



**SUMMARY AND RESPONSE TO PUBLIC COMMENTS**

A draft Methodology for Capturing and Destroying Methane from U.S. Coal and Trona Mines was developed by Ruby Canyon Engineering and the American Carbon Registry (ACR).

All new methodologies and methodology modifications, whether developed internally or brought to ACR by external parties, undergo a process of public consultation and scientific peer review prior to approval.

The methodology was posted for public comment from October 15 – November 18, 2018. Comments and responses are documented here. If applicable, additional public comments received after the formal close of the public comment period are also documented herein and were considered in the final version of the methodology.

#	Organization	Commenter	Comment	Author Response
1	Environmental Commodities Corporation	Ben Apple	Consider expanding to North America. This protocol has potential in CAN and MEX, both of which have geology similar to that of the U.S.	The protocol's applicability has been expanded to include Canada and Mexico.
2	Environmental Commodities Corporation	Ben Apple	Consider eventual application for other minerals beyond coal and trona	Thank you for the comment. ACR will consider adding additional minerals in a future revision to the protocol.



3	Environmental Commodities Corporation	Ben Apple	Consider use of this protocol for reporting methane destruction as part of a regulatory compliance obligation (this is being considered in U.S. states and CAN provinces).	ACR is open to the use of the protocol for quantification and reporting of regulatory compliance obligations. The specific terms of use of the protocol can certainly be negotiated with relevant regulatory bodies in North America.
4	Environmental Commodities Corporation	Ben Apple	3.2 II.B. – Note that some states use the term “Abandoned” to indicate mines that were closed prior to 1977, irrespective of conditions at the mine site. Perhaps select a term that indicates the mine is not extracting mineral, there are no plans to reactivate the relevant portions of the mines (e.g., underground workings), and steps have been taken to indicate mining activities will not resume at the mine (e.g., reclamation activities).	ACR’s definition addresses these suggestions in the following definition of “Abandoned Underground Mine”: <i>A mine where all mining activity including mine development and mineral production has ceased, mine personnel are not present in the mine workings, and mine ventilation fans are no longer operative. A mine must provide evidence to demonstrate it to be abandoned by the Mine Safety and Health Administration (MSHA) or other applicable state, provincial, or federal agencies to be eligible for an abandoned mine methane recovery activity.</i>
5	Environmental Commodities Corporation	Ben Apple	Pg. 20 – Need to define “date of mine abandonment”	The following guidance has been added to the methodology: <i>The date of mine abandonment shall be determined through MSHA or other state, provincial, or federal regulatory body documentation establishing the date on which the mine became abandoned.</i>



6	Environmental Commodities Corporation	Ben Apple	Table 2 – Clarify combustion of MM, not methane (vehicles can run on natural gas)	This has been clarified in Tables 2, 3, and 4.
7	Environmental Commodities Corporation	Ben Apple	5.1.1 – Consider possibility of using a mass flow meter and converting measurement to volumetric flow. This eliminates need to convert CH <sub>4</sub> % values and could simplify calculations.	Mass flow meters are allowed. See, for instance, language in grey scale under Equation 7 (this language is repeated in the quantification section for each mine type).
8	Environmental Commodities Corporation	Ben Apple	Pg 78 – ER,AMM should include all methane emissions (including drainage), not just VAM	Equation has been deleted in revised draft of the methodology.
9	Environmental Commodities Corporation	Ben Apple	Suggest recording period for VAM activities be every 15 minutes. VAM is stable; fluctuation of VAM characteristics will not be at a frequency greater than every 15 minutes.	The recording period for VAM activities has been modified to every 15 minutes.
10	Environmental Commodities Corporation	Ben Apple	Suggest allowing more frequent averages of CH <sub>4</sub> % and total flow volumes. The current method causes inaccuracy when a destruction device starts midday, particularly if the CH <sub>4</sub> % ramps up prior to activation of destruction device.	More frequent averaging is allowable. See, for instance, language in grey scale under Equation 7 (this language is repeated in the quantification section for each mine type).
11	Environmental Commodities Corporation	Ben Apple	AMM projects – data from drilling wells can be difficult to achieve and is not always generated by drillers. Consider use of reasonable assumptions (emissions from	Default factors have been added to Appendix A.



			drilling are mostly from diesel use and are quite low).	
12	Environmental Commodities Corporation	Ben Apple	Open Flare is not defined	The following definition has been added to the methodology: <i>A flare in which the main flame is atop a stack and visible. For purposes of this methodology, an open flare is considered a flare.</i>
13	NextEra Energy Marketing	John Savage	There is a common principle that in order to qualify, a destruction device can't be in use prior to the project start date (see section 2.1.II for example). What if I take an RTO from one project and, when that shaft is closed by the mine or its methane % declines, I move it to another bleeder shaft at the mine? The language suggests this would not be eligible, but I'm not sure that the intent is to disqualify this scenario since bleeder fans don't usually have a 10-year lifespan and a normal scenario would be to move the equipment. The language is potentially in conflict with section 2.1.IV among others.	The look back period for pre-project devices has been modified for VAM, CMM, SMM, and AMM in the revised draft of the methodology.
14	NextEra Energy Marketing	John Savage	The phrase "all sharing the earliest commencement date" in section 2.2.III could use some clarification. I think you mean that the project start date will be deemed to be the earliest start date for any of the	This has been clarified in sections 2.1 and 2.2 as follows: <i>The mine methane capture and destruction activity that began first shall be used to</i>



			qualifying activities/devices included in the project.	<i>determine the project start date, per the requirements of Section 3.5.</i>
15	NextEra Energy Marketing	John Savage	In Section 2.3.I, I'm not clear why a CBM well would qualify. The way this reads to me is that someone could start flaring an existing CBM well if they claimed it would be shut in once the mine reached it. There is no limitation on having to wait for the mine to take out the well before claiming ERs, which raises an additionality issue (what if mine plan changes?).	Extending the life of CBM wells within a mine plan is applicable to the methodology. There is a limitation on claiming emission reductions from SMM in Section 5.3.1.V.
16	NextEra Energy Marketing	John Savage	In Section 2.4.IV do you mean "horizontal" instead of "vertical". Not sure how overlying works if vertically separated?	Vertical is correct. While not a common practice in the U.S., several underground coal mines can occupy the same surface lat/long but be located in different coal seams at different depths.
17	NextEra Energy Marketing	John Savage	Why is the word "destroyed" used in Section 3.4.III?	All instances of the word "destroyed" have been removed from Section 3.4.
18	NextEra Energy Marketing	John Savage	In Section 3.3.II, how do you account for gas currently flowing to pipeline? It occurs to me that someone could go to a gas company flowing mine methane to a processing plant and just pay them to flare it instead.	A pre-project lookback period of 24 months limits this from happening.

19	NextEra Energy Marketing	John Savage	In 3.4, there may be some additional criteria that would assure you avoid CBM being used in a project. I don't think the strata is a sufficient approach.	During verification, the verification body reviews well completion records to confirm the extent of well perforation locations.
20	NextEra Energy Marketing	John Savage	In project boundaries, it would be helpful if you could clarify that the project is not considered to be part of the mine ventilation plan and is therefore not subject to MSHA jurisdiction.	This has been clarified in Section 3.7 – Regulatory Compliance.
21	Perennial Energy	Chrys Fisher	The draft protocol eliminates distinctions related to flooded, partially flooded, and venting criteria with respect to abandoned mine methane activities. The practical application of these distinctions are ambiguous and confusing because some or all of these criteria could apply to the same project depending on the location and scope of the project within the greater mine footprint.	
22	Perennial Energy	Chrys Fisher	Another improvement addresses the non-qualifying destruction device issues as part of the baseline emission calculation. Under the CARB protocol, certain non-qualifying baseline emissions are added into the mathematical equation only to be subtracted back out from the formula later in the mathematical progression. The ACR draft	

			seeks to simplify the calculation by eliminating the add in/subtract out syndrome.	
23	Perennial Energy	Chrys Fisher	<p>An area for improvement relates to calculation of baseline emissions for abandoned mine projects. In our view, the current baseline quantification method expressed as the hypothetical decline curve approach should be discarded in its entirety. A much simpler and logically consistent approach is based on the scientifically accepted principle that the natural rate of emissions of an abandoned mine includes all gas existing within the mine void because Darcy’s law states the gas will dissipate into the atmosphere over time. Therefore, avoided emissions should consider and include mine void gas that is verifiably extracted and destroyed during the crediting period. The virtue of this modification is that it is consistent with scientifically established gas law principles supporting avoided emissions, is based on methane destruction occurring in practice rather than a hypothetical construct, eliminates unnecessary issues injected by MSHA record gaps, and expands the number of project candidates for AMM destruction.</p>	<p>We agree with this comment in principle and have removed the decline curve concept for AMM recovery and associated historical data collection requirements in the revised draft of the methodology.</p>

24	Perennial Energy	Chrys Fisher	<p>Unfortunately, the ACR draft continues to embrace the decline curve concept, but does not allow aggregation of baseline emissions over a 10 crediting period duration. Rather than express the baseline emissions factor as a function of avoided emissions generated in one crediting period, the ACR draft considers the baseline emissions as a function of the cumulative avoided emissions over the life of 10 crediting periods. When baseline emissions are expressed in a cumulative amount as opposed to an annual emission rate, it leaves open the possibility for the project developer to extract and destroy as much abandoned mine methane as feasible so long as the total metric tons of methane destroyed do not exceed the cumulative baseline emission amount during the life of the project. This refinement is a positive development, but we would recommend a clear statement of the intent for this cumulative cap rule as a stated goal in the methodology. Perennial’s engineering staff is in the process of running several different hypothetical datasets through the proposed equations to determine whether those equations achieve the intended result. If our hypothetical illustrations indicate a flaw in</p>	<p>The decline curve approach to AMM recovery has been removed from the revised draft of the methodology.</p>
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			the mathematical equation, we will report our results accordingly with ACR.	
25	Perennial Energy	Chrys Fisher	We believe the definitions section of the protocol should be placed at the beginning of the document as opposed to its current place at the end. Some of the definitions are not in alphabetical order. Other basic terms such as “crediting period” and “reporting period” are not defined.	Definitions in all ACR template methodologies are placed at the end of the document. The definitions have been placed in alphabetical order. Basic terms such as crediting period and reporting period are defined in ACR’s Standard which governs the broader ACR program.
26	Perennial Energy	Chrys Fisher	We believe the draft would benefit from a short, plain and nontechnical statement of purpose that explains each mathematical calculation.	Each equation is preceded by an explanation of the terms used in the equation.
27	Perennial Energy	Chrys Fisher	We believe stakeholders would benefit from participating in a joint draft working group once the draft protocol has completed the public comment phase. We believe a working group process could produce some meaningful refinements particularly with regard to some of the mathematical calculations.	Thank you for the suggestion, but unfortunately ACR’s methodology development process is not designed for a work group format at this time. ACR embraces a continuous improvement process and will consider future methodology revisions, if necessary, after completion of the peer review process and publication of the first version.