Dear CCAR –

Thank you for the opportunity to provide comments to the CCAR on the revised Landfill Project Reporting protocol which are due not later than Thursday, October 23, 2008 at 5:00 pm PDT. The Solid Waste Industry for Climate Solutions (SWICS) supports the changes your are proposing -- consistent with our attached comments -- including:

- Update of the Non-Methane Organic Compounds (NMOC) threshold analysis. We support raising the upper limit of NMOC concentrations to be considered additional. However, for the reasons stated in the attached, we believe there is ample evidence and justification to further raise the upper limit to 3000 pounds of NMOCs per month -- rather than the now proposed upper limit of 2700 pounds of NMOCs per month.
- Allowance for open flares to be used as a methane destruction device. We support this change consistent the attached documents.
- Formatting adjustments to the emission reductions quantification methodologies. We support these adjustments consistent with the attached documents.

In addition, we recommend further modifications to the protocol as we have previously advised and are requesting in the attached documents. Unfortunately, we were not able to obtain a Word version of the proposed protocol document from CCAR so we had to translate from the provided Adobe pdf version to a Word version in order to advise you of our recommended changes. As a result, there are minor formatting inconsistencies between you Version 2.0 and SWICS recommend Version 2.1. In addition, we have attached a separate document that further substantiates the reasons for the changes we are recommending and requesting. Both documents are labeled "Version 2.1" so as to differentiate them from Version 2.0 which is currently under review. We have eliminated any CCAR logos from our comment version 2.1 and have labeled each page "SWICS PROPOSAL". We offer these suggested changes so as to provide maximum opportunity for landfill projects to generated GHG reduction credits while maintaining environmental integrity, additionality, transparency, rigor and accuracy.

We request and recommend that CCAR reissue the revised Landfill Project Reporting Protocol Version 2.1 as we have suggested in the attached documents for public review and comment.

Please contact any one of the undersigned individuals if you have any questions regarding our comments or wish to discuss these matters further.

<<SWICS Proposed Changes Landfill Protocol 10-14-08.doc>>
<<Revised - Support to CCAR revised 10.08.doc>>

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Landfill Project Reporting Protocol Supplement

Version 2.1

October, 2008

(Supporting Document)

I. *CCAR Standard: Better than business-as-usual*

VERSION 2.1 PROTOCOL: *The performance threshold represents "better than business-as-usual." If the project meets the threshold, then it exceeds what would happen under the business-as-usual scenario and generates surplus/additional GHG reductions.*

Business-as usual refers to the methane that is collected and destroyed in a landfill gas (LFG) collection and combustion system (GCCS) as a result of adhering to current federal, state and local regulations as well as permitting conditions. Under the current version of the Protocol, better than business-as-usual refers to the destruction of methane above and beyond what is required by regulations. In order for a landfill owner or operator to reduce greenhouse gas (GHG) emissions in a manner that is considered better than business-as-usual, they must achieve reductions of methane only through conventional LFG collection and control. The performance threshold should represent "better than business-as-usual" including, for beneficial uses of the LFG. Beneficial uses may include, but are not limited to, the generation of renewable energy as well as displacement of fossil fuels or chemical products. If the project meets the threshold, then it exceeds what would happen under the business-as-usual scenario and generates surplus/additional GHG reductions. Moreover, many of the technologies employed by the solid waste industry are for beneficial uses which subsequently result in GHG reductions beyond the destroyed methane.

Many of the emergent technologies employed by the solid waste community for beneficial use, which reduce GHG emissions, include converting LFG to chemical products, utilization of bioreactor technologies, as well as the displacement of fossil fuels from LFG to energy projects. However, all of the above technologies are not eligible for GHG reductions under the current version of the Landfill Project Reporting Protocol (LPRP). The utilization of these technologies is conducted outside of regulatory compliance and is considered by the industry as better than business-as-usual practices.

Additionally, AB 32 asserts that the state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. The Solid Waste Industry for Climate Solutions (SWICS) believes emergent technologies such as bioreactors, LFG to energy projects (i.e. displacement of fossil fuels) and LFG to chemical products (i.e. the production of ethanol, methanol, etc.) are technologically feasible and must be recognized in this Protocol.

The ability of a project developer to reduce GHG emissions in a technologically feasible and cost effective manner is essential for the success of the LPRP and there should be no limit on the technologies used.

II. *CCAR Standard: GHG project must be designed to be entirely separate*

VERSION 2.1 PROTOCOL: *A new GHG project must be designed to be entirely separate from the existing collection system and must be monitored separately from the existing system in order to gain credits under this protocol. These conditions will ensure that the reductions resulting from the new GHG project can be accounted for separately from current collection and combustion.*

A new GHG project may be designed as a continuous extension of the existing collection system or entirely separate from the existing system. Although GCCSs have proven effective in reducing GHG emissions, the startup capital costs can be as high as $500,000 to several millions of dollars. From a capital cost stand point, this portion of the performance standard test is impractical and must be changed to reflect the owner/operators ability to exceed the business-as-usual scenario to generate surplus/additional GHG reductions without having to incur excessive and unneeded additional costs. If additional methane reductions are achieved beyond what is currently being done, those reductions should be credible regardless whether the systems are kept separate.

The SWICS understands the importance of the Eligibility Rule I and how the integrity of this rule must be maintained to strengthen the creditability of the Protocol. However, rather than designing a completely separate GCCS, an additional piping system with an independent monitoring system, continuous or weekly flow monitoring can be incorporated into the existing GCCS and allow monitoring of distinct portions of the GCCS . This will keep costs down while accounting for additional GHG reductions. Additionally, this approach would preserve the integrity of the eligibility rule, while providing a cost effective approach for the owner/operator to reduce additional GHG emissions.

III. *CCAR Standard: Displacement of fossil fuels are not included in this protocols framework*

VERSION 2.1 PROTOCOL: *Furthermore, producing power for the electricity grid (and thus displacing fossil-fueled power plant GHG emissions) is a complementary and separate GHG project activity to destroying methane gas from landfills, and not included within this protocol's accounting framework.*

Landfills which convert LFG to energy should be able to register GHG reductions under this protocol. A protocol without this provision would be of little use to the solid waste industry, which is currently leading all other industries in GHG reductions and the development of renewable energy projects. Developers can implement a variety of GHG reduction activities associated with the collection, transportation, sorting, recycling and disposal of solid waste. Installing technology to capture and combust methane from landfills is but one of many GHG emissions reduction projects which occur within the solid waste sector at landfills. Credible GHG reductions are achieved through beneficial use technologies which include, but are not limited to, the use of engines and turbines to achieve power generation, use of LFG to displace natural gas, vehicle fuels, and/or conversion into usable commercial products.

Furthermore, the use of modern renewable energy technologies produces less pollution than burning fossil fuels especially with respect to net emissions of greenhouse gases. Indigenous renewable energy resources also represent a secure and stable source of energy for our communities and a potential source of jobs and economic development. Confronting climate change through beneficial use technologies achieves three goals; sustainable GHG reductions, a cleaner environment and economic development.

Whether project developers destroy methane by combustion, conversion or displacement, it is the management of GHGs which proves to be the ultimate benefit to society. Landfill owners and operators manage GHGs by employing the best available control technologies for beneficial uses. All available technologies must be acknowledged in this protocol to achieve sustainable GHG reductions.

IV. *CCAR Standard: Bioreactor technologies are not eligible to use this protocol*

VERSION 2.1 PROTOCOL*: Landfill operations that utilize bioreactor technologies are not eligible to use this Protocol, as it is unclear what effects the bioreactor may have on the baseline fugitive methane emissions.*

Landfills which employ bioreactor technologies do so predominately for the benefits of converting LFG to energy as well as reduced post closure costs. LFG recovery for energy benefit results in the reduction of GHG emissions through both direct and avoided emissions as well as the displacement of some use of fossil fuels, all of which are for beneficial use.

The Landfills National Emission Standards Hazardous Air Pollutants (NESHAP) definition of bioreactors in 40 CFR 63.1990 of (Subpart AAAA) include a provision that the average moisture content of the waste in the area into which liquid is added must be at least 40 percent (by weight) for the landfill or portion of the landfill to be considered a bioreactor and should be regulated by the NESHAP. Landfills which meet the NESHAP definition of a bioreactor are required to collect LFG immediately, and therefore are unable to register reductions resulting from the management of that gas and could achieve any credible early reduction. Only bioreactor landfills which contain moisture content less than 40 percent (by weight) and satisfy the other eligibility rules should be eligible to register GHG reductions using this protocol.

Although landfills, which utilize bioreactor technologies, have higher LFG generation in the early years of the landfill's life; their net emissions, over the life span of the landfill, are comparable to that of a traditional landfill.

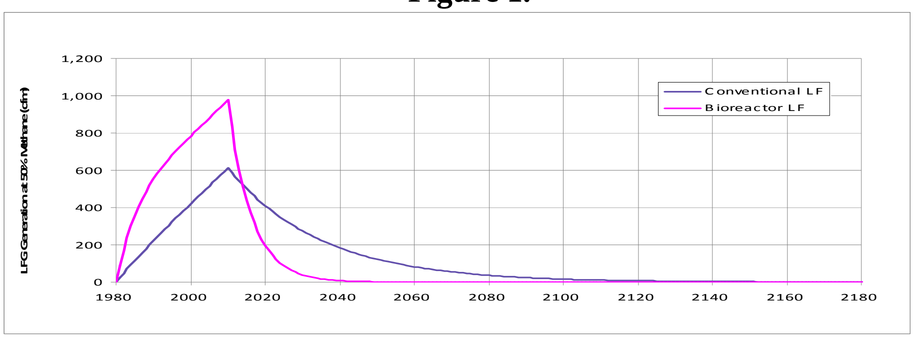
As noted in the LPRP, baseline emission calculations are not required for the Protocol for the quantification of methane reductions. In the baseline scenario, all uncontrolled methane emissions are considered to be released to the atmosphere except for the portion of methane which would be oxidized by bacteria in the soil of uncovered landfills, absent the project. This should be no different for bioreactor landfills.

However, the LPRP eliminates landfills which utilize bioreactor technologies (including leachate recirculation) due to the uncertainty of its fugitive emissions during the baseline years.

Conventional landfills as well as bioreactors both calculate their baseline fugitive emissions in the same manner, by determining the amount of the amount of methane recovered from the control device and estimating the collection efficiency of the LFG system over the span of the reporting period. Bioreactors can achieve similar collection efficiencies and do not result in an increase in LFG surface emissions.

Bioreactors generate more LFG per year than conventional landfills during the early life of the landfill or bioreactor cells. However, over time, the amount of LFG generated per landfill (assuming waste in place, liner and cover are equal) will generally be the same over its lifetime. Because a larger percentage of the LFG generation occurs while the landfill is still active, bioreactor landfills are expected to have fewer emissions since more LFG is controlled while the facility is manned full time. Figure 1 illustrates the LFG generation rates over time for conventional and bioreactor landfills.

Figure 1.



Assumptions for Figure:

1. Refuse filling operations intiated in 1980.
2. Landfill closure in 2009.
3. Conventional LF uses 0.04 decay rate constant
4. Bioreactor Landfill uses 0.16 decay rate constant

V. *CCAR Standard: The ultimate fate of the methane must be combustion*

VERSION 2.1 PROTOCOL: *Captured landfill gas could be combusted on-site, transported for off-site use (e.g., through gas distribution or transmission pipeline), or used to power vehicles. Regardless of how project developers take advantage of the captured landfill gas, for the project to be eligible to register GHG reductions under this protocol, the ultimate fate of the methane must be combustion.*

PROTOCOL: *It is possible that at some point landfill gas may be used in the manufacture of chemical products. However given that these types of projects are few, if any, non-combustion landfill gas destruction projects are not addresses in this protocol.*

Some of the chemicals that make up LFG can be isolated and later used to supplement other commercial industries. SWICS believes that extracted LFG chemicals, recycled for commercial purposes, reduce the combustion of fossil fuels ordinarily needed to commercially produce them.

An example of this displacement of fossil fuels is the extraction of sulfur from LFG. Hydrogen sulfide is a common constituent of LFG resulting from the breakdown of construction and demolition (C&D) debris within a landfill. The Pollution Control Financing Authority of Warren County (PCFAWC) in New Jersey is currently isolating over one ton of sulfur per day from LFG. This sulfur is then recycled back into commercial use, reducing the amount of fossil fuel need to produce this element. [1]

Another example of LFG chemicals used for commercial purposes is the conversion of methane to methanol. Methanol is one of the top 25 chemicals produced worldwide. UOP LLC, a Honeywell company, is currently developing cost effective procedures to convert methane from LFG to methanol.

Furthermore, Acrion Technologies Inc. is currently isolating carbon dioxide from LFG for commercial purposes. At their New Jersey complex, Acrion currently can convert 140,000 standard cubic feet of LFG into one ton of liquid carbon dioxide.[2]

Additionally, the Kyoto Protocol's Clean Development Mechanism recognizes the GHG emissions which are avoided by preventing waste from disposal (i.e., the displacement of GHG)[3] and sets a precedent for the recognition of fuel displacement. The scope and applicability of the Annex 10 (EB 35) tool is for calculating the methane emissions which are avoided during the year by preventing waste disposal at a landfill. Landfilling operations which also lead to the displacement of fossil fuels must be eligible for GHG reductions in the LPRP.

[1] Carlton, J., Williams, J., Graubard, D., "Turning Sour Landfill Gas to Sweet Energy". Gas Technology Products, http://www.gtp-merichem.com/support/technical_papers/lfg_electricity/index.php

[2] National Energy Technology, "DOE-Sponsored Process Enhances Use of Landfill Gas, Improves Air Quality", November, 2001

[3] CDM – Executive Board, Annex 10 Methodology Tool, "Tool to determine methane emissions avoided from dumping solid waste at a solid waste disposal site". http://cdm.unfccc.int/methodologies/Tools/eb26_repan14.pdf

VI. *CCAR Standard: Project start date after 2001*

VERSION 2.1 PROTOCOL: *For the purpose of this protocol, the GHG reduction project is the installation of a landfill gas control system for capturing and combusting methane gas that commences operation on or after January 1, 2001.*

The solid waste community is concerned that many of the eligibility conditions noted in the LPRP restrict project developers from registering GHG reductions. SWICS disagrees with the current project start date of January 1, 2001, as it will disqualify many landfill methane reduction projects which have already occurred from being recognized for credible reductions and ultimately render the project Protocol meaningless. Since landfills have been very proactive in achieving reductions since 1990 (under California's update GHG inventory, landfills are the only industry whose 2004 emissions are already below 1990 levels), this would eliminate the vast majority of potential credible reduction. No industry should be punished for being proactive in creating GHG reductions. SWICS recommends a project start date of January 1, 1990 to coincide with the baseline year under California's AB 32 program and Kyoto Protocol. The Kyoto Protocol states that a Party may submit data to establish its level of carbon stocks in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years. [4] Under California's pending cap and trade program, it will be important to have sufficient quantity of viable GHG credits going back to 1990 to offset future growth in the state. At a minimum, the LPRP should allow for a project start date of January 1, 1999. This start date is consistent with the Chicago Climate Exchange (CCX) methane destruction protocol codified in Chapter 9 of its Rules Book or January 1, 1994 to coincide with the creation of the U.S. EPA Landfill Methane Outreach Program (LMOP), which promotes collection and beneficial use of LFG under U.S. EPA's climate change programs.

VII. *CCAR Standard: Continuous Methane Monitoring or 10%-20% penalty on emission reduction credits*

VERSION 2.1 PROTOCOL: *The continuous methane analyzer should be the preferred option for monitoring methane concentrations, as the methane content of landfill gas captured can vary by more than 20% during a single day due to gas capture network conditions (dilution with air at wellheads, leakage on pipes, etc.). When using the alternative approach of weekly methane concentration measurement using a calibrated portable gas analyzer, project developers must account for the uncertainty associated with these measurements by applying a 10% discount factor to the total quantity of methane collected and combusted.*

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[4] Kyoto Protocol, Article 3.

VERSION 1.0 PROTOCOL: *For qualifying projects that became operational between January 1, 2001 and January 1, 2008, the use of monthly methane concentration measurements using a calibrated portable gas analyzer is acceptable under this protocol up until January 1, 2008 after which a continuous methane analyzer or weekly measurement using a calibrated portable gas analyzer is required. In the case where monthly methane concentration measurements are used, project developers must account for the uncertainty associated with these measurements by applying a 20% discount factor to the total quantity of methane collected and combusted.*

In the rare event that the methane concentration in LFG would be reduced by 20%, due to network conditions, other continuously monitored parameters would identify the variance in methane concentration. For example, flares are monitored for temperature; should the methane content drop by 20%, the temperature of the flare would drop as well. Furthermore, if the network were to experience a significant loss of integrity due to leakage at the well head or pipes, then the event would be documented. The dates in which the GCCS experienced a loss of integrity would be documented as well as a corresponding corrective action in accordance with federal, state or local regulations. In the case of a documented integrity loss of the GCCS, a discount factor of may be applied to the dates in which the event occurred. However, it should not be applied unilaterally to all projects without continuous monitoring systems.

Additionally, Table 2 in the LPRP references data to be collected and used to monitor emissions from the project activity. This table appears to come from the CDM protocol number ACM0001/Version 07; however it has been modified to be more restrictive. Specifically, the CDM protocol allows for periodic monitoring of the gas quality; it does not require continuous monitoring of gas composition. The proposed LPRP requires continuous monitoring exclusively. There is no adequate justification provided for this additional expense.

SWICS recommends that the LPRP allow for both approaches. Continuous measurement and recording of gas quality, specifically methane content, is beyond the NSPS, CCX, and CDM requirements. NSPS requires intermittent readings at least one per month, whereas CCX prefers weekly. CDM requires periodical measurements with 95% confidence level using calibrated portable gas meters (i.e., GEM) and taking a statistically valid amount of samples.

Continuous recording of LFG flow, which is captured and combusted, is beyond NSPS and CCX requirements. CDM protocol ACM00001/Version 07 and the supporting tools (i.e., “Tool to determine project emissions from flaring gases containing methane”) do not speak to recording frequency, only measurement frequency. The CDM protocol and tools do however reference hour averaging of flow data and then aggregating the flow data monthly and yearly. These protocols do not require continuous recording of flow;

they require continuous OR periodic. CCAR should replace "recording frequency" with "measurement frequency" on Table 2 of the LPRP to be consistent with the CDM protocol ACM00001/Verion07. The LPRP should also clarify that the amount of LFG flared and/or combusted and/or upgraded must be continuously measured and recorded at least once every 15 minutes. The flow rates should then be aggregated monthly and yearly.

VIII. *CCAR Standard: 600 pounds of NMOC per month threshold*

VERSION 2,1 PROTOCOL: *If the total mass flow of NMOC for the landfill gas control system is less than 600 pounds NMOC per month, then the landfill gas control system is eligible as a GHG reduction project under this protocol. If the total mass flow of NMOC for the landfill gas control system is greater than 600 pounds NMOC per month, then the landfill gas control system is not eligible as a GHG reduction project under this protocol.*

The Registry developed an NMOC emissions threshold of 600 lbs/month whereby the eligibility of a project can be determined. The determination of the NMOC emissions threshold analysis was performed assuming an average flare system cost of $350,000 and a carbon adsorption system (CAS) operational period of 5 years. However, the NMOC emissions threshold of 600 pounds per month, which according to Appendix B of the LPRP is equal to the installation and maintenance of a thermal oxidizer unit or flare, is artificially low. This cost assessment, which was provided by a carbon vendor, is conservative in nature and is designed to cover the worst case, theoretical scenario. Carbon vendors routinely provide conservative quotes in an effort to compensate for unforeseen circumstances. The actual O&M costs associated with a CAS would suggest an NMOC threshold of 2,040 to 4,052 pounds per month is more reasonable and appropriate and is based on actual operating CASs, which have been compiled by SWICS and previously submitted to CCAR, rather than theoretical data.

IX. *CCAR Standard: Application of a 10% oxidation factor to collected and combusted methane*

Equation 1 in the LPRP accounts for the total annual project GHG reductions. However, it applies a 10% oxidation factor to the methane which is collected and combusted. [5] The USEPA AP-42 document categorizes emission sources at landfills as uncontrolled emissions or controlled emissions. Controlled emissions are defined as emissions that are typically controlled by collection of gas through a gas collection system and destruction of the gas through combustion, most typically a flare. [6]The oxidation of methane applies only to fugitive or uncontrolled emissions.

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[5] California Climate Action Registry, Landfill Project Reporting Protocol, Collecting and Combusting Methane from Landfills, Version 1, November 2007, Section VI, Pg. 17.

[6] SCS engineers, **"**Current MSW Industry Position and State-of-the-Practice on LFG Collection Efficiency, Methane Oxidation, and Carbon Sequestration in Landfills". July, 2007. http://www.scsengineers.com/Papers/Sullivan_LFG_Collection_Efficiency_White_Paper_SWICS.pdf

A methane oxidation factor associated with conversion of methane in the landfill cover is misapplied. Such discounting is inconsistent with existing protocols, most notably, the CDM protocol number ACM00001/Version 07, and CCX landfill methane destruction protocol. A landfill oxidation factor is normally applied when trying to estimate methane emissions by a landfill in the absence of a LFG collection and control system or for the methane escaping collection. However, in the presence of a landfill GCCS, LFG recovery can be measured through the application of a proper flow meter. There is no need to use an oxidation factor to offset or reduce the measured flow, as any methane converted in the landfill cover is not part of the "offset" being generated and credited, in the first place and thus is not being double-counted. Any references to the use of a methane oxidation factor should be deleted from these calculations, as it is a misapplication of the concept.

X. *CCAR Standard: Methane Density Determination*

According to footnote numbers 20 and 23, the density of LFG should be calculated based on the metered temperature and pressure of the gas. No separate monitoring of temperature and pressure is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters. Some flow meters, like a Thermal Mass meter, automatically adjust the flow rate based on measured temperature and pressure; however not ALL flow meters do this automatically. The CDM protocol number ACM00001/Version 07 requires that temperature and pressure be determined but includes standard conditions conversion factors for methane density, which can also be used.

XI. *CCAR Standard: Periodic re-evaluation of LFG protocol*

VERSION 2.1 PROTOCOL: *The Registry will periodically re-evaluate the appropriateness of the Performance Standard Threshold by updating the market penetration analysis in appendix A. The Registry recognizes the importance of waste diversion and recycling programs.*

This new language added to the LPRP appears to tie the viability of LFG collection projects to the effectiveness of recycling and diversion programs. This language suggests that if recycling and diversion protocols have not become operational with demonstrated effectiveness by the year 2013, that somehow these LFG protocols could be temporarily suspended.

Recycling and diversion activities have no relationship to a landfill owner/operators ability to efficiently collect and destroy methane above and beyond the business-as-usual scenario. Furthermore, the two sited activities are completely independent of what landfill owners/operators can exert control over. The cumulative GHG reductions via a GCCS should not be dependent on effectiveness of recycling and diversion programs.