

Montague CWF

Biosolids Reuse Study Intro
6/05/2024





**THANK
YOU!**

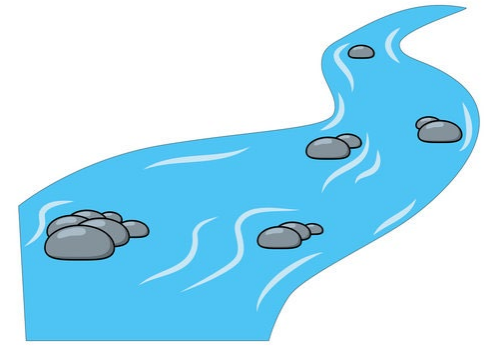
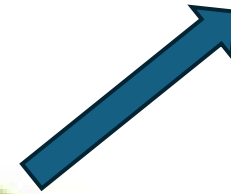
Mission Statement

- Prioritizing sustainable wastewater treatment to include disposal methods
- Emphasizing beneficial reuse of biosolids

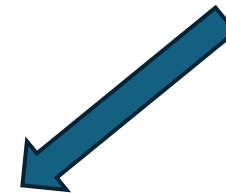


Biosolids Disposal

- Effluent-CT River
- Sludge-



- Biosolids: solid organic matter recovered from wastewater treatment
- Beneficial reuse-fertilizer



Biosolids Disposal (cont)



- Montague dewateres sludge
- This dewatered sludge (cake) gets hauled to incinerators in CT and RI
- Biosolids burned
 - Environmental impacts
 - Trucking-Carbon emission concerns
 - Disruption to nitrogen cycle
 - Expensive
 - Volatile markets, no where to go

Reuse Study

- How do we tackle these issues?
- Becoming self sustainable
- Beneficially reusing biosolids
- Reducing our carbon footprint
- Reducing disposal costs in volatile markets
- Weston & Sampson's Biosolids Reuse Action Plan
 - Investigates two potential options



Montague Regional Composting/Drying Analysis

*Public Meeting
June 5, 2024*



Describe the Current Region of Sludge Disposal

Present the Options: Composting vs. Drying

Understand the Benefits & Impacts

Describe the Implementation Steps

Receive Feedback

01

The Current Region

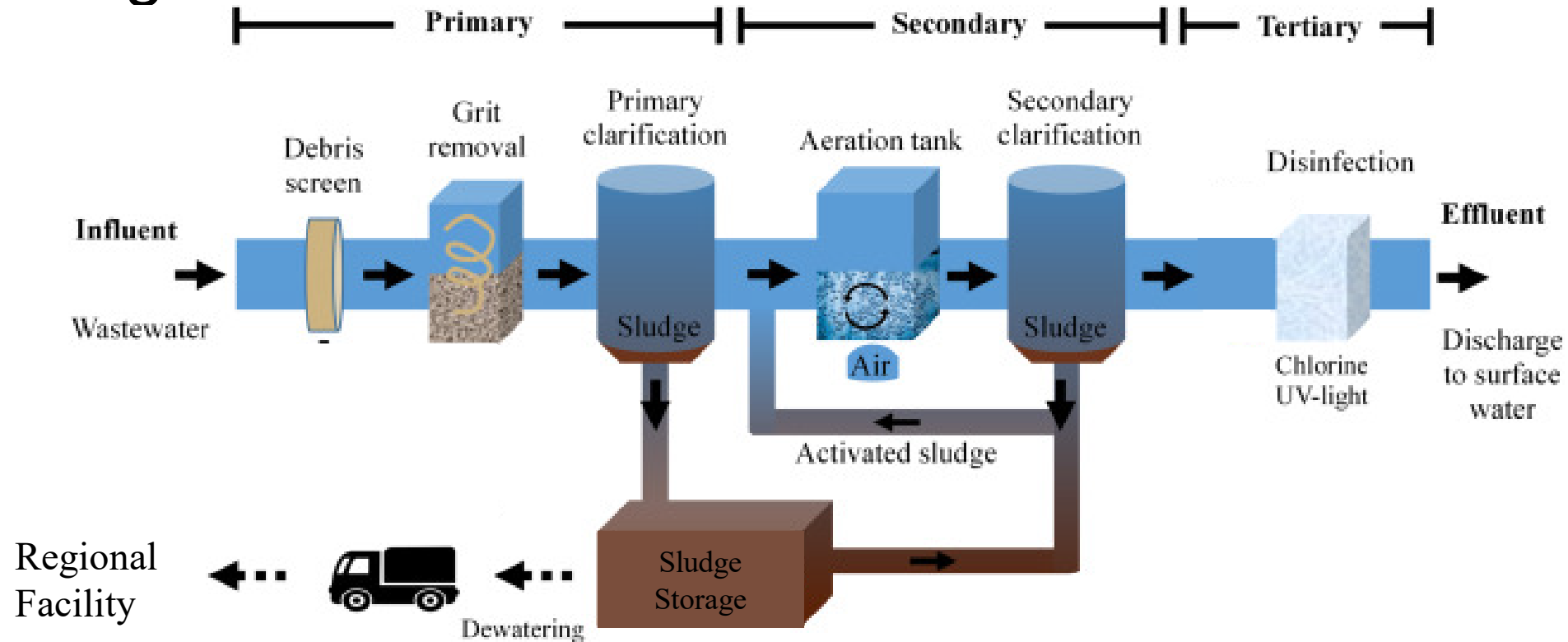
02

Composting vs. Drying

03

Implementation

- Montague CWF



- The CWF processes 3.7 dry tons per week of solids directly from the Town.
- Dewatered on site, then brought to a regional incineration facility via third party contract.
- Contract prices have risen ~7% per year in the last few years.

- Current method of solids processing
 - Costly
 - Harmful to the environment
 - Wasteful
- A better solution
 - Class A dried biosolids
 - Reusable directly on land for virtually any use
 - Sustainable, aligned with Montague's mission
 - Savings over assets' lifetime



- Regional Communities are Struggling as Well
 - Low availability of facilities to accept sludge
 - High costs of these disposal contracts
 - Some of these communities already bring sludge to Montague's CWF
 - Relieves regional incinerators
 - Allows lower cost outlets to neighbors
 - Assists with biological treatment at Montague's CWF



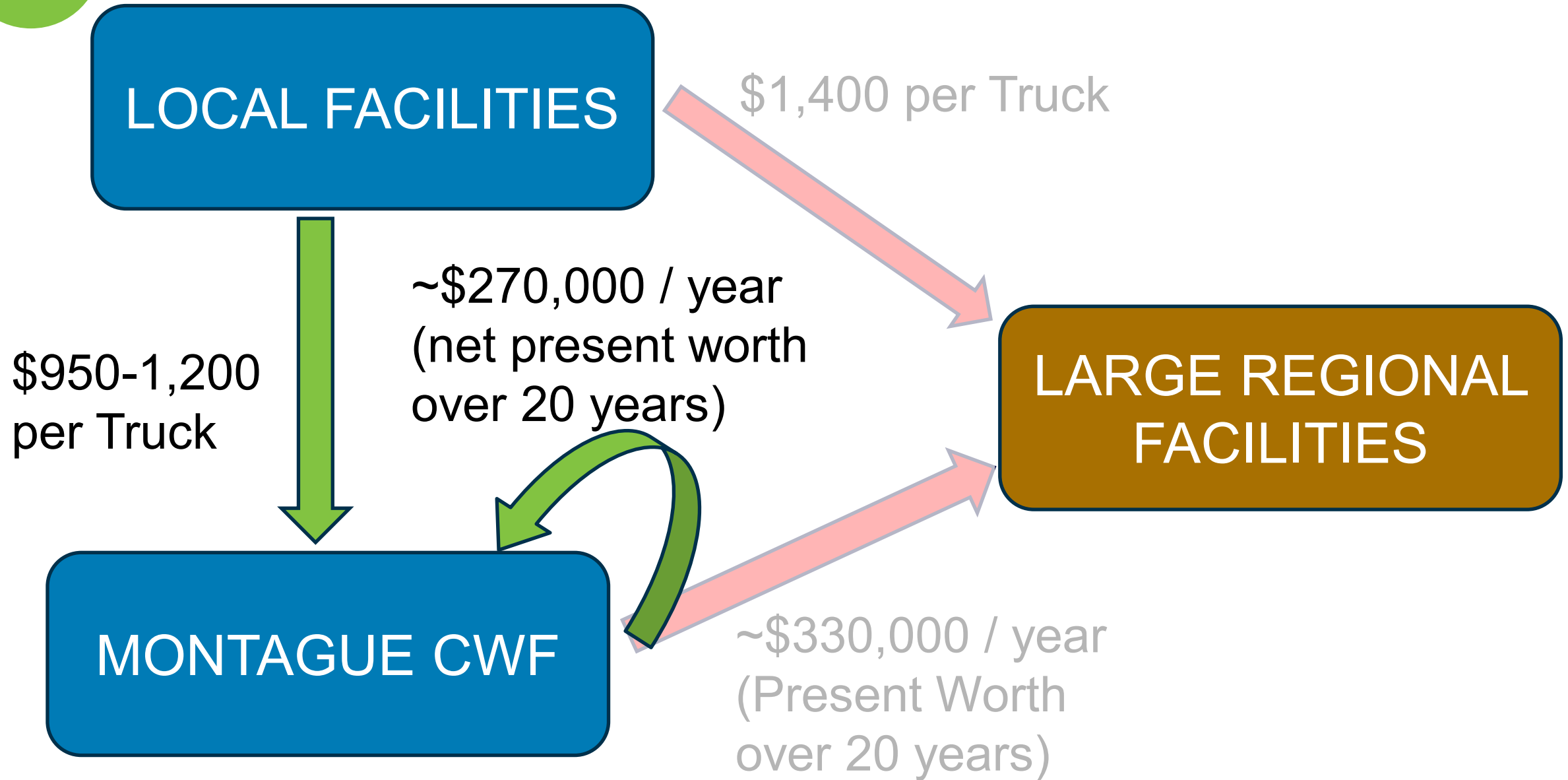
Neighbors



Montague

01

Current Region



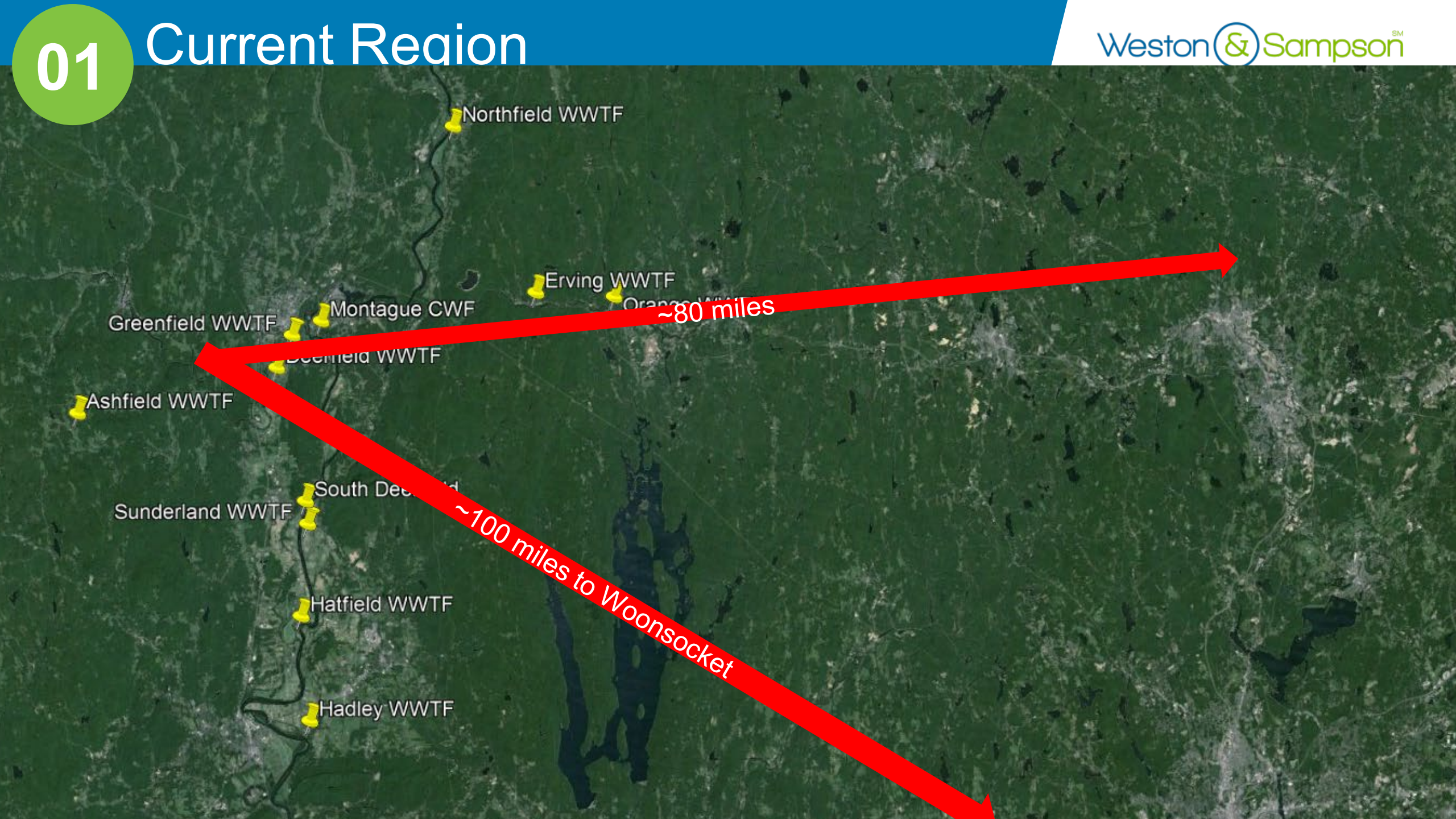
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Current Region

- Northfield WWTF
- Erving WWTF
- Orange WWTF
- Greenfield WWTF
- Montague CWF
- Greenfield WWTF
- Ashfield WWTF
- Sunderland WWTF
- South Deerfield
- Hatfield WWTF
- Hadley WWTF

~80 miles

~100 miles to Woonsocket



- Data from Franklin County Solid Waste Management District (FCSWMD)
- Current Totals

Facility	Annual Gallons	Avg. % solids	Dry Tons
Ashfield	27,000	2.28%	2.57
Old Deerfield	207,000	2.29%	19.77
So. Deerfield	819,000	2.07%	70.70
Erving	225,000	2.08%	19.52
Greenfield	2,400,000	4.06%	406.32
Hadley	1,242,000	2.05%	106.17
Hatfield	234,000	1.90%	18.54
Northfield	144,000	1.86%	11.17
Orange	441,000	2.29%	42.11
Sunderland	342,000	2.28%	32.52
Annual Total	6,081,000		729.38
Per Day	16,660		2.00
Per Week	116,622		13.99

- Current FCSWMD loads to Montague July 2023-March 2024
- Greenfield – too large of a volume per day

Facility	Annual Gallons	Avg. Solids %	Dry Tons
Ashfield	0	2.28%	0.0
Old Deerfield	24,000	2.29%	2.3
So. Deerfield	387,000	2.07%	33.4
Erving	81,000	2.08%	7.0
Greenfield	0	4.06%	0.0
Hadley	0	2.05%	0.0
Hatfield	45,000	1.90%	3.6
Northfield	36,000	1.86%	2.8
Orange	126,000	2.29%	12.0
Sunderland	180,000	2.28%	17.1
Annual Total	879,000		78
Per Day	3,208		0.29
Per Week	22,456		2.00

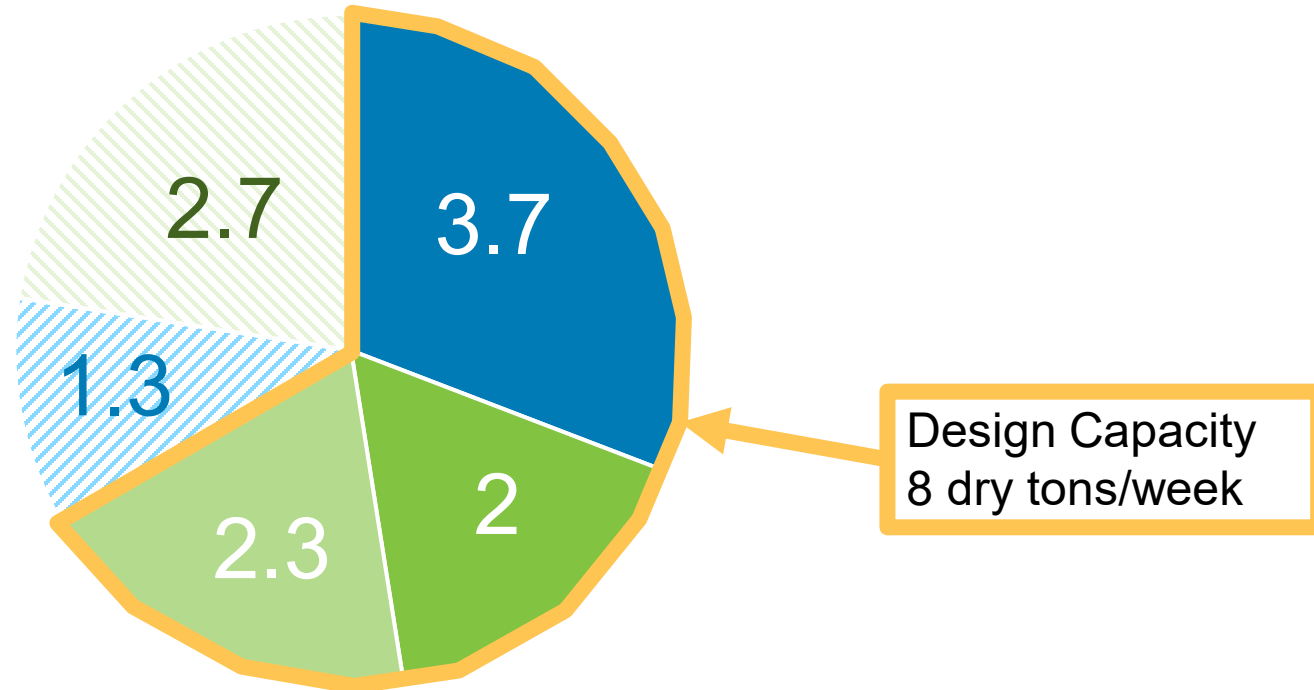
- Increasing Regional Acceptance

Facility	Annual Gallons	Avg. % solids	Dry Tons	% Loads To Montague	Dry Tons to Montague
Ashfield	27,000	2.28%	2.57	70.00%	1.80
Old Deerfield	207,000	2.29%	19.77	70.00%	13.84
So. Deerfield	819,000	2.07%	70.70	70.00%	49.49
Erving	225,000	2.08%	19.52	70.00%	13.66
Greenfield	2,400,000	4.06%	406.32	0.00%	0.00
Hadley	1,242,000	2.05%	106.17	70.00%	74.32
Hatfield	234,000	1.90%	18.54	70.00%	12.98
Northfield	144,000	1.86%	11.17	70.00%	7.82
Orange	441,000	2.29%	42.11	70.00%	29.48
Sunderland	342,000	2.28%	32.52	70.00%	22.76
<i>Annual Total</i>	<i>6,081,000</i>		<i>729.38</i>		<i>226.14</i>
<i>Per Day</i>	<i>16,660</i>		<i>2.00</i>		<i>0.62</i>
<i>Per Week</i>	<i>116,622</i>		<i>13.99</i>		<i>4.34</i>

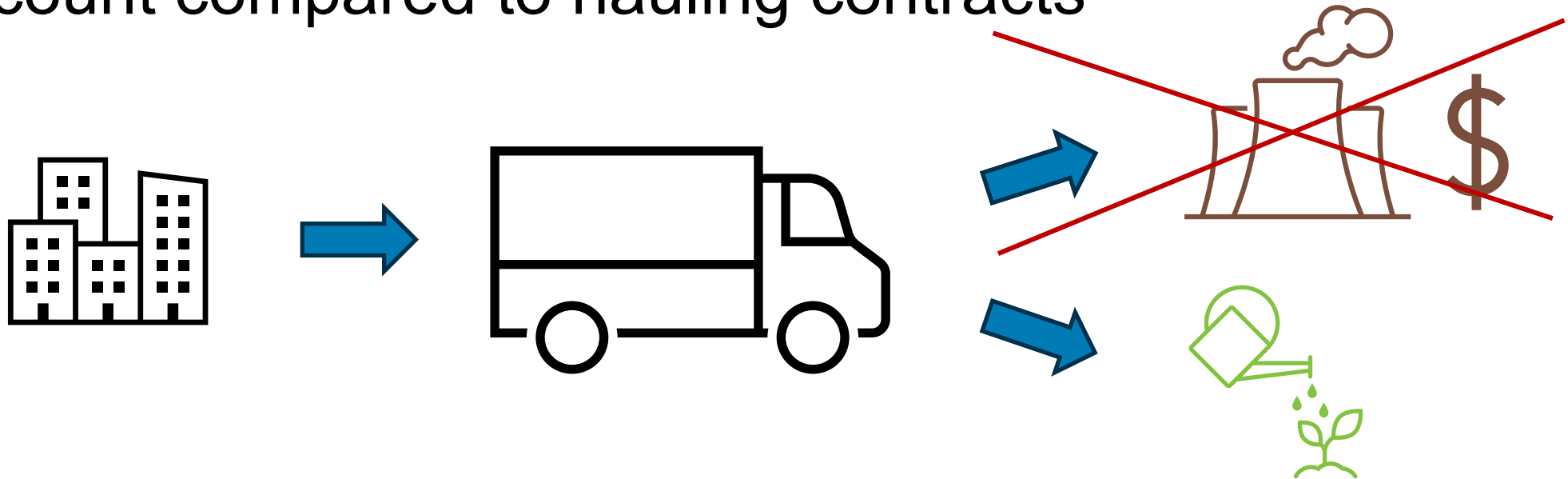
(49,500 gallons per week)

Regional Facility Capacity Allocation
(dry tons/week)

- Current - Montague
- Current - Regional Communities
- Immeditate - Regional Communities
- ▨ Future - Montague
- ▨ Future - Regional Communities



- Montague currently charges between \$700-965 per truck load of sludge discharged at the CWF
- Other facilities' hauling contracts charge \$1,400 per truck
- Montague wants to offer class A biosolids treatment for a discount compared to hauling contracts



- Regional Mileage & Carbon Footprint

Origin Facility	Distance to Lowell	Distance to Montague
Montague	75	0
Old Deerfield	80	3.5
South Deerfield	84	10.5
Erving	67	12
Northfield	75	12
Orange	63	16
Sunderland	82	10
Hatfield	90	16
Ashfield	101	19
Hadley	84	21

	Current	Montague Regional Facility
Miles Per Month	29,645	11,509
Annual CO ₂ Emissions, kg	349,164	138,108

Reduction of 211,000 kg of CO₂ per year

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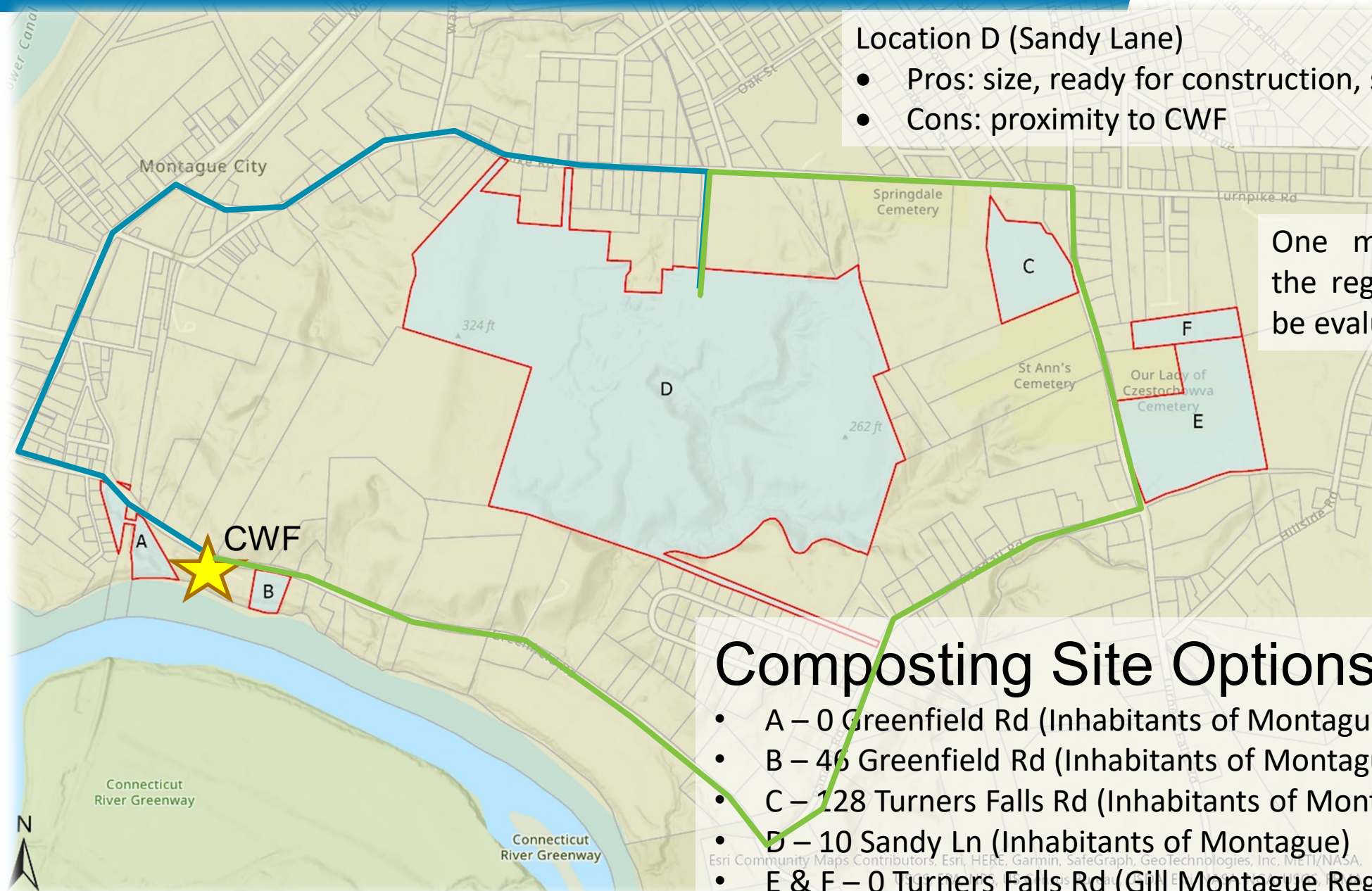
The Current Region

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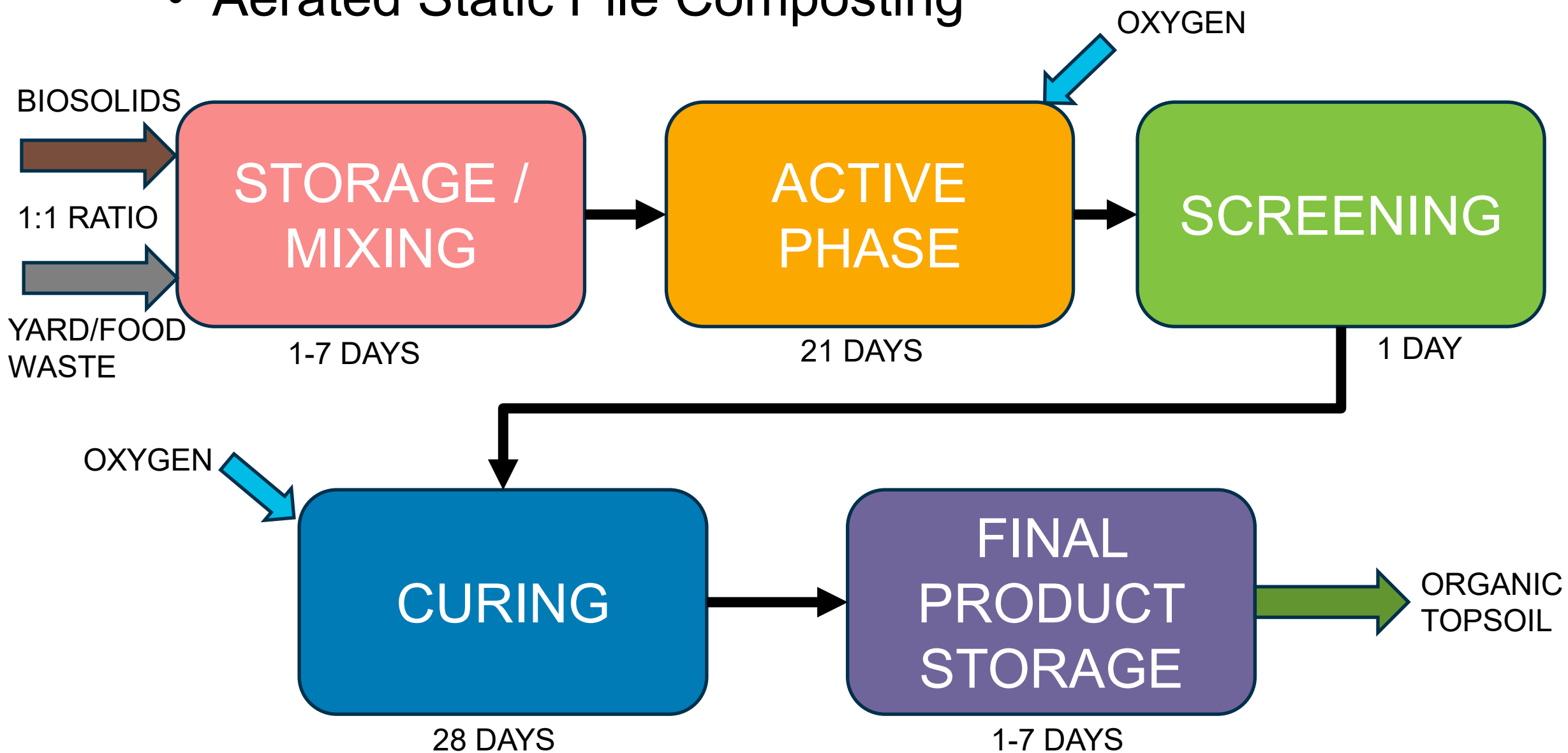
Composting vs. Drying

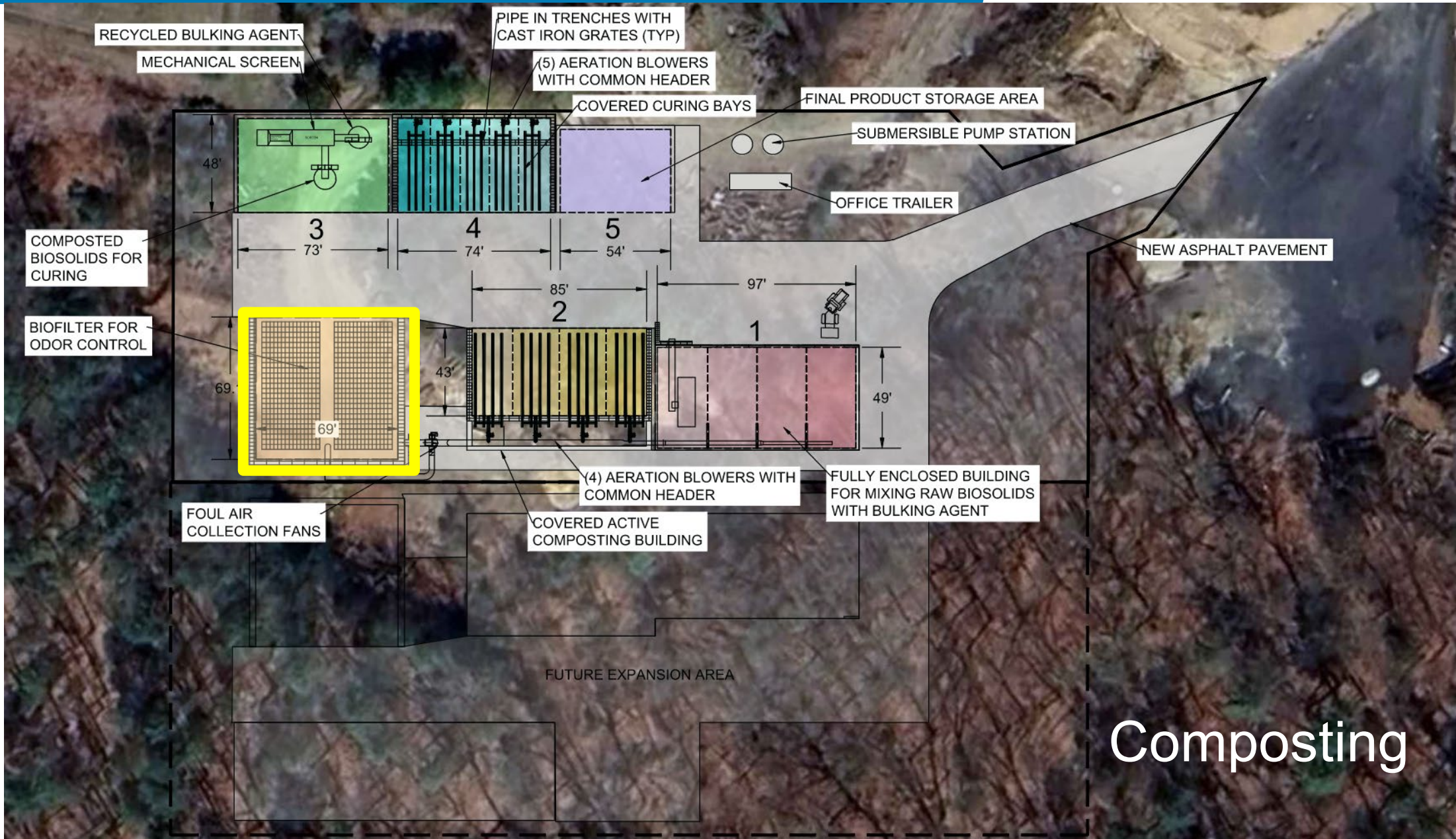
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Implementation

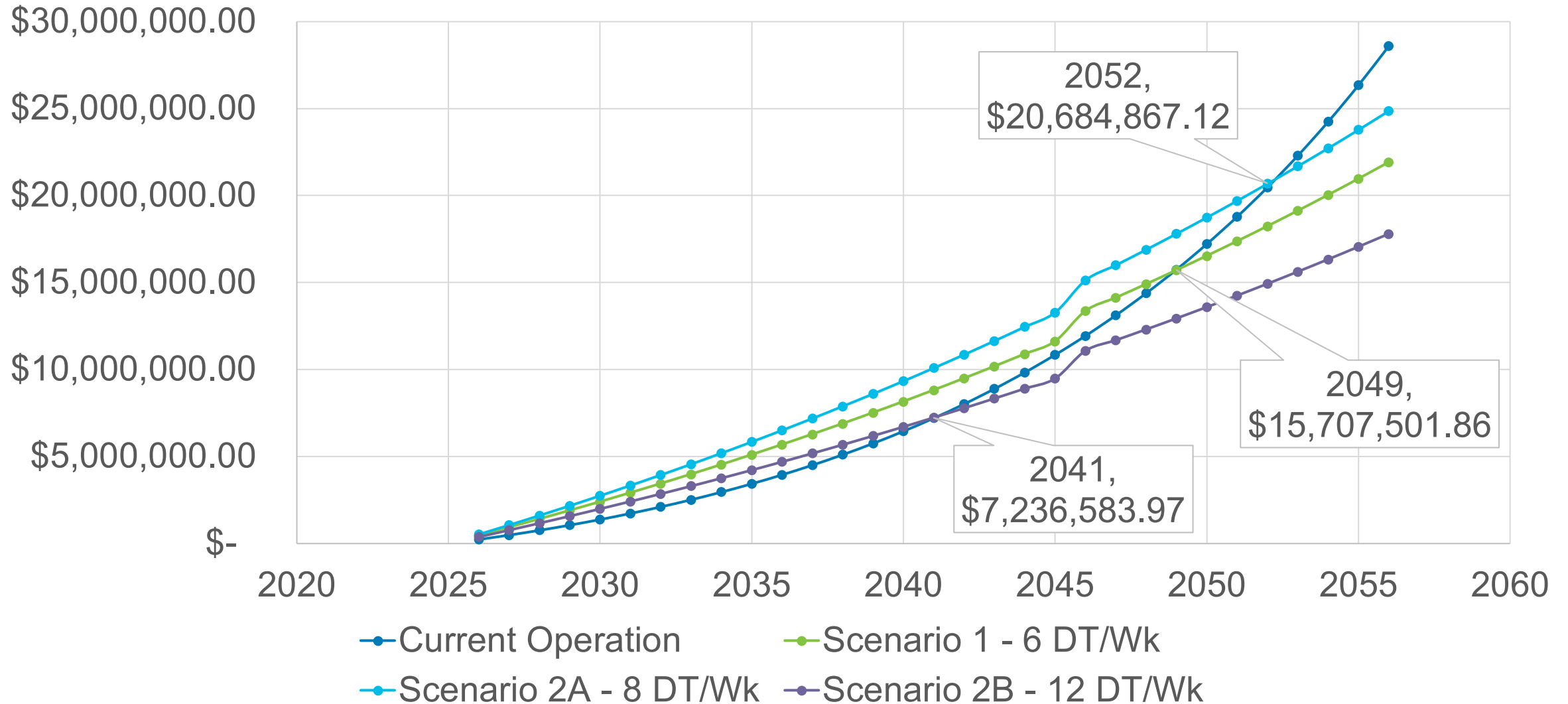


- Aerated Static Pile Composting





Total Net Cost - Current Operation vs. Regional Composting Facility (Future Values, 30-yr Loan)



- Drying Technologies
 - Plate Belt Dryer
 - Heated Screw
- Heating Options
 - Electric
 - ~~Natural Gas~~ (moratorium in Franklin County)
 - Propane

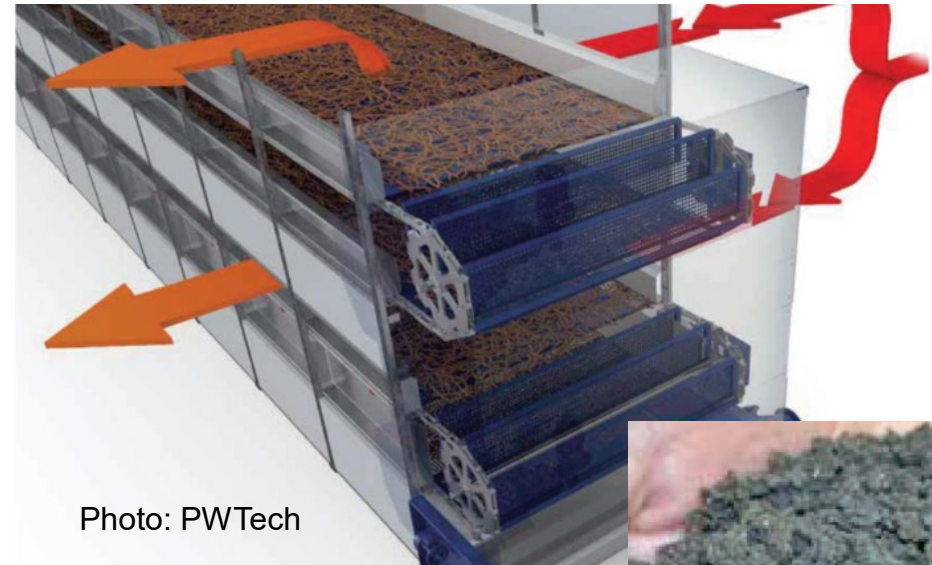


Photo: PWTech

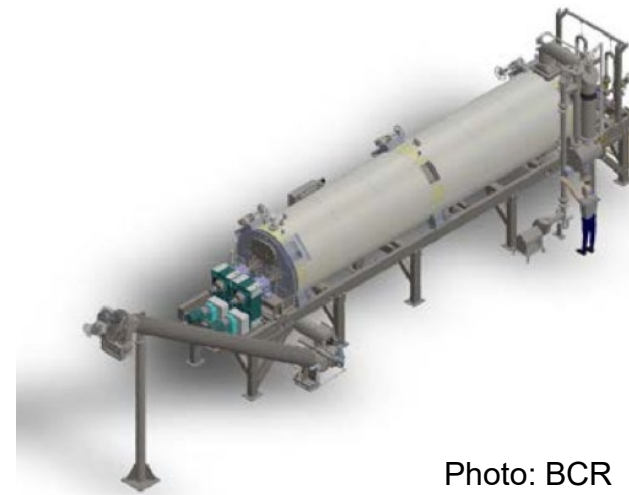
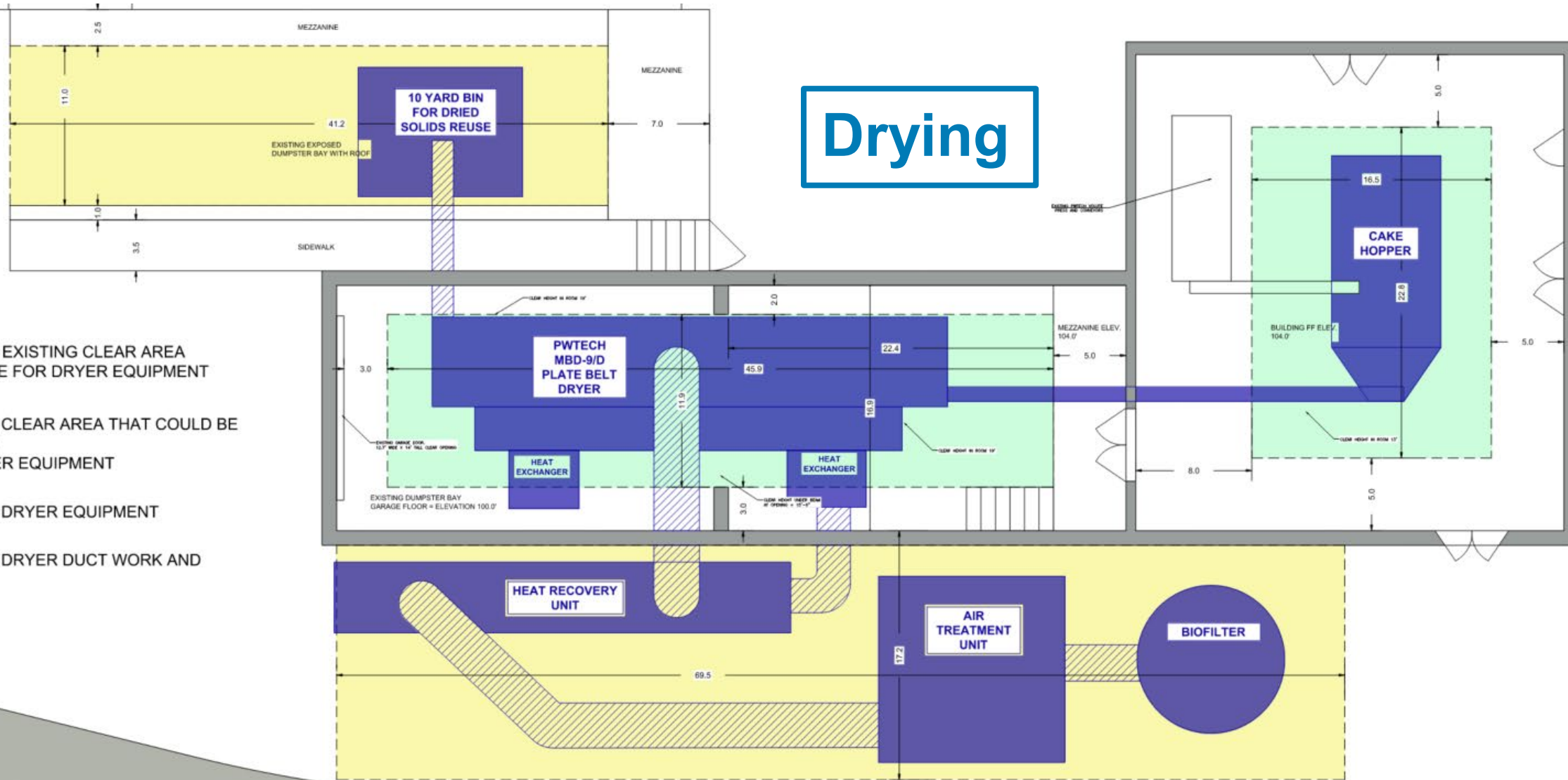


Photo: BCR

An aerial photograph of a wastewater treatment plant facility. The image shows several large circular tanks, rectangular buildings, and various pieces of equipment. A red dashed rectangular box highlights a specific area in the center of the facility, which is identified as the existing biosolids dewatering area. A white arrow points from a text box at the bottom to this highlighted area. The facility is situated near a road labeled 'Greenfield Rd'.

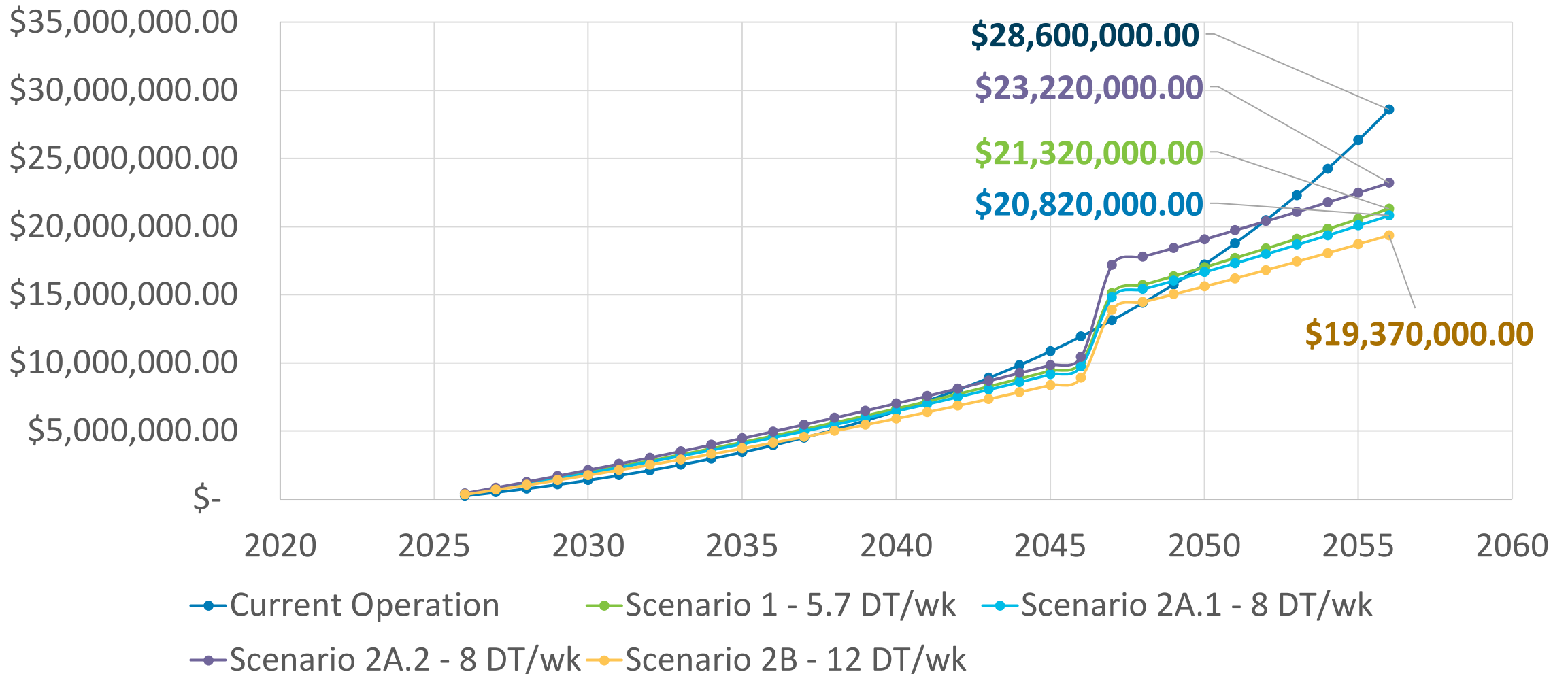
Drying

EXISTING BIOSOLIDS
DEWATERING AREA



CONCEPTUAL LAYOUT FOR UP TO 12 DRY TONS/WEEK
PWTECH MBD-9/D

30-Year Life Cycle Cost Mechanical Dryer vs. Current Operation Future Values, 30-yr Loan



Summary of Costs

Parameter	Current Operation	Composting 8 DT/wk	Drying 8 DT/wk
Capital Cost	\$0	\$9,024,000	\$5,166,000
Annual O&M Cost, 2024 Dollars	\$245,700	\$480,000	\$318,800
Additional Revenue, 2024 Dollars	\$0	\$257,200	\$253,200
Total 20-year Cost, Future Value	\$11,940,000	\$15,133,000	\$9,740,000
Total 20-year Cost, Present Worth	\$6,611,000	\$8,379,000	\$5,393,000
Total 30-year Cost, Future Value	\$28,600,000	\$24,850,000	\$20,820,000
Total 20-year Cost, Present Worth	\$11,783,000	\$10,246,000	\$8,578,000

Assumed/Observed Financial Rates

Capital Loan Interest	2%
Utility Inflation / PW Rate	3%
Sludge Cake Disposal Inflation	7%
Revenue Rate Inflation*	3%
Capital Replacement Inflation	3%

8 Dry tons/week was used as a conservative value to ensure a beneficial life cycle cost at 67% capacity. Each system would be capable of processing 12 dry tons/week, which would result in even greater financial benefits.

*Regional rates calculated at \$950/truck in 2024 dollars (compared to the \$1,400/truck they currently pay).

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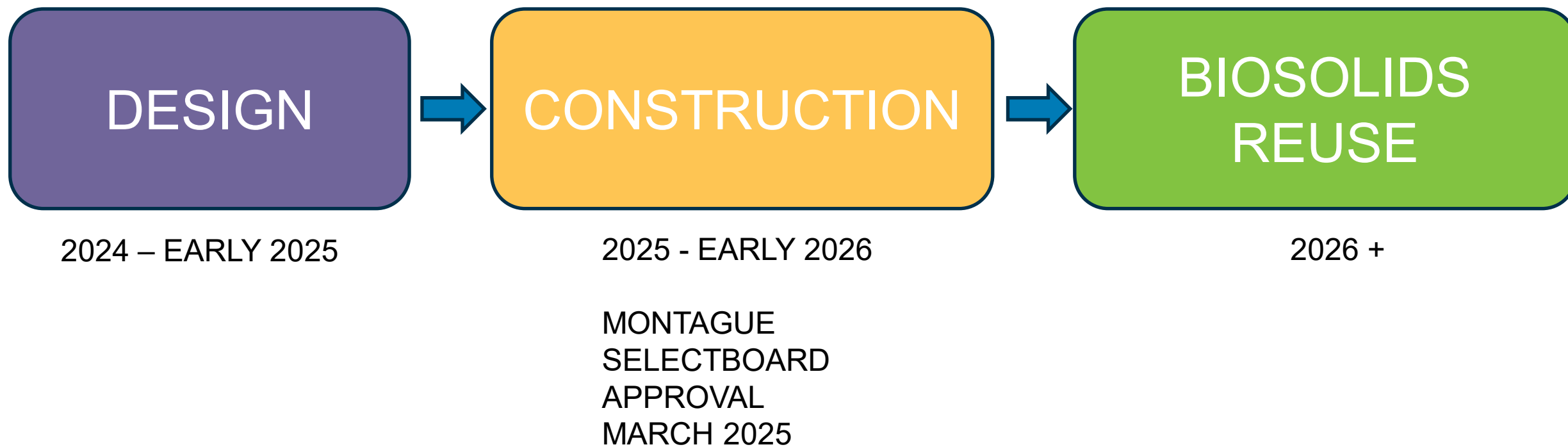
The Current Region

02

Composting vs. Drying

03

Implementation



New Sludge Handling Contracts

- FCSWMD intends to utilize Montague's facility as much as possible
- FCSWMD would still utilize their current regional facilities to maintain redundant options
- Montague would manage the contracts with FCSWMD and other facilities
- Montague would assess the contract pricing on an annual basis to keep up with financial impacts.



Describe the Current Region of Sludge Disposal

MILEAGE,
COSTS

Present the Options: Composting vs. Drying

BOTH VIABLE,
20-YR VS. 30-YR

Understand the Benefits & Impacts

LOWER COST, REUSE
RESOURCES, RISK

Describe the Implementation Steps

DESIGN, CONSTRUCTION,
AGREEMENTS/CONTRACTS

Receive Feedback

IS THE COMMUNITY SUPPORTIVE?

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