California Natural Gas Vehicle Coalition
California Refuse Recycling Council
California State Association of Counties
California Waste Association
County Sanitation Districts of Los Angeles County
DeKalb County Georgia Sanitation Division
Rural Counties' Environmental Services JPA
Kern County Waste Management Department
League of California Cities
National Solid Wastes Management Association
OC Waste & Recycling
Republic Services
Riverside County Waste Management Department
SCS Engineers
Solid Waste Association of North America
Solid Waste Industry for Climate Solutions
Waste Connections
Waste Management

April 6, 2009

Ms. Mary Nichols
Chairwoman
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Management and Analysis of Waste Sector in the Low Carbon Fuel Standard

Dear Chairwoman Nichols:

On behalf of a coalition of public and private solid waste entities and low carbon fuel providers, we wish to thank you for the opportunity to comment on the proposed Low Carbon Fuel Standard and in particular, the application of the LCFS to the management and analysis of solid waste derived fuels.

The entities represented by this coalition are fully committed to the maximum feasible production of renewable low carbon energy and fuels within the earliest possible time frame. Our objective is to provide policy makers with the most accurate information about opportunities for the development of low carbon fuels and energy from solid waste and to reduce greenhouse gas (GHG) emissions from solid waste management.

In particular, we are concerned about recent comments as made by *Californians Against Waste* and others in a March 27, 2009, letter (*CAW Letter*) relating to CARB's approach in calculating the carbon intensity of fuels produced from recovered landfill gas. While we understand the concerns expressed in the *CAW Letter*, we believe, as we will explain below, that they are based on a misunderstanding of landfill gas management technologies and practices. We believe the approach recommended in the *CAW Letter* would greatly undermine the economic viability of converting California's vast biomethane resource into clean fuels and could actually result in increased GHG emissions from landfills.

Therefore, we strongly urge CARB to:

1. Maintain its current approach in calculating carbon intensity – an approach that will incentivize capital investments in clean fuel production and in the improved collection of methane from landfills;
2. Continue to rely on your other (and more appropriate) regulatory control measures to ensure reductions in landfill gas emissions; and
3. Defer to the Integrated Waste Management Board in developing and implementing its "Organic Road Map" as the most effective means to reduce the disposal of organic materials in landfills and to encourage the most environmentally sound management technologies for organic wastes.

We wish to respond specifically to several comments that were included in the *CAW Letter* with the following:

1. The approach that the ARB staff and consultants have taken with respect to calculating carbon intensities for fuels derived from landfill gas (LFG) is totally appropriate and should be sustained by the ARB board in adopting the LCFS.

The ARB analysis of low carbon fuels derived from LFG is based on the fact that this gas will be wasted if not converted into useful energy. Landfills are required by local, state and federal regulations to collect and combust LFG in flares. Diverting the LFG from flares in order to produce a fuel results in virtually no additional GHG emissions. The only difference in emissions reflects the amount of energy necessary to power the fuel refining operation, which is offset many times over by the energy recovery from methane.

Thus, instead of wasting energy by combusting methane in a flare, for nearly the same emissions, the landfill operator can now produce a useful low carbon transportation fuel that can displace high carbon intensity fossil fuels. The use of the LFG methane to produce a low carbon fuel results in only slightly greater emissions than would have been the result of flaring the methane without useful energy recovery. The reduced flare emissions essentially offset the fuel emissions resulting in a very low carbon fuel. For example, we strongly support the LFG to CNG analysis that shows that this CNG has a carbon intensity of only about 10% of Diesel Fuel – making it ***the lowest*** carbon fuels of all the fuels being analyzed by CARB – and it is available ***immediately*** in California.

2. ***Fugitive landfill emissions should not be considered when determining the carbon intensity of fuels derived from LFG that would have otherwise been combusted in a flare. Including fugitive emissions will not result in a more beneficial outcome.***

We agree with CARB staff that fugitive landfill emissions are a separate issue that should be addressed in specific control measures. CARB is currently developing regulations to ensure that landfill operators are keeping their fugitive emissions to an absolute minimum. The solid waste industry has made tremendous strides in reducing GHG emissions in cooperation with local, state and federal regulations over the past 30 years and will continue to do so. We remain the only major industry in California whose current GHG emissions are less than our 1990 baseline.

The *CAW Letter* claims their proposal to include fugitive emissions into the calculation of the LCFS would result in environmental benefits. We respectfully disagree. It would in fact undermine the incentives needed to support large capital investments in LFG to low carbon fuel projects. As a result, the LFG will still continue to be generated and wasted in flares. The Environmental Defense Fund, a signatory to the letter, separately has recognized the importance of converting LFG to fuel, as evidenced in EDF's release announcing a challenge to EPA LFG rules, "[c]apturing the waste gas leaking from the nation's landfills *and converting it to a local source of energy is a trifecta for the nation's economy, environment and energy security*. *Converting methane pollution to a homegrown energy source is a common sense solution to address global warming and protect our kids' health while boosting our economy"*.
(http://www.edf.org/pressrelease.cfm?contentID=8714).

We agree with these statements made by EDF. The control of landfill GHG emissions must be a carefully crafted to include both regulations to control landfill fugitive emissions and incentives to maximize the beneficial capture and use of otherwise wasted and flared LFG energy.

3. ***Managing a solid waste landfill to enhance energy recovery does not increase fugitive landfill gas emissions.***

The letter states that there are "potential additional emissions associated with 1) operating the landfill as an energy supplier as opposed to a containment system,[1] with the footnote stating that "managing a landfill for maximum energy production (*through reducing pressure* or *recirculating liquids*) can result in a net increase of fugitive emissions…" (Emphasis added). This claim is not supported by the facts.

Many facilities that clean up LFG to produce low carbon fuel or energy do require very low nitrogen levels in the LFG, and they achieve this by reducing vacuum on the well field to minimize air intrusion. However, when this approach is used, the number of wells is increased and multiple header loops are installed so that landfill fugitive emissions can be controlled -- even with a low vacuum. There is also technology available which removes the nitrogen from the LFG so that the well field can be operated without regard to the LFG quality needed by the gas processing facility. This is the type of technology that will be typically used to convert an otherwise wasted LFG into a low carbon fuel such as LNG or CNG. Landfills can effectively produce low carbon LNG or CNG from landfill gas without compromising landfill methane collection and destruction efficiency, either by supplementing the well field or by including nitrogen removal technology in the process.

With respect to recirculating liquids, managing liquids in a landfill is strictly controlled by state and federal regulations. When allowed under these regulations, operations to optimize landfill moisture content can be used to manage and optimize the rate of decomposition to increase useable landfill capacity, reduce post closure maintenance, and reduce contaminant levels in the landfill leachate. The addition of liquids can also optimize gas production that can support a greater degree of energy recovery over shorter time window to optimize the viability of such a project. Such operations may increase LFG production and necessitate additional flare capacity, or increased energy or low carbon fuel production. However, such moisture optimizing operations are rarely performed for the primary purpose of justifying a new landfill energy or fuel plant or for supporting an existing landfill energy or fuel plant. There is absolutely no basis for assuming that when moisture is properly managed in a landfill, the incremental increase in LFG cannot be successfully collected and managed by the gas collection system. In fact, it is exactly this type of landfill technology that can reduce the need to site new landfills by taking maximum advantage of existing permitted landfill capacity. All of these objectives can be balanced so that landfills with energy recovery and/or liquids recirculation do not have any increase in fugitive methane emissions.

4. Maximizing the capture and beneficial use of LFG to produce a fuel is not in conflict with the diversion of waste to alternative technologies to produce fuels, energy and compost.

Anaerobic digesters that handle 300 – 500 tons per day cannot produce enough gas to justify a dedicated gas purification and compression facility. Thus, LFG can serve as a transitional fuel source until such time as anaerobic digestion facilities and source

separation infrastructure can economically support alternative energy facilities. One option many landfill operators are considering is the co-location of anaerobic digestion facilities at landfills to make maximum use of existing infrastructure The anaerobic digestion gas output would be combined with the LFG to provide a threshold quantity of gas for a LFG to CNG (or LNG) plant. As the anaerobic digestion capacity ramps up, more organics will be diverted to the digesters and never reach a landfill, which is the shared goal of the signers of this letter as well as the *CAW letter*. By developing LFG to CNG, we expect to actually <u>*speed up*</u> the feasibility and application of anaerobic digestion by providing proven technology and in-place facilities for its output.

5. Encouraging the development of LFG to low carbon fuels is not in conflict with policies to divert organic waste from landfills.

The California Integrated Waste Management Board (CIWMB) is moving aggressively to implement its Strategic Directive and Organics Roadmap to reduce the landfilling of organics by 50 percent by 2020. To do this, at least 15 million tons of organics, much of it compostable, will have to be diverted from landfills on an annual basis. The solid waste industry is committed to working with CIWMB to achieve this goal while providing ample opportunity for anaerobic digesters and other technologies to demonstrate their benefits and feasibility. In the meantime, artificially constraining the maximum beneficial use of energy derived from waste already in landfills (and the up to 50% of organics that may still require landfill disposal beyond 2020) is counter-productive. Disincentivizing landfill methane capture and beneficial use will not change organics diversion, but it will result in less effective management of our landfills by discouraging the further development of LFG to energy and fuel. Indeed, the fact is that a properly promulgated LCFS can incentivize even greater capture and beneficial use of our significant biomethane resources, including sites that might not otherwise capture their methane, and can hasten the development of larger and more effective anaerobic digester systems – again, a result the signers of both letters would welcome.

6. Landfill methane collection and destruction efficiencies are highly variable and difficult to measure – but likely highest in California with a well developed regulatory structure designed to minimize fugitive LFG emissions.

While it is true that landfills with comprehensive LFG systems may capture only a portion of the gas generated from the anaerobic decomposition of waste, the quote provided in the *CAW Letter* regarding IPCC's findings on landfill capture efficiency was not reported fully and taken out of context. Chapter 10 (Waste) in the IPCC 4th Assessment Report for Working Group III Mitigation cited the range of capture efficiency from published literature: from 20% to more than 90%. It is important to understand the basis of each of these numbers. The 20% "lifetime" rate was reported as an estimate in a Dutch study dating from the mid-1990s. The >90% rate was reported in a refereed journal article in 2006 based on intensive field studies of the landfill methane mass balance at multiple cells at three landfill sites. The latter number is more consistent

with the capture rate we believe exists in many well-operated California landfills. With our stringent federal, state, and local regulations in California, LFG capture in this state is clearly not on the low end of international sites. In addition, it is important to remember that it is the IPCC that cites LFG recovery as a way to *directly reduce* GHG emissions.

Thank you for the opportunity to provide these comments for your consideration. We believe the LCFS as proposed by CARB will make it possible to tap California's vast and underutilized biomethane resources for the production of extremely low-carbon transportation fuels. Please contact any one of the undersigned if you have questions.

Sincerely,

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