Composting Alternatives: Location, Technology and Funding

Identify Potential Locations

**Alternative #1: Blatchley Middle School Site**

The Blatchley site would work well as a small to medium scale pilot for handling compost from larger organizations such as schools, restaurants and hospitals. An appropriately sized composter should be matched to handle the anticipated waste.

| Location already used for composting (e.g. grass clippings, spent grains, etc.) | Potentially higher cost of management to city (dependent on cost analysis of savings) |
| Possible central composting for all schools | Not as publicly visible to community |
| Strong tie-in to composting education at schools | Higher volume requires end use considerations (i.e. more work needed to develop business plan) |
| Manage waste from schools, restaurants, hospitals | |
| More easily supported by city | |

**Alternative #2: Recycling Center**

The Recycling Center is a good alternative site particularly to engage local residents further about waste and compost opportunities. At least initially, a smaller sized composter seems more appropriate.

| Location already a drop-off center for recycling and logical addition of compost | Greater vigilance of composting |
| Greater potential educational outreach of waste issues to Sitka community | Potential issue with bears requires ensuring good management of compost |
| Space is available at the recycling center that could be used for compost | Need to consider leachate or other environmental considerations |
| Recycling center managed by Norm Campbell who is interested in composting/waste reduction | Potential to turn people off to compost if not managed properly |

**Alternative #3: Harbor Site**

The harbor is a good site to demonstrate positive use of fish waste resources. While this is a unique proposition for site location it does encounter a number of barriers.

| Opportunity to utilize fish waste resource and start precedent that may scale up to processors | Irregular amount of fish particularly after the summer months |
| Save city money from spending on dumping fish out at sea | Difficulty in transporting other compost materials to dock |
| Could work with SEARHC and Mt. Edgecumbe High School and combine inputs | Difficulty in moving finished soil product off the dock |

**Other Site Alternatives:**

**Composters at each school:** while each school has sufficient waste for a small composter, it would require greater coordination and individual management at each school
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Mt. Edgecumbe High School/SEARHC: combine waste streams at joint site without harbor option

Composting Technologies

Many of the composting technologies available are geared toward large quantities of waste. At this stage we have decided to develop a small pilot drop-off/on-site composter that could increase motivation and be scaled up later. Green Mountain Technologies out of Washington state offers a composter for smaller scale uses that has been used by many schools, hospitals, cities and universities to treat compost. The Earth Tub is an in-vessel composter featuring power mixing, aeration, and biofiltration of all process air. The composter is fully contained to maintain proper moisture and ensures safety with bears.

**Earth Tub Package #1:**
$9,975 + shipping
Processes 40-150 pounds/day

**Earth Tub Package #2:**
$18,475 + shipping
Processes up to 300 pounds/day


Select List of Organizations Using EarthTubs: Davis Food Coop, University of California Santa Cruz, Moore Recycling Associates, City of Thousand Oaks Public Works Department, National Park Service, Connecticut Department of Recycling, University of Georgia, County of Kauai, Iowa State University, University of Montana, University of North Carolina, Columbia University, Oregon State University, Breitenbush Hot Springs, City of Eugene, Lane Community College, and Newberg School District

Other Suppliers:

<table>
<thead>
<tr>
<th>In-Vessel Composters</th>
<th>Model</th>
<th>State</th>
<th>Size</th>
<th>Max. Capacity</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Big Hanna Vertal</td>
<td>T60</td>
<td>Quebec</td>
<td>4 x 8’</td>
<td>45-80 lbs./day</td>
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<tr>
<td>BW Organics</td>
<td>306</td>
<td>Texas</td>
<td>8 x 10’</td>
<td>1 yd³/day</td>
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<td>DTE Environmental</td>
<td>EnviroDrum</td>
<td>Washington</td>
<td>4 x 8’</td>
<td>.9 yard³/day</td>
<td>$45-65,000</td>
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<tr>
<td>Green Mtn. Technologies</td>
<td>Earth Tub</td>
<td>Washington</td>
<td>7.5’ diameter</td>
<td>40-150lbs/day</td>
<td>$9,985</td>
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<tr>
<td>Green Mtn. Technologies</td>
<td>Earth Tub 2</td>
<td>Washington</td>
<td>15’ diameter</td>
<td>300lbs/day</td>
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<tr>
<td>Green Mtn. Technologies</td>
<td>Earth Bin</td>
<td>Washington</td>
<td>5 x 24’</td>
<td>.25-2 tons/day</td>
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<td>Jet Composting</td>
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<td>Texas</td>
<td>3 x 6’</td>
<td>24 ft³ capacity</td>
<td>$8,000</td>
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<tr>
<td>North American Trading</td>
<td>Rocket A500</td>
<td>New York</td>
<td>8 x 2’</td>
<td>160gallons/wk</td>
<td>$18,500</td>
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</tbody>
</table>

Appendix:

Earth Tub Evaluation from Seattle’s King County School District and Business Pilot

“All five of the originally installed EarthTubs are still in use. Users of this system have generally become quite attached to their EarthTubs and have been impressed with the amount of food waste that can be
Composting Alternatives: Location, Technology and Funding

added to their system, the appearance of the system, and the fact that the biofilter works well for keeping odors down. The biggest problem schools dealt with on the Earth Tubs has been the need to get a school district electrician to come to their site and connect the system. Businesses generally did not have that level of bureaucracy to deal with.

Operational hurdles discovered with the Earth Tubs stemmed from the need to make sure basic composting concepts were understood. Numerous educational techniques were employed including monthly e-mailed “Compost Hints” discussing these concepts, technical assistance site visits and instruction, and 3 yearly half-day Earth Tub Summits. The EarthTub Summits have been quite popular and drew other EarthTub operators, entities investigating their own use of EarthTubs, and interested educators, students, and solid waste professionals from 4 counties, as well as the King County pilot program participants. A large part of each EarthTub Summit has been the communication and networking opportunities provided by bringing EarthTub operators together to ask questions and learn from innovations that each operator makes. The summits have all been held at participants’ facilities so they were able to show off their system and talk about their site specific issues while attendees got to see real life applications.

All five Earth Tubs users are generally happy with their systems. One system is temporarily disconnected due to extensive remodeling of the facility, and another is under-used because the planned expansion of the school program has not occurred within the expected time frame. Yet the users continue to express enthusiasm about their EarthTubs and their potential for the future.” See website for more info: http://your.kingcounty.gov/solidwaste/garbage-recycling/documents/Onsite_food_pilot_final-report.pdf

EARTH TUB DESCRIPTION OF OPERATIONS
Four basic steps to operate Earth Tub:
(1) An organic “recipe” (i.e., a mixture of food waste and wood chips) is loaded into the Earth Tub through the loading hatch in the lid.
(2) The operator turns on the internal auger mixer, which thoroughly mixes and shreds the material as the operator rotates the lid.
(3) Once the active composting cycle is complete (approximately 3-4 weeks), the auger discharges the compost through a side door of the vessel. In order to remove all the compost, shoveling will be required.
(4) This compost can be used directly as mulch or can be cured (stand in a pile) for 30 days before being used as a soil amendment. Screening will make the finished product even finer!

1. Food Scrap Loading - The first step is to make sure that the kitchen waste is collected for composting with as little contamination from plastics, etc. as possible. Hard foods such as pineapples, stale loaves of bread, etc., should be chopped up prior to disposing in the Earth Tub. Because food scraps are wet, a dry bulking agent such as wood shavings must be added to create a balanced compost recipe.

2. Mixing and Shredding
Once the new material has been added, you are ready to begin mixing. The powered auger system has been designed to take the work out of turning over your compost pile. The mixing process is accomplished by slowly turning the powered auger/lid assembly in a counter-clockwise direction for one complete rotation, then moving the auger to the center and rotating clockwise. A complete mix should
take approximately 10 minutes, and should be performed at least two times per week.

3. The Active Composting “Baking” Phase
Thermophilic composting at temperatures above 115 F occurs rapidly in the insulated Tub. The food waste becomes soft or “baked” at this temperature and is easily shredded by the notched auger. Continue adding material until the tub is full to the top of the auger screw. When the Earth TubÔ has been loaded to its capacity, no additional food waste should be added for approximately 14 days. During this time, the operator should mix the material at least once per week.

4. Unloading and Curing the Compost
Once the compost has finished active composting, it is ready to be unloaded. The Earth Tub should not be completely emptied, a small amount of compost remains and serves as a bulking agent and microbial starter for the next cycle. Here is a list of the steps for unloading the Earth Tub.
· Place a tarp or low wheelbarrow on the ground below the outside of the two discharge doors.
· Turn on the auger and push the compost out of the side doors. This will remove about 1/2 of the compost. Shoveling will be required to completely empty the Earth Tub.
· The compost could be used directly as thin mulch on the surface of the soil.
· To cure the compost, it should be placed outside in a pile for approximately 30 days.
· The compost can be screened to produce a finer compost product and remove any course-bulking agent

Larger Scale Composter Options: Both Engineering Compost Systems and Renewable Carbon Management are two suppliers that stand out for larger scale composters.

· **A-C Equipment Services Corp:** John Vitas, jvitas@a-cequipment.com, Milwaukee WI
· **Biosystem Solutions:** [http://www.biosystemsolutions.com/solutions/composting_systems.html](http://www.biosystemsolutions.com/solutions/composting_systems.html)
· **Engineered Compost Systems (ECS):** [http://www.compostsystems.com/](http://www.compostsystems.com/) $400,000-500,000 + Mixer, conveyor, controls $140,000 for a total system cost of $540,000-640,000. This does not include permits, civil engineering, ECS equipment installation, construction, surface water and leachate and treatment, access roads and storage pads, lights, utilities, buildings, pre-processing design, taxes
· **Renewable Carbon Management (RCS):** [www.composter.com](http://www.composter.com) RCS would require $1,100,000 for startup costs
· **Wright Environmental Management:** Claims largest in vessel provider in world (not quite sure about that), [http://www.wrightenvironmental.com/index_nonflash.html](http://www.wrightenvironmental.com/index_nonflash.html)