Land Application of Concrete Byproducts: Next Steps

Introduction and Overview

- Background
- Waste Management
- Land Application
- Permit Renewal/Modification
- Summary
Background

- Diamond Grinding is a pavement preservation technique:
  - Thin Surface of Pavement Removed
  - Closely Spaced Diamond Saw Blades

Background – Diamond Grinding

Diamond Grinding New Concrete
Background – Diamond Grinding

Advantages:
- Cost Effective – fraction of pavement overlays
- Increases Smoothness and Improves ride
- Reduces Noise
- Improves Skid Resistance
- Improves Drainage
Background – Typical Disposal

- Wastewater Typical Disposal Options:
  - Wastewater Treatment Facilities
  - Landfills
  - Dewatered in Trenches or Pits

NCDOT and its Contractors are legally responsible for all industrial process wastes generated during construction, maintenance and preservation projects. NCDOT is required to minimize waste sent to landfills from its projects.
Waste Management – Land Application

- 2010 - Developing a New Approach to Disposal
- 2011 - Land Application Identified
- 2012 - Land Application Permit for W.Wake Expressway
- 2013 - Statewide Permit for Land Application Received
- 2014 - Statewide Permit Including Reduced Monitoring.
  - Metals testing removed
  - pH, total solids, calcium carbonate equivalence (CCE) remain

Waste Management- Guidelines

- 2015 – NCDOT “Guidelines on the Management and Disposal of Concrete Grinding Residuals” (CGR)
  - Management Plan – Collection & Containment (30 days prior)
  - Sampling & pH Control Plan
  - Spill Control Plan
  - Document Disposal Option
Waste Management – pH Adjustment

pH Adjustment thru addition of Muriatic Acid

2015 – NCDOT “Guidelines” Disposal Options Include:

- POTW or Permitted WWTP
- Solids at Municipal Landfill
- Land Application Statewide Permit
Land Application

- Land Application is the measured distribution of beneficial products on a crop based upon agronomic rates
  - Example: Diamond grinding slurries from concrete residuals can be applied to road shoulders at agronomic rates to improve soil acidity

Land Application - Benefits

- Benefits of Land Application Include:
  - Soil pH adjustment
  - Replaces need for agricultural lime
  - Potential reduction in disposal cost for contractors and NCDOT
  - Reduction of materials that are being landfilled
Land Application

AgChem TerraGator Land Applying

Land Application

Pumper Truck Land Applying
Permit Renewal/Modifications – Clarification

➤ Additional Clarification to 2015 Guidelines:
  ▪ pH Adjustment
  ▪ Acceptable Discharge Methods
  ▪ Temporary Storage Concept

➤ Address in Permit Renewal/Potential Modifications

Permit Renewal/Modifications

➤ Acceptable Direct Discharge Methods will be Summarized

➤ Example: Direct Discharge through an open pipe is not considered Land Application and is not allowed.
2\textsuperscript{nd} Example: Although Acceptable in Other States; Not Currently Allowed in North Carolina

Acceptable Temporary Storage Methods will be Summarized
Example: Difficult to Handle because of Phase Separation; Temporary Storage Options may be Limited
Federal and State Regulations Govern Management of Byproducts:
- Environmental Protection Agency (EPA)
- Resource Conservation and Recovery Act (RCRA)
- NC Dept. of Environmental Quality (NCDEQ), Division of Water Resources (DWR)
- NCDEQ, Division of Waste Management (DWM)

2017 – Statewide Permit Renewal/Modifications
Guidelines for Direct Discharge
- Acceptable Discharge Practices
- Application Rates
- Monitoring
Guidelines for Temporary Storage
- Acceptable Storage Practices
- Storage Concepts
- Monitoring
Permit Renewal/Mod – Tech Transfer

Education
- Guidelines specifics may be further detailed in standard operating procedures available to contractors
- Guidelines incorporated into contract language
- Guidelines posted on internet
- Conferences
- Cost estimation tool

Summary

Advantages of Pavement Resurfacing:
- Cost Effective – fraction of pavement overlays
- Increases smoothness and improves ride
- Reduces noise
- Improves skid resistance
- Improves drainage

Advantages of Land Application Include:
- Soil pH adjustment
- Replaces need for agricultural lime
- Potential reduction in disposal cost for contractors and NCDOT
- Reduction of materials that are being landfilled

Guidelines for Direct Discharge and Temporary Storage:
- In Progress for May 31, 2017 Statewide Permit Renewal
THANK YOU

Questions