



# Improved Management Strategies of Processing Acid Producing Materials on Transportation Projects

## **Problem Description**

Roadway excavation cuts in Tennessee frequently encounter rock, shale, or soil materials that could be considered acid producing material (APM). The geotechnical material properties of APM are adequate for roadway fill, but the APM produces acidic leachate that creates a condition of environmental pollution. TDOT has prepared a guidance manual in 2007 for dealing with these types of projects. TDOT routinely uses these design and construction protocols for proper handling of APM with APM processing strategies consist of blending with lime, relocating to landfills, or placement in engineered encapsulation cells on-site or off-site. These strategies, however, result in considerable increases in project costs and reductions in construction productivity, thus driving the need to assess current APM construction procedures to enhance our management of APM encountered in TDOT roadway projects with improved cost-effectiveness and construction productivity.

## **PROJECT NUMBER:**

RES2023-14

## **PRINCIPAL INVESTIGATOR:**

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## **TDOT LEAD STAFF:**

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## **PROJECT SCHEDULE:**

August 2022 to January 2025

## **Research Objectives**

The overall objective of the proposed project is to assess current APM construction management procedures and provide improvements in methodologies that could promote process improvements. Specific tasks to be completed by the project team include the following:

- Evaluate current site characterization methods for project screening and assessment.
- Critically review current APM processing methodology and assess alternative APM testing methods for the quantification of field-relevant acid producing capacity of APM.
- Evaluate the feasibility of current APM encapsulation and relocation requirements.
- Review non-destructive geophysical testing methods for site characterization.
- Evaluate the current state of APM monitoring methods.
- Establish GIS location mapping of potential landfill sites capable of accepting APM from TDOT projects.
- Perform a cost-benefit analysis of current practices against alternative practices.

## **Potential Implementation and Expected Benefits**

APM management has been a multi-divisional impact, including Geotechnical, Environmental, Design, Right-of-Way and Construction Divisions. Therefore, findings of this research will be used to further guide inter-Divisional APM policy discussion. Additional benefits will include costing savings due to less conservative design, efficiency gains through optimized management practices, and time savings with expedited decision making with more accurate testing methods.