Good afternoon councilors and others interested in Cambridge's food scrap collection program. My name is Laura Orlando. I am a civil engineer, executive director of RILES, and an adjunct professor at the Boston University School of Public Health.

**Cambridge's food scrap collection program**

Note that I am not calling what Cambridge is doing with its food scraps "composting" because composting is not part of the processing of this valuable waste material. It is erroneously called "curbside composting" by the city in its marketing materials and other information made available to the public. This is not news to anyone working for the city that is engaged in this effort, but it may be news to members of the public. But a name change won't fix the problem. Diverting the food scraps away from the wastewater treatment plant will.

What is happening now? Cambridge city trucks pick up food scraps collected by households and bring them to an industrial facility in Charlestown managed by a multinational corporation called Waste Management, Inc. There the food scraps are ground-up and mixed with water or other liquids and then hauled in trucks to the Greater Lawrence Sanitary District (GLSD) wastewater treatment plant in North Andover. The trucks off load the slurry with a hose fit to a pipe that sends it to one of four anaerobic sludge digesters at the plant. Once in the digester the food slurry comingles with sewage sludge, the always toxic byproduct of wastewater treatment. The goal of the effort for Cambridge is to remove food scraps from landfills, which it achieves. But where the food scraps go is of fundamental importance to the health and safety of the people of Cambridge and the citizens of Massachusetts. Right now the city is trading one waste management hazard for another.

**What is sewage sludge?**

Sewage sludge is a by-product of wastewater treatment. Wastewater brings to sewage treatment plants all the wastes sent into the sewers from industrial and commercial drains, hospitals, toilets, and road runoff. Whatever toxicants, hazardous materials, and other pollutants that happen to be removed from the water in the process of wastewater treatment, and that are then concentrated in the sludge, will remain in the sludge. Nothing in the processing of sewage sludge “treats”—e.g., detoxifies--sludge.

Sewage sludge is regulated for some heavy metals such as lead and copper, but hundreds of known toxic chemicals in sludge are not. The EPA in its 2009 Targeted National Sewage Sludge Survey concluded that all sewage sludge contains toxic and hazardous materials.¹ These include

---

¹ https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003RNO.PDF?Dockey=P1003RNO.PDF
flame retardants, antimicrobials, and surfactants -- all of which can cause harm to wildlife and humans. A 2015 study by researchers at Arizona State University reports, "Many organics sequestered and concentrated in MSS [municipal sewage sludge] meet the U.S. Environmental Protection Agency's definition of being persistent, bioaccumulative, and toxic. The United States Geological Survey found the antiepileptic drug carbamazapine, steroids, polycyclic aromatic hydrocarbons, detergent metabolites, fragrance compounds, and disinfection chemicals in all of the samples of sewage sludge it tested. Perfluorinated alkyl substances (PFAS), a deeply problematic chemical with serious adverse human health effects increasingly found in drinking water, including here in Massachusetts, are in sludge too."

What about sludge rules and regulations?

All municipal wastewater treatment facilities are required to get a National Pollutant Discharge Elimination System (NPDES) permit to operate. It stipulates the level of treatment of wastewater and sludge. The GLSD permit regulates none of the chemicals I have mentioned here. It is instead concerned with so-called conventional pollutants, primarily pathogens and nutrients. GLSD is not unlike any of the other WWTPs in the US. The thousands of toxicants in wastewater and sludge are not regulated because we do not have the technology to remove them. Prevention is the way to mitigate the damage from toxicants. That, and backing off sewers.

The GLSD Sewage treatment plant

Before the election of Ronald Reagan in the 1981, sewage treatment plants could expect more than 80% federal financing for capital expenditures and upkeep. After Reagan left office in 1989, federal dollars for infrastructure like wastewater treatment plants (WWTPs) dried up. It was up to local and state authorities to keep them running. Why does this matter in our discussion here? Because the City of Cambridge is participating in a rebranding of WWTPs like the GLSD to bring in revenue from new sources, such as the MA Dept. of Energy Resources, MA Renewable Energy Trust, and the MA Executive Office of Environmental Affairs. The rebranding includes "Organics to Energy" programs like at GLSD. For example, the GLSD will receive energy credits for as long as it produces a particular volume of biogas, generated by the anaerobic digestion of the sludge and food scraps in its digesters.

The GLSD manages 52 MGD of sewage. It is the second largest WWTP in Massachusetts. It serves 168,000 residents of Andover, North Andover, Lawrence, Mathuen, and Salem, NH. 80% of its influent is from households and 20% from industries. It has 40 significant industrial users. It discharges treated wastewater into the Merrimack River and produces 52.5 wet tons a day of sludge, which is dried to about 38 dry tons/day (2013). Some of those residents on the system are the poorest in the state. This becomes an environmental justice issue when one considers the increase in O&M from the food scraps program at the treatment plant. 50% of these costs are carried by the people of Lawrence, the largest city on the system. Published budgets show a 20%
increase in O&M since the 4th digester meant to handle food scraps went online. This won't come out of Cambridge projects, but will instead be paid for by people in the Merrimack Valley.

GLSD built 3 anaerobic digesters in 2002 and started construction on a 4th in 2014, with significant state funding. The 4th digester was added to prepare for food scraps that would be coming from Massachusetts municipalities like Cambridge. But the digester cannot process the food into biogas unless it is approximately 15% solids, so a RFP was sent out by GLSD to establish an industrial facility to make the slurry. The contract was won by Waste Management, Inc. (WMI) and sited in Charlestown. This infrastructure was teed up by the state and GLSD, with at more than $20 million in grants from the state. So when Cambridge went looking for a place to bring its food scraps, the WMI facility in Charlestown was ready. Why does this matter? Because millions have been invested by the state to turn your food scraps into a source of pollution. The same investments can be made to create transfer stations and other infrastructure necessary to turn food scraps into compost.

**What about the energy produced by the digestion of food scraps at the GLSD?**

Wastewater treatment plants are not carbon neutral. Their carbon footprint includes aeration required in the secondary treatment process, sludge processing, pumps and machinery, sludge hauling by trucks, and the production of chemicals used in the treatment process.

The IPCC estimates that 5% of global methane (CH4) emissions and 3% of global nitrous oxide (N2O) emissions come from wastewater treatment plants. Both are greenhouse gasses more potent than carbon dioxide (methane has 25 times the global warming potential than carbon dioxide and nitrous oxide has 300 times the global warming potential). WWTPs use massive amounts of electricity too, by some estimates 1% (38 billion kWh/year) of all electricity use in the US.

Making biogas at the plant is a dirty, dangerous operation. The purpose of sludge digestion is not to produce biogas, but instead for volume and pathogen reduction. But capturing the gas is a good idea. To do so, it has to be monitored, metered, cleaned, stored, and used. Why cleaned? Because the sludge is so loaded with siloxanes -- which are silicone compounds from personal care products, sealants and lubricants -- that their oxidation forms deposits on engine parts. These compounds cause cancer and harm the reproductive and immune systems. Once filtered out they are brought to the landfill. WWTPs are multipliers of environmental trouble.

When there is a disruption in the service by mechanical failure or human error, the gas is released into the atmosphere. When everything is running smoothly, 18% of the biogas is flared and the rest goes into processing the sewage sludge -- which only consists of 8% of the energy needs of the treatment plant -- which are now increased by the addition of the food scrap slurry. And round and round we go.

**Conclusion**
What to do? Do not mix Cambridge food scraps with sewage sludge. Instead, compost food scraps, making a soil amendment that contributes to healthy soils. This translates into carbon sequestration and healthy plants; helping agriculture be the foundation of public health.

The timeline for real composting has to include the development of the infrastructure to make this happen, just as the comingling food waste with sludge was planned far in advance of the Cambridge Compost Program. This city and our state can reverse this error and really make the Cambridge Curbside Compost Program just that -- a compost program. Other municipalities in Massachusetts are watching, as is the rest of the county. What Cambridge does with its food scraps, matters greatly.

Laura Orlando  
Executive Director, RILES  
1330 Beacon St. STE 355A  
Brookline, MA 02445  
Email: orlando@riles.org