Beyond the South Wake Landfill Study

WAKE COUNTY
NORTH CAROLINA

October 2026

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Solid Waste Program Manager

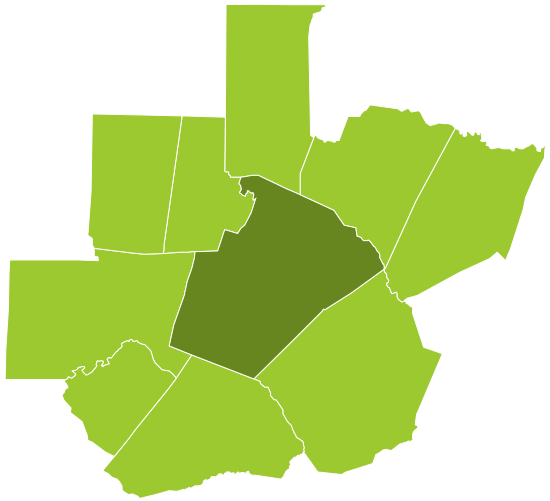
Why are we studying waste disposal options now?

- The South Wake Landfill has a **finite capacity** to receive waste and may **reach capacity between 2040 and 2045**.
- Because of the lag **time needed to develop disposal options**, we must begin researching options now.
- We wanted to investigate a wide **range of waste disposal options** needs to be considered to create a plan that meets the County's long-term disposal needs.
- CDM Smith, Inc. was selected to lead the study on November 18, 2024.

Goals of the Beyond the SWLF Study

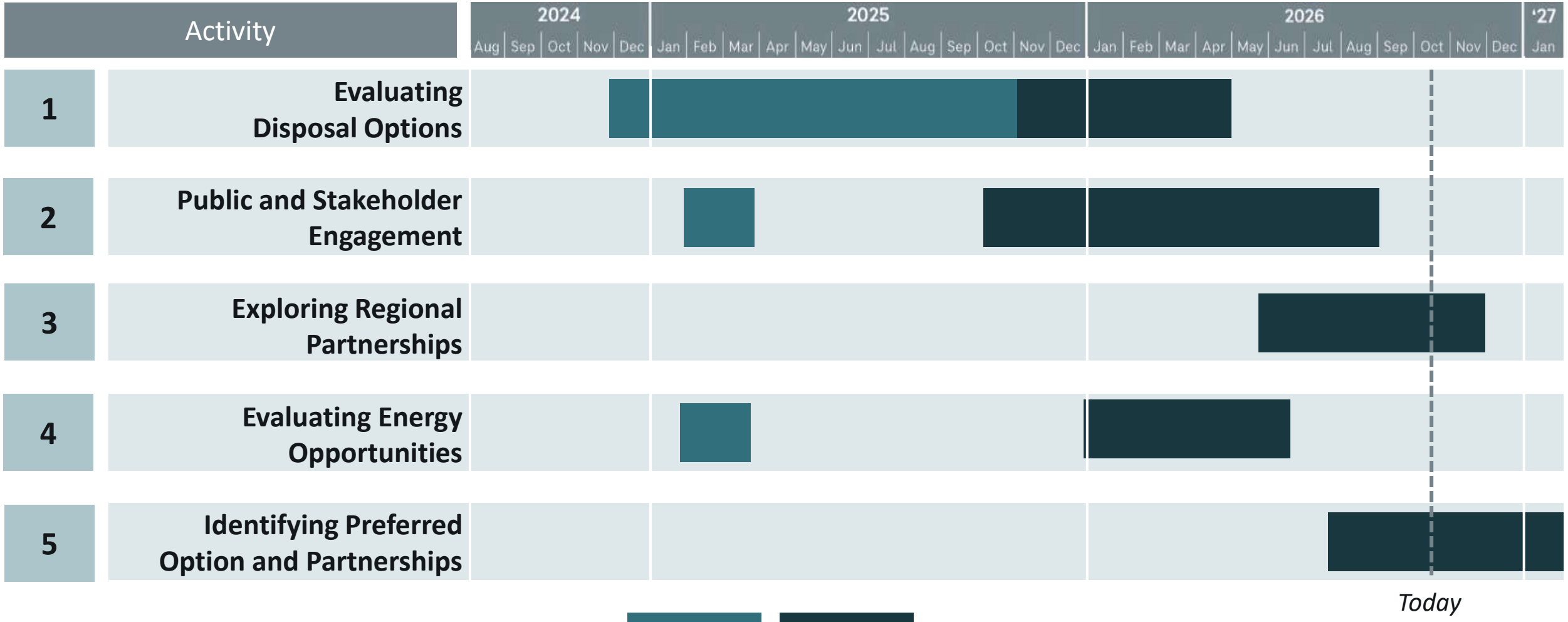
1. Objectively evaluate long-term solid waste disposal options
2. Engage stakeholders and the public in the decision-making process





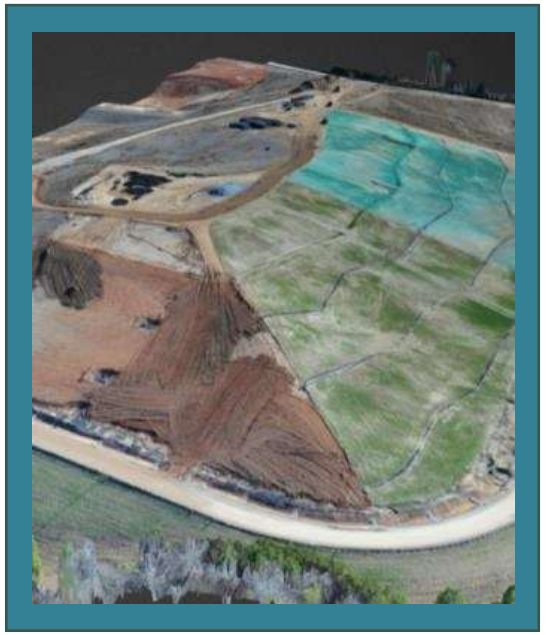
3. Solidify local partnerships and explore regional partnerships
4. Develop an adaptive plan for implementing the preferred option

Study Timeline



What Are The Disposal Options?

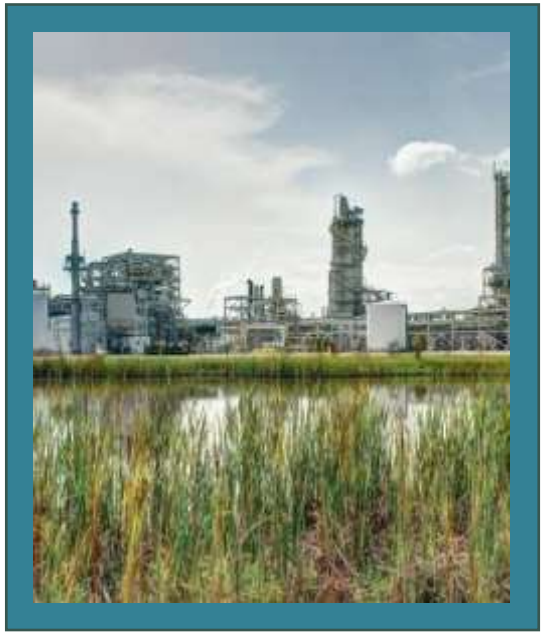
Long-term Solid Waste Disposal Options



New Publicly Owned Landfill in Wake County



Hauling and Disposal at Regional Landfill(s)



Alternative Disposal Technologies



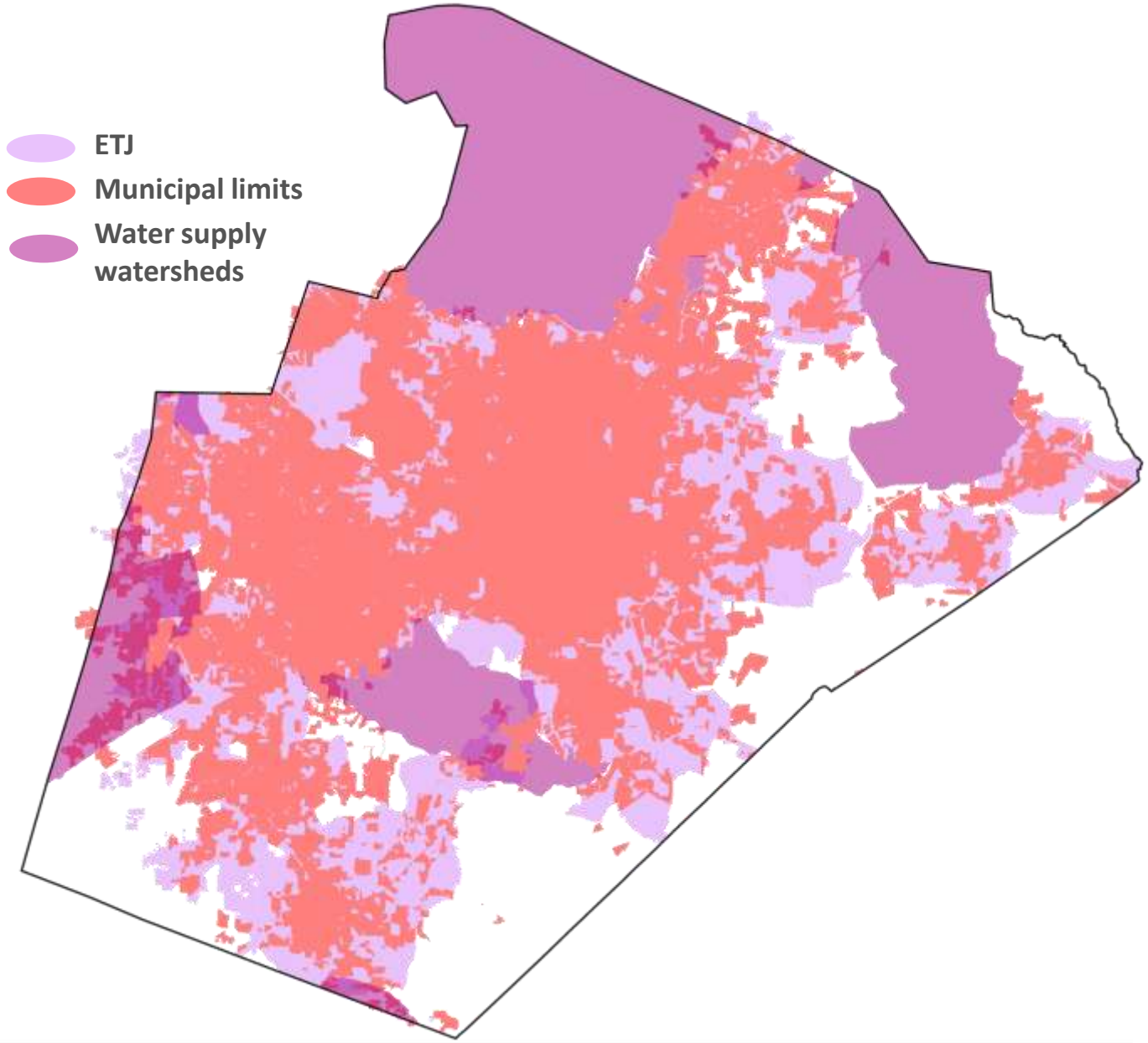
Publicly Owned Waste-to-Energy Facility

Scenario 1 - New Landfill in Wake County

Screening Criteria

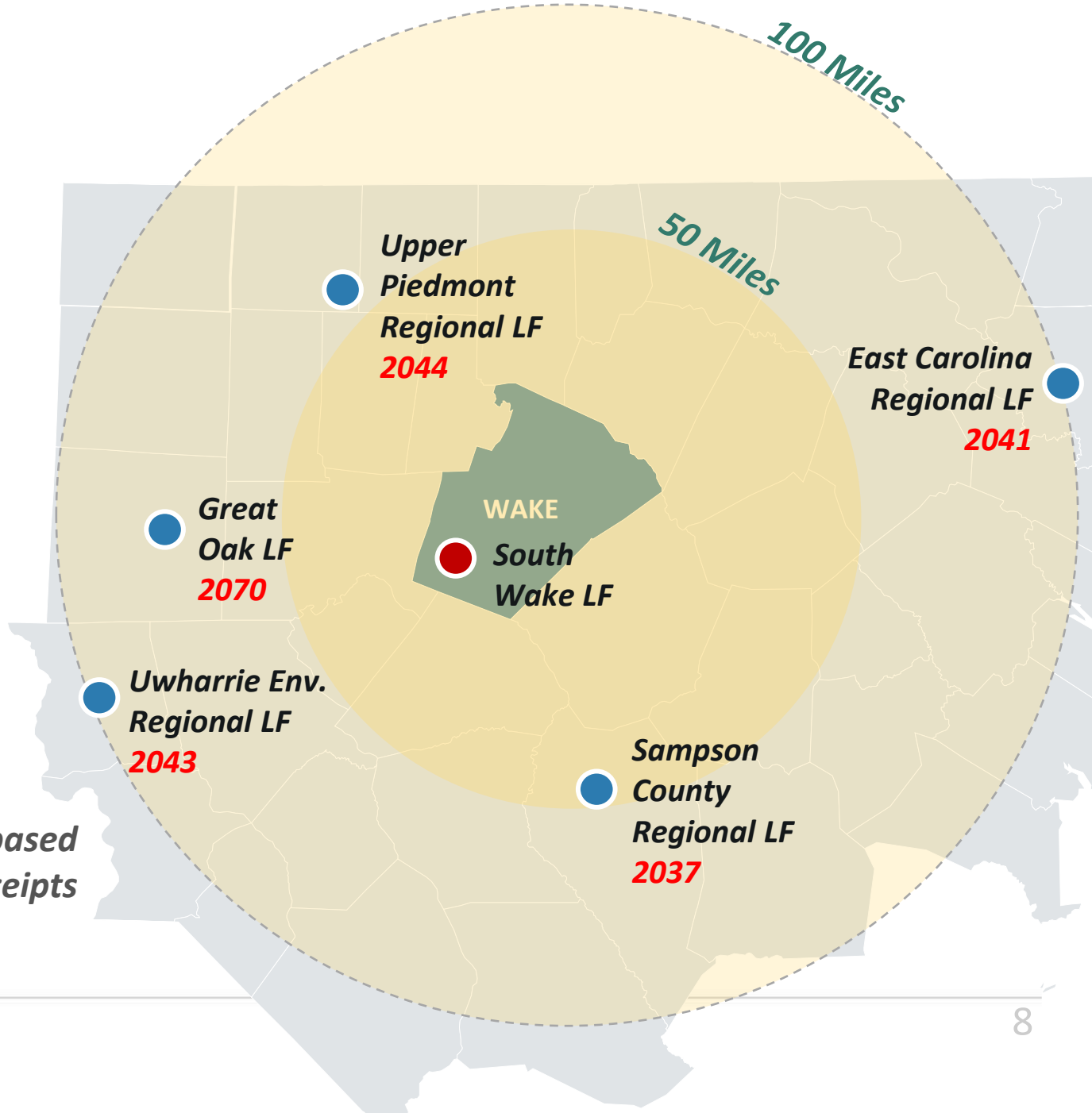
- 400+ contiguous acres and
- Excluding:
  - Municipal and ETJ limits
  - Airport exclusion zones
  - Water supply watersheds
  - Cultural, natural, or historic resources
  - “Developed” land uses
  - …and other criteria

Initial Screening Information Resulted in Substantial Location Constraints



Scenario 2 - Hauling to Regional Landfill(s)

- Four of the five regional landfills could run out of ***permitted*** airspace before the SWLF reaches capacity.
- All five regional landfills appear to have room to expand, which could extend their life, unofficially.



***Year at capacity** based on FY24 waste receipts*

Scenario 3 - Alternative Disposal Technologies

To be considered for Wake County, a technology must show:

- Demonstrated reliability
- Effectiveness processing mixed MSW
- Ability to scale to the County's 2,000 TPD
- Minimal pre-processing for incoming waste deliveries
- Minimal residual waste for disposal

Results of Alternative Technology Review:

- None of the technologies have demonstrated the ability to process mixed MSW at scale and present a viable option for Wake County.

- Mechanical/ Biological Treatment
- Gasification
- AI Sorting
- Pyrolysis
- Anaerobic Digestion

Scenario 4 - Waste-to-Energy

- Mass burning of MSW to make energy
- 2,800 WTE plants worldwide
  - 1,000 in Japan, 650 in China, 500 in Europe, and 63 operating in the U.S.
- Most U.S. WTE plants were constructed prior to 1996
- WTE reduces MSW volume by 90% and allows for metals recovery
- WTE is above landfilling on EPA's "Waste Management Hierarchy"









Disposal Options Evaluation
Time Phase 1

Life Cycle Assessment (LCA)

An LCA was performed to evaluate and compare **three example disposal scenarios (ADT removed)**, assuming 2,000 TPD of MSW. The criteria included:

Environmental Performance

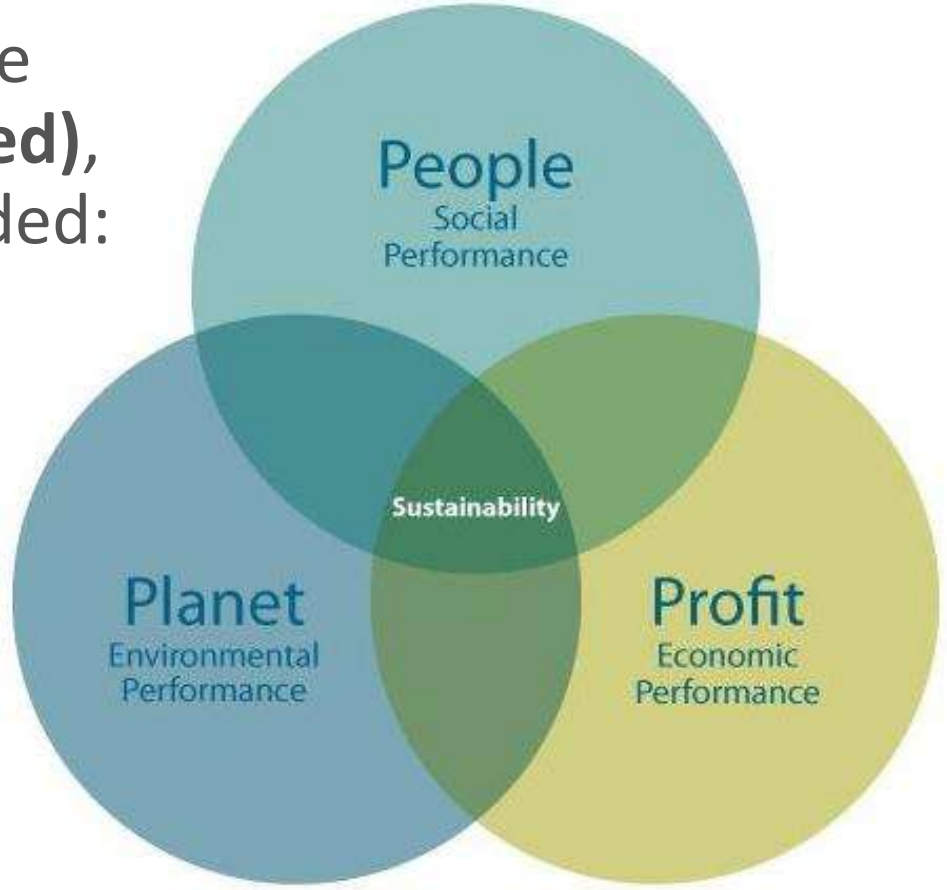
- Greenhouse gas emissions
- Criteria air pollutant emissions

Economic (Financial) Performance

- Cost per ton ranges

Social Performance

- Vehicle collisions



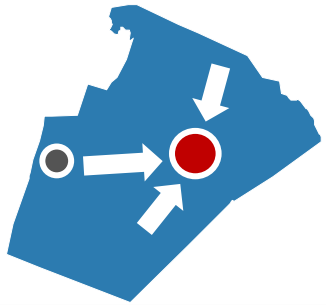
Triple Bottom Line

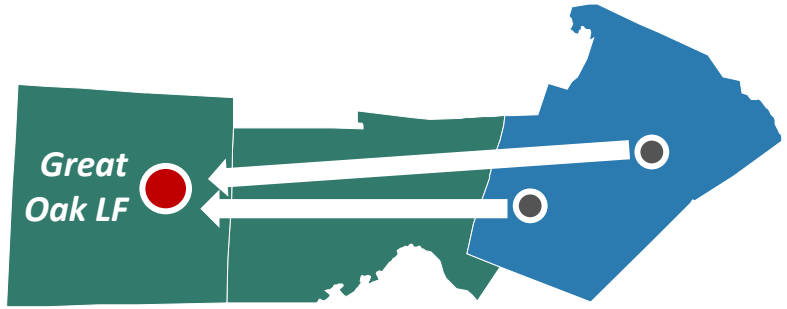
Modeling Criteria For The Life Cycle Assessment (LCA)

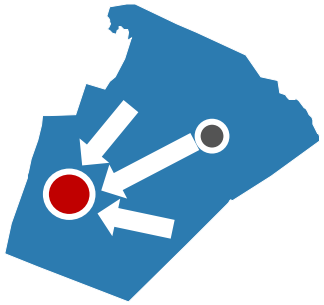
- Important to note that locations of future solid waste facilities have not been determined.
- However, to run the analysis, it was necessary to identify **example** locations.
- Note: as the study progresses, feedback will be gathered regarding the different disposal options as well as potential locations.

The LCA Evaluated 3 Example Scenarios:

Scenario 1 – A New Landfill in Wake Co.	Scenario 2 – Disposal at a Regional Landfill	Scenario 3 – A Waste-to-Energy Facility in Wake Co.
✓ New landfill in "eastern" Wake County	✓ Use of existing East Wake Transfer Station	✓ A WTE facility at the SWLF
✓ New transfer station at the SWLF	✓ New transfer station at the SWLF	✓ Ash disposal in the SWLF
✓ Hauling distance of 11,000 miles per day	✓ Hauling distance of 19,200 miles per day	✓ Continued use of the East Wake Transfer Station
		✓ Hauling distance of 10,000 miles per day

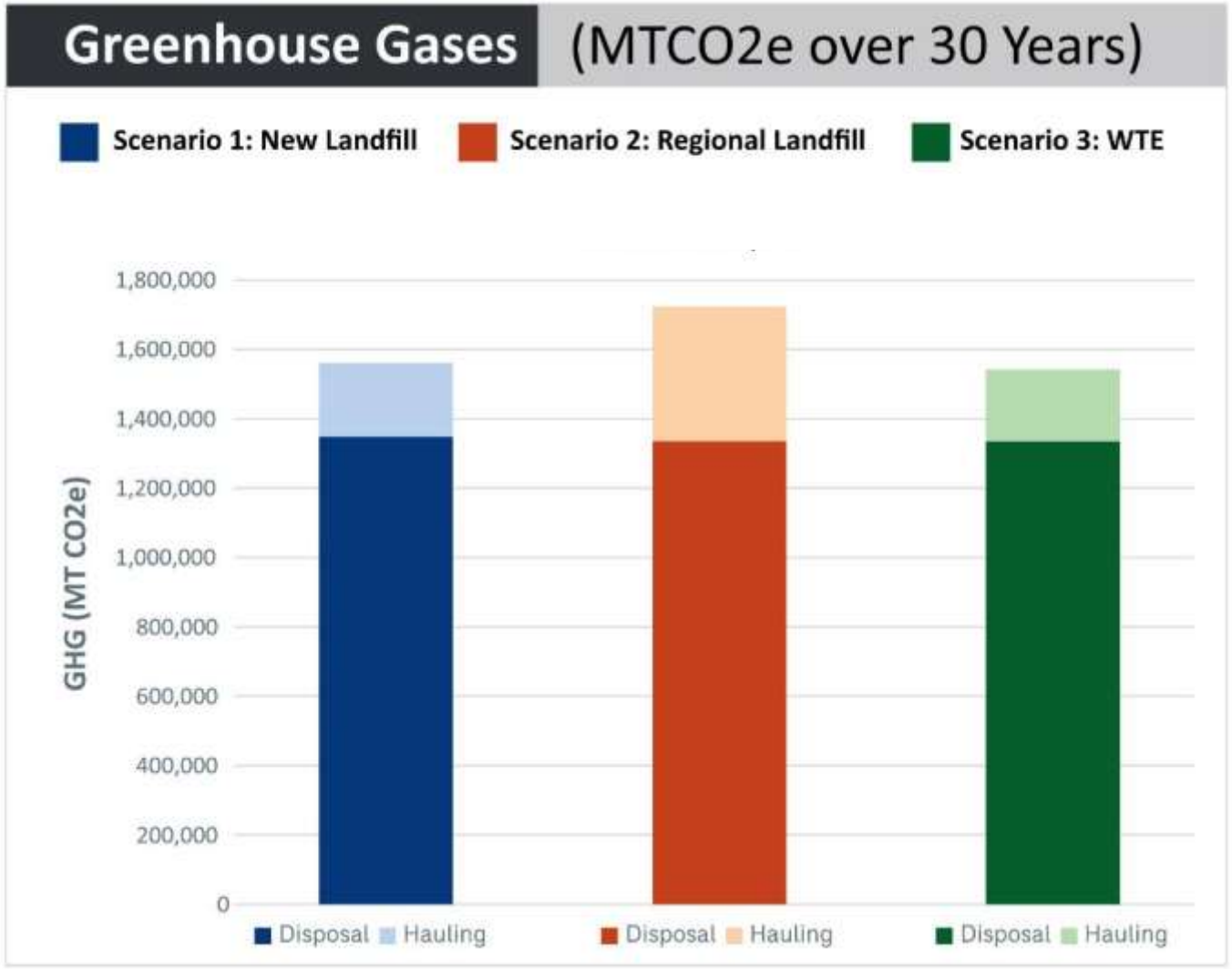






Environmental Performance

= Most favorable
= Less favorable
= Least favorable

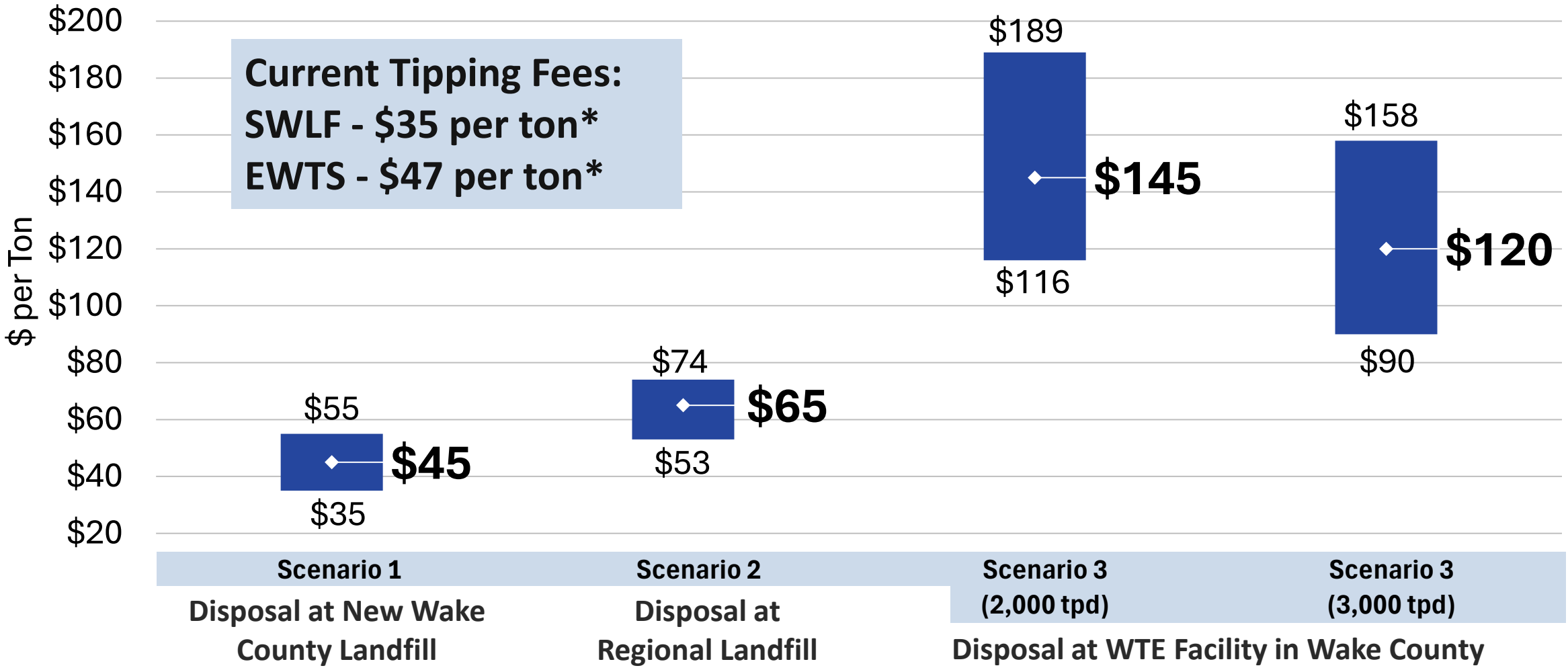


Criteria Air Pollutants as a Percentage of the National Ambient Air Quality Standards

Pollutant	Scenario 1 New Landfill	Scenario 2 Regional Landfill	Scenario 3 WTE
CO	0.98%	3.6%	0.007%
NO_2	42.0%	67.6%	1.4%
SO_2	4.9%	15.2%	0.36%
PM_{10}	25.9%	19.3%	0.02%
$PM_{2.5}$	110.9%	82.9%	0.09%

CO, NO_2, and SO_2 use 1-hr averaging periods
Particulate Matter 2.5 and 10 use 24-hr averaging periods

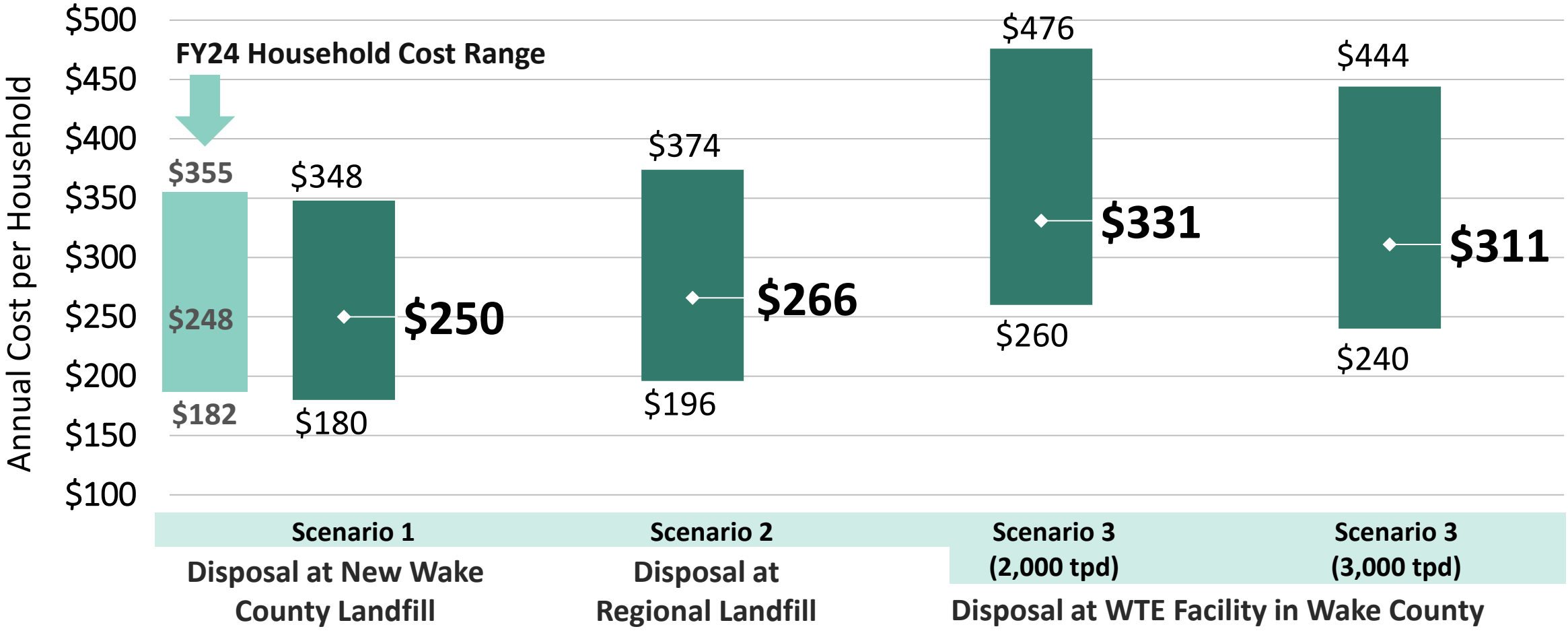
Financial Performance – Cost per Ton* Range



* = does not include $2 per ton State tax

Financial Performance – Cost per Municipal Household

Estimated MSW, Recycling, and Yard Waste Costs per Household



Social Performance - Vehicle Collisions



Scenario 1
Disposal at New Wake County Landfill
(11,000 miles/day)



Scenario 2
Disposal at Regional Landfill
(19,200 miles/day)



Scenario 3
Disposal at a WTE Facility in Wake County
(10,000 miles/day)



I-40, November 13, 2025



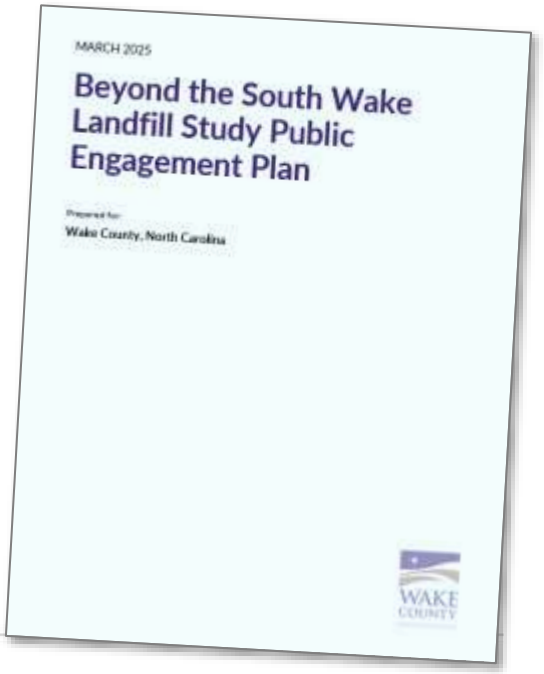
Phase 1 Disposal Options Evaluation Summary

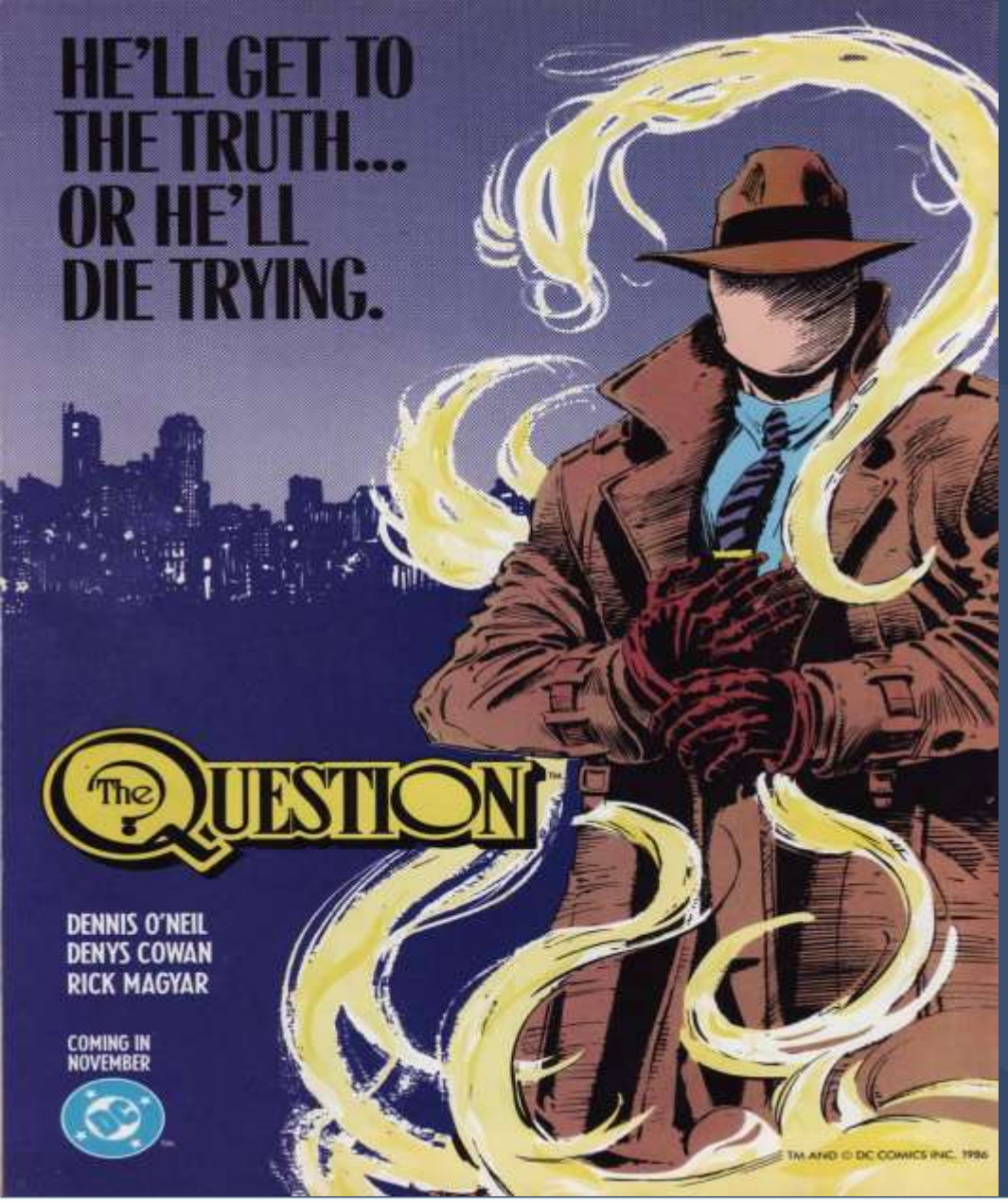
- There is limited land remaining in Wake County that meets regulatory and other search criteria and is sufficient size to site a **new landfill**.
- Expansions of existing **regional landfills** and/or new regional landfills are needed if out-of-county disposal is pursued.
- Estimated **greenhouse gas** emissions are similar for each scenario.
- Estimated **air pollutant** impacts are higher for the landfilling alternatives after accounting for how emissions disperse in the atmosphere.
- **WTE** is a viable option, but the economics are challenging and there is uncertainty in the regulatory landscape.

Currently in Phase 2 - Focuses on:

- **Engaging with Stakeholders**
  - ✓ Wake Energy Advisory Commission
  - ✓ Wake County Solid Waste Technical Advisory Committee
  - ✓ Triangle Solid Waste Consortium (Central Pines Regional Council)
  - ✓ County/City/Towns Managers
  - ✓ Environmental Advisory Boards, Committees, and Groups
  - ✓ Chamber of Commerce and other business interests
  - ✓ Community groups and residents
- **Launched a project webpage and community survey**
- **Actively Increasing Awareness through Social Media**
- **Held Five Public Engagement Meetings**
- **Further Exploring the Waste-to-Energy Option**







Contact Information

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