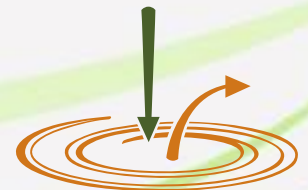


Biosolids Composting Taking Root in Florida

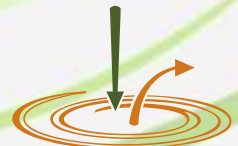
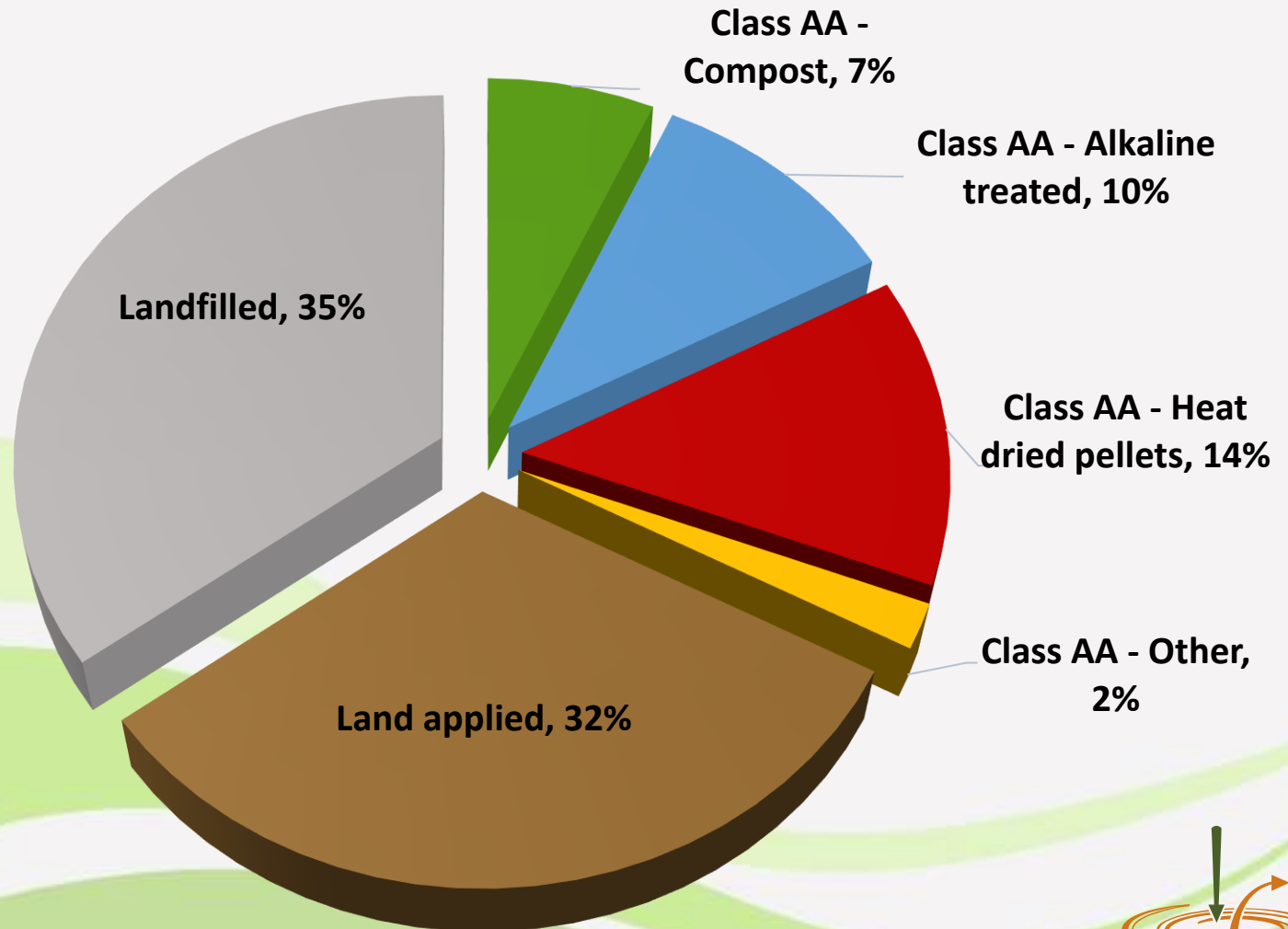
Peter Engel & Miriam Zimms
Senior Consultants, Kessler Consulting, Inc.

Recycle Florida Today, Annual Conference
St. Augustine, FL
June 14, 2016

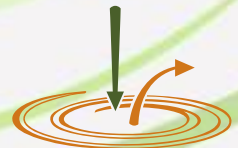
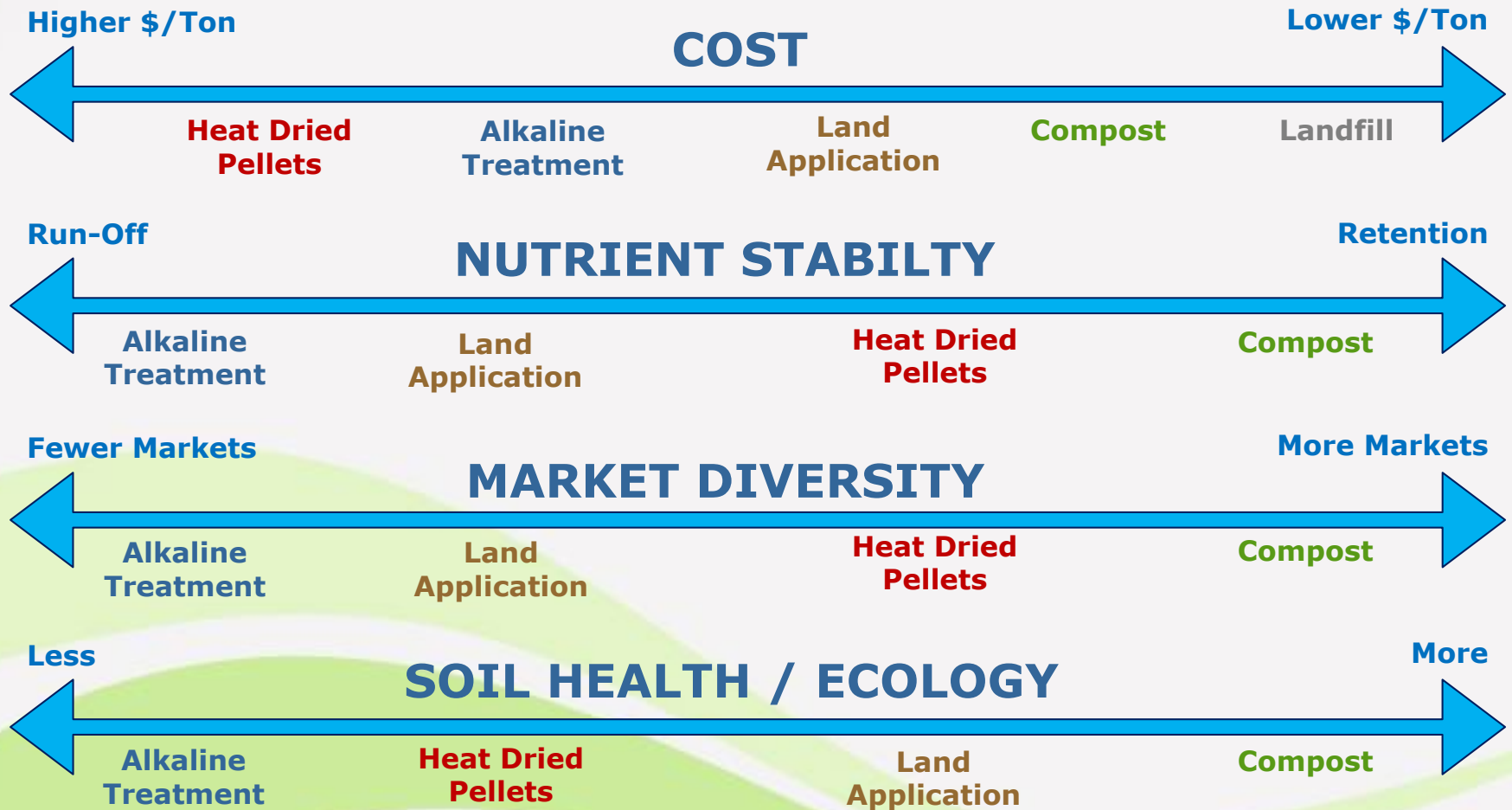


kessler consulting inc.
innovative waste solutions

The State of Biosolids in Florida



Biosolids Management Options



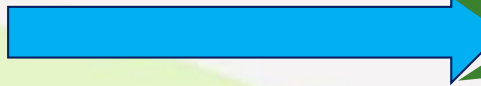
Modified Static Aerobic Pile (MSAP) Method

Operational
Simplicity



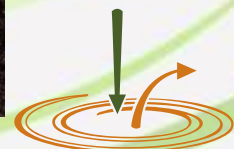
MSAP

Odor
Control

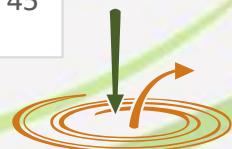
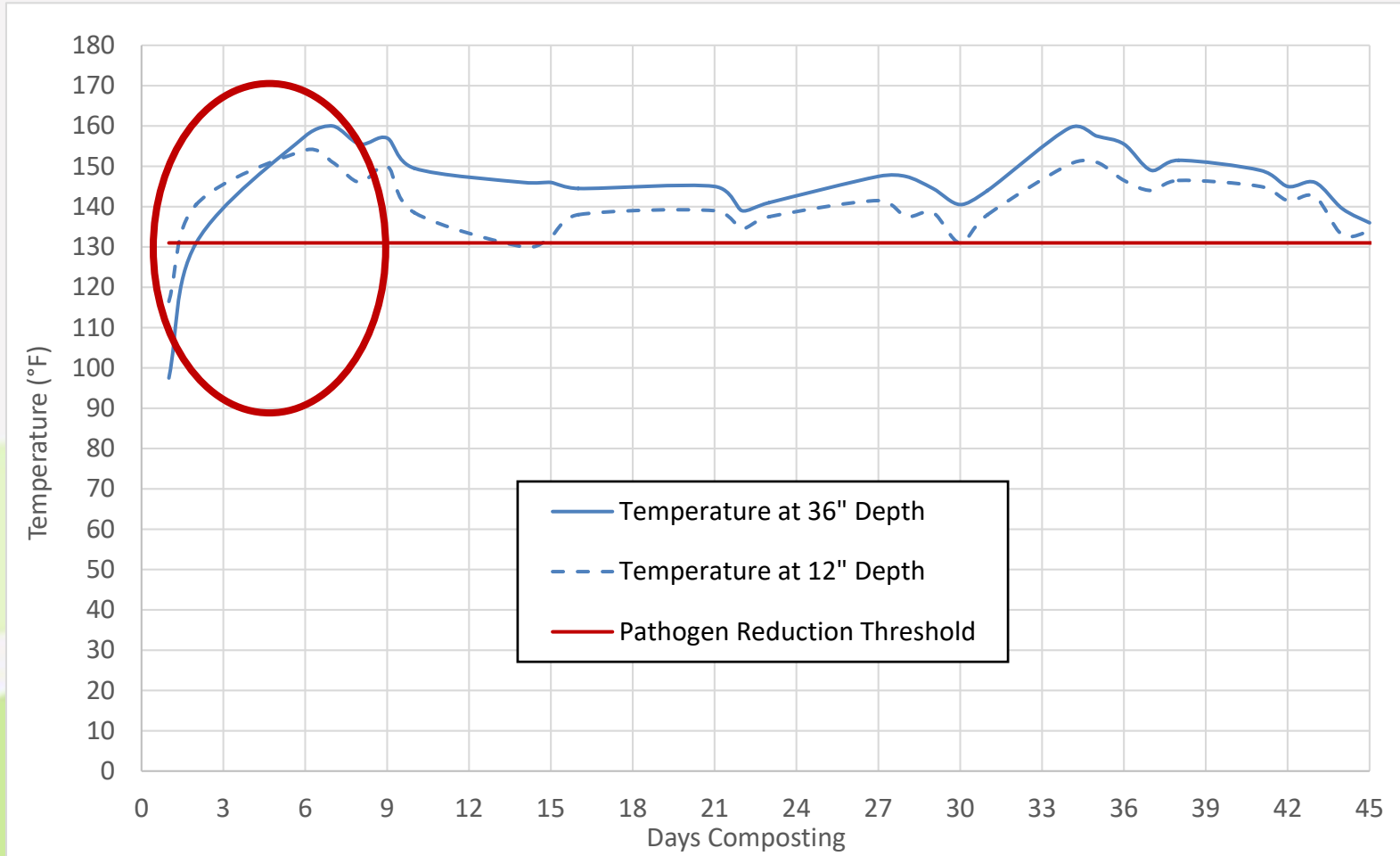


Product Quality

Cost
Efficiency

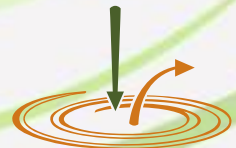


Composting From the Outside In



Compost Helps Control Plant Diseases

- Studies show compost's disease-suppressing properties for Florida crops
- Beneficial microbes in compost:
 - Outcompete harmful microbes
 - Produce antibiotic compounds
 - Parasitize and predate harmful microbes
 - Activate disease-resistance genes in plants
- MSAP compost has a several-fold higher population of beneficial microbes compared to other compost

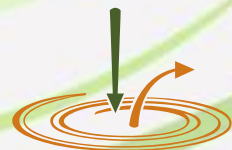


Two Biosolids Composting Case Studies

ECUA

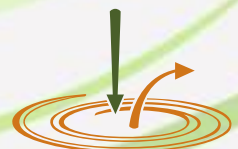


Hillsborough
County

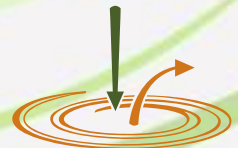


Overview

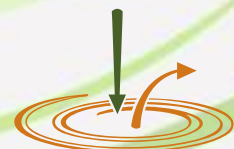
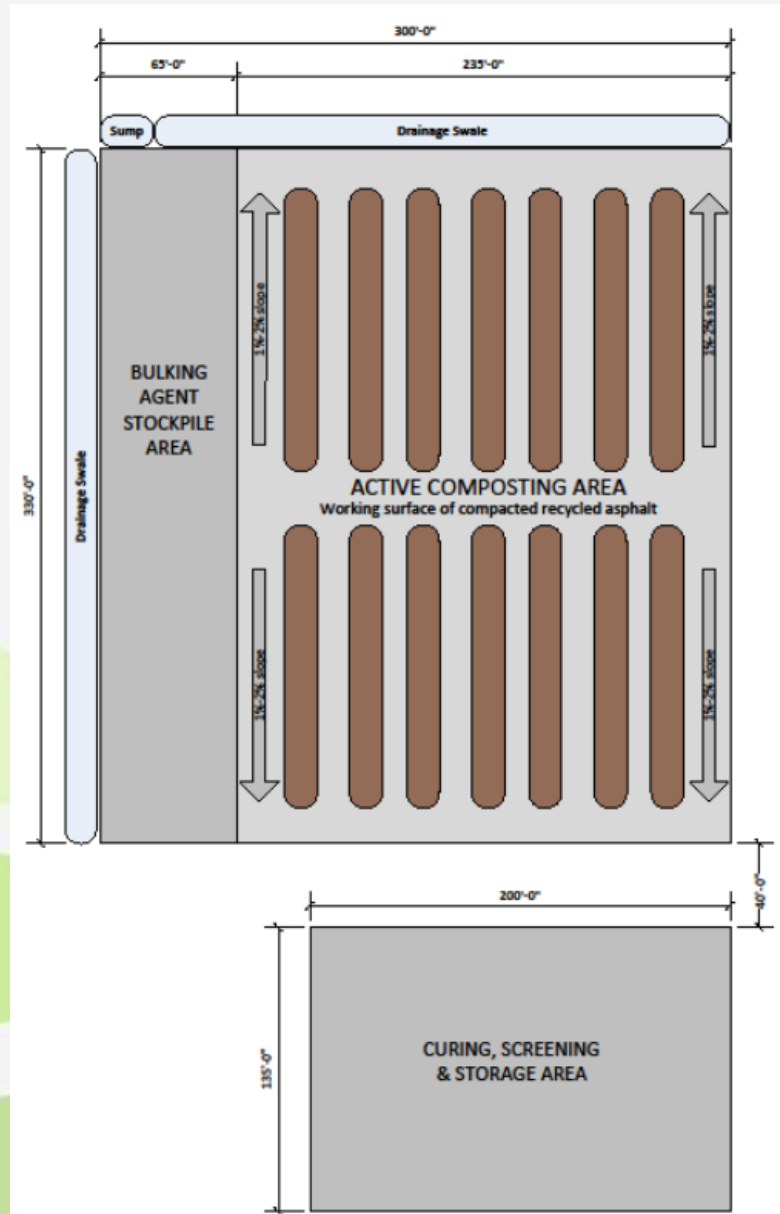
	Hillsborough County	Emerald Coast Utilities Authority (ECUA)
Project type	Pilot	Full-scale operation
Previous disposal method	Land application & Landfill	Heat drying & Land application
Site size	3.48 acres	24.5 acres
Timeframe	Mar. '15 – Aug. '15	Nov. '15 - Ongoing
Biosolids capacity (wet tons/day)	53	80
Estimated compost production (cubic yards/day)	101	128
Estimated operating costs (per wet ton of biosolids)	\$20-\$25	\$23-\$28



Hillsborough County

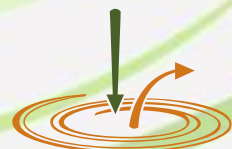


Hillsborough - Site Plan



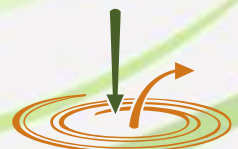
Hillsborough – Financial Analysis

Item	Full Scale – Equipment Lease	Full Scale – Equipment Purchase
Capital Cost		
Site Development	\$232,540	\$232,540
Equipment	\$0	\$900,000
Total Capital Cost	\$232,540	\$1,132,540
Annual Capital Cost	\$44,360	\$155,322
Operating Cost		
Labor	\$123,200	\$123,200
Equipment O&M	\$163,168	\$231,832
Equipment Lease	\$201,500	\$0
Other Costs	\$63,150	\$63,150
Total Operating Cost	\$551,018	\$418,182
Revenue		
Biosolids Tip Fee	\$0	\$0
Finished Compost Sales	\$121,176	\$121,176
Total Revenue	\$121,176	\$121,176
Net Annual Cost	\$474,201	\$452,327
Net Cost Per Wet Ton Biosolids	\$25.49	\$24.32



Hillsborough – Results

- High quality compost produced
- Very low odor generation
- Compost distributed to nearby sod farm
- Strong interest from other markets

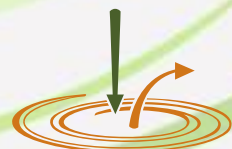
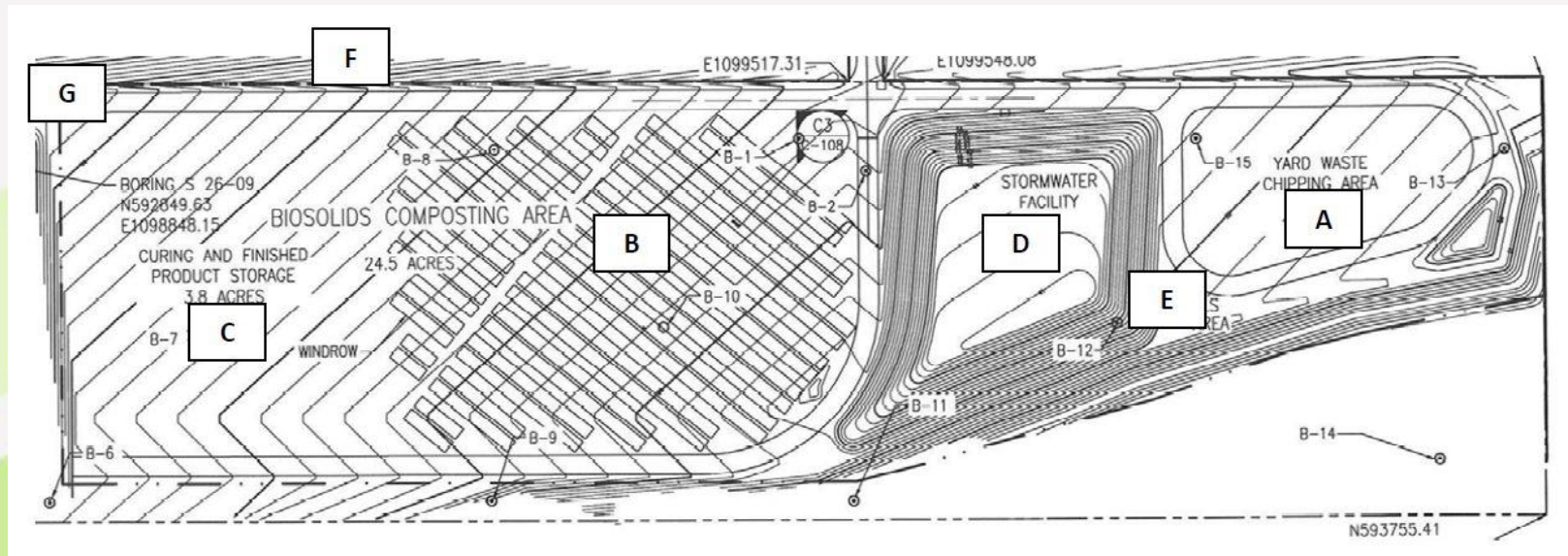


ECUA's Biosolids Compost Facility

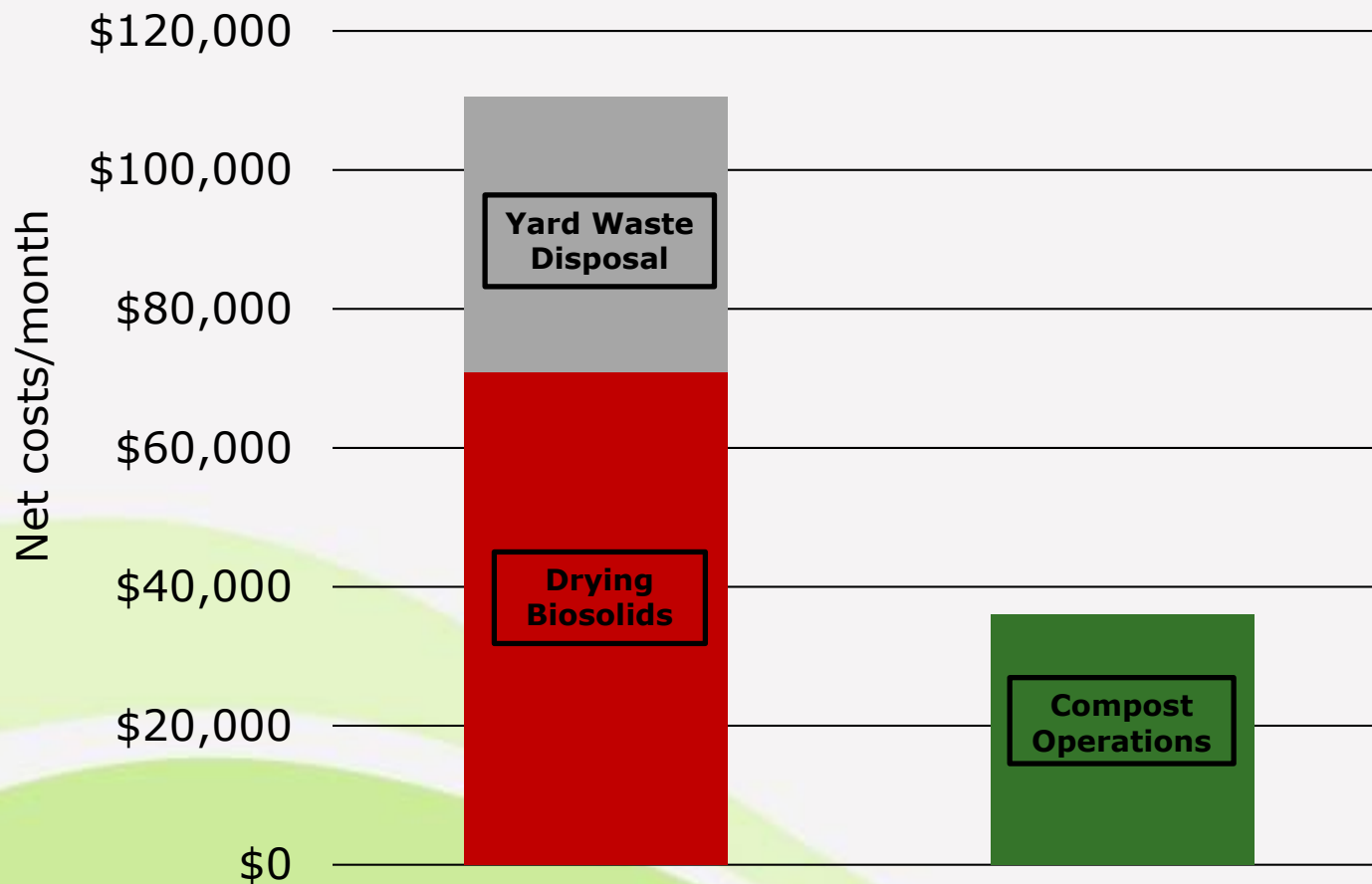


ECUA - Site Plan

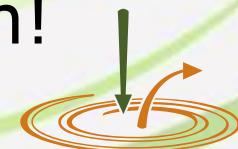
- A) Grinding Area
- B) Active Compost Area
- C) Curing and Compost Storage Area
- D) Stormwater Facility
- E) Lift Station
- F) Perimeter Berm
- G) Entrance Road



ECUA - Results

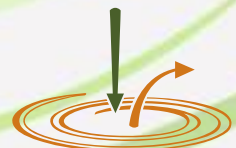


Composting saves nearly \$75,000 per month!

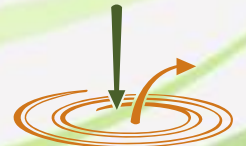


ECUA - Results

- Composting facility solves 2 problems: yard waste disposal and biosolids treatment.
- Generates more revenue than heat drying
- Lessons learned
 - Remote thermometers
 - Cover to keep finished compost dry
- ECUA expanding to compost all biosolids



ECUA
Facility & Product
Marketing



Keeping It Clean!

Have you heard?
Brown
is the new **Green**

At the forefront of the environmental frontier, ECUA has a newly-constructed a biosolids/composting facility that processes yard waste and the biosolids derived from the water reclamation process at our Central Water Reclamation Facility into a compost product.

In order to maximize the quality of the mulched yard waste, we recommend the use of brown compostable paper yard waste bags, or reusable plastic cans designated for yard waste, in place of the traditional plastic bags. Plastic bags make yard waste incapable of being used as compost or mulch because plastic does not decompose.

Paper yard waste bags are easily found in home improvement centers and large retailers, through online sources and in garden centers and nurseries. Plus, if you ask for paper bags at the grocery store (yes, some local stores still offer this service), they'll never double-duty when you recycle them into yard trash bags!

It's never too early to start, so the next time you find yourself reaching for that plastic bag, remember that brown is the new green!




www.ecua.fl.gov • 850-476-0480

Have you heard?
Brown is the new **Green**

Leaf the Plastic Behind - Brown Bag It Instead!
ecua.fl.gov



DO NOT FILL ABOVE THIS LINE
to close bag, roll down and crimp securely



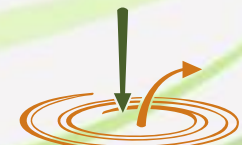
Brown
is the New **Green**



BIODEGRADABLE
(NO glass, metal, stones, or plastic)
FOR LEAVES, GRASS CLIPPINGS, YARD WASTE



ECUA
Leaf the Plastic Behind
Brown is the New Green



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innovative waste solutions

Branding the Product

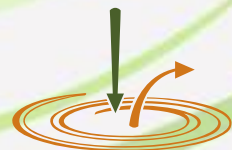


End-User Targets

- Target Audience
- Target Database
- Tracking Mechanism
- Reporting Mechanism
- Follow-up Protocol

Target

20	Agriculture
3	Bulk materials
7	Gardens
1	Mannco
36	Golf
12	Green lodging
14	Landscape contractors
15	Lawn maintenance
2	Institutional (FDOT and KPB)
87	Nurseries
34	Retail
4	Recreational
5	Sod farms
240	Total



End User Target Marketing

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Welcome and Overview

Composting is a natural process that recycles organic waste into a valuable soil amendment. The Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility is a state-of-the-art facility that produces high-quality compost from biosolids. This process not only reduces the volume of waste sent to landfills but also creates a valuable product for agricultural and landscaping use.

The facility is designed to handle up to 100,000 tons of biosolids annually. The composting process involves several stages, including screening, curing, and screening again to produce a fine, uniform compost. The final product is then stored in large piles until it is ready for distribution.

We welcome you to contact ECUA for additional information.

ECUA
Emerald Coast Utilities Authority

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Biosolids Compost Use: General Information, Contacts, and What You Should Know

Biosolids Compost End User Information and Contact:
 ECUA Biosolids Compost is available for sale to end users. For more information, please contact the Biosolids Compost Sales Office at (904) 241-1100. The sales office is located at the ECUA Biosolids Composting Facility, 10000 W. 10th Avenue, Panama City, FL 32409.

End User Information:
 ECUA Biosolids Compost is a high-quality product that can be used in a variety of applications, including agriculture, landscaping, and soil amendment. It is rich in nutrients and helps improve soil structure and water retention.

Use of Compost on Florida Soils:
 ECUA Biosolids Compost is suitable for use on all types of Florida soils. It helps improve soil fertility and structure, and can be used in a variety of applications, including agriculture, landscaping, and soil amendment.

Specialty Applications:
 ECUA Biosolids Compost is also suitable for use in specialty applications, such as golf courses, sports fields, and parks. It helps improve soil fertility and structure, and can be used in a variety of applications, including agriculture, landscaping, and soil amendment.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Modified Static Aerobic Pile (MSAP) – Composting Method Used by ECUA

History of the MSAP Method:
 The Modified Static Aerobic Pile (MSAP) method is a composting process that has been used for many years. It is a simple and effective method that produces high-quality compost from biosolids.

How Does the Process Work?
 The MSAP method involves several steps, including screening, curing, and screening again. The biosolids are first screened to remove any large pieces of debris. They are then cured in a large pile for several weeks. After curing, the biosolids are screened again to produce a fine, uniform compost.

Benefits of the MSAP Method:
 The MSAP method has several benefits, including its simplicity and effectiveness. It produces high-quality compost from biosolids, and it is a cost-effective method that can be used in a variety of applications.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

US Composting Council's Seal of Testing Assurance (STA) program

The US Composting Council (USCC) is a national organization that promotes the use of compost. The USCC Seal of Testing Assurance (STA) program is a certification program that ensures the quality of compost products. ECUA Biosolids Compost is a USCC STA certified product, which means it meets the highest standards of quality and safety.

Participant:
 ECUA Biosolids Composting Facility is a participant in the USCC STA program. This means that ECUA Biosolids Compost has been tested and certified by the USCC.

Requirements of the program:
 The USCC STA program has several requirements, including that the compost must be produced from approved feedstocks, that it must be tested for quality and safety, and that it must be sold in a way that ensures its quality and safety.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Test Result Tables (February 2016)

Parameter	ECUA's Compost	ECUA's Compost	ECUA's Compost
Moisture	42%	42%	42%
Organic Matter	85%	85%	85%
Carbon to Nitrogen Ratio	20:1	20:1	20:1
pH	6.5	6.5	6.5
Ammonia Nitrogen	0.05%	0.05%	0.05%
Salinity	0.05%	0.05%	0.05%
Chloride	0.05%	0.05%	0.05%
Heavy Metals	0.05%	0.05%	0.05%
Pathogens	0.05%	0.05%	0.05%
Stability	0.05%	0.05%	0.05%
Germination	0.05%	0.05%	0.05%
Seedling	0.05%	0.05%	0.05%
Soil	0.05%	0.05%	0.05%

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Sample Windrow Temperature Monitoring Log

This log shows the temperature of a windrow of ECUA Biosolids Compost over a 45-day period. The temperature starts at approximately 100°F and rises to a peak of about 160°F around day 10. It then gradually declines, reaching about 100°F by day 45.

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Product Price Sheet

Volume	Picked up	Delivered	Picked up	Delivered
1000 CY	\$160/CY	\$162/CY	\$164/CY	\$166/CY
5000 CY	\$152/CY	\$154/CY	\$156/CY	\$158/CY
10000 CY	\$144/CY	\$146/CY	\$148/CY	\$150/CY
20000 CY	\$136/CY	\$138/CY	\$140/CY	\$142/CY

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

Product Price Sheet

Standard Compost **Fine Compost**

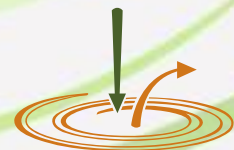
Volume	Picked up	Delivered	Picked up	Delivered
1000 CY	\$160/CY	\$162/CY	\$164/CY	\$166/CY
5000 CY	\$152/CY	\$154/CY	\$156/CY	\$158/CY
10000 CY	\$144/CY	\$146/CY	\$148/CY	\$150/CY
20000 CY	\$136/CY	\$138/CY	\$140/CY	\$142/CY

Emerald Coast Utilities Authority (ECUA) Biosolids Composting Facility

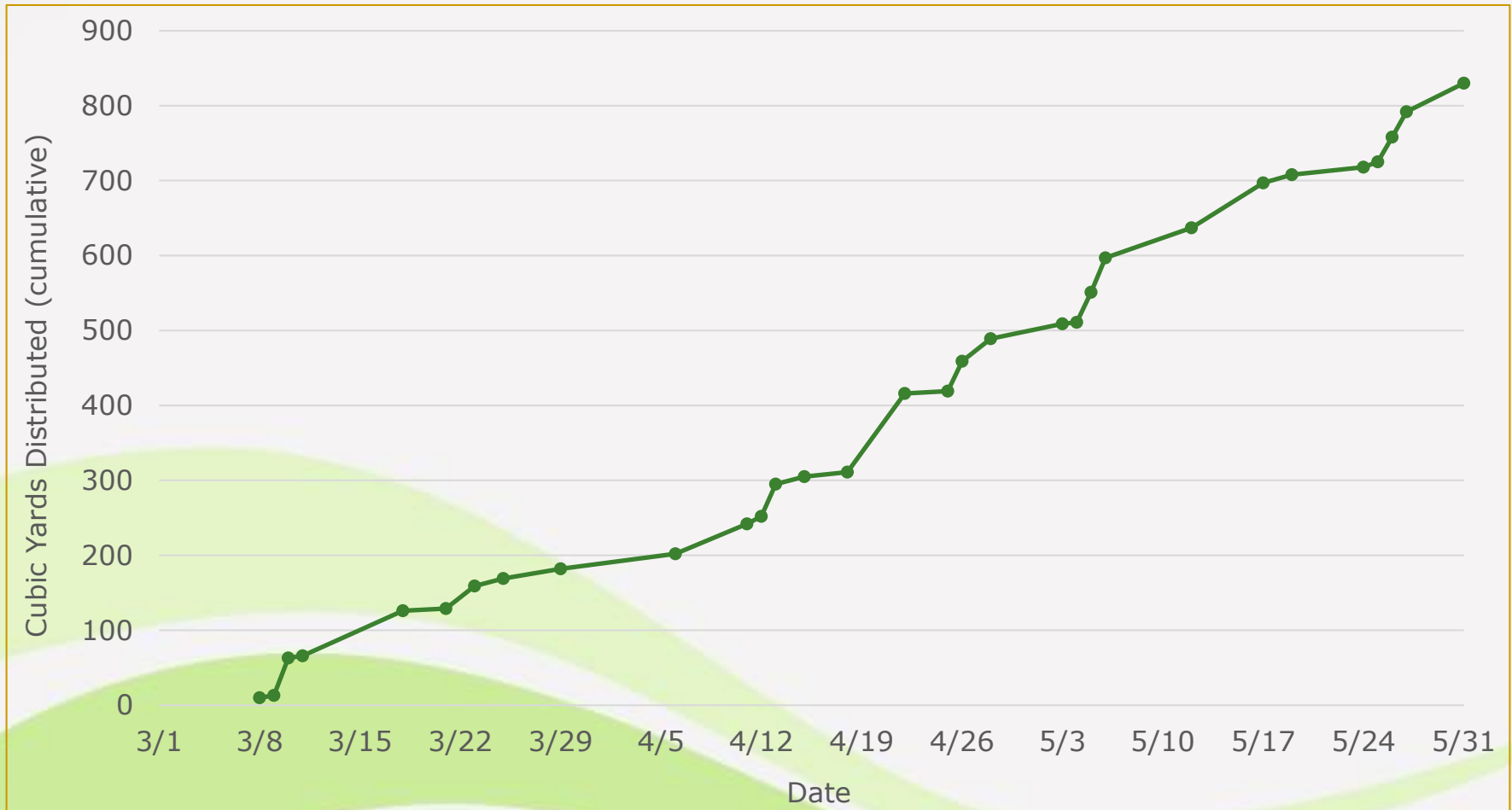
Creating Facility & Product Awareness

- Website
- News Articles
- Field Day
 - Direct Mail
- Brochure
 - Direct Mail
- Recycling Coordinator
- Public Information Officer
- State and National Awards

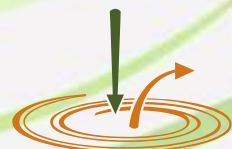
<http://www.livegreenecua.com/composting.php>



Sales/Distribution Results To Date

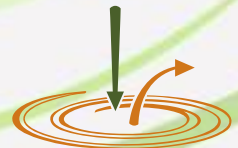


Total Cubic Yards: 830



Next Steps

- Hillsborough county
 - Permitting and constructing a full-scale facility
- ECUA
 - Expanding the facility to double capacity and compost all of its biosolids
 - Continuing sales and distribution
 - Securing a large bulk buyer
 - Maintaining local education and outreach
 - Procure and utilize a 1/4 inch screen



Thank you!

Contact Information

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(813) 601-5047

mzimms@kesconsult.com

