



# Partnering for Change

Larimer County  
Solid Waste Infrastructure  
Master Plan

*Larimer County, Colorado*

October 25, 2018

*DRAFT – FOR  
LARIMER COUNTY  
ADOPTION*

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- Memo A: Task 3 – Emerging Technologies Technical Memorandum
- Memo B: Task 3 – Solid Waste Management Practices Memo
- Memo C: Task 5 – Solid Waste Volumes Memo (with attachments)
- Memo D: Analysis of Infrastructure Options (with attachments)
- Memo E: Potential Local Government Options and Policies (with attachments)
- Memo F: Disposal Site Options – Advantages and Disadvantages (with attachments)

### VOLUME III: APPENDICES

- Appendix A: Colorado Integrated Solid Waste & Materials Management Plan
- Appendix B: Final Report – Phase 1 Regional Wasteshed Planning Study
- Appendix C: Stakeholder Presentations (1-7)

## Acronyms and Abbreviations

AD	Anaerobic Digestion
BCR	Benefit-Cost Ratio
C&D	Construction and Demolition
CAA	Clean Air Act
Coalition	North Front Range Regional Wasteshed Coalition
COBRA	Co-benefit Risk Analysis
eGRID	Emissions & Generation Resource Integrated Database
EPA	U.S. Environmental Protection Agency
HHW	Household Hazardous Waste
LF	Landfill
MMRF	Multi-Materials Recovery Facility
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
NHSM	Non-Hazardous
PAC	Policy Advisory Committee
Plan	Solid Waste Infrastructure Master Plan
RDF	Refuse Derived Fuel
SROI	Sustainable Return on Investment
TAC	Technical Advisory Committee
TBL	Triple Bottom Line
TS	Transfer Station
VMT	Vehicle Miles Traveled
Wasteshed	North Front Range Regional Wasteshed
WTE	Waste to Energy
WWTF	Waste Water Treatment Facility
YW	Yard Waste

# Executive Summary

## Background

Responsible solid waste management has long been a shared goal of the governing agencies within Larimer County. The Larimer County Landfill began operations in the late 1960s. In 1972, the cities of Fort Collins and Loveland and Larimer County collaborated when the jointly owned landfill was established to ensure that environmental regulations and citizen needs could be met for waste disposal in the Wasteshed. With the inevitable upcoming closure of the Larimer County landfill (expected around 2025) and predictions of continued regional population growth, these partners, plus the neighboring community of Estes Park, worked together to evaluate waste management needs and develop guidance plans to manage waste for the region into the future. The result of that effort is this Master Plan.

The North Front Range Regional Wasteshed Coalition (Coalition) was formed in 2015 to address the future of solid waste management. The Coalition includes a Policy Advisory Committee (PAC) made up of elected officials from Fort Collins, Loveland, Estes Park, and Larimer County, a Technical Advisory Committee (TAC) made up of staff members from the same entities and a Stakeholder Advisory Group consisting of representatives from local businesses, community groups, educational institutions, regional governance and all eight municipalities within Larimer County. The charter of the Coalition is to responsibly address the current solid waste management and resource recovery needs of the region, while considering infrastructure and policy that will meet community needs in the future.

Although the current solid waste infrastructure in the Wasteshed is working well, significant portions of the waste stream are recoverable and challenges are foreseeable in the near future. These challenges include the closure of the Larimer County Landfill (which is expected to reach capacity in 2025 and is the primary asset of the current infrastructure system) the need to address population growth and additional future waste, infrastructure capacity, sustainability, and other related issues, while paying close attention to financial constraints and responsibilities.

In 2016, the Coalition initiated the first phase of the process. A Regional Wasteshed Report was developed through public engagement that included four public forums in September 2016 focused on the issues of resource recovery and materials management. This report formed the basis for further evaluation of infrastructure options developed to address current and future solid waste demands within the Wasteshed.

The Coalition initiated the second phase of its multi-year Regional Wasteshed Planning Study in 2017, and retained the firm of HDR Engineering, Inc., to further identify a road map for the continued efficient, economical, and environmentally responsible handling of waste generated within the Wasteshed. To further identify and analyze options for developing the future regional waste infrastructure system, this North Front Range Regional Wasteshed Coalition Solid Waste Infrastructure

Master Plan (Plan) reviews and recommends potential infrastructure options based on established goals and objectives, population and waste projections, resource needs, capital and operational costs, and sustainable return on investment analyses.

## Goals of the Plan

Through active collaboration and feedback from stakeholders and community members, the Coalition developed the following goals to assist in guiding the Wasteshed to a sustainable and achievable future regional solid waste infrastructure system. The shared goals are as follows:

**Goal #1:** Establish a comprehensive, regional solid waste materials management system by 2025 that is implemented in an economically, environmentally, and socially sustainable manner.

**Goal #2:** Create a comprehensive solid waste materials management plan and implement programs and facilities that reflect the needs and desires of users.

**Goal #3:** Develop a set of waste diversion/reduction goals that are adopted and implemented by all jurisdictions in the Wasteshed.

**Goal #4:** Develop a strong public education and outreach program that is consistent throughout the Wasteshed.

## Phase 2 Study Stakeholder Engagement

To ensure alignment with the needs and expectations of the local businesses and communities, the Coalition actively developed and engaged a Stakeholder Advisory Group comprised of 88 representatives from throughout the Wasteshed including: regional governments/agencies, boards and commissions, educational institutions, solid waste industry, business/industry, and various associations. The Stakeholder Advisory Group was key in reviewing and providing consensus with the findings and recommendations presented by the TAC throughout the study process.

A total of seven (7) stakeholder meetings were held throughout Phase 2; each meeting covered specific topics discussed in the sections of this Plan and included progress updates of the infrastructure evaluations. Prior to each meeting, an email invitation was sent to the entire members of the Stakeholder Advisory Group to inform them of the meeting date, time, location, and topic. A website was established specific to the stakeholders that housed documents shared with the stakeholders and provided a forum for submitting comments in the event they missed a meeting.

## Infrastructure Options Considered

Through a collaborative effort with the Coalition's TAC, stakeholders, and community partners, 11 potential solid waste infrastructure options were chosen to further refine, identify, and analyze. The options selected for further evaluation were:

- Status Quo
- Central Transfer Station



- New County Landfill or Alternate Disposal Site
- Material Recovery Facility (Clean)
- Yard Waste Organic Processing Facility
- Construction and Demolition Debris Processing Facility
- Energy From Waste Facility – Direct Combustion
- Mixed Waste Processing (Dirty Material Recovery Facility [MRF])
- Static Aerated Composting including Food Waste
- Anaerobic Digestion
- Refuse Derived Fuel Processing

Upon completion of the individual infrastructure options evaluation, the Coalition’s TAC carefully considered the impacts, costs, and benefits of a complete and comprehensive solid waste infrastructure system. This proposed comprehensive solid waste infrastructure system was presented to the Stakeholders and the PAC, for their concurrence and eventual selection as the recommended option to proceed forward as the future solid waste management infrastructure for the Wasteshed. Table ES-1 outlines the tiered infrastructure options selected with the Sustainable Return on Investment (SROI) ranking, a potential schedule for siting approval, permitting and design, construction and year to be placed in service. The TAC chose not to eliminate technologies from future consideration, in the event that in the future they became more viable, so instead ranked them in a tiered approach given the current status of each technology.

Table ES-1. Tiered Infrastructure Options				
Tier Recommendations	Potential Schedule			
	Local Siting Approval	Permitting/ Design	Construction	In Service
<b><u>Tier 1</u></b>				
Central Transfer Station	2019	2020	2021	2022
New County Landfill	2019	2020	2022	2023
Yard Waste Open Windrow Composting	2020	2021	2022	2022
Construction & Demolition Waste Processing	2020	2021	2022	2022
Food Waste Composting – Static Aerated Bin	2021	2021	2023	2024

Table ES-1. Tiered Infrastructure Options				
Tier Recommendations	Potential Schedule			
	Local Siting Approval	Permitting/ Design	Construction	In Service
<b><u>Tier 2</u></b>				
Clean Material Recovery Facility /Upgrade	Assessed Annually Moving Forward			
Anaerobic Digestion /Pre-Processing - WWTP				
<b><u>Tier 3</u></b>				
Waste to Energy (Direct Combustion)	Possible Future Consideration			
Refuse Derived Fuel Processing				
<b><u>Not Considered Viable</u></b>				
Mixed Waste Processing - Dirty MRF	Not Currently Viable			
Status Quo				

The New County Landfill infrastructure option was initially evaluated as a publicly owned and operated facility. Subsequent to the initial evaluation, the TAC considered further evaluating an alternative disposal site or privately owned and operated facility for the landfill infrastructure option as a result of an unsolicited private disposal option. Based on this further evaluation the recommendation was made to move forward with the option of a publicly owned and operated landfill.

As the New County Landfill infrastructure option moves forward, additional investigation of the site owned by the County will need to be initiated to ensure suitability for construction and operation of a landfill facility. If the property is not suitable for a landfill, the TAC and the PAC will reconvene and re-evaluate disposal options.

## Process Controls and Risk Management

The TAC considered potential regulations and policies to be adopted that would support the business model of the infrastructure options chosen for the regional solid waste management system. This included an assessment of associated risks, advantages and disadvantages for each process control. During the TAC's evaluation of process controls options, consideration was given to the implications for the public, commercial industry, private haulers, solid waste industry, and elected officials. Each of the controls evaluated have been previously implemented in some manner throughout the region or elsewhere in the country.

Key findings resulting from review of potential local process controls options and policies included:

- Currently, there are limited controls, policies and regulations in place in the Wastashed to guarantee that waste is directed to infrastructure that supports the goals and objectives that the Coalition has established to enhance waste reduction and diversion.
- It is common practice for municipalities and local government to employ some method of regulatory control, whether it be through ordinances, policies or procedures to ensure waste is handled in an environmentally responsible manner.
- Due to the competitive nature of the waste industry in the region, more specifically the low cost of burying waste, local governments can be subject to the risk of rising costs if regulatory control is not established for waste reduction and diversion purposes.
- Regulatory control protects the health, safety and the welfare of the community by providing greater control and oversight of solid waste management activities and protects natural resources by allowing the municipalities to designate disposal and recycling sites that meet required environmental standards or assist with achieving diversion goals.

## Phase 2 Study Public Outreach

The Coalition held a series of four public meetings around Larimer County for members of the public to learn more about the future of solid waste in the region and to provide feedback on the draft regional master plan concepts for waste recovery and disposal. The meetings were held in an open-house format, displaying 11 informational boards throughout the room and included project overview presentations. Comment forms were provided for attendees to submit written feedback.

More than 100 participants attended the public meetings and provided valuable feedback to the Coalition members.

## Phase 2 Study Recommendations

Building on the vision, goals, and objectives established by the Coalition, stakeholders, and community members, and their recommendations for

infrastructure facilities, an implementation schedule was established that outlines the 7-year plan for moving forward with the recommended actions. Table ES-2 outlines the recommendations and implementation schedule for the Coalition to put in to action prior to the closure of the Larimer County Landfill.

Table ES-2. Implementation Schedule								
Recommendation	Implementation Responsibility	Implementation Year						
		2018	2019	2020	2021	2022	2023	2024
<b>Infrastructure</b>								
The Coalition and stakeholders recommend that the Tier 1 Infrastructure be approved, built and in service prior to the closure of the Larimer County Landfill in 2025. Recommended Tier 1 facilities are:	Larimer County							
• Central Transfer Station (Jan 2019–Jan 2023)			✓	✓	✓	✓		
• New County Landfill <sup>1</sup> (Jan 2019–Jan 2024)			✓	✓	✓	✓	✓	
• Yard Waste Open Windrow Composting (Jan 2020–Jan 2023)				✓	✓	✓		
• Construction and Demolition Waste Processing (Jan 2020–Jan 2023)				✓	✓	✓		
• Food Waste Composting – Static Aerated Bin (Oct 2021–Feb 2025)					✓	✓	✓	✓
The Tier 2 Infrastructure will be reviewed on an annual basis by the Coalition for possible implementation at a later date.	Larimer County City of Fort Collins City of Loveland Town of Estes Park	Ongoing						

**Table ES-2. Implementation Schedule**

Recommendation	Implementation Responsibility	Implementation Year						
		2018	2019	2020	2021	2022	2023	2024
<b>Policy and Process Controls</b>								
Draft policy language will be developed through a collaborative process by the TAC for process controls, waste bans and hauler licensing that will yield specific results associated with waste diversion, reductions and recycling while achieving consistency amongst the Coalition members. Once drafted, the policies/codes should be vetted through each of the Coalition's government entities for comments.	Larimer County City of Fort Collins City of Loveland Town of Estes Park	Q4	-	-	-	-	-	
An Intergovernmental Agreement for Solid Waste handling will be drafted by the Coalition members and adopted by each of the Coalition's government entities.	Larimer County City of Fort Collins City of Loveland Town of Estes Park	-	Q1	-	-	-	-	
<b>Administration and Education</b>								
The Coalition members will work cooperatively to establish a public education and outreach program to educate the citizens and stakeholders on upcoming changes to the waste management system in the Wasteshed.	Larimer County City of Fort Collins City of Loveland Town of Estes Park	Ongoing						

Table ES-2. Implementation Schedule								
Recommendation	Implementation Responsibility	Implementation Year						
		2018	2019	2020	2021	2022	2023	2024
Upon adoption of the Intergovernmental Agreements, an Advisory Board should be established which consists of Coalition members, stakeholders and members of the public to advise on solid waste management issues.	Larimer County City of Fort Collins City of Loveland Town of Estes Park	-	Q3	-	-	-	-	-

<sup>1</sup>The recommendation will require an initial site evaluation to determine if the County owned site is suitable for landfill infrastructure.