BURNS McDONNELL

COMPOST FEASIBILITY STUDY

BOULDER COUNTY

February 25, 2025

BOCC Phase I Presentation

AGENDA

1 Project Overview & Goals

2 Existing System

3 Contamination Challenges

4 Decision Matrix

5 Processor Interviews

6 Next Steps

PROJECT OVERVIEW & GOALS

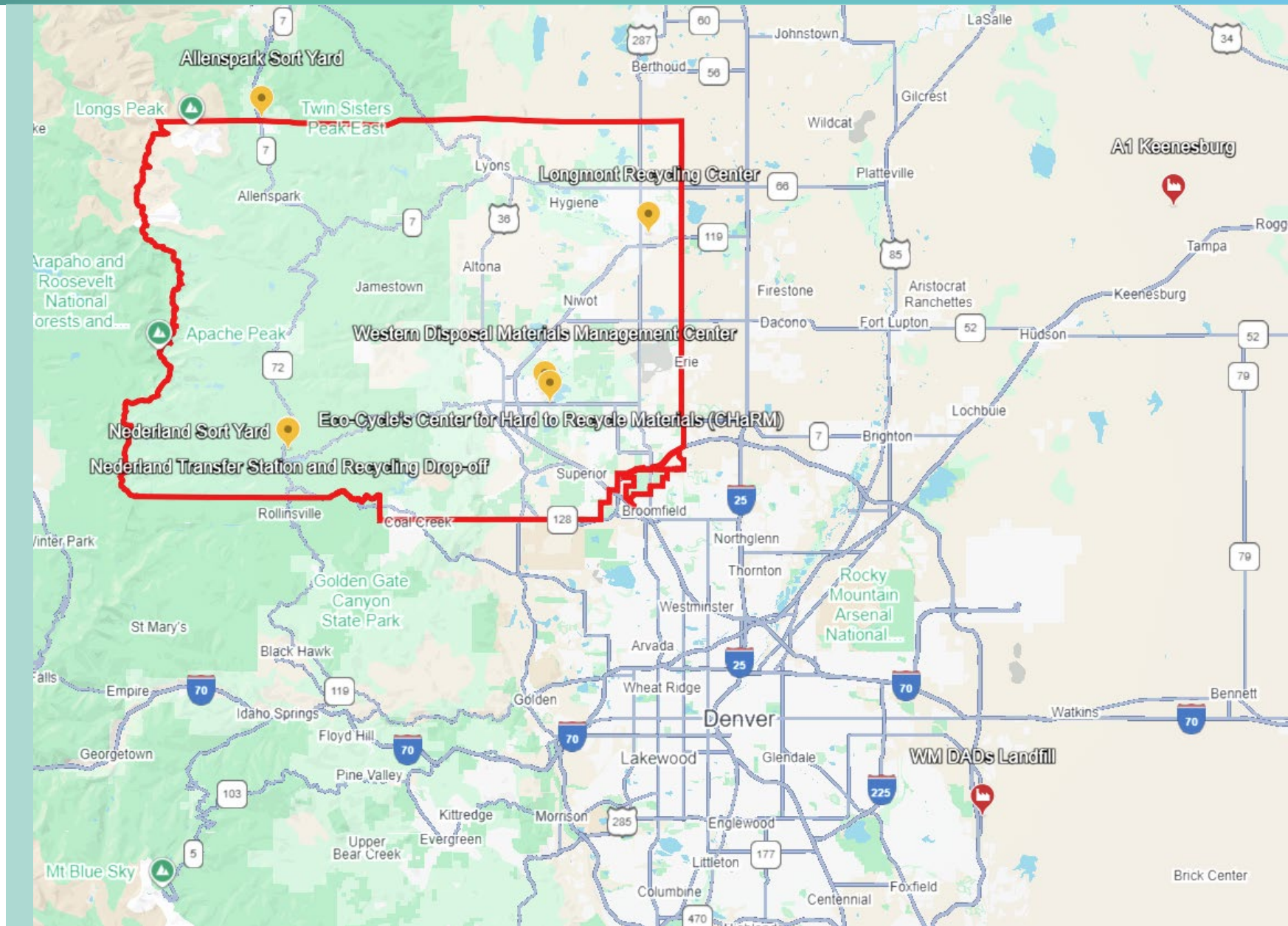
To understand organics processing infrastructure options, financial and operational models, and the overall feasibility of a County organics management facility.

- **County core value to prioritize environmental ethics and racial equity**
- **County desire to manage responsibility over County-generated organics (residential and commercial)**
- **Manage end products of soil amendments within the County for a closed loop**
- **Reduce hauling distances to improve sustainable management of organics**

EXISTING SYSTEM

EXISTING SYSTEM OVERVIEW

- Boulder County currently relies on A1, a **privately owned** centralized composting facility to process their organic waste.
- Food and yard waste is collected by a network of private and municipal haulers through Western Disposal
- Organics are hauled to the composting facility in **Keenesburg, CO**.
- A1 possesses a **depackager** and employs **turned windrow** composting.
- The haul distance is approximately **45-60 miles** one way.
- Branches/limbs/stumps managed through a network of community drop off sites



Google Maps

WASTE COMPOSITION OF LANDFILLED ORGANICS

36% of County landfilled waste is organic

County Waste Composition Study, 2019

*Icons are for illustrative purposes and circles are not to scale

41,721 Tons Food Waste

18,439 Tons Compostable Paper

7,654 Tons Yard Waste

19,450 Tons Clean Wood & Pallets

8,342 Tons Branches / Limbs / Stumps

180 Tons BPI Products

136 Tons Marijuana Waste

0 Tons Agricultural Waste (Crops)

41,500 tons of County organic waste is diverted.

County Hauler Reported Data, 2023

BPI = Biodegradable Products Institute

CONTAMINATION CHALLENGES

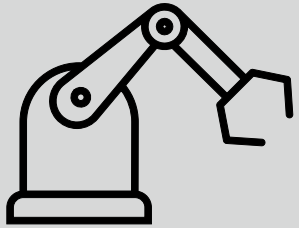
COMPOSTING FACILITY PROCESS

1. Feedstocks

Organic waste is separated from the landfill stream and hauled to the facility.

Collected materials are delivered to a receiving area.

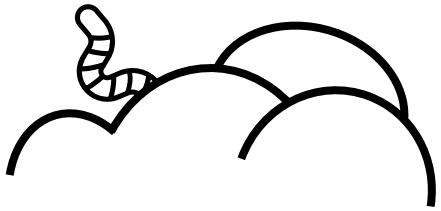
2. Pre-Processing



Contamination is removed from feedstocks through manual and/or mechanical means.

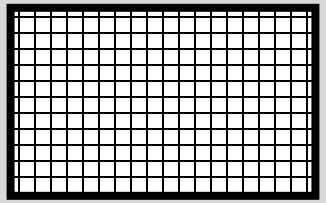
Bulky feedstocks are reduced in size.

3. Active Processing



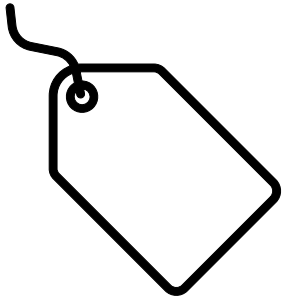
Feedstock is converted into finished compost through active composting and curing.

4. Post-Processing



Finished compost is screened for product sizing specifications and final contamination removal.

5. End Market



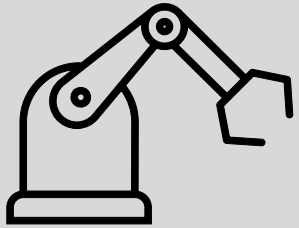
Compost is utilized internally as a cost savings or sold for use.

CONTAMINATION CHALLENGES

1. Feedstocks

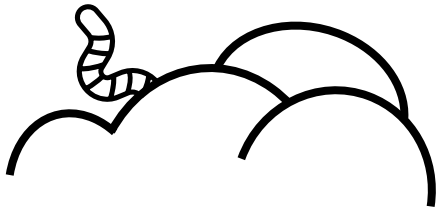
- Indistinguishable products
- Inorganic products contaminate the feedstock

2. Pre-Processing



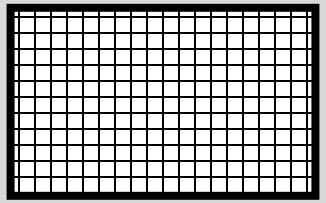
- Indistinguishable products
- Both inorganic contamination and compostable products are likely landfilled

3. Active Processing



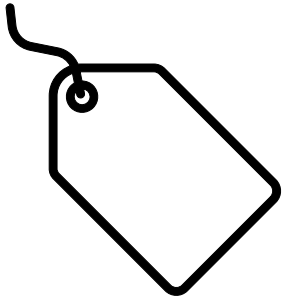
- Compostable products rarely break down completely in practice

4. Post-Processing



- Not all contamination fragments are caught through screening

5. End Market



- Fragments remain, lowering the value and application
- Not certifiable as organic
- May contain PFAS

OPTIONS FOR COMPOSTABLE PRODUCTS

Option		Challenges
1	Accept compostable products from residential **WITHOUT** pre-processing	• Windblown litter • Contaminated end product
2	Accept compostable products from residential **WITH** pre-processing	• Materials are removed and landfilled • Contaminated end product
3	Accept only a limited list of compostable products (e.g., coffee filters and paper towels) from residential	• Requires significant education • Slightly cleaner, but still contaminated end product
4	Do not accept compostable products	• Materials are landfilled

For the matrix evaluation, it was assumed that compostable products ***would not be accepted*** *at this facility initially, though the County could be poised to process them in the future as technology improves.*

DECISION MATRIX

DECISION MATRIX METHODOLOGY

1. Definitions of infrastructure alternatives
2. Identification of County goals and priorities
3. Selection of critical screening criteria
4. Burns & McDonnell rating of infrastructure alternatives
5. County staff prioritization of criteria

INFRASTRUCTURE ALTERNATIVES

- Centralized Turned Windrow Composting Facility
- Centralized Aerated Static Pile (ASP) Composting Facility
- Decentralized Composting Facilities
- Anaerobic Digestion (AD) Facility
- Biochar Facility
- Organics Transfer Station Facility

CRITICAL CRITERIA

Maturity / Prevalence of Technology

System Resiliency

End Product / Byproducts

CRITICAL CRITERIA SCREENING RESULTS

Critical Criteria Screening	Existing System	Centralized Turned Windrow Composting	Centralized ASP Composting	Decentralized Composting	Anaerobic Digestion	Biochar	Organics Transfer Station
	Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail	Pass / Fail
Maturity / Prevalence of Technology	Pass	Pass	Pass	Fail	Fail	Fail	Pass
System Resiliency	Fail	Pass	Pass	Pass	Fail	Fail	Pass
End Product / Byproducts	Pass	Pass	Pass	Pass	Pass	Pass	Fail

Failing Alternatives can still Contribute to the Solution

REMAINING SCREENING CRITERIA

Diversion Considerations

- Acceptable Feedstocks
- Impact of Feedstock Contamination
- Impact to Waste Diversion
- Relative Retention Times

Siting Considerations

- Zoning Classification
- Relative Spatial Requirement
- Potential for Growth
- Impact to Greenhouse Gas Emissions

Operational Considerations

- Odor Implications
- Noise Implications
- Impact to Water Quality
- Impact to Air Quality

Financial Considerations

- Development Costs
- Capital Costs
- Operating Costs
- Market Competition

KEY FINDINGS

The following would likely **fall short** of the County's goals on their own:

- Decentralized Composting
- Anaerobic Digestion
- Biochar
- Organics Transfer Station

Centralized composting in the form of

- Turned Windrows
- Aerated Static Piles

may best meet the County's goals through the development of new infrastructure

PROCESSOR INTERVIEW

FINDINGS

EXAMPLES OF OPERATIONAL MODELS FOR COMPOSTING

Responsibility	County-Owned and Operated	County-Owned with Private Operations	Privately Owned and Operated on County Land	Processing Services Agreement
Land Ownership	County	County	County	Private
Capital Investment	County	County	Private	Private
Operations	County	Private	Private	Private

Table is taken from the Recycling Partnership Recycling Contract Document

INTERVIEWS SUMMARIZED

- All companies **interested** in responding to a Public Private Partnership (P3)
- Companies are supportive in providing capital for development as well as running operations
- Needs to make financial sense through **committed feedstock** and cost sharing
- Need a **joint effort in utilization and marketing** of the end product
- Managing **contamination should be a priority**
- **Permitting and siting** are the biggest barriers to developing a compost facility

NEXT STEPS

- **Site Identification**
- **End Market Analysis**
- **Financial Analysis**

QUESTIONS?

Which Cup is Compostable?

Source: Justin Garrity, Veteran Compost