



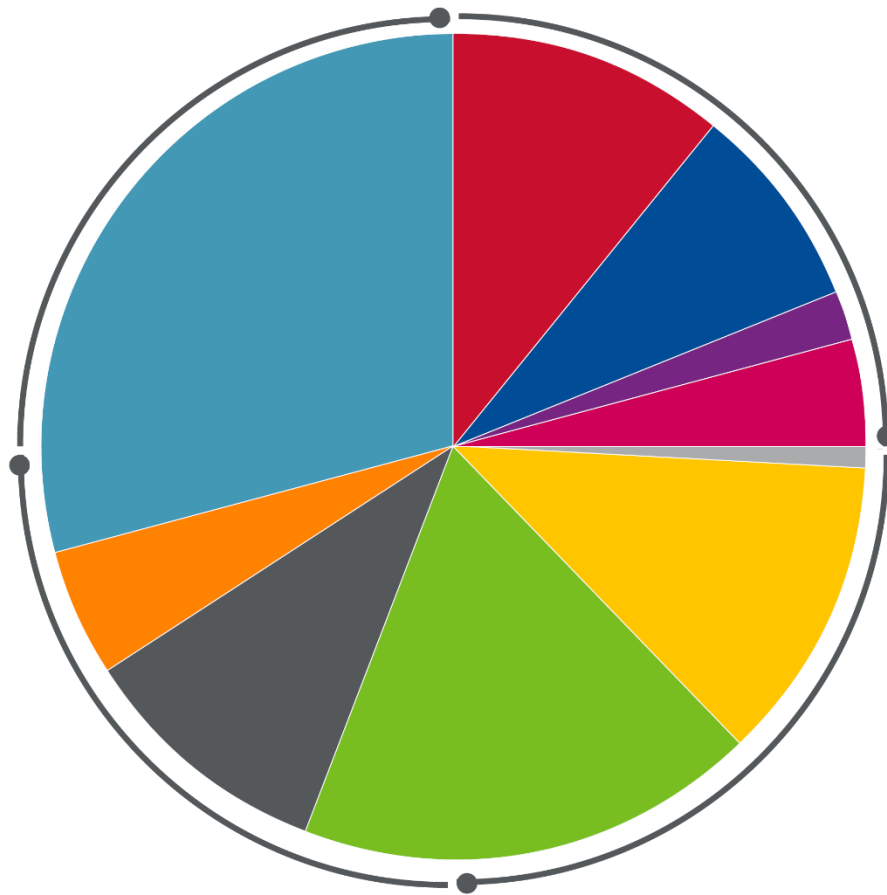


Expiring Solid Waste Disposal Systems & Planning The Next Generation of Solid Waste Management

Doug DeCesare, PE | August 27, 2019



Larimer Co. 2016 Waste Composition & Characterization Analysis



- Paper 11%
- Plastic/Leather/Rubber 8%
- Glass & Ceramics 2%
- Ferrous Metal 4%
- Non Ferrous Metal 1%
- Yard Waste 12%
- Wood 18%
- Food Waste 10%
- Textiles 5%
- Other (2) 29%

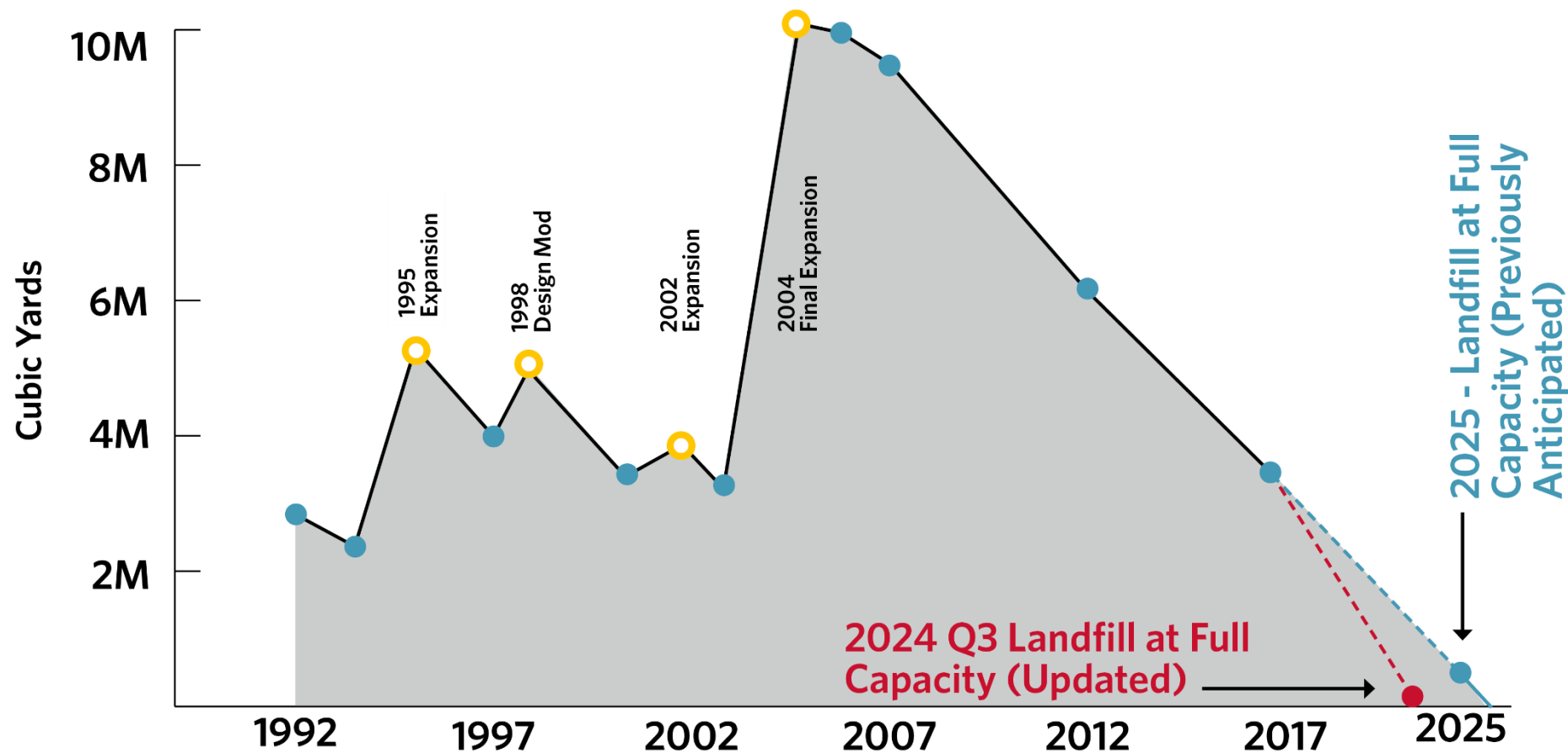
*Percent by Weight, All Wastes Delivered to Landfill
(Other = construction and demolition debris and other materials)*

Self Haul Vehicles Continue to Increase

	2017	2018 (Jan-Oct)
Total Self Haul	90,326 vehicles	75,705 vehicles
Total Landfill	157,652 vehicles	141,668 vehicles
Self Haul as a % Total	57.3%	53.4%

Why is a new system needed?

AIR SPACE REMAINING AT LANDFILL



Solid Waste Challenges

Increasing Volume
of Solid Waste Material



Need for Consistent
Goals and Programs



Anticipated Closure
of County Landfill



Balancing of
Economic, Environmental
and **Social Costs**



Coalition Charter



As stewards of the public trust, the charter and charge of the North Front Range Regional Wasteshed Coalition is to **responsibly address current solid waste management and resource recovery needs of the region, while considering infrastructure and policy that will meet community needs in the future.**



Coalition History

2015



Coalition Formed
Initial Planning Began
Stakeholder Forum

2016



County-wide Survey
Spring & Fall Waste
Characterization Study
Phase 1 Study Complete
Four (4) Public Forums

2017



Formulated Broader
Planning Process
Phase 2 Scope of Work
Hired Consultant
Formed Phase 2
Stakeholder Group

Policy Advisory Committee

1. Define Coalition Objectives & Provide Strategic Direction
2. Establish Attainable Goals for Solid Waste, Recycling and HHW Management
3. Evaluate Alternatives and Recommendations from TAC
4. Establish Unified Vision for Future Solid Waste Practices and Infrastructure



Larimer County
Steve Johnson



City of Fort Collins
Wade Troxell
Ross Cunniff



City of Loveland
Leah Johnson



Town of Estes Park
Ken Zornes
Wendy Koenig*

Technical Advisory Committee

- Evaluates Existing and Future Wasteshed Service Demands
- Collects and Review Technical and Financial Data
- Identifies Potential Alternatives for Solid Waste Management
- Conducts Studies and Prepares Summary Reports
- Provides Technical and Financial Recommendations to Policy Committee



Larimer County

Todd Blomstrom*
Stephen Gillette
Ron Gilkerson*



City of Fort Collins

Honore Depew
Susan Gordon
Caroline Mitchell



City of Loveland

Mick Mercer
Tyler Bandemer



Town of Estes Park

Frank Lancaster



Facilitation

Martin Carsasson - CSU

Stakeholder Advisory Group

THE COALITION ACTIVELY ENGAGED A STAKEHOLDER ADVISORY GROUP. INVITATIONS WERE SENT TO REPRESENTATIVES FROM ALL 8 MUNICIPALITIES WITHIN LARIMER COUNTY, INCLUDING THE FOLLOWING:



Local Business

- › Commercial Haulers
- › Uncle Benny's
- › Biochar Now
- › Etc.



Community Groups

- › Sierra Club - Poudre Canyon
- › TYMA of the Rockies
- › Estes Park League of Women Voters
- › Etc.



Education Institutions

- › Colorado State University
- › Poudre School District
- › Thompson School District



Boards & Commissioners

- › Fort Collins Natural Resources Advisory Board
- › Larimer County Environmental Science Board
- › Fort Collins Chamber of Commerce



Regional Governance

- › Colorado Department of Public Health and Environment (CDPHE)
- › Wyoming Department of Environmental Quality

Goals & Objectives

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

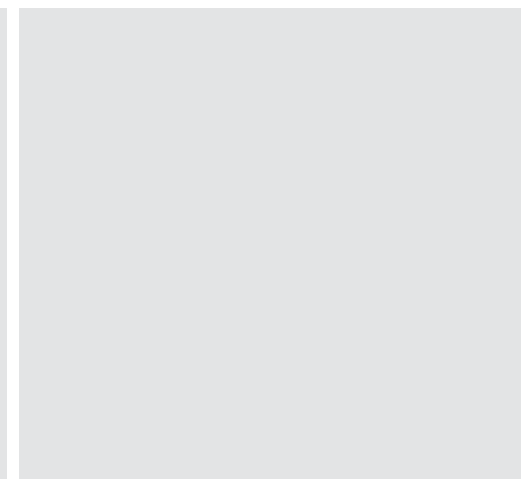
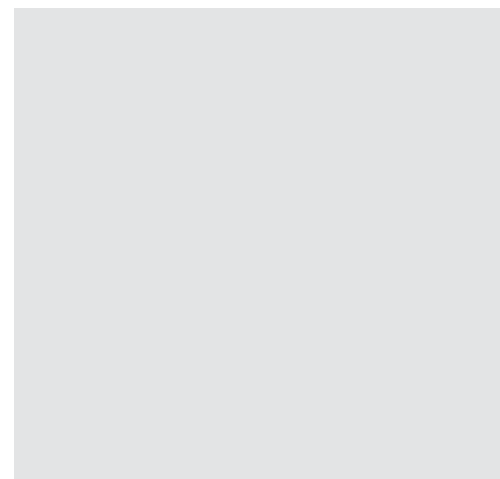
Develop a strong public education and outreach program that is consistent throughout the Wasteshed.

Emerging Technologies Overview

- The North Front Range Wasteshed Coalition has a variety of recycling, disposal, and diversion based solid waste management options in preparation for the closure of the Larimer County Landfill.
- Researched emerging and alternative technologies that may positively affect waste diversion rates, facility design and other factors within the Wasteshed.
- Considered additional infrastructure options for further analysis that have been successfully implemented in other communities.

Eleven Infrastructure Options Evaluated

- Status Quo
- **Central Transfer Station**
- **New County Landfill**
- Material Recovery Facility (Clean)
- **Yard Waste Organics Processing Facility**
- **C&D Processing Facility**
- Energy from Waste Facility (Direct Combustion)
- Mixed Waste Processing (Dirty MRF)
- **Aerobic Composting Including Food Waste**
- Anaerobic Digestion
- Refuse Derived Fuel (RDF) Processing



Technologies Ruled Out

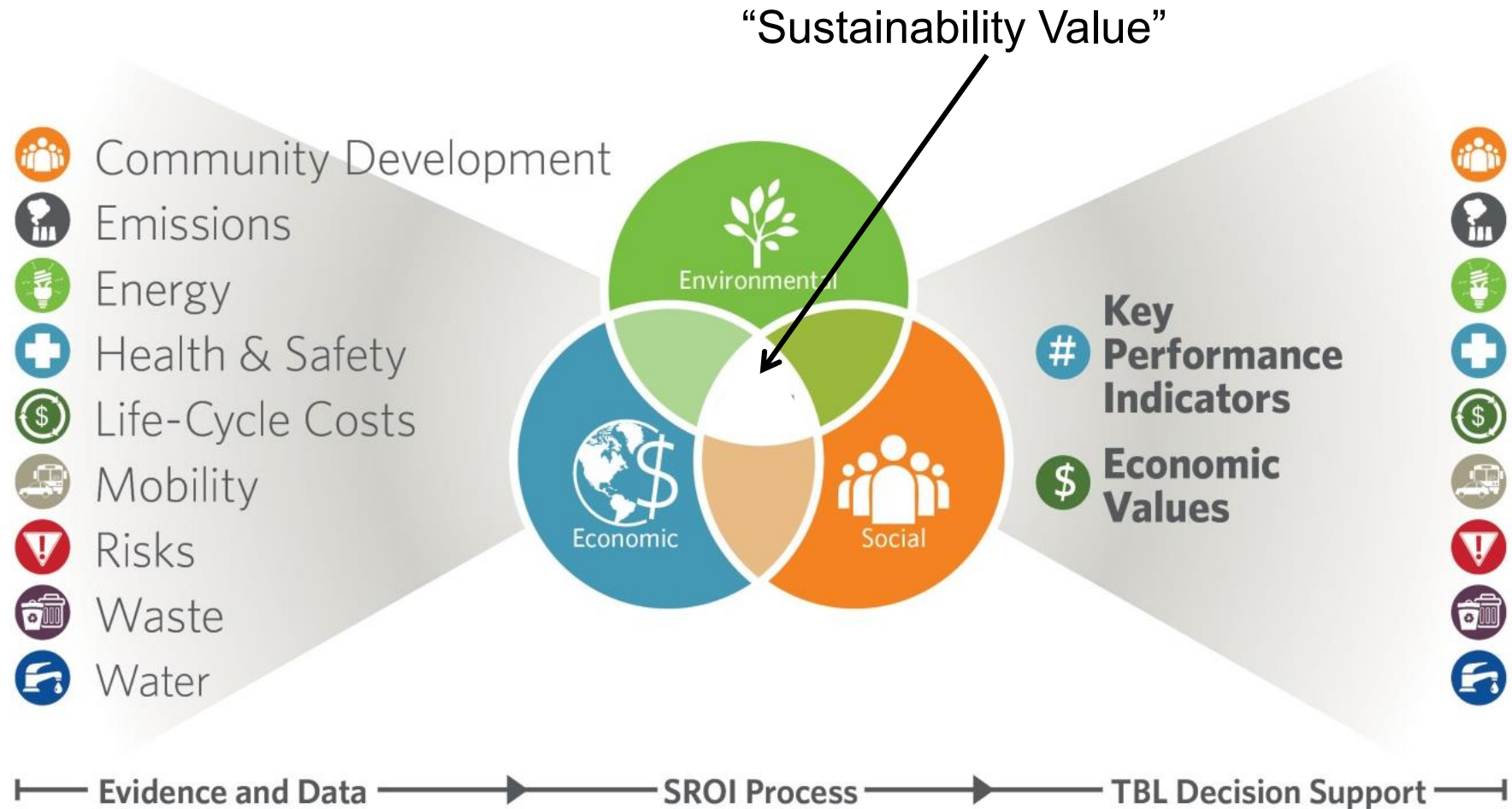
To meet the need of a solution after about 2025 for disposal for Larimer County, a developed technology is necessary. The technologies which are the least developed and therefore not recommended for further consideration include:

- Plasma Arc Gasification
- Pyrolysis
- Waste to Fuels
- Hydrolysis
- Catalytic and Thermal Depolymerization
- Autoclaving
- Gasification
- Mechanical Biological Treatment



Sustainability Value Assessment (SVA) Services

A Better Approach



Initial Tier Recommendations

TIER RECOMMENDATIONS	SROI CRITERIA BENEFIT/ COST RATIO	POTENTIAL SCHEDULE			
		Local Siting Approval	Permitting/Design	Construction	In Service
Tier 1					
Central Transfer Station	0.36	2018	2020	2021	2022
New County Landfill	0.75	2018	2020	2022	2023
Yard Waste Composting	2.75	2018	2019	2020	2020
C & D Processing	1.03	2019	2020	2022	2022
Existing Single Stream Recycling Center	-	-	-	-	-
Tier 2A					
Clean MRF/Upgrade	1.15	2019	2021	2022	2023
Anaerobic Digestion (Commercial Source Separated Organics to WWTP)	4.56	2019	2021	2022	2023
Tier 2B					
Food Waste Composting – Static Aerated Bin (Residential Source Separated Organics)	1.81	2019	2023	2025	2026
Tier 3					
Waste to Energy (Direct Combustion)	0.41	2019 (Addl. investigation)	2024	2026	2028
RDF Processing	0.07	2019 (Addl. investigation)	2024	2026	2028
Dirty MRF	0.33	2019 (Addl. investigation)	2022	2024	2025
Anaerobic Digestion	4.56	2019 (Addl. investigation)	2024	2026	2026



Yard Waste Organics Processing Facility

New County Landfill

Construction & Demolition (C&D) Processing Facility

Recommended Infrastructure Options

Central Transfer Station

Aerobic Composting Including Food Waste

Existing MRF Transfer



Costs of Recommended Facilities

Facility	Cost
Public Landfill	\$11.7M (Equity – 1 st Phase)
Central Transfer Station	\$15.8M (Equity)
Yard Waste & Food Waste Composting Facilities	\$11.8M (Finance)
Construction & Demolition Debris Processing Facility	\$13.7M (Equity)
Recycling Center Upgrades	<u>\$3.0M</u> (Finance)
Total:	~\$56M

ESTIMATED Residential Cost Per Household Impact (Example)

Current monthly fee:

- 17-gallon cart: **\$3.25** per mo.
- 35-gallon cart: **\$6.50** per mo.
- 65-gallon cart: **\$13.00** per mo.
- 95-gallon cart: **\$19.50** per mo.

Maximum monthly increase:

- **\$3.45** per mo. (20¢ increase)
- **\$6.90** per mo. (40¢ increase)
- **\$13.80** per mo. (80¢ increase)
- **\$20.10** per mo. (\$1.20 increase)

6.2% Overall Increase



Public & Private Landfill Advantages/Disadvantages

PUBLIC

Control and stability for waste disposal

Ability to direct waste to new or evolving resource recovery options

Tip fees set by local government / competitive rates

Increased service quality and flexibility

Competitive market could reduce volumes resulting in higher tip fee

Capital costs for construction & equipment

Increased traffic to new landfill

No current guarantees property is suitable for landfill use

PRIVATE

No capital costs for construction

No Operations & Management costs

Potential cost savings measure as tip fees can be negotiated

Environmental liability is partially mitigated

Loss of control and stability

Volume or type of waste increases or decreases over time impacting pricing

Potentially discourages resource recovery

Contract disputes if terms are not clear

Public/Private – Private/Public Transition Times

Transition from Public Landfill to Private Landfill



Six to Twelve Months

Transition from Private Landfill to Public Landfill



Main Policy Controls

Flow Control

Construction & Demolition
Debris

- Mixed loads
- 10-year term
- Jobsite convenience
- Market development

Flow Control

Mixed Recyclables

- “Single-stream” recyclables
- Residential and commercial
- Assured volumes attract investment

Organics

Yard and Food Waste

- Community driven diversion policies
- Readily recyclable at multiple sites
- Generate finished compost

Stakeholder Engagement Highlights

MAY 2017



30 comments were provided, in addition to discussion, to **guide the confirmation** of the North Front Range Regional Wasteshed **final Goals & Objectives**

JUN 2017



86% of stakeholders agreed that the Coalition identified all appropriate infrastructure options for review.

AUG 2017



95% of stakeholders agreed the solid waste volume data presented was detailed enough to support the next phase of the project.

OCT 2017



91% of stakeholders agreed they would **support the implementation of process controls/ordinances** for the handling of **construction & demolition waste** in order to increase rates of diversion

78% of stakeholders would **support process controls/ordinances** for **yard and food waste organics**

JAN 2018



96% of stakeholders **provided consensus to move forward** with the five **Tier 1 Recommendations**

MAR 2018



90% of stakeholders agreed to the proposed **solid waste process controls** and **limited flow controls** for **construction & demolition debris** generated in Larimer County

100% of stakeholders agreed to the **proposed process controls** for **yard waste** and **single stream recycling**

AUG 2018



70% of stakeholders **support a publicly owned landfill** with a focus on having control

PUBLIC

Informational
Meetings



FOUR PUBLIC MEETINGS

Public meetings held around Larimer County to learn more about the future of solid waste in the region and provide feedback.

ELEVEN INFORMATIONAL BOARDS






For an open house format and included an overview presentation.



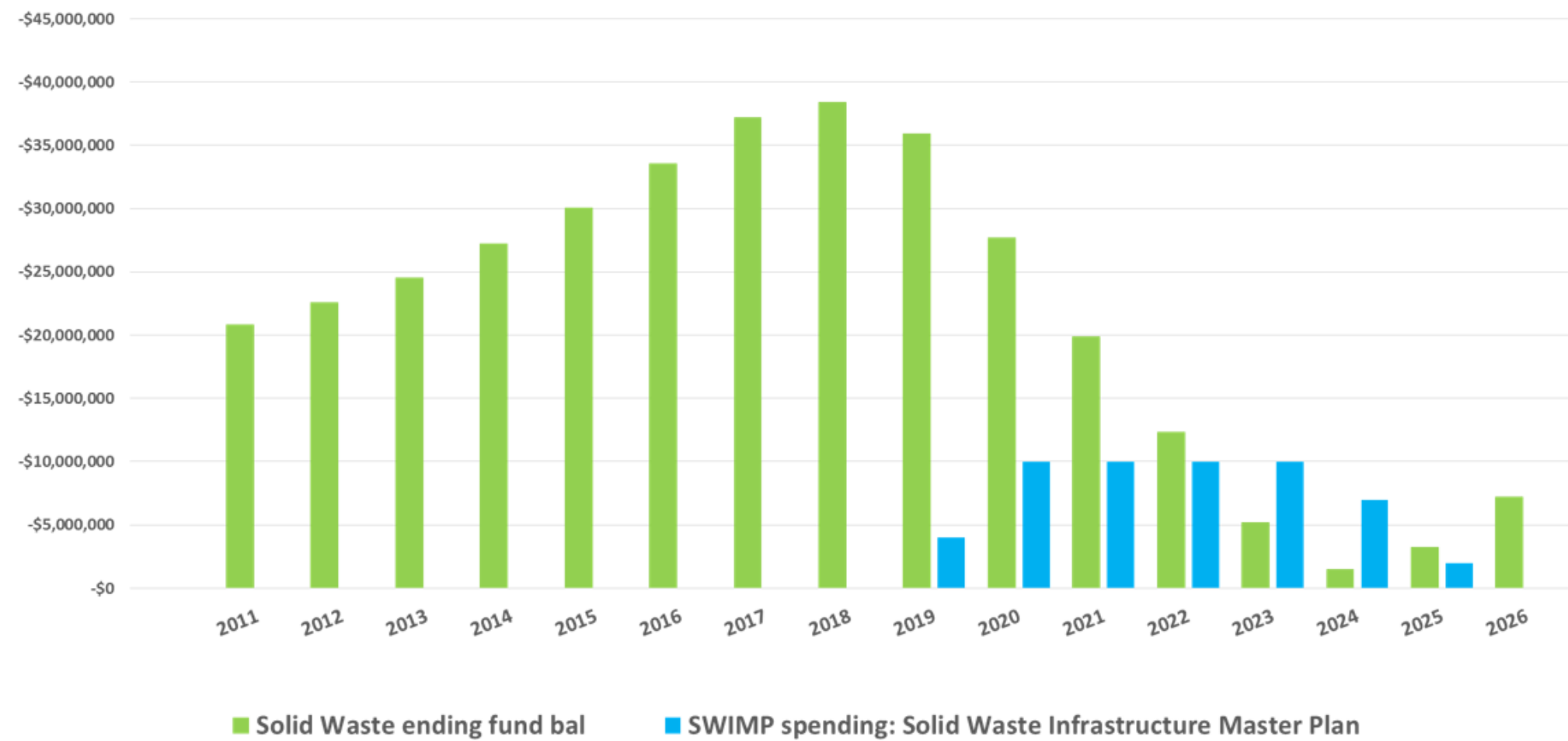
OVER 100 PARTICIPANTS

Public meetings held around Larimer County to learn more about the future of solid waste in the region and provide feedback.

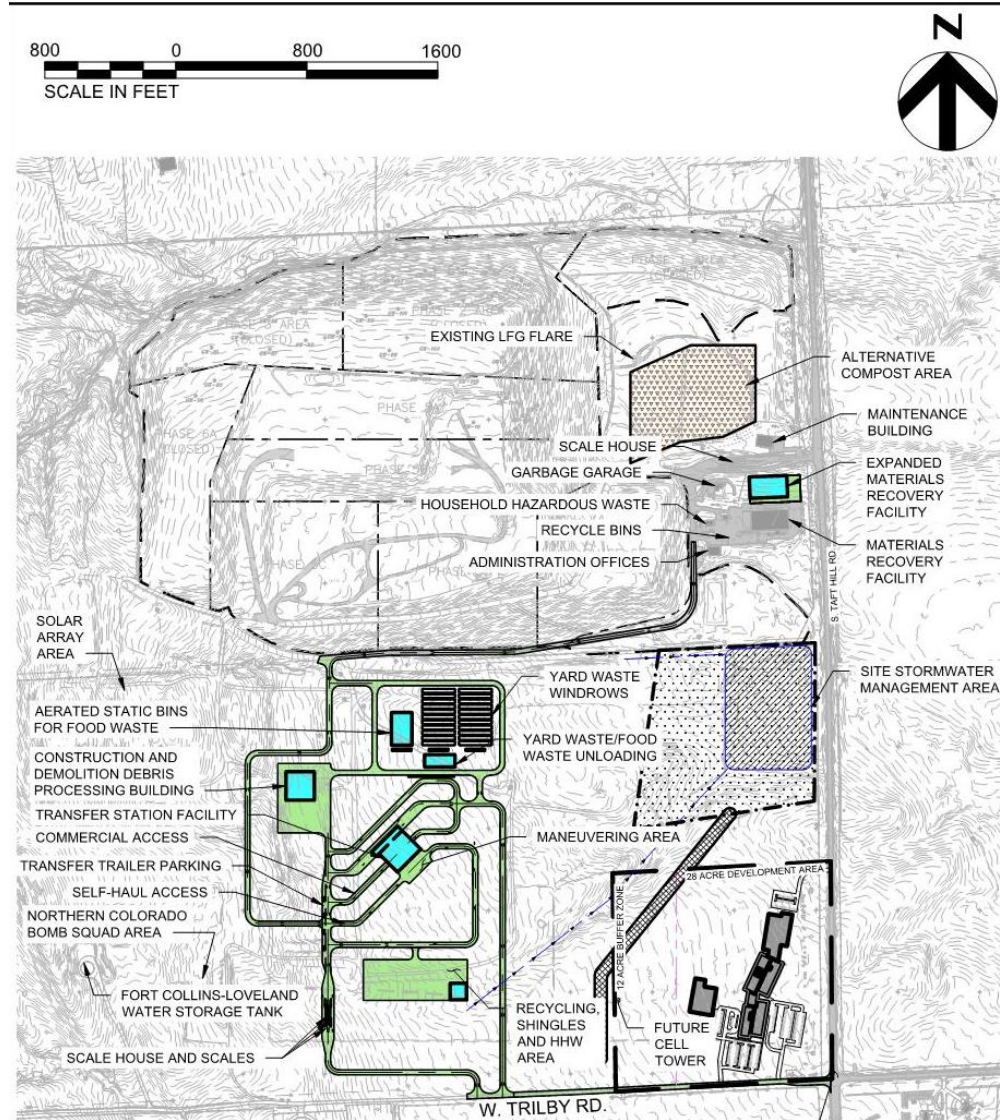
Facility Development Timeline

	2019	2020	2021	2022	2023	2024
Central Transfer Station (Jan 2019 – Jan 2023)						
Public Landfill (Jan 2019 – Jan 2024)						
Yard Waste Composting Open Windrow (Jan 2020 – Jan 2023)						
Construction and Demolition Waste Processing (Jan 2020 – Jan 2023)						
Food Waste Composting Static Aerated Bin (Oct 2023 – Feb 2025)						

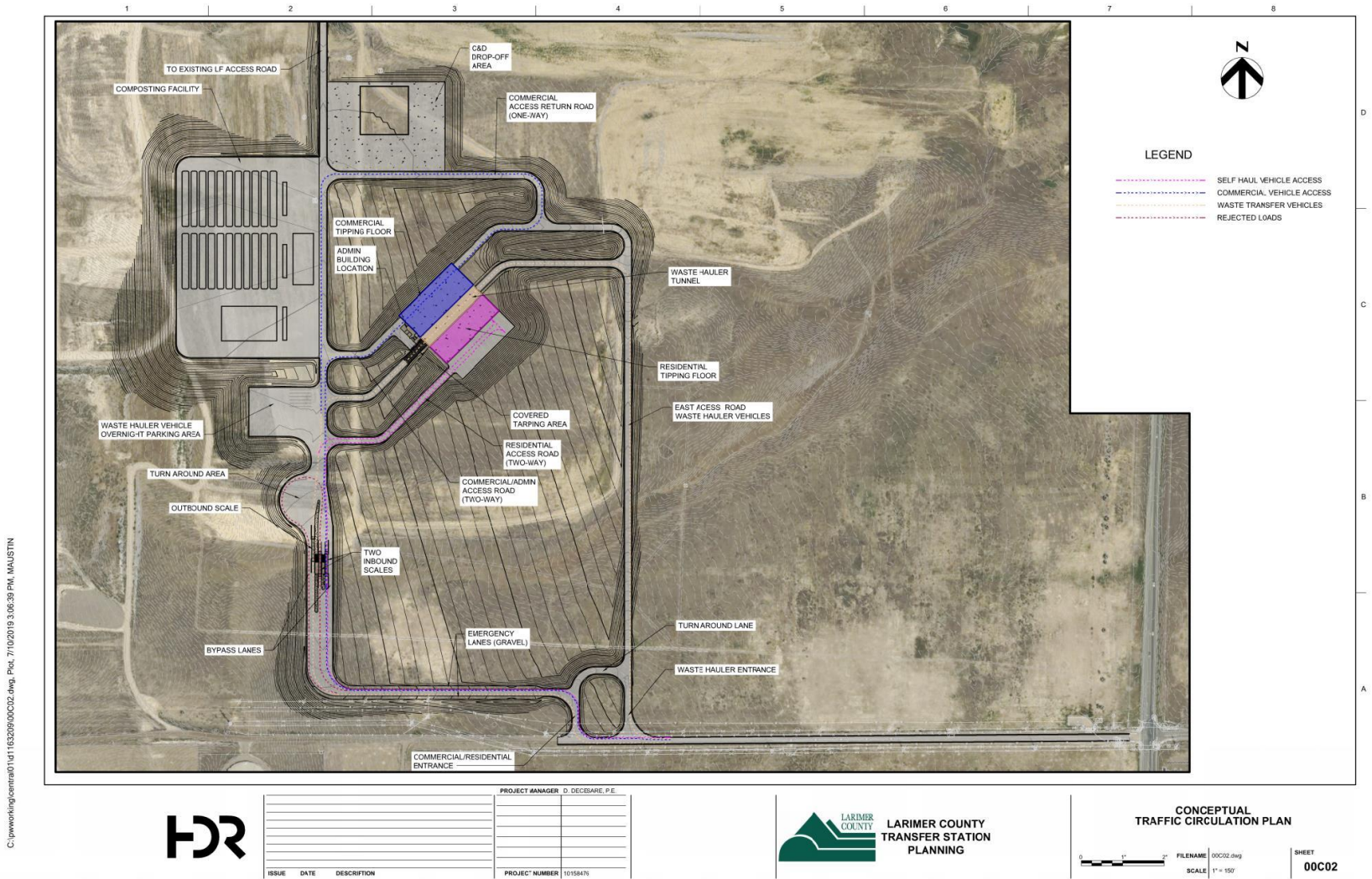
Solid Waste Fund Balance



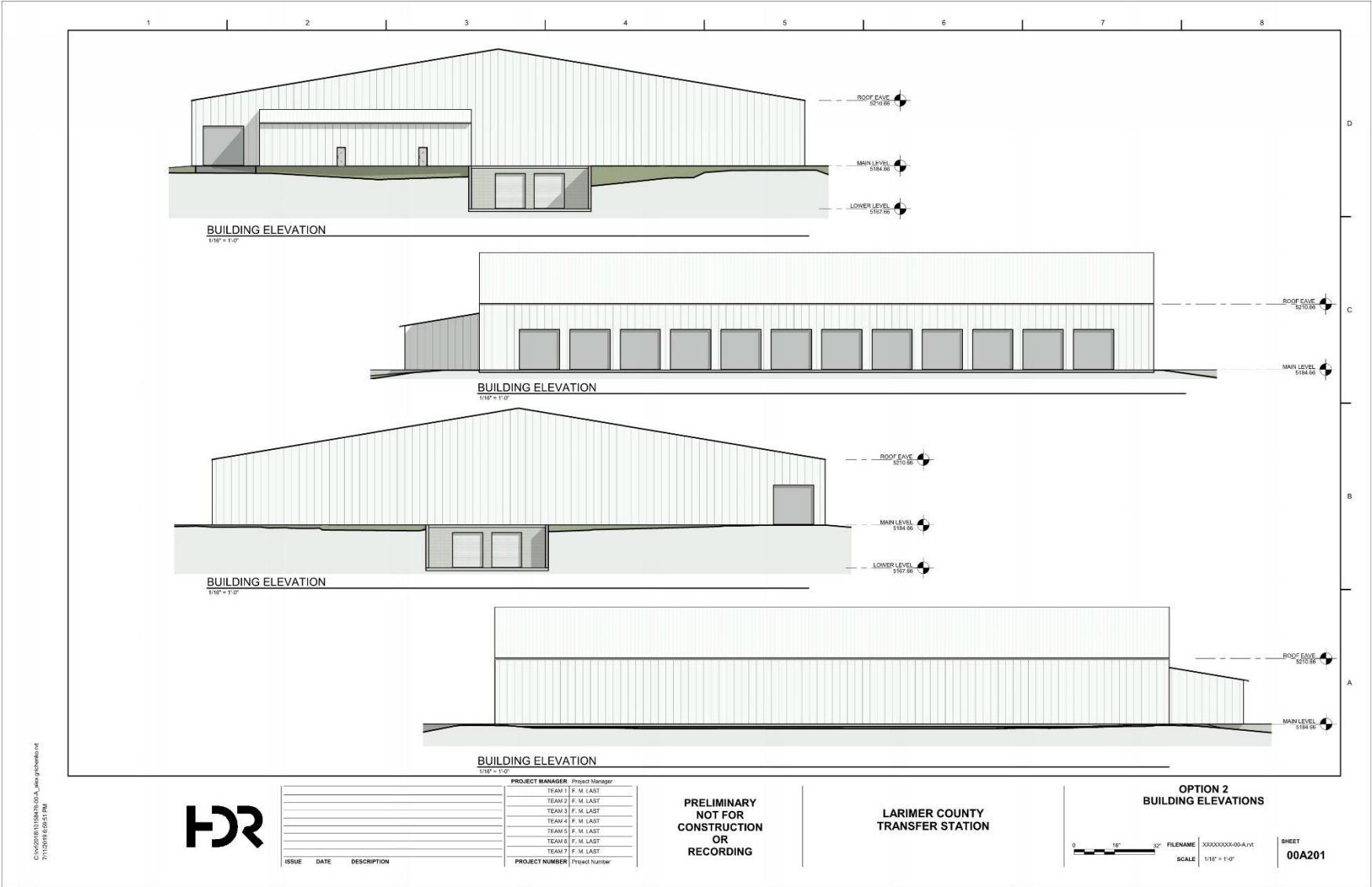
Draft Site Plan



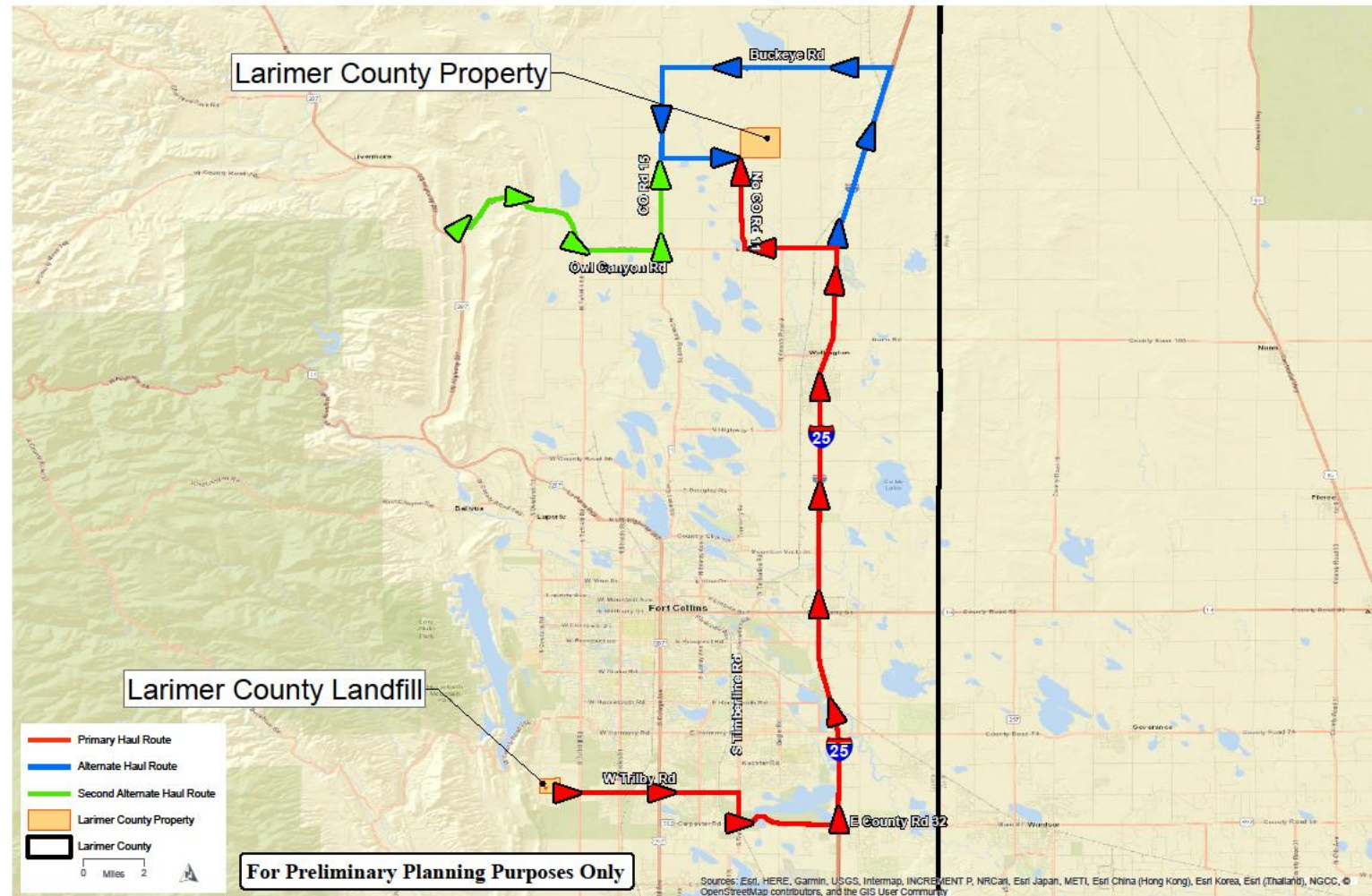
Draft Transfer Station Layout



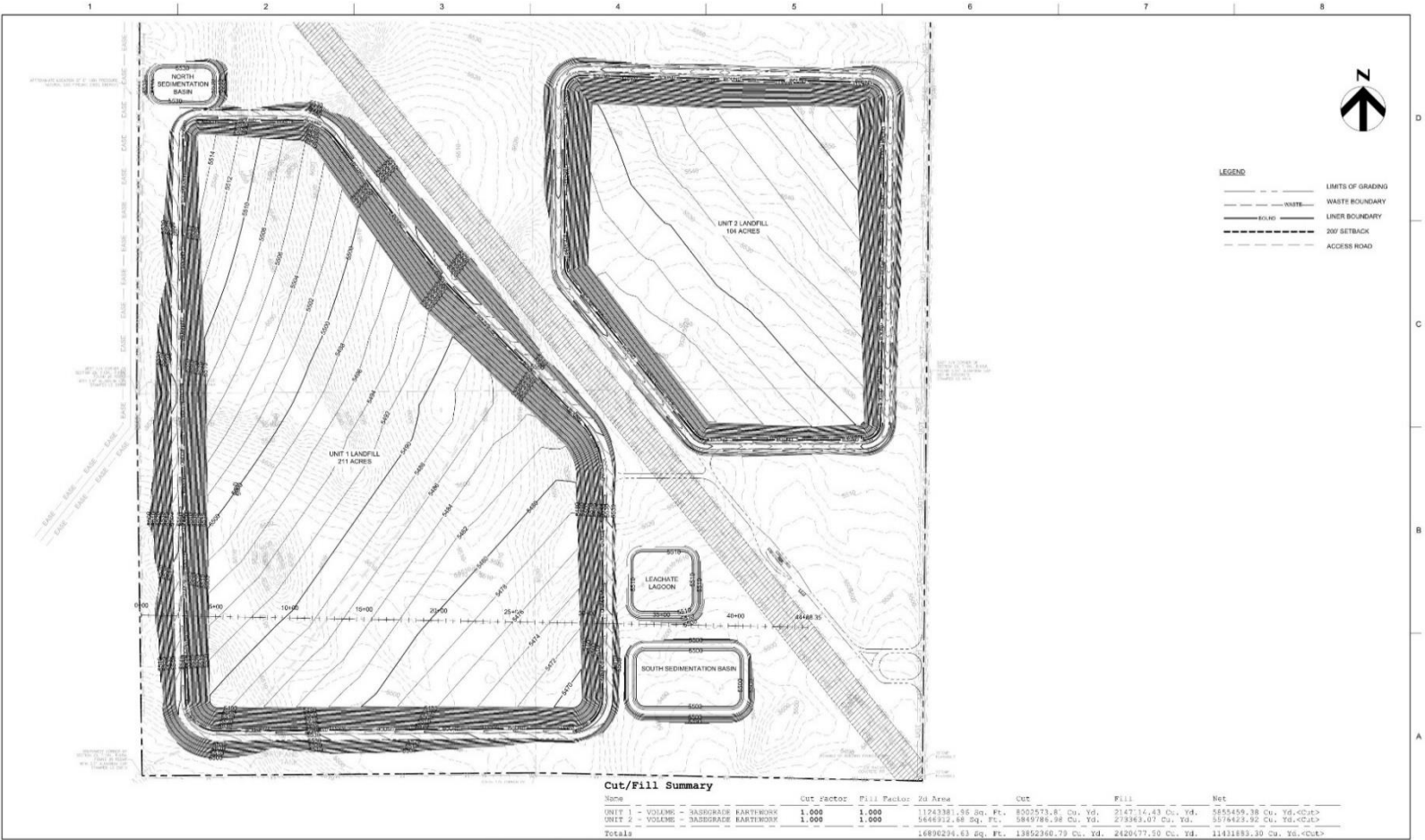
Preliminary Transfer Station Elevations



Preliminary Haul Route



Draft Landfill Layout



PROJECT MANAGER: D. B. BROWN			CIVIL ENGINEER		
ISSUE			DATE		
DESCRIPTION			PROJECT NUMBER: 00010157567		

LARIMER COUNTY
NORTH LANDFILL PLANNING

BASE LINER GRADING PLAN

FILENAME: 00010157567.dwg
SCALE: 1" = 500'

SHEET
2



Questions