Mollie Bogardus
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JUN 13 2013

June 7, 2013

To: Townships of Martha's Vineyard

Several weeks ago representatives from Green Mountain Technologies, Inc. were invited to speak at a town meeting on Martha's Vineyard concerning the alternatives available for the disposal of food waste. The cost of waste disposal on the island is a compelling reason to address more on island capacity. With Massachusetts law mandating that food waste from larger producers will be outlawed from the waste stream next year, this is a timely subject. We believe we have a solid, cost effective solution to begin a tiered process to deal with the food waste on the Island. Please review the enclosed/attached information. I will be contacting you to answer any questions or concerns and look forward to an opportunity to work with you on this project.

Sincerely,

Mollie

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Date: June 4, 2013

Submitted to: Chilmark Board of Health and Board of Selectmen

Submitted by: Mollie Bogardus, Van Calvez and Michael Byran-Brown, Green Mountain Technologies

Subject: Concept for Martha's Vineyard Distributed Composting Infrastructure

We are pleased to offer the following concept for a distributed composting infrastructure on Martha's Vineyard.

The idea is to locate self-contained, in-vessel composting systems at key, strategic locations around Martha's Vineyard. Our Earth Flow composting system would be ideal for this application. GMT can also provide simpler aerated static pile systems for farms as part of this distributed model.

For example, one strategy would be to locate an Earth Flow system at each of the six transfer stations. This would allow residential and commercial drop-off of food waste, green waste and other biodegradables. Rather than transporting this putrescible mix, the Earth Flow would compost this material at the transfer station in 14-21 days and can be fed continuously whenever the transfer station is open. Transport of the finished compost would be easier and less expensive, whereas food waste has to be removed frequently to avoid odors and flies. Furthermore, additional Earth Flow systems could be sited at farms and other strategic locations.

A distributed, community-based composting approach for your community would have the following advantages:

- **Scalable Solution.** Allows you start small and build capacity over time, rather than having to make a large capital investment upfront for a centralized facility.
- **More Intelligent Use of Limited Space.** Eliminate the need to dedicate a large piece of land for a centralized composting facility.
- **Easier Permitting.** The distributed approach will make DEP permitting easier and, in most cases, allow systems to be exempted or permitted using general permits.
- **Reduced Transport.** By siting composting systems strategically at transfer stations, farms and other convenient locations, the amount of transport (and associated costs) can be significantly reduced.
- **Reduced Risk.** Finished compost is hygienic and roughly half the weight/volume of the biodegradable feedstocks. It is easier and less expensive to store and transport the finished compost.

While Earth Flow systems can vary in size, our EF-40 Earth Flow system (8' x 40') would be an excellent choice as it would provide the maximum processing capacity for each location. An EF-40 can receive between 1.25-1.5 tons per day of combined biodegradables.

Here are some key advantages/benefits with the Earth Flow System that we see for this application:

- **Food Waste Composting.** The Earth Flow system was designed specifically for food waste composting and is the optimum technology for this application.
- **Always Available.** Since the Earth Flow is a continuous flow composting system, biodegradables can be added at any time and finished compost can be removed at any time.
- **Operational Simplicity.** The fully automated Earth Flow system provides automated mixing and aeration of compost. The operator simply loads and unloads material and oversees the process/tracks compost temperatures.
- **Controls Pests and Odors.** The fully self-contained Earth Flow system provides excellent control over pests and nuisance odors.
- **Freestanding Composting System.** No additional structure required.
- **Year Round Composting Capability.** Designed for harsh weather conditions (such as snow, wind and extreme cold).
- **Speed of Composting.** The Earth Flow system is capable of thermophilically composting food waste in 14-21 days (an additional 1-2 months of curing is recommended after compost exits the Earth Flow).

- **Superior Compost Quality.** The combination of the inclined, traveling auger and the positive aeration system in the Earth Flow produce an extremely rich, friable, oxygenated compost.

Approximate Capital and Operating Costs
The following information summarizes projected capital and operating costs for installing a single EF-40 at a location on Martha's Vineyard.

Capital Costs
Approximate capital costs are presented below.

Earth Flow System Pricing with Recommended Features, Freight and Installation:	**Price**
Earth Flow™ 40 (EF-40) – Stainless Steel – Base Price	$ 119,900
Insulation Package (R18)	$ 9,500
Replacement Bolt-On Auger Flighting	$ 995
Estimated Freight	$ 8,500
Installation, Start-Up and Training per Vessel (including travel expenses)	$ 8,000
Subtotal:	$ 146,895
Options:	
1200W Floor-Level Heater	$ 1,950
Powered Tote Loader	$ 9,980
Moisture Addition System	$ 1,200
Extended Parts Only Warranty*	$ 1,980/yr

* Does not include to labor to remove or install components. Standard Warranty is a 1-year parts only warranty. Limit two additional years.

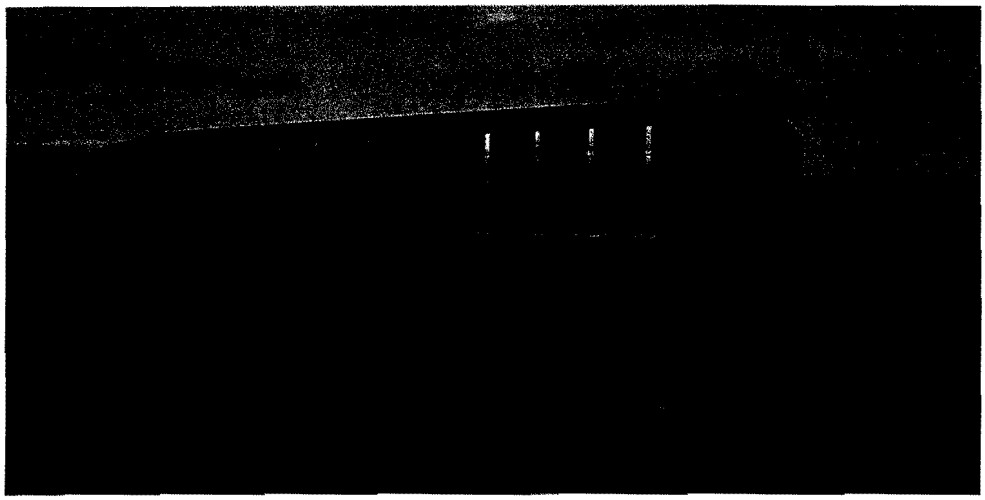
Notes:
- These costs do not include applicable taxes.
- These costs do not include system placement, concrete pad, electrical service, bulking agent storage, curing compost storage.
- These costs do not include a biofilter. We are happy to provide a quote on an appropriate biofilter or guidance on the provision of a biofilter for this system.

Approximate Operating Costs
Operating Costs are based upon the following factors:
- Operator time requirements (including system operation, monitoring, loading and unloading) average 1 person-hour per day. These costs do not include transport of feedstocks, bulking agent, curing and finished compost.
- Maintenance costs (including labor and materials) are estimated to be 3% of capital costs per year.
- Expected daily power requirements are approximately 5.5-9.5 kWh per day (not including the heater).

We are excited to work with you to establish a successful composting infrastructure for Martha's Vineyard.

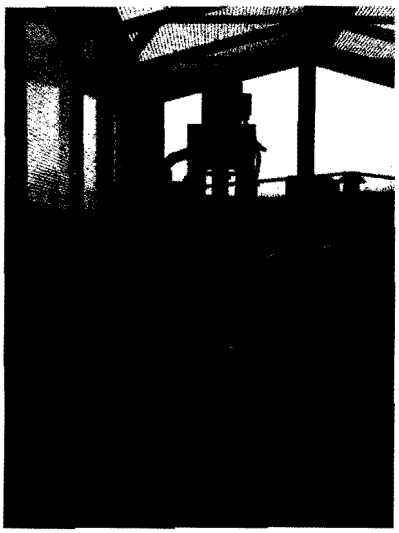
Enclosures
- Earth Flow Cut Sheet
- EF-40 Price Sheet

The Earth Flow™



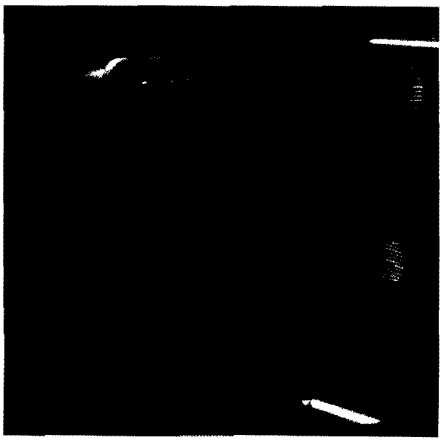
Earth Flow with Greenhouse Roof Enclosure

The Earth Flow™ is an in-vessel system that converts up to one ton per day of organic waste into compost. The unique design incorporates a fully enclosed vessel and odor control system with an inclined auger for mixing, shredding and discharging the organic waste. The compost process is automated by the control panel which turns on the mixing system, blower and sprayers based on settings from LCD interface.



Auger Mixing System

The stainless steel inclined auger is mounted on a carriage which moves side to side and fore and aft within the vessel. The auger churns and shreds the compost in the vessel in less than ½ hour advancing it slowly toward the discharge end of the vessel.



Mixer Control Panel

The control panel operates the auger, odor control and moisture addition systems based on operator settings. The controller uses efficient variable frequency drives to regulate the mixer speed while minimizing the use of electricity.

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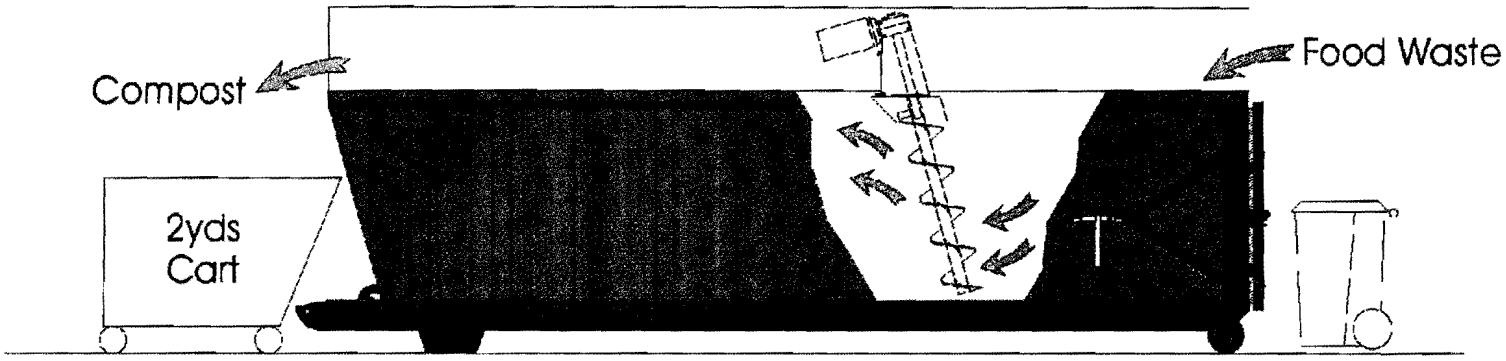
The Earth Flow Plug Flow Design



Earth Flow Operations

Food waste can be added daily to the loading end of the Earth Flow along with shredded woody or green waste materials. The auger mixes the food waste into the hot compost which rapidly breaks down as it moves toward the discharge end of the vessel. The typical process time for the waste to flow through the vessel is 14 to 21 days. As the organic waste converts into compost, its volume is typically reduced by about 50-60% allowing compost to be unloaded about once a week. To unload compost, open the discharge door and the auger will lift the compost up to 3 feet and push out several yards of compost into a bucket loader, cart or pick-up truck.

Equipment Specifications

Vessel Insulation	R-18 urethane foam insulation (optional)
Mixing Auger	14" 304 Stainless steel (13" on EF-12)
Gear Motor	5hp 3ph (208/230/460V–50/60 Hz)*
Gearbox	Helical bevel synthetic lube
Carriage and Rail Drives	VS ¼ hp motor (½ hp on EF-30 & EF-40)
Control Panel	Programmable PLC in NEMA 4x panel
Power Requirements (Motors)	30A 220V single or 208V 3 phase
Power Requirements (Fan and Controls)	15A 110V

* 3hp on EF-10

Vessel Specifications	EF-12	EF-16	EF-20	EF-30	EF-40
Total System Capacity (yd3)	14	18	22.6	34	45
Processing Capacity (lbs/day)	665	1000	1330	2000	3000
Processing Capacity (tons/day)	0.33	0.50	0.67	1.0	1.5
Length – Overall	12'	16'	20'	30'	40'
Width – Overall	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"
Height – Overall (to roof peak)	9'-6"	9'-6"	9'-6"	9'-6"	9'-6"
Approx System Weight (lbs)	5,000	6,000	7,000	10,000	13,000

Contact:
Phone: (802) 368-7291
Fax: (802) 368-7313

Green Mountain Technologies
www.compostingtechnology.com

Location:
5350 McDonald Ave
Bainbridge Island, Wa 98110

Earth Flow™ 40 Price & Specifications

Effective January 15, 2012

EF-40 BASE PRICE **$119,900**

Vessel Specification

Earth Flow™ Key Features

- Exclusive Traveling Auger and Plug Flow Technology
- Stainless Steel Walls and Floor
- Stainless Steel Carriage and Travel Car
- Translucent Roof Enclosure for Passive Solar Gain

Total vessel capacity (cubic yards)	45 yd3
Processing capacity (lbs/tons per day)	2,500-3000 lbs/day (~1.25-1.5 tons/day)
Recommended retention time (days)	14-21 days
Length overall (ft)	40'-0"
Width overall (ft)	8'-4"
Height overall (ft)	9'-6"

Mixing System

Mixing Auger	14" 304 stainless steel, 3/8" thick flighting
Gear Motor	5hp, 3 ph (208/230/460V – 50 Hz)
Gearbox	Helical bevel, synthetic lube
Carriage & Rail Drives	VS ½ hp motors
Control Panel	Programmable PLC in NEMA 4x panel
Power Requirements (Motors)	30A 208V 3 phase
Power Requirements (Fan and Controls)	15A 110V

Options Available

Replacement Bolt-On Auger Flighting	$ 995 (2 pieces per set)
Insulation Package (R-18)	$ 9,500
Tote Loader with Hydraulic Package	$ 9,980
Moisture Addition System	$ 1,200
1200W Floor-Level Aeration Heating System	$ 2,250
Single Phase Power Conversion	$ 895
Extended Parts Only Warranty*	$ 1,980/yr
On-Site Trouble Shoot & Repair Service**	$ 3,490/yr

* This extended warranty is for replacement of defective parts only. It does not include labor to remove or install components. Our Standard Warranty is a 1-year parts only warranty. Limit two additional years.

** This option is for labor only to repair or replace defective components. Does not include preventative maintenance such as inspection, cleaning and lubrication. Parts replacement is covered by the Standard/Extended Parts Only Warranty. Limit two additional years.

Custom Sizes Available. Prices subject to change without notice. Shipping FOB Origin, assembled.

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