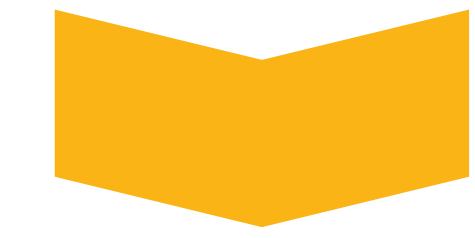




WEDNESDAY, MAY 18, 2022

WELCOME

Larimer County North Landfill Project  
Neighborhood Meeting



# OUR COMPREHENSIVE WASTE SYSTEM

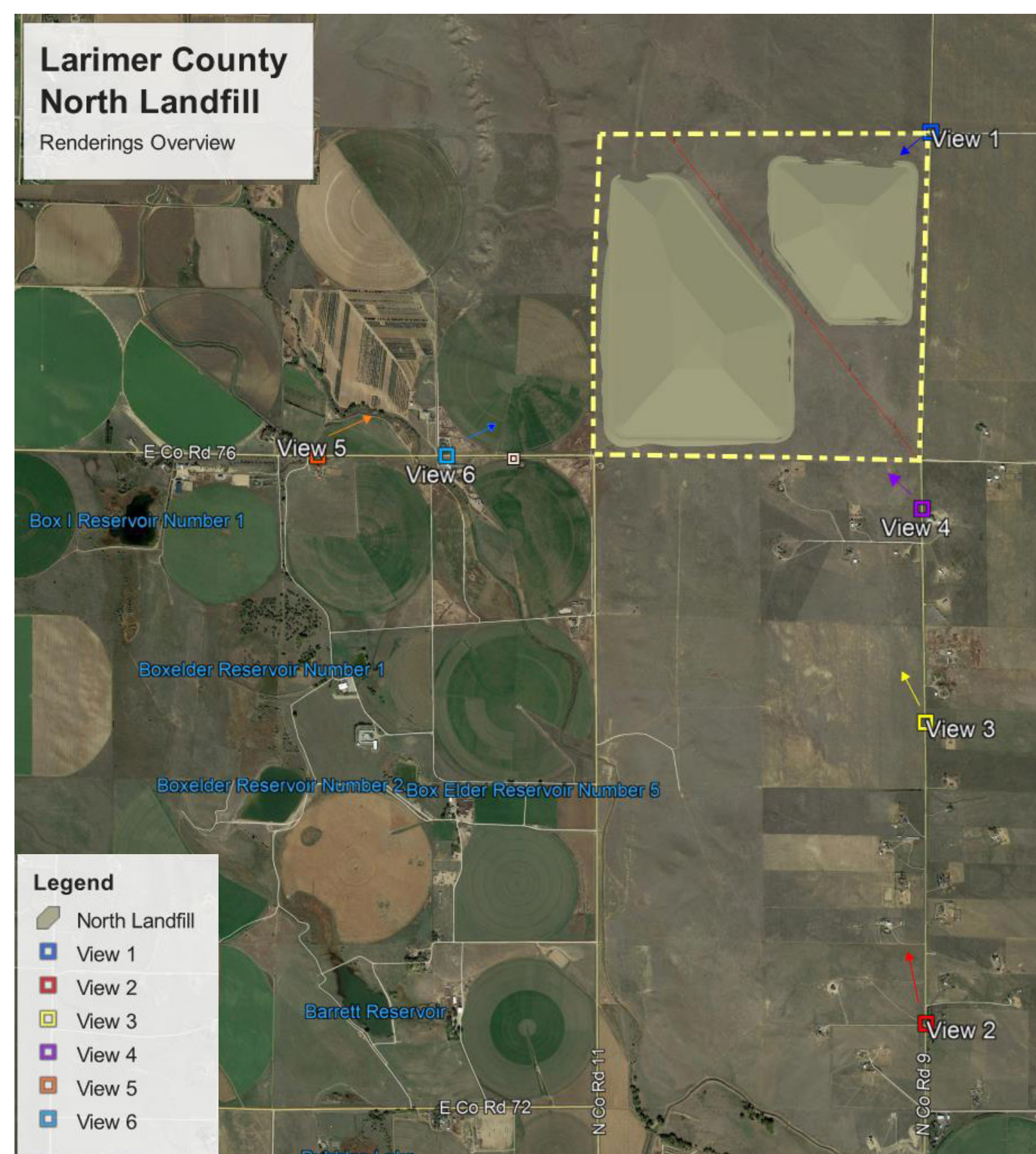
AFTER INTENSIVE DATA COLLECTION, THOROUGH ANALYSIS, AND STAKEHOLDER ENGAGEMENT, THE FOLLOWING FIVE FACILITIES ARE RECOMMENDED AS THE MOST FEASIBLE FOR THE WASTESHED TO MEET ESTABLISHED GOALS:





# NEW COUNTY LANDFILL

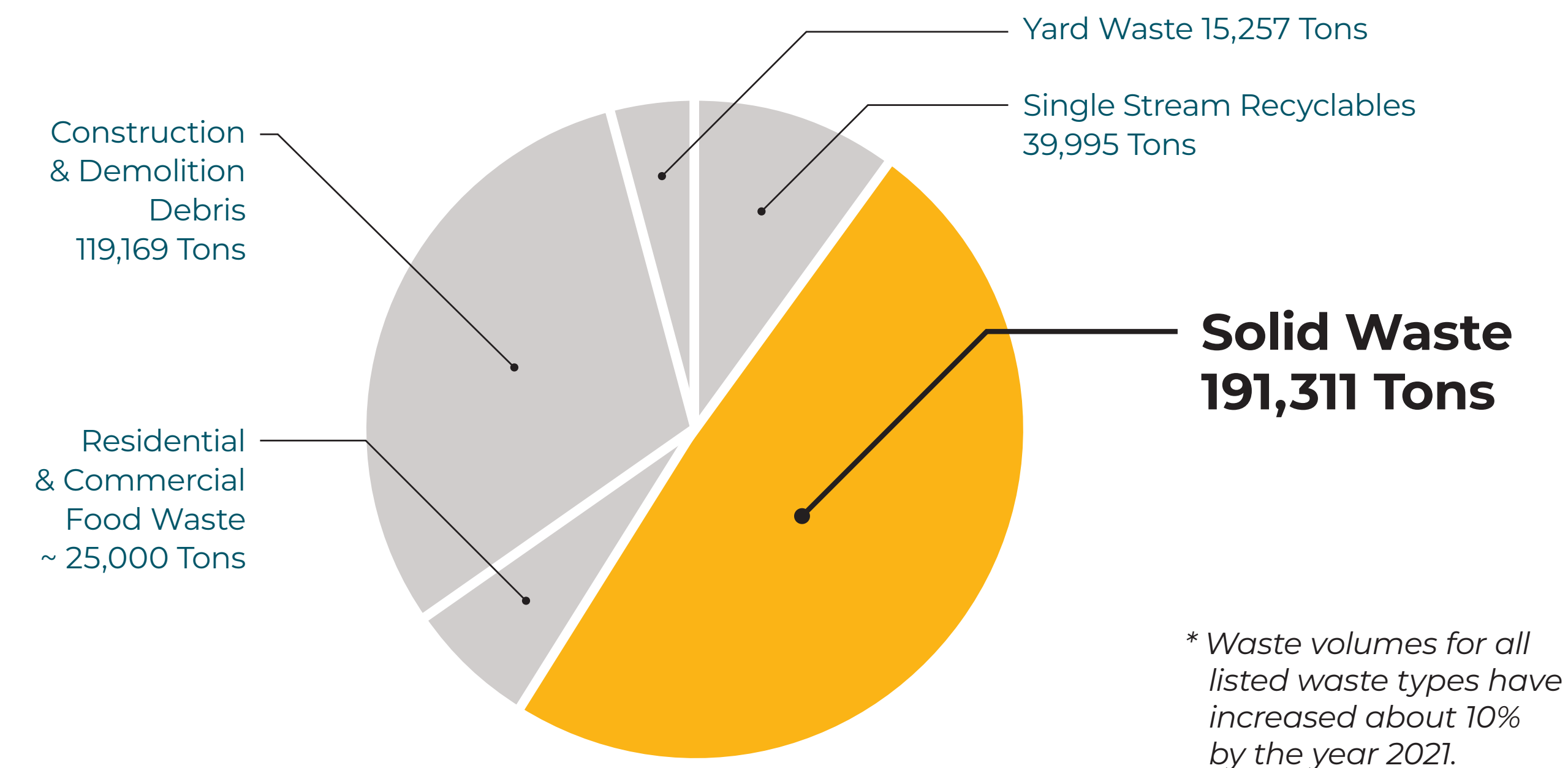
TO BE DEVELOPED IN THE NORTHERN PORTION OF THE COUNTY, SUBSEQUENT TO THE CLOSURE OF THE EXISTING COUNTY LANDFILL, AS A MULTI-FUNCTIONAL FACILITY TO DISPOSE OF SOLID WASTE MATERIALS BY BURYING AND COVERING WITH SOIL.



The future Larimer County Solid Waste Management Site has already been selected.

## DATA BREAKDOWN\*

2016 Waste Composition and Characterization Analysis Numbers

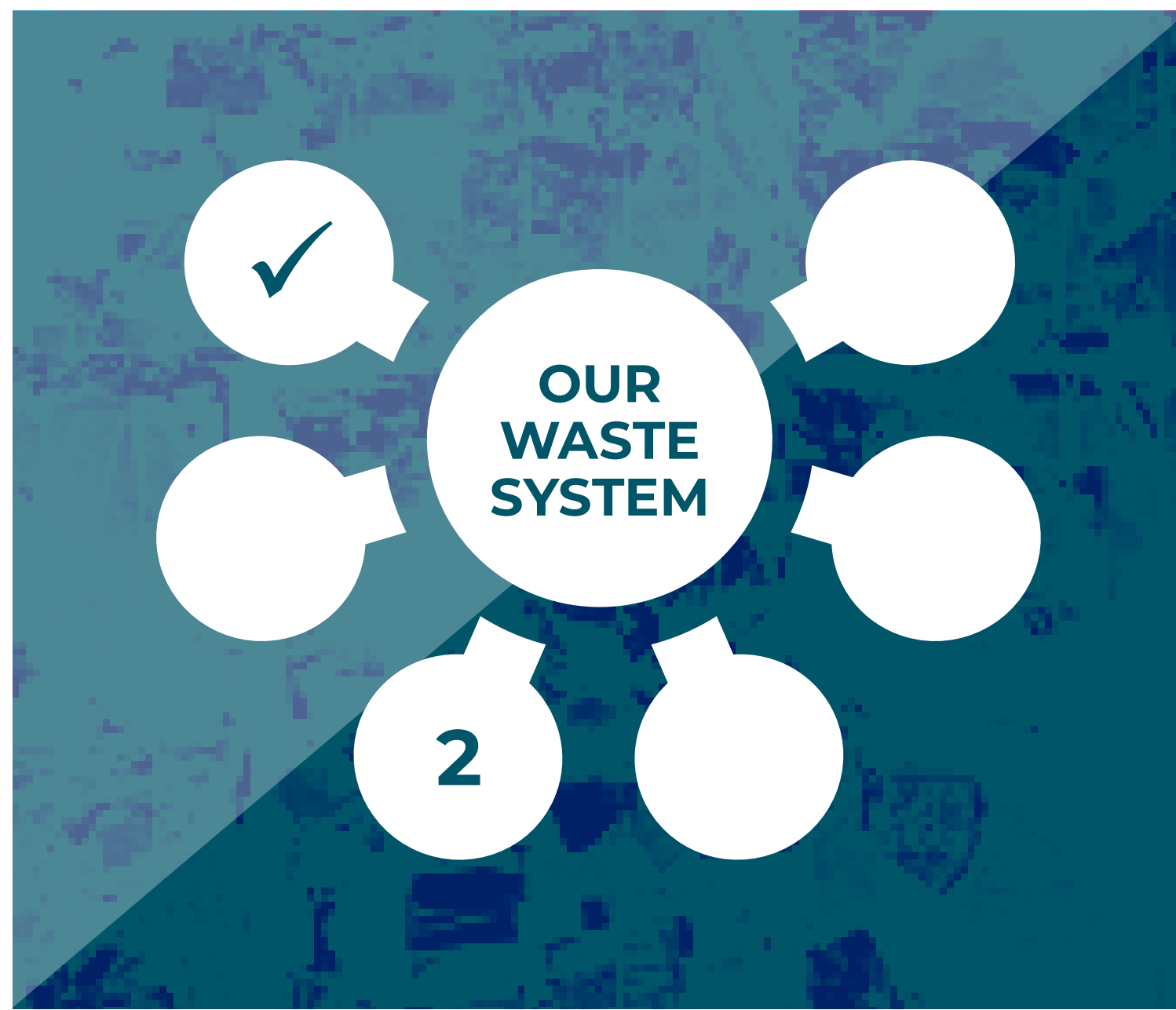


## BENEFITS

- County owned **tract of land available** for environmentally sound facility
- First phase of landfill at **\$11.7m** can handle all solid waste generated in County
- **Self-sustaining revenues** that support other County programs such as household hazardous waste, recycling, convenience centers, and public education
- Social, economic, and environmental monetary **benefits outweigh the costs**

## RECOMMENDED PROCESS CONTROLS

- **Hauler licensing**
  - Pay as you throw, or PAYT, has a volume based pricing structure
  - Potential bundling of recycling and trash collection for multi-family unit & single family residential customers
  - Direct haul to the new landfill will be limited
  - Landfill Gas Capture for Municipal Solid Waste collected in Larimer County



# CENTRAL TRANSFER STATION

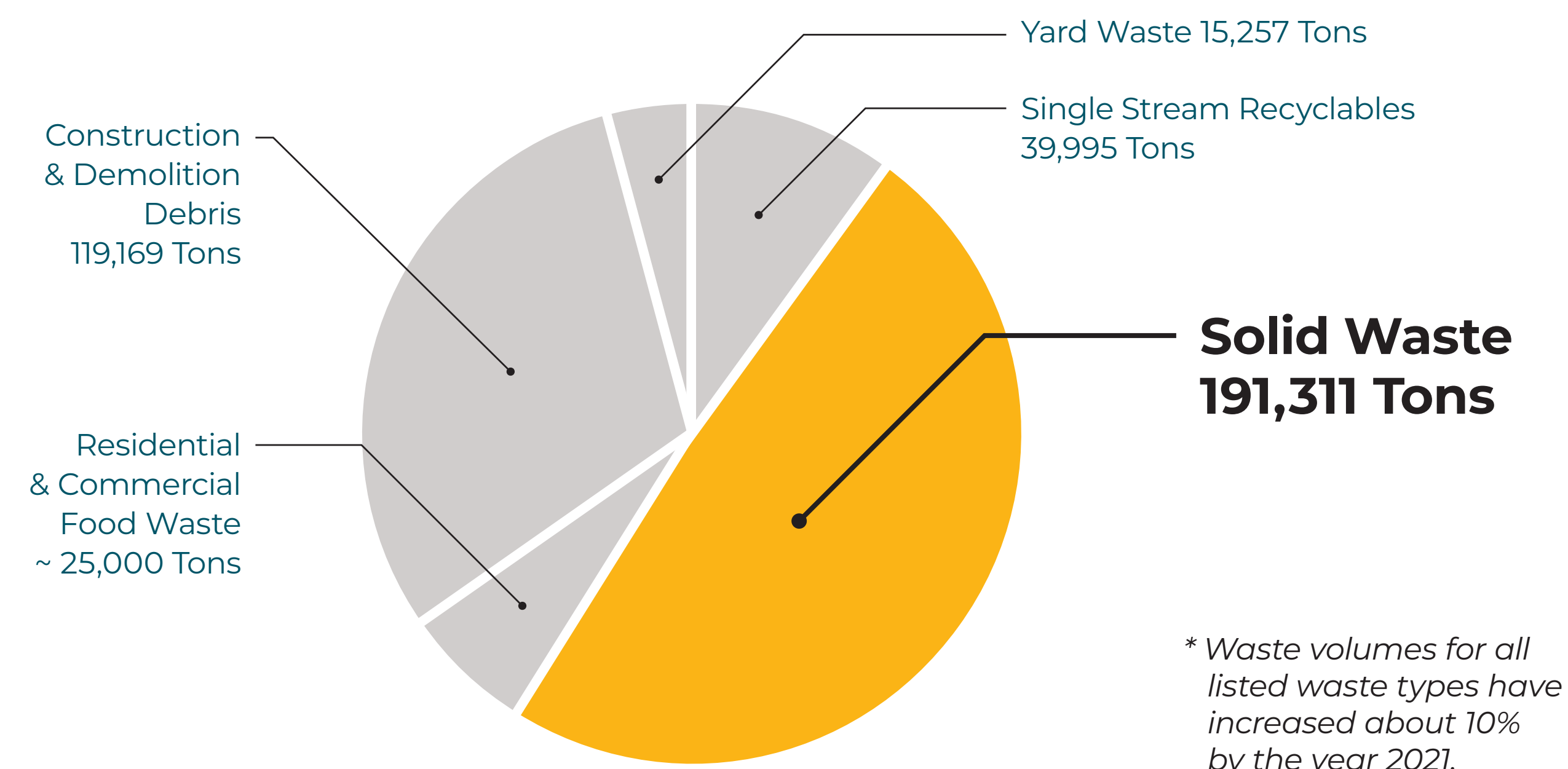
A FACILITY THAT RECEIVES MATERIALS FROM WASTE HAULERS AND THE PUBLIC TO BE TAKEN OFF-SITE ON A LARGER TRANSFER VEHICLE FOR TRANSPORT TO A SOLID WASTE HANDLING FACILITY LIKE A LANDFILL.



Images of example Central Transfer Station facilities.

## DATA BREAKDOWN\*

2016 Waste Composition and Characterization Analysis Numbers



\* Waste volumes for all listed waste types have increased about 10% by the year 2021.

## BENEFITS

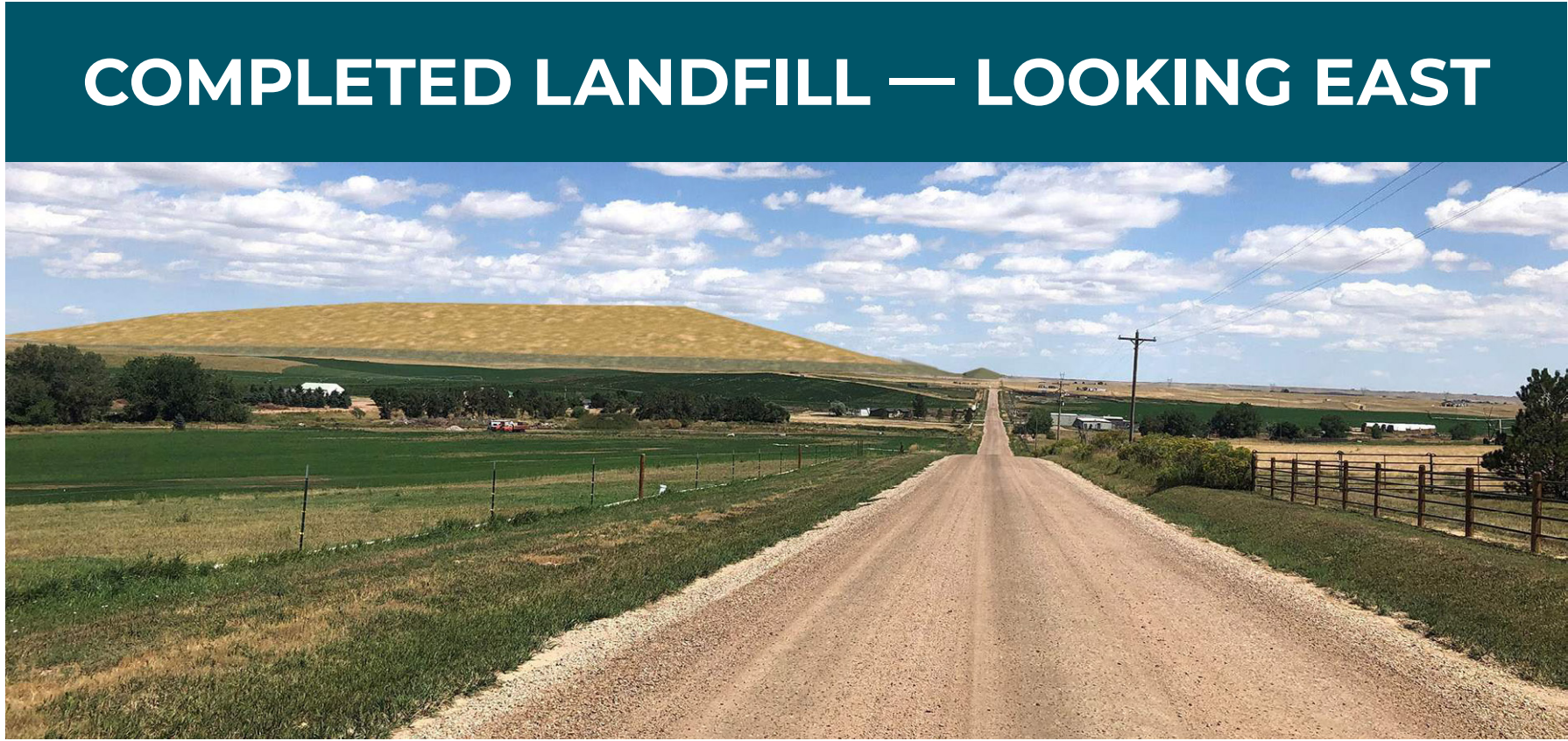
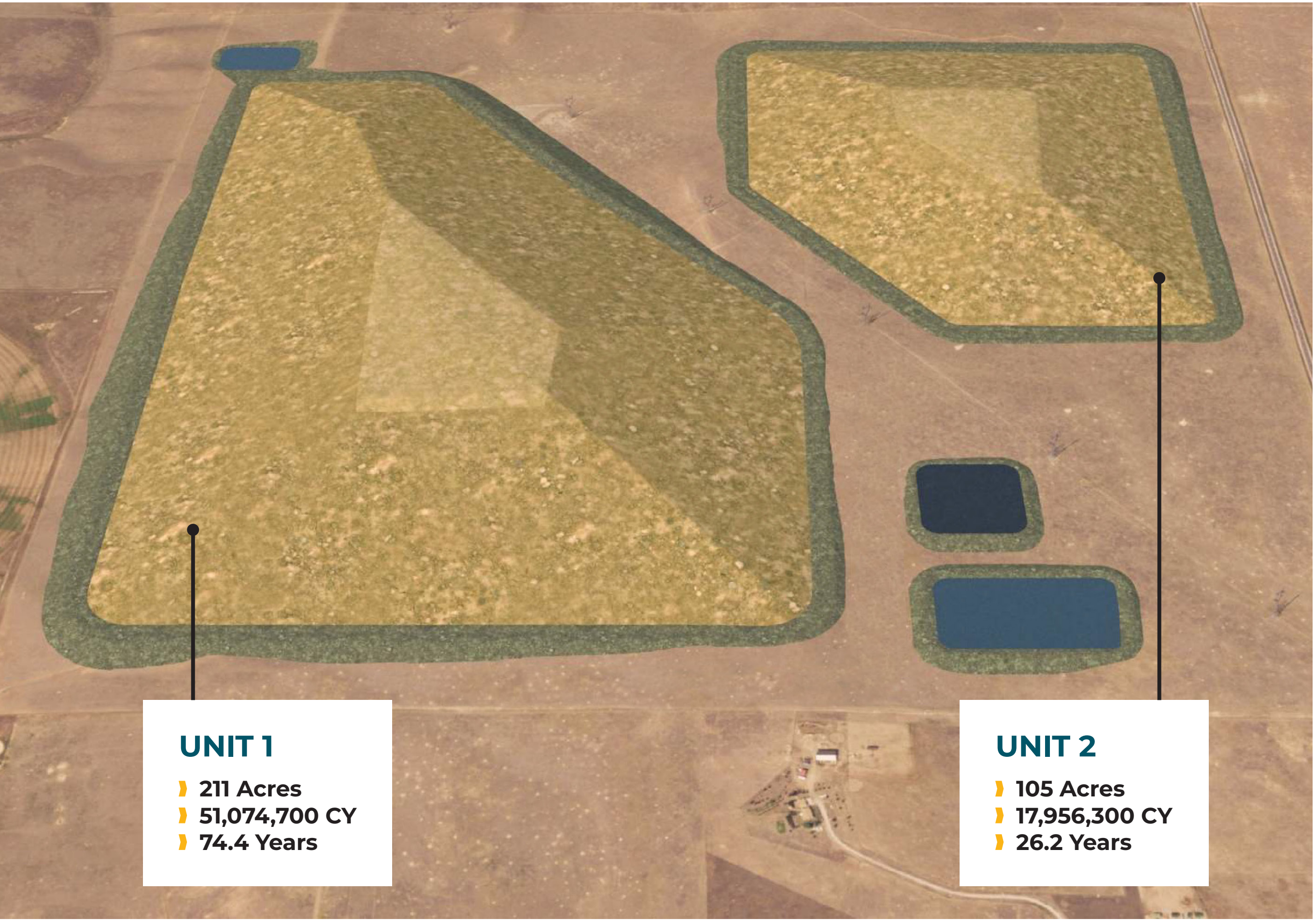
- Continued **convenient disposal location** for existing customers — centrally located amongst high density population areas
- For **\$15.8m** various waste materials can be managed and provides flexibility for future changes in waste management
- Increases **collection efficiencies** for customers by consolidating waste in one location for eventual transfer
- Social, economic, and environmental monetary **benefits outweigh the costs**

## RECOMMENDED PROCESS CONTROLS

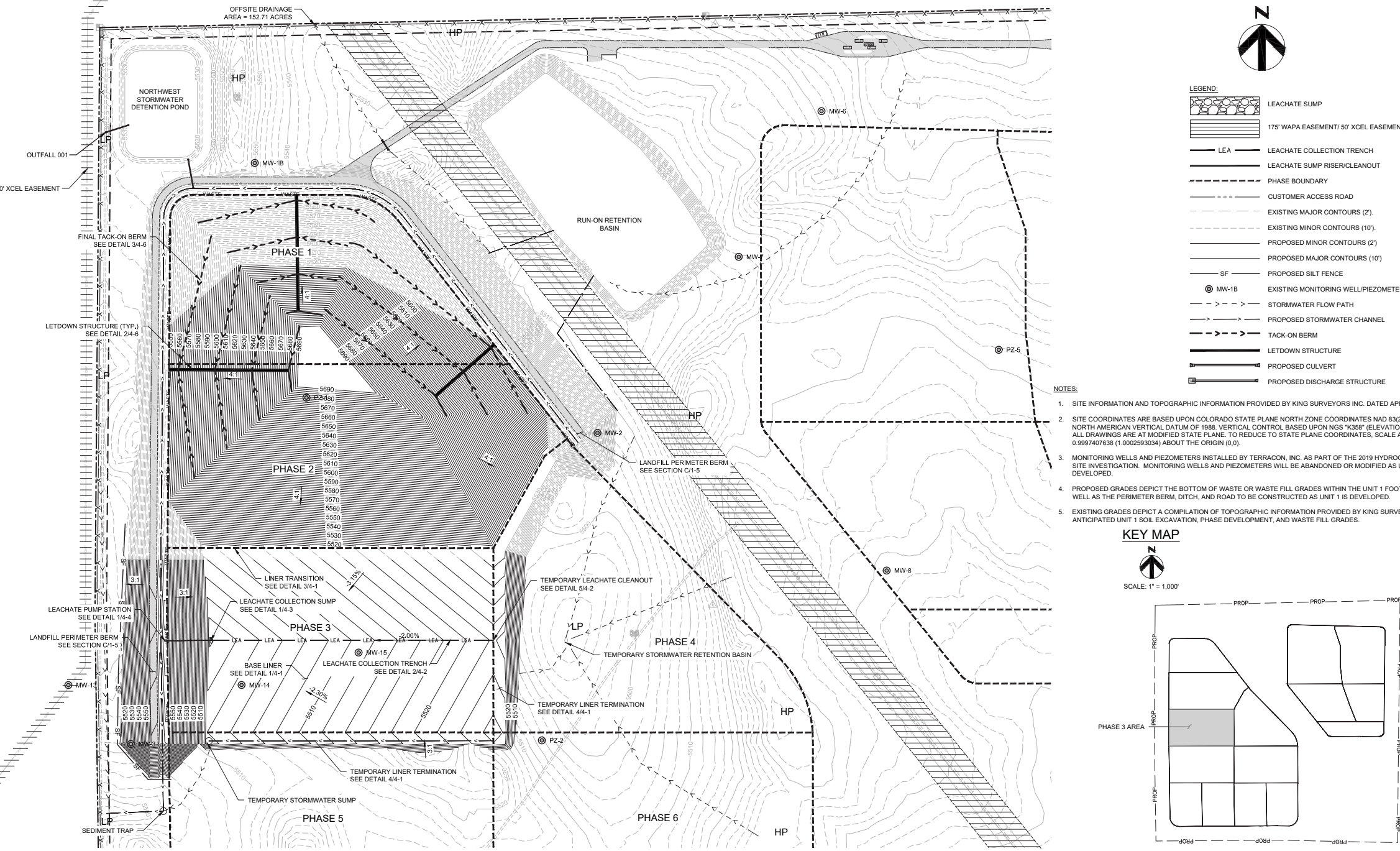
- **Hauler licensing**
  - Pay as you throw, or PAYT, has a volume based pricing structure
  - Potential bundling of recycling and trash collection for multi-family unit & single family residential customers
  - Direct haul to the new landfill will be limited



# LANDFILL PHASING



**UNIT 1 — PHASE 1**



**UNIT 1 — PHASE QUANTITIES**

Phase	Earthwork to Construct		Total Liner/Leachate Collection System (ac)	Total Airspace Volume (cy)*	Operating Life (yrs)
	Excavation Volume (cy)	Fill Volume (cy)			
1	565,000	522,000	20.0	1,688,300	2.4
2	806,200	616,100	28.9	5,077,000	7.4
3	725,400	321,800	26.0	5,342,900	7.8
4	131,500	804,700	25.5	5,346,700	7.8
5	251,300	319,100	25.8	5,090,100	7.5
6	331,300	100,000	25.5	5,092,600	7.5
7	309,300	276,700	15.0	1,654,100	2.4
8	161,000	123,800	15.1	4,617,700	6.7
9	193,300	71,300	15.0	7,096,900	10.3
10	293,200	58,800	14.4	10,068,200	14.6

\* Volume in each phase includes waste placed in the phase plus waste placed (piggybacked) in adjacent phases.

**UNIT 2 — PHASE QUANTITIES**

Phase	Earthwork to Construct		Total Liner/Leachate Collection System (ac)	Total Airspace Volume (cy)*	Operating Life (yrs)
	Excavation Volume (cy)	Fill Volume (cy)			
1	624,500	88,900	33.1	3,116,500	4.5
2	682,000	75,400	28.2	4,369,300	6.4
3	226,600	19,600	19.3	2,376,000	3.5
4	210,400	16,900	14.3	5,425,800	7.9
5	52,000	36,400	9.8	2,667,400	3.9

\* Volume in each phase includes waste placed in the phase plus waste placed (piggybacked) in adjacent phases.



# DAILY LANDFILL OPERATIONS

**DAILY HOURS** › Open from 7:30 a.m. to 4:30 p.m. Monday through Saturday. However, with operational challenges, we are permitted with the Colorado Department of Public Health and Environment (CDPHE) to run a 24/7 facility in order to adequately manage the facility and best serve the County.

**FENCING** › Minimum of three levels of fencing including immediate protection at the working face, internal supplemental fencing, and at the site perimeter. Litter picking crews will be on site and have access to a litter vacuum.

**DUST CONTROL** › Native grass revegetation of disturbed areas, haul road water/dust suppressant applications, and optimized material hauling routes.

**DAILY COVER** › Applied at the end of each operating day, or more frequently as needed to cover exposed solid waste in the landfill. Alternative daily cover (ADC) is cover other than soil such as spray materials.

**MONITORING** › On-site Weather Control Station that monitors wind direction and speed.

**PROTOCOLS** › Landfill Closure in a “High Wind Warning” of sustained winds of 40 miles per hour or greater, or gust of 55 miles per hour or greater, are expected to persist for one hour or longer, as defined by the National Weather Service.



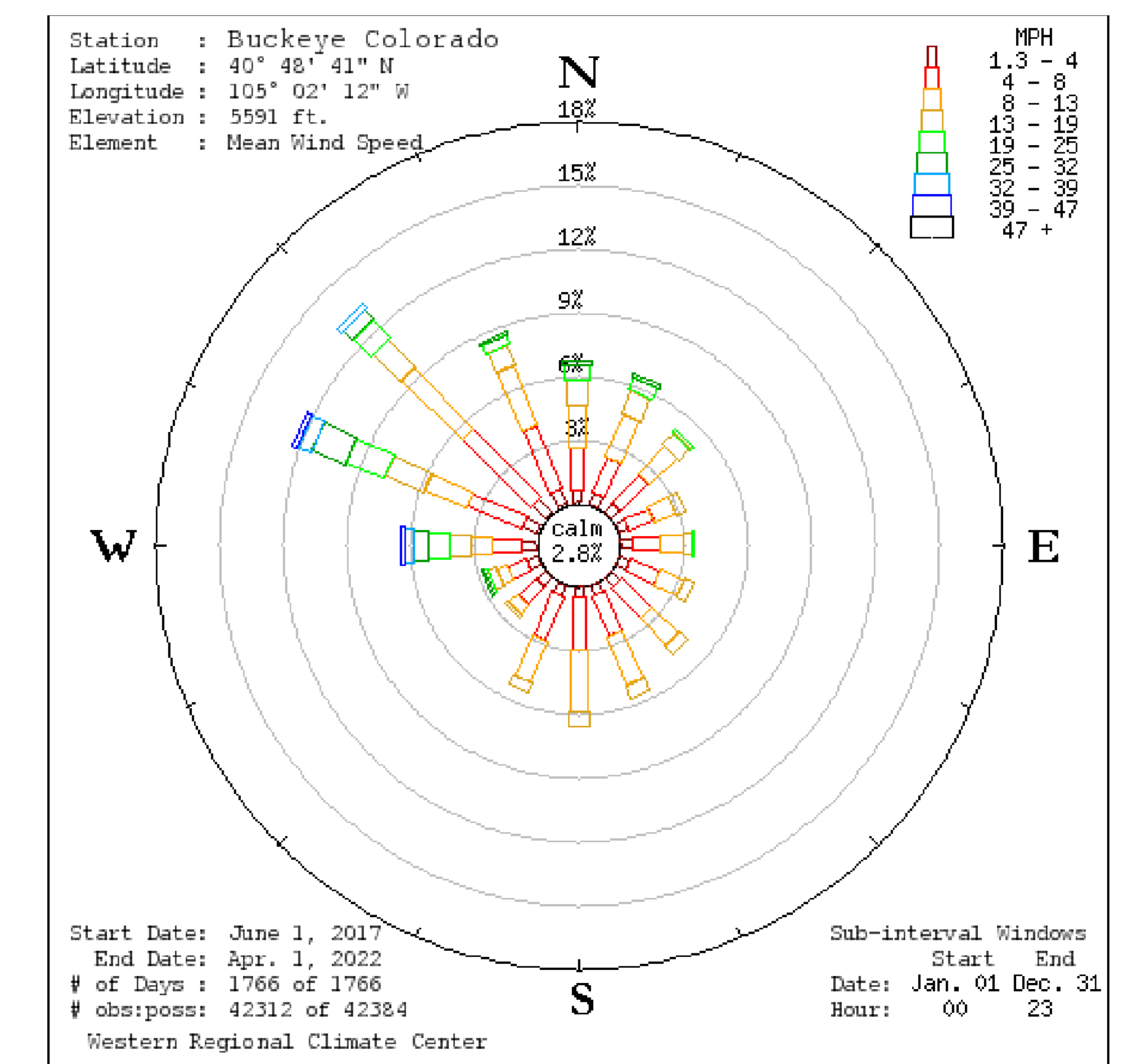
Site Perimeter Fencing.



Portable panel fencing near the working face.



Tow behind “Xtreme Vac” for cleaning site fencing windblown litter.



Mean wind speeds from June 1, 2017 through April 1, 2022 at the Buckeye, Colorado station.



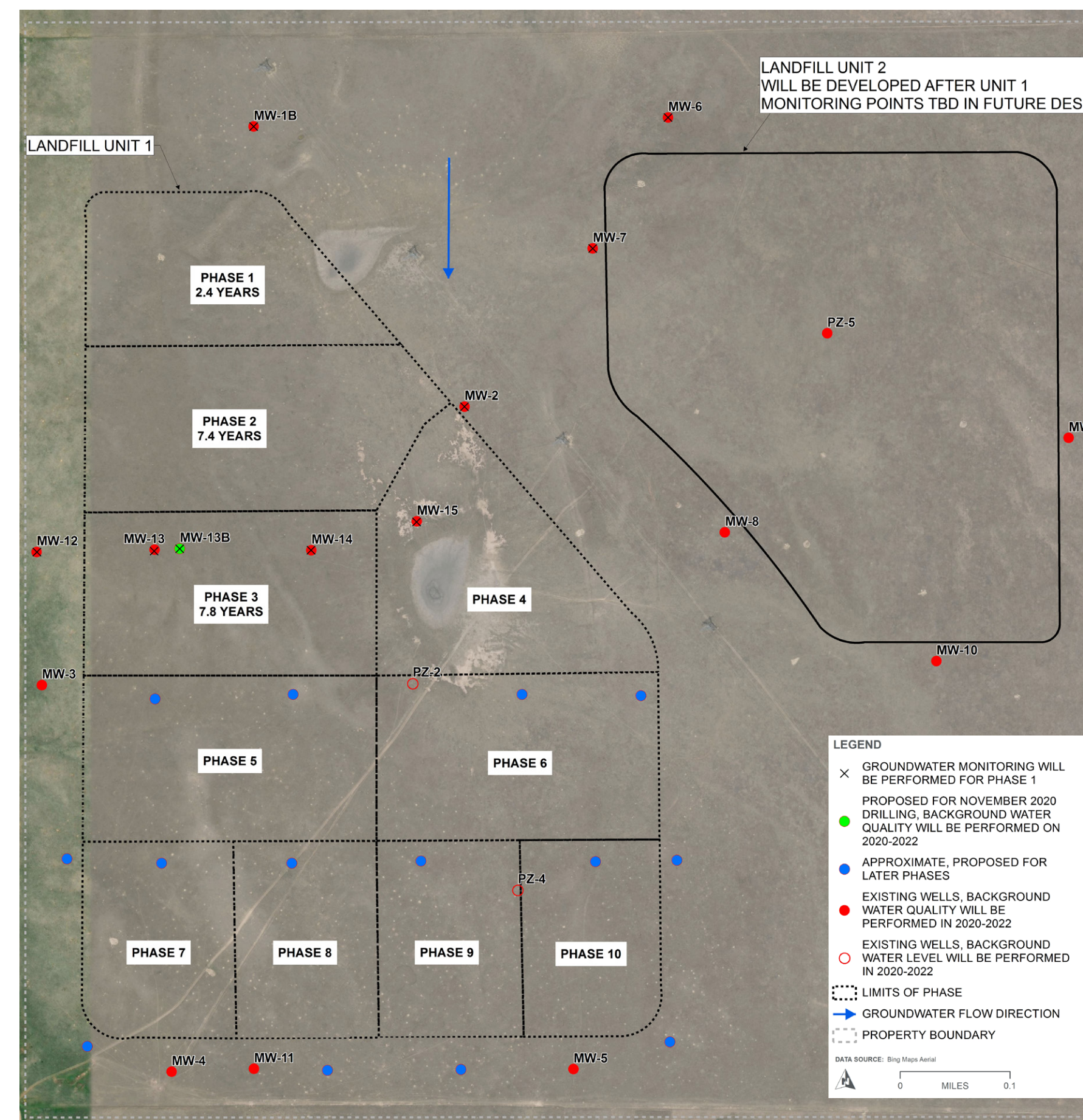
# ENVIRONMENTAL

## GROUNDWATER MONITORING

- Solid Waste regulations 6 CCR 1007-2 Part 1 Section 2.2 Ground Water Monitoring — Appendix B
- Seven quarters of background water samples collected to date since Q3 2020
- Total of 16 monitoring wells and three piezometers installed
- Installation of bottom liner system



Groundwater monitoring well.



Current locations of existing groundwater wells.

### GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Well I.D.	Latitude	Longitude	Top of Casing Elevation (feet amsl)	Screen Interval (ft bgs)	Well Type
PZ-2	40.80380	-105.03189	5508.00	63-73	2-in PVC
PZ-4	40.80107	-105.03006	5510.80	50-60	2-in PVC
PZ-5	40.80843	-105.02468	5535.40	34-44	2-in PVC
MW-1B	40.81159	-105.03466	5531.46	30-40	2-in PVC
MW-2	40.80746	-105.03099	5508.60	23-33	2-in PVC
MW-3	40.80378	-105.03834	5515.00	33-43	2-in PVC
MW-4	40.79869	-105.03615	5507.80	73-83	2-in PVC
MW-5	40.79871	-105.02909	5510.50	52-62	2-in PVC
MW-6	40.81128	-105.02745	5544.50	42-52	2-in PVC
MW-7	40.80955	-105.02876	5529.60	35-45	2-in PVC
MW-8	40.80580	-105.02646	5522.20	32-47	2-in PVC
MW-9	40.80705	-105.02048	5532.60	41-51	2-in PVC
MW-10	40.80410	-105.02278	5512.00	29-39	2-in PVC
MW-11	40.79871	-105.03465	5502.47	33-43	2-in PVC
MW-12	40.80554	-105.03843	5528.65	34-44	2-in PVC
MW-13*	40.80557	-105.03638	5550.93	55-75	2-in PVC
MW-13B	TBD ~40.80557	TBD ~-105.03638	TBD ~5550.93	70-100	2-in PVC
MW-14	40.80556	-105.03366	5522.74	27-47	2-in PVC
MW-15	40.80594	-105.03182	5500.79	9-19	2-in PVC

POC = Point of Compliance Well

\*MW-13 was installed and screened in what appeared to have wet fracture interval at elevation similar to the anticipated groundwater elevation in other site wells but MW-13 was observed to be dry after completion; therefore, monitoring will continue at MW-13 and in addition another well, MW-13B, is being installed in effort to locate the groundwater and monitor groundwater in this location.

## SURFACE WATER MONITORING

- Stormwater management plan
- Best Management Practices (BMP's)
- Quarterly Outfall runoff samples
- National Pollutant Discharge Elimination System (NPDES) Bi-annual inspection
- Revegetation of disturbed areas
- Site grading plans

## LANDFILL GAS MONITORING

- Installation of gas monitoring probes anticipated for 2022/2023 to obtain background conditions
- Monthly Perimeter Monitoring
- Active/Passive LFG collection system



Landfill gas wellhead.



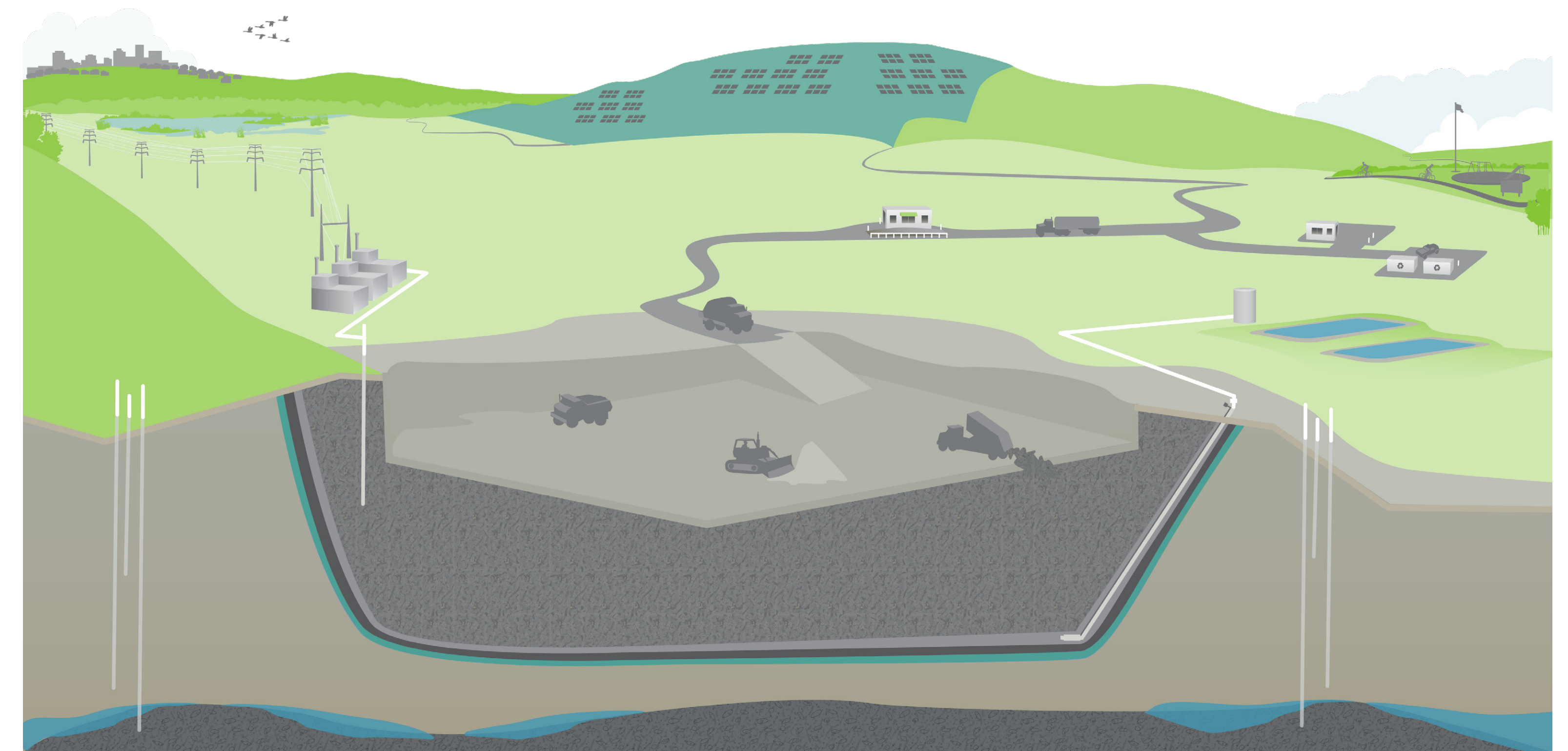
# LANDFILL ENGINEERING

## OVERVIEW

- › RCRA Subtitle D 40 CFR 258
- › Landfill Operation
- › Waste Received
- › Nuisance Conditions
- › Groundwater Monitoring
- › Explosive Gases
- › Closure
- › Post Closure Care and Maintenance
- › Financial Assurance

## LANDFILL DESIGN

- › Landfill Siting
- › Liner Systems
- › Leachate Control
- › Stormwater Management
- › Gas Collection System
- › Final Cover System
- › Site Access



## PREVENTION OF NUISANCE CONDITIONS

- › Explosive gas, bird hazards, disease vectors, odors, windblown solid wastes or cover materials, open burning, water pollution, air pollution, noise pollution and traffic congestion.



Installation of 60 mil HDPE Geomembrane Liner on geosynthetic clay liner and the prepared subgrade.



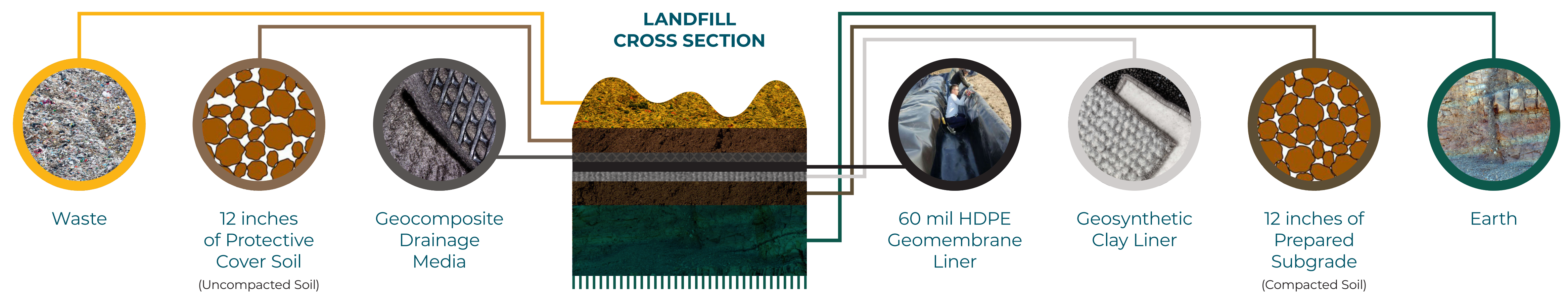
**NEW  
LANDFILL  
LOOKING NORTH**



**COMPLETED  
LANDFILL  
LOOKING NORTH**

## BOTTOM LINER

- › 12-inch prepared subgrade, a geosynthetic clay liner (GCL) and a 60-mil HDPE geomembrane in accordance with Section 3.2.5(C)(4) of the Regulations.







# PROPOSED HAUL ROUTES

## ESTIMATED TRAFFIC

40 Transfer Trailers

75 Trash Trucks

Limited Self-Haul Vehicles



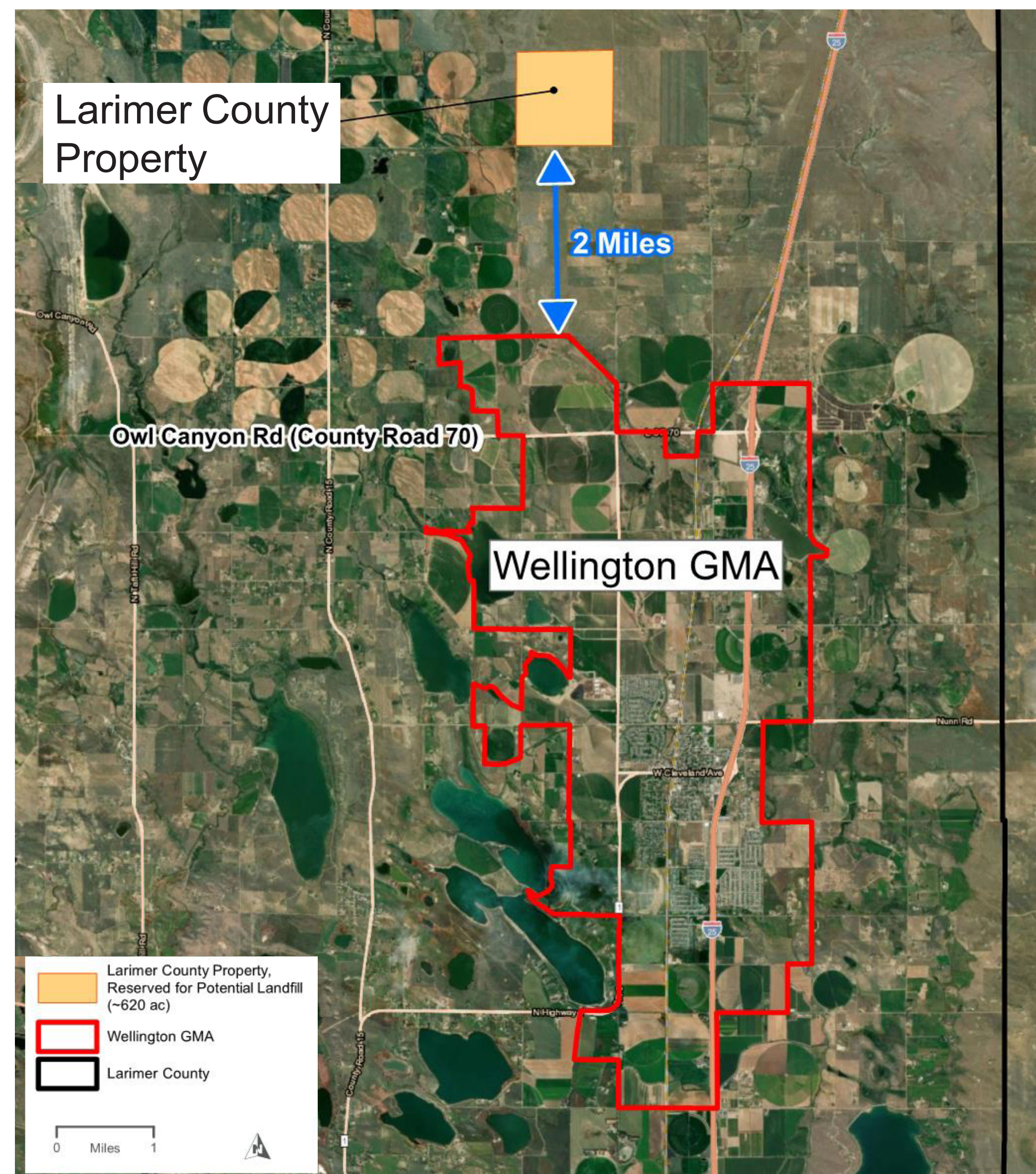
Transfer Trailers



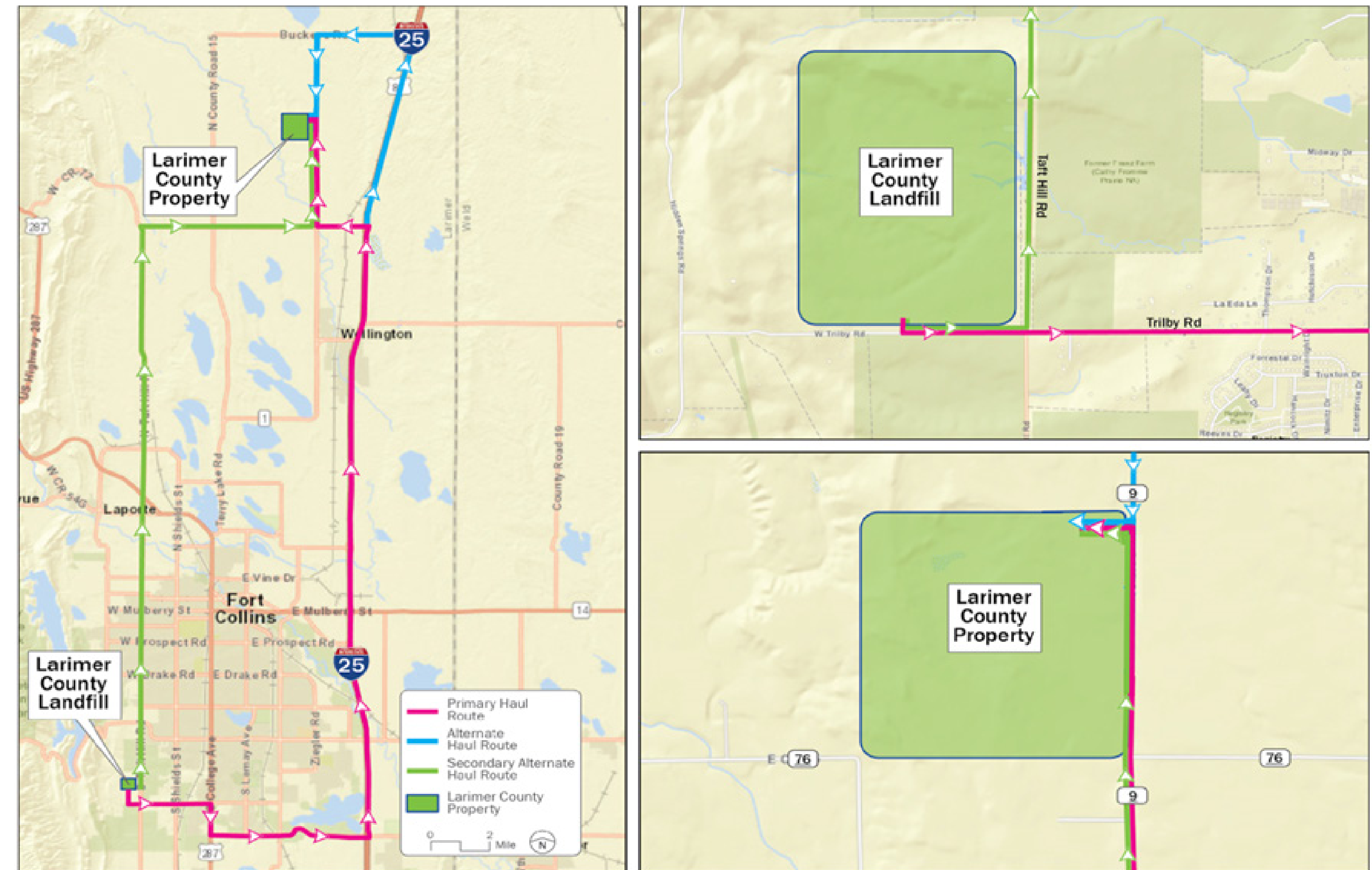
Trash Trucks



Self-Hauling



## Primary Haul route from the current Larimer County Landfill to the North Landfill Property



## Primary Haul route, "turn by turn" from the current landfill to the North Landfill Property

