September 24, 2018

Via electronic mail to CalRecycle Docket

To Whom It May Concern:

The California Association of Sanitation Agencies (CASA) appreciates the opportunity to comment on the draft discussion paper on permitting new and expanded composting facilities in California as released by CAPCOA, CARB, and CalRecycle.

CASA is an association of local agencies and associate members, engaged in advancing the recycling of wastewater into usable water, as well as the generation and reuse of renewable energy, biosolids, and other valuable resources. Through these efforts, we help create a clean and sustainable environment for Californians. Our members are focused on helping the State achieve its 2030 mandates and goals (also referred to as the Governor's Five Pillars), which include:

- Reducing short-lived climate pollutant (SLCP) emissions
- Effectively diverting organic waste from landfills
- Providing 50 percent of the State’s energy needs from renewable sources
- Reducing carbon intensity of transportation fuel used in the State
- Increasing soil carbon and carbon sequestration under the Healthy Soils Initiative and Forest Carbon Plan

Roughly 700,000 dry metric tons of biosolids are managed in California annually with more than 60% of them land applied for agricultural use, used in landscaping, or for public distribution. Almost a third of the biosolids are currently being composted. Wastewater plants can utilize existing infrastructure in the form of anaerobic digesters to co-digest food waste and other organic waste, thereby diverting it from landfills. The resulting biosolids produced can be land applied directly but we anticipate a sharp increase in the quantity of biosolids that would then be composted prior to land application or other use. Therefore the permitting process and requirements are extremely important to the wastewater sector.

In general, this paper does a good job of articulating the current landscape of air quality regulations at the state and local level. CASA agrees with the papers’ assertion that it is unlikely there are enough VOC offsets available under the current systems to permit the required compost capacity to meet SB 1383’s 75% organic waste diversion mandate. The paper does not offer concrete solutions but rather offers various options to consider that may result in facilitating the permitting and operation of additional compost facilities. This paper will initiate an ongoing dialogue in which I look forward to participating. The overall recommendations for further work are reasonable and supportable, though there is no sure outcome. CASA will commit to working with the regulators moving forward to find viable solutions.

Specific comments on the draft discussion paper include the following:

1. Page 6/110 – Figure 2 states that there is no future role for biomass conversion technology as a solution for organic waste. However, this is an emerging innovative technology which should be embraced to the extent it becomes a practical and cost-effective management option.

2. Page 18/110 – Are the authors aware of CASA’s estimate of excess capacity for co-digestion and the presence of anaerobic digesters at wastewater treatment plants (Figure 2)? This data does not appear to have been
considered, so we are attaching it to this letter for your files and reference. In general, the solids in 94% of the wastewater flow in the state is treated through existing anaerobic digestion.

3. Page 28/110 – We urge the inclusion of biosolids in the organic solid waste baseline in Table 1, since they are explicitly included as part of the definition in organic waste under SB 1383 which mandates the 75% diversion target. The data upon which Table 1 is apparently built are from the 2014 waste characterization study to which we have also provided data for biosolids and requested that it be updated. There were some 867,000 wet US tons of biosolids utilized at landfills in 2014 so it is not insignificant. We would be glad to resend this data.

4. Page 34/110 – It is unclear if the authors are aware of the work done by Dr. Peter Green at UC Davis to speciate VOC emissions from biosolids compost facilities. Dr. Green found that 95% of VOCs were very low reactive alcohols contributing very little to ground level ozone formation. (See Comment 4 & 5 below as well). We are attaching a link to this study. http://casaweb.org/documents/2011/werf2c10_web.pdf

5. Page 49/110 and 59/110 – Compost VOC Emission Factors – It is hoped that new credible science can help inform the permitting and technical requirements for compost facilities moving forward. Dr. Green’s work speciating the VOCs released from biosolids compost facilities can better inform these requirements. We urge proactive dialogue with USEPA and the work necessary to change legislation based upon science. This is critical in order for the state to achieve its many laudable objectives.

6. Page 57 – We strongly concur with the recommendations in Table 7 to
   a. Discuss with USEPA the ability to incorporate VOC reactivity as a regulatory approach – also on pages 59&60/110.
   b. Considering VOC Emission factors based on feedstock – also on page 61/110.
   c. Pursue the designation, especially of wastewater and biosolids treatment, as essential public services (whether performed by public or private entities) – also on pages 49 and 61/110.

7. Page 64/110 – Recommendations to advance potentially viable options – We concur with all of these recommendations.

We welcome the opportunity to provide any additional information or clarification on any of our points. We recognize the importance of composting in helping to meet the SB 1383 requirements and stand ready to partner with the state to achieve them. Please feel free to contact me at gkester@casaweb.org or at 916-844-5262.

Sincerely,

Greg Kester
Director of Renewable Resource Programs
CASA developed an estimate of existing excess capacity at municipal wastewater treatment plants (WWTPs) in California where food waste (FW) and Fats, Oils, and Grease (FOG) could be accepted for co-digestion.

We estimate that municipal WWTPs have capacity in existing digesters for at least 75% of the FW currently being landfilled. This percentage does not yet include organic waste that may go to composting.

The estimate was developed in 2015, but it remains a reasonable estimate based on conservative assumptions (see Table 1). The estimate was developed by contacting the 9 largest municipalities in the state, plus one medium-sized plant, which collectively represent 17 WWTPs managing approximately 35% of the total wastewater flow in the state. We obtained data on their volume of digester capacity and their current Mean Cell Residence Time (MCRT) in anaerobic digestion. These factors are used to measure the existing daily flow \( (q1) \) to the anaerobic digesters. We then calculated what the flow would be based on the same capacity but with a MCRT of 15 days \( (q2) \), which is the minimum requirement in state and federal regulations. The difference in flow represents the excess capacity.

Example Calculation based on Facility “A” from Table 1:
Total Digester Volume = 19,800,000 gallons at a MCRT of 20 days

Current Flow (\( q1 \)) = 19,800,000 gallons over 20 days = 990,000 gallons per day

If MCRT is 15 days, then the flow (\( q2 \)) = 19,800,000 gallons over 15 days = 1,320,000 gallons per day

Excess Capacity = \( q2 - q1 \) = 1,320,000 – 990,000 = 330,000 gallons per day

We then applied a multiplier of 35% to estimate the capacity of the remaining 136 existing WWTPs that have anaerobic digestion and manage more than 1 million gallons per day (MGD) of wastewater. It is important to note that the remaining 136 plants actually represent 65% of the influent flow across the state and the 17 surveyed WWTPs represent 35% of influent flow, which indicates that the 35% multiplier is a conservative assumption.

Based on verbal communication with CalRecycle, of the 30 million tons of solid waste disposed of annually at landfills, roughly 17% (or 5 million tons), is FW (including an unknown percent of FOG). Our estimating approach assumes 90% of the organic waste stream is FW and 10% is FOG. The percentage of FOG may be a significant over-estimate, in which case the percentage of FW would then be increased.

In order to maximize use of the existing capacity at WWTPs, investments will be necessary in both infrastructure and market development. There will need to be increased processing of FW prior to receipt at the WWTP and before introduction into the digesters, as well as additional infrastructure to clean the biogas and put it to productive use. This is true whether it is used for electricity production, thermal production, converted to transportation fuel, or injected into the pipeline. Also of significant importance is the fact that additional biosolids will be produced from utilizing excess capacity and both policy and funding support for the recycling of biosolids is critical. It should be noted that the quantity
of FW received may be decreased if flow from connected users increases, operational limitations that
may limit the receipt of hauled-in waste, and during periods of digester maintenance.

Our estimate also includes the estimated reduction in short-lived climate pollutant/greenhouse gas
emissions that could be achieved through the utilization of the excess capacity for co-digestion of FW.
These estimates were based on factors used in the USEPA Warm Model (March 2015), which is
conservative approach. It does not take into account the additional biogas production of co-digestion
and subsequent increased renewable energy or low carbon fuel production, nor the benefits of the land
application of biosolids realized via carbon sequestration and avoidance of fossil fuel based inorganic
fertilizer use. With that said, we estimate 2,662,500 MTCO$_2$e could be avoided each year.
Table 1. Estimate of Excess Existing CA Municipal WWTP Anaerobic Digestion Capacity Available for Organic Waste Co-Digestion

<table>
<thead>
<tr>
<th>Facility</th>
<th>Design flow (MGD)</th>
<th>Actual flow (MGD)</th>
<th>MCRT (Days)</th>
<th>Digester Volume (Gallons)</th>
<th>q1 (gal/day)</th>
<th>MCRT Min (days)</th>
<th>Excess Capacity q2 - q1 (gal/day)</th>
<th>Rounded q2 - q1 (gal/day)</th>
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Total Estimate for CA (gal/day): 8,000,000

Total excess capacity available at 17 WWTPs (representing 35% of the states influent flow).

8,000,000 gal/day results from increasing 5,805,000 by a factor of 35% based remaining 136 CA WWTPs (having anaerobic digestion that treating >1 MGD). While the remaining plants represent an additional 65% of influent flow in the state, we assume 35% additional capacity to be conservative.

ASSUMPTIONS:

30,000,000 wet tons of solid waste disposed per year, of which ~17% is anaerobically digestible food waste (FW) and some Fats/Oils/Grease (FOG)

30,000,000 wet tons per year x 0.17 = 5,000,000 wet tons per year of anaerobically digestible material (ADM)

5,000,000 wet tons per year/365 days per year = 13,700 wet tons per day x 2,000 lb/ton = 27,400,000 wet lbs per day

If we assume food waste diverted from landfill is 30% TS, then:

27,400,000 wet lbs per day x 0.3 = 8,220,000 dry lbs per day

8,220,000 dry lbs per day / 2,000 lbs per ton = 4,110 dry tons per day

Assuming ADM is 90% FW and 10% FOG to determine the flow capacity of FW and FOG that can be reserved at WWTPs:

Assume total solids % of FW received at a WWTP would be ~22% and total solids % of FOG would be ~3%, to be conservative.

8,000,000 x 0.90 = 7,200,000 gallons reserved for FW

8,000,000 x 0.10 = 800,000 gallons reserved for FOG

Mass Loading (Lbs/day) = Flow (MGD) x Concentration (mg/L) x Conversion factor (8.34 lb/MG x mg/L) x Specific Gravity (assume 0.9)

Then:

Mass loading FW = 7.2 x 220,000 x 8.34 x 0.9 = 11,890,000 lbs per day --> 5,945 dry tons per day --> 145% of daily load as FW

Mass loading FOG = 0.8 x 30,000 x 8.34 x 0.9 = 180,145 lbs per day --> 90 dry tons per day --> 2% of daily load as FOG

Total Potential Available Excess Capacity for FW/FOG co-digestion at Existing WWTPs = 6,035 dry tons per day --> 147% of daily load as FW/FOG diverted

Therefore, conservatively estimate that at least 75% of FW/FOG can be accepted at municipal WWTPs, even though it is likely more.

Assume WWTPs dilute FW to 4% TS prior to introducing it to a digester, as well as use sludge to slurry and dilute it. Gallons needed for dilution:

Calculated for 10 dry tons FW per day (which can then be easily converted for varying quantities received):

10 dry tons FW/0.04 = 250 tons of combined FW/water --> 240 tons of process water x 2000 lbs per ton / 8.34 lbs per gallon = 57,000 gallons of process water/sludge per 10 dry tons of FW

75% of the total wet tons of ADM currently being landfilled: 5,000,000 wet tons x 0.75 = 3,750,000 wet tons FW digested

3,750,000 wet tons digested x 0.71 MTCO₂ = 2,662,500 MTCO₂ avoided SLCP/GHG emissions per year

*Emissions factor based on USEPA WARM Model (March 2015), which includes the benefit of avoiding landfill emissions but does NOT include the benefit of co-digestion (biogas production/use) nor land application of biosolids (carbon sequestration and avoidance of inorganic fertilizer)