



# Food Waste Diversion - SB 1383: Navigating the New World Order and Identifying Best Practices for K12 Schools

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*KIT FUNDS approved for some BOH equipment infrastructure that enables convenient, sanitary and often less costly compliance*

This article will provide some background on the purpose of the legislation, the current status of implementation and offer various approaches K12 Schools should consider as they plan their own waste diversion approach.

The scope of this review will mainly focus on the diversion of non-edible food scraps. We assume that the 20% portion of edible food “waste” that must now be recovered for human consumption will be achieved via other means, in partnership with food pantries and organizations that specialize in safe, timely and sanitary collection/transportation of said edible food to those organizations who channel it to individuals who are food insecure and face hunger.



<https://calrecycle.ca.gov/Organics/SLCP/collection/?emrc=63f7d63970904>

**Public Schools and School Districts, State Agencies, Special Districts and Federal Facilities do not fall under a jurisdiction’s authority and must either:**

1. *Subscribe to a collection service that the jurisdiction provides*
2. *Contract for collection service independently OR*
3. *Self-haul organic waste to a specified composting facility, community composting program*

According to a detailed and fairly comprehensive report-out by Heather Jones in BioCycle magazine (March 17, 2020): “All organic waste generators, both residents and businesses, as well as non-local entities and local education agencies, are required to participate in organic material collection programs.” This includes most K12 Schools, so maybe it’s time to figure out your plan...

<https://www.biocycle.net/sb-1383-revolution-organic-waste/>

**Background SB 1383: Purpose is to Establish Methane Reduction Targets and Edible Food Recovery Threshold**

California’s Short-Lived Climate Pollutants (SLCP) Reduction Act, most commonly referred to these days



simply as Senate Bill 1383 (SB 1383) was signed into law back in September 2016. SLCPs have short atmospheric lifespans and include methane and hydrofluorocarbons. Acting to reduce this type of emissions can have immediate positive impact on climate change and public health. Food waste sent to anaerobic landfills creates methane gas, a Greenhouse Gas (GHG) that is shown to be roughly 80 times more potent than carbon dioxide, in its first 20 years in the atmosphere. On a 100 year time-horizon, methane is still considered to be 25 times more potent than CO<sub>2</sub>. Diverting food waste to other beneficial re-use channels dramatically mitigates that and helps feed hungry people (or animals) and create nutrient-rich feedstocks to make compost that can even help with carbon capture.

**SB 1383 set out to totally change the way California manages organic waste. The legislation called for a 50% reduction in organic waste disposal from 2014 levels by 2020 and a 75% reduction by 2025.** It also requires that not less than 20% of edible food that is currently disposed of be recovered for human consumption. SB 1383 set forth a variety of programmatic and policy-related requirements for jurisdictions, generators and other entities to comply with the legislation.

While Covid-19 caused a delay in implementation target dates on both fronts, the overall intent and commitment to implementation remains steadfast and by 2024 schools can expect potential enforcement actions, if they are not demonstrably on a path to organics diversion. The California Department of Resources, Recycling and Recovery (CalRecycle) oversees a variety of programs and policy initiatives to reduce the amount of solid waste going to landfills, including organic waste, and seeks to promote recycling in California. CalRecycle offers four Model Implementation Tools to jurisdictions to use and customize to meet their local needs.

**How it all works and potential negative consequences for non-compliance:** In a nutshell, enforcement of SB 1383 would occur by the state imposing penalties on local jurisdictions and the local municipalities are tasked to impose the fines or penalties on non-compliant generators. The locality will be fined either way. Technically, it's their choice to pass the buck...and most will gladly do so.

**News You Can Use:** Following the CSNA Conference in Pasadena in October 2022, the California Department of Education's (DOE) reviewed specifications for on-site food waste dehydrators, such as

the Compost Accelerator™ and found them to be viable and acceptable for purchase, using Kitchen Infrastructure and Training (KIT) funds.

**Approximately \$600M is available and the estimated deadline to apply for funds is 11/30/2023**

<https://www.educationgrantshelp.com/grants/14220-kitchen-infrastructure-and-training-kit-funds-ca/>  
<https://www.cde.ca.gov/ls/nu/kkitfunds2022.asp>

**Most people know the “old school” methods of food waste diversion and collection, using multiple bins and bags to collect and store raw food waste. The Old School model requires frequent handling and collection due to flies, odors and sanitation issues that result after 48-hours (or less) when materials are stored outside at ambient temperatures, especially in the warmer months.**



**Sidebar:**

In some states and cities cold-storage, meaning allocating refrigerator or cooler space, can decrease the required frequency of collection. In most places, you'll likely be looking at 2xWk or 3xWk collection, which can be expensive, unsightly and pose both sanitary concerns and space constraints in the BOH.

In the Old School food waste collection method, you put raw food waste into small bins and then pour those into larger totes that are collected by a standard hauler that transports the raw material to a Compost Site or maybe large scale anaerobic digester (AD) facility. This is perfectly functional, but differs from **the New School approach of Reduce material by 80%+ before transporting it.**

**Determining which diversion approach is right for your kitchen and district depends on several variables:**

- 1) Collection availability** – most jurisdictions should by now have a plan in place to collect Organics, so that should be available
- 2) Cost and Frequency of Collection** – the more often something has to be collected, typically, the more expensive that service is
- 3) Space Constraints** – must consider trade-offs between frequent collection and risks of odor mitigation, flies and vectors
- 4) Staffing** – consider how many trips outside to dumpster area or bin storage site does the conventional approach require

**There are now some “new school” methods of waste reduction that reduce the material on-site by one of two primary methods: Digesters or Dehydrators.**

*Below is a vented, food waste dehydrator, designed to reduce food waste on-site by 80% to 90%.*



*This type of “vented” dehydrator has the same on-site reduction benefits as the earlier generations of commercial dehydrators, but avoids the challenges/risks of discharging effluent into the waste-water treatment system, which like some on-site digesters can lead to high levels of Total Suspended Solids (TSS) or spikes in either BOD or COD levels. Suffice to say, venting off moisture as steam is simpler and avoids potential downstream challenges with waste-water treatment plants.*



*In Fillmore USD, Barbara Vazquez, Director, Child Nutrition Services (L) with Wynona Cronin, Fillmore High School Cafeteria Manager, alongside an on-site dehydrator. 100% diversion! 80%-90% reduction occurs inside the dehydrator, simply by removing the moisture from the organics. The 10% to 20% residual material or dehydrated food waste (DFW) is high in Nitrogen and Crude Protein, so it can be used as a compost feedstock or in animal feed.*



### **Large-scale Anaerobic Digesters vs on-site BioDigesters**

By now, most folks in California are vaguely familiar with massive, large-scale anaerobic digestion (AD) projects. Maybe you’ve heard of dairy farms processing cow manure and processing it to create energy. Anaerobic Digestion is simply the process by which organic materials (food waste, manure etc) in an enclosed vessel are broken down by micro-organisms in the absence of oxygen. This process produces biogas made mainly of methane and carbon dioxide. That biogas can be combusted to run generators to produce electricity. That’s pretty cool and works well at large scale projects that cost millions of dollars to set up...and still usually rely on the Old School methodology of **Haul it Before you Reduce the Mass...** That’s not relevant to our on-site reduction review.

### **On-site Organics Reduction: Digesters vs. Dehydrators**

Almost a decade ago, BioCycle magazine, The Organics Recycling Authority, ran a great piece to set the stage for understanding the basics of the two main options, when it comes to large-scale, on-site organics reduction: BioDigesters vs Dehydrators. Part I of the series by Zoe Neale (Oct. 2013, Vol. 54,



<https://www.biocycle.net/analysis-of-biodigesters-and-dehydrators-to-manage-organics-on-site/>

The article titled Analysis Of Biodigesters And Dehydrators To Manage Organics On Site serves as a great point of departure: “Current interest in and/or government mandates to divert source separated organics (SSO) frequently outpaces development of locally available composting and anaerobic digestion capacity. Food waste, the predominant SSO in the commercial organics stream, is wet and heavy leading to financial and logistical challenges when trucking it from the generator to an often distant processing facility. This reality has led to opportunities for on-site processing systems that either:

- 1) Substantially reduce the weight and volume of the organics prior to hauling; or
- 2) Biologically break down and liquefy the organics to the point that they can be disposed through the existing sanitary sewer system, eliminating hauling for this waste stream altogether.”

**There were pros and cons to each platform. Each can substantially reduce food waste on-site, reducing hauling costs.**

Dehydrators accomplish two critical pieces of what most food waste generators, like K12 Schools, would hope for:

A. Safely/Reliably provide significant on-site Reduction (80% to 90%) of the solid food waste (without odors and fly issues)

B. Save disposal/labor costs and take up much less space between collections (compared to traditional raw food waste hauling)

**In many ways, biodigesters initially appeared to have two main up-front advantages from the waste generator’s perspective:**

A. typically pumped the entire “issue” of food waste down the drain, leaving no residual to deliver a Last Mile for value extraction

B. power consumption was less than that required by dehydrators

**What Happened with on-site BioDigesters?**

Time and experience among many operators from

restaurants, grocery stores, universities and even prisons would, ultimately, reveal why on-site digesters enjoyed only a brief splash. When the splash from the first big wave of adopters receded to calmer waters, there were many disillusioned customers. The seminal BioCycle article from 2013 foreshadowed and anticipated some of the potential future challenges that wastewater authorities at the municipal and district levels would soon enough encounter. Some customers abandoned the biodigester platform due to operating issues like backed-up pipes (along with E. coli) and costly pipe corrosion. Others were simply shut down by their waste-water treatment authorities for reasons related to Total Suspended Solids.

The main challenges with biodigesters usually became clear to authorities within about 18 months.

First and foremost, the wastewater treatment facility that ultimately receives the liquid (and solids) that were digested begins to detect Total Suspended Solids (TSS) levels above safe and permissible levels. This relates to biological oxygen demand (BOD) and/or chemical oxygen demand (COD) levels.

BOD and COD tests essentially establish what level of organic matter is in water downstream. If the level of organics in water is too high, it robs oxygen from marine plant and animal life. In a nutshell, excess suspended solids can damage aquatic ecosystems. There are filters and other measures one could take to better address the issue, but they add cost, time and complexity. Suffice to say, the digesters, which once seemed to have an Easy Button, lost some of their shine over time. Other on-site challenges involved the on-going cost of having to add enzymes every 3 to 6 months and lacking on-site expertise to properly keep pH and bacteria levels “balanced” in the tank, given varying types of food waste input. This, along with the large daily quantities of water usually required to operate a digester keeping the bacteria and pH balanced in the right range inside the system. Finally, when the “wrong” food or foodservice items inevitably end up in the digester tank, they can cause back-ups and unlike with a dehydrator, which is designed to separate out water from solids and then capture the solids for their value, digesters lacked the ability to separate out solids.

**A Detour Through Household, Small-Scale Dehydrators...and some key learnings**

In the January 2023 edition of Composting News, there’s a feature on a firm called Mill. Matt Rogers, who was on the Apple team that developed the iPhone before co-founding Nest helped launch the



membership-based service that provides a kitchen bin that “dries, shrinks and de-stinks” kitchen scraps overnight, turning the “ingredients” into “food grounds.” This clever approach also allows you to use an App to schedule pick-up of the dried material. They get shipped back to Mill and turned into a chicken feed.

Mill claims their material is “...is different from composting and keeps food as food.” That’s fair. The reality is, though, that dehydrated food waste (DFW) is just a “feed stock”. It’s actually suitable as both a valuable feedstock for Compost (due to high Nitrogen content) and as animal feed feedstock (due to high Crude Protein). In some cases with hogs or chickens, the DFW may be safely used directly in a blend with other feedstocks to immediately comprise a healthy and nutritious component of animal feed.

The verdict is still out on how uptake will be with the Mill subscription-based model and the cost of sending the dehydrated material to a central location for final “value extraction” and turning the material into a new value-added chicken feed...but there approach is honest and straight forward and doesn’t make any dubious claims about the Steps required to arrive at a finished byproduct.

### **Buyer Beware on some so-called Household Kitchen “Composters”**

You’ve probably seen household items marketed recently, like the Lomi Kitchen Composter by Pela. Pela has done some great things in making recyclable phone cases and educating consumers about how bad it is to allow food waste to end up in Landfills, because it will then create Methane gas, which is 25 times more potent than CO<sub>2</sub>. The Lomi is being pushed through aggressive on-line advertising with comments by some enthusiastic reviewers initially reading:

“Lomi takes waste management to the next level by turning your food waste into compost with the press of a single button!” – Mr. Gadget.com.

(Well, hmmm, not so much. May need to dig a little deeper into the compost pile to get a more accurate understanding of how best to use the residual material that results from pushing that little button)

**Buyer Beware:** While the Lomi technology performs a constructive dehydration approach for much smaller amounts of household waste, contrary to some of the initially misleading video advertising, the dried

material that comes out is not a “finished compost.” Anyone recall the sweet little girl sprinkling some so-called Lomi “compost” directly onto a houseplant with her Dad?

That approach is not exactly advisable, unless the material had first been taken outside, blended with carbon and water, cured for a few weeks (at least) after hitting thermophilic temperatures of 140F-150F for long enough to become “cured” and “stable” compost.

The Lomi is a technological advance for home use, to be sure. It’s a welcome addition to a bevy of similar new in-home dehydration technology. It can absolutely help prevent the creation of noxious methane gas, which is what happens when food waste goes to a landfill. The output material is temporarily “stable” – so long as it’s kept dry. It’s not going to be a “stable compost” however, until it gets blended with some water and its Carbon counterpart (e.g. wood chips) to finish the compost cycle and achieve a “stable” compost.

### **Understanding the Last Mile of a DFW feedstock**

The Last Mile journey of dehydrated food waste (DFW) is important to understand with any home-use or commercial grade food waste dehydrator. Large-scale dehydrators designed to handle anywhere from 250 lbs of food scraps up to 1 ton or more of material, and are durable and built to last in a wet, Back-of-House (BOH) kitchen environment, serving hundreds or thousands of meals per day. The DFW must still be blended with other feedstocks to completely Close-the-Loop. For compost, that means carbon sources. A professional compost facility can easily be trained with US Compost Council (USCC) data on proper blend rates for DFW to Carbon (wood chips) to arrive at a great finished compost product, after a windrow process. The on-site reduction of food waste can greatly accelerate the compost process, compared to bringing non-reduced, raw food waste to a similar facility for composting.

### **Key Freight Advantage of On-site Dehydration**

The output material (DFW) can be stored safely and for a long period of time before it needs to be transported!

This is often a major freight and cost advantage in a commercial setting and is a key motivation to invest in such technology.

Reducing mass and weight by 80% to 90% before needing to haul a given material like food waste makes

intuitive sense.

According to Dr. Sally Brown, Research Associate Professor at the University of Washington's School of Environmental and Forest Sciences and BioCycle Trailblazer and frequent contributor: "Dehydration is a common tool to produce a shelf stable product. Instant mashed potatoes are just one example of shelf stable food. Commercial scale dehydrators for food scraps create a similar shelf stable product, with the exception being that it is not targeted for human consumption. Understanding the implications of this - for reduced collection frequency, reduced weight, and greater flexibility for end uses is critical to the goals of SB 1383. It is likely the beginning of a new era in food scrap management with a number of home appliances under development or in market to do the same."

**SB 1383 inadvertently penalizes K12 Schools or other users of commercial dehydrators, by forcing more frequent collections than would actually be required, from a scientific perspective, if odor mitigation or mold-prevention are the concerns.**

In SB 1383 dehydrated food waste (DFW) is simply treated as if it is a "solid waste" which is what "raw food waste" falls under. Neither are quite capture the reality, but for simplicity's sake the little-understood DFW was lumped in with the "solid waste" when it comes to how often it is required to be hauled away from the generator's site.

As a result, SB 1383 appears to generally require weekly collections (at a minimum) or, if one petitions and receives a local exemption, then every-other-week (EOW) collection may be possible. The regulations currently do not allow for once a month or every-other-month collection, based on the current lack of understanding of this material. This has the unfortunate knock-on effect of putting more trucks needlessly on the road to collect material that is, in fact, stable as long as it's stored in a dry place, like a toter with a lid and latch. Thus, SB 1383 would benefit from an updated scientific understanding of the soil science surrounding dehydrated food waste (DFW), so that one could make it permissible to only collect it once every 2 or 3 months... or even at six month intervals. This would further reduce emissions from the trucks hauling it to its end destination -- either a Compost facility or an animal feed processing plant.

It's understandable that SB 1383 didn't account for the significant differences in the unique characteristics

of DFW at the time the legislation was written, since dehydrators were relatively new back then. That said, it is time SB 1383 be updated on this key point, so that innovators who have adopted this sort of technology can lower their hauling costs while lowering overall emissions associated with hauling the residual material to its final home. Other states, like Washington are modeling their legislation on SB 1383 and appear to continue to create this unnecessarily frequent collection burden on generators of food waste who do adopt on-site dehydration technology.

The early on-line Lomi videos sure made it look like one could just happily apply the output material directly to houseplants or garden plants to add nutrient value. If you use it directly as a fertilizer supplement you may see it mold or produce unpleasant odors. It may well be a great product as a "feedstock," but just remember, the reality of what to do with the dried residual material is a bit more complicated than their advertising first makes it appear. That's true whether we're talking about your kitchen counter at home or your large-scale BOH space at a K12 school.

One needs to treat DFW as a "feedstock" and not a "finished" compost. As long as one understands that it is a Nitrogen feedstock and must still be blended with Carbon feedstocks, like dried wood chips, sticks or leaves, one can use it to make a finished compost. Takes a tiny bit of understanding of soil science, but if you're patient and willing, it can work at home. It's just not "instant fertilizer."

***Conclusions:***

***SB 1383 and organics diversion mandates have arrived. Enforcement actions are likely to begin with warnings and generosity, but the grace period will likely come to an end sometime in 2024.***

***On-site Dehydrators can provide attractive cost benefits, storage advantages and be more sanitary and hygienic vs Old School bin collection of raw food waste, with multiple bins required. KIT Funds can be used to help you on your journey to becoming compliant with SB 1383, before your district begins to face fines and penalties for non-compliance.***