BURNS McDONNELL

BOULDER COUNTY, CO

Compost Facility Feasibility Study

Phase 1 and Phase 2

Project No. 176638
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List of Abbreviations

Abbreviation	Term/Phrase/Name
A1	A1 Organics
AACE	Association for the Advancement of Cost Engineering
AD	Anaerobic Digestion
APCD	Air Pollution Control Division
APENs	Air Pollution Emissions Notices
ASP	Aerated Static Pile
ASTs	Aboveground Storage Tanks
BPI	Biodegradable Products Institute
C&D	Construction and Demolition
C3	Colorado Circular Communities
CAS	Chemical Abstracts Service
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFWR	Composting and Food Waste Reduction
CHaRM	Eco-Cycles Center for Hard to Recycle Material
C:N	Carbon to Nitrogen Ratio
CO	Carbon monoxide
COGCC	Colorado Oil and Gas Conservation Commission
County	Boulder County, Colorado
cy	Cubic Yards
DADs	Denver Arapaho Disposal Site
DOT	Department of Transportation
EA	Each
EJ	Environmental Justice
EPA	Environmental Protection Agency
EPR	Extended Producer Responsibility
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
HAP	Hazardous Air Pollutant
HEO	Heavy Equipment Operator
HREC	Historically Recognized Environmental Condition

Abbreviation	Term/Phrase/Name
ICI	Industrial, Commercial, and Institutional
IPaC	Information for Planning and Consultation
LS	Lump Sum
MSAP	Modified Static Aerated Piles
mcd/cm^2	Millicandelas Per Square Centimeter
MRF	Material Recovery Facility
msl	Mean Sea Level
MSW	Municipal Solid Waste
Nox	Nitrous oxixide
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OCC	Old Corrugated Containers
OUAIP	Office of Urban Agriculture and Innovative Production
P3	Public-Private Partnership
PA	Plugged And Abandoned
PBC	Public Benefit Corporation
PET	Polyethylene Terephthalate
PFAS	Per- and Polyfluoroalkyl Substances
PLA	Polylactic Acid
PM	Particulate matter
REC	Recognized Environmental Condition
ROM	Rough Order of Magnitude
SFHA	Special Flood Hazard Area
SO_2	Sulfur dioxide
Study	Compost Facility Feasibility Study
TA	Temporarily Abandoned
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
USR	Use by Special Review
VOCs	Volatile Organic Compounds
Western Disposal	Western Disposal Services
WM	Waste Management

Executive Summary

Boulder County, Colorado is committed to progressing towards its zero-waste goal through actions like increasing organics diversion. As part of this effort, the County contracted with Burns & McDonnell Engineering Company, Inc. to conduct this Compost Facility Feasibility Study (Study) to understand organics processing infrastructure options, financial and operational models, and overall feasibility of a County owned organics management facility. The County's goal is to develop a sustainable organics management system capable of accepting food waste, yard waste, branches/limbs/stumps, and clean wood/pallets from residential and commercial sectors. Through this Study, a centralized compost facility utilizing aerated static pile technology emerged as an optimal alternative solution for the County's compost facility.

This Study explored options for managing the County's organic waste, and the following are the key findings.

- **Current System**: The County currently relies on a mix of private and municipal haulers, drop-off centers, and limited processing facilities within the County. Most collected organics are transported to A1 Organics in Keenesburg, 45–60 miles away. The current system faces several challenges, including long transport distances, limited County control over what materials are accepted, and a lack of local large-scale composting options.
- **Diversion Potential**: In 2023, the County diverted approximately 41,500 tons of organic material. A 2019 waste characterization study revealed that 36% of landfilled waste was organic materials comprising approximately 80,000 tons, indicating significant potential for increased diversion.
- **Compostable Products**: The Study considered compostable products and their contamination risks if accepted in County compost feedstock. These items are often indistinguishable from non-compostable materials and may not fully break down during processing. As a result, they can lower the quality of the final compost and prevent it from being allowed for organic certification, reducing end market opportunities. Therefore, for this 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.
- **Infrastructure Alternative Options**: The Study evaluated six composting infrastructure alternative options using a decision matrix with 19 criteria. These alternatives included centralized turned windrow composting, centralized aerated static pile (ASP) composting, decentralized composting, anaerobic digestion, biochar, and an organics transfer station. After initial screening, only two centralized composting options remained viable: turned windrow and ASP. The ASP method emerged as the most promising due to its smaller footprint, shorter retention time, and improved odor control.
- **Public-Private Partnerships (P3)**: The Study also explored public private partnerships (P3) as a way to share costs and responsibilities. Interviews with five haulers and processors showed strong interest in participating in a P3, provided the project is financially viable and includes shared responsibility for feedstock, costs, and marketing the final product. Additionally, several funding opportunities, both state and national, were identified that could support a County compost facility
- **Facility Sizing**: The proposed ASP facility would process approximately 63,000 tons of feedstock annually, requiring approximately 26 acres.
- **Site Evaluation**: The Distel Property in Longmont, CO was identified as a viable potential location. While environmental justice concerns and historical site conditions exist, additional exploration of geotechnical and environmental conditions may be able to support responsible development.

- **Market Analysis**: The facility is projected to produce approximately 132,000 cubic yards of compost and 27,000 cubic yards of mulch annually. The biggest sectors which the County can sell finished compost to are wholesalers, landscapers, government entities, and agriculture. Emphasis on quality and strategic partnerships will be key to market penetration. Government engagement, particularly through procurement policies and building codes, could drive increased adoption.
- **Financial Feasibility**: Three ownership and operational scenarios were evaluated. Scenario 2, County-owned facility with private operation and equipment investment, was the most financially favorable, potentially yielding net revenue of approximately $2.8 million annually.

The Study confirms that a centralized ASP compost facility is technically, financially, and environmentally feasible for the County. With strategic planning, stakeholder collaboration, and public-private partnerships, the County is well-positioned to implement a sustainable organics management system that supports its long-term zero-waste and climate action goals.

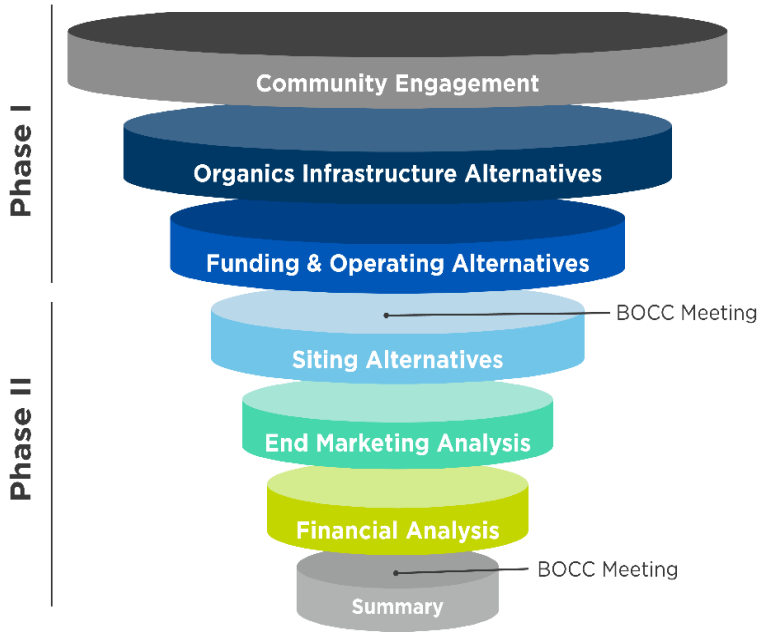
1.0 Study Overview, Guiding Principles, and Definitions

Boulder County, Colorado (County) has a commitment to "Zero Waste or Darn Near," and other climate action goals. As part of this effort, the County contracted with Burns & McDonnell Engineering Company, Inc. to conduct this Compost Facility Feasibility Study (Study) to understand organics processing infrastructure options, financial and operational models, and overall feasibility of a County organics management facility. The County's goal is to develop an organics management system capable of accepting food waste, yard waste, branches/limbs/stumps, and clean wood/pallets from residential and commercial sections. Notably, sewage sludge (also called biosolids) and agricultural waste were excluded from this Study's analysis because they are handled through separate land application or composting processes outside the scope of a proposed County facility. The Study also evaluated the potential of accepting compostable products and paper products.

1.1 Study Overview

The Study included two phases as follows with activities depicted in **Figure 1-1**.

Figure 1-1: Project Approach



Phase 1 included an evaluation of the County's current composting system and several infrastructure alternatives. The infrastructure alternatives were evaluated based on criteria and weighting factors determined by the County, and the output was a decision matrix. Phase 1 also included assessing potential facility funding and operating models of various combinations of public-private partnerships. Phase 1 concluded with a presentation to the public and two members of the Board of County Commissioners on February 25, 2025. The presentation summarized the Phase 1 activities and outlined the activities to be performed during Phase 2. A question-and-answer session was also held with those in attendance.

Phase 2 included sizing calculations and a siting study of a potential location, an evaluation of end markets, and the financial feasibility of potential funding and operating models, including capital cost, operating cost, and revenue analysis.

This report presents the results of Phase 1 and Phase 2 of the Study.

1.2 Study Guiding Principles

The Study's guiding principles aligned with the existing County values as follows:

- Prioritize environmental ethics and racial equity.
- Manage responsibility over County-generated organic materials.
- Manage end products of soil amendments within the County for a closed loop.
- Reduce hauling distances to improve sustainable management of organic materials.

1.3 Definitions

The following definitions and key terms are used throughout the Study and are necessary for a comprehensive understanding of the current organics management systems and strategies that may be implemented in the future.

1.3.1 Materials

Several material categories are handled through various collection, disposal, and processing methods and facilities, depending on the category. This section provides definitions for the primary categories of materials addressed in this Study, consistent with the County's waste composition study from 2019.

- **Feedstock.** Organic materials that are the raw ingredients for composting include food waste, yard waste, brush, clean wood, compostable paper, compostable products, agricultural and industrial materials. The nature of the feedstocks determines composting process conditions and have a significant impact on the quality of resulting compost. Often, multiple feedstocks are mixed together to create optimized composting process conditions.
- **Municipal Solid Waste (MSW).** The entirety of the waste stream that is generated by everyday activities in the residential and commercial sectors. MSW can be further categorized by material types, including refuse, single-stream recyclables, organics, and household waste. Different MSW material types align with different best management practices. Refuse is disposed of in MSW landfills. Much of the MSW generated can be recycled or composted at various processing facilities. MSW does not include commercial hazardous waste or industrial, agricultural, mining, or sewage sludge waste projects.
- **Organics.** Plant or animal-based materials. Organics may have the potential to be diverted from landfill disposal through composting, mulching, anaerobic digestion (AD), and biochar processes. Within the category of organics, there are several sub-categories:
    - **Branches, Limbs, Stumps.** Branches, limbs, and logs greater than 2 inches in diameter.
    - **Certified Compostables.** Food-related containers, cutlery, and any other similar materials identified as certified compostable, typically with the certification agency logo or text, indicating that they have met standards for decomposition and biodegradability based on a lab test. There are other certifications that require field testing.
        - **Biodegradable Products Institute (BPI) Certified Compostables.** Containers, cutlery, and any other similar materials identified as BPI compostable certified, typically with the BPI certification logo or text, indicating that they may break down in a commercial compost setting.
    - **Clean Wood.** Any wood, like dimensional lumber, that does not contain an adhesive, paint, stain, fire retardant, pesticide or preservative; it may contain metal items such as screws and nails.

  - **Compostable Paper.** Soiled and used fibers such as tissues and paper, including old corrugated containers (OCC) that are soiled with food like paper plates, paper cups, pizza boxes, popcorn bags and paper towels. May include wax-coated OCC.
  - **Compostable Products.** Includes compostable paper (see definition) and certified compostables (see definition, above).
  - **Food Waste.** Putrescible organic materials which are the by-products of activities connected with the growing, preparing, cooking, processing, or consuming of food by humans or pets.
  - **Marijuana Waste.** Marijuana clippings, plants, and products. This can include potting soil for plants grown in potting soil but the growing media varies considerably.
  - **Other Organics.** Organic material that does not fit into the categories specified above, and items that are primarily organic but include other materials like plastic or metal. Examples include cotton balls, hair, Q-tips, wax, soap, kitty litter, animal feces, and animal carcasses.
  - **Wood Pallets.** Wood pallets and crating materials commonly used for industrial and commercial packaging and shipping.
  - **Yard Waste.** Grass clippings, leaves, flowers, plant trimmings, and branches less than 2 inches in diameter.
- **Single-stream Recyclables.** Materials that are typically accepted through municipal curbside recycling programs or drop-off locations, processed through a material recovery facility (MRF), and sold as commodities to markets, where the material is then repurposed. Single-stream recyclables include items such as, but are not limited to, plastic and glass containers, aluminum and steel cans, cardboard, and other various paper products. The full range of materials accepted through a municipality's single-stream recycling program can vary by community or by hauler.
- **Industrial Waste.** Material generated as byproducts of industrial or manufacturing processes. This waste type is typically uniform in its disposal, containing a single waste product and/or its packaging in a load for disposal.

1.3.2 Sectors

Material generation is broadly categorized into two primary sectors: residential (single-family and multifamily) and commercial. Construction and demolition (C&D) debris is not considered MSW and is handled separately from residential and commercial MSW; however, in the State of Colorado, it is comingled when disposed of. For this report, sectors are defined as follows:

- **Single-Family Residential Sector.** A single-family dwelling is defined as a detached building that is occupied or which is arranged, designed, and intended to be occupied by not more than one household and which contains not more than one dwelling unit.
- **Multifamily Residential Sector.** Multifamily dwellings are defined as buildings that are occupied or are arranged, designed, and intended to be occupied by two or more households and contain more than one dwelling unit, but not including hotels, motels, or boarding houses.
- **Commercial Sector.** The commercial sector includes material generated by commercial (offices, retail and wholesale establishments, restaurants, etc.) and institutional facilities (schools, libraries, hospitals, etc.). This sector is also referred to as Industrial, Commercial, and Institutional (ICI) in the waste composition study report.

2.0 Current System

The County's current organics management system includes a network of private and municipal haulers, drop-off centers, transfer facilities, and processing facilities. The County does not haul or process residential or commercial organics but has a hauler licensing program that requires organics collection services in some parts of the County. Additionally, some local municipalities have universal waste and recycling ordinances requiring the collection of organics. The system faces challenges, including long haul distances, minimal County control over acceptable feedstock, and the lack of alternative large-scale composting facilities in the region. This section details applicable regulations, existing infrastructure, and County generation and diversion of organic materials.

2.1 Organics Regulations

Boulder County Ordinance #2019-3 requires hauler licenses for all hauling companies operating within the County that collect, transport, or dispose of discarded materials. Hauler licenses must be renewed annually by the hauler, and as a provision of their license, they must report tonnage data. The ordinance requires that haulers who operate in specified unincorporated and urbanized areas indicated by various County-identified zones are to provide for the collection of yard waste and food waste. There are 76 licensed haulers within the County, but only a portion of those licensed haul organic waste (Boulder County, 2024a).

The State of Colorado passed the Compostables Labeling Act (Senate Bill 23-253) in 2023 to ensure that certified compostable products are clearly labeled and easily recognized to reduce the disposal of non-compostable plastic products in compost operations. To clearly indicate that a product can be composted, it must display the ASTM D6400 and D6868 compostable certification logo, be labeled "compostable," utilize green coloring or symbols, and not show any chasing arrow identification code/recycling symbols (CDPHE, 2024).

2.2 Processing Facility Infrastructure

According to the Colorado Department of Public Health and Environment (CDPHE) website, there are two Class III regulated composting facilities within the Denver Metro area: A1 Organics (A1) and Waste Management (WM) Denver Arapaho Disposal Site (DADS) (CDPHE, 2025d). Compost facility classes are structured around the type of feedstock accepted and the size of the facility. Class III facilities can accept any type of feedstock material, including food and yard waste, relevant to the County's commercial needs. Detailed information about each of the regional Class III compost facilities is in **Table 2-1**.

Table 2-1: Regional Class III Compost Facilities

Name	Location	County	Accepted Material Types
A1 Organics	12002 WCR 59 Keenesburg, CO 80643	Weld	Food waste, yard waste, biosolids, industrial waste
WM Denver Arapahoe Disposal Site	3500 Gun Club Road Aurora, 80018	Arapahoe	Food waste, yard waste, biosolids, industrial waste

Organics collected in the County are primarily processed at A1's site in Keenesburg, 45-60 miles from major County municipalities. A1 accepts food scraps, plants, and yard trimmings but does not accept compostable products. This recent change from April 2023 is an effort to reduce contamination in the compost and

improve A1's ability to sell its product (Boulder County, 2023). Within the County, Western Disposal Services (Western Disposal) privately operates an organics transfer station. Their facility includes a commercial depackager for pre-processing food waste before transferring to A1. Western Disposal also manages yard and wood waste through its materials management center (Western Disposal, 2025c).

2.3 Drop-Off Centers

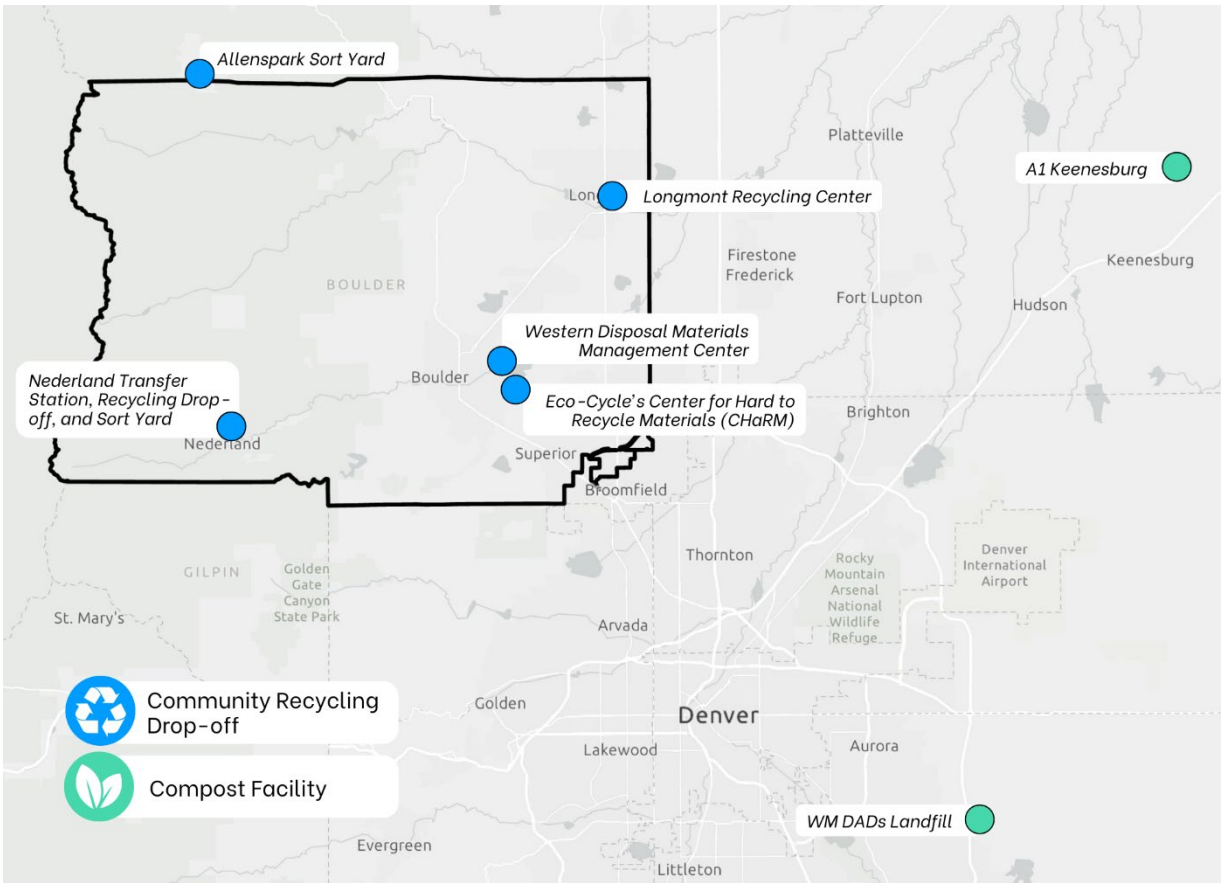
To support the County's composting goals, a network of six drop-off centers is in place. They can be found in Allenspark, Longmont, Nederland, and Boulder. These drop-off centers primarily accept yard waste, with food waste accepted at select locations. Residents are billed by volume, and some centers offer free material giveaways. Detailed information about each of the drop-off locations is presented in **Table 2-2**.

Table 2-2: Yard Waste and Food Scrap Drop Off Location Information

Community Organics Drop-Off Locations	Address	Materials Accepted	Giveaways
Allenspark Sort Yard	8200 Hwy 7 Allenspark, CO 80510	Yard Waste	Wood for arts and crafts projects and compost-like material are available for free.
Eco-Cycles Center for Hard to Recycle Material (CHaRM)	6400 Arapahoe Rd Boulder, CO 80301	Food Waste	N/A
Longmont Recycling Center	140 Martin St. Longmont, CO 80501	Yard Waste, Food Waste	Limbs and yard waste are ground into mulch, which is available to Longmont residents free of charge.
Nederland Sort Yard	291 Ridge Road Nederland, CO 80466	Yard Waste	Wood for arts and crafts projects and compost-like material are available for free.
Nederland Transfer Station and Recycling Drop-Off	286 Ridge Road Nederland, CO 80466	Yard Waste, Food Waste	N/A
Western Disposal Materials Management Center	2051 63rd Street Boulder, CO 80301	Yard Waste, Wood Waste	N/A

The proximity of the drop-off centers to other surrounding compost facilities within the County boundaries (in red) is shown in **Figure 2-1**.

Figure 2-1: Drop Off, Sort Yards, and Surrounding Compost Facilities Map



2.4 Collection System

Organic waste is collected by a network of private and municipal haulers. Commercial organics collection is serviced by private haulers on the open market as an optional service in some areas. The residential curbside organics collection system varies throughout the cities and unincorporated areas of the County. Service is either provided through an open-market system, where residents contract directly with a hauler, or provided by the City through a single hauler. Organics collection is either offered as an optional opt-in service for an additional fee or provided as a universal service as part of the base fee. Detailed information about County municipal organics collection systems is provided in **Table 2-3**.

Table 2-3: Boulder County Jurisdictions Residential Organics Collection Systems

City	Estimated 2023 Population* (Per Census) (United States Census Bureau, 2023)	Provision of Service	Hauler	Organics Service System
Boulder (City of Boulder, 2024)	105,898	Open Market	Multiple	Universal Curbside
Longmont (City of Longmont, 2024)	98,630	Municipal Hauler	Waste Services	Opt-In
Erie (Town of Erie, 2024)	35,269	Open Market	Multiple	Opt-In
Lafayette (City of Lafayette, 2024)	30,439	Municipal Contract	Republic Services	Universal Curbside
Louisville (City of Louisville, 2024)	20,390	Municipal Contract	Republic Services	Universal Curbside
Superior (Town of Superior, 2024)	13,361	Municipal Contract	Republic Services	Opt-In
Lyons (Lyons, Colorado, 2024)	2,151	Open Market	Multiple	Opt-In
Nederland	**1,471**	Open Market	Multiple	**Drop-Off Only**
Jamestown	**256**	Open Market	Multiple	**None**
Ward	**128**	Open Market	Multiple	**None**
Unincorporated	24,620	Open Market	Multiple	Universal Curbside

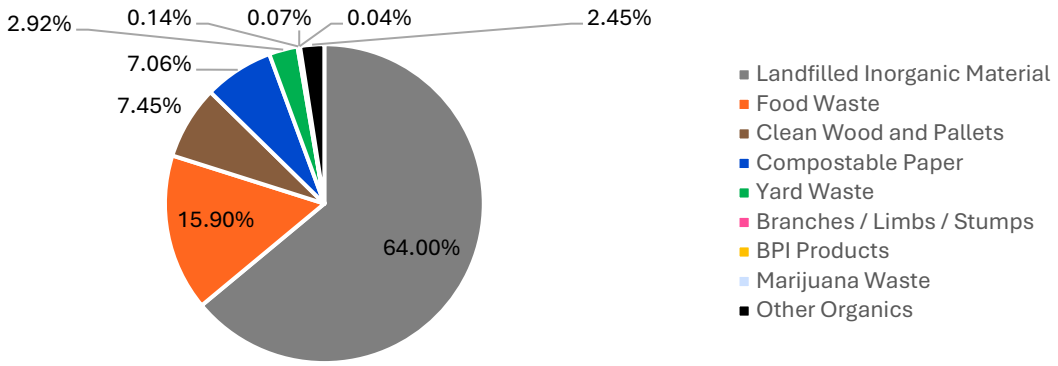
*Some cities contain populations outside of Boulder County. The total population for the whole city, both inside and outside the County, is represented in this column.

2.5 Organic Material Characteristics, Generation, and Diversion

According to the County's hauler-reported diversion data on organics, 41,500 tons of organics were diverted in 2023 (ReTrack, 2023). County haulers reported 54 percent of their organic diversion as yard and wood waste recycling and the remaining 46 percent as food waste. The County's organics diversion program generators are mostly commercial sources (48 percent), with single-family (36 percent) and multifamily (16 percent) residences contributing the rest.

A County-wide waste characterization study was conducted by MSW Consultants in 2019 and found that 36 percent, or 83,700 tons, of all landfilled waste was characterized as organic, prompting the opportunity for an expanded organics collection system (MSW Consultants, 2019). The majority of landfilled organics was food waste, followed by clean wood and pallets, compostable paper, and yard waste, as seen in **Figure 2-2**. Notably, BPI-certified compostable materials accounted for less than one-tenth of a percent of landfilled waste. But this most likely indicates a lack of market penetration, rather than that these materials are being composted. The majority of "compostable" (including look-a-likes, biodegradable, non-certified, etc.) food-related products currently end up in landfills. Landfilled inorganic material is defined as all other landfilled material that cannot be accepted into a compost facility. For example, that includes but is not limited to plastic, metal, and glass, some of which could also be diverted through other mechanisms.

Figure 2-2: Waste Characterization by Material Type, 2019*



*(MSW Consultants, 2019)

In December 2024, the CDPHE held several public meetings regarding its proposal to reduce emissions from MSW landfills that accept common household waste. Proposed regulations will likely mandate methane emission controls for more landfills than the current EPA rules (Thakore, 2024). Food waste is a major contributor to methane emissions. By collecting these materials for composting, significant reductions in methane emissions can be achieved. Therefore, there is potential in the market for a higher influx of organic waste to be diverted to composting facilities instead of landfills. Potentially, the end markets across the state would expand, benefiting the County as well.

2.6 Summary of Findings

The County's current organics management system includes a network of private and municipal haulers, drop-off centers, transfer facilities, and processing facilities. Most organics generated in the County are transported 45–60 miles to A1 in Keenesburg. Residential organics collection systems vary by municipality, with a mix of open-market and municipal contracts. Services range from universal curbside to opt-in programs. The County has an ordinance that requires haulers to provide for the collection of yard waste and food waste (variable by defined zones throughout the County). Municipal and county collection systems and policies have led to 41,500 tons of organics diverted in 2023. A 2019 study found 36 percent of landfilled waste was organic, indicating significant diversion potential. Food waste is the largest component of landfilled organics. BPI-certified compostables make up less than one tenth of a percent of landfilled waste.

3.0 Compostable Products Analysis

The management of compostable products - products designed to break down under controlled composting conditions - at a composting facility is a complex issue. While such products aim to reduce single-use plastics and facilitate food scrap collection, they present significant operational and market challenges.

3.1 Compostable Product Challenges

Compostable products (mostly food service ware and food-related packaging) are envisioned to help reduce the use of single-use plastics, facilitate food scraps recovery, and reduce contamination at compost facilities, but have so far failed to deliver on those promises. Compostable products are typically derived from biological origins but may also contain some petroleum content. The term comprises several chemistries and can broadly be divided into plastic and fiber, but there are numerous hybrids and resins under the broad category of "compostable products."

To some extent, compostable products strive to replace single-use packaging on a one-to-one basis. This has proved troublesome since a clear to-go cup made of compostable Polylactic Acid (PLA) looks comparable to a clear non-compostable polyethylene terephthalate (PET) cup. Identification by the consumer is one of the most significant challenges of implementing and recovering compostable products, since consumers need to be able to determine which bin to put the compostable item in.

Additionally, the difference between certified vs. non-certified compostable products is confusing for consumers. Certified compostable items meet third-party standards of composition (e.g., no toxic ingredients like PFAs) and must pass testing requirements for decomposition and biodegradation, often through lab tests (not field tests) without leaving harmful residues. Uncertified products lack this verified guarantee and may not break down properly, could contain toxins, or simply be non-compostable or contain other non-compostable ingredients. Consumers struggle to differentiate "certified compostable" vs. "compostable" and "biodegradable." The potential for greenwashing with these claims is substantial, so advocating certified compostable requirements may reduce this and increase consumer confidence. However, there are a lot of conflicting messages in this space.

Compostable plastics (somewhat distinct from fiber products) make up less than 0.5 percent of the global plastics market. Compostable plastics are commonly made from by-products of abundant starch sources (e.g., corn, sugar cane, microorganisms, petroleum or a combination of all of these). While the production of these products is predicted to increase dramatically, there is no such growth predicted in the number of facilities and infrastructure required to successfully collect and compost these materials. There are fewer than 200 composting facilities in the US capable of handling food scraps, and fewer than half of those are willing/able to accept these products (BioCycle, 2023). While the number of households with access to food waste collection is increasing, it is unclear how or whether compostable plastics have a role in facilitating these collection programs. Most compostable plastics in use today end up in landfills. Consumers are confused as to how to sort them, few programs exist to compost them, and many large composters are installing depackaging equipment to try to manage the overwhelming volume of plastic (of all types) in the organic stream. This equipment is inadvertently separating compostable plastics as well as conventional plastics since depackagers cannot distinguish by resin type.

Throughout various stages of the composting process, compostable products pose a threat to clean end products. Compostable products are often indistinguishable from non-compostable single-use products such as utensils, tableware, and takeout packaging. Thus, non-compostable products contaminate the incoming feedstock since consumers may unassumingly dispose of non-compostable products in their compost, and pre-processing machinery cannot distinguish between them. Pre-processing machinery is not selective; therefore, both non-compostable contamination and compostable products are likely to be landfilled. Additionally, while compostable products are designed to completely biodegrade, they rarely break down completely during the active processing stage of composting (BioCycle, 2024b). Consequently, residual fragments remain in the finished product that post-process screening does not always remove. With fragments remaining, end market opportunities decrease since the end product cannot be certified as organic with contamination (BioCycle, 2021). By accepting feedstocks with compostable products, the finished product may even contain per- and polyfluoroalkyl substances (PFAS), contaminating the end product and minimizing market value (Schwartz-Narbonne, et. al., 2023). The composting process and its contamination challenges are summarized in **Table 3-1**.

Table 3-1: The Composting Process and Its Contamination Challenges

	Feedstocks	Pre-Processing	Active Processing	Post-Processing	End Market
Compost Facility Process	Organic waste is separated from the landfill stream by commercial and residential generators.	Contamination, like plastic bags, silverware, glass, and other non-compostable materials, is removed from feedstocks through manual and/or mechanical means.	Feedstock is converted into finished compost through active composting and curing.	Finished compost is screened for product sizing specifications and final contamination removal.	Compost is utilized internally as a cost-saving measure or sold for use.
Contamination Challenges	Indistinguishable products. Non-compostable products contaminate the feedstock.	Indistinguishable products. Both non-compostable contamination and compostable products are likely removed and landfilled.	Compostable products rarely break down completely in practice.	Not all contamination fragments are caught through screening.	Organic and inorganic fragments remain, lowering the value. Not certifiable as organic. May contain PFAS.

3.2 Scenarios Analysis

This Study analyzed four operational scenarios to evaluate how compostable products could be managed at a potential composting facility. Pre-processing, refers to a hypothetical County compost facility having a depackager to remove contamination (including compostable products) from the waste stream. To assess the practical implications, scenarios were evaluated in **Table 3-2**.

Table 3-2: Compostable Product in Feedstock Scenarios

Scenarios		Challenges
1	Accept compostable products from the residential sector WITHOUT pre-processing	• Windblown litter • Contaminated end product
2	Accept compostable products from the residential sector WITH pre-processing	• Compostable materials are removed and landfilled • Slightly cleaner, but still a 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 a contaminated end product
4	Do not accept compostable products	• Compostable materials are landfilled

In the first three scenarios, the end product is contaminated with compostable products. Therefore, 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.

3.3 Summary of Findings

Compostable products, while intended to reduce single-use plastics and facilitate food scrap recovery, present significant challenges for composting operations. Compostable products are often indistinguishable from non-compostable items, causing confusion among consumers, leading to contamination in the feedstock and finished compost. While certification programs do exist, they are in the early stages of implementation and do not generally reach compostable products manufactured abroad and imported into the US, causing further customer confusion. The matrix evaluation assumed that compostable products would not be accepted at this facility initially. However, future technological advancements may allow for their inclusion.

4.0 Evaluation of Alternatives - Decision Matrix

The following organic processing infrastructure alternatives were evaluated in comparison to the County's current processing services agreement, and a decision matrix was developed.

- 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

The County's desired feedstocks are food waste, yard waste, branches/limbs/stumps, and clean wood/pallets. Notably, biosolids were excluded from this Study's analysis because the County is not considering accepting them as feedstock. Additionally, while agricultural waste data was not reported to be by haulers or identified in the waste characterization study, the County facility decision matrix included acceptance of agricultural materials.

4.1 Infrastructure Alternative Definitions

Centralized Turned Windrow Composting Facility refers to a dedicated facility where a significant volume of a community's organic waste (food waste, yard waste, branches / limbs / stumps, clean wood / pallets, and agricultural waste) is processed into compost at a large scale. Compostable papers and plastic products would likely not be accepted at this facility initially, though the County could be poised to process them in the future as technology improves. Organic feedstock is formed into rows of long piles called windrows, which are turned regularly with specialized equipment to redistribute the feedstock, redistribute moisture, release trapped gases and to re-establish pile porosity. Finished compost can be used as a soil amendment to retain nutrients and moisture and sequester carbon.

Centralized ASP Composting Facility refers to a dedicated facility where a significant volume of a community's organic waste (food waste, yard waste, branches / limbs / stumps, clean wood / pallets, and agricultural waste) is processed into compost at a large scale. Compostable papers and plastic products would likely not be accepted at this facility initially, though the County could be poised to process them in the future as technology improves. Organic feedstock is formed into piles with engineered dimensions and aerated through a network of piping to maintain oxygen levels throughout the material. This product can be used as a soil amendment to retain nutrients and moisture and sequester carbon.

Decentralized Composting Facilities refers to a network of small to medium scale facilities that together process a significant volume of a community's organic waste (food waste, yard waste, branches / limbs / stumps, clean wood / pallets, compostable paper, and agricultural waste) into compost. Compostable papers and plastic products would likely not be accepted at these facilities initially, though the County could be poised to process them in the future as technology improves. Operators can employ methods such as static piles, turned windrows, aerated static piles, or in vessel composting to generate finished compost. In-vessel composting involves loading organic feedstock into an enclosed container fitted with forced aeration and/or mechanical agitation to automate the composting process. This product can be used as a soil amendment to retain nutrients and moisture and sequester carbon.

AD Facility refers to a specialized facility of various scales where organic waste (manure, food waste, fats oils and grease) is processed through a fully contained system of tanks into biogas and digestate. Certain anaerobic digestion systems can additionally manage yard waste and agricultural waste. Compostable paper and compostable plastic products would not be diverted from the landfill waste stream. Biogas is a renewable energy source that can be used for heating, electricity generation, or vehicle fuel. Digestate can be used as a fertilizer, soil amendment, livestock bedding, or horticulture products.

Biochar Facility refers to a specialized facility where organic waste material or biomass (yard waste, branches / limbs / stumps, and agricultural waste) is partially combusted in the presence of limited oxygen to produce biochar, a stable, carbon-rich solid. This process, known as pyrolysis, not only helps in carbon sequestration but also produces a valuable soil amendment that can enhance soil fertility and reduce greenhouse gas emissions.

Organics Transfer Station Facility refers to a dedicated facility where organic waste is collected, sorted, pretreated, consolidated, and temporarily stored prior to transportation to its processing or disposal site. Pretreatment options can include mechanical, biological, thermal, chemical, or a combination of treatments. This facility would generate no finished products and rather relies on unaffiliated offsite processors to accept the organic waste for finishing. Because of this, any organic waste material could potentially be managed through an organics transfer station assuming that a processor has been identified to receive these materials for finishing.

4.2 Evaluation Criteria

The six infrastructure alternatives and the existing system were considered through 19 screening criteria to develop the decision matrix.

4.2.1 Critical Screening Criteria

All alternatives were initially screened using critical screening criteria. This removed an alternative if it did not meet the County's needs regarding the following:

- **Maturity / Prevalence of Technology** defines whether the alternative shows a history of success in similar applications and scale.
- **System Resiliency** considers whether the County would maintain control over its own waste management.
- **End Products / Byproducts** analyzes the ability of an alternative to create a closed loop with amendments to improve local soil health.

These key prescreening criteria were chosen to align with the County's goals for a potential organics processing facility. The results of the critical screen criteria are summarized in **Table 4-1**. Through this prescreening evaluation, decentralized composting, AD, biochar, and organics transfer were all eliminated from the additional criteria screening included in the decision matrix.

Table 4-1: Critical Screen Criteria Results

Critical Criteria Screening	Existing System	Centralized Turned Windrow Composting	Centralized ASP Composting	Decentralized Composting	Anaerobic Digestion	Biochar	Organics Transfer Station
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

While the matrix screened out these four alternatives as single solutions for the County's organic waste system, they can still contribute to organic waste diversion in the County. For example, the County fully supports the diversion of material through small-scale decentralized facilities and biochar, but neither of these is likely to be the sole solution for the feedstock and scale of this project (Boulder County, 2024c).

Additionally, the existing system failed the prescreening criteria due to a lack of system resiliency that would support County control of its own waste management; however, it was still considered in the full matrix evaluation for comparative purposes.

A decentralized composting network was eliminated from this Study because it would require dozens, if not hundreds, of composting sites to process the volume generated by the County. The smaller processing capacity conditions make a decentralized composting network an unrealistic alternative to consider in the decision matrix; however, they are a valued contributor to the overall organics management system in tandem with any selected alternative technology. Compost Queen Public Benefit Corporation (PBC) in Fort Collins, Colorado, illustrates a decentralized composting system. They operate three composting sites (two on family farms and one at a botanical garden) and have an operating capacity to compost about 700 tons/year (BioCycle, 2024a). For reference, the County diverted about 41,500 tons of organic materials in 2023; therefore, a decentralized network would have to be enormous to support the anticipated tonnage of a County facility. Additionally, siting a compost facility is a challenge with a combination of environmental, community, and logistical concerns. A decentralized composting network would exacerbate this challenge due to the need to site multiple composting facilities.

AD was eliminated from this Study due to its lack of adoption across the state, its minimal feedstock acceptance compared to the County's desired feedstocks, and the minimal opportunities for its end/by products. There is no substantive use of AD to manage organics from the municipal solid waste stream in Colorado (Eunomia, 2024). Implementing this option would reduce the current diverted feedstock that the County's system management prioritizes, falling short of system resiliency criteria. AD is at its best with consistent, reliable feedstocks, which are uncommon for municipal waste streams. Wood waste and yard waste, though manageable, are not ideal feedstocks for AD. These are key feedstocks that the County has expressed a desire to process. Additionally, biogas is the main end product of AD. Waste-to-energy projects do not have historical support from the County. Digestate is a byproduct of the AD process and, though it boasts several potential beneficial uses, it is often in reality a cost to dispose of. These conditions make AD an unrealistic alternative to consider further in this Study.

Biochar was eliminated due to its minimal feedstock acceptance compared to the County's desired feedstocks, its lack of national adoption of the technology, and the minimal opportunities for its end products. Biochar has limited compatible feedstocks and would not be able to compost food waste, the largest category of landfilled organic waste in the County. Implementing this option would reduce the current diverted feedstock that the County's system management prioritizes, falling short of system resiliency criteria. A commercial biochar market is developing in the State, but biochar adoption is relatively low (Colorado State University, 2024). There is a similarly minimal existing market for the biochar product. These conditions make biochar a nonviable alternative to consider in the Decision matrix.

Finally, a new organics transfer station was eliminated due to its market competition with the County's existing system in dealing with organics. It would not meet the critical criteria to create a closed loop with amendments to improve local soil health. Currently, the County sends its yard waste to Western Disposal, so a new transfer station would be redundant and competition for Western Disposal, making it a nonviable alternative to continue studying in the full Decision matrix (Boulder County, 2024b).

4.2.2 Screening Criteria

After alternatives were considered for critical screening criteria, the following 16 remaining screening criteria were considered for the existing system, centralized turned windrow composting, and centralized ASP composting. These 16 remaining screening criteria can be grouped into four categories:

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

4.3 Methodology

The Decision matrix was developed by assigning weights and ratings to each of the alternatives for the 19 total screening criteria. The 19 screening criteria were assigned with a score of 1, 2, or 3. A score of 3 meant that the alternative is most likely advantageous to the County for the criteria considered, 2 meant that the

alternative may or may not benefit the County for the criteria considered, and 1 meant that the alternative could be disadvantageous to the County for the criteria considered.

The County was then given the opportunity to assign a weight to each of the 19 screening criteria with a score of 1, 2, or 3. All weights were relative to those considered. A score of 3 means the criteria is of the highest priority to the County's goals for their management of organic waste; 2 means the criteria is of moderate priority to the County's goals for their management of organic waste; and 1 means the criteria is of the lowest priority to the County's goals for their management of organic waste.

Then, the weight and rating were multiplied to create a weighted score for each of the screening criteria and added up for each of the three alternatives for comparison.

4.4 Decision Matrix Results

The completed decision matrix is provided in **Appendix A**. It shows the scores for the existing system (96 points), centralized ASP composting (91 points), and centralized turned windrow composting (87 points). All the options scored relatively high and within only a few points of one another. The existing system scored the highest overall; however, the importance of system resilience to manage responsibility over County-generated organics is a priority for the County. The primary advantages of ASP technology over windrow technology are the reduction of facility footprint, faster processing time, and the ability to manage odors. According to the decision matrix, a compost facility utilizing ASP technology could be the best option to meet the County’s goals through the development of new infrastructure.

4.5 Summary of Findings

The Study evaluated six composting infrastructure alternatives using a decision matrix based on 19 criteria. Four alternatives—decentralized composting, AD, biochar, and an organics transfer station—were eliminated early due to failing one or more critical criteria. While these were not viable as standalone solutions, they may still contribute to broader organics diversion efforts.

After the critical screening, the existing system, centralized ASP composting, and centralized turned windrow composting were fully evaluated. The centralized ASP composting facility emerged as the most promising option due to a smaller facility footprint, faster processing time, and superior odor control.

5.0 Funding and Operating Evaluation

Public-private partnership (P3) funding and operating models were evaluated for this Study. Five private-sector organics haulers and processers in the Boulder County market were interviewed to provide a more comprehensive understanding of existing services, opportunities, and level of interest in a potential P3. Additionally, a review of potential funding mechanisms was conducted.

5.1 Public Private Partnership Models

P3s can be effective models to provide necessary infrastructure without the full financial risk falling on either the local government or the private sector. Effective P3's exist when both local governments and the private industry collaborate to share resources, capital investment, risk, and revenue. When considering a P3, a local government should consider the degree to which it wants to be involved in the operations and capital investment of a facility. The different types of arrangements and their corresponding responsibilities have advantages and disadvantages. **Table 5-1**, **5-2**, **5-3**, and **5-4** provide an overview of the different P3 options available to local governments and private businesses and evaluates the advantages and disadvantages of each model.

Table 5-1: Examples of P3 Models

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 5-2: P3 Land Ownership Evaluation

Owner	Possible Advantages	Possible Disadvantages
Local Government	• Flexibility with P3 structures • Cost savings if local government already owns land • Can retain facility long-term • High control of facility and overall site (e.g., potential future expansion)	• Increased level of effort • Higher risk to the local government
Private	• Lower level of effort for local government • Lower risk to the local government	• No local government involvement • Local government will not retain facility in the long-term • Local government has low control of facility and site

Table 5-3: P3 Operations Evaluation

Operator	Possible Advantages	Possible Disadvantages
Local Government	• Local government to receive 100% of the revenue • Control over operational standards	• Limited composting processing experience • Sole responsibility for sourcing material • Limited in materials marketing capabilities, scale, and experience • Hiring and other aspects of facility staffing may be constrained by public hiring and human resources processes
Private	• Experience with compost processing • Local government and private company work together to source material • Potential to market a large volume of material from multiple facilities • Sophisticated materials marketing (e.g., hedging, derivatives)	• Local government must manage contractor and provide oversight • Local government likely to incur processing fee and must share revenue • Local government has limited control over operations

Table 5-4: P3 Capital Investment Evaluation

Operator	Possible Advantages	Possible Disadvantages
Local Government	• Municipal cost of capital is lower • Local government does not have to earn a return on capital investment • Potentially longer depreciation period • High control of facility and overall site	• Large capital outlay for local government • Potentially longer project schedule • Higher risk
Private	• No capital outlay required by local government • Potential for some cost and/or schedule savings due to private-led procurement processes • Lower risk	• Higher cost of capital • Private will compress depreciation period to match contract term • Private must earn a return on capital investment • Lower control over facility and site for a local government partner

Overall, P3s offer the County a flexible and potentially cost-effective approach to developing composting infrastructure, with the choice of model depending on the County's desired level of control, risk tolerance, and long-term operational goals.

5.2 P3 Interview Findings

Interviews were conducted with commercial organics haulers and processors currently engaged in the collection and/or processing of organic material from customers both within and outside the County. The purpose of the interviews was to provide a more comprehensive understanding of existing services, opportunities, and level of interest in a potential County P3.

5.2.1 Interview Methodology

The County identified five private companies to participate in the interview process. These five companies were identified as being representative of the organics industry in the County, regional, and national market. They represent both large and small companies, providing services locally, regionally, and/or nationally. These companies have not been pre-qualified for any future activity that could be conducted by the County

(e.g., procurement) and would not be given any advantages in such a procurement because of their participation in the interview process.

Interviews were conducted in December 2024 and January 2025. Prior to an interview, a memorandum was provided to the interviewees that introduced the County's planning process and gave an overview of the purpose of this Study. The memorandum included a list of questions to guide the interview process and ensure consistency in the topics discussed with each of the companies. A copy of this memorandum is provided in **Appendix B**.

The interviews were conducted virtually via Teams, and County staff did not participate. As agreed by the County and the companies' representatives, the responses from individual companies are confidential and are not disclosed in this memo. All results have been aggregated to understand the industry's interests and opinions as a whole.

5.2.2 Company Experience

Each interview began with a company overview, each company's experience with processing organic materials, and their current end markets. The following summarizes the responses:

- Commercial organic haulers provide multiple services to meet their customers' varied needs. These include hauling, pre-processing, sorting, grinding, transferring, composting, and selling finished organic products.
- Haulers collect and process tonnage from residential, commercial, and industrial sources.
- These private companies have organic processing experience nationally, regionally, and locally. Two companies even work internationally in Canada.
- These companies are most familiar with working with windrow and ASP composting. One company works with in-vessel composting outside Colorado, and another company works with modified static aerobic piles (MSAP) and the GORE® Cover System.
- All companies have experience processing at least one, if not all the following: yard trimmings, food waste, compostable products, wood waste, and agricultural waste.
- Compostable products are the most troublesome to process, and none of the companies currently accept them in their feedstock.
- Landscapers, the Department of Transportation (DOT), topsoil amendments, and wholesalers are the biggest end markets for finished compost in the State.
- Some companies have trouble getting rid of their finished compost, either giving it away for free or paying to remove it, while other companies sell it easily.

5.2.3 Challenges to Organics Diversion in the County

During the interviews, haulers were asked to describe the challenges and barriers to organics diversion in the County. The following summarizes the responses and is the opinion of those interviewed. Note that not all the haulers expressed each response.

- There is a general lack of infrastructure for organics processing in the County.
- Plastic and compostable products contamination is a challenge with food waste.
- End markets for compost are a big challenge. It is important to have a clean end product without contamination of plastic (whether compostable or not). There is not enough demand currently for

compost contaminated with compostable plastics, and there is also limited demand for clean compost.
- Colorado's high altitude and climate make processing and selling compost difficult due to dryness and seasonal demand.
- The current compost facility that the County uses is far away, which drives up hauling distance and cost.
- There are concerns about changing/emerging Environmental Protection Agency (EPA) regulations and PFAS restrictions that could affect compost contamination.

5.2.4 Opportunities for County Involvement

Haulers were asked what the County could do to help increase organics diversion and improve the marketability of compost. The following summarizes the responses. Note that each of the responses were not expressed by all the haulers.

- Closer infrastructure that would reduce hauling distance would be economically beneficial as long as tipping fees stay competitive.
- Education and outreach are key to ensure compost is not contaminated.
- County ordinances need to be better enforced for more efficient organics diversion.
- The County needs to be a major end market for composters, perhaps putting a requirement that all County projects must use a certain amount of compost or organize free compost giveaway days.
- Some haulers recommend that the County start small with limited feedstock and size. Then, they can expand as more public and private investment is introduced.

5.2.5 P3 Interest

In each interview, haulers were asked about their experience with P3 arrangements for organics materials management, their interest in working with the County in one, and their preferred scenario for a facility within the County. The following summarizes the responses based on potential partnerships. Note that each of the responses was not expressed by all the haulers, and many of these answers were tentative until more information was confirmed.

- Most companies say they are open or interested in having a follow-up conversation about a P3.
- Many companies find great benefit in the County permitting a facility as opposed to the private company attempting that.
- Location would be a major factor in accepting a P3, with acreage for future facility expansion being a plus.
- There is interest in P3 for a composting facility, specifically for a County developed, privately operated model.
- Often, private companies would prefer to provide the cost of capital upfront and participate in an agreement that would ensure they recoup the costs within a set number of years. Most private companies are willing to provide the equipment as they have the best expertise.
- Some private companies have experience participating in an existing P3 on a city and county level, both within and outside of Colorado.

5.3 Potential Funding Mechanisms

This section outlines available state and federal funding opportunities that could support the development, construction, and operation of a composting facility in the County.

5.3.1 State Funding

Colorado Bill HB22-1355, titled "Producer Responsibility Program for Recycling," was signed in June 2022 and required the implementation of a statewide extended producer responsibility (EPR) program. This program covers packaging material intended for single or short-term use. Certified compostable products are also covered; thus, facilities that process such compostable products may be eligible to receive grant funding. The grant focus is on infrastructure and is anticipated to have annual grant funding (Circular Action Alliance, 2024).

Colorado Bill HB24-1449, titled "Environmental Sustainability Circular Economy," was signed in May 2024 and supports funding opportunities for projects that promote a circular economy. These grants are funded by a fee on solid waste disposed of in Colorado landfills and are organized by the Colorado Circular Communities (C3) program. Composting production qualifies as a circular economy project and has the potential to get funding from this program. Applicants can apply for Mini Grants (awards up to $50,000), Impact Grants ($50,000 to $250,000), and Capacity Building Grants (over $250,000) (Colorado Circular Communities, n.d.).

5.3.2 Federal Funding

The United States Department of Agriculture (USDA)'s Composting and Food Waste Reduction (CFWR) program, authorized by the 2018 Farm Bill and funded by the American Rescue Plan Act of 2021, provides cooperative agreements to local and municipal governments. These agreements support projects that develop and implement strategies for municipal composting and food waste reduction. Funded activities include acquiring materials and equipment for composting, collecting food waste, and conducting training. Projects prioritizing economic benefits, community compost accessibility, food recovery integration, and multi-partner collaborations are favored. County governments are eligible to apply for either a Planning Project grant or an Implementation Project grant. The USDA's Natural Resources Conservation Service (NRCS), leading the Office of Urban Agriculture and Innovative Production (OUAIP), administers the program (USDA, 2025). In 2024, the program awarded $7.5 million to 26 projects (USDA, 2024).

5.4 Summary of Findings

The Study explored several P3 structures, ranging from full County ownership and operation to privately owned and operated facilities. Each model presents trade-offs in terms of control, risk, capital investment, and operational responsibility.

For the Study, five regional haulers and processors were interviewed. Those interviewed generally expressed interest in participating in a P3, particularly if the project is financially viable and includes shared responsibility for feedstock sourcing, operational costs, and marketing of the final compost product. Many interviews emphasized the value of County involvement in permitting and expressed a preference for upfront capital investment with structured agreements to ensure cost recovery.

The Study identified several state and federal funding mechanisms that could support the development of a compost facility. These funding sources could offset capital and operational costs.

6.0 Facility Sizing

The spatial requirements for the County to develop a composting facility were analyzed based on the assumed availability of feedstock within the County and surrounding areas and operating conditions typical for ASP technology. The feedstock and sizing calculations presented are not based on a specific design or location, though these considerations may impact the findings.

6.1 Feedstock Analysis

The facility's feedstock analysis considers current organics diversion and a combination of the multiple variables that could increase organic feedstock without a change in policy. As previously reported in **Section 2.5**, the County reported that 41,500 tons of organics were diverted in 2023. In addition to what the County's currently diverting, 21,600 more tons of organic waste is assumed to be potentially received through capturing additional landfilled organic material, material that a private operator may provide, population growth, and increased commercial and out-of-County customers. The County estimates there may be an additional 6,000 to 8,000 tons of biomass generated from County modifications to their forest management practice. This calculation excludes the theoretical biomass addition as the County has not yet implemented the changes. Capture rates are based on professional industry assumptions. **Table 6-1** below demonstrates the key organic waste streams that may be anticipated to be captured through a new compost facility.

Table 6-1: Composting Facility Feedstock*

Feedstock	Diverted (2023 tons)	Landfilled (2023 tons)	Total Generated (2023 tons)	Quantity Capturable (2023 tons)
Food Waste	19,500	41,720	61,220	32,170
Clean Wood	6,360	10,250	16,610	10,150
Wood Pallets	5,710	9,200	14,910	8,330
Yard Waste	4,750	7,650	12,400	6,990
Branches, Limbs, Stumps	5,180	370	5,550	5,470
Total	**41,500**	**69,190**	**110,690**	**63,110**
*Numbers may not sum exactly due to rounding				

Only Boulder County waste data was analyzed for this Study; no detailed analysis was conducted for the waste streams of neighboring counties to identify specific potential sources, whether by haul radii or other methods. However, the County can anticipate that reducing the haul distance for any of these neighboring communities could be an incentive in attracting this material to a new, closer facility.

6.2 Compost Mix Design

It is estimated from preliminary calculations that all of the potentially capturable feedstock of 63,100 tons could be incorporated into a combination of mulching and composting feedstocks while still providing an acceptable moisture content and carbon to nitrogen (C:N) ratio. This Study assumes that 50 percent of the County's clean wood and wood pallets would be processed into mulch products, and the remaining sum of the divertible feedstock materials would be processed into compost. This assumption results in a proposed compost recipe of 185,000 cubic yards worth of annual feedstock with about 20 percent food waste by

volume. Additionally, up to 46,000 cubic yards of wood products would be ground into mulch, though this material can also benefit the operation as a reserve in carbon-rich material should it be needed to further balance the County's nitrogen-rich food waste.

The ideal C:N ratio of feedstocks at the start of the composting process is between 25:1 and 40:1, and the ideal moisture content is between 50-60 percent. Based on waste characterization data reported by haulers and industry-accepted assumptions for feedstock material properties, it is estimated that this recipe would produce or meet the ideal ranges. The actual values may vary depending on the actual properties of the feedstocks. Consequently, the actual recipe will likely be adjusted from this assumed composition and will require ongoing management of the material streams. The proposed recipe would yield approximately 132,000 cubic yards of compost and 27,000 cubic yards of mulch annually.

6.3 Facility Spatial Requirements

Spatial requirements for an ASP compost facility include feedstock receiving and storage, compost processing space, finished compost storage, stormwater management, and various additional considerations. These areas as they relate to the County's projected feedstock are summarized in **Table 6-2** and further discussed in the sections below. The estimated spatial requirements presented in this section are based on several assumptions and conceptual design considerations; therefore, they are not exact. Further site design is necessary to estimate spatial requirements in greater depth.

Table 6-2: Estimated ASP Facility Spatial Requirements

Feedstock Receiving and Storage Area (acres)	Compost Processing Area (acres)	Finished Product Screening and Storage Area (acres)	Stormwater Management Area (acres)	Additional Facility Operational Needs (%)	Total Area (acres)
10.50	2.75	6.75	1.75	20%	26.00

6.3.1 Feedstock Receiving and Storage Area

The compost facility is anticipated to receive approximately 63,100 tons of feedstock annually. Receiving operations for food waste and all other materials will look very different to accommodate the difference in characteristics between feedstocks. This incoming material will also require a certain amount of pre-processing before it is ready for composting. These three operations make up the 10.5 acres anticipated for the feedstock receiving and storage area.

Yard waste, branches, limbs, and stumps are streams that will vary seasonally. Because of this, a compost facility requires space to stockpile this vital material to continue operations year-round. To account for this variance, 4 months' worth of stockpiling is assumed based on industry practices. Clean wood and wood pallets are expected to provide a more consistent flow of feedstock, so only 1 month's worth of storage volume is anticipated. Stockpile heights of 12 feet are conservatively assumed in this Study according to best practices for mitigating fire risk.

The food waste stream is expected to serve as a steady inflow of compost material. Due to the speed at which food waste decomposes, it is not recommended to be stored in its raw form longer than a few days. To mitigate the risk of nuisance odors and vectors, a 12,000 square foot enclosed tipping building is assumed. This simple building would include a tipping & mixing floor, depackaging operations for contaminated waste streams, and storage space for redundancy.

6.3.2 Compost Processing Area

The compost processing area includes both a primary and secondary composting operation. The primary composting phase is characterized by the greatest microbial activity which in turn generates the highest temperatures, the most decomposition of odorous compounds, and the highest oxygen demand. The secondary composting phase serves to improve compost quality and is characterized by decreasing temperatures, minimal odor concerns, and lower oxygen demand.

The primary composting area consists of eight individual 26-foot by 90-foot by 10-ft bunkers, each operating on its own ASP blower zone through trenches embedded below grade. A blower system capable of reversing airflow coupled with a separate biofilter area is recommended to further mitigate odors. The area also includes considerations for drive paths and buffer space around the composting bunkers and ASP blower system. This phase is estimated to operate on a 20-day retention time.

The secondary composting area consists of 14 individual 20-foot by 200-foot by 8-foot curing piles spaced 3 feet apart. This area also includes assumptions for drive paths around the perimeter of the group of curing piles. Because most microbial activity has occurred in the primary bunker system, little to no active turning of piles is anticipated. This phase is estimated to operate on at least a 35-day retention time.

6.3.3 Finished Product Screening and Storage Area

Once the organic material has made its way through the composting process (or grinding in the case of mulch), it will require screening to achieve finished product quality goals. Additionally, the demand for compost and mulch fluctuates seasonally and necessitates a facility's ability to stockpile finished product. This Study accounts for the storage of 4 months' worth of finished compost and mulch. Stockpile heights of 12 feet are conservatively assumed in this Study according to best practices for mitigating risk of anaerobic activity and fires.

6.3.4 Stormwater Management Area

Because a compost facility requires a significant impervious footprint regardless of the technology used, stormwater runoff can considerably impact spatial requirements. Handling nitrogen-rich and contamination-adjacent materials like food waste has high potential to impact water quality. This spatial analysis directs the runoff from contact- and non-contact water areas into separate best management practices to accommodate different potential treatment needs. Retention ponds are conservatively assumed in these calculations, though the County may want to pursue alternate sustainable options like bioswales for non-contact water runoff.

The compost processing area is an assumed source of contact water. Preliminary calculations indicate a peak runoff volume of about 38,900 cubic feet for the 25-year design storm. Assuming a pond depth of 4 feet, this would require a pond footprint of about 0.25 acres.

Assumed non-contact water sources include the feedstock receiving and storage area, including the enclosed tipping building, and the finished compost screening and storage area. Preliminary calculations indicate a peak runoff volume of about 242,700 cubic feet for the 25-year design storm. Assuming a pond depth of 4 feet, this would require a pond footprint of about 1.5 acres.

6.3.5 Additional Facility Operational Needs

In addition to the considerations discussed in the sections above that directly coincide with the producing of compost and mulch, this Study has anticipated the following additional spatial needs:

- Facilities for staff including a scale house building with a single restroom, kitchen and breakroom area, single office, and parking for 10 employees
- Two access drives to encourage a safe traffic flow onsite
- Equipment storage
- Setback from the property boundary
- Contingency to account for some irregularity in property shape

To account for these operational needs without a specific site selected, an additional 20 percent of the calculated facility acreage was added to the footprint.

6.4 Summary of Findings

The Study estimates that the County could capture approximately 63,100 tons of organic material annually. This projection is based on current diversion rates and potential increases from population growth, commercial sources, and reduced landfill disposal.

A compost mix design was developed to process this feedstock while maintaining acceptable moisture content and C:N ratios. The proposed recipe would yield approximately 132,000 cubic yards of compost and 27,000 cubic yards of mulch annually. The mix assumes that half of the clean wood and pallet material would be diverted to mulch production, with the remainder incorporated into composting.

To accommodate this volume, the facility would require an estimated 26 acres. The spatial estimates are based on conceptual design assumptions and may require refinement during site-specific planning and engineering.

7.0 Site Evaluation

Independent of this Study, the County conducted a thorough analysis of potential locations for siting an organics facility. The County identified and analyzed a short list of potential properties that met its criteria. Through this process and in collaboration with the City of Longmont, one site emerged as a potential location for further evaluation, known as the Distel Property at 1587 County Rd 20 ½, Longmont, CO 80504. This Study evaluates the Distel Property and includes an evaluation of the physical, regulatory, environmental, and transportation criteria as described below.

Physical Constraints and Infrastructure

- Spatial needs
- Topography
- Capacity for separate ingress and egress
- Potential for future expansion
- Utility connections
- Geological properties
- Hydrologic properties

Regulatory

- Compliance
- Planning and Zoning
- Proximity to surrounding community

Environmental

- Environmental justice
- Proximity to residences
- Water quality
- Air quality
- Odor
- Noise
- Light pollution
- Threatened and endangered species

Transportation

- Access to major arterial roads
- Support roads level of service classification
- Feeding road network
- Truck queuing
- Distance to generators and other organic processing infrastructure

The Distel Property is located within the northeast quarter of Section 17, Township 2 North, Range 68 West, in Longmont, CO and consists of multiple city parcel ID numbers, including 131317100002, 131317000052, 131308300001, and 131308000017 as depicted within the red border in **Figure 7-1**, from the Weld County Property Portal (Weld County, 2025a). The total available area at the Distel Property is approximately 114 acres. Holcim, Inc. (formerly Aggregate Industries) currently occupies the site. The site's southern portion of

approximately 20-30 acres is being considered for the City of Longmont's use before Holcim Inc.'s lease expires (Huffer, 2025). Therefore, while the entire parcel is included in this Study's analysis, the actual potential site for a County compost facility includes only the lower half. The area has a history of sand and gravel mining, and existing mining equipment, structures, and access roads remain (Terracon Consulting, Inc., 2024). The site is zoned as agriculture but operates under Use by Special Review (USR) authorized by Weld County.

Figure 7-1: Distel Property Boundary and City Parcel IDs

7.1 Physical Constraints and Infrastructure

The following sections consider the physical constraints and infrastructure requirements that may influence both development and operation when evaluating a site's suitability for a composting facility.

7.1.1 Spatial Needs and Potential for Future Expansion

The spatial needs required for a compost facility processing 63,100 tons of feedstock annually would be about 26 acres. The Distel Properties' potential available acreage to the County would be able to contain the compost facility, though the footprint of available land is abnormally shaped, which would impact the efficiency of the facility footprint.

7.1.2 Capacity for Separate Ingress and Egress

Currently, the site has a paved ingress and egress on the south end of the property that connects to County Rd 20 ½. The Distel Property is about 2.25 miles west of Interstate-25 (off exit 235 or 240) and 1 mile south of Colorado State Highway 119. There is the availability to add additional ingress and egress for increased access on the southeast end of the property; however, there should be considerations for the neighboring single-family residences.

7.1.3 Utility Connections

Access to utilities do not appear on the Weld County Property Portal map. However, the current property occupier, Holcim, Inc., has an office building with an electric HVAC system, which confirms electricity access. One single-family residence is located south of the Distel Property, and three single-family residences are located southeast of the Distel Property and appear to also have access to utilities. However, the City of Longmont owns open space and conservation easement lands adjacent to the Distel Property to the north and west, which do not appear to have access to public utilities, including water service, sanitary sewer service, and electric service (Weld County, CO, 2025a). Fire service to the Distel Property is provided by the Mountain View Fire Protection District located at 1990 CO-119, Longmont, CO, approximately 4.4 miles from the Distel Property traveling via the road. The Fire Service Map for Weld County is in **Appendix C.**

7.1.4 Topography, Soil, and Geological Conditions

Based on the 2022 U.S. Geological Survey (USGS) Longmont 7.5-minute Quadrangle topographic map, the site gradually rises in elevation from approximately 4,870 feet at the northern end to 4,900 feet at the southern end. The Distel Property generally slopes northeast toward Boulder Creek. Boulder Creek runs parallel to the north edge of the property. For a compost facility that would be on the south end of the Distel Property, it appears as though no areas on the parcel would prove topographically difficult to build. However, due to the current nature of mining activities, there may be site work needed to prepare the Distel Property for compost operations. Surface water drainage for the Distel Property area is generally towards the northeast (USGS, 2022).

Property soil data was obtained from the USDA Web Soil Survey. The USDA identified that the Distel Property consists of Aquolls, Aquents, water, and Vona Sandy Loam. The Vona Sandy Loam complex makes up approximately 53 percent of the southeast portion of the property, ranging in 0 to 5 percent slopes and has a depth of more than 80 inches to bedrock. This is where a County compost facility would most likely sit. A small portion, 2 percent, of the property boundary contains water on the very north edge of the property. The remaining 45 percent of the property contains aquolls and aquepts on the north and parts of the south end of the property. These are gravelly substratum and flood with a depth of more than 80 inches to bedrock (Natural Resources Conservation Service, 2025). These soil types illustrate the varying land cover on the Distel Property. A map of the soil designation for the property, as well as descriptions of the included soils are provided in **Appendix D.**

Geological conditions were obtained from a May 2024 geotechnical report prepared by Terracon Consultants, Inc. The area has a history of sand and gravel mining. Exploratory boring locations illustrate sand and gravel between 4,885 and 4,871 feet mean sea level (MSL) on the southern end of the property. Borings completed in the pavement on the southern end of the property showed lean clay and silt in the first 4 to 7 feet of drilling until sand was hit (Terracon Consulting, Inc., 2024). The upper 4 to 7 feet of lean clay and silt may provide decent support for surface-level infrastructure. Clay and silt can help retain moisture, but poor drainage might be an issue during heavy rain. Groundwater was observed in all borings at depths of approximately 2 to 9 feet below existing site grades (Terracon Consulting, Inc., 2024). An additional geotechnical investigation may be necessary for the design phase of a potential compost facility.

7.1.5 Hydrologic Conditions

Floodplain information was reviewed from the Federal Emergency Management Agency (FEMA) and the City of Longmont Floodplain Inquiry Map Web Application (City of Longmont, Colorado, 2025; FEMA, 2024). The property's north boundary is approximately 650 feet south of Boulder Creek. One of Boulder Creek's

tributaries flows on the edge of the northwest property boundary. The property is partially located within the 100-year floodplain, with a portion to the north located within the AE Zone classified as a Special Flood Hazard Area (SFHA) by FEMA. SFHAs are defined as areas inundated by the flood event having a 1 percent chance of being equaled or exceeded in any given year. Additionally, there are parts of the north end of the property that sit within a 0.2 percent Annual Chance Flood Hazard Zone. The floodplain will need to be taken into consideration during the design and development of the property and be compliant with associated regulatory requirements. However, the southern end of the property, where the County compost facility would be built, would not sit in a floodplain. The full floodplain maps from FEMA and the City of Longmont are provided in **Appendix E.**

A review of the National Wetlands Inventory (NWI) online database has identified one wetland on the Distel Property. This is a freshwater pond on the north end of the property, labeled PUBGx (U.S. Fish and Wildlife Service, 2025b). The southern end of the property, where the County compost facility would be built, would not sit in a wetland. This is illustrated in the NWI Map provided in **Appendix F.**

7.2 Regulatory

This section outlines the regulatory landscape, which is essential for identifying site-specific constraints, minimizing legal risks, and ensuring a smooth development approval process.

7.2.1 Compliance

To establish a commercial compost facility, the operator must obtain a special use permit from the Weld County Community Planning & Permitting Department and register the Class III Composting Facility with the CDPHE. The permitting process necessitates comprehensive reviews of site design, engineering, operations, traffic, and environmental impact, with impact mitigation required before permit issuance.

Air pollution emissions notices (APENs) issued through the CDPHE Air Pollution Control Division (APCD) will be needed for the compost piles, haul roads, grinders and screens associated with the compost facility. An APCD construction permit will be required if the calculated emissions exceed certain thresholds for haul roads, grinders, and screens. Compost piles alone are exempt from APCD construction permitting. Criteria pollutants and non-criteria pollutants are regulated under an APEN. Criteria pollutants include carbon monoxide (CO), nitrogen oxide (Nox), sulfur dioxide (SO_2), particulate matter (PM)10, PM2.5, total suspended particulates, ozone, volatile organic compounds (VOCs), lead, fluorides, sulfuric acid mist, hydrogen sulfide, total reduced sulfur, reduced sulfur compounds, and municipal waste combustor emissions. Non-criteria pollutants are called hazardous air pollutants (HAPs) and are found in Regulation No. 3, Appendix B in the Code of Colorado Regulations (CDPHE, 2025b). Some HAPs that could be reasonably encountered in a composting operation, organized by Chemical Abstracts Service (CAS) number, are included in **Appendix G**. A Title V Air Quality permit is required if the facility directly emits, or has the potential to emit, 10 tons per year or more of any single HAP or 25 tons per year or more of any combination of hazardous air pollutants (CDPHE, 2025a). It is not expected that a compost facility at this site would require a Title V permit based on the proposed activities. For comparison, the A1 facility in Keenesburg with similar operations to the proposed County Compost Facility does not require one. While the compost facility at WM DADs has a Title V permit, it is co-located and inclusive of landfill operations.

7.2.2 Planning and Zoning

The current zoning of the parcels on the Distel Property is "Agriculture," but Holcim Inc. operates under USR authorized by Weld County (County Code Chapter 23, Article IV) (Weld County, CO, 2025b; Weld County, CO, 2025c). Further north of the site, it is zoned as "Planned Unit Development." North and west of the property, it is zoned as "the City of Longmont," which continues until the border of Boulder County.

The Distel Property is in unincorporated Weld County, outside the County's jurisdiction. The property's current zoning would require a special review permit from Weld County for a municipal or industrial composting facility. In Weld County, rezoning from agricultural to industrial land uses is a complex process that requires careful consideration and adherence to local zoning regulations. The Board of County Commissioners can amend the zoning map, but the Planning Commission must review the request, according to Weld County Code (Weld County Department of Planning Services, 2024). A map of the property zoning from the City's Parcel Viewer is presented in **Appendix H**.

7.2.3 Proximity to Surrounding Community

Approximately 574 people live within a 1-mile radius of the Distel Property, which represents approximately 0.5 percent of Longmont's population (Demographics by Radius, 2025; The City of Longmont, 2024). The nearest schools are St. Vrain Valley Schools Innovation Center and Legacy Elementary School, which are approximately 3.15 miles west and 3.5 miles southeast of the site boundary, respectively. A soccer and baseball complex are about 1 mile northwest of the site boundary. The nearest church, White Fields Community Church, is approximately 1.2 miles northwest of the site boundary. The nearest hospital, UCHealth Longs Peak Hospital, is approximately 1.2 miles northwest of the site boundary.

The Distel Site's proximity to the surrounding community supports the notion that the property is reasonably suited for a compost facility, especially with smart siting on the parcel and basic odor and traffic management practices.

7.3 Environmental

This section evaluates the environmental impacts of a County compost facility. Considering how a compost facility interacts with both the natural world and the surrounding population is key to sustainable development.

7.3.1 Environmental Justice Screen

Demographic and socioeconomic indicators for the Distel Property and the surrounding area were evaluated utilizing the CHDPE's Environmental Justice (EJ) Report (CDPHE, 2025c). The location of the Distel Property is classified as a disproportionately impacted community and includes multiple pollution and climate indicators at or above the 80th percentile. Within a 1-mile radius of the Distel Property, 72 percent of households are considered low-income. The population is approximately 76 percent people of color. The property is close in proximity to both Interstate-25 and Colorado State Highway 119, impacting air quality and pollution exposure. The community experiences toxic releases to air at levels at the 94th percentile compared to other areas in Colorado. Similarly, proximity to mining locations and oil and gas sites is above the 97th percentile.

Table 7-1 provides an overview of prominent indicators for the area.

Table 7-1: Distel Property Environmental Justice Indicators

Metric	Percentile Score
Environmental Exposures	76.27
Environmental Effects	76.90
Climate Vulnerability	75.14
Sensitive Populations	43.23
Demographics Percentile Score	75.99

For the following indicators, the higher scores indicate a higher burden.

- The environmental exposure score represents a community's exposure to certain environmental risks relative to the rest of the state. It is the average of data on diesel particulate matter, traffic proximity, ozone, PM 2.5, air toxics, other air pollutants, lead exposure risk, drinking water violations, and noise.
- The environmental effects score represents the number of hazardous or toxic sites in a community relative to the rest of the state. It is the average of data on proximity to mining, oil and gas operations, impaired surface waters, wastewater discharge facilities, Superfund sites, facilities that use hazardous chemicals, and facilities that generate, treat, store, or dispose of hazardous wastes.
- The climate burden score represents a community's risk of drought, flood, extreme heat, and wildfire compared to the rest of the state.
- The sensitive populations score captures how at risk a community is to environmental exposures and climate impacts as it relates to health. The score is calculated using data on asthma hospitalization rate, cancer prevalence, diabetes prevalence, heart disease prevalence, life expectancy, low birth weight rate, mental health, population over 65, and population under 5.
- The demographics score represents a community's social and economic vulnerabilities. It is calculated using data on people living with disabilities, housing cost burden, educational attainment, limited English proficiency, income, and race and ethnicity.

While the surrounding area of the Distel Property has environmental justice concerns, development of the Distel Property also has the potential to bring opportunities to a disadvantaged community. The project could increase the availability of local jobs at the compost facility and reduce pollution from the current gravel mine. However, existing mining operations would not cease and could potentially expand north. These aspects aimed at community improvement could inherently provide an increase in quality of life over time.

7.3.2 Water Quality

A Phase I Environmental Site Assessment (ESA) completed by Terracon in 2019 identified multiple listings related to water quality on the site. The Colorado Oil and Gas Conservation Commission (COGCC) documented historical oil and gas activities at two locations (central and northeastern) on the site. The central area contained seven plugged and abandoned (PA) wells, two temporarily abandoned (TA) wells, and a former tank battery (since reclaimed). A produced water spill near the former tank battery resulted in the delineation, excavation, and off-site disposal of impacted soil. The COGCC closed the case in October 2019. Terracon's review of COGCC records classifies the former tank battery and spill as a historically recognized environmental condition (HREC).

From the 2019 Terracon Phase I ESA, multiple aboveground storage tanks (ASTs) of diesel, gasoline, and used oil were observed in secondary containment. No spill containment at the vehicle fueling area was

observed, thus making the paved area for industrial vehicle maintenance and fueling a recognized environmental condition (REC) to the site. Additionally, three ASTs did not contain spill containment measures that appeared to be sufficient for the size of the tank and constituted a REC to the site. The status of the RECs is unknown. The potential releases from the identified RECs have not been investigated to the extent to evaluate whether they have impacted the environmental media on the site (Terracon Consulting, Inc., 2019).

In general, the site and its 1-mile radius have various EJ concerns regarding water quality. The EJ report indicates that the area is within the 63.12th percentile for impaired streams and rivers compared to the rest of Colorado. Additionally, the site sits within the 83.49th percentile of drinking water regulations that measure the duration of resolved and unresolved health-based violations from active community public water systems. The site is also within the 72.57th percentile for the wastewater discharge indicator, measuring toxic chemical concentrations in stream segments (CDPHE, 2025c).

A compost facility at the Distel Property could impact the water quality of the surrounding area, but these impacts could be mitigated with proper stormwater controls, site grading, and runoff management.

7.3.3 Air Quality and Odor

A Phase I ESA completed by Terracon in 2019 identified multiple listings related to onsite air permitting activities with several violations but concluded that they do not constitute a REC to the site (Terracon Consulting, Inc., 2019).

According to the CDPHE EJ Report, the Distel Property and its 1-mile radius struggle with air quality issues. They sit within the 93.52nd and 97.11th percentiles for air toxics emissions and other air pollutants, respectively (CDPHE, 2025c).

Currently, the mining operations on the Distel Site require a Title V Air Quality permit, but a compost facility likely would only need APENs. By transitioning the Distel property from a mining operation to composting, it would reduce the overall emissions from the property, which indicates that composting poses less environmental risk for the property than mining. However, with the proposed land swap agreement within the City of Longmont, Holcim Inc. is negotiating to continue its mining operations on the northern end of the site (Huffer, 2025). Therefore, under this scenario, adding a compost facility may add to the existing air emissions and may decrease the overall air quality for the area.

Overall, a compost facility at the Distel site could impact the air quality of the surrounding area from increased truck emissions, HAPs from **Appendix G**, emissions from machinery, and general odor from processing compost (Nordahl at. el., 2023). Given that the existing mining operations on the Distel Site are subject to more stringent air quality regulations, it indicates that a compost facility would result in less property air pollutant emissions. However, if Holcim Inc. continues mining in the northern part of the Distel Site, then a compost facility would contribute more air emissions to the surrounding area. With proper operational practices and technology, overall air quality impacts could be mitigated.

7.3.4 Noise

The Distel Property and its 1-mile radius do not have current noise issues, according to the CDPHE EJ Report. It sits within the 27.97th percentile for noise compared to the rest of Colorado (CDPHE, 2025c). Replacing the current gravel mining site with a compost facility could either help or hurt noise levels for nearby residents,

depending on the specific operations of the compost facility and the existing noise levels from the gravel mine.

7.3.5 Light Pollution

The Distel Property is about 27 miles from downtown Denver; thus, light pollution for the general metro area is high. According to World Atlas Data, the calculated artificial brightness of the site is 0.916 millicandelas per square centimeter (mcd/cm^2), compared to 1.64 mcd/cm^2 in Longmont and 5.90 mcd/cm^2 in downtown Denver (World Atlas Data, 2015). Light pollution from this compost facility would likely be minimal compared to other sources, such as streetlights or industrial facilities. The primary light sources at a compost facility would be security lighting and any lighting needed for nighttime operations (if any).

7.3.6 Threatened and Endangered Species

A desktop review of the threatened and endangered species was conducted for the Distel Property. This data pertains to the area within the property boundary, which was made available by the United States Fish and Wildlife Service (USFWS) (U.S. Fish & Wildlife Service, 2025a). The Information for Planning and Consultation (IPaC) report cross-referenced the Distel site boundary with USFWS maps of species ranges and designated critical habitat (IPAC, 2025). A range includes all places the species naturally occupies, whether seasonally or year-round. A range is not necessarily protected; it is just a description of where the species exists. A critical habitat refers to areas essential to the conservation of a listed species and may include parts of the species' current range or areas not currently occupied but vital for recovery. No species' critical habitat overlaps with the project boundary. A summary of the threatened and endangered species whose ranges exist within the project area is provided below in **Table 7-2**.

Table 7-2: Threatened and Endangered Species' Ranges Within the Distel Property

Group	Common Name	Species Name	Habitat	Status	Critical Habitat
Mammal	Preble's Meadow Jumping Mouse	Zapus hudsonius preblei	Well-developed riparian habitat with adjacent, relatively undisturbed grassland communities, and a nearby water source	Threatened	The project area does not overlap the critical habitat.
Bird	Eastern Black Rail	Laterallus jamaicensis ssp. jamaicensis	Salty, brackish, or freshwater marsh habitats	Threatened	None defined
Bird	Piping Plover	Charadrius melodus	Sandy or gravel beaches, shorelines of alkaline lakes and reservoirs, river sandbars, and islands	Threatened	The project area does not overlap the critical habitat.
Bird	Whooping Crane	Grus americana	Coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields	Endangered	The project area does not overlap the critical habitat.
Fishes	Pallid Sturgeon	Scaphirhynchus albus	Missouri and Mississippi rivers and some tributaries	Endangered	None defined
Insects	Monarch Butterfly	Danaus plexippus	Prairies, meadows, grasslands, roadsides, canyons, riparian areas, and forests. Breeding habitats require milkweed plants	Proposed Threatened	The project area does not overlap the critical habitat.
Insects	Suckley's Cuckoo Bumble Bee	Bombus suckleyi	Open meadows and prairies, farms and croplands, urban areas, boreal forests, and montane meadows	Proposed Endangered	None defined
Flowering Plants	Ute Ladies'-tresses	Spiranthes diluvialis	Moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations between 4,300-6,850 feet	Threatened	None defined
Flowering Plants	Western Prairie Fringed Orchid	Platanthera praeclara	Unplowed, calcareous prairies, and sedge meadows	Threatened	None defined

Even though the Distel Property does not overlap with any threatened or endangered species' critical habitat, there is still an opportunity for them to exist within the property boundary. Many species listed hold habitat in areas with similar characteristics to the Distel Property. Since the Distel Property includes a northern marsh area, there is potential for listed species to be present on-site. These species should be considered throughout the development process. Further evaluation may need to be conducted to ensure these populations are left undisturbed if found present on the site.

A sensitive species study should be performed to evaluate the potential impacts that development could have on sensitive species. Construction methods like erosion control should be chosen to minimize and avoid impacts on listed species. If sensitive species are discovered, the requirements of the Environmental Species Act would be followed.

7.4 Transportation

Transportation is a key consideration when siting a compost facility, as easy access to major roads supports efficient delivery of feedstock and shipment of finished compost. This section outlines transportation considerations, which, with careful planning, can help minimize local traffic disruptions, reduce emissions, and ensure safe year-round operations.

7.4.1 Access to Major Arterial Roads and Support Roads

The Distel Property is about 2.25 miles west of Interstate-25 (off exit 235 or 240) and 1 mile south of Colorado State Highway 119. According to the Weld County Property Portal, the site can be directly accessed from County Rd 20 ½ to the south, which is classified as a collector road (Weld County, 2025d).

7.4.2 Truck Queuing

While this Study did not include a formal traffic analysis, preliminary observations suggest that queuing is unlikely to pose significant challenges under day-to-day operations. The site offers approximately 0.25 miles of internal queuing capacity before reaching County Road 20½, which should sufficiently accommodate truck traffic associated with the proposed composting activities. During unusual circumstances, such as community events or peak delivery periods, temporary queuing beyond typical limits may occur and warrant additional traffic coordination. Notably, there is a residential home at 1443 County Rd 20 ½, about 300 feet south of the southern end of the Distel Property border. Truck traffic and queuing may potentially impact this home during community events.

7.4.3 Distance to Generators and Other Organic Processing Infrastructure

The Distel Property is about 38 miles west of A1 in Keenesburg, the existing organics processors for the County. The Distel Property is about 20 miles from Boulder (City), 6.2 miles from Longmont, and 8.2 miles from Erie. Currently, organics collected in the County processed at A1 in Keenesburg are 45-60 miles from major County municipalities. Thus, a compost facility at the Distel Property would reduce hauling distance by over 50 percent. Additionally, Western Disposal has a transfer station that serves Boulder County and is about 18 miles southwest of the Distel Property.

7.5 Summary of Findings

The Distel Property in Longmont, Colorado, was evaluated for its suitability as a compost facility site based on physical, regulatory, environmental, and transportation criteria. The southern portion (20–30 acres) of the 114-acre site is being considered for development of a potential compost facility.

Physical Suitability:

- The site meets the spatial requirements for a 63,100 ton/year compost facility, though its irregular shape may affect layout efficiency.
- Existing mining operations on the site would require land restoration and geotechnical assessments for the design phase of construction.
- The topography is favorable, with gradual slopes and no major elevation challenges.
- The southern portion is outside the 100-year floodplain and designated wetlands.

Regulatory Considerations:

- The site is currently zoned agricultural and requires a USR permit from Weld County and registration with CDPHE for a Class III Compost facility.
- The site is near sensitive receptors but not in immediate proximity to schools or hospitals.
- A compost facility would require APENs, whereas the current mining operations are subject to the more stringent Title V permit, suggesting that composting presents a lower environmental risk for the property.

Environmental Factors:

- The area is classified as a disproportionately impacted community with existing high environmental exposure and pollution indicators.
- Historical oil and gas activity and aboveground storage tanks present RECs according to a previous Phase 1 ESA which indicated a presence or likely presence of hazardous substances or petroleum products on the property. A Phase 2 ESA should be conducted.
- No critical habitats overlap the site, though species of concern may be present. Further ecological assessments are recommended.

Transportation Access:

- The site is well-positioned near major roads (Interstate-25 and Colorado State Highway 119) and has internal queuing capacity.
- A nearby residence may be affected by intermittent traffic and queuing during community events.
- Proximity to existing organics generators and transfer stations is favorable for the County.

The Distel Property presents a viable option for a compost facility, with no immediate red flags identified. However, environmental justice concerns, previous RECs, geotechnical conditions, and regulatory hurdles require careful consideration. An additional geotechnical investigation may be necessary for the design phase of a potential compost facility.

8.0 Market Analysis

This section considers the quantity of finished compost that would be generated by a County facility and its potential end markets for the finished product. Strategies and policies to enable end market growth are also considered below.

Building a new compost facility for the County requires an understanding of the end market feasibility for its end products. The County commissioned a compost market study in 2012 that contained valuable information used in this more recent analysis. However, the data is over 13 years old; thus, this report supplements the results with new and refreshed information. Major takeaways of this market analysis conclude that the County may sell its end market product, primarily targeting wholesalers and landscapers, but would be competing against another major Colorado compost processor. The County and its municipalities should also consider becoming larger consumers of compost products. There is an opportunity to expand end markets within the County based on government policies, increased marketing, and providing a high-quality end product.

8.1 Projected Product Output

The County's proposed compost facility is estimated to process 63,100 tons of organics annually. After processing, the county's compost facility would need to find end markets for an estimated 132,000 cubic yards of finished compost and 27,000 cubic yards of mulch. About two-thirds of this is already being accounted for by the existing processors, as a County facility would presumably shift material away from other facilities.

8.2 2012 Compost Market Study Review

The County commissioned a Compost Market Study in 2012 to understand the County's compost markets, potential buyers, and compost materials sold. The findings of the 2012 Compost Market Study provide valuable insights into the potential end markets for compost processors, sellers, and consumers. The study found that 58,000 to 82,200 cubic yards of finished compost were used in the County in 2011. These numbers have likely increased over the past decade since the study was completed. It also found that landscaping and agriculture made up 70-80 percent of the total compost consumed for use. The results from the 2012 Compost Market Study give an informative but outdated snapshot of the compost markets in the County and considerations for changes over the last decade should be considered.

8.2.1 Processors

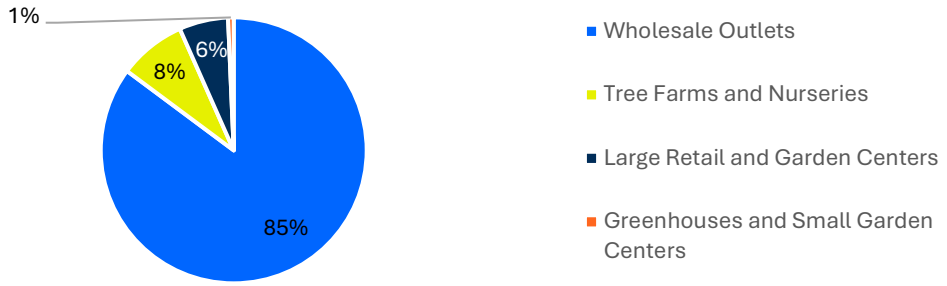
According to the 2012 Compost Market Study, about 220,0000 to 280,000 cubic yards of finished compost were processed in or around the County (Skumatz Economic Research Associates, Inc., 2012). Major compost processors in and around the County are A1, Western Disposal, and WM.

8.2.2 Sellers

According to the 2012 Compost Market Study, wholesale outlets (often direct from the processor), hold the majority share of the market (85 percent) in the County, but partnering with tree farms/nurseries and large retail centers could improve the breadth of the County's end market (Skumatz Economic Research Associates, Inc., 2012). **Figure 8-1** depicts the proportion of different County compost sellers within the County. Compost sold within the County does not necessarily mean it was made in the County. Processors

of organic materials often sell their products wholesale, creating a notable overlap between organic processors like A1 and sellers. Opportunities for the County's end products to get incorporated into the economy would be to market a variety of compost products, including Seal of Testing Assurance (STA)-certified compost, compost-topsoil blends, potting mixes, and certified organic options.

Figure 8-1: Compost Sellers in Boulder County*



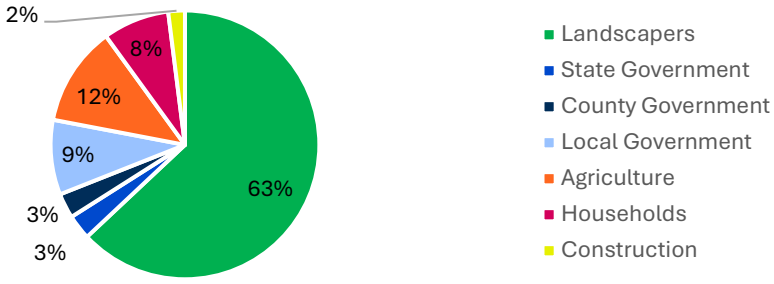
*(Skumatz Economic Research Associates, Inc., 2012)

8.2.3 Consumers

The biggest consumers of compost in the County are landscapers, government entities, and agriculture. The 2012 Compost Market Study found that landscapers make up about 63 percent of the consumer end market for finished compost in the County. Governments (state, county, and local) make up about 15 percent of the consumer end market for finished compost in the County. These are incorporated in commercial, residential, and transportation products. Agriculture (vegetable growers) make up about 12 percent of the consumer end market for finished compost in the County.

Finished compost products used within the County, regardless of whether they were processed within the County, are presented in **Figure 8-2**. Most compost used on farms is currently sourced from out-of-county processors, often from distant locations, due to cost and quality considerations rather than local producers. Wood, mulch, and compost made/used onsite at nonpermitted facilities or backyard composting do not count towards the estimated use totals.

Figure 8-2: Compost Consumers in Boulder County*



*(Skumatz Economic Research Associates, Inc., 2012)

8.2.4 Growth Opportunities

The biggest opportunities for compost end market growth would be in landscaping and agriculture (Skumatz Economic Research Associates, Inc., 2012). **Table 8-1** outlines strategic opportunities to expand compost use across various sectors in the County.

Table 8-1: Sectors and Potential Growth in End Markets

Sector	Opportunity for Growth
Landscapers	• Promote or mandate compost use in new construction projects across the county.
Agricultural	• Target outreach to growers to improve access to high-quality compost at a reasonable cost. • Consider sponsoring some agricultural demonstrations and/or low-cost grant programs to stimulate markets.
State Government	• Provide training for engineers on compost properties and benefits. • Develop state specifications for compost use in erosion control, stormwater management and fire restoration products. • Encourage or mandate building codes requiring compost-based soil amendments after land disturbances or improvements. • Adopt state compost specifications for soil amendments in county transportation departments. • Conduct outreach workshops with Colorado DOT to specify and use compost.
County Government	• Implement and enforce building codes requiring compost-based soil amendments. • Educate staff on compost application areas, usage methods, and benefits. • Establish and maintain a consistent compost procurement policy. • Define acceptable standards for finished compost. • Collaborate with relevant sectors to promote compost utilization. • Consider outreach to demonstrate how and why to spread compost on municipal park, golf courses, etc. • Partner with CU Boulder facility and grounds to use finished compost.
Local Government	• Implement and enforce building codes requiring compost-based soil amendments. • Educate municipal staff and residents on compost benefits and application techniques. • Partner with CU Boulder facility and grounds to use finished compost.
Households	• Increase public awareness of compost benefits and household usage methods.
Construction (road and reclamation)	• Raise awareness of existing compost procurement standards. • Develop compost standards for soil amendments in applicable projects. • Educate stakeholders on compost's benefits for water retention and runoff reduction. • Encourage the use of erosion blankets and erosion logs made with compost. • Encourage or mandate use of compost on new or retrofit projects greater than X square feet.
Sod Farms	• Develop individual outreach, education, and partnership strategies.
Golf Courses	• Provide on-site presentations by product representatives.
Universities	• Depends on future expansion.
School Districts and Private Schools	• Educate staff on compost applications, sourcing, and benefits. • Partner with county and local governments to streamline procurement.

Key recommendations from the 2012 Compost Market Study include enhancing education and training for government staff and engineers, developing and enforcing building codes that mandate compost-based soil amendments, and establishing clear standards for finished compost. Targeted outreach to landscapers, vegetable farmers, and municipal staff aims to increase awareness and accessibility of compost products. Additionally, consistent procurement policies and collaboration among sectors are emphasized to support broader adoption of compost in construction, agriculture, and residential applications.

8.2.5 Study Key Findings

According to the 2012 Compost Market Study, several factors hinder the widespread adoption of compost. Economic downturns in construction and landscaping directly impact demand. Colorado's short growing

season restricts sales opportunities. Furthermore, limited consumer awareness of compost benefits, inconsistent procurement policies that do not always prioritize certified compost, and competition from cheaper alternatives like unfinished manure and fertilizers all contribute to the challenges faced by the compost industry.

The 2012 Compost Market Study also offered several recommendations to boost compost usage: establishing a national or state compost certification program would ensure consistent product quality; increased consumer education about compost's benefits; enforcing building codes that mandate soil amendment with compost in landscaping projects; promoting local procurement policies that favor compost; and finally, collaborating with government agencies to require compost use in public projects.

8.3 Current Compost Market Analysis

A review of the current product pricing from regional compost facilities was conducted to inform the current market. Outreach was conducted to landscaping and agricultural operations in the County, and interviews were conducted with processors per **Section 5.2**. Additionally, County departments were engaged to evaluate the potential for internal operational end use of compost.

8.3.1 Processor Products and Pricing

Current end-product compost prices range from $25.00 to $63.50 per cubic yard, depending on the compost product, as presented in **Table 8-2**. Depending on the County's finished product, there is a precedent that end product can be sold at a premium. Currently, A1 is the largest organics processor in Colorado and sells approximately 410,000 cubic yards of finished compost a year to users across the state, including in Boulder County (Recycle Colorado, 2022). A1, the County's biggest competitor, has a 50+ year history of processing organics that has created a reputation for quality. Thus, an emphasis on quality and comparable prices for a closer facility on the Front Range would be a marketing strategy needed to insert the County's new facility into the market.

Table 8-2: Processor Products and Pricing

Processor	Annual Estimated Amount of Finished Compost	Products	Product Price	Gate Fees
A1 Organics	410,000 cubic yards (Recycle Colorado, 2022)	Compost: Premium 3 BioComp, Comand, EcoPlus Amended Soils and Medias: Screened Topsoil, Amended 30, Amended 50, PRO4 Soil-Less Growing Media	Compost: $44 – $63.50 per cubic yard Amended Soils and Medias: $36.75 – $79.50 per cubic yard	$16.00 per cubic yard, plus a $5 environmental fee per load. 2 cubic yard minimum tip rate per visit (A1 Organics, 2025).
Western Disposal	None	CMI Silver compost from Colorado Materials* Home-Grown Mulch	Compost: $38 per cubic yard Mulch: $7.25 per cubic yard	Yard/Wood Waste (Residential): $2.97/100 lbs Yard/Wood Waste (Commercial): $99.20/ton (Western Disposal, 2025b)
WM (at DADS)	~50,000 cubic yards (WM, 2025)	Finished compost from DADs site*	Compost: $25 per cubic yard	$100 per ton. 2-ton minimum tip rate per visit (WM, 2025).

		Beneficial reuse in landfill operations		

*Compost is not made from material within Boulder County.

The County also has a network of drop-off centers and sort yards that process and distribute materials to the public. These products include wood, mulch, "compost-like material," and a specialty product called compost tea (Boulder County, 2024b). These are materials that will not be considered in further end market analysis.

8.3.2 Landscaping and Agricultural Interviews and Processer Interviews

As part of this Study, 12 landscaping and agricultural businesses were contacted, but only four responded. While the goal was to validate initial findings from the 2012 compost market study through stakeholder engagement, the limited response rate resulted in inconclusive outcomes. Feedback from businesses who did respond indicated that the key factors influencing compost product selection were quality, price, and proximity to project sites.

Processor interviews from **Section 5.2** of this Study stated that wholesalers (who often sell to landscapers) and the government are the biggest users of finished compost in the state. Processors emphasized the need for high compost quality (without contamination) and a low price low enough for consumers to choose finished compost over other products.

8.3.3 Government Engagement

As part of this Study, the following County departments were engaged to understand their utilization of end products: Parks & Open Space; Public Health; Public Works (Roads); Public Works (Building Services); Housing & Human Services; Community Planning & Permitting; Office of Sustainability, Climate Action & Resilience.

A major takeaway was that Parks & Open Space was the major buyer of compost within the County, spending $450,000 in 2024. This number is so high because the Parks & Open Space's Soil Health Grants program has subsidized compost purchases for agricultural tenants since 2023, benefiting roughly 1,000 acres annually (out of 25,000 total agricultural acres) at a cost of $450 per acre. This grant program is slated to end in 2026, at which point farmers will be responsible for compost acquisition costs. The Public Works Department Building Services Division also bought compost, but in a much smaller quantity of 5-10 cubic yards/year. All the other departments either did not respond to the email or do not regularly purchase/use any compost.

Based on received responses, the County's biggest barrier to using organic finished products in projects is cost. The Public Works Department Road Division could envision using compost to mix with their topsoil, but that would be an added cost to rent screening equipment to mix the materials.

The Public Works Department Road Division usually has a large stockpile of wood chips/mulch (200-300 cubic yards) that accumulates from tree damage. Bringing that to a County facility would greatly benefit them since this division often has difficulty finding low-to-no-cost ways of getting rid of it.

This Study determined that no County department can commit to buying finished products from a County facility. However, the Public Works Department Road Division could potentially provide feedstock for the facility.

8.4 Summary of Findings

The feasibility analysis for a County compost facility reveals a promising but competitive market landscape. While the County would face competition from established processors like A1, there is a viable opportunity to enter the market by emphasizing keeping costs competitive, creating high-quality, value-added products and leveraging local demand. To support market growth, the County should consider promoting certified and organic compost products that the County facility could produce itself, educating consumers and municipal staff on compost benefits; advocating for policy changes that mandate compost use in construction and landscaping, and supporting local procurement and exploring grant programs to offset costs. Overall, while challenges exist, the County is well-positioned to establish a successful compost facility by aligning product quality, pricing, and outreach with the needs of local end users. Any new facility of this scale must commit to market development as early as possible. Experience shows users like to try-before-they-buy, so the County may want to consider developing specifications, doing agricultural outreach projects and ongoing outreach to landscapers both private and public. There are many ways of doing this and many resources available from the US Composting Council and other sources.

9.0 Financial Analysis

The following section presents the rough order of magnitude (ROM) construction, capital, and operating costs, annualized costs, costs per ton, and pricing considerations for the centralized ASP composting facility. Land acquisition costs are excluded. There are several factors, particularly policy decisions regarding the level of public-private partnership, that can influence the cost of managing material at the potential compost facility. Given the variability at which these decisions can influence costs, three financial pro formas were completed for the following scenarios.

- **Scenario 1:** County Owns Facility; County Pays for Capital and Operating Expenditure
- **Scenario 2:** County Owns Facility; County Pays for Construction Capital Expenditure; Private Entity Pays for Equipment Capital and Operating Expenditure
- **Scenario 3:** County Owns Facility; Private Entity Pays for Capital and Operating Expenditure

The financial pro formas and pricing analysis for the three scenarios are provided in **Appendix I.**

9.1 Rough Order of Magnitude Capital and Operating Costs

A planning-level estimate of ROM capital and operating costs was developed for the compost facility. Estimates, analyses, and recommendations presented in this evaluation relating to capital costs and schedules, operation and maintenance costs, inflation, equipment characteristics and performance, and operating results are based on Burns & McDonnell's experience, qualifications, and judgment as a design and consulting professional. While the information presented herein is assumed to be reasonably accurate, Burns & McDonnell has no control over cost and availability of labor, material and equipment, labor productivity, unavoidable delays, economic conditions, tariffs, and other factors affecting such cost opinions or projections, Burns & McDonnell does not guarantee that actual rates, costs, performance, schedules, and related items will not vary from cost estimates and projections. Further evaluation of certain information, assumptions, and scenarios may be warranted at the discretion of the County.

The cost estimates presented in this section are an Association for the Advancement of Cost Engineering (AACE) Class 5 estimate for concept screening at an 80 percent confidence interval. This level of estimating is defined as having a limited basis of information, a wide range of accuracy (-30 percent / +50 percent), and with appropriate end uses including planning, business development, feasibility study, preliminary budgeting, etc.

9.1.1 Rough Order of Magnitude Capital Costs

The ROM construction cost in 2025 United States dollars (2025 USD) for the aerated static pile composting facility is estimated at approximately $21.0 million, including a 30 percent contingency and $2 million for engineering and permitting. Further breakdown of the ROM construction cost is presented in **Table 9-1**.

Table 9-1: Rough Order of Magnitude Construction Cost Estimate

Item Number	Description	Quantity	Unit	Unit Cost (2025 USD)	Total Cost (2025 USD)
1	Site Work / Infrastructure	1	Lump sum (LS)	$4,470,000	$4,470,000
2	Storm Drainage / Waterline	1	LS	$794,000	$794,000
3	Compost Storage Bins (Structure Only)	1283	CY	$1,037	$1,330,600
4	Compost Air Delivery System	1	LS	$2,434,000	$2,434,000
5	Scale House (Including Scale System)[1]	1000	SF	$854	$854,000
6	Tipping Building	12000	SF	$275	$3,294,000
7	Electrical System	1	LS	$1,513,000	$1,513,000
				Total Direct Construction Cost	**$14,689,600**
8	Contingency (30%)	1	LS	$4,333,432	$4,333,400
9	Engineering & Permitting	1	LS	$2,000,000	$2,000,000
				Total ROM Construction Cost	**$21,023,000**

1. Estimated lump sum cost of scale system is $150,000 in 2025 USD.

In general, this ROM estimate assumes concrete pavement under the primary ASP composting system to structurally support the embedded trenches, asphalt pavement under the secondary composting piles for reduced maintenance and ease of contact water collection, and compacted earth under all remaining drive paths and feedstock and finished material stockpiles for cost savings.

Because this facility was estimated without a specific site identified, land acquisition costs are excluded from the totals. Should the County proceed with siting a centralized ASP composting facility, this ROM construction cost estimate may warrant revisiting to address this and other site-specific considerations.

The total equipment capital is estimated at $3.9 million in 2025 USD. A tabulation of anticipated equipment needs and their associated capital costs is presented in **Table 9-2**.

Table 9-2: Rough Order of Magnitude Equipment Capital Cost Estimate

Item Number	Description	Lifespan[1] (Years)	Quantity	Unit	Unit Cost (2025 USD)	Total Cost (2025 US)
1	Front Loader	4.9	2	Each (EA)	$300,000	$600,000
2	Depackager	15.5	1	EA	$800,000	$800,000
3	Excavator	18.9	1	EA	$361,800	$361,800
4	Grinder	15.2	1	EA	$1,400,000	$1,400,000
5	Monitoring	2.4	1	LS	$4,000	$4,000
6	Screen	4.8	1	EA	$770,000	$770,000
					Total ROM Equipment Cost	**$3,935,800**

1. Equipment lifespans are estimated based on vendor projections, as available, and estimated annual operating hours

When combining the ROM construction and equipment cost estimates, the County could expect a total capital cost of approximately $25.0 million in 2025 USD. Initial capital investments could be reduced through a phased construction to incrementally scale facility throughput or by selecting more economical construction materials than described above. However, the County should consider the potentially offsetting impact these changes may have on construction efficiency, revenue, and/or operating costs.

9.1.2 Rough Order of Magnitude Operating Costs

Labor is often the greatest operating expense of a composting facility. In addition to heavy equipment operators (HEOs), laborers will be needed to manage feedstock receipt and monitor composting data. Supervisors are necessary to maintain efficient operations of a facility of this magnitude while meeting compliance requirements. This analysis assumes the facility would have a dedicated business manager/administrative assistant position to support administrative activities and marketing finished product. **Table 9-3** demonstrates this concept with a ROM estimate of the personnel necessary to operate the facility.

Table 9-3: Rough Order of Magnitude Labor Cost Estimate

Personnel	Base Salary	Benefits	Total Compensation	Quantity	Total Cost (2025 USD)
Supervisor	$95,600	$44,000	$139,600	2	$279,200
Heavy Equipment Operator	$77,900	$35,900	$113,800	3	$341,400
Laborer	$67,300	$31,000	$98,300	4	$393,200
Business Manager/Administrative Assistant	$74,200	$34,200	$108,400	1	$108,400
			Total	**10**	**$1,122,200**

Another significant operating expense of a composting facility is fuel. Based on the assumed operating hour requirements of each piece of equipment and fuel consumption per hour, the total fuel cost was estimated assuming a unit cost of $3.57 per gallon based on the June 2025 Rocky Mountain No 2 Diesel Retail Price from the U.S. Energy Information Administration. **Table 9-4** demonstrates this concept with a ROM estimate of the fuel necessary to operate the facility. Electric grinders are also an alternative to fuel; however, that alternative comes at an increased cost. While fuel costs could be reduced with electrified equipment, there is a tradeoff for increased utility costs and significantly elevated capital costs.

Table 9-4: Rough Order of Magnitude Fuel Cost Estimate

Item Number	Description	Quantity	Fuel Consumption (Gallons/Hour)	Annual Operating Hours[1]	Annual Fuel Consumption (Gallons/Year)	Total Cost[2] (2025 USD)
1	Scale	1	0.00	2,080	0	$0
2	Front Loader	2	4.50	4,110	18,495	$66,100
3	Depackager	1	0.00	1,610	0	$0
4	Excavator	1	3.45	530	1,829	$6,600
5	Grinder	1	11.00	660	7,260	$26,000
6	Monitoring	1	0.00	520	0	$0
7	Screen	1	6.00	735	4,410	$15,800
			Total	**10,245**	**31,994**	**$114,500**

1. Annual operating hours are estimated from a material handling exercise based on a facility schedule of 8 hours per day, 5 days per week, and 52 weeks per year.
2. Fuel costs are based on the Rocky Mountain No 2 Diesel Retail Prices for June 2025 at a price point of $3.57 per gallon. Total

Operating costs are presented in **Table 9-5** and are based on the average annual operating hours by equipment type. Direct composting operation costs are assumed to include labor, fuel, and maintenance. Maintenance costs are estimated to be 15 percent of the estimated capital cost of the equipment. Administrative costs are estimated to be five percent of the combined labor, fuel, and maintenance costs and are considered ancillary to direct composting operations. Scenarios two and three account for an operator margin to cover profit, taxes, and depreciation for the private entity operating the facility. The operator margin, where applicable, is estimated at a 20 percent markup of combined labor, fuel, maintenance, and administrative costs.

Table 9-5: Rough Order of Magnitude Operating Cost Estimate

Item Number	Description	Operating Hours[1]	Labor[2]	Fuel[3]	Maintenance[4]	Administration[5]	Operator Margin[6]	Operating Cost
Scenario 1								
1	Scale	2,080	$227,900	$0	$22,500	$12,600	$0	$263,000
2	Front Loader	4,110	$450,200	$66,100	$90,000	$30,400	$0	$636,700
3	Depackager	1,610	$176,400	$0	$120,000	$14,900	$0	$311,300
4	Excavator	530	$58,100	$6,600	$54,300	$6,000	$0	$125,000
5	Grinder	660	$72,300	$26,000	$210,000	$15,500	$0	$323,800
6	Monitoring	520	$57,000	$0	$600	$2,900	$0	$60,500
7	Screen	735	$80,500	$15,800	$115,500	$10,600	$0	$222,400
	Total	**10,245**	**$1,122,400**	**$114,500**	**$612,900**	**$92,900**	**$0**	**$1,942,700**
Scenario 2								
1	Scale	2,080	$227,900	$0	$22,500	$12,600	$52,600	$315,600
2	Front Loader	4,110	$450,200	$66,100	$90,000	$30,400	$127,400	$764,100
3	Depackager	1,610	$176,400	$0	$120,000	$14,900	$62,300	$373,600
4	Excavator	530	$58,100	$6,600	$54,300	$6,000	$25,000	$150,000
5	Grinder	660	$72,300	$26,000	$210,000	$15,500	$64,800	$388,600
6	Monitoring	520	$57,000	$0	$600	$2,900	$12,100	$72,600
7	Screen	735	$80,500	$15,800	$115,500	$10,600	$44,500	$266,900
	Total	**10,245**	**$1,122,400**	**$114,500**	**$612,900**	**$92,900**	**$388,700**	**$2,331,400**
Scenario 3								
1	Scale	2,080	$227,900	$0	$22,500	$12,600	$52,600	$315,600
2	Front Loader	4,110	$450,200	$66,100	$90,000	$30,400	$127,400	$764,100
3	Depackager	1,610	$176,400	$0	$120,000	$14,900	$62,300	$373,600
4	Excavator	530	$58,100	$6,600	$54,300	$6,000	$25,000	$150,000
5	Grinder	660	$72,300	$26,000	$210,000	$15,500	$64,800	$388,600
6	Monitoring	520	$57,000	$0	$600	$2,900	$12,100	$72,600
7	Screen	735	$80,500	$15,800	$115,500	$10,600	$44,500	$266,900
	Total	**10,245**	**$1,122,400**	**$114,500**	**$612,900**	**$92,900**	**$388,700**	**$2,331,400**

1. Annual operating hours are estimated from a material handling exercise based on a facility schedule of 8 hours per day, 5 days per week, and 52 weeks per year.
2. See **Table 9-3**.
3. See **Table 9-4**.
4. Maintenance costs are estimated to be 15 percent of annualized equipment capital costs.
5. Administrative costs are estimated to be 5 percent of combined labor, fuel, and maintenance costs.
6. Operator margin is estimated at a 20 percent markup of combined labor, fuel, maintenance, and administrative costs.

9.2 Annualized Costs

Annualized facility cost estimates, including construction and equipment, are presented in **Table 9-6**. The assumed site useful life is 20 years, based on discussions with County staff, at which point the facility would require capital investment to maintain efficient operations. Useful life for each equipment type is based on the number of lifetime hours recommended for operation compared to the number of annual operating hours

required to perform composting activities under each scenario. Similarly, the required daily operating hours by equipment type were utilized to evaluate the amount of equipment that must be purchased for operations.

Table 9-6: Annualized Facility Cost Estimates

Item Number	Description	Lifespan[1] (Years)	Scenario 1	Scenario 2	Scenario 3
Construction Capital Cost					
1	Site Work / Infrastructure	20	$358,700	$358,700	$546,400
2	Storm Drainage / Waterline	20	$63,800	$63,800	$97,100
3	Compost Storage Bins (Structure Only)	20	$106,800	$106,800	$162,700
4	Compost Air Delivery System	20	$195,400	$195,400	$297,500
5	Scale House (Including Scale System)	20	$68,600	$68,600	$104,400
6	Tipping Building	20	$264,400	$264,400	$402,700
7	Electrical System	20	$121,500	$121,500	$185,000
8	Contingency (30%)	20	$347,800	$347,800	$529,700
9	Engineering & Permitting	20	$160,500	$160,500	$244,500
Construction Capital Cost Subtotal			**$1,687,500**	**$1,687,500**	**$2,570,000**
Equipment Capital Cost					
1	Front Loader	4.9	$142,000	$184,400	$184,400
2	Depackager	15.5	$75,300	$110,200	$110,200
3	Excavator	18.9	$30,100	$45,400	$45,400
4	Grinder	6.1	$134,000	$195,300	$195,300
5	Monitoring	2.4	$1,900	$2,300	$2,300
6	Screen	4.8	$185,800	$241,000	$241,000
Equipment Capital Cost Subtotal			**$569,100**	**$778,600**	**$778,600**
Operating Cost					
1	Scale		$263,000	$315,600	$315,600
2	Depackager		$636,700	$764,100	$764,100
3	Front Loader		$311,300	$373,600	$373,600
4	Excavator		$125,000	$150,000	$150,000
5	Grinder		$323,800	$388,600	$388,600
6	Monitoring		$60,500	$72,600	$72,600
7	Screen		$222,400	$266,900	$266,900
Operating Cost Subtotal			**$1,942,700**	**$2,331,400**	**$2,331,400**
Total Annualized ROM Cost Estimate			**$4,199,300**	**$4,797,500**	**$5,680,000**

1. Construction lifespans are estimated based on a 20-year life of site, based on discussions with County staff. Equipment lifespans are estimated based on vendor projections, as available, and estimated annual operating hours.

9.3 Unit Costs

Table 9-7 presents the unit costs for the composting facility by ton and cubic yard (CY). Costs are broken down into the three primary cost components, construction, equipment, and operating costs. This section reflects the costs of the composting facility only and when determining pricing, the County should consider the revenue generated from the sale of material as discussed in **Section 9.4**.

Table 9-7: Composting Facility Unit Costs

	Annualized ROM Cost	Annual Inbound Tons	Annualized Cost per Inbound Ton	Annual Inbound CY	Annualized Cost per Inbound CY
Scenario 1					
Construction	$1,687,500	63,100	$26.74	231,000	$7.32
Equipment	$569,100	63,100	$9.02	231,000	$2.47
Operating	$1,942,700	63,100	$30.78	231,000	$8.43
Total	**$4,199,300**	**63,100**	**$66.54**	**231,000**	**$18.22**
Scenario 2					
Construction	$1,687,500	63,100	$26.74	231,000	$7.32
Equipment	$778,600	63,100	$12.34	231,000	$3.38
Operating	$2,331,400	63,100	$36.94	231,000	$10.11
Total	**$4,797,500**	**63,100**	**$76.02**	**231,000**	**$20.81**
Scenario 3					
Construction	$2,570,000	63,100	$40.73	231,000	$11.15
Equipment	$778,600	63,100	$12.34	231,000	$3.38
Operating	$2,331,400	63,100	$36.94	231,000	$10.11
Total	**$5,680,000**	**63,100**	**$90.01**	**231,000**	**$24.64**

9.4 Pricing and Revenue

The amount of revenue generated by a composting facility is dependent on several factors including the gate rate, amount of material sold, and unit pricing for finished product. **Table 9-8** presents a single pricing and revenue scenario for consideration by the County. The following list explains the key assumptions for this analysis:

- **Cost Recovery Through Gate Rates:** Drawing on the project team's knowledge of privately operated composting facilities across the United States, these facilities typically aim to recover approximately 75 percent of their annual operating costs through gate fees. This target is set conservatively high to account for potential year-to-year fluctuations in revenue from material sales, which can impact overall cost recovery.
- **Material Volume Reduction and Product Yields:** The analysis assumes a 40 percent reduction in the volume of inbound material during the composting process. Additionally, 50 percent of the wood waste processed at the facility is expected to be converted into mulch. This mulch stream is projected to undergo a 40 percent volume reduction during processing as well.
- **Market-Based Pricing Assumptions:** Bulk compost is assumed to be sold at $26.00 per CY, based on benchmarking data from privately owned and operated regional composting facilities. Mulch is priced at $18.00 per CY, informed by regional benchmarks for untreated or uncolored mulch products. For additional information about regional price benchmarking, see **Section 8.3.1**.
- **Sales Volume Assumptions by Scenario:** As detailed in **Section 8.0**, regional markets for compost and mulch are considered strong.
    - In Scenario 1 (County-operated facility), it is assumed that 80 percent of all finished product will be sold.
    - In Scenarios 2 and 3 (privately operated facility), the sale rate increases to 100 percent of finished product, reflecting the enhanced marketing capabilities and customer networks typically leveraged by private operators, including the ability to secure large-volume contracts.

Based on the pricing scenario presented in **Table 9-8**, Scenario 2 is the most financially favorable option for the County. It yields the highest net revenue of approximately $2.7 million annually, with the greatest return

per inbound ton and cubic yard. This scenario assumes private operation of the composting facility, enabling full sales of finished compost and mulch. The enhanced marketing capabilities and customer relationships of a private operator are key drivers of this performance.

Table 9-8: Pricing and Revenue

	Scenario 1	Scenario 2	Scenario 3
Gate Rate			
Gate Rate Cost Recovery	75%	75%	75%
Gate Rate per CY	$13.66	$15.61	$18.48
Annual Inbound CY	231,000	231,000	231,000
Annual Revenue From Gate Rate	**$3,149,475**	**$3,598,125**	**$4,260,000**
Material Sales			
Compost Volume (CY)	132,000	132,000	132,000
Percentage of Material Sold	80%	100%	100%
Compost Price per CY	$26.00	$26.00	$26.00
Sale of Compost	$2,745,697	$3,432,121	$3,432,121
Mulch Volume (CY)	27,000	27,000	27,000
Percentage of Material Sold	80%	100%	100%
Mulch Price per CY	$18.00	$18.00	$18.00
Sale of Mulch	$394,209	$492,761	$492,761
Total Sale of Processed Materials	**$3,139,906**	**$3,924,883**	**$3,924,883**
Annualized Net Revenue			
Revenue	$6,289,381	$7,523,008	$8,184,883
Cost	($4,199,300)	($4,797,500)	($5,680,000)
Net Revenue	**$2,090,081**	**$2,725,508**	**$2,504,883**
Net Revenue per Inbound Ton	**$33.12**	**$43.19**	**$39.69**
Net Revenue per Inbound CY	**$9.07**	**$11.82**	**$10.87**

Appendix I includes a break-even pricing analysis, which can help the County evaluate how changes in cost structure or sales volumes affect financial outcomes. Prices set about the break-even level return profit to the County or private operator. If the County chooses to contract with a private operator, it may be advantageous to establish a processing and revenue-sharing agreement or implement a host fee. These mechanisms allow the County to share in the profits generated by the facility, even without direct operational control. Such arrangements are common in recycling processing contracts and are equally applicable to composting operations.

9.5 Summary of Findings

The financial analysis evaluated three ownership and operational scenarios for a centralized ASP composting facility. The analysis included capital and operating cost estimates, unit cost breakdowns, and revenue projections based on gate rates and finished product sales. The total capital costs were estimated at approximately $25.0 million, including construction and equipment, and before accounting for a private operating margin. Operating costs ranged from $1.9 million to $2.3 million annually, depending on the scenario. Scenario 2, County-owned facility with private operation and equipment investment, emerged as the most financially favorable, yielding the highest net revenue of $2.7 million annually and the greatest return per inbound ton and cubic yard. If the County pursues a public-private partnership, it may benefit from a revenue-sharing agreement or host fee, allowing participation in profits without direct operational control.

Overall, the financial analysis supports the feasibility of a County compost facility and highlights the potential for an economically viable organics management system through strategic partnerships and market engagement.

10.0 Key Findings and Next Steps

The County is committed to achieving its zero-waste goal through actions like increasing organics diversion. This Study explored options for managing the County's organic waste, and the key findings and next steps are presented as follows.

10.1 Key Findings

A centrally located compost facility with ASP technology emerged as the optimal infrastructure option due to its smaller footprint, faster processing, and better odor control. Compostable products were evaluated but not included in the matrix evaluation due to contamination risks, processing issues, and limiting end market availability. The southern portion of the Distel Property in Longmont, CO was identified as a viable location that meets spatial, regulatory, environmental, and transportation criteria. Interviews with five haulers and processors showed strong interest in participating in a P3, provided the project is financially viable and includes shared responsibility for feedstock, costs, and marketing the final product. A County-owned facility with private operation and equipment investment emerged as the most financially favorable P3 option, yielding the highest net revenue and balancing control with operational efficiency. End market penetration for a County compost facility is possible with an emphasis on quality and competitive pricing.

10.2 Next Steps

With this Study, the County is well-positioned to move forward with the development of a centralized ASP compost facility. This Study will conclude with a presentation to the public and the Board of County Commissioners. If the City of Longmont decides to pursue the development of a compost facility at the Distel Property, the following are the recommended next steps for the County:

- Conduct a Phase II Environmental Site Assessment at the Distel Property.
- Initiate permitting processes with Weld County and CDPHE.
- Develop a procurement strategy for selecting a private operator.
- Apply for state and federal funding to support capital investment.
- Finalize facility design and engineering specifications.
- Continue community engagement and education efforts.

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Appendix A – Decision Matrix

Boulder County Composting Facility Feasibility Study
Project No. 176638
Organics Processing Infrastructure Alternatives
Decision Matrix

Critical Screening Key:	**Pass**	Any alternative receiving a rating of '2' or '3' on those criteria identified as critical by the County has passed this screening and is further scored below
	Fail	Any alternative receiving a rating of '1' on those criteria identified as critical by the County has failed this screening and is not considered for further scoring.
Criteria Rating Key:	**3**	This alternative is most likely advantageous to the County for the criteria considered.
	2	This alternative may or may not benefit the County for the criteria considered.
	1	This alternative could be disadvantageous to the County for the criteria considered.
Criteria Weighting Key:	**3**	Relative to those considered, this criteria is of the highest priority to the County's goals for their management of organic waste
	2	Relative to those considered, this criteria is of moderate priority to the County's goals for their management of organic waste
	1	Relative to those considered, this criteria is of the lowest priority to the County's goals for their management of organic waste

Critical Criteria Screening		**Existing System**		**Centralized Turned Windrow Composting**		**Centralized Aerated Static Pile (ASP) Composting**		**Decentralized Composting**		**Anaerobic Digestion (AD)**		**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	
Criteria	**Weight**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**	**Rating**	**Weighted Score**
Maturity / Prevalence of Technology	3	3	9	3	9	3	9	-	-	-	-	-	-	-	-
System Resiliency	3	1	3	2	6	2	6	-	-	-	-	-	-	-	-
Acceptable Feedstocks	3	1	3	2	6	2	6	-	-	-	-	-	-	-	-
Impact of Feedstock Contamination	3	2	6	2	6	2	6	-	-	-	-	-	-	-	-
Impact to Waste Diversion	3	1	3	2	6	2	6	-	-	-	-	-	-	-	-
Zoning Classification	2	3	6	2	4	2	4	-	-	-	-	-	-	-	-
Relative Retention Times	1	3	3	1	1	2	2	-	-	-	-	-	-	-	-
Relative Spatial Requirement	2	3	6	1	2	2	4	-	-	-	-	-	-	-	-
Potential for Growth	2	1	2	3	6	2	4	-	-	-	-	-	-	-	-
Impact to Greenhouse Gas Emissions	2	1	2	2	4	2	4	-	-	-	-	-	-	-	-
Odor Implications	3	3	9	2	6	2	6	-	-	-	-	-	-	-	-
Noise Implications	2	3	6	2	4	2	4	-	-	-	-	-	-	-	-
Impact to Water Quality	3	3	9	1	3	2	6	-	-	-	-	-	-	-	-
Impact to Air Quality	2	1	2	2	4	2	4	-	-	-	-	-	-	-	-
Development Costs	2	3	6	1	2	2	4	-	-	-	-	-	-	-	-
Capital Costs	2	3	6	2	4	1	2	-	-	-	-	-	-	-	-
Operating Costs	2	3	6	2	4	2	4	-	-	-	-	-	-	-	-
End Product / Byproducts	3	2	6	3	9	3	9	-	-	-	-	-	-	-	-
Market Competition	1	3	3	1	1	1	1	-	-	-	-	-	-	-	-
Total Score			**96**		**87**		**91**		**FAILED**		**FAILED**		**FAILED**		**FAILED**

Appendix B – Memo for Hauler Interviews

Boulder County Compost Facility Feasibility Study

Stakeholder Engagement Letter and Interview Questions

Introduction:

Boulder County is investigating the feasibility of developing a centralized compost facility within the County. As part of the evaluation, the County is engaging stakeholders to understand potential interest in a public private partnership to develop and operate the facility. The County has retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to evaluate the feasibility of a potential composting facility and to conduct interviews with organic material processors.

The County is at the beginning of evaluating the feasibility and does not have a site or a technology determined. The County does not intend to collect or haul organic materials and will rely on private haulers for delivery of materials to the proposed compost facility.

Burns & McDonnell will be scheduling virtual interviews between December 10, 2024, and January 8, 2025 and we invite your organization to participate. Virtual interviews may be scheduled by contacting Kayla Benson at kebenson@burnsmcd.com or calling 708-267-7344.

If you cannot participate in a virtual interview, we also welcome a submittal of your written response to the questions below to kebenson@burnsmcd.com. Written responses must be received by January 8, 2025, to be included in the study. Your input is valuable, and we would like to hear from you.

The following is a list of the questions that we would like to discuss during the interviews. **All information provided by private companies will be aggregated and not publicly disclosed in our report to protect the confidentiality of the respondents.**

Organics Material Processors

1. Provide a company overview and describe your experience with processing organic materials.

    - Material types collected/processed (food waste, yard waste, brush, etc.)?
    - Generators (residential, commercial, industrial)?
    - Quantities of material managed from generators in Boulder County?
    - Approximate facility/ies footprint and throughput in tonnage or yards?

2. What are the challenges to organics waste diversion in Boulder County?

3. What policies or actions could the County take to support your organization being successful at increasing organics diversion in Boulder County?

4. What are the infrastructure needs to increase organics diversion in Boulder County?

5. Would you be interested in a public-private partnership with Boulder County and which options would your company have an interest in responding to an RFP: operations only or operations and facility development?

6. Do you have any experience with a public-private partnership arrangement for organic materials management? If so, please describe.

7. Describe advantages and disadvantages for a County-owned and operated facility as compared to the County partnering with a private company.

8. What would be the optimal or preferred public-private partnership scenario for a facility within Boulder County? Be specific as possible in describing the arrangements of ownership of land, investment in development, equipment ownership, operations, and profit sharing.

9. The County wants to create an equitable arrangement, a sustainable organics management system, and divert as much suitable organic material as possible. What would you propose as a financial arrangement that is win/win for both you and the County (specifically regarding additional material that is brought to the facility)?

10. The County is considering a variety of technologies. What is your experience and interest in each of these technologies:

    - Windrow
    - Aerated Static Pile
    - In Vessel
    - Other not listed above

11. The County is considering a variety of feedstocks. What is your experience and interest in processing each of these feedstocks:

    - Brush and yard trimmings
    - Food waste
    - Compostable products (paper and plastic)

- Wood waste (e.g., wood pallets)
- Agricultural waste

12. Would the County need to guarantee feedstock quantities? If so, what material types and quantities? If so, please answer the follow-on questions below:

    a. What level of contamination could you manage?

    b. What is your approach to contaminant removal?

    c. How would you address compostable products (paper and plastics)?

13. Can your company commit feedstock to the facility? If yes, approximately how many tons (by material type) would you have to commit?

14. Describe your approach to marketing compost. What are your major market categories for finished compost?
    - Agriculture
    - Landscaping
    - Horticulture
    - Retail
    - Topsoil
    - Department of Transportation
    - Landfill
    - Other (please describe):

15. What additional services do you provide at the point of sale?
    - Blending
    - Bagging
    - Delivery
    - Spreading
    - Blower Truck
    - Testing / Analysis
    - Product Education
    - Other (please describe):
    - None

16. What are the greatest barriers that your facility faces in marketing compost?

17. How can the County help improve the marketability of compost?

18. What other ideas or recommendations would you like to share with the County?

Appendix C – Fire Service Map for Weld County

WELD COUNTY FIRE DISTRICTS

PAWNEE FIRE PROTECTION DISTRICT

NUNN FIRE PROTECTION DISTRICT

RAYMER - STONEHAM FIRE PROTECTION DISTRICT

BRIGGSDALE FIRE PROTECTION DISTRICT

POUDRE VALLEY FIRE PROTECTION DISTRICT

AULT FIRE PROTECTION DISTRICT

GALETON FIRE PROTECTION DISTRICT

EATON FIRE PROTECTION DISTRICT

WINDSOR SEVERANCE FIRE PROTECTION DISTRICT

GREELEY FIRE

WESTERN HILLS FIRE PROTECTION DISTRICT

EVANS FIRE PROTECTION DISTRICT

PLATTE VALLEY FIRE PROTECTION DISTRICT

WIGGINS FIRE PROTECTION DISTRICT

NO FIRE DISTRICT

FRONT RANGE FIRE RESCUE FIRE PROTECTION DISTRICT

LA SALLE FIRE PROTECTION DISTRICT

BERTHOUD FIRE PROTECTION DISTRICT

MOUNTAIN VIEW FIRE PROTECTION DISTRICT

PLATTEVILLE - GILCREST FIRE PROTECTION DISTRICT

LONGMONT FIRE

FREDERICK FIRESTONE FIRE PROTECTION DISTRICT

SE WELD FIRE PROTECTION DISTRICT

FORT LUPTON FIRE PROTECTION DISTRICT

HUDSON FIRE PROTECTION DISTRICT

GREATER BRIGHTON FIRE PROTECTION DISTRICT

NORTH METRO FIRE PROTECTION DISTRICT

Highway
Paved
Gravel
Municipal, Paved
Municipal, Gravel
City Limits
Lakes & Rivers

N
W E
S

0 5 10 Miles

Disclaimer

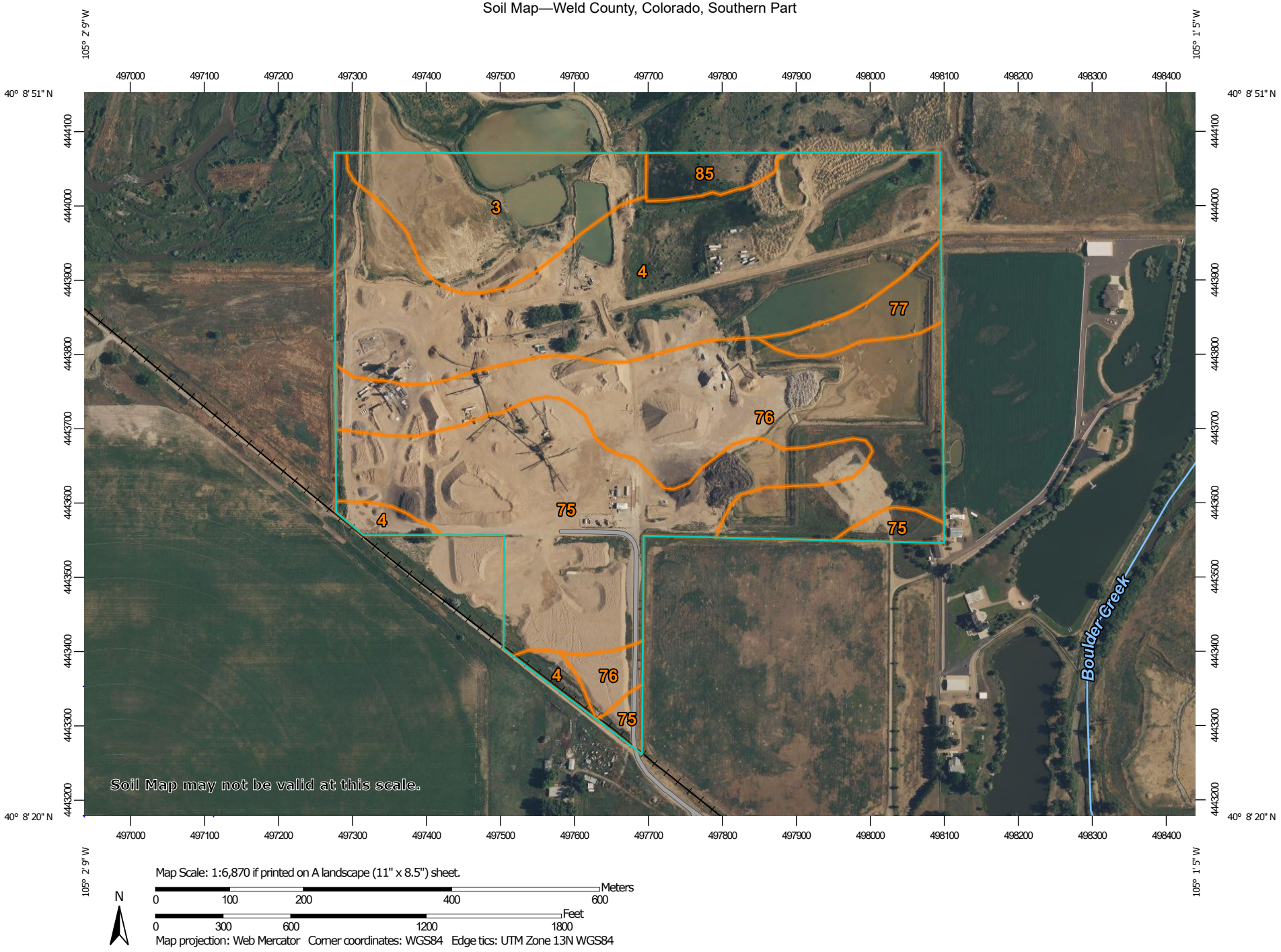
This product has been developed solely for internal use only by Weld County. The GIS database, applications, and data in the product is subject to constant change and the accuracy and completeness cannot be and is not guaranteed. The designation of lots or parcels or land uses in the database does not imply that the lots or parcels were legally created or that the land uses comply with applicable State or Local law. UNDER NO CIRCUMSTANCE SHALL ANY PART THE PRODUCT BE USED FOR FINAL DESIGN PURPOSES. WELD COUNTY MAKES NO WARRANTIES OR GUARANTEES, EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS, ACCURACY, OR CORRECTNESS OF SUCH PRODUCT, NOR ACCEPTS ANY LIABILITY, ARISING FROM ANY INCORRECT, INCOMPLETE OR MISLEADING INFORMATION CONTAINED THEREIN.

Data Sources:
Weld County GIS
ESRI

Printing Date: February 2025
Weld County GIS

Appendix D – USDA Web Soil Map

Soil Map—Weld County, Colorado, Southern Part



Map Scale: 1:6,870 if printed on A landscape (11" x 8.5") sheet.

N

0 100 200 400 600 Meters

0 300 600 1200 1800 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 23, Aug 29, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

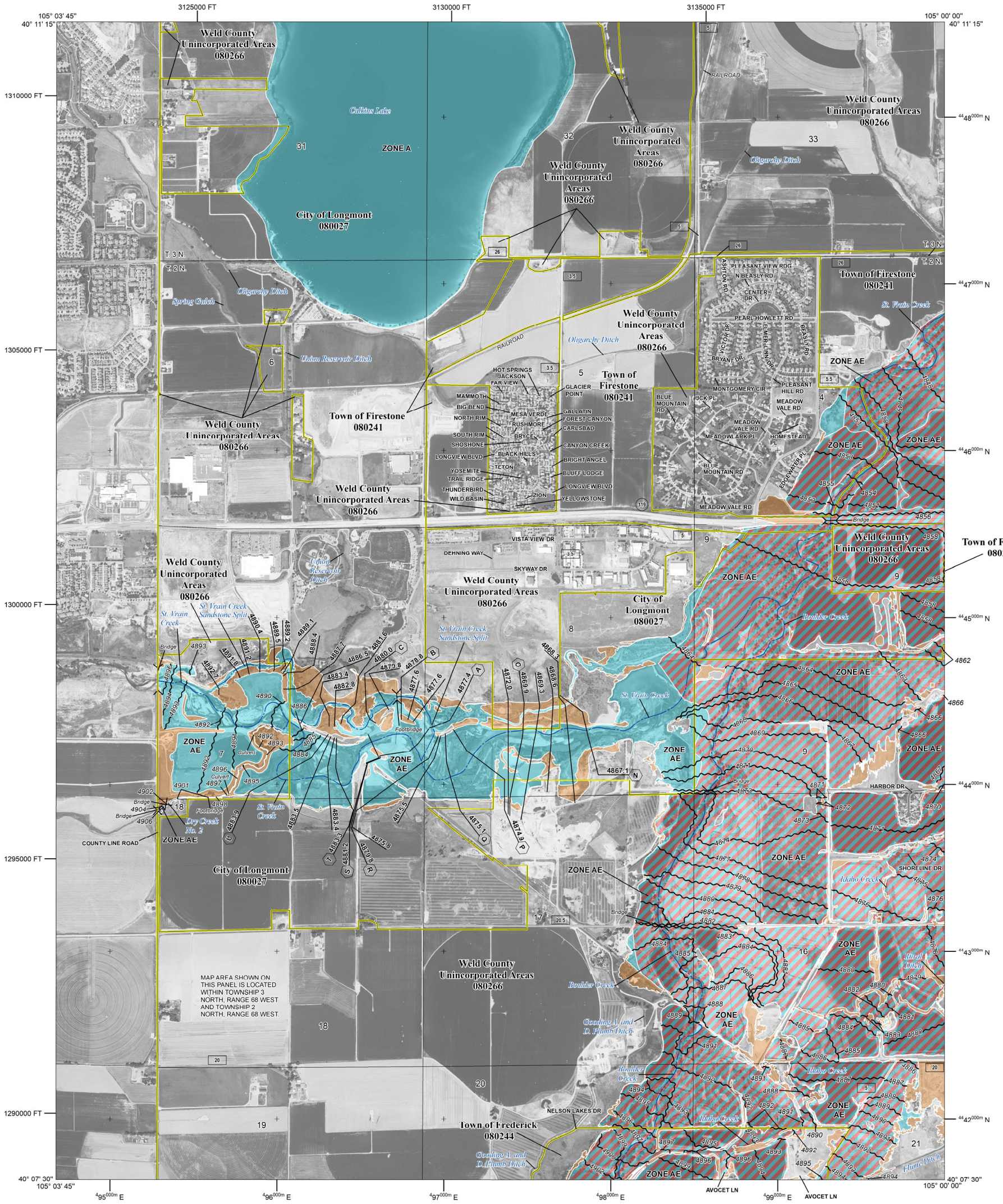
Date(s) aerial images were photographed: Jul 2, 2021—Aug 25, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Aquolls and Aquents, gravelly substratum	12.6	10.9%
4	Aquolls and Aquepts, flooded	39.5	34.2%
75	Vona sandy loam, 0 to 1 percent slopes	28.3	24.4%
76	Vona sandy loam, 1 to 3 percent slopes	29.7	25.6%
77	Vona sandy loam, 3 to 5 percent slopes	3.3	2.9%
85	Water	2.3	2.0%
Totals for Area of Interest		**115.7**	**100.0%**

Appendix E – FEMA Floodplain Map



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A,V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- E 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from the National Flood Hazard Layer (NFHL), dated 2016 and digital data provided by Weld County GIS Department, dated 2018 and OrthoImagery derived from the National Agriculture Imagery Program (NAIP), dated 2017.

SCALE

N

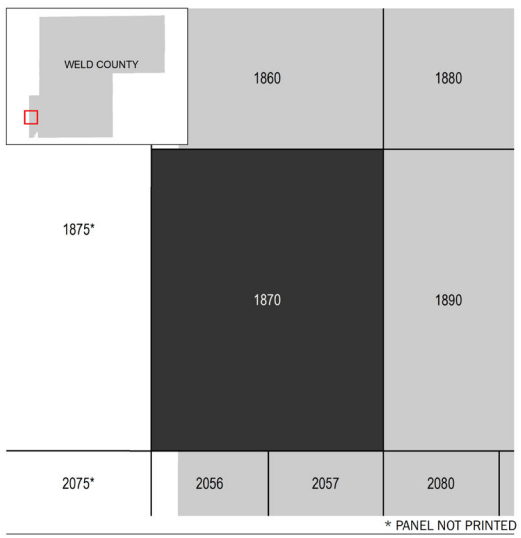
Map Projection:
Universal Transverse Mercator (UTM) Zone 13N; North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 1,000 feet 1:12,000

0 1,000 2,000 4,000 feet

0 250 500 1,000 meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

WELD COUNTY, COLORADO
and Incorporated Areas

PANEL 1870 OF 2250

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
FIRESTONE, TOWN OF	080241	1870	F
FREDERICK, TOWN OF	080244	1870	F
LONGMONT, CITY OF	080027	1870	F
WELD COUNTY	080266	1870	F

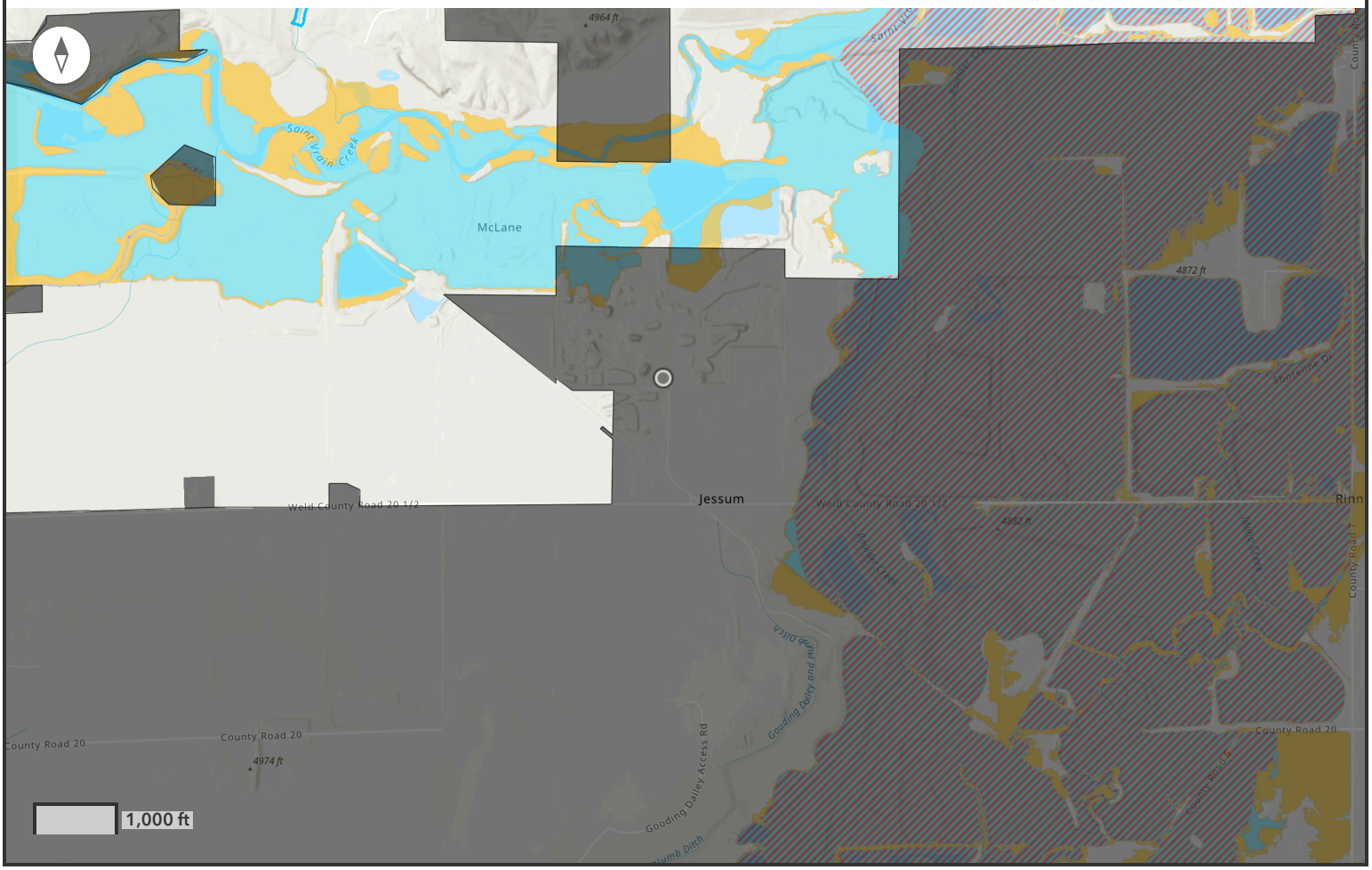
VERSION NUMBER
2.6.4.6

MAP NUMBER
08123C1870F

MAP REVISED
SEPTEMBER 26, 2024

Appendix F – National Wetlands Inventory Map

Floodplain Inquiry Map Web Application



Political Boundaries **Areas outside Longmont City Limits**

Flood Hazard Zones: Boulder County FIRMs Effective October 24th, 2024 : Weld County FIRMs Effective September 26th, 2024

Flood Zones

A, AO, AH, AE - 1% annual chance flood (100-year flood event) or Special Flood Hazard Area (SFHA)

AE - Floodway, 1% annual chance flood (100-year flood event) or Special Flood Hazard Area (SFHA)

X - 0.2% annual chance flood hazard (500-year flood event)

Effective LOMRs, October 24th, 2024 **Hwy 66 Overtopping Modeling**

Effective

Hwy 66 Overtopping Modeling

Inundation Boundary - Existing

Inundation Boundary - Proposed

City Mapped 1% Chance (100-Year) Floodplain

Lykins Gulch	Spring Gulch #2	Updated Spring Gulch #2 Floodplain (Draft)

Search result

1587 County Road 20 1/2, Longmont, Colorado, 80504

Appendix G – Composting-Related HAPs

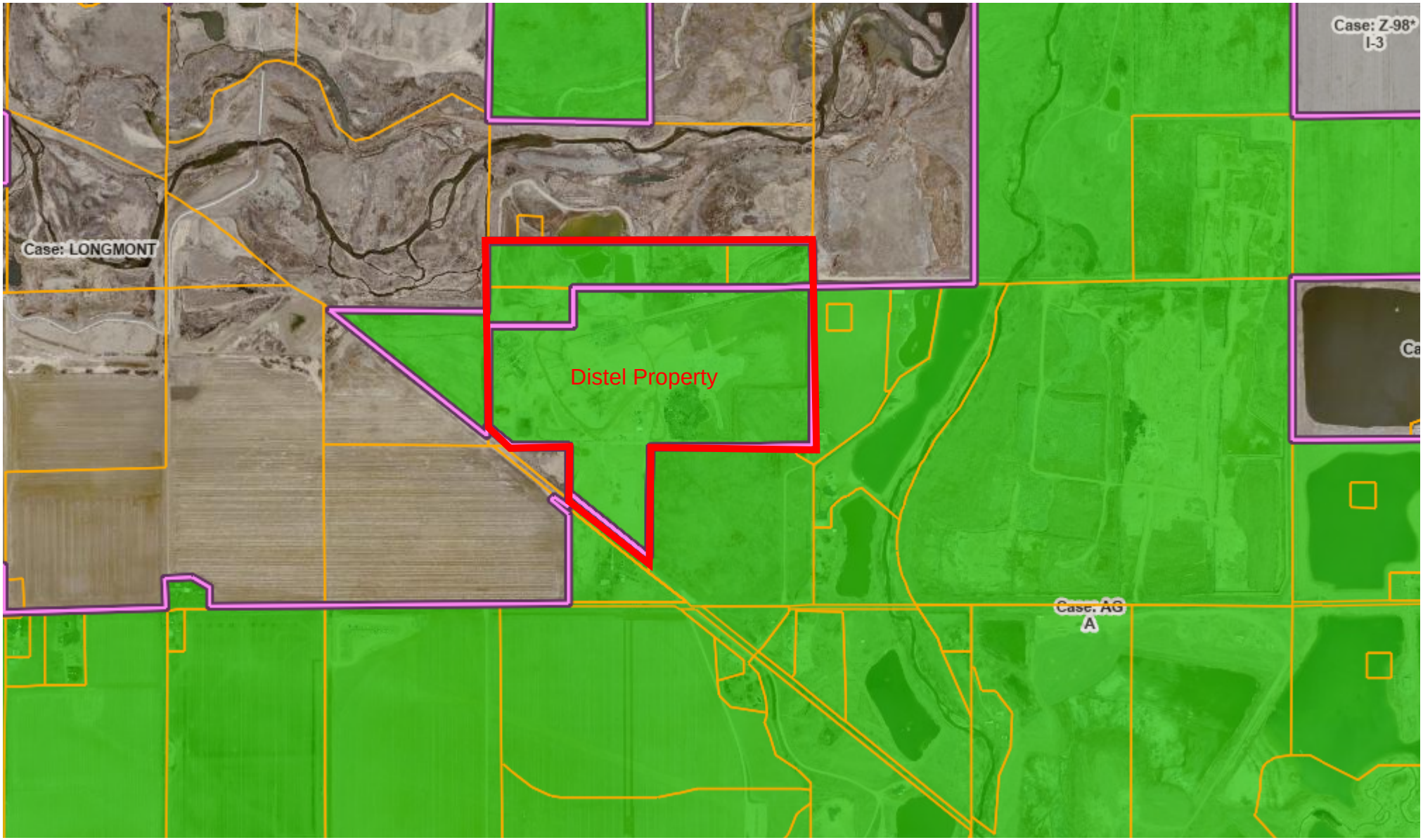
CAS	Toxic	Causes
0	Arsenic compounds	Contamination of wood feedstock
0	Chromium compounds	Contamination of wood feedstock
0	Glycol Ethers	Cleaning solvents (if used)
0	Lead compounds (except elemental lead)	Contamination of wood feedstock
0	Manganese compounds	Contamination of wood feedstock Equipment wear
0	Polycyclic Organic Matter	Incomplete combustion during fire Accidental anaerobic decomposition
50000	Formaldehyde	Decomposition of organic matter Contamination of wood feedstock
67561	Methanol (Methyl alcohol)	Accidental anaerobic decomposition Decomposition of plant and wood matter
74931	Methyl Mercaptan (Methanethiol)	Decomposition of food waste Accidental anaerobic decomposition
75070	Acetaldehyde	Decomposition of organic matter
75183	Dimethyl Sulfide (Methyl sulfide)	Accidental anaerobic decomposition
78988	Methylglyoxal	Decomposition of food waste
79107	Acrylic acid	Contamination of wood feedstock
91203	Naphthalene	Decomposition of wood matter Combustion of wood during fire
95476	o-Xylene	Accidental anaerobic decomposition Contamination of wood feedstock
95487	o-Cresol	Accidental anaerobic decomposition Contamination of wood feedstock
106423	p-Xylene	Decomposition of organic matter Contamination of food feedstock
106445	p-Cresol	Decomposition of wood matter
107028	Acrolein	Decomposition of organic matter Combustion of plant and wood matter during fire
107211	Ethylene glycol	Engine coolant leaks
108383	m-Xylene	Decomposition of organic matter Contamination of food feedstock
108394	m-Cresol	Decomposition of wood matter
108883	Toluene	Decomposition of organic matter Contamination of wood feedstock
108952	Phenol	Decomposition of wood matter
120809	Catechol	Decomposition of wood matter Combustion of wood during fire
122601	Phenyl glyceryl ether (3 phenoxy 1,2 propanediol)	Contamination of wood feedstock
123386	Propionaldehyde	Accidental anaerobic decomposition
123739	Crotonaldehyde (E)	Decomposition of organic matter
131113	Dimethyl phthalate	Contamination of feedstock
463581	Carbonyl sulfide	Accidental anaerobic decomposition
1319773	Cresylic acid/Cresols	Decomposition of wood matter
1330207	Xylene (and mixed isomers)	Contamination of wood feedstock
1402682	Aflatoxins	Moldy food waste
7664417	Ammonia	Decomposition of food waste

7664939	Sulfuric acid	Secondary formation from sulfur compounds
7697372	Nitric acid	Secondary formation from nitrogen compounds
7783064	Hydrogen sulfide	Accidental anaerobic decomposition
16752775	Methomyl	Contaminated food or yard waste feedstock
21548323	Fosthietan	Contaminated food or yard waste feedstock
21923239	Chlorthiophos	Contaminated food or yard waste feedstock
24934916	Chlormephos	Contaminated food or yard waste feedstock
28772567	Bromodiolone	Contaminated food waste feedstock
53558251	Pyriminil	Contaminated food or yard waste feedstock
108171262	Chlorinated paraffins (C12, 60% chlorine)	Contaminated wood feedstock

Appendix H – Distel Property Zoning

4/25/2025 3:07:00 PM

Distel Property Zoning



Scale: 1:13236

Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Notes:
AG - Agriculture
Distel Property Boundary

Appendix I – Financial Analysis

Scenario Summary
Scenario 1: County Owns Facility; County Pays for Capital and Operating Expenditures
Scenario 2: County Owns Facility; County Pays for Construction Capital Expenditure; Private Entity Pays for Equipment and Operating
Scenario 3: County Owns Facility; Private Entity Pays for Capital and Operating Expenditures

	Scenario 1	Scenario 2	Scenario 3
Annual Inbound Tonnage	63,106	63,106	63,106
Annual Inbound Volume (CY)	230,511	230,511	230,511
Annual Outbound Compost (CY)	132,005	132,005	132,005
Annual Outbound Mulch (CY)	27,376	27,376	27,376
Annualized Costs			
Facility Construction	($1,687,500)	($1,687,500)	($2,570,000)
Equipment	($569,100)	($778,600)	($778,600)
Operations	($1,942,700)	($2,331,400)	($2,331,400)
Total	**($4,199,300)**	**($4,797,500)**	**($5,680,000)**
Cost Recovery Through Gate Rate			
Revenue Requirement	$3,149,475	$3,598,125	$4,260,000
Per Ton Gate Rate	**$49.91**	**$57.02**	**$67.51**
Per CY Gate Rate	**$13.66**	**$15.61**	**$18.48**
Annual Revenue			
Gate Rate per CY	$13.66	$15.61	$18.48
Revenue from Gate Rate	**$3,149,475**	**$3,598,125**	**$4,260,000**
Compost Price per CY	$26.00	$26.00	$26.00
Sale of Compost	**$2,745,697**	**$3,432,121**	**$3,432,121**
Mulch Price per CY	$18.00	$18.00	$18.00
Sale of Mulch	**$394,209**	**$492,761**	**$492,761**
Net Revenue	$2,090,081	$2,725,508	$2,504,883
Revenue/(Cost) per Inbound Ton	**$33.12**	**$43.19**	**$39.69**
Revenue/(Cost) per Inbound CY	**$9.07**	**$11.82**	**$10.87**

Date	8/29/2025
Estimate Basis	Construction of Composting Facility at the Distel Site
Scenario	County Owns Facility; County Pays for Capital and Operating Expenditures

Assumptions	
Annual Inbound Tonnage	63,106
Annual Inbound CY	230,511
Material Designated for Mulch	24%
Composting Processing Volume Reduction	10%
Site Life	20 Years
City Interest Rate	5%
Private Interest Rate	8%
Maintenance (% of CAPEX)	15%
Administration (% of OPEX)	5%
Operator Margin (profit, taxes, and depreciation)	20%
Percent of Compost Sold	80%
Bulk Compost Price per CY	$26.00
Percent of Mulch Sold	80%
Bulk Mulch Price per CY	$18.00

Composting Facility

Capital Cost Estimate

Facility Construction	Funding Source	Count	Units	Useful Life	Unit Price	Total Price	Adjusted Price (Operator Margin)	Annualized Cost
Site Work / Infrastructure	County	1	LS	20 Years	$4,470,000	$4,470,000	$4,470,000	$358,700
Storm Drainage / Waterline	County	1	LS	20 Years	$794,000	$794,000	$794,000	$63,800
Compost Storage Bins (Structure Only)	County	1283	CY	20 Years	$1,037	$1,330,600	$1,330,600	$106,800
Compost Air Delivery System	County	1	LS	20 Years	$2,434,000	$2,434,000	$2,434,000	$195,400
Scale House (Including Scale System)	County	1000	SF	20 Years	$854	$854,000	$854,000	$68,600
Tipping Building	County	12000	SF	20 Years	$275	$3,294,000	$3,294,000	$264,400
Electrical System	County	1	LS	20 Years	$1,513,000	$1,513,000	$1,513,000	$121,500
Subtotal						**$14,689,600**	**$14,689,600**	**$1,179,200**
Contingency	County	1	LS	20 Years	$4,333,432	$4,333,400	$4,333,400	$347,800
Engineering & Permitting	County	1	LS	20 Years	$2,000,000	$2,000,000	$2,000,000	$160,500
Subtotal						**$6,333,400**	**$6,333,400**	**$508,300**
Total with Contingency						**$21,023,000**	**$21,023,000**	**$1,687,500**

Facility Equipment	Funding Source	Count	Units	Useful Life	Unit Price	Total Price	Adjusted Price (Operator Margin)	Annualized Cost
Front-End Loader	County	2	EA	5 Years	$300,000	$600,000	$600,000	$142,000
Depackager	County	1	EA	16 Years	$800,000	$800,000	$800,000	$75,300
Excavator	County	1	EA	19 Years	$361,800	$361,800	$361,800	$30,100
Grinder	County	1	EA	15 Years	$1,400,000	$1,400,000	$1,400,000	$134,000
Monitoring	County	1	LS	2 Years	$4,000	$4,000	$4,000	$1,900
Screen	County	1	EA	5 Years	$770,000	$770,000	$770,000	$185,800
Total						**$3,935,800**	**$3,935,800**	**$569,100**

Operating Cost Estimate

Facility Equipment	Operator	Annual Operating Hours	Labor	Fuel	Maintenance	Administration	Operator Margin	Annualized Cost
Scale	County	2,080	$227,900	$0	$22,500	$12,600	$0	$263,000
Front-End Loader	County	4,110	$450,200	$66,100	$90,000	$30,400	$0	$636,700
Depackager	County	1,610	$176,400	$0	$120,000	$14,900	$0	$311,300
Excavator	County	530	$58,100	$6,600	$54,300	$6,000	$0	$125,000
Grinder	County	660	$72,300	$26,000	$210,000	$15,500	$0	$323,800
Monitoring	County	520	$57,000	$0	$600	$2,900	$0	$60,500
Screen	County	735	$80,500	$15,800	$115,500	$10,600	$0	$222,400
Total		**10,245**	**$1,122,400**	**$114,500**	**$612,900**	**$92,900**	**$0**	**$1,942,700**

Cost Component	Total	Annualized Cost	Annualized Cost per Inbound Ton	Annualized Cost per Inbound CY
Facility Construction Cost	$21,023,000	$1,687,500	$26.74	$7.32
Equipment Capital Cost	$3,935,800	$569,100	$9.02	$2.47
Operating Cost	$38,854,000	$1,942,700	$30.78	$8.43
Total	**$63,812,800**	**$4,199,300**	**$66.54**	**$18.22**

Inbound Material Volumes	**yd^3/yr**
Food Waste	40,600
Brown Waste	91,478
Green Waste	98,433

Outbound Composting Volumes	**yd^3/yr**
Compost	132,005
Mulch	27,376

Gate Rate	**Cost**
Costs for Recovery Through Gate Rate	$3,149,475
Gate Rate per Inbound Ton	$49.91
Gate Rate per Inbound CY	$13.66

Cost Recovery	**Annualized Cost/(Revenue)**
Annual Gate Rate Revenue	($3,149,475)
Annual Composting Revenue	($2,745,697)
Annual Mulch Revenue	($394,209)
Annual Composting Cost	$4,199,300
Net Revenue	**($2,090,081)**
Annual Inbound Tonnage	63,106
Cost/(Revenue) per Ton	**($33.12)**
Annual Inbound Volume	230,511
Cost/(Revenue) per CY	**($9.07)**

Date	8/29/2025
Estimate Basis	Construction of Composting Facility at the Distel Site
Scenario	County Owns Facility; County Pays for Capital Expenditures; Private Entity Pays for Operating Expenditures

Assumptions	
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Bulk Mulch Price per CY	$18.00

Composting Facility

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Facility Construction	Funding Source	Count	Units	Useful Life	Unit Price	Total Price	Adjusted Price (Operator Margin)	Annualized Cost
Site Work / Infrastructure	County	1	LS	20 Years	$4,470,000	$4,470,000	$4,470,000	$358,700
Storm Drainage / Waterline	County	1	LS	20 Years	$794,000	$794,000	$794,000	$63,800
Compost Storage Bins (Structure Only)	County	1283	CY	20 Years	$1,037	$1,330,600	$1,330,600	$106,800
Compost Air Delivery System	County	1	LS	20 Years	$2,434,000	$2,434,000	$2,434,000	$195,400
Scale House (Including Scale System)	County	1000	SF	20 Years	$854	$854,000	$854,000	$68,600
Tipping Building	County	12000	SF	20 Years	$275	$3,294,000	$3,294,000	$264,400
Electrical System	County	1	LS	20 Years	$1,513,000	$1,513,000	$1,513,000	$121,500
Subtotal						**$14,689,600**	**$14,689,600**	**$1,179,200**
Contingency	County	1	LS	20 Years	$4,333,432	$4,333,400	$4,333,400	$347,800
Engineering & Permitting	County	1	LS	20 Years	$2,000,000	$2,000,000	$2,000,000	$160,500
Subtotal						**$6,333,400**	**$6,333,400**	**$508,300**
Total with Contingency						**$21,023,000**	**$21,023,000**	**$1,687,500**

Facility Equipment	Funding Source	Count	Units	Useful Life	Unit Price	Total Price	Adjusted Price (Operator Margin)	Annualized Cost
Front-End Loader	Private	2	EA	5 Years	$300,000	$600,000	$720,000	$184,400
Depackager	Private	1	EA	16 Years	$800,000	$800,000	$960,000	$110,200
Excavator	Private	1	EA	19 Years	$361,800	$361,800	$434,200	$45,400
Grinder	Private	1	EA	15 Years	$1,400,000	$1,400,000	$1,680,000	$195,300
Monitoring	Private	1	LS	2 Years	$4,000	$4,000	$4,800	$2,300
Screen	Private	1	EA	5 Years	$770,000	$770,000	$924,000	$241,000
Total						**$3,935,800**	**$4,723,000**	**$778,600**

Operating Cost Estimate

Facility Equipment	Operator	Annual Operating Hours	Labor	Fuel	Maintenance	Administration	Operator Margin	Annualized Cost
Scale	Private	2,080	$227,900	$0	$22,500	$12,600	$52,600	$315,600
Front-End Loader	Private	4,110	$450,200	$66,100	$90,000	$30,400	$127,400	$764,100
Depackager	Private	1,610	$176,400	$0	$120,000	$14,900	$62,300	$373,600
Excavator	Private	530	$58,100	$6,600	$54,300	$6,000	$25,000	$150,000
Grinder	Private	660	$72,300	$26,000	$210,000	$15,500	$64,800	$388,600
Monitoring	Private	520	$57,000	$0	$600	$2,900	$12,100	$72,600
Screen	Private	735	$80,500	$15,800	$115,500	$10,600	$44,500	$266,900
Total		**10,245**	**$1,122,400**	**$114,500**	**$612,900**	**$92,900**	**$388,700**	**$2,331,400**

Cost Component	Total	Annualized Cost	Annualized Cost per Inbound Ton	Annualized Cost per Inbound CY
Facility Construction Cost	$21,023,000	$1,687,500	$26.74	$7.32
Equipment Capital Cost	$4,723,000	$778,600	$12.34	$3.38
Operating Cost	$46,628,000	$2,331,400	$36.94	$10.11
Total	**$72,374,000**	**$4,797,500**	**$76.02**	**$20.81**

Inbound Material Volumes	**yd^3/yr**
Food Waste	40,600
Brown Waste	91,478
Green Waste	98,433

Outbound Composting Volumes	**yd^3/yr**
Compost	132,005
Mulch	27,376

Gate Rate	**Cost**
Costs for Recovery Through Gate Rate	$3,598,125
Gate Rate per Inbound Ton	$57.02
Gate Rate per Inbound CY	$15.61

Cost Recovery	**Annualized Cost/(Revenue)**
Annual Gate Rate Revenue	($3,598,125)
Annual Composting Revenue	($3,432,121)
Annual Mulch Revenue	($492,761)
Annual Composting Cost	$4,797,500
Net Revenue (Required Recovery by Gate Rate)	**($2,725,508)**
Annual Inbound Tonnage	63,106
Cost/(Revenue) per Ton	**($43.19)**
Annual Inbound Volume	230,511
Cost/(Revenue) per CY	**($11.82)**

Date	8/29/2025
Estimate Basis	Construction of Composting Facility at the Distel Site
Scenario	County Owns Facility; Private Entity Pays for Capital and Operating Expenditures

Assumptions	
Annual Inbound Tonnage	63,106
Annual Inbound CY	230,511
Material Designated for Mulch	24%
Composting Processing Volume Reduction	10%
Site Life	20 Years
City Interest Rate	5%
Private Interest Rate	8%
Maintenance (% of CAPEX)	15%
Administration (% of OPEX)	5%
Operator Margin (profit, taxes, and depreciation)	20%
Percent of Compost Sold	100%
Bulk Compost Price per CY	$26.00
Percent of Mulch Sold	100%
Bulk Mulch Price per CY	$18.00

Composting Facility

Capital Cost Estimate

Facility Construction	Funding Source	Count	Units	Useful Life	Unit Price	Total Price	Adjusted Price (Operator Margin)	Annualized Cost
Site Work / Infrastructure	Private	1	LS	20 Years	$4,470,000	$4,470,000	$5,364,000	$546,400
Storm Drainage / Waterline	Private	1	LS	20 Years	$794,000	$794,000	$952,800	$97,100
Compost Storage Bins (Structure Only)	Private	1283	CY	20 Years	$1,037	$1,330,600	$1,596,800	$162,700
Compost Air Delivery System	Private	1	LS	20 Years	$2,434,000	$2,434,000	$2,920,800	$297,500
Scale House (Including Scale System)	Private	1000	SF	20 Years	$854	$854,000	$1,024,800	$104,400
Tipping Building	Private	12000	SF	20 Years	$275	$3,294,000	$3,952,800	$402,700
Electrical System	Private	1	LS	20 Years	$1,513,000	$1,513,000	$1,815,600	$185,000
Subtotal						**$14,689,600**	**$17,627,600**	**$1,795,800**
Contingency	Private	1	LS	20 Years	$4,333,432	$4,333,400	$5,200,100	$529,700
Engineering & Permitting	Private	1	LS	20 Years	$2,000,000	$2,000,000	$2,400,000	$244,500
Subtotal						**$6,333,400**	**$7,600,100**	**$774,200**
Total with Contingency						**$21,023,000**	**$25,227,700**	**$2,570,000**

Facility Equipment	Funding Source	Count	Units	Useful Life	Unit Price	Total Price	Adjusted Price (Operator Margin)	Annualized Cost
Front-End Loader	Private	2	EA	5 Years	$300,000	$600,000	$720,000	$184,400
Depackager	Private	1	EA	16 Years	$800,000	$800,000	$960,000	$110,200
Excavator	Private	1	EA	19 Years	$361,800	$361,800	$434,200	$45,400
Grinder	Private	1	EA	15 Years	$1,400,000	$1,400,000	$1,680,000	$195,300
Monitoring	Private	1	LS	2 Years	$4,000	$4,000	$4,800	$2,300
Screen	Private	1	EA	5 Years	$770,000	$770,000	$924,000	$241,000
Total						**$3,935,800**	**$4,723,000**	**$778,600**

Operating Cost Estimate

Facility Equipment	Operator	Annual Operating Hours	Labor	Fuel	Maintenance	Administration	Operator Margin	Annualized Cost
Scale	Private	2,080	$227,900	$0	$22,500	$12,600	$52,600	$315,600
Front-End Loader	Private	4,110	$450,200	$66,100	$90,000	$30,400	$127,400	$764,100
Depackager	Private	1,610	$176,400	$0	$120,000	$14,900	$62,300	$373,600
Excavator	Private	530	$58,100	$6,600	$54,300	$6,000	$25,000	$150,000
Grinder	Private	660	$72,300	$26,000	$210,000	$15,500	$64,800	$388,600
Monitoring	Private	520	$57,000	$0	$600	$2,900	$12,100	$72,600
Screen	Private	735	$80,500	$15,800	$115,500	$10,600	$44,500	$266,900
Total		**10,245**	**$1,122,400**	**$114,500**	**$612,900**	**$92,900**	**$388,700**	**$2,331,400**

Cost Component	Total	Annualized Cost	Annualized Cost per Inbound Ton	Annualized Cost per Inbound CY
Facility Construction Cost	$25,227,700	$2,570,000	$40.73	$11.15
Equipment Capital Cost	$4,723,000	$778,600	$12.34	$3.38
Operating Cost	$46,628,000	$2,331,400	$36.94	$10.11
Total	**$76,578,700**	**$5,680,000**	**$90.01**	**$24.64**

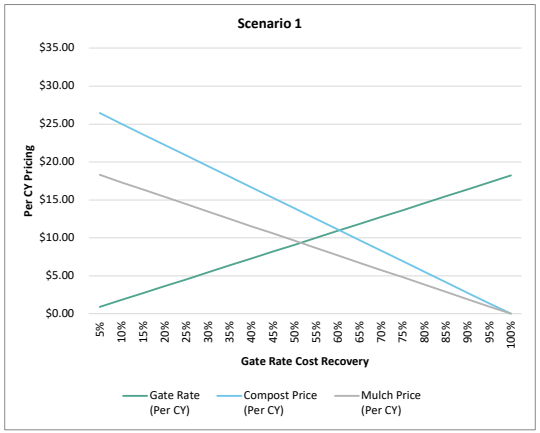
Inbound Material Volumes	**yd^3/yr**
Food Waste	40,600
Brown Waste	91,478
Green Waste	98,433

Outbound Composting Volumes	**yd^3/yr**
Compost	132,005
Mulch	27,376

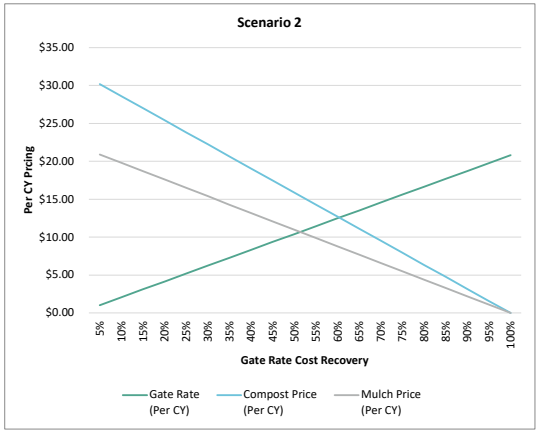
Gate Rate	**Cost**
Costs for Recovery Through Gate Rate	$4,260,000
Gate Rate per Inbound Ton	$67.51
Gate Rate per Inbound CY	$18.48

Cost Recovery	**Annualized Cost/(Revenue)**
Annual Gate Rate Revenue	($4,260,000)
Annual Composting Revenue	($3,432,121)
Annual Mulch Revenue	($492,761)
Annual Composting Cost	$5,680,000
Net Revenue (Required Recovery by Gate Rate)	**($2,504,883)**
Annual Inbound Tonnage	63,106
Cost/(Revenue) per Ton	**($39.69)**
Annual Inbound Volume	230,511
Cost/(Revenue) per CY	**($10.87)**

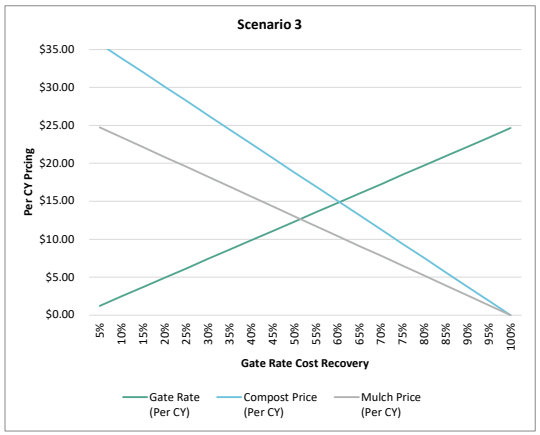
Scenario 1					
County Owns Facility; County Pays for Capital and Operating Expenditures					
Gate Rate Cost Recovery	Gate Rate (Per CY)	Compost Sold	Compost Price (Per CY)	Mulch Sold	Mulch Price (Per CY)
5%	$0.91	80%	$26.43	80%	$18.30
10%	$1.82	80%	$25.04	80%	$17.33
15%	$2.73	80%	$23.65	80%	$16.37
20%	$3.64	80%	$22.25	80%	$15.41
25%	$4.55	80%	$20.86	80%	$14.44
30%	$5.47	80%	$19.47	80%	$13.48
35%	$6.38	80%	$18.08	80%	$12.52
40%	$7.29	80%	$16.69	80%	$11.56
45%	$8.20	80%	$15.30	80%	$10.59
50%	$9.11	80%	$13.91	80%	$9.63
55%	$10.02	80%	$12.52	80%	$8.67
60%	$10.93	80%	$11.13	80%	$7.70
65%	$11.84	80%	$9.74	80%	$6.74
70%	$12.75	80%	$8.35	80%	$5.78
75%	$13.66	80%	$6.95	80%	$4.81
80%	$14.57	80%	$5.56	80%	$3.85
85%	$15.48	80%	$4.17	80%	$2.89
90%	$16.40	80%	$2.78	80%	$1.93
95%	$17.31	80%	$1.39	80%	$0.96
100%	$18.22	80%	$0.00	80%	$0.00



Scenario 2					
Owns Facility; County Pays for Construction Capital Expenditure; Private Entity Pays for Equipment and Operating Expe					
Gate Rate Cost Recovery	Gate Rate (Per CY)	Compost Sold	Compost Price (Per CY)	Mulch Sold	Mulch Price (Per CY)
5%	$1.04	100%	$30.19	100%	$20.90
10%	$2.08	100%	$28.60	100%	$19.80
15%	$3.12	100%	$27.01	100%	$18.70
20%	$4.16	100%	$25.42	100%	$17.60
25%	$5.20	100%	$23.84	100%	$16.50
30%	$6.24	100%	$22.25	100%	$15.40
35%	$7.28	100%	$20.66	100%	$14.30
40%	$8.32	100%	$19.07	100%	$13.20
45%	$9.37	100%	$17.48	100%	$12.10
50%	$10.41	100%	$15.89	100%	$11.00
55%	$11.45	100%	$14.30	100%	$9.90
60%	$12.49	100%	$12.71	100%	$8.80
65%	$13.53	100%	$11.12	100%	$7.70
70%	$14.57	100%	$9.53	100%	$6.60
75%	$15.61	100%	$7.95	100%	$5.50
80%	$16.65	100%	$6.36	100%	$4.40
85%	$17.69	100%	$4.77	100%	$3.30
90%	$18.73	100%	$3.18	100%	$2.20
95%	$19.77	100%	$1.59	100%	$1.10
100%	$20.81	100%	$0.00	100%	$0.00



Scenario 3					
County Owns Facility; Private Entity Pays for Capital and Operating Expenditures					
Gate Rate Cost Recovery	Gate Rate (Per CY)	Compost Sold	Compost Price (Per CY)	Mulch Sold	Mulch Price (Per CY)
5%	$1.23	100%	$35.75	100%	$24.75
10%	$2.46	100%	$33.86	100%	$23.44
15%	$3.70	100%	$31.98	100%	$22.14
20%	$4.93	100%	$30.10	100%	$20.84
25%	$6.16	100%	$28.22	100%	$19.54
30%	$7.39	100%	$26.34	100%	$18.23
35%	$8.62	100%	$24.46	100%	$16.93
40%	$9.86	100%	$22.58	100%	$15.63
45%	$11.09	100%	$20.69	100%	$14.33
50%	$12.32	100%	$18.81	100%	$13.02
55%	$13.55	100%	$16.93	100%	$11.72
60%	$14.78	100%	$15.05	100%	$10.42
65%	$16.02	100%	$13.17	100%	$9.12
70%	$17.25	100%	$11.29	100%	$7.81
75%	$18.48	100%	$9.41	100%	$6.51
80%	$19.71	100%	$7.53	100%	$5.21
85%	$20.94	100%	$5.64	100%	$3.91
90%	$22.18	100%	$3.76	100%	$2.60
95%	$23.41	100%	$1.88	100%	$1.30
100%	$24.64	100%	$0.00	100%	$0.00

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