



Randolph County, North Carolina

# **Randolph County - Board of Health Meeting**

**February 11, 2013**





# Presentation Outline

- Landfill Development Project Objectives
- Modern Solid Waste Disposal Facilities
  - Facility components
  - Regulatory requirements
  - Construction and closure
  - Environmental monitoring
  - Operations
  - Unauthorized Waste
  - Human Health
- Proposed Facility Layout
- Activities Completed
- Activities In-progress
- Next Steps





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## Subtitle D Solid Waste Landfills

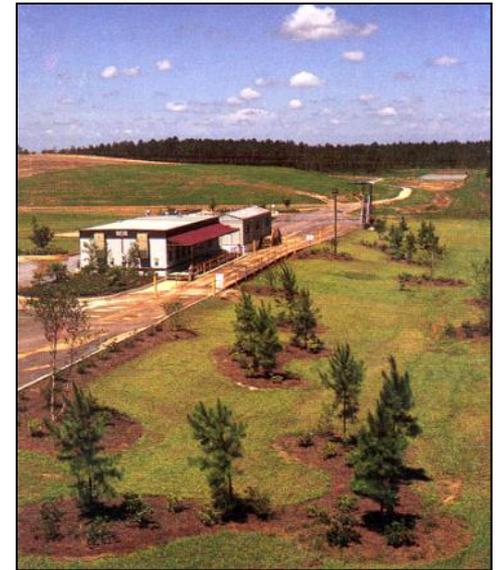
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- North Carolina Department of Environment and Natural Resources (NCDENR)
  - Protect human health and environment
  - Preservation of natural resources
  - Review and approval of MSW disposal facilities
- MSW facility components
  - Bottom liner systems with liquids collection
  - Final cover systems with LFG collection
  - Environmental monitoring systems for air and water
- Checks and balances
  - Construction QA/QC
  - Engineering certifications
  - State inspection and approval



# Landfill Development Project Objectives

- Long-term County solid waste disposal needs
- Cost reduction for County residence and businesses
- Create additional jobs within County
- Increase recycling opportunities
- Provide additional revenue sources
  - Host fees
  - Landfill gas-to-energy
- Provide community assets
  - Educational programs
  - Recreational areas
- Protect human health and the environment



# Landfill Schematic

## PROPOSED RANDOLPH COUNTY LANDFILL

### -What is leachate?

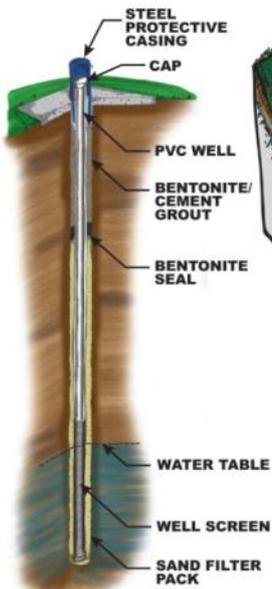
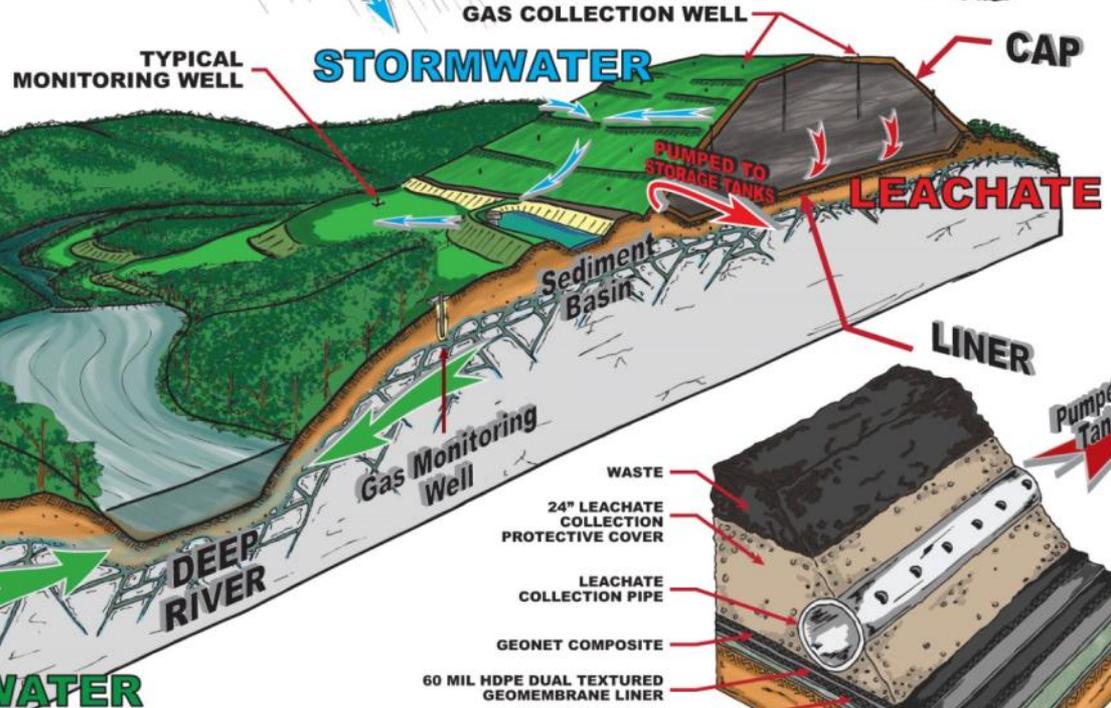
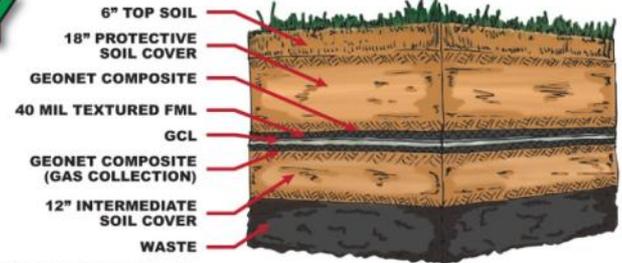
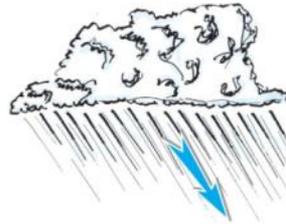
Leachate is any water that contacts waste.

### -What is groundwater?

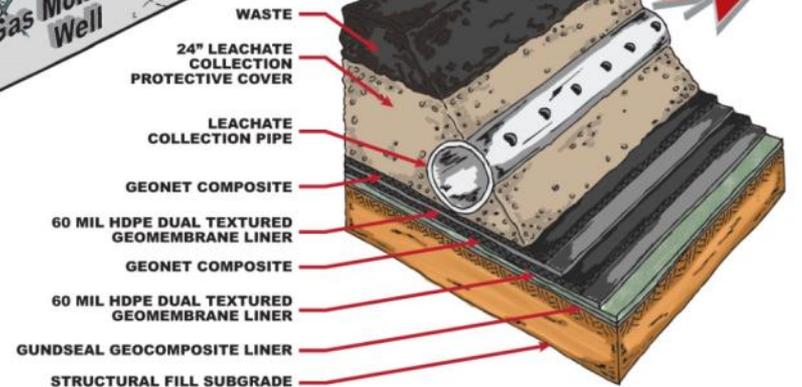
Water beneath the ground surface in voids in the soil and bedrock.

### -What is stormwater?

Runoff from a rain storm or snow melt.



**TYPICAL MONITORING WELL**





# Regulatory Requirements

- State approvals required (NCDENR)
  - Engineering plans
  - Construction reports
  - Environmental controls
- Exceeds regulatory requirements
  - Double bottom liner system (leak detection)
  - Additional buffers (> 200 feet)
- Other regulatory stakeholders
  - NC Department of Cultural Resources
  - US Army Corps of Engineers
  - NC DOT
  - FAA





## Senate Bill 1492

- 2007 legislative session
- Next generation of waste disposal in NC
- Supported by the Sierra Club
- Solid waste permitting reform
  - More stringent financial assurance requirements
  - Penalties for improper disposal activities
  - Environmental impact study
  - Increased buffer requirements
  - Caps landfill size
  - Contaminated site clean up fund
  - Recycling programs





# Landfill Construction





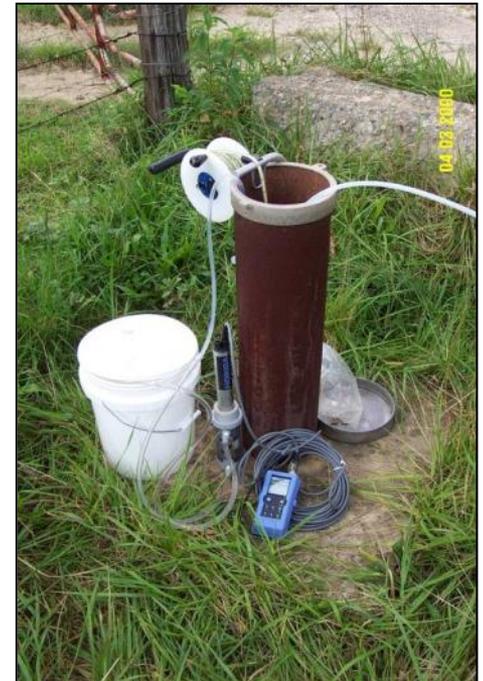
# Landfill Closure





# Landfill Environmental Monitoring

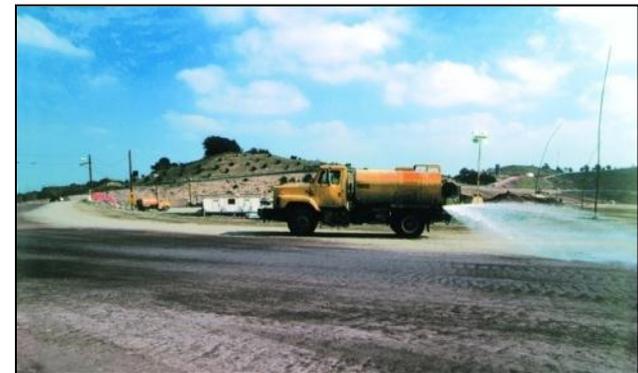
- Water quality and LFG monitoring programs
  - Protect human health and environment
  - NCDENR approved programs
- Groundwater
  - Monitoring wells
  - Sampling and analysis
  - Regulatory reporting
- Surface water (i.e., streams)
  - Deep River
  - Tributaries
- Stormwater program (NPDES)
- LFG (i.e., methane) collection and control
  - Surface emission monitoring
  - Boundary monitoring





# Landfill Operations

- Operations Plan
  - Protect human health and environment
  - NCDENR approved program
- Certified operator training
- Employee health and safety training
- Unauthorized waste program
- Placement, compaction, and daily cover requirements
- Litter, noise, odor, dust and vector control
- Record keeping and reporting
- State and County inspections





# Unauthorized Waste Program

- Unauthorized Waste Program
  - Protect human health and environment
  - Pathogenic and hazardous wastes
  - NCDENR approved program
- Inspection procedures
  - Incoming loads
  - Working face
- Removal procedures
  - Segregation and loading
  - Manifesting and proper off-site disposal
  - Regulatory reporting
- Annual training of employees
- Penalties for improper disposal activities





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# Unauthorized Wastes

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- Hazardous waste
- Regulated medical waste
- Industrial waste
- Lead acid batteries
- Liquid paint
- Used oil and filters
- Antifreeze
- Electronics
- Wooden pallets
- Yard waste
- White goods
- Aluminum cans
- Scrap tires
- Beverage containers
- Plastic containers
- Oyster shells

- Governmental Studies
  - U.S. Department of Health and Human Services – Agency for Toxic Substances and Disease Registry (ATSDR)
- Randomly selected 25 out of 220 public health assessments conducted on landfills between 1999 and 2012 in the U.S.
- Studies included risk assessments of hazardous and non-hazardous landfills throughout the U.S.
  - 22 of the 25 assessments reported no apparent public health threat from the landfill
  - 3 of the 25 assessments reported insufficient data to draw a health threat conclusion
- Exposure pathways included inhalation, ingestion, and dermal absorption with contaminated air, soil, and water



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## Human Health Cont.

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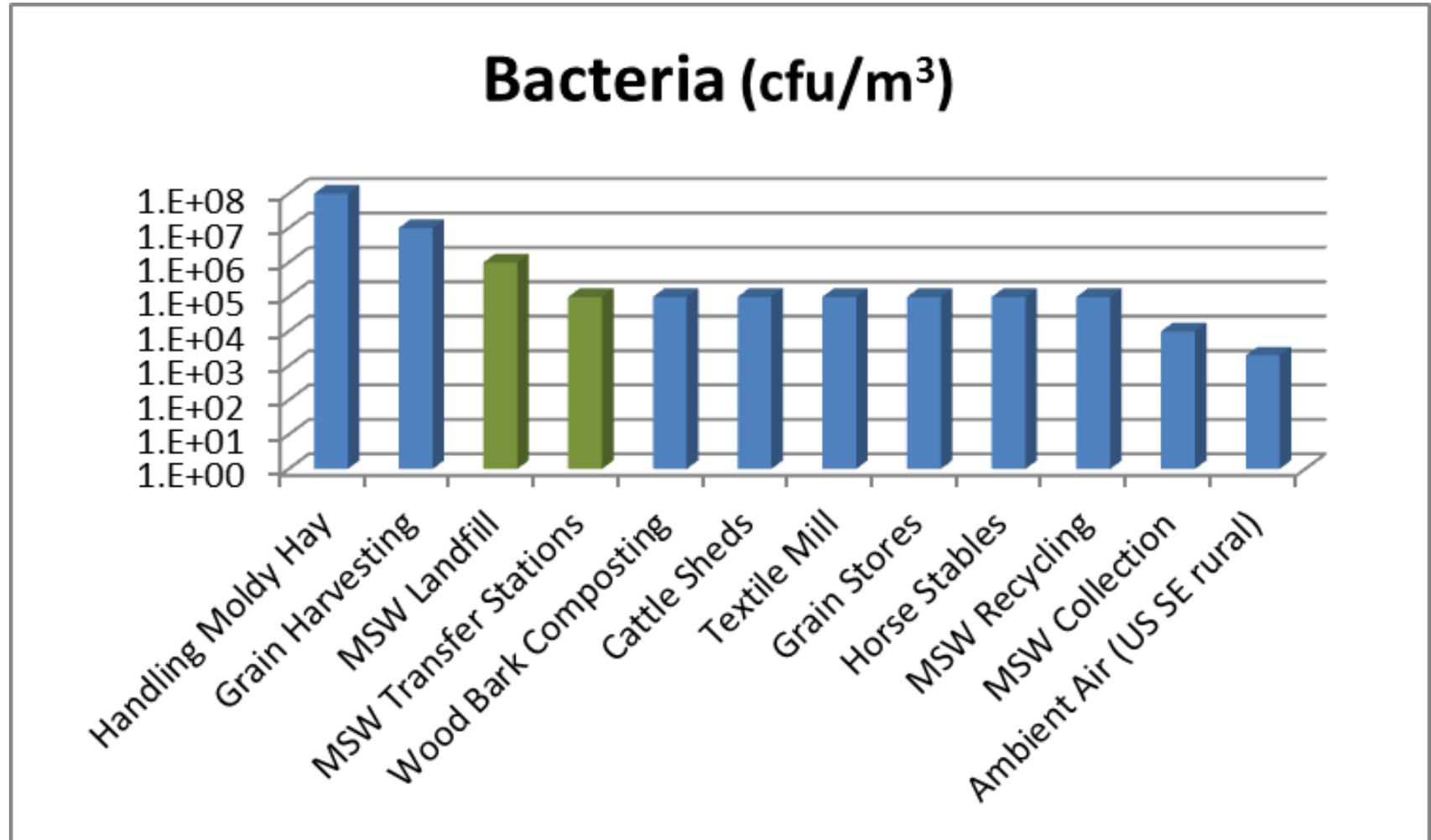
### Occupational and Environmental Exposure to Bioaerosols from Composts and Potential Health Effects

The Composting Association and Health and Safety Laboratory for the Health and Safety Executive 2003, UK

- Large-scale organic waste composting (MSW)
- Airborne micro-organisms (i.e., bacterial and fungi)
- Exposure levels to workers and nearby residents
- Bioaerosol concentrations declined with distance from source
- Reduced to ambient air concentrations within 650 to 820 feet
- No evidence of ill health effect to nearby residents
- Comparison to other industries



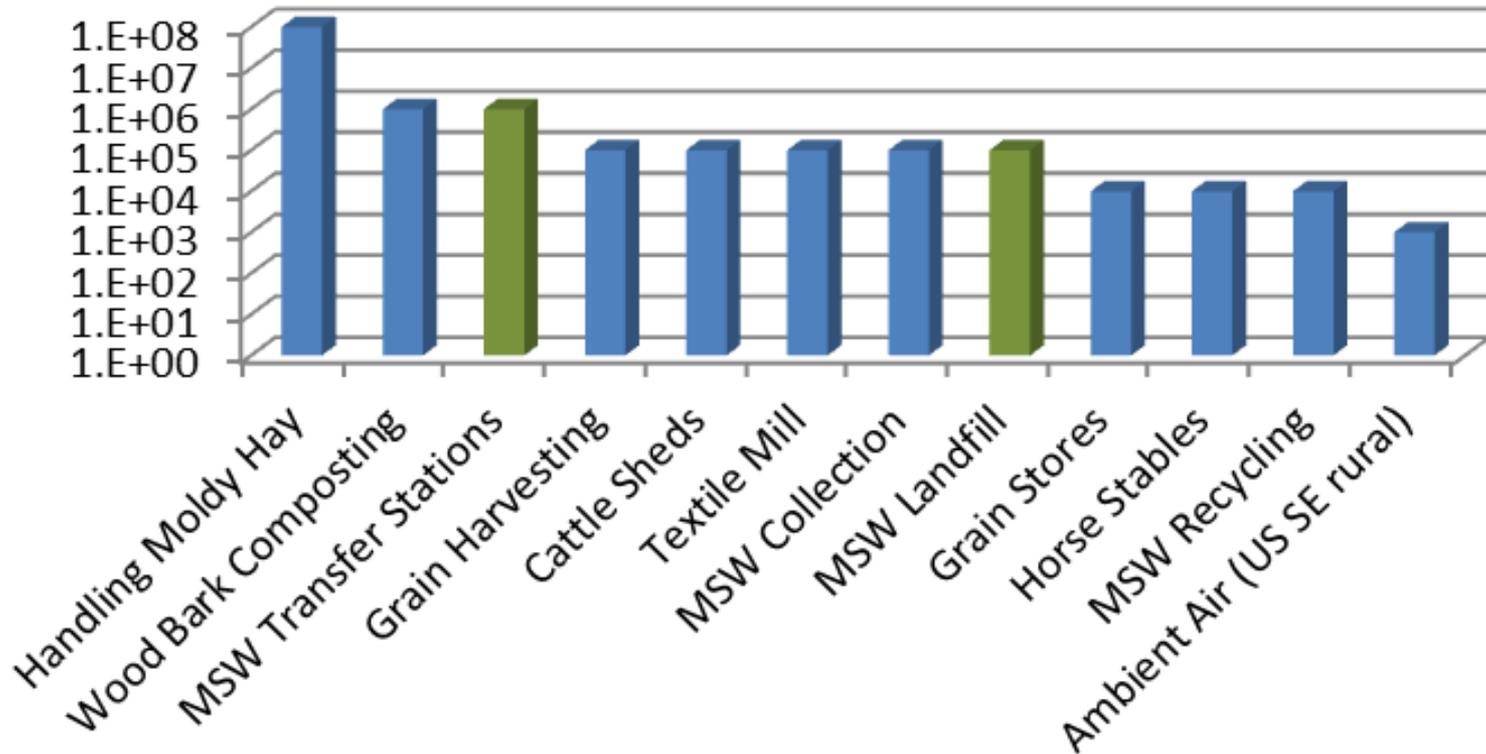
## Human Health Cont.





## Human Health Cont.

### Fungi (cfu/m<sup>3</sup>)





## Human Health Cont.

Mercury Study Report to Congress - (EPA Dec. 1997)

Office of Air Quality Planning and Standards

Emissions Summary Document for Source Mercury

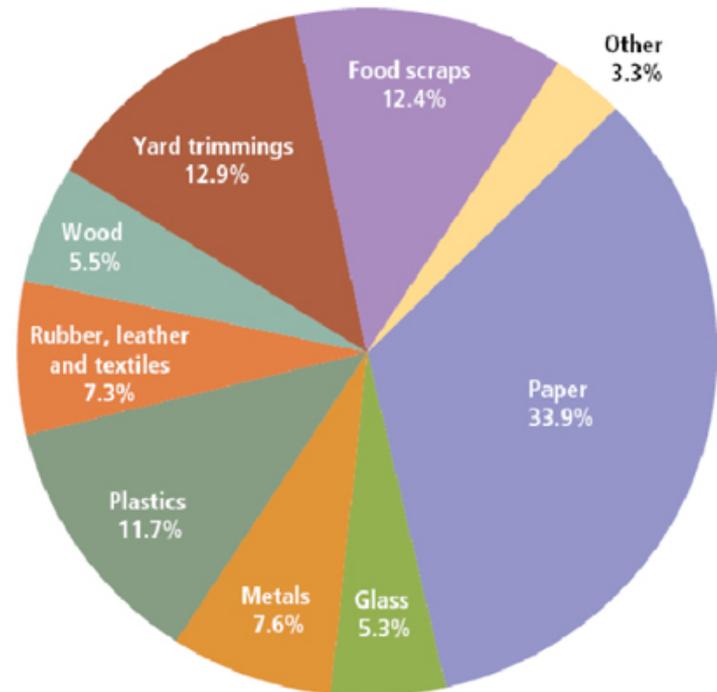
<b>NATIONAL SOURCE MERCURY EMISSION RATES BY CATEGORY</b>			
<b>Sources of Mercury</b>	<b>1994-1995 Mg/yr.</b>	<b>1994-1995 tons/yr.</b>	<b>% of Total Inventory</b>
<b>Combustion Sources</b> (e.g. Utility heaters, waste combustors)	<b>125.2</b>	<b>137.9</b>	<b>86.9</b>
<b>Manufacturing Sources</b> (e.g. cement, paper)	<b>14.4</b>	<b>15.8</b>	<b>10.0</b>
<b>Lamp Breakage</b>	<b>1.4</b>	<b>1.5</b>	<b>1.0</b>
<b>Miscellaneous Sources</b> (e.g. geothermal power)	<b>1.3</b>	<b>1.4</b>	<b>0.9</b>
<b>General Laboratory Use</b>	<b>1.0</b>	<b>1.1</b>	<b>0.7</b>
<b>Dental Preparations</b>	<b>0.6</b>	<b>0.7</b>	<b>0.4</b>
<b>Landfills</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>



## Human Health Cont.

### Landfill Gas Composition

- Methane, CH<sub>4</sub> (45 to 58%)
- Carbon Dioxide, CO<sub>2</sub> (32 to 45%)
- Nitrogen, N<sub>2</sub> (0 to 3%)
- Oxygen, O<sub>2</sub> (<1%)
- Hydrogen, H<sub>2</sub> (<1%)
- Carbon Monoxide, CO (<1%)
- Hydrogen Sulfide, H<sub>2</sub>S (<1%)
- VOCs (<1%)
- Mercury, Hg (<0.0001%)
- Moisture (10 to 15%)

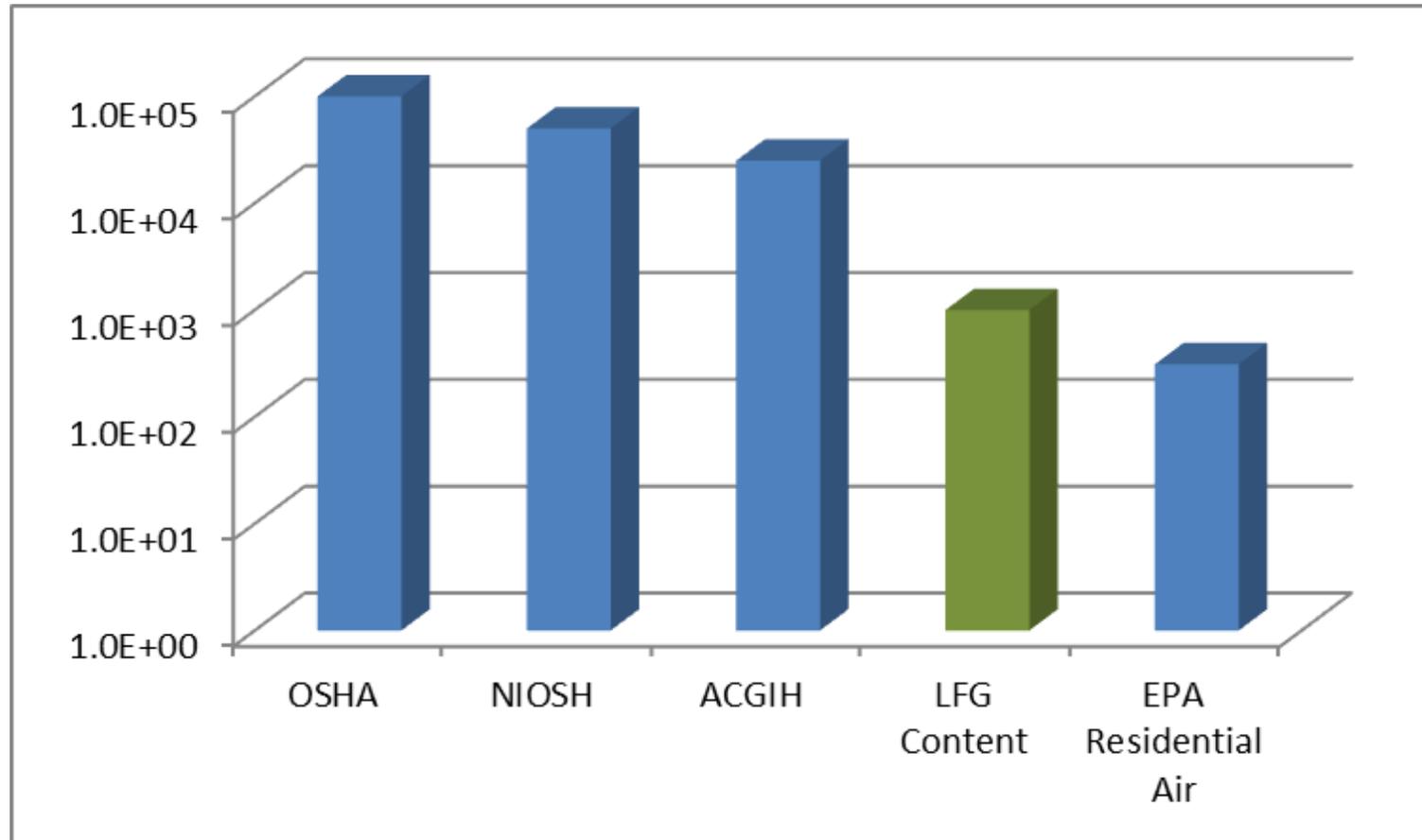


Total MSW generation (by Material). 2006 EPA



## Human Health Cont.

### Mercury Vapor Content and Exposure Standards (ng/m<sup>3</sup>)



LFG Data Source: Washing State Department of Ecology, 2003



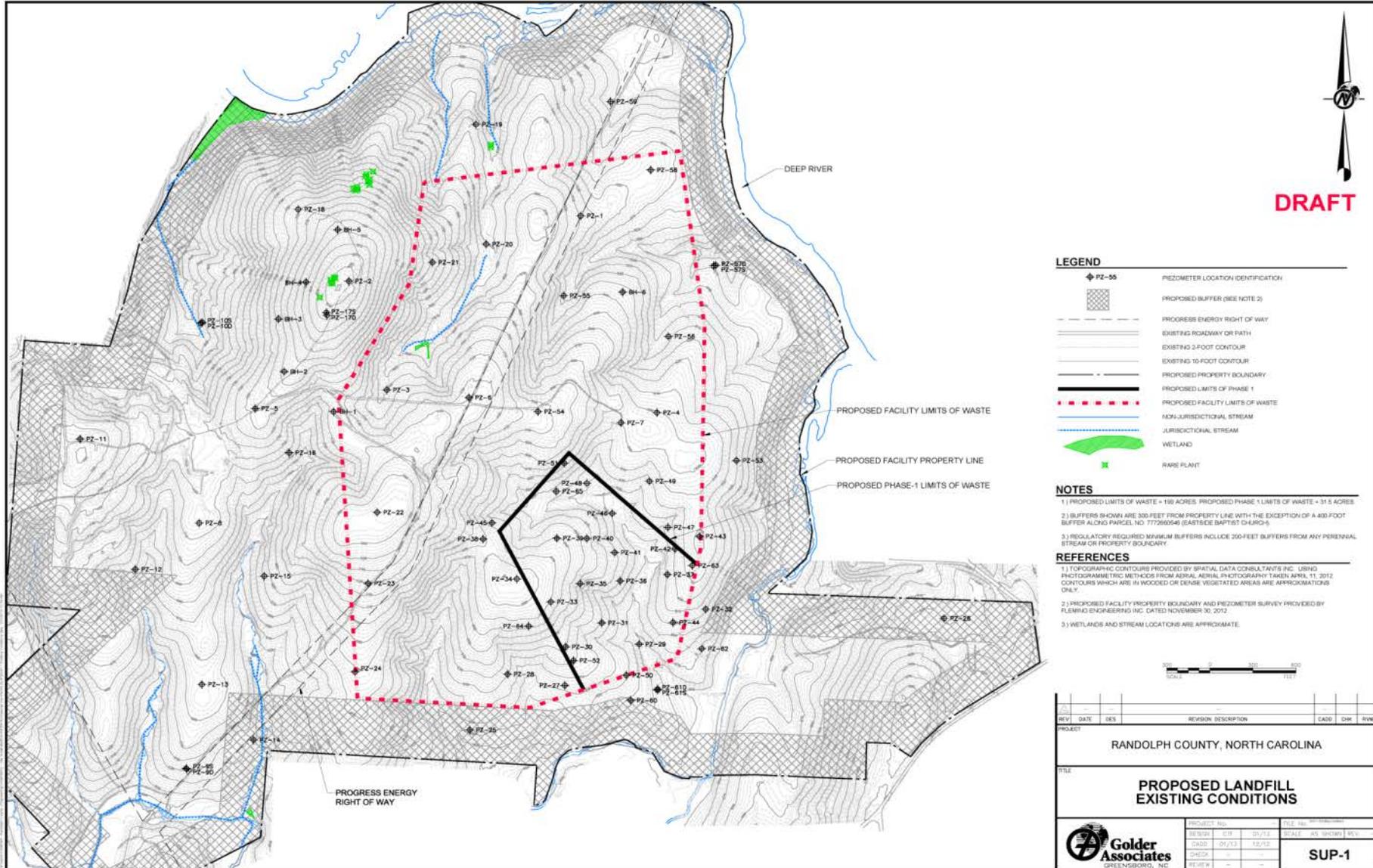
## Proposed Facility Layout

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- Proposed footprint ~ 200 acres
- Proposed final grades < 110 feet above highest natural grade on site (~ 950 feet msl)
- Design Capacity ~ 48 million cubic yards
- Well over 30 years of airspace at desired daily tonnage (1,500 tons/day)
- Estimates of up to 100 trucks per day at desired daily tonnage
- Buffers  $\geq$  300 feet to property lines/Deep River (exceeds State requirements) and  $\geq$  400 feet along portions of southern property line
- Entrance along Old Cedar Falls Road between Foxworth Road and Training Center Drive



# Existing Conditions and Proposed Footprint



### LEGEND

- PZ-55 PIEZOMETER LOCATION IDENTIFICATION
- PROPOSED BUFFER (SEE NOTE 2)
- PROGRESS ENERGY RIGHT OF WAY
- EXISTING ROADWAY OR PATH
- EXISTING 3-FOOT CONTOUR
- EXISTING 10-FOOT CONTOUR
- PROPOSED PROPERTY BOUNDARY
- PROPOSED LIMITS OF PHASE 1
- PROPOSED FACILITY LIMITS OF WASTE
- NON-JURISDICTIONAL STREAM
- JURISDICTIONAL STREAM
- WETLAND
- RARE PLANT

### NOTES

- 1.) PROPOSED LIMITS OF WASTE = 180 ACRES. PROPOSED PHASE 1 LIMITS OF WASTE = 31.5 ACRES.
- 2.) BUFFERS SHOWN ARE 300-FOET FROM PROPERTY LINE WITH THE EXCEPTION OF A 400-FOOT BUFFER ALONG PARCEL NO. 777269546 (EASTSIDE BAPTIST CHURCH).
- 3.) REGULATORY REQUIRED MINIMUM BUFFER BUFFERS INCLUDE 200-FOET BUFFERS FROM ANY PERENNIAL STREAM OR PROPERTY BOUNDARY.

### REFERENCES

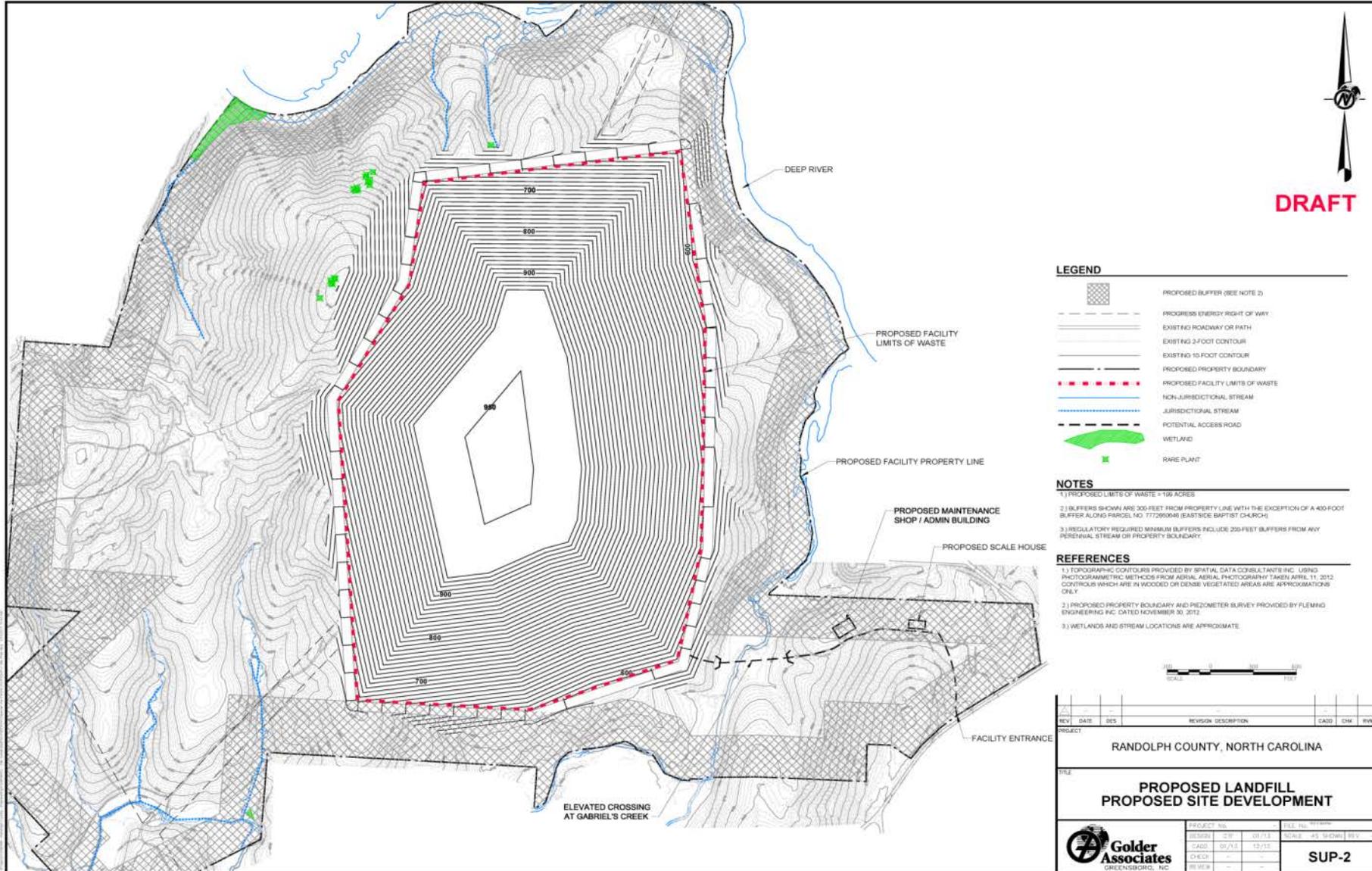
- 1.) TOPOGRAPHIC CONTOURS PROVIDED BY SPATIAL DATA CONSULTANTS INC. USING PHOTOGRAMMETRIC METHODS FROM AERIAL AERIAL PHOTOGRAPHY TAKEN APRIL 11, 2012. CONTOURS WHICH ARE IN WOODED OR DENSE VEGETATED AREAS ARE APPROXIMATIONS ONLY.
- 2.) PROPOSED FACILITY PROPERTY BOUNDARY AND PIEZOMETER SURVEY PROVIDED BY FLEMING ENGINEERING INC. DATED NOVEMBER 30, 2012.
- 3.) WETLANDS AND STREAM LOCATIONS ARE APPROXIMATE.



REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	APP
PROJECT: RANDOLPH COUNTY, NORTH CAROLINA						
TITLE: PROPOSED LANDFILL EXISTING CONDITIONS						
PROJECT No.		DATE		FILE No.		
REVISION	BY	DATE	SCALE	AS SHOWN	REV	
CHECK						
<b>Golder Associates</b> GREENSBORO, NC						<b>SUP-1</b>

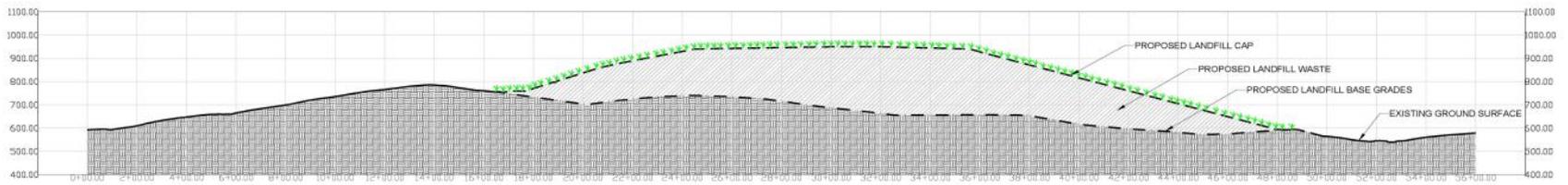
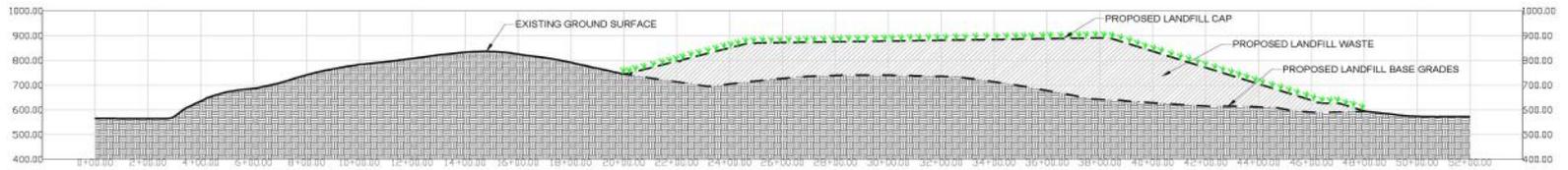


# Proposed Development Plan





# Development Plan Cross-sections



**DRAFT**



**LEGEND**

- EXISTING GROUND
- - - PROPOSED CAP
- - - PROPOSED BASE GRADER
- ▨ PROPOSED WASTE MATERIAL
- ▩ EXISTING GROUND SURFACE

REV	DATE	BY	DESCRIPTION	CAO	DH	RW
PROJECT						
PRELIMINARY HYDROGEOLOGIC INVESTIGATION PROPOSED RANDOLPH COUNTY LANDFILL						
TITLE						
<b>CROSS SECTIONS</b>						
PROJECT No. 003094E		FILE No.				
DESIGN	RS	2-24-11	SCALE	AS SHOWN	REV	
CADD	LAR	3-24-11				
CHECK						
SCALE						
 <b>Golder Associates</b> <small>ENGINEERS, ARCHITECTS, ENVIRONMENTAL SCIENTISTS</small>			<b>DWG 1</b>			



# Facility Entrance Plan



VIEW #1: LOOKING SOUTHWEST TOWARD PROPOSED ENTRANCE.



VIEW #2: LOOKING NORTHEAST TOWARD PROPOSED ENTRANCE.

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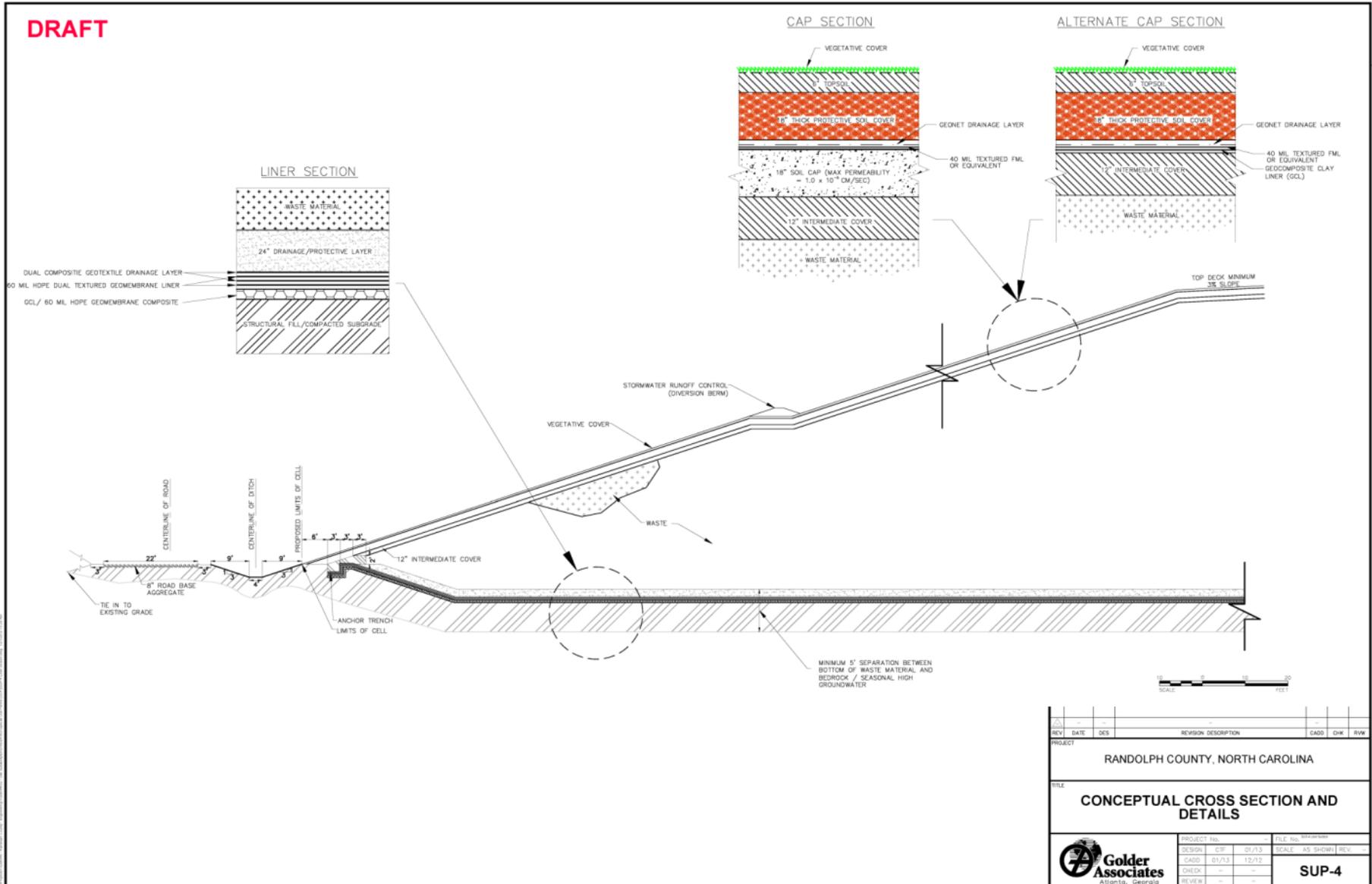


REV	DATE	DES	REVISION DESCRIPTION	CADD	DWG	REV
PROJECT						
RANDOLPH COUNTY, NORTH CAROLINA						
TITLE						
PROPOSED LANDFILL ENTRANCE PLAN						
PROJECT No.		FILE No.				
DESIGN	EST	01/15	SCALE	AS SHOWN	REV	
LEAD	01/13	12/12				
CHECK						
REVIEW						
 <b>Golder Associates</b> <small>GREENSBORO, NC</small>						<b>SUP-5</b>



# Typical Construction Details

**DRAFT**



REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	REVW
PROJECT						
RANDOLPH COUNTY, NORTH CAROLINA						
TITLE						
CONCEPTUAL CROSS SECTION AND DETAILS						
PROJECT No.		FILE No.				
DESIGN	CS	01/13	SCALE	AS SHOWN	REV	
DRAWN	01/13	12/12				
CHECKED						
REVIEW						
						<b>SUP-4</b>



## Activities Completed

- Fatal Flaw Study
- Alternate Site Evaluation
- Financial Analysis
- Market Study
- Site Suitability Study
  - Geophysical Survey
  - Phase I Cultural Resources Survey
  - Phase II Cultural Resources Survey
  - Rare Plant Survey
  - Wetlands and Perennial Stream Delineation





## Activities in Progress

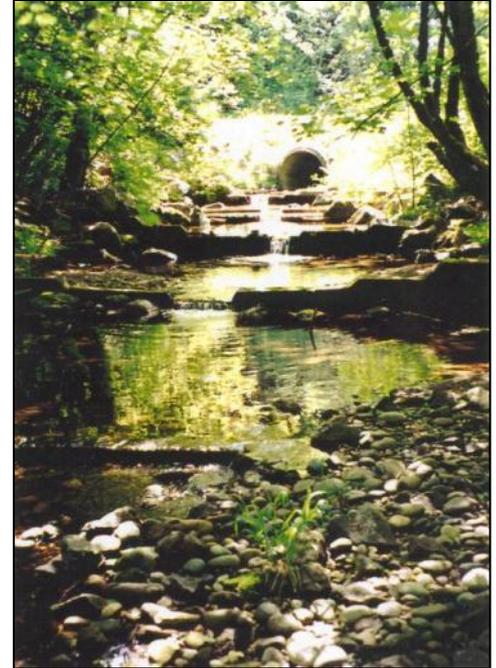
- Hydrogeologic/Geotechnical Investigation
  - Drilling/Survey completed
  - Other field work in progress
    - Aquifer testing
    - Bedrock mapping
    - Water level gauging
- Facility Plan
  - Preliminary footprint
  - Facility entrance
  - Support structures
  - Grading and phasing





## Activities in Progress

- Environmental Impact Study
  - Site Suitability
  - Sound and visual impacts
  - Cumulative impacts
  - Socioeconomic factors
  - Long-term growth
  - Resource commitment
  - Forest resources
  - Available infrastructure
  - Potential mitigation activities
  - Traffic Study
    - In progress with CDM-Smith
    - Additional data/maps as required by state law





## Next Steps

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- Environmental Impact Study
  - In progress
- Site Suitability Report
  - Submitted after SUP approval
- Facility Plan & Design Hydrogeologic Report
  - Submitted with Site Suitability Report
- Application for Permit to Construct
  - Prepared after site suitability approval and operator selection
- Regulatory Meetings and Public Hearings
  - Hearing for SUP and other requested Commissioner meeting(s)
  - 2 Hearings for EIS
  - 2 Hearings for NCDENR
  - Possible Hearing for Franchise Agreement



# Questions?

