow. A meter with calibration accuracy tested before cleaning may be found to have >5% drift, but after cleaning it might have <5% drift. We recommend that the protocol specify assessing calibration drift before cleaning to determine an accurate assessment of the calibration accuracy, which can be applied to biogas flow data as necessary following the protocol. If a meter is found to have >5% drift it can be cleaned and then the calibration accuracy re-tested. If after cleaning it continues to have drift >5% it should be sent to the manufacturer for a full calibration, however if after cleaning it has <5% drift then it can be considered a successful field check, but the pre-cleaning drift can still be applied to biogas flow data resulting in conservative crediting.

10. Appendix A, Table A.4 (p.48-29). Suggest referencing the most updated version of the US EPA annual GHG inventory, so that the TAM and VS values can be updated more frequently rather than fixed by specifying values in these tables which causes them to become outdated as COP livestock protocol updates cannot happen frequently.

11. Section 6.2(c) (pg. 34). Some biogas flow meter manufacturers report calibration accuracy in milliwatts, and state that 1 milliwatt equals 1% drift. However the calibration zero on a certain meter might be 121 mW or 82 mW so arithmetically 1% does not equal 1mW, but the manufacturer's manual (specification) says that 1mW=1%. Please clarify this section and address how this should be handled. It is not clear whether the arithmetic or the manufacturer's specification should take precedent here.

12. Section 6.2(c)(1) (pg. 34). Why is "independently for each meter" mentioned here? Calibration accuracy is inherently independent for each meter. In addition, total emissions reductions cannot be calculated independently for each meter as the total biogas flow from all devices (usually each with a separate meter), and the weighted BDE needs to be calculated to get total emissions reductions. Suggest removing "independently for each meter" for clarity.

13. Section 6.2(c)(1)(b) (pg. 34). Frequently, when a meter is sent to the manufacturer for a full calibration the % drift is different at different levels of

biogas flow. E.g. at 10 SCFM the drift may be 10% (1 SCFM), at 300 SCFM the drift may be 3% (3 SCFM) and at 1000 SCFM the drift may be 1% (10 SCFM). For an engine meter that commonly operates at > several hundred SCFM using the 10% drift (100 SCFM), which is not representative of the operations, has a substantial adverse impact. It would be helpful if this requirement were revised to reflect the drift that was representative of the flow during the period under consideration. Perhaps like for the data substitution Appendix some sort of confidence interval could be used to assess the predominant flow during the period under consideration.

14. Section 6.1(e) (pg. 33); Section 6.1(f) (pg. 30); Section 6.1(g) (pg. 30). Devices that are equipped with valves to prevent leakage should be specifically mentioned here as an exception.

15. Section 6.1(d) (pg. 33).
    a. Further specification about the hourly operational data requirement here would be helpful, particularly for projects that have more frequent than hourly flow data (e.g. 15 min). E.g. if there is kWh from an engine at 12:00, does this mean that flow at 11:15 is considered operational? What about flow at 12:45? What about both since they are both within 1 hour of 12:00?

    b. Section 6.1(d) (pg. 33). Frequently one device may not be operational but multiple other devices are operational. The statement that, "No registry offset credits or ARB offset credits will be issued for any time period during which the destruction device is not operational" suggests that a period of zero crediting should be claimed, however it seems more appropriate to apply a zero BDE to the particular device that is not operational, so that project emissions are increased (and crediting related to that device does not happen), but so that the project as a whole and other devices with confirmed operational destruction can still be credited. Clarification of this common issue would be helpful.

    c. Section 6.1(d)(1) (pg. 33). Thank you for acknowledging that many devices are equipped with valves that prevent gas from escaping when the device is not operational. Further clarification about the data that CARB would want reviewed during the verification would be helpful. The current language leaves open many questions about how to verify that a valve inside an engine is present and operational without dismantling the

engine. In addition, flares often have valves and weights so that gas cannot escape until sufficient pressure has built up. But these can corrode, and confirming that they are operational would require constant inspection of a device that is 20+ feet in the air and frequently on fire, which is not practical.

16. Section 6.1(a) (pg. 32). Often manufacturer specifications are not clear, don't specifically address issues considered in the Protocol or don't meet CARB's published/unpublished standards. Guidance about how to handle this situation would be helpful. E.g. Which takes precedent? CARB's interpretation or manufacturer specification?

17. Section 6.2(a)(3) (pg. 34). Please clarify whether the as found/as left calibration accuracy with the percent drift must be documented when a biogas flow meter is sent to a manufacturer for a full calibration other than a field check within 2 months of the end of the reporting period.

18. Section 5.1(f) (pg. 19); Section 5.1(m) (pg. 21); Section 5.2(q) (pg. 26); Section 5.2(w) (pg. 27). Regarding the availability of site-specific data to document the fraction of volatile solids directed to each different management on a farm, in many cases operator estimates are the only way to determine a fraction. For example if a farm has 5 barns the operator may have an estimate of the number of cows in each barn on average, but the actual number changes daily. Then from each barn the majority of manure may be sent to the BCS (or lagoon in baseline), but there may be a couple loads of manure each day that are stacked. It is impossible to know exactly what proportion of manure these couple loads represent, and exactly how many cows are in each barn each day, there is simply too much variability. Measuring and verifying data for these parameters is not practical for implementation of the Protocol. However, conservative estimates can be made. These are often based on operator experience and interviews. **Specific mention of conservative estimates based on operator experience and interviews as acceptable site-specific data in these sections would be helpful to OPOs and verifiers in implementing the Protocol. Other data beyond operator experience/interview may not be available, and Table A.9 does not capture all potential situations.**

19. Section 5.2(K) (pg. 224). Regarding venting events in many cases there is a one-time event when the digester is cleaned out and manure is bypassed directly to the lagoon until the digester can be filled again, therefore the average flow from

the digester and number of days is not relevant. In other cases there may not be a complete venting of the digester, but there may be venting from one or more pipes which would have gone to a particular device. In this situation the average flow from the digester and number of days is relevant. Equation 5.6 doesn't seem to be able to handle these situations, and seems to require accounting for project emissions that would not have happened in these common scenarios. We suggest a slight revision to the syntax of the equation to allow for these common either/or situations.

20. Section 6.2(d) (pg. 34). Frequently a digester vendor or project developer will have one or more portable methane analyzer's that are used to take quarterly methane concentration samples from multiple projects. Therefore it is problematic to have the frequency of the instruments calibration tied to each projects reporting period as the projects are frequently on different schedules. Instead like in the previous version of the protocol it would be very helpful to have the frequency of calibration be related to the meter based on manufacturer specifications or annually at the longest. This is especially significant because missing one quarterly methane concentration sample has a very large impact on crediting since it impacts and entire quarter of a year. Here is an example: Project A has a reporting period from 1.1.15 to 12.31.15. Project B has a reporting period from 7.1.15 to 6.30.16. They share a portable methane analyzer that the manufacturer recommends be calibrated annually. The analyzer comes into service on 1.15.15 and is used quarterly by both projects throughout their reporting periods. The analyzer gets calibrated on 1.15.16 (one year) per manufacturer specification. However this is outside the first reporting period for Project A, which loses credits. If the calibration frequency were tied to the meter not each project, the issue is avoided.

21. Section 5.2(t) (pg. 26). Guidance on acceptable site-specific data for average live weight would be helpful.

22. Section 5.2(j) (pg. 24). Please clarify how digestate within the vessel should be considered when calculating maximum biogas storage volume. Should only the headspace in the digester be considered for a one time venting event?

23. Section 6.4, Table 6.1, Parameter: $MS_{L,BCS}$ (pg. 40). Farms usually do not maintain operational records of the % of manure to different management systems, and this often is not feasible. This number is usually determined based on system designs/layout that is fixed over time until there is a major structural change.

Suggest revising. Consistency with the other MS parameters in the table would be helpful.

24. Section 5.2(e) (pg. 23); Section 5.3(d) (pg. 29). Further clarification about how to obtain written permission from the Executive Officer regarding utilization of site-specific BDE would be helpful. In addition the requirement for the accuracy of the default BDEs is not clear. It seems this could mean two things; 1) that the site specific BDE must be more efficient than the default value, or 2) that the uncertainty associated with the site-specific BDE is less than the uncertainty associated with the default BDE. If the intent is #1 then is seems CARB would want site-specific values to be less conservative that the defaults rather than more conservative. If the intent is #2) then please publish the uncertainty associated with each default BDE in Appendix A.6 so there is a way to determine if a site-specific value is more accurate.

25. Section 5.4(d) (pg. 30); Section 5.4(g) (pg. 31). Often purchase receipts and utility records don't distinguish between fossil fuels consumed for the project and those used elsewhere on the farm. For example there might be only one receipt for diesel purchases on the farm during a given month including all tractors and that used to heat a digester. Guidance about how to handle this situation would be helpful.

26. Appendix A, Table A.10 (pg. 59).
    a. The table suggests that a flush system is most common for an anaerobic lagoon on farms with >200 cows. However, in general, flush systems are only practical in areas that don't frequently freeze in winter. In cold climates a flush system would usually turn a dairy barn into a skating rink, so "scrape systems" that feed to an anaerobic lagoon are common. Suggest revising.
    b. How was the 10% solid storage value derived for the $MS_L$ parameter? Greenfield projects are often the most efficient as the design can start from scratch rather than use a layout that has evolved over years. Therefore 100% of manure is often sent to the anaerobic lagoon.
    For new large farms with >200 cows, the manure from the lagoon is often removed during many months of the year given nutrient management regulations, the ability for soil to absorb nutrients and the time limitations of spreading a years worth of manure in a short period of time. In addition it is very rare that a lagoon is completely emptied including removal of all sludge.