

BOULDER COUNTY COMPOST MARKET STUDY

Submitted to:

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Boulder County Commissioner's Office

Boulder County, Colorado

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SECTION 1: EXECUTIVE SUMMARY

Boulder County contracted with Superior, Colorado based Skumatz Economic Research Associates (SERA) to complete the following compost market study. The goals of the study include:

- Identify and characterize compost markets in Boulder County
- Survey potential buyers
- Identify compost materials currently sold in the County

SERA contacted nearly 200 end users, processors, sellers, and composting experts in the region and completed over 100 interviews to conduct the market research.

Total Compost Use in Boulder County

Statewide, a total of 540,974 cubic yards of compost were sent off-site from Colorado composters in 2011.¹ Based on interviews with the processors, distributors, retailers, and others in and around Boulder County, this market analysis estimates that between 58,000 and 82,200 cubic yards of finished compost were used in Boulder County in 2011. This number includes materials that were processed in and out of the County and materials that were sold and given away. It does not include compost that was made and used on-site at non-permitted compost facilities or back yard composting.

Market Sectors and Potential

Two sectors, landscaping and agriculture, account for between 70 and 80% of the total compost used in the County. Other significant users include local and county government, households, and road and reclamation construction. The total potential for *additional* compost use in Boulder County is estimated, by this market analysis, to be between 24,000 and 41,100 cubic yards annually under similar economic conditions. Figure 1.1 displays the estimates of current compost use and potential in Boulder County.

Figure 1.1: Compost Use and Potential in Boulder County

Sector	Estimated Use (cubic yards)	Additional Potential (cubic yards)
Tree Farms and Nurseries	Less than 100 cubic yards used	Minimal (except in sales)
Large Retail and Garden Centers	Less than 100 cubic yards used	Minimal (except in sales)
State Government	1,500 – 3,000	1,000 – 2,000
County Government	2,500 – 2,600	800 - 1,000
Local Governments	7,800 – 8,200	5,000 - 6,000
Landscape (contractor, design, maintenance)	36,000 – 56,000	8,000 - 20,000
Agricultural (vegetable and field)	9,000 – 11,000	5,000 - 7,000
Construction (road and reclamation)	5,00 – 2,000	500 -1,000
Sod Farms	0	2,000 - 2,500
Golf Courses	50 – 100	50 – 100
Universities	150 - 200	Depends on future expansion
School Districts and Private Schools	175 – 200	50 - 75
Sports Complexes	25 – 75	70 - 100
Landscape Architects	N/A	N/A
Households (<i>retail sales</i>)	5,600 - 6,700	1,500 – 2,300
<i>Total</i>	<i>58,000 to 82,200²</i>	<i>24,000 to 41,100</i>

¹ Colorado Department of Public Health and Environment (CDPHE) Annual Data from state compost facility reporting

² The total use estimate was based on data from processors, sales, and use

SECTION 2: INTRODUCTION

2.1: Project Goals and Purpose

As part of its quest to reach zero waste, Boulder County is interested in learning more about the markets for finished compost products. The County estimates that approximately 91,000 tons of county generated organic material (manure, bio-solids, and animal mortalities are not included in this estimate) end up in landfills annually³. The County would like to know more about what would happen to the compost end product if these materials were diverted from the landfill and instead processed at a composting facility. The goals of this project are:

- Identify and characterize compost markets in Boulder County
- Survey potential buyers
- Identify compost materials currently sold in the County

2.2: Background

Compost is both a process and a product. This report focuses on compost as a product, not a process. The Colorado Department of Public Health and Environment (CDPHE) defines compost (the product) broadly as:

Material or product which is developed under controlled conditions and which results from biological degradation processes by which organic waste decompose

Because the weight and density of compost varies with the type of product, compost is measured in volume, most often by the cubic yard. While the density of compost can vary depending on the moisture content and other factors, we used a conversion rate of 1,400 pounds per cubic yard of finished compost when converting tons to cubic yards⁴. Throughout this document the cubic yard estimates are for finished compost, not material blends (sand and compost, top soil and compost, etc.).

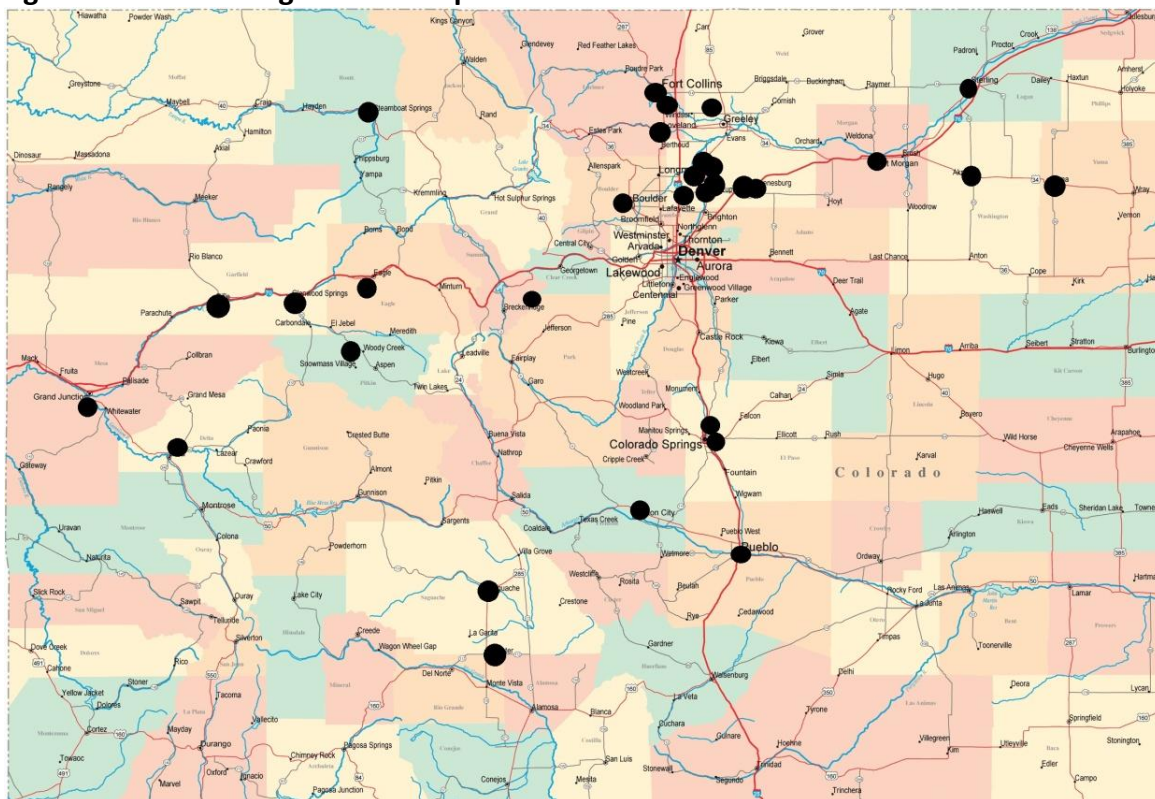
While there is only one CDPHE permitted compost facility located in Boulder County, a Class II privately owned facility located at 2655 N. 63rd Street (Western Disposal Compost Site), there are several compost facilities located in the region that could potentially both accept materials generated in, and sell products to, Boulder County. The largest concentration of certified composters in the State is located in neighboring Weld County (10 facilities or 30% of the total facilities in the state)⁵. The map in Figure 2.2 displays the locations of the registered compost facilities in the State of Colorado (Appendix B includes more facility information).

³ 2010 Boulder County Waste Composition Study, MSW Consultants

⁴ Solid Waste Technical Committee, American Public Works Association (APWA)

⁵ Processing capacity was not considered in this research

Figure 2.2: CDPHE Registered Compost Facilities



2.3: Research Methodology and Fielding

The research project included three main steps:

- 1) Secondary research - Review of existing data and literature: Included any previously completed market studies in the area (none were available), review of literature on compost markets regionally and nationally, and a review of data from the CDPHE on permitted compost facilities including statewide totals on cubic yards of material accepted and composted
- 2) Primary research – Interviews and surveys: The SERA team worked with the County to choose over 20 potential sectors for research and interviews and design a survey instrument. A total of 187 contacts were identified and were contacted either by phone or in person by SERA staff. SERA reached out to each contact three times or until an interview was completed (whichever came first). In order to develop a full picture of Boulder County's market, processors, distributors, and others located outside of the County borders were included in the research. Figure 2.3 displays the sectors, the number of contacts in each, and the number of completed interviews.
- 3) Analysis: The data collected during the research stages of the project were compiled to characterize the compost market in Boulder County

Figure 2.3: Research Sectors and Total Contacts

Sector	Goal (contacts)	Contacts	Interviews ⁶
Local government	20	22	7
State government	5	4	2
School district(s)	4	8	4

⁶ No goal for the number of completed interviews was set.

Sector	Goal (contacts)	Contacts	Interviews⁶
Greenhouses	4	10	8
Nurseries / Tree farms	4	8	5
Landscapers	6	24	13
Contractors	10	9	6
Landscape architect	4	8	3
Large retail	10	10	5
Wholesale	4	10	5
Universities	5	8	4
Agriculture	12	12	7
Golf courses	5	8	3
Sports complexes	2	4	3
Engineering firms	4	6	5
Hospitals	2	6	4
Large Industrial Campuses	2	4	2
Federal facilities	2	3	2
Cemeteries	2	2	2
Associations / Trade Groups	6	6	4
HOA's	3	7	3
Processors	7	8	5
<i>Total</i>	123	187	102

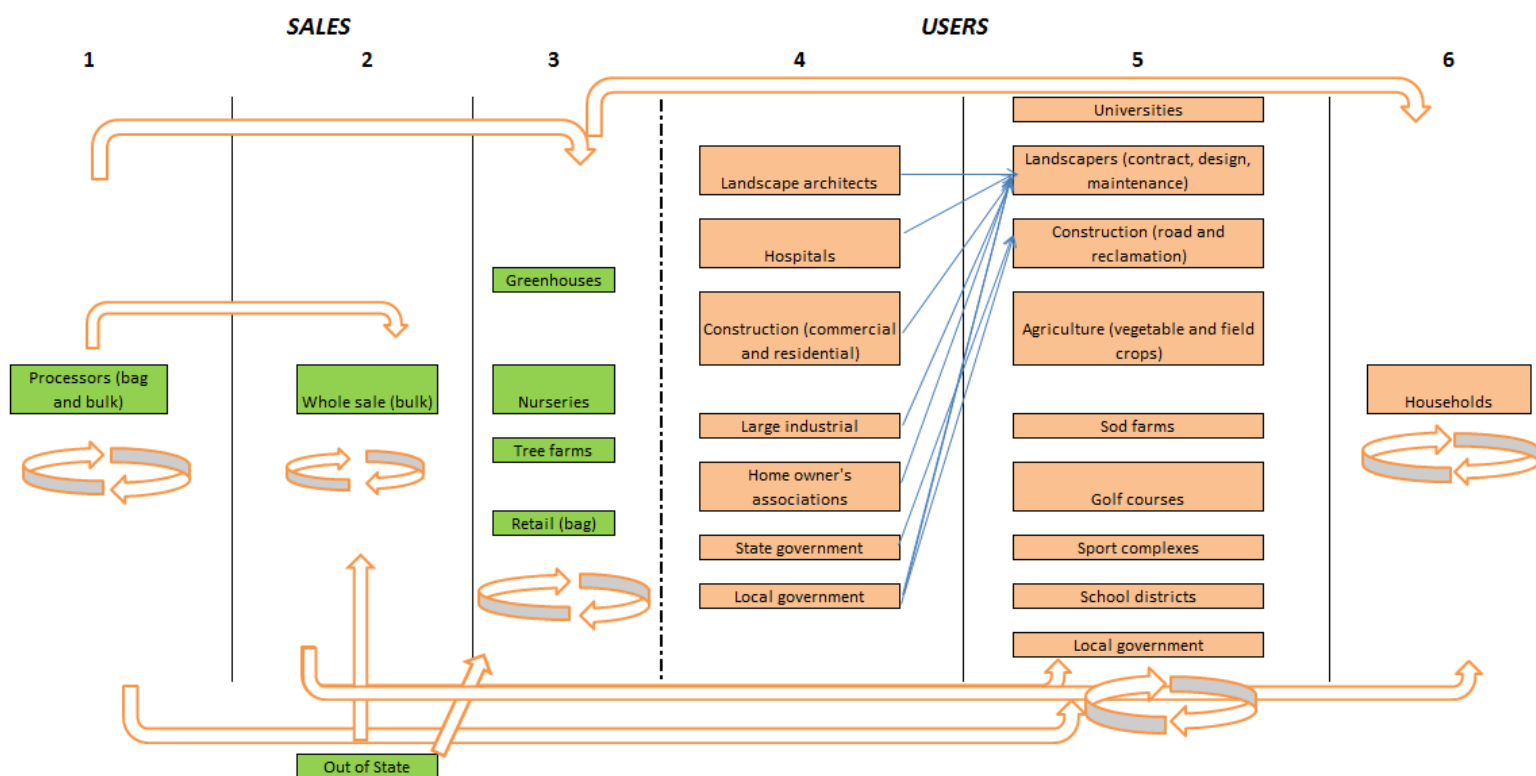
SECTION 3: MARKET OVERVIEW

The remainder of this report describes the compost market in Boulder County.

3.1: Material Flow

Before discussing the total current use, end users, and potential, it is important to understand how compost materials flow through the market in Boulder County. Unlike some other commodities, the flow of compost is non-linear and the delineation between market actors is not distinct. It is possible for one entity to act as processor, purchaser, distributor, and retail outlet. On the other hand, some of the end-users of compost (i.e. hospitals) do not purchase any compost directly but instead use a contracted landscaper to install or apply the compost. Figure 3.2 displays an overview of Boulder County's compost market. Columns 1 through 3 describe the compost sales in the County and columns 4 through 6 are the compost end-users. Note that for all of the columns (with the exception of column 4) compost moves both between and *within* the group. For example, compost processors may sell finished compost product (or compost inputs) to other processors and nurseries may make their own compost. The lines going from column 4 to 5 indicate that although the groups in column 4 use compost, they tend to do so through a landscaper or construction (road and reclamation) contractor.

Figure 3.1: Compost Material Flow Overview



The flow of compost through the market is described in more detail below:

Compost Sales

- Column 1: Compost Processors: The processors are the permitted facilities and include bulk sales (both delivery and on-site) to customers and each other, bagged sales to retail outlets, limited on-site bag sales, and some compost give-aways, trades or others.
- Column 2: These are the large scale distributors of landscape and building supplies in the County. For the most part they get their materials from a processor and sell bulk amounts to landscapers and other end users. In some instances they act as a compost broker, helping to arrange for the sale and delivery of compost from a processor to an end user.
- Column 3: Column three includes mainly retail sale of bagged compost product with some limited bulk sales. The market actors in this category purchase materials from the processors and sell the majority of their materials to household users. While they may use some compost on-site in their own operation, the compost they use tends to be made on-site or a highly specialized product.

Compost Users

- Column 4: Although these actors use compost, they tend to purchase it through an intermediary. For example, turf building for new homes is one of the largest compost uses in the County; however, the home builders generally contract with a landscaper to install the turf, and thus the compost. Note that state and local government are located in both columns 4 and 5.
- Column 5: These actors represent the main end users of compost in Boulder County. They are not listed in order of use.
- Column 6: Households include at home gardening, non-professional landscaping, and other residential uses. Although at-home composting may (or may not) be a significant source of compost in the County it was not considered in this research.

3.2: Market Use and Potential

Total Market Use

The CDPHE requires each permitted compost facility to report annually on the number of cubic yards used on-site and sent off-site. Statewide, a total of 540,974 cubic yards of compost were sent off-site.⁷ Based on interviews with the processors, distributors, retailers, and others in and around Boulder County, this market analysis estimates that between 58,000 and 82,200 cubic yards of finished compost were used in Boulder County in 2011. This number includes materials that were processed in and out of the County and materials that were sold and given away. It does not include compost that was made and used on-site at non-permitted compost facilities (i.e. garden centers, nurseries, farms) or back yard composting. Based on these findings, Boulder County used between 11% and 15% of the compost sent off-site by the State's compost processors in 2011. The majority of the compost (over 70%) is sold through the processors and wholesalers.

⁷ Colorado Department of Public Health and Environment (CDPHE) Annual Data from state compost facility reporting

Market Sectors and Potential

Two sectors, landscaping and agriculture, account for between 70% and 80% of the total compost used in the County. Other significant users include local and county governments, households, and road and reclamation construction. The total potential for *additional* compost use in Boulder County, based on this market analysis, is estimated to be between 24,000 and 41,100 cubic yards annually under similar economic conditions. Combined, the processors interviewed believed the local compost market could sustain an additional 10,000 to 30,000 cubic yards of compost annually. Although it is possible additional amounts of compost above this estimate could be used in Boulder County, the economic conditions would need to change significantly in order for that to happen. These include: housing and construction starts, price of compost, policies, and price of alternative or substitute goods. Figure 3.3 displays the estimates of current compost use and potential in Boulder County.

Figure 3.2: Compost Use and Potential in Boulder County

Sector	Description	Estimated Use (cubic yards)	Additional Annual Potential (cubic yards)
Tree Farms and Nurseries	Largest seller of bagged compost, do not use very much compost	Less than 100 cubic yards used	Minimal (except in sales)
Large Retail and Garden Centers	Includes small garden centers, greenhouses, and florists, use very little, sell bags to households	Less than 100 cubic yards used	Minimal (except in sales)
State Government	The major use of compost at the state level is for transportation projects	1,500 – 3,000	1,000 – 2,000
County Government	Majority of compost used in the County was for road, bridge and transportation projects, compost is also used in open space, parks, and ball fields	2,500 – 2,600	800 to 1,000
Local Governments	The amount of compost used by municipalities in the County range from 0 cubic yards per year to 6,000	7,800 – 8,200	5,000 to 6,000
Landscape (contractor, design, maintenance)	Landscape contractors, designers, and maintenance are the major users of compost in the County.	36,000 – 56,000	8,000 to 20,000
Agricultural (vegetable and field)	Vegetable growers are the agricultural users of compost, not field crops or grass land / grazing	9,000 – 11,000	5,000 - 7,000
Construction (road and reclamation)	Contracted by the County or municipalities to undertake public works, road, erosion control, and reclamation projects.	5,00 – 2,000	500 - 1,000
Sod Farms	Compost is not being used in the production of turf in Boulder County	0	2,000- 2,500
Golf Courses	Most courses in the county are using some sort of blended compost product as a top dressing	50 – 100	50 – 100
Universities	High quality compost is used as top dressing for turf and athletic fields and compost is used in planting beds	150 - 200	Depends on future expansion
School Districts and Private Schools	Some schools are using compost as a blended top dressing in sports field and for classroom lessons	175 - 200	50 -75
Sports Complexes	The majority of sports field in Boulder County are managed by municipalities, the County, or school districts and are covered elsewhere	25 – 75	70 - 100
Landscape Architects	Design landscaping plans that most often include soil amendment, contractors typically do the work and select the product.	N/A	N/A
Households ⁸	Purchase bagged compost from retail, nurseries, and garden centers	5,600 to 6,700	1,500 – 2,300
<i>Total</i>		<i>58,000 to 82,200⁹</i>	<i>24,000 to 41,100</i>

⁸ The household estimates (both use and potential) are based on the retail sales numbers.

⁹ The total use estimate was based on data from processors, sales, and use

3.3: Individual Sectors

The remainder of this section focuses on the use, barriers, and recommendations for each of the researched market sectors.

Compost Sales

Sector: Processors

The processors include both bulk and bagging operations.

Overall, they reported that while the demand for compost is not outstripping supply, they were able to sell all that they produced last year. They estimate that the market locally has the potential to sustain another 10,000 to 30,000 cubic yards annually¹⁰.



- **Estimated Amount Finished Compost:** More than 220,000 to 280,000 cubic yards of finished compost are processed in the surrounding area (only a portion is sold or used in Boulder County). The Statewide total is 540,975 cubic yards.
- **Description:** Processors sending materials into Boulder County include Class I through Class V permitted facilities with feedstocks that include yard scraps, food scraps, manure, agricultural waste, and biosolids. Not all of the facilities are STA certified (see Appendix A for more information on compost classifications and permitting) and the amount, quality, and price of the compost materials sold vary widely. The majority of processors does not bag their own products but instead sell their products in bulk to wholesalers and customers (and some to other processors to bag). There are two large scale bagging operations in the region and the bagged products were reported to be distributed and sold in markets across the entire United States.
- **Compost Products:** The compost products sold vary greatly depending upon the processor (for more information see the Appendix on compost products). The products include Class I and Class II STA certified products, dairy, cow and sheep manure products, specialized compost mixes (top soil blends, top dressing blends, planters mixes, golf course mixes, etc.), organic certified compost, and materials that are not certified and for which the nutrient values and content were not made available to the researchers. The prices vary as much as the types and depend upon contracts with the processor, who is selling the material (and who is buying), the amount sold, transportation, when it is being sold, and of course the type of product. Only one processor reported doing compost 'give aways' and the price of bulk compost ranged from around \$8 -\$10 per cubic yard to \$47 per cubic yard.
- **Barriers:** The major barriers to increased compost sales in Boulder County were reported to be:
 - Overall economy: The down economy has negatively impacted new construction and new turf installation (both commercial and residential) over the past several years
 - Certification: A lack of national or state certification for compost products means that there is not a level playing field for all producers. This allows some processors to sell potentially inferior products for a lower price, driving the entire market price down and allowing inconsistent products make it to the marketplace.

¹⁰ This includes the entire metropolitan area, not just Boulder County, as all of the processors except one were located outside of the County.

- Colorado's seasons: There is a shorter planting and growing season in Colorado compared to other markets nationally that limit the window in which materials can be sold
- Lack of knowledge among consumers: End users that could benefit from the application of compost are not always aware of the benefits of the product.
- State and local procurement policies: The policies of both state and local government do not necessarily encourage the use of a certified compost product. There has been some positive movement on this issue (CDOT and others) but it was still reported to be a barrier¹¹.
- Compost application: It is difficult to spread compost for large scale applications
- Regulations: There is some concern that proposed regulation, particularly on air quality, may increase the cost of processing and the cost of final products
- Competing products: Un-finished manure, fertilizers, and other products are often less expensive than compost
- **Recommendations:** Capacity for processing additional organics was not reported to be a limiting factor – however, distance to the processors and the associated costs may be. The processors felt that they could process additional organics and potentially market 10,000 to 30,000 cubic yards annually under current market conditions. In order to sell more compost they felt that the market needed to change. The recommendations for changing the market ranged from 'do nothing, let the open market dictate what happens' and 'it is up to the processors to do the marketing, the infrastructure and knowledge is there' to more specific and proactive recommendations. These included increased education for consumers, a state or national certification for compost products, have the county and every city in the county adopt and enforce building codes that require 3 to 6 cubic yards of soil amendment to every 1,000 square feet of disturbance or improvement, consider preferable purchasing in procurement for locally produced materials (particularly in communities that have organics collection) to create a closed loop system, and work with the state to require compost as soil amendment in projects.

Sector: Wholesale (landscape and building supply)

Wholesale outlets are the largest sellers of compost in Boulder County. They sell bulk compost made by local and regional processors to landscapers, contractors, municipalities, and others. The prices range widely depending on the product, delivery, and amounts, and range from around \$14 per cubic yard to over \$40 per cubic yard. The products include compost and compost blends.

- **Estimated Sales:** 30,000 to 50,000 cubic yards annually.
- **Description:** This sector is the main distributor of compost in the County. Sales are in bulk and primarily to landscapers and contractors. Products can be picked up or delivered and some offer compost application services.
- **Compost Product:** The compost products vary depending on the outlet. Products range from Class I and II STA Certified materials to dairy and sheep manure products to compost top soil blends. Certified organic composts are also available. Each firm had their own standards for what they purchase and sell, for example one reported they would not sell compost that is high in heavy metals, another reported they stay away from compost that has visible contaminants such as small plastic pieces. The majority of local wholesalers report that they purchase compost from local or metropolitan area processors. There is significant overlap between the processors and wholesalers.

¹¹ Boulder County procurement policy specifies an STA certified compost product with preference given to product created in Colorado.

- **Barriers:** The economy has negatively impacted the sales of bulk compost due to less building activity overall in the County. Transportation costs and application were also reported as barriers to compost sales along with competing materials.
- **Recommendations:** See landscaper, construction (road and reclamation), and local and county government sections for recommendations.

Sector: Tree Farms and Nurseries

Almost all of the compost utilized on-site for growing trees, shrubs, and plants is made on site and compost use is estimated to amount to less than 100 cubic yards annually. However, this sector is responsible for the majority of the sales of bagged compost in the County. They purchase pre-bagged compost from processors for sales to customers (both residential and some landscaping). The potential for increased compost usage in tree farms and nurseries is very little. Increased potential for tree farm and nursery sales of compost is between 1,500 and 2,000 cubic yards.

- **Estimated Sales and Use:** 4,200 - 4,800 cubic yards in sales, less than 100 cubic yards used for tree/plant growing process
- **Description:** Tree farms provide wholesale and retail trees to contractors, landscapers, and homeowners. The facilities sell compost as a service to customers for soil amendment and in root balls when planting the newly purchased trees. Some of the tree farms in Boulder County also provide a tree planting / landscaping service which often includes amending the soils. Slightly over half the tree farms identified in Boulder County purchase compost and sell it to customers, the others reported that they do not use or sell any compost products.
- **Compost Product:** Most of the tree farms interviewed reported that for the resale to customers they require a certified compost product with both cost and quality being the most important features. Cost because they don't want to add considerable additional expense to the cost of purchasing and installing trees, and quality since most have guarantees on their trees and need to give them the best possible start in the new location. They all purchase bagged products that are ordered in pallets and are typically delivered. The products include not only metro-area compost but also bagged compost from South Dakota and Utah. Bags are preferred over bulk for the ease of transportation. If the tree farms reported they used compost for growing trees on-site, the compost tended to be made on site and not purchased. More often they used fertilizers or other compost alternatives for growing on-site.
- **Barriers:** Tree nurseries reported that they do not require compost for the growing process. Most use fertilizers and worm castings to nourish their trees. Another popular choice is cotton ball compost for its clay busting abilities which they purchase from out of state. Barriers to sales include customer awareness and cost.
- **Recommendations:** Most of the potential in this sector lies on the sales side of the equation. Purchasing local for this sector is important for keeping down cost and may increase. Education for customers (both households and landscapers) on benefits, working with the tree farms to encourage standard practices that include soil amendment when planting or selling, and potentially an incentive to replace the out-of-state purchased compost with in-state processed and bagged compost may help boost the use of local or regionally processed compost in this sector.

Sector: Large Retail and Garden Centers

Along with Tree Farms/ Nurseries, this sector is the largest seller of bagged compost products in the County. They purchase a wide array of bagged products from regional and out of state processors for sales to households. They do not sell bulk products. Any potential for this sector is through increased sales. The estimated potential is between 30 and 300 cubic yards annually.



- **Estimated Sales:** 2,300 to 3,500 cubic yards annually.
- **Description:** This sector includes the large retail outlets and garden centers in the County (for example Lowes, Home Depot, and Wal-Mart). They do not use compost on-site, they only sell it. The vast majority of sales are reported to be to households and not professional landscapers who tend to buy items in bulk directly from wholesalers and processors.
- **Compost Product:** The compost products are sold in bags and vary significantly. The bag labels tend not to include any information on certification, nutrients values, or actual product contents. Prices range from \$0.88 per cubic foot for a manure product to nearly \$6 per cubic foot for an organic food scraps based compost. In addition to straight compost products, the retail outlets sell a number of compost / top soil blends and potting mixes. The products come from in-state, Utah, Texas, South Dakota, Oregon, and elsewhere.
- **Barriers:** Availability and comparable price of alternatives, lack of product labeling, customer knowledge
- **Recommendations:** Most of the large retailers, (like the smaller garden centers) thought that the sales of compost were increasing. Decisions on which products to sell are based on delivery, costs, supply chains, and others, but there may be an opportunity to increase the percentage of locally produced products. This is an effort best left to the local processors and baggers marketing teams.

Sector: Greenhouses and Garden Centers

This sector includes small garden centers, greenhouses, and florists. They typically purchase already potted plants for sale or use worm castings or potting soil without compost to grow their products. They are recommending and selling bagged compost products almost exclusively to homeowners. They report sales of compost have been increasing due to more at-home gardening over the past several years.

- **Estimated Use:** 200-400 cubic yards of bagged products from in, and outside, of Colorado for customer sales. Zero compost usage for greenhouse plantings.
- **Compost Product:** This category generally does not use compost in their nursery business. They do not grow new plants from seed but more often purchase starter plants for sale that are already potted. This category does sell a significant amount of bagged compost to their customers. There is a large range of products that are sold in this category. Some of those we spoke to said customers want only organic and will only sell certified products. Others said customers are only concerned with price, not quality. The food scraps products are generally more expensive and require more 'selling' to customers compared to manure products. Manure products are sometimes sold as a top dressing for lawns. The customer knowledge is varied and some ask for compost while others have never heard of the product. These outlets sell almost exclusively to households and do not sell in bulk.

- **Barriers:** Greenhouses are not using compost in their own growing process and serve only as retail outlets. Customers seem unaware of the benefits of compost and the need for soil amendment in Colorado. Home grown vegetables are popular now, but most people are new to the process and don't know the products needed to be successful. The lack of product certification makes it difficult for customers to know exactly what is in the products. There is also a risk associated with compost use ('burning lawns') that is not as prevalent with some of the alternatives.
- **Recommendations:** More information on packaging on contents, nutrients, and use may help reduce some of the 'risk' of compost. Also, the end user, homeowners, would benefit from education on compost advantages especially for home vegetable gardens and drought mitigation for lawns.

Compost End- Users - Government

Sector: State Government

The major use of compost at the State Government level is as soil amendment in transportation projects. Compost is identified and defined as a recommended soil amendment. There is the potential to use compost on a higher percentage of road construction jobs across the state and the potential for increased road construction in the future as well as increased compost use in erosion blankets and logs. The potential additional use in Boulder County is in the range of 1,000 to 2,000 cubic yards¹².

- **Estimated Use:** ~40,000 Cubic yards statewide in 2011 with 1,500 to 3,000 cubic yards used in Boulder County.
- **Description:** The Colorado Department of Transportation, through its contractors, is the main user of compost at the state level. The compost is used for seeding and soil amendment road, bridge, or other projects in which native soils are disturbed. CDOT does not do any work themselves and it is up to each region and project engineer to choose whether or not they specify compost as a soil amendment for the contractors. The state estimates that about 60% of the current projects do specify compost as a soil amendment.
- **Compost Product:** The state has adopted specifications for compost and it must be a US Composting Council STA Certified Class I material from a CDPHE permitted facility. Although there is not a specification for the amount of compost, typical use is 65 cubic yards per acre of disturbance. Having consistent, certified, compost materials was reported to be one of the most important considerations for the state. The compost benefits for projects include increased seed growth in vegetation, reduced run-off, and improved soil health.
- **Barriers:** There are three major barriers; cost, availability, and individual engineers. It is up to each engineer to specify whether the projects use soil amendment (compost), fertilizer, top soil, or some combination in their project. Some engineers opt for non-compost materials because of the cost (purchase, transportation, and application) and in some areas of the state (not a barrier in Boulder County) availability of compost is an issue. Finally, some engineers are not convinced of the benefits of compost as opposed to fertilizer or straight top soil.
- **Recommendations:** These include a state certification of compost products to help ensure a consistent quality product¹³, more education for individual project engineers, particularly on the properties of

¹² The potential for increased use is from a higher percentage of projects using compost and more projects overall. The recently passed Federal Highway bill is reported to provide on-going funding for more road projects in the state over the next few years.

¹³ One interviewee noted that a 'bad batch' of compost with weed seeds, high pH, or other issues, could hurt the industry and the state's ability to recommend the use of compost.

compost to reduce run-off, state specifications that will allow the use of compost in erosion control blankets and erosion logs (or socks), encouraging or perhaps requiring counties and municipalities in the state to adopt building codes requiring soil amendment in disturbances or improvements, county transportation departments adopting state compost specifications for soil amendment, and defining what an acceptable finished compost is.

Sector: County Government

The majority of compost used in the County was for road, bridge and transportation projects either directly by County staff or through contracted construction companies. About 20% of the compost used in the County is for parks, open space, and the County fairgrounds. While there is some potential to use perhaps 800 to 1,000 additional cubic yards of compost in open space and parks, the County thinks they will most likely use less compost in transportation projects next year.

- **Estimated Use:** 2,500 – 2,600 cubic yards
- **Description:** Boulder County uses compost as a soil amendment, often combined with top soil, in road, bridge, and other transportation projects to help increase the growth of vegetation and improve the overall soil health. Compost is also used in flower beds and decorative areas around County buildings and opens spaces and facilities use it as top dressing (often in 60/40 or 80/20 blends) for turf and athletic fields. The County gets compost for no cost as part of an agreement with a processor, purchases additional compost as needed from processors, or puts in bid specifications for projects on an as needed basis. The transportation department estimates that compost is used as a soil amendment on perhaps 30 – 40% of the county projects, and the parks and open space departments estimate that compost is used on about one-third of the fields a year and about 75% of the flower and ornamental boxes and planters annually.
- **Compost Product:** The compost product varies throughout the county based on the project and application. In some cases, such as a highly visible sports field, the County requires a premium compost product with specific N, P, K, pH, and soluble salts. For other projects, such as on the side of a road where the materials are blended with native soils, the product specifications are not as exacting. In all cases the compost product must be visually ok (no large contaminants or trash) and must not smell and the County has adopted a procurement specification for an STA-certifies compost product (similar to CDOT). Although cost is extremely important in choosing a compost product, quality is more important. The County reports that they have opted for a more expensive and higher quality product at times in the past.
- **Barriers:** The barriers to increased compost use by Boulder County were reported to be an inconsistent product in the past, the cost of the product (this was the most important for transportation¹⁴), knowledge about compost for the staff involved in the projects, the time and labor needed to spread compost on fields, and that there is not widespread awareness of the standard procurement policy or compost definition at the county level.
- **Recommendations:** If the County has not adopted and enforced building codes requiring the use of soil amendment they should consider doing so. The transportation department was not in favor of putting preferences for certain compost products in procurement guidelines and there was some reticence to require contractors to use compost as a soil amendment because it could increase the cost of transportation projects. Additional outreach to staff about where compost could be used, how to use

¹⁴ The Transportation Department reported that once compost gets to be around \$8 to \$10 per cubic yard it cuts into their budget for other building materials and they will not purchase it

it, and the benefits, a consistently followed procurement policy, a definition of ‘compost’, and working with the sectors described later in this report to advocate for increase compost use (landscapers, agriculture, and others) may help improve the local market for finished compost.

Sector: Local Governments

The amount of compost used by municipalities in the County ranges between 0 cubic yards per year to 6,000 cubic yards. The materials are used in flower / ornamental boxes, new parks, turf building, trail heads, give aways to residents, and top dressing at ball fields and parks. The municipalities buy directly from a processor, are given materials from a processor as part of an agreement, or make their own compost. The specifications vary and whether or not a municipality has and enforces a code requiring soil amendment in residential or commercial projects varies. There is potential to use 5,000 to 6,000 additional cubic yards per year.

- **Estimated Use:** 7,800 – 8,200 cubic yards per year¹⁵
- **Description:** Municipalities that use compost report that they use it to improve the health of the soil, increase plant growth, and decrease the need for fertilizers. The majority of material is blended and used as top dressing on sports and other turf fields, given away to the residents, or used in new parks, trail heads of other areas. Municipalities are also using compost in flower beds and new plantings; however this number is much smaller. There are a few municipalities in the County that reported they use 50 cubic yards or less per year.
- **Compost Product:** While almost all the municipalities said that compost quality was one of the main drivers in choosing a compost product, the majority did not have an official specification for what acceptable finished compost should be. Erie and Boulder are notable examples of municipalities with specifications. With the exception of Louisville, who makes their own compost at the waste water treatment facility, the municipalities are getting their materials directly from a processor. In some cases the compost is provided to the municipality at no charge. A number of the municipalities reported that they would be hesitant to use a product that was made from bio-solids and a lack of visible contamination, namely plastic pieces, was also a threshold barrier to acceptability.
- **Barriers:** Choice for compost products was mainly driven by the quality of the product for the municipalities that used it. The communities that were not using compost expressed some concern about the quality of products and were worried that a product that had not been tested could kill grass or vegetation. The cost of purchase, transportation, and applying the material and a lack of awareness among staff responsible for choosing compost as opposed to alternative products was mentioned as a barrier.
- **Recommendations:** Communities that have not yet adopted a building code requiring anywhere from 3 – 6 cubic yards of soil amendment per 1,000 square feet of disturbance should consider adopting one¹⁶. Additionally, those that have adopted this type of code but do not enforce it should consider additional enforcement. The Town of Superior and the City of Boulder could provide advice and recommendations to communities in the County that are looking to use more compost and improve the health of their managed landscapes. The Town of Erie has compost use written into building codes (along with the City of Denver enforcement mechanisms) that could serve as model code language for

¹⁵ This includes 6,000 cubic yards that are made at the Louisville WWTP from bio-solids and yard waste drop-offs and collections. The City uses much of the compost themselves but also trades, gives away, and sells the product. Without the Louisville materials the total amount of compost used in the other communities in the County is between 1,800 and 2,000 cubic yards.

¹⁶ Cities may wish to consider the implications of native xeriscaped landscapes in these regulations- potentially allowing for exceptions to compost soil amendment requirements.

others in the County. Finally, education for municipal staff and residents on the benefits of compost and how to apply it properly may help increase the use of materials locally.

Compost End- Users – Large Users

Sector: Landscape (contractor, design, maintenance)

Landscape contractors, designers, and maintenance are the major users of compost in the County. They use compost to build new lawns and turf, renovate or upgrade existing landscaping, replace dead and dying turf, and maintain ball fields, parks, and other areas. The use of compost is increasing among landscapers but there are some who choose to use fertilizers instead. The potential for increased use is driven mainly by the construction industry with some opportunity to use more per job and increase the percentage of landscapers using compost. It is estimated that the landscapers have the potential to use between 8,000 to 20,000 additional cubic yards per year.



- **Estimated Use:** 36,000 – 56,000 cubic yards
- **Description:** This sector is responsible for installing turf, ornamentals, trees, and shrubs in new construction (both commercial and residential), redoing or upgrading existing landscapes, and maintaining existing landscapes. In some years new construction may drive much of the market and use but many of the landscapers reported that renovating and maintaining existing landscapes is the majority of their current work (with a few notable exceptions). The firms reported using an average of around 250 to 300 cubic yards per year with some firms saying they used no compost and others using as much as 5,000 cubic yards annually¹⁷.
- **Compost Product:** There was not a consistent product preference or product selection method among the landscape contractors. For larger projects, it is possible that the landscape architect or project manager will specify the compost product or nutrient values or that the landscape firm will submit a bid and include information on the compost or soil amendment they will use. Many reported that it is 'standard practice' for them to use compost as a soil amendment and the amount ranged from 2 cubic yards per 1,000 square feet to 6 cubic yards per 1,000 square feet¹⁸. One contractor reported that they typically use between 0.5 and 2 cubic yards per residential lawn project. The landscapers tended to purchase their materials from wholesalers.
- **Barriers:** The largest barrier to increased compost use is the overall economy and the lack of significant new construction in the County. Contractors reported that during times of increased economic activity (like 2006 – 2007) they were using as much as 4 to 5 times the amount of compost they are currently using. The costs of compost are 'up front' and are not spread out over time while the benefits (water retention, soil health) are long-term which can make compost seem more expensive. Also, compost

¹⁷ This high end of 5,000 cubic yards was reported by a firm specializing in new turf / sod installation, one of the largest in the metropolitan area.

¹⁸ Some of these same landscapers reported that 10 to 20 years ago it was not standard practice to use soil amendment when building lawns.

quality, consistency, and cost compared to the alternatives were mentioned as major barriers. Compost can be higher priced than some alternative products and some landscapers reported concerns about compost product ‘burning’ the grass or shrubs.

- **Recommendations:** The largest driver for increased compost use in landscaping is based on macro-economic forces that the County has little control or impact on. The landscapers interviewed believed that increased awareness of compost benefits among consumers would help¹⁹, a more consistent compost product on the market would be beneficial, and of course, a less expensive compost product could help increase use. The landscapers also expressed support for building codes encouraging or requiring the use of soil amendment.

Sector: Agricultural (vegetable and field)

The main use of compost in agriculture is to improve soil health, water, and nutrient retention on vegetable cropland; however, only about 50% of the vegetable croplands in the County are using compost. The compost product is often specific and can be brought in from long distances. Cost and application are the major barriers to increased use and the potential for compost use is an additional 5,000 to 7,000 cubic yards (not including any use on field crops).

- **Estimated Use:** 9,000 – 11,000 cubic yards per year
- **Description:** There is a total of 109,000 acres of agricultural lands in Boulder County²⁰ and the majority of the land is used for grazing livestock. There is estimated to be approximately 40,000 acres of harvested lands and of that, the vast majority is field crops. The remaining 1,000 acres of vegetable crops in the County are the ones using almost all of the compost. Only about 50% of the vegetable croplands are assumed to be using compost. Those that use compost use it to improve the soil quality, increase the soil retention of nutrients and water, reduce their reliance on fertilizers, and increase their overall crop quality and yield.
- **Compost Product:** Compost quality is very important to most of the farmers that use the product. A number reported that they are certified organic farmers and thus are required to use certified organic compost product to maintain their organics status. A few of the smaller farms reported that they use compost that they make on site, and one of the larger vegetable farms in the County reported that they were no longer using compost because they could not source a product that met their specifications. Soluble salts, pH, and nutrient values were all important to the farmers. Unlike some of the other sectors, the majority of the compost used on farms currently is not purchased locally; it is being brought in from out of County processors, often from processes located quite some distance from the farm. The driver for compost choice was reported to be both cost and quality. Compost is generally brought to the farms on semi trailers or dump truck loads and applied to the fields by the farm staff.



¹⁹ One landscaper suggested a county or city pamphlet that they could hand out to their customers highlighting the benefits of compost use

²⁰ United States Department of Agriculture, National Agriculture Statistics Service estimate of total agricultural land in Boulder County, 2007.

- **Barriers:** Despite the large areas of agricultural land in the County, the barriers to compost use limit the potential significantly. The interviewees reported that the barriers to compost use in field crops will most likely continue to outweigh the benefits and the majority of the potential lies in the 50% of vegetable croplands that are not currently using compost²¹. The most important barriers are the cost of the compost and the cost of applying the compost. The use of compost does not allow a farmer to stop using fertilizer and is viewed as an additional cost, not a replacement cost. Although there was reported to be a high level of knowledge and awareness about compost, there is still misunderstanding among some of how to use compost properly and the potential benefits. Other barriers include the consistency of compost products and the ability to easily see test results of nutrient values of the product, and the risk associate with the misapplication of compost compared to fertilizer. Another barrier mentioned was the low price of alternatives to compost (i.e. petro-fertilizers) and delivery and transportation of compost was mentioned as a barrier for smaller farms.
- **Recommendations:** The County should focus their efforts primarily on the vegetable farmers for which the use of compost makes sense and has been shown to be beneficial on many of the other farms in the County. Requiring the use of soil amendment in County or City leased farm lands was discussed and has merits but in the opinion of many interviewees it would not be a viable solution²². Recommendations included county (or city) assistance in increasing the availability of quality compost products, perhaps by having a public compost facility that could provide a low cost product to farmers²³.

Sector: Construction (road and reclamation)

This sector is contracted by the County or municipalities to undertake public works, road, erosion control, and reclamation projects. They use compost, top soil, fertilizers, or other products as specified in the project scope and bid documents. The potential increase in compost use is estimated to be between 500 and 1,000 cubic yards per year.

- **Estimated Use:** 500 – 2,000 cubic yards per year²⁴
- **Description:** Contracted construction and reclamation firms provide services as described in bid specifications. In some cases the bid specifications include compost as a soil amendment and in others they do not. The amount of work done per year varies however, the amount of road construction is expected to be less in Boulder County next year compared to last year.



²¹ The majority of farmers and experts interviewed reported that it does not make sense to use compost for field crops, but not all of them. A few interviewees, including some field crop farmers, reported that using compost for all types of farming is beneficial and that if the price / cost were right, there is no reason why field crops couldn't use a very large amount of compost. This sentiment was repeated by interviewees outside of Boulder County whom are focusing on increasing the use of compost on agricultural lands in the eastern portion of the state. If using compost for field crops was cost effective and beneficial, the potential use in the County would be vastly greater.

²² Costs for farmers would be too high and the cost and logistics to administer is a barrier.

²³ Multiple respondents recommended that the County invest in a spreader that could be leased or lent to farmers to help them spread compost material. Unfortunately, others felt that since all of the farmers would want to use the equipment the same few weeks during the season this may not be a useful investment.

²⁴ This estimate does not include land reclamation related to oil and gas drilling. The oil and gas industry was not included in this research however, there may be the potential to use significant amounts of compost in the future to re-vegetate land that is disturbed as a result of hydraulic fracturing. This may be especially true in the eastern areas of the County.

Compost is used mainly as a soil amendment to encourage increased growth of vegetation and reduce run-off.

- **Compost Product:** The County procurement policies recommend an STA-certified compost product. The contractors usually choose to get compost from a wholesaler or directly from a processor and make their decisions primarily on the product price.
- **Barriers:** Cost of compost, application, and a lack of awareness surrounding the procurement standards are the major barriers. In some projects the ground is too steep or access is difficult and it is not possible to amend the soil with compost, a spray-on liquid fertilizer or other option is used. Also, with a down economy and tighter project budgets compost is often one of the bid specification items that can be cut to save on overall project costs without a large impact on the project goals.
- **Recommendations:** The County can increase awareness of the existing procurement standards for compost and consider standards for soil amendment in certain projects. Additional information on the benefits of compost on water retention and reduced run-off showing the long term benefits and money savings may help increase the use. Encouraging the use of erosion blankets and erosion logs made with compost would also increase the overall use locally.

Compost End- Users – Small or Secondary

Sector: Sod Farms

While compost is important and recommended for use in installations of new turf, it is not being used in the production of turf in Boulder County. Spreading compost at a rate of 35 cubic yards per acre is recommended by research facilities to improve the turnover rate for sod production²⁵. Those farms adjacent to Boulder County that are purchasing compost are mainly using it for installation/ landscaping purposes. There is significant potential to increase usage. If just the one sod farm in Boulder County begins using compost, they have the potential to use from 2000- 2,500 cubic yards annually. There are multiple sod farms in near proximity to Boulder County that could use compost.

- **Estimated Use:** 0 cubic yards²⁶.
- **Description:** There is only one existing sod farm in Boulder County and they use liquid fertilizer on their 70 acres. We spoke with several nearby sod farms who recognized the value of compost in sod production, but were unable to spread on their fields due to current economic constraints.
- **Compost Product:** There is great flexibility in compost products for turf production. Multiple studies²⁷ recommend biosolids and lower grade compost products. For turf installations, higher grades are more important. Cost, consistency, spreadability, pH, and soluble salts were reported as important considerations in choosing a product.
- **Barriers:** Liquid fertilizers are easier and cheaper to use and thus, are commonly used in turf production in the region. The cost of compost and lack of means to spread it are the biggest barriers. Distance from the compost source and resulting transportation costs are also an issue. Nearby sod farms range in size from 70 to over 300 acres and represent a significant potential, *if*, the barriers to

²⁵ Vermont Agency of Natural Resources (VANR), Johnson, Qian, Davis “Effects of Compost Top Dressing on Turf Quality of Kentucky Bluegrass”. Colorado State University.

²⁶ Only one Sod Farm exists in Boulder County and they do not use compost; however, there are sod farms in Weld County that reported they are using significant amounts of compost in both planting on-site and sod delivery and installation services.

²⁷ Vermont Agency of Natural Resources (VANR), Johnson, Qian, Davis “Effects of Compost Top Dressing on Turf Quality of Kentucky Bluegrass”. Colorado State University. among others.

use could be overcome. Unfortunately, the sod farm reported that what they are doing now works well for them and there is little incentive or reason to change their practices.

- **Recommendations:** Sod farms that we spoke with outside of Boulder County seemed interested in spreading compost on their turf farms especially if the price was mitigated (perhaps under \$10 / cubic yard). Since there are only a handful of nearby farms, working on an individual basis to encourage usage through education and partnering may be a possible solution.

Sector: Golf Courses

Many of the courses in the county are using some sort of blended compost product as a top dressing for tee boxes, driving ranges, and high traffic areas of golf courses and a small amount of compost is used in planting and flower boxes. There is the potential to use perhaps an additional 50 to 100 cubic yards of compost per year.

- **Estimated Use:** 50 – 100 cubic yards per year²⁸
- **Description:** Golf courses are only a small user of compost in the County and they tend to use a specialty blend of sand and compost (80/20 ratio) as a top dressing on tee boxes, driving ranges, and a small portion of their fairways. They do not use compost, even as a top dressing, on the greens. Compost is also used to grow divot replacements. The golf courses purchase compost and they make compost on-site out of their plant trimmings (one reported they only used compost they made themselves).
- **Compost Product:** The golf courses use a specific top dressing blend that is designed for their use. The material must be easy to spread, have fine particles and meet the USGA recommendations for quality and content. They tend to purchase materials from specialty processors and sellers. In addition to top dressing they use a small amount of compost in garden boxes and plantings. They do not use compost on the greens or the majority of the acres of fairways. The top dressing costs around \$14 to \$20 per ton delivered.
- **Barriers:** The risk of compost harming golf courses is a barrier, especially on the greens, and the golf course superintendents reported they would not use it, even as a blended product, on the greens. It is cost prohibitive to purchase and apply compost as top dressing to the entire fairway, and compost cannot replace the need for fertilizers. The interviewees also reported the potential for compost to cause 'black layering'²⁹ if not applied correctly.
- **Recommendations:** The golf course superintendents felt that the best way to increase the use of compost and top dressing in the County is through product marketing. Golf course superintendents are time constrained and if a product representative can come to them, tell them the benefits and the specifications for compost products; it would potentially increase the use throughout the County.

Sector: Universities

Universities and colleges in Boulder County vary from having 3 million square feet of turf to no landscaping. Those with smaller amounts of landscaping use compost only on rare occasions using more potting mix for beds. The largest university purchases in bulk annually for use as part of a mix on turf and planting beds. Potential for increased usage depends on future construction plans.

²⁸ The amount of topdressing is much higher and is closer to 875 to 1,750 tons per year. The top dressing is generally 80/20 sand to compost ratio with about a 25 to 1 sand to compost ratio by weight.

²⁹ Black layer occurs when the compost does not mix well with the native soil and a visible layer of compost forms.

- **Estimated Use:** 150-200 cubic yards per year³⁰
- **Description:** CU Boulder has an estimated 3 million square feet of turf with another 2 million in the housing area. They also have 783,000 square feet of planting beds and another 301,000 included in housing. For planting beds they use a higher percentage of compost mixed in and a lesser amount on turf.
- **Compost Product:** The University is required to follow standards set that require certified products. Products that are applied to turf are especially important due to the human contact. Not only in the sports areas, but also near building and dormitories where students often rest on the lawns. CU also has a very small window after winter in which to get the turf fields up to the required standards to meet the athletic needs, therefore, they are very particular that the quality of the product they apply. They reported that the products they use most meet nutrient and content standards as well as visual standards including no visible contamination.
- **Barriers:** A barrier for the many of the actors in the university sector is simply lack of need for the product due to few landscaped areas. CU is not expecting any large developments and believes their compost usage will remain the same in the next five years. Specific requirements for time and product quality and past experiences with poor quality products make them hesitant to deviate from their current plan.
- **Recommendations:** CU Boulder has an emphasis on sustainability and idea of procuring compost locally is appealing. However, as CU has specific standard for quality especially on turf, any new product they use would have to meet standards and be proven to be consistent. There is somewhat more leeway for products going on planter beds, but CU is not a large potential source of increased use in the near future.

Sector: School Districts and Private Schools

School districts are using compost as a top dressing for sports fields. There is some small usage in planting beds and as part of composting education. Private schools contacted ranged from no sports fields, using municipal fields, to one school with large acreage and fields, but making their own compost. The personnel as well as landscapers who work for the school district indicated that there is desire for increased compost usage; perhaps up to 50 to 75 cubic yards year.



- **Estimated Use:** 175 to 200 cubic yards annually
- **Description:** There are two public school districts having approximately 115 buildings in Boulder County and part of Broomfield County. They purchase top dressing for use on their sports fields. Private contractors are typically used for new construction and new turf. Boulder Valley SD also has a composting education program called GreenStar with 23 schools in Boulder County where compostable materials are collected. At the end of the year they receive compost back for use in their school gardens or by families. On average, about 5 schools per year receive 10 to 20 cubic yards of compost. St. Vrain School District also has some schools that are beginning community garden-type programs. Most private schools in Boulder County do not have enough space for their own fields and

³⁰ This is the amount of compost, the number of tons of blended top dressing used are considerably higher.

use municipal sports fields. One private school with large acreage is making its own compost with leaves and grass clippings producing about 100 cubic yards a year.

- **Compost Product:** Public Schools are purchasing compost/ sand premixed product for use on turf as top dressing. As students come in contact with this product it must meet particular standards for ingredients and screening. The community garden and compost projects have less rigorous screening requirements and include food scraps, but must be safe for vegetable gardens.
- **Barriers:** Public schools are dramatically influenced by price and requirements for public use. The product needs to be screened so that they can put it down in areas that children use. It also needs clear labeling. Employees and landscapers that we spoke with recognize the benefits of more compost spreading for high use fields, but have constraints of budgeting.
- **Recommendations:** Boulder Valley School District (BVSD) provides a good example of compost use on fields and in education and could serve as a possible example for other school districts. This includes sharing information on compost application, sourcing, and benefits with other school district staff. Budgets will remain a limiting factor to compost use.

Sector: Sports Complexes

The vast majority of sports field in Boulder County are managed by municipalities, the County, or school districts and the privately owned / maintained fields are limited. Horse arenas and turnout pastures were included in this sector and provided no additional tonnages of compost use. Potential additional usage is limited unless other privately owned fields are developed and is estimated to be 70 to 100 cubic yards annually.

- **Estimated Use:** 25 to 75 cubic yards annually.
- **Description:** Multiple sports complexes were identified in Boulder County, but they were owned and operated by the various municipalities or by the State University. Their usage of compost is included in the totals for those sectors. The sports field sector reported they use topdressing on the fields, but they tend not to do so on an annual basis due to cost. Horse arenas and fields were also included in this section. Those we spoke with used their onsite manure to apply to the fields and used a sand and topsoil mixture in the arenas.
- **Compost Product:** The top dressing the sports association uses is a compost and sand mixture (typically 80/20 blend). They reported they would use a manure product if it were properly matured, but they would not use anything with biosolids. The top dressing is purchased from a specialty processor.
- **Barriers:** Transportation, application, and cost for small sports associations are a barrier. For horse farms, the availability of free product is a barrier for usage of other purchased compost.
- **Recommendations:** This is a very small sector and at this time we are not aware any planned additional private sport complexes. Horse farms may be interested in using food scraps to add to their manure for compost. For the sports association, there is the potential of 70 to 100 additional cubic yards a year if the price were competitive.

Sector: Landscape Architects

Landscape architects design landscaping plans that most often include soil amendment. The firms, for the most part, do not do the work themselves and it is up to the landscape contractor to select the product. The landscape designers tend to recommend the addition of between 3 and 6 cubic yards of compost per 1,000 square feet of improvements.

- **Estimated Use:** N/A – use included under landscape (contract, design, and maintenance)

- **Description:** The landscape architects often serve as the intermediary between a landscape contractor and a project manager or homeowner. The majority of landscape architects include specifications for soil amendment in their plans (between 3 and 6 cubic yards per 1,000 square feet) but do not dictate the actual soil amendment product. Some of the landscape architects design plans that are bid on and others have a select number of landscapers that they work with regularly. The architects included plans for commercial and new and existing residential.
- **Compost Product:** The compost products used are generally decided upon by the landscapers, not the landscape architects. In some cases the landscape architect will include product nutrient and pH specifications and in others they do not. The level of soluble salts and the acidity / alkalinity of the compost were reported to be the most important considerations. The products are usually purchased from wholesalers in bulk by the landscapers themselves.
- **Barriers:** The only barrier to increased compost use was reported to be the general economic slowdown and the lack of significant new construction in the County. Once again, cost was also a barrier to increased use.
- **Recommendations:** The majority of landscape architects already specify the use of soil amendment in their plans. It is possible the County could work with the sector to define what an acceptable compost product is (as CDOT did), and a compost product certification at the state level might help compost gain greater acceptance in the sector.

Sectors that Do Not Directly Purchase or Use Compost

Cemeteries, Large Industrial Campuses, Home Owners Associations, Federal Facilities, and Civil and Structural Engineers were all interviewed for this research project. Although compost may be applied to the open space on a HOA, the HOAs contacted reported that it was up to the contracted landscaper to make decisions on the use of compost and compost products. The same was reported by the large industrial and federal facilities interviewed. The cemeteries interviewed reported they do not use any compost and the civil and structural engineering firms that are responsible for projects in Boulder County such as the Boulder Creek Path, renovations at University of Colorado, contracting with municipalities, and large commercial like the 29th Street Mall, reported that all decisions on soil amendment and compost use are made by the landscape architects and landscape designers. Multiple residential and commercial contractors were contacted and all reported that the landscaping is contracted out to landscapers regardless of the size or type of the development.

Appendix A: Compost Facility and Product Classifications

Products

Compost end product, not to be confused with mulch, wood chips, top soil, or manure, can vary greatly depending on the feedstock (food scraps, yard waste, biosolids, manure, etc.) and the process by which it is made. While there is no one national or state designation of classifications for certified compost, the US Composting Council has developed the Seal of Testing Assurance (STA) to test, label, and certify compost end product. The STA certification is recognized and used by many of the leading manufacturers of composting in the US, including many in Colorado and is referred to throughout this report. Under STA there are four classifications of compost, as described briefly in Figure A.1 below.

Figure A.1: USCC STA Compost Classifications

<i>Class I</i>	<i>Class II</i>	<i>Class III</i>	<i>Class IV</i>
Fully composted, stabilized product generally made from non-manure feedstock	Fully composted, stabilized and mature product generally made from manure based feedstock	Partially composted or dehydrated product, may be shredded or screened but is not mature / stable	Raw feedstock such as manure

Facilities

Processing was not a focus of the project. However, a brief review of facility types and feedstocks was necessary to provide a context for the research. Section 14 of the state Solid Waste Regulations sets forward compost site classifications based on the type of feedstock, the volume of feedstock, the size of the facility and the facility's operation type.

The regulations use three feedstock "types" in their classifications:

- Type I: Agricultural crop residues, manure, untreated wood wastes, yard, paper and green wastes
- Type II: Animal material, animal mortalities and source separated food waste
- Type III: Biosolids, solid waste, processed solid waste and sludge

The feedstock types are used to delineate the 5 permitting classifications:

- Class I: The most highly regulated classification requiring the most site planning, accepts Types I, II, and III
- Class II: Accepts Type I and II
- Class III: Accepts Type I only, limited in volumes but less regulation
- Class IV: Accepts Type I only and food waste generated on site with less volume and regulations than Class III
- Class V: For agricultural composters
- Other classifications include Pilot project, Backyard composter, and Ag. Exempt.

Appendix B: Registered Compost Facilities

FACILITY NAME, Classification, Facility Address, City, County (alphabetical by County) ³¹
WESTERN DISPOSAL COMPOST SITE, Class II 2655 N. 63rd st. Boulder Boulder
CB INDUSTRIES COMPOSTING, Class I 11289 Doughspoon Road Austin Delta
TOWN OF GYPSUM Class I Trail Gulch Road Gypsum Eagle
DONS GARDEN SHOP Class III 6001 E Platte Ave. Colorado Springs El Paso
MIDWAY LANDFILL and MIDWAY ORGANIC Class I 8925 Rancho Colorado Blvd. Pueblo El Paso
ROCKY TOP RESOURCES, INC. 1755 East Las Vegas Street Colorado Springs El Paso
FREMONT CORRECTIONAL FACILITY Class IV Hwy 50 and Evans Blvd Canon City Fremont
SOUTH CANYON SOLID WASTE DISPOSAL SITE Class I 1205 County Road 134 Glenwood Springs Garfield
WEST RIFLE COMPOST 2515 W Centennial Pkwy Rifle Garfield
COLORADO STATE UNIVERSITY COMPOST FACILITY Class IV 4318 Laporte Ave Ft. Collins Larimer
DYE DAIRY Class V 1137 N. County Line Rd 1 Ft. Collins Larimer
MOUNTAIN VIEW FARM Class V 6875 N Cty Rd 9 Loveland Larimer
STERLING CORRECTIONAL FACILITY Class IV 12101 HWY 61 Sterling Logan
MESA COUNTY LANDFILL Class I 3071 Highway 50 Grand Junction Mesa
TEAGUE ENTERPRISES Class II 15366 Road O Fort Morgan Morgan
PITKIN CTY SOLID WASTE CENTER Class V 32046 Highway 82 Snowmass Village Pitkin
MILNER LANDFILL Class I 20650 Routt County Road Milner Routt
COLORADO NATURAL COMPOST 18504 County Road 50 Saguache Saguache
COMPOST TECHNOLOGIES, LLC 51201 County Rd. G Center Saguache
SUMMIT COUNTY RESOURCE ALLOCATION PARK Class I 639 SCR 66 Dillon Summit
COLORADO COMPOST Class III SE 1/4 Section 10, T2N, R52W Akron Washington
BOSS COMPOST 16700 WCR 12 Ft. Lupton Weld
EATON COMPOSTING-A1 Class I 16350 WCR 76 Eaton Weld
FRONT RANGE DAIRY Class V 9743 WCR 16 Fort Lupton Weld
HIGHWAY 66 COMPOSTING-A1 Class I 7391 Highway 66 Platteville Weld
ORGANIX SUPPLY Class V 15121 County Road 32 Platteville Weld
PERMAGREEN PRODUCT COMPANY Class III 2663 Weld County Road Erie Weld
RATTLER RIDGE COMPOSTING-A1 Class I 12002 WCR 59 Keenesburg Weld
STROMO COMPOSTING, LLC 21970 Rd 30 Hudson Weld
TV DAIRY Class V 7678 WCR 17 Fort Lupton Weld
ACE COMPOSTING Class I 10639 CoRd 30 Yuma Yuma

³¹ From the Colorado Department of Public Health and Environment (CDPHE) Solid Waste and Material Management Unit

Appendix C: Compost Products Available in Boulder County

Figure C.1: Bagged Products

<i>Product Name</i>	<i>Manufacturer</i>	<i>Specs on Bag</i>	<i>Certification</i>	<i>Price per cubic foot</i>
Brownie Cow manure	Permagreen	No	Not listed	\$1.78
Mushroom Compost Blend	Permagreen	No	Not listed	\$2.40 to \$3.318
Sheep and Peat	Permagreen	No	Not listed	\$3.66
Second cycle	Permagreen	No	Not listed	\$2.77
EKO Compost	Richlawn	No	Not listed	\$3.55 to \$3.31
Nature's Yield	Richlawn (Organix)	No	Not listed	N/A
Earth Essentials - Cow and Compost	Richlawn (Organix)	No	Not listed	N/A
Earth Essentials - Sheep, Peat, and Compost	Richlawn (Organix)	No	Not listed	N/A
Earthgro Steer manure	Scotts	No	Not listed	\$0.88
Compost Mix	EcoScraps	No	Not listed	\$5.97
Super Soil- Enriched Planting Compost	Rod McLellan Company	Yes	Mulch and Soil Council	\$2.89
Super Soil - Garden Amender	Rod McLellan Company	Yes	Mulch and Soil Council	\$2.89
Western Disposal	Western Disposal	N/A	STA Class 1	~\$5

Figure C.2: Bulk Products

<i>Product Name</i>	<i>Manufacturer</i>	<i>Certification</i>	<i>Price per cubic yard</i>
BioComp	A1 Organics	STA Class 1	\$36.95
Progro	A1 Organics	STA Class 2	\$46.95
Premium	A1 Organics	STA Class 2	\$35.95
Planters Mix (30% compost / 70% topsoil)	A1 Organics	STA Certified	\$35.95
Second Cycle Compost (yw only)	Permagreen	None	\$32
Premium Compost (manure and YW)	Permagreen	None	\$29.50
Black Tea Compost	BOSS	Class I	Not listed
Boston Tea Compost	BOSS	Class II	Not listed
Black Tea Outback Compost	BOSS	Class I	Not listed
Western Disposal	Western Disposal	STA Class II	\$26
Humalfa	Humalfa (T.J Crowder and Sons LLC)	STA Class II	Not listed
Nature's Own	Renewable Fibers	Not listed	\$31.95
Premium Dairy	Renewable Fibers	Not listed	\$30.95
Royal	Renewable Fibers	Not listed	\$33.95
Hardwood humus	Soil rejuvenations	Not listed	\$35.00
Dairy	Soil rejuvenations	Not listed	\$21.00
Garden Compost #5	Soil rejuvenations	Not listed	\$100.00