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MEMORANDUM

Date: May 9, 2011
To: Max DuBuisson, Policy Manager
Climate Action Reserve

From: Matt Lamb, Project Scientist
Richardson Smith Gardner and Associates
RE: **Comments – DRAFT Landfill Project Protocol revision (U.S. Version 4.0)**

This memorandum contains comments from my review of the Climate Action Reserve DRAFT Landfill Project Protocol Version 4.0, issued for public comment on May 5, 2011. These comments are based on my understanding of the draft revisions, and our conversation regarding the revisions on May 6, 2011.

Section 6.1 Wet vs. Dry Gas

In a footnote to **Section 6.1**, the protocol discusses measurement of landfill gas flow and methane content on wet or dry bases, but does not define these terms. For instance, typically landfill gas flows through a mesh pad demister and is heated as it travels through the blower prior to flow and methane measurement. This removes some free liquid in the gas. In virtually all in-line methane analyzers, additional filtration and/or desiccant drying of only the sampled gas occurs prior to methane measurement to protect the measurement equipment. Portable methane analyzers also have in-line particulate and moisture filters on sample tubes. Additional drying of the total gas stream may occur in some cases as the gas flows through air to air heat exchangers, and air to liquid chilling units. I assume that the protocol refers to "dry" gas as treated gas that has gone through filtration, dewatering, and filtration, and wet gas as not having gone through this process.

I recommend contacting methane analyzer manufacturers such as Landtec, Siemens, and Elkins Earthworks for a better understanding of the filtration and drying required to measure methane.

A.2 2010 Update to the Performance Standard Analysis

Analysis of the dataset in **Appendix A.2** has determined that approximately **17%** of unregulated landfills with renewable energy projects have done so without realizing revenue from GHG offsets. The Reserve is assuming that these landfills never pursued revenues from GHG offsets, or that these revenues were not included in project economics. While it is possible that project owners did not pursue GHG offsets because they did not need the money, I think it is much more likely that these landfills were unable to verify, market, and sell these offsets. The Reserve apparently relied solely on the EPA LMOP database of landfills to determine eligibility, even though NSPS regulatory status is the only criterion affecting additionality addressed in this database. I would estimate that the majority of these projects are unable to verify offsets due to

the following:

- state or local requirements to install collection systems,
- pre-existing destruction devices,
- contractual ambiguity over ownership of GHG offsets, and/or
- Inability to list/register projects within the prescribed timeframe.

I recommend broadening the scope of regulatory review beyond the LMOP database. CAR's protocol requires other regulatory issues besides NSPS applicability be examined during verification. I would argue that the data reviewed during protocol revision should look beyond NSPS compliance as well.

A.3 New Performance Standard Criterion #1: RECs Exclusion for LFGE Projects

RECs are generated from the offset of carbon emissions from non-renewable energy sources, such as coal, natural gas, fuel oil, etc. They are completely unrelated to the offset of carbon emissions from the destruction of methane in landfill gas. These are two wholly independent activities which can occur separately, and should not be linked in determining project additionality or eligibility, unless specifically bundled together in a power purchase agreement or other verifiable document related to the project.

CAR's analysis suggests that the majority of projects claiming RECs do not claim GHG offsets, and vice versa. **Table A.7** of the draft protocol shows 92 landfills claiming RECs, 76 landfills claiming GHG offsets, and 31 landfills claiming both. From these data, CAR makes the assumption that the value of RECs or GHG offsets alone supports a project in the absence of the other. However, this does not account for other, more likely possibilities previously discussed, and elaborated on below.

First, it is not uncommon for landfill gas to electricity power purchase agreements to confer the rights to all environmental attributes, including GHG offsets, to the purchaser of the renewable energy generated from the project. In return, the seller of the power receives a bundled price for the avoided cost of the power and the REC. This allows the purchaser, often an investor-owned utility, to utilize the value of the GHG offset, many times by internally retiring it to offset emissions from other non-renewable sources of energy. CAR and the other offset registries may never be aware of these actions, since the offsets are never registered or transacted through their programs. This does not diminish the value of the offsets to the project, however.

Second, it is not uncommon for an "unregulated" project that is generating RECs to fail additionality or eligibility tests for the landfill protocol. The Reserve's data analysis in **Appendix A** of the draft protocol defines regulated landfills as subject to the collection/control requirements of the federal NSPS rules. However, several states (e.g., Wisconsin, Illinois, California) have more stringent rules that require installation of such systems well before NSPS. Additionally, methane migration, groundwater contamination, or nuisance odors may lead the state or local agencies to require collection and control prior to federal rules. So it is possible

that, while not meeting the definition used in **Appendix A**, many of the landfills included in **Table A.7** are indeed mandated to install collection/control systems, and should therefore be excluded form this analysis. These nuances in compliance and regulatory status will not be included in the data sets analyzed by the Reserve, but are included in the protocol, and is evident through the verification process. Further, it is very likely that many of the renewable energy projects simply were unaware of, or missed the deadline for project submittal under the current version of the protocol.

I would recommend developing a random sample set of landfills that is large enough to be representative of the 61 landfills shown to be generating RECs, but not offsets, and perform a preliminary survey regarding their decision to not utilize offsets. This may include phone or written interviews with the project owners, site managers, and state regulators. I believe this will demonstrate that many of the projects previously assumed to be additional under the existing protocol are not. It may also identify projects that were otherwise eligible that failed to initiate the submittal process within the required timeframe.

A.4 New Performance Standard Criterion #2: Size Threshold on LFGE Projects

Using the amount of waste in place at a landfill should only determine eligibility/additionality relative to NSPS, or more stringent state rules that use this threshold as a trigger to require control of landfill gas. The WIP thresholds proposed in the draft revisions to the protocol effectively penalize landfills for being good candidates for landfill gas collection from a technical standpoint. However, this does not ensure that these landfills will be good candidates for gas to energy or carbon projects from an economic standpoint. Based on my experience verifying landfill gas projects and designing collection systems, I am aware of **NO ECONOMICALLY VIABLE** landfill gas to energy projects with less than 715,000 megagrams of waste in place. It is obvious that, since the majority of landfills that would otherwise be additional are excluded from eligibility, this requirement is overly stringent, and should be excluded form the protocol.

The Reserve purports to consider project viability in determining additionality. However, that CAR has not considered actual project economics when developing the revisions to the protocol. Payback periods for such projects generally span over several years, and produce modest returns compared to other investments. I recommend that the Reserve review several economic analyses of representative projects across the U.S. If done under the protection of confidentiality, there should be several facilities that would willingly share this information. Additionally, simple spreadsheets could be created to evaluate hypothetical projects, using current representative pricing from the industry.

Final Thoughts

CAR and other programs have many criteria that may exclude a landfill gas to energy project from verifying GHG offsets, however, the data analyzed in **Appendix A.3** only focuses on one criterion, NSPS regulation. This inconsistent approach, while less-labor intensive, leads to erroneous assumptions that will unfairly impact the majority of potential landfill gas to energy

projects. Additionally, CAR's assumption that a project would chose to forego one revenue stream (e.g., GHG offsets), simply because it has another (e.g., RECs) shows a lack of understanding of the economics related to such projects.

Further, it is not clear how the Reserve defines economic viability in terms of GHG projects. Many private investors and lending institutions will insist on internal rates of return exceeding 20%. Project economics are complicated by variable operations/ maintenance costs, regulatory burdens, and variable energy costs (especially if offsetting natural gas usage). Also, the simple existence of a gas to energy project does not demonstrate its economic viability. I am aware of several projects that are not making the return on investment promised at the outset. This is evident also in the rate of acquisition of existing projects by firms other than the original developer. These factors cannot be ignored to simplify the process. If eligibility and additionality is to be based on project economics, a more stringent review of the actual conditions and factors influencing these dollars and cents decisions needs to be conducted.

The proposed size threshold criterion is widely divergent from established NSPS and PSD rules governing landfill gas emissions. The fact that the majority of candidate landfills with gas to energy projects will be excluded nationwide is sufficient cause to strike this requirement from the protocol.

CAR assumes that many landfill projects in existence would have been implemented in the absence of GHG offsets, and this justifies adopting more stringent additionality rules based on incomplete data. However, if additionality rules are made more stringent, the number of landfills installing voluntary collection systems will decline. This is especially true in the current environment where uncertainty exists regarding the carbon market, the overall economy in general, and future regulations regarding greenhouse gases. These restrictions on eligibility under the protocol will directly impact at least five (5) projects that I am aware of that are currently under construction, and several others that have recently come on line. Broad changes to rules concerning eligibility, coupled with other market and regulatory issues, will have a definite chilling effect on the future development of these projects, resulting in an increase in GHG emissions over time.