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Current Compost Emission Reduction Factor is Flawed

The attached comment is in response to a White Paper presented by the California Compost Coalition. The White Paper relies upon a Compost Emissions Reduction Factor from 2011, that has been proven to only apply to food waste composting (see attached). ARB and CalRecycle are currently working on updating the CERF and any policy or funding decision related to diverting organics should rely upon the new CERF or on the currently more accurate federal EPA emission factors. For example, Technology Demonstration and Deployment: Demonstrate and Evaluate Environmentally and Economically Sustainable Food-Waste Biomass-to-Electricity Systems (Funding Initiative S13.2), should make it clear that the current CERF would not apply to mixed waste composting projects, and should only apply to pure food waste composting projects when documenting the emission reductions of such projects

Additional submitted attachment is included below.

March 7, 2016

RE: Comment on Docket 15-MISC-04 in regards to the Composting Emission Reduction Factor (CERF)

I. Introduction

The current CERF should not be applied to all composting projects in California. The crux of Interra's position comes from an analysis done by the United States Environmental Protection Agency ("US EPA"), which was used to create the 2006 WARM model and continues in the 2012 WARM model. Essentially, the US EPA recognized in 2006 that food waste and green waste have very different baseline emissions. Thus, when the California Air Resources Board ("ARB") released the 2011 report relying on the 2006 Model, it was an error to apply the same CERF to both food and green waste.

A CERF assumes a baseline scenario, and those two feedstock sources have far different baseline emissions. Allowing all composting projects to rely on the 0.42 CERF figure (from the 2011 CA EPA report[1]) grossly overstates the greenhouse gas ("GHG") benefits of green waste composting and provides a tool for policy makers to support those projects over other uses of green waste (including landfilling in CA) that have lower life-cycle GHG emissions.

II. Summary of Concerns with Current CERF

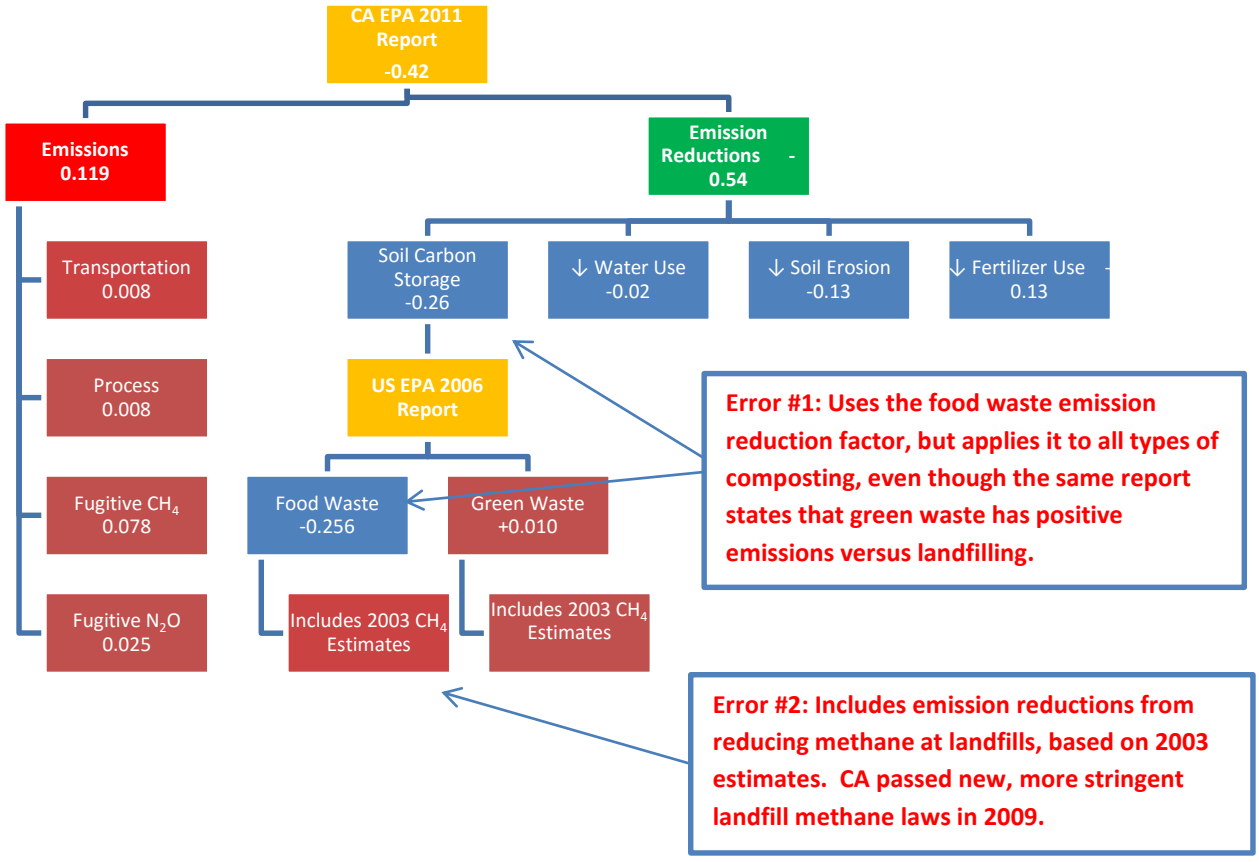
To frame this conversation, it needs to be stated that Interra does not advocate maintaining the current practice of landfilling organic materials. Interra is deeply concerned about the GHG emissions from the waste sector and designed a technology from the ground up to address the California policy goals associated with current diversion practices. However, it is well documented that certain methods and practices for achieving the state's organics diversion goals are in direct conflict California's GHG emissions policy goals.

Interra fully supports the diversion of organic waste from landfills. However, where it can be shown that alternative processes have higher GHG emissions than landfilling, those alternatives should not be considered, let alone implemented, just for the sake of diverting the materials from landfills.

[1] http://www.arb.ca.gov/cc/protocols/localgov/pubs/compost_method.pdf

ARB has relied upon a November 14, 2011 report from the California Environmental Protection Agency ("CA EPA") to calculate the emission reductions from composting.[2] This document concludes that compost operations have an emission reduction of 0.42 MTCO2E/ton of feedstock.[3] However, the 2011 CA EPA Report document states that those relying on the report's estimates of composting emissions should understand the "shortcomings of [the] quantification method and apply them in a judicious manner."[4] For instance, the variability analysis shows that composting emissions under the study range from positive 0.22 MTCO2E/ton of feedstock to -0.90 MTCO2E/ton of feedstock.[5] The large range results from the fact that the report attempts to calculate a composting emission reduction factor for all types of organic waste, instead of breaking down individual organic waste streams (i.e. food waste, wood waste, mixed waste). In the end, the 0.42 MTCO2E/ton emission reduction factor chosen only reflects the emission reductions from food waste composting and does not accurately reflect the emissions from green waste, or mixed waste, composting.

Table 1: Flowchart Documenting Current Errors with ARB's Composting Emission Factor



[2] http://www.arb.ca.gov/cc/protocols/localgov/pubs/compost_method.pdf. *See also*, answer to question 11 at http://www.CALRECYCLE.ca.gov/Climate/GrantsLoans/Organics/FY201415/Apply/QandA.htm.
[3] *Id.* at 20.
[4] Id. at 19.
[5] *Id.* at 18.

A. Errors with Soil Carbon Storage Calculations

The first major shortcoming of the current CERF is that the factor used for estimating the increase in soil carbon storage in the CA EPA report is flawed. CA EPA chose to use 0.256 MTCO2E/ton of feedstock as the factor for carbon storage from composting. This is the main reason that the overall emission reduction number becomes -0.42 MTCO2E/ton of feedstock. The 0.256 MTCO2E/ton of feedstock factor comes from a 2006 United States Environmental Protection Agency ("US EPA") report.[6] However, as mentioned in that report, the 0.256 factor *only* applies to the composting of organic food waste. The report goes on to state:

> - Composting is a management option for food discards and yard trimmings. The net GHG emissions from composting are lower than landfilling for food discards (composting avoids CH_4 emissions), and higher than landfilling for yard trimmings (landfilling is credited with the carbon storage that results from incomplete decomposition of yard trimmings). Overall, given the uncertainty in the analysis, the emission factors for composting or combusting these materials are similar.

Figure 2: Language from the 2006 US EPA report.

Exhibit ES-4
Net GHG Emissions from Source Reduction and MSW Management Options (MTCE/Ton)[a]

Material	Source Reduction[b]	Recycling	Composting	Combustion[c]	Landfilling[d]
Food Discards	NA	NA	-0.05	-0.05	0.20
Yard Trimmings	NA	NA	-0.05	-0.06	-0.06
Mixed Paper					
Broad Definition	NA	-0.96	NA	-0.18	0.09
Residential Definition	NA	-0.96	NA	-0.18	0.07
Office Paper Definition	NA	-0.93	NA	-0.16	0.13
Mixed Metals	NA	-1.43	NA	-0.29	0.01
Mixed Plastics	NA	-0.41	NA	-0.27	0.01
Mixed Recyclables	NA	-0.79	NA	-0.17	0.04
Mixed Organics	NA	NA	-0.05	-0.05	0.06
Mixed MSW as Disposed	NA	NA	NA	-0.03	0.12

In 2006 – the EPA still reported that Composting is only better from a GHG perspective with Food or Mixed Organics – NOT Yard Trimmings

Figure 1: US EPA WARM factors from 2006 with notations added.

[7]

An update to the US EPA WARM factors, in 2012, shows that composting of green waste materials (besides pure grass) has higher emissions that the national average for landfilling operations. Why the 2011 CA EPA Report used the -0.256 factor without stating that it only applies to food waste is unknown. However, agencies relying upon that figure should know that it should only apply to food waste.

[6] Id. at 7 and 13-14.

[7] USEPA, Executive Summary: Background and Findings, Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks, 3rd Edition, ES-13 (2006), *available at* http://www.epa.gov/climatechange/wycd/waste/downloads/execsum.pdf.

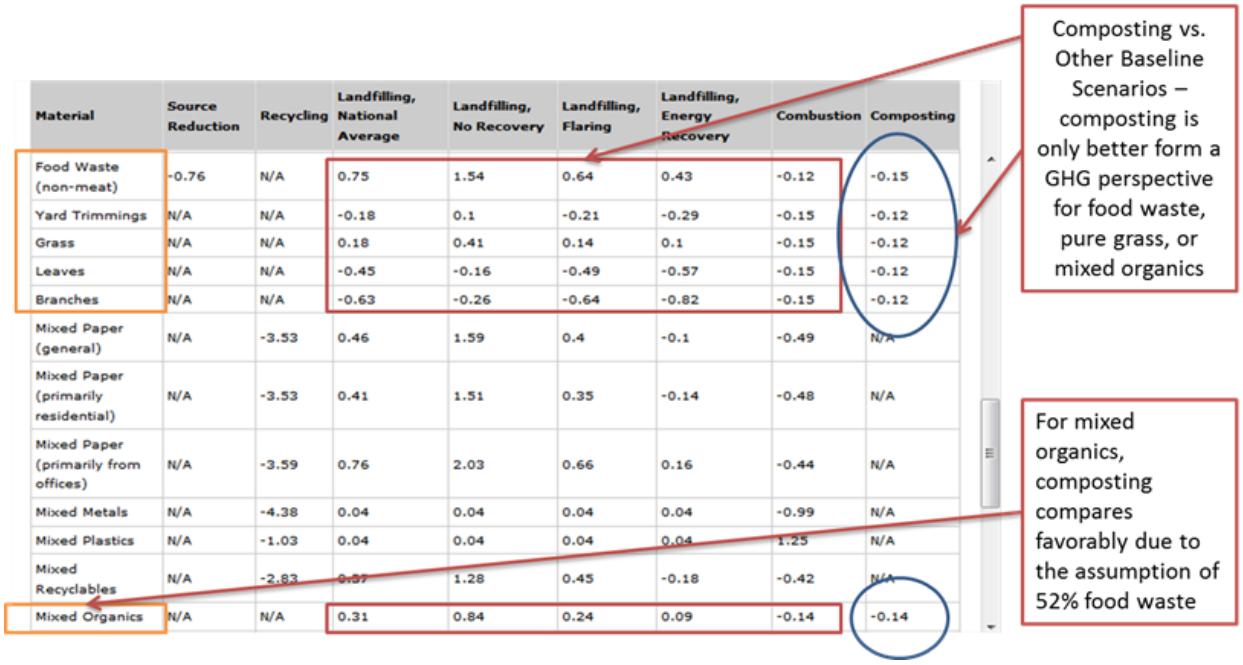


Figure 3: US EPA WARM factors from 2012 with notations added.

B. Errors with Emission Reductions from Methane Recovery Calculations

The second issue with the 0.256 MTCO2E/ton of feedstock factor, used by ARB in 2011 to calculate the soil carbon storage benefit, is that it includes net emission reductions from diverting the feedstock from landfills with an "estimated national average CH4 recovery in year 2003"[8] and "based on assuming zero net emissions for composting."[9] As California changed the laws regarding landfill methane recovery in 2009, using the 2003 figure is highly inaccurate and results in in a higher emission reduction factor than should be attributed to composting projects.

Included below are two tables breaking down the emission factors of landfilling and composting by various waste types. The current US EPA Warm Model uses more accurate up-to-date figures, which are seen in Table 2 below.[10]

[8] Id. at ES-14
[9] *Supra* note 34 at ES-15
[10] http://epa.gov/epawaste/conserve/tools/warm/Warm_Form.html

Table 2: 2012 EPA WARM Emission Factors with lowest GHG Process Bolded[11]

	PLA	Food Scraps	Yard Trimmings	Grass	Leaves	Branches
Landfill – Energy Recovery	**-1.62**	0.43	**-0.29**	0.13	**-0.57**	**-0.82**
Landfill – National Average	**-1.62**	0.75	**-0.18**	0.18	**-0.45**	**-0.63**
Composting	-0.13	**-0.15**	-0.12	**-0.12**	-0.12	-0.12
Composting (Using life-cycle figures)		**-0.369 to -0.281**	-0.151			

Table 3: Summary of CERF for Yard Trimming and Food Waste

	Yard Trimmings	ARB CERF 2011 (applies to all organics)	Food Waste (75% CH_4 Diversion)	Food Waste (Updated figures)
Transportation Emissions	0.008 (CA EPA)	0.008 (CA EPA)	0.008 (CA EPA))	0.04 (US EPA WARM 2012)
Process Emissions	0.008 (CA EPA)	0.008 (CA EPA)	0.008 (CA EPA)	0.008 (CA EPA)
Fugitive CH4 Emissions	0.078 (CA EPA)	0.078 (CA EPA)	0.078 (CA EPA)	0.078 (CA EPA)
Fugitive N20 Emissions	0.025 (CA EPA)	0.025 (CA EPA)	0.025 (CA EPA)	0.025 (CA EPA)
Soil Carbon Storage	0.010 (US EPA 2006)[12]	-0.26 (US EPA 2006)[13]	-0.12 (US EPA 2006 × .25)[14]	-0.24 (US EPA WARM 2012)[15]
Decreased Water Use	-0.02 (CA EPA)	-0.02 (CA EPA)	-0.02 (CA EPA)	-0.02 (CA EPA)
Decreased Soil Erosion	-0.13 (CA EPA)	-0.13 (CA EPA)	-0.13 (CA EPA)	-0.13 (CA EPA)
Decreased Fertilizer Use	-0.13 (CA EPA)	-0.13 (CA EPA)	-0.13 (CA EPA)	-0.13 (CA EPA)
Decreased Herbicide Use	0.00 (CA EPA)	0.00 (CA EPA)	0.00 (CA EPA)	0.00 (CA EPA)
Total	**-0.151**	**-0.42**	**-0.281**	**-0.369**

[11] http://epa.gov/epawaste/conserve/tools/warm/Warm_Form.html.
[12] US EPA, at ES-15, available at http://www.epa.gov/climatechange/wycd/waste/downloads/execsum.pdf
[13] *Id.*
[14] US EPA 2006 estimate 0.20 MTCE / ton of emission for landfilling. Assuming 75% methane capture would result in .05 MTCE / ton. This figure is added to the -0.07 soil carbon storage factor used by the US EPA in the 2006 report.
[15] US EPA, WARM Version 12, Composting: Section 2 http://epa.gov/epawaste/conserve/tools/warm/pdfs/Composting.pdf

Until the new CERF is finalized by ARB, other agencies in California should not rely upon the 2011 CERF for composting projects that are not solely for food waste due to its stated limitations and errors in calculation. Instead, the US EPA factors should be used until a new CERF has been approved by ARB.

Sincerely,

Kenny S. Key
Vice President, General Counsel
Interra Energy, Inc.