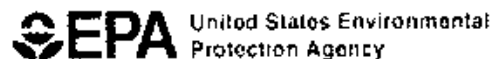


US EPA ARCHIVE DOCUMENT

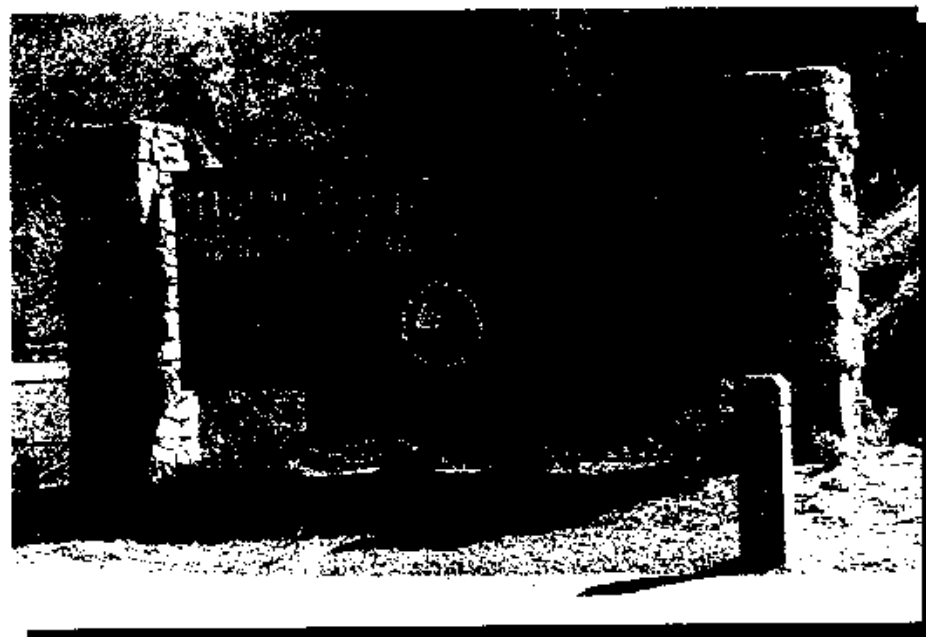
# Buncombe County, North Carolina

## Subtitle D Landfill “Bioreactor” Project Proposal for USEPA Project XL



Presented

February 9, 2000



1999 SWANA North America Bronze Award Winner  
Landfill Category

# Buncombe County Project Team

## ■ Buncombe County

- Bob Hunter - Director, General Svc. Dept.
- Jon Creighton - Assistant County Manager
- Sonny Hollifield - General Services Dept.

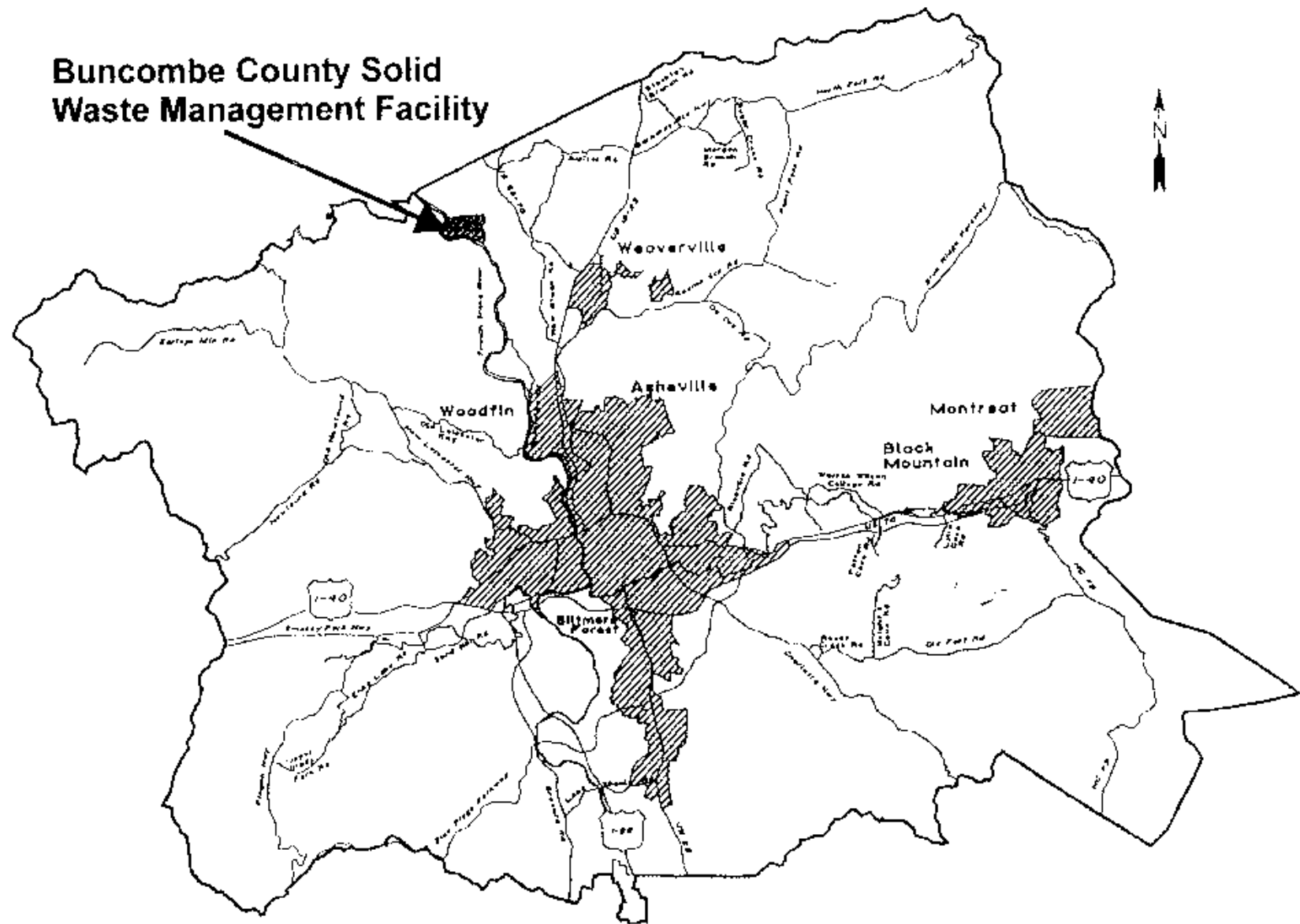
## ■ Camp Dresser & McKee

- Joe Wiseman - Project Manager
- Tim Grant - Hydrogeologist
- Chris Gabel - Landfill Design Engineer

**Buncombe  
County**

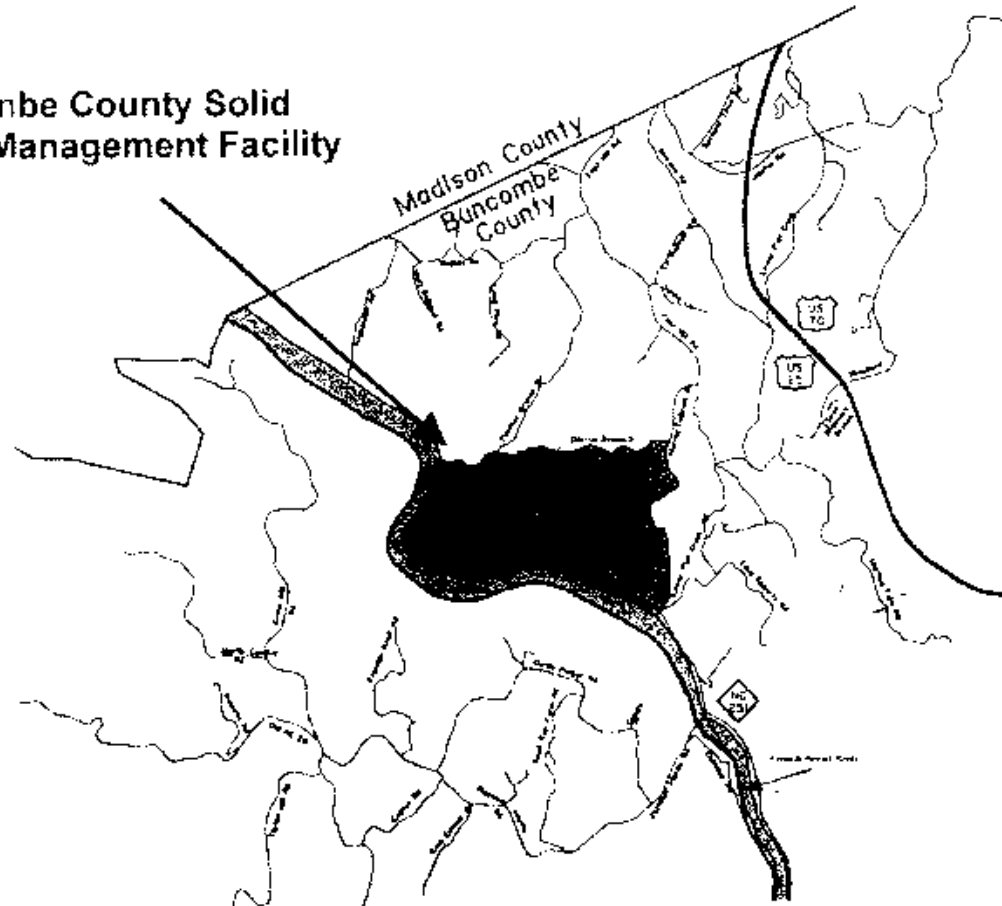


# Buncombe County Solid Waste Management Facility Site Location Map



# Site Location Map

Buncombe County Solid  
Waste Management Facility



# **Buncombe County Statistics**

- **Current Population 195,000**
- **Landfill Receives About 150,000 tpy of MSW and C&D Waste**
- **Award Winning Solid Waste Program**
  - **1999 NC SWANA Gold Award for Outstanding Integrated SW Program**
  - **1999 SWANA Bronze Award in North American Landfill Competition**
  - **2000 NC ACC Award for Haz Waste Program**
  - **1998 NC CEC Design Excellence Award**
- **Bioreactor Project Identified as a Top County Priority**

# Project Description

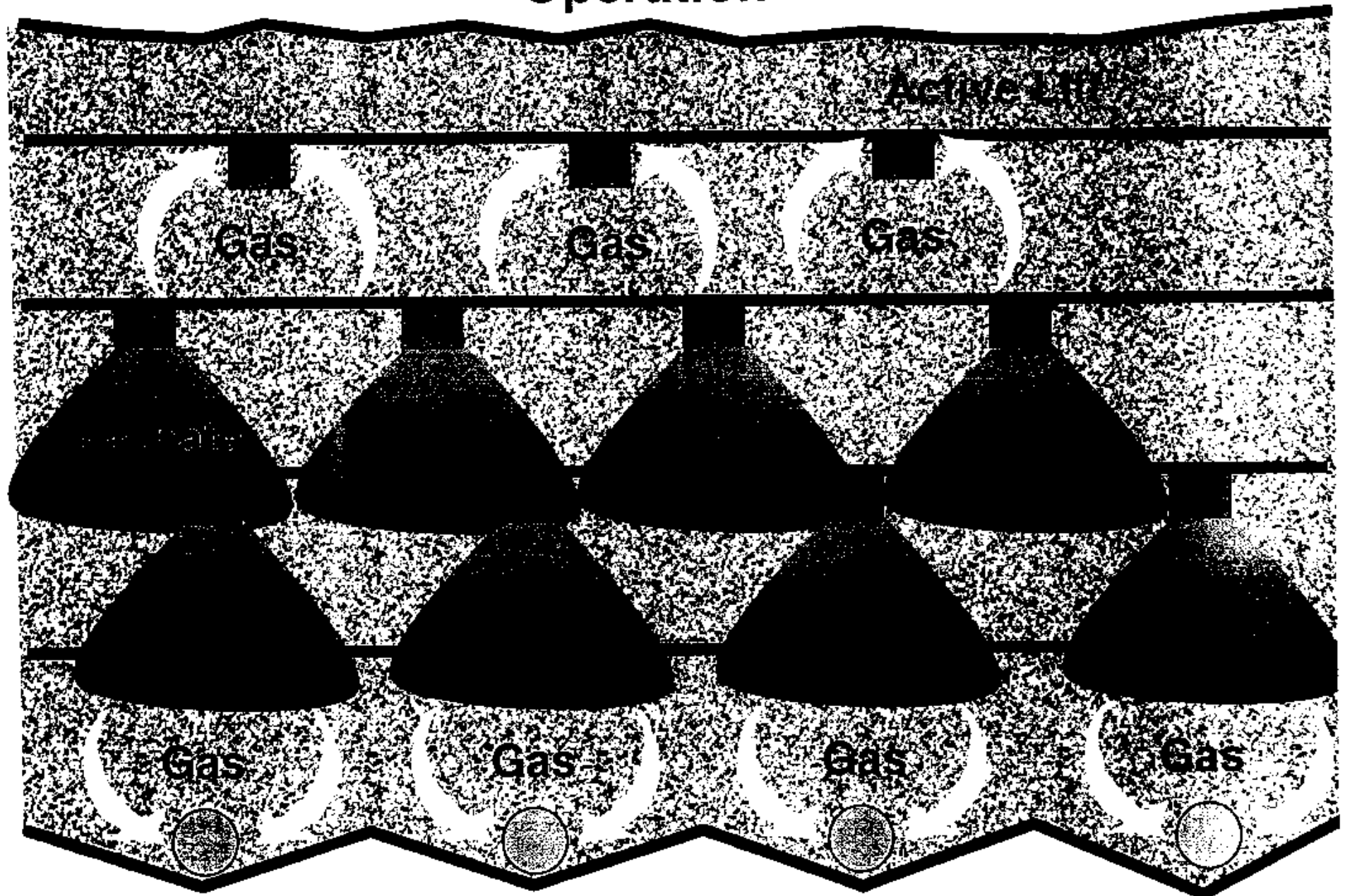
- **Combined Leachate Recirculation and Gas Collection**
- **Horizontal Trenches**
- **Pressure Injection System**
- **Active Gas Collection**
- **Alternative Liner**



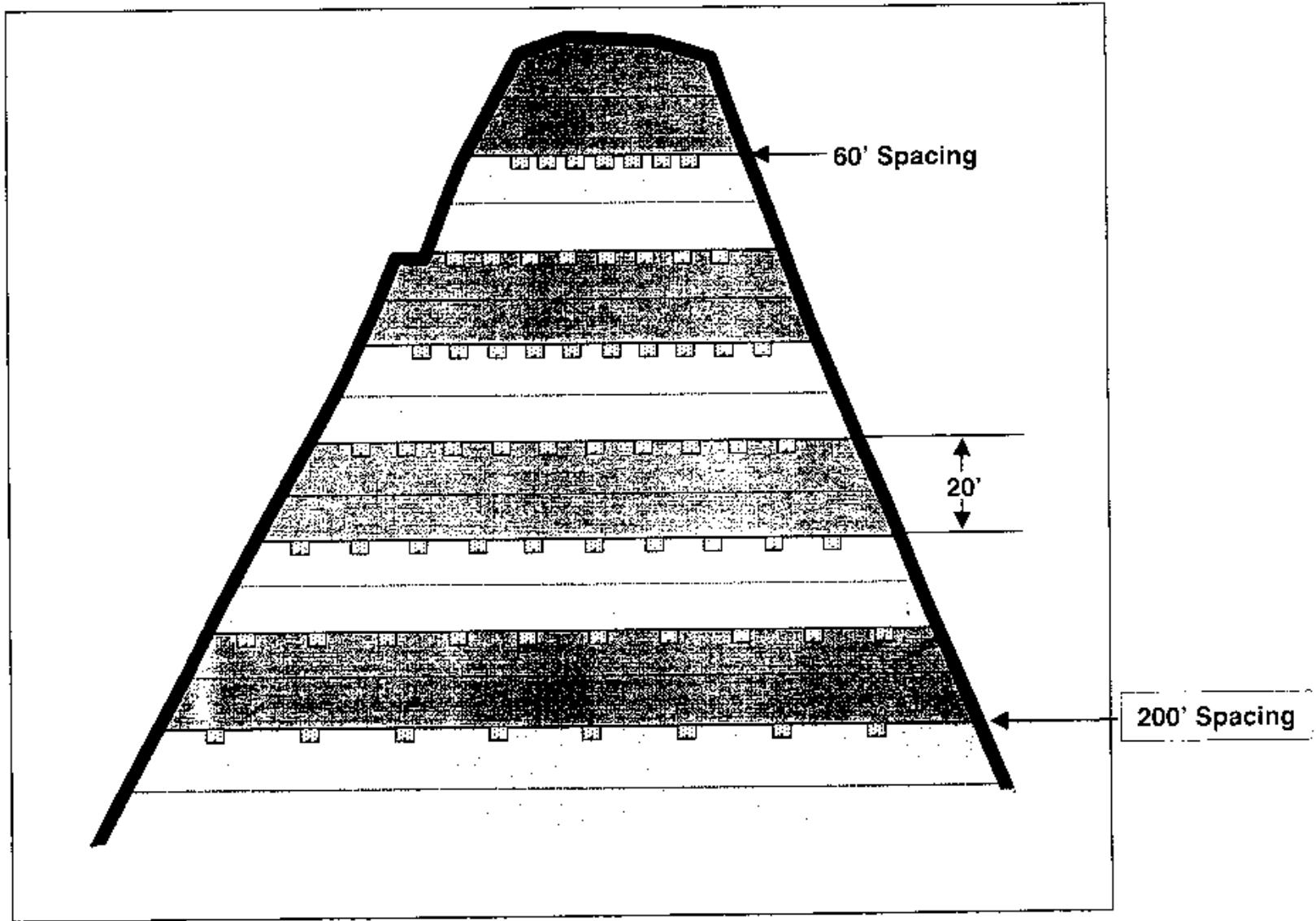
# Requested Flexibility

- **Allow Recirculation Over an Alternative Liner System**

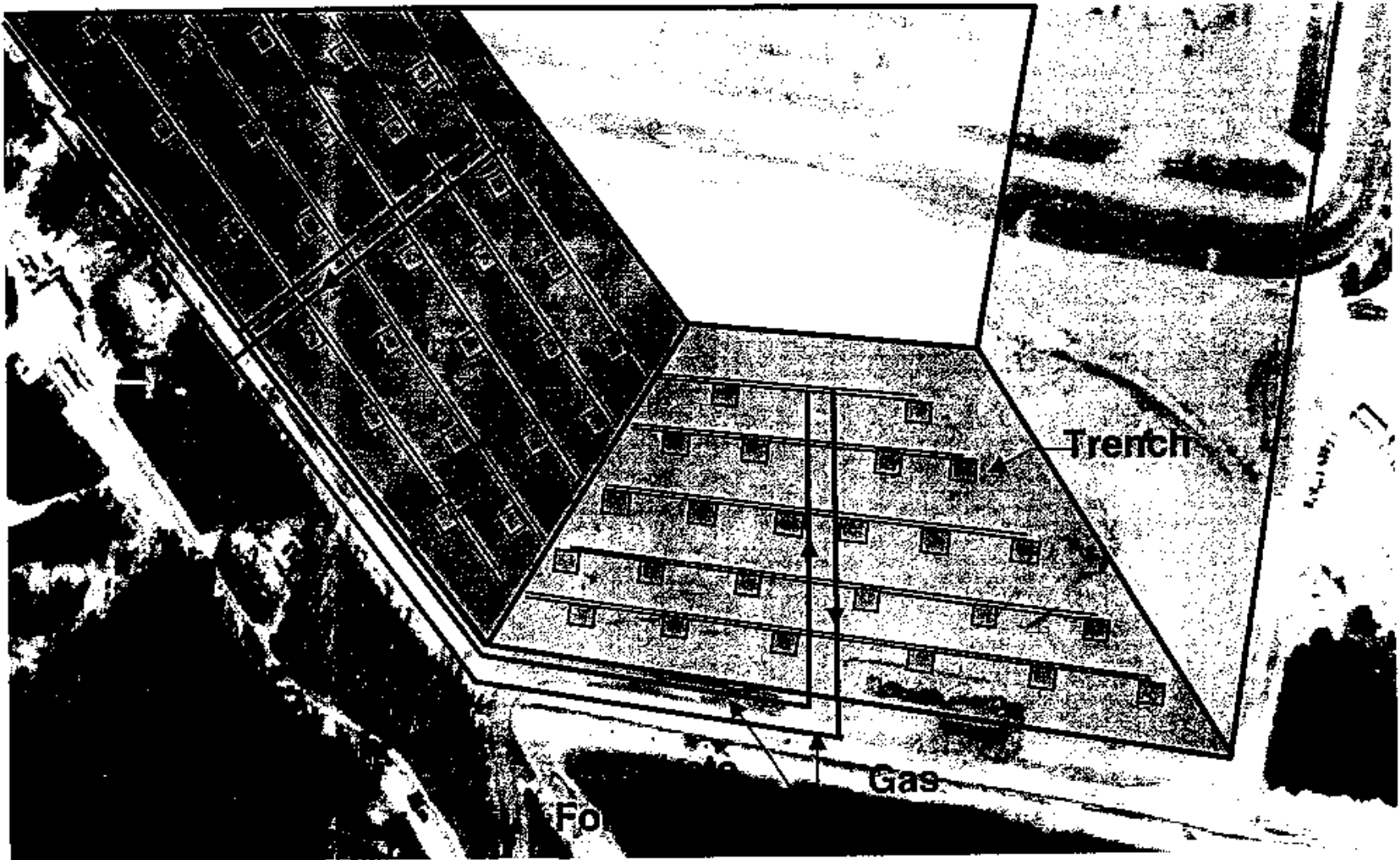
# Combined Recirculation/Gas Collection Operation



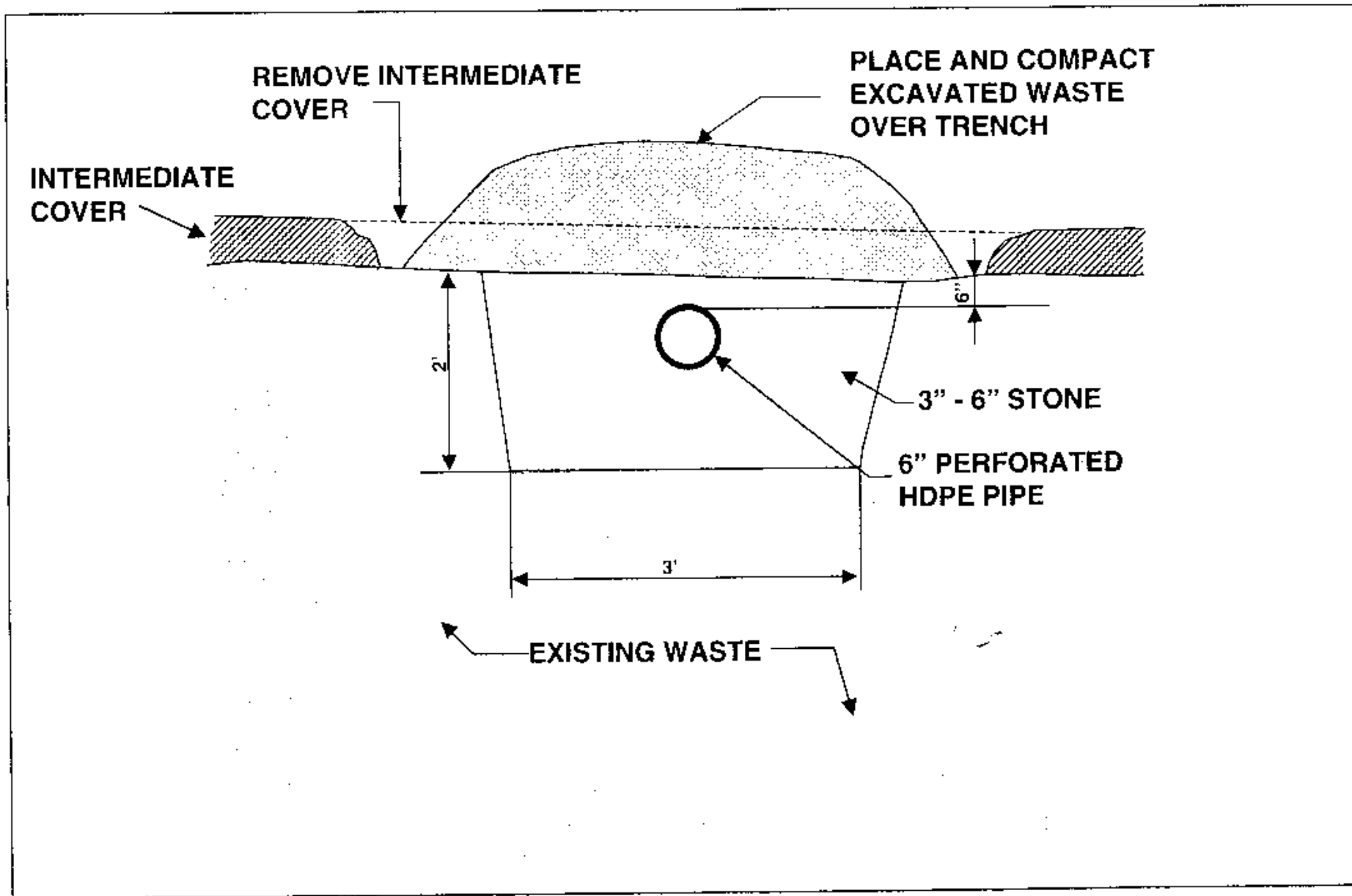
# Trench Placement



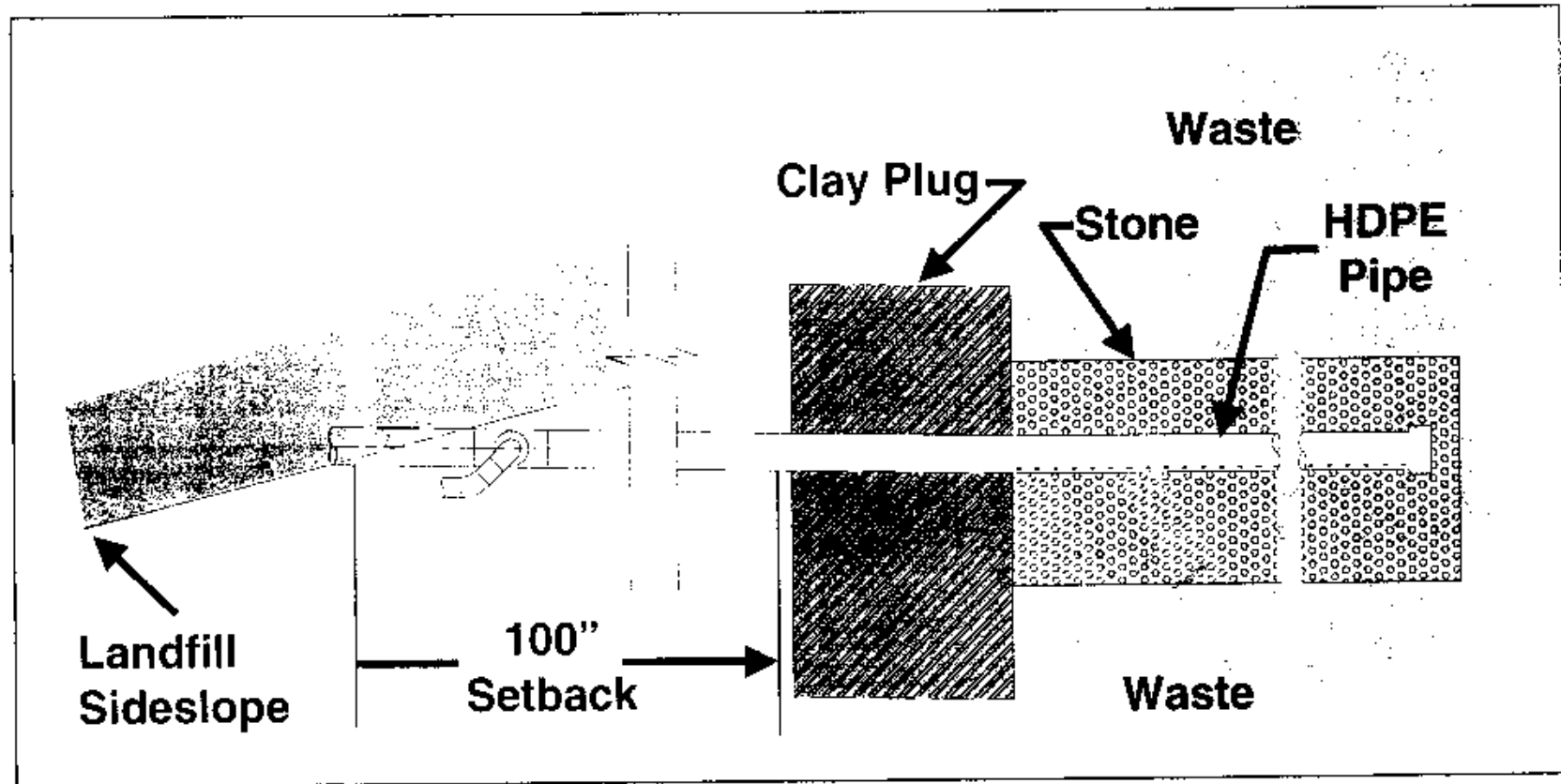
# Distribution Piping



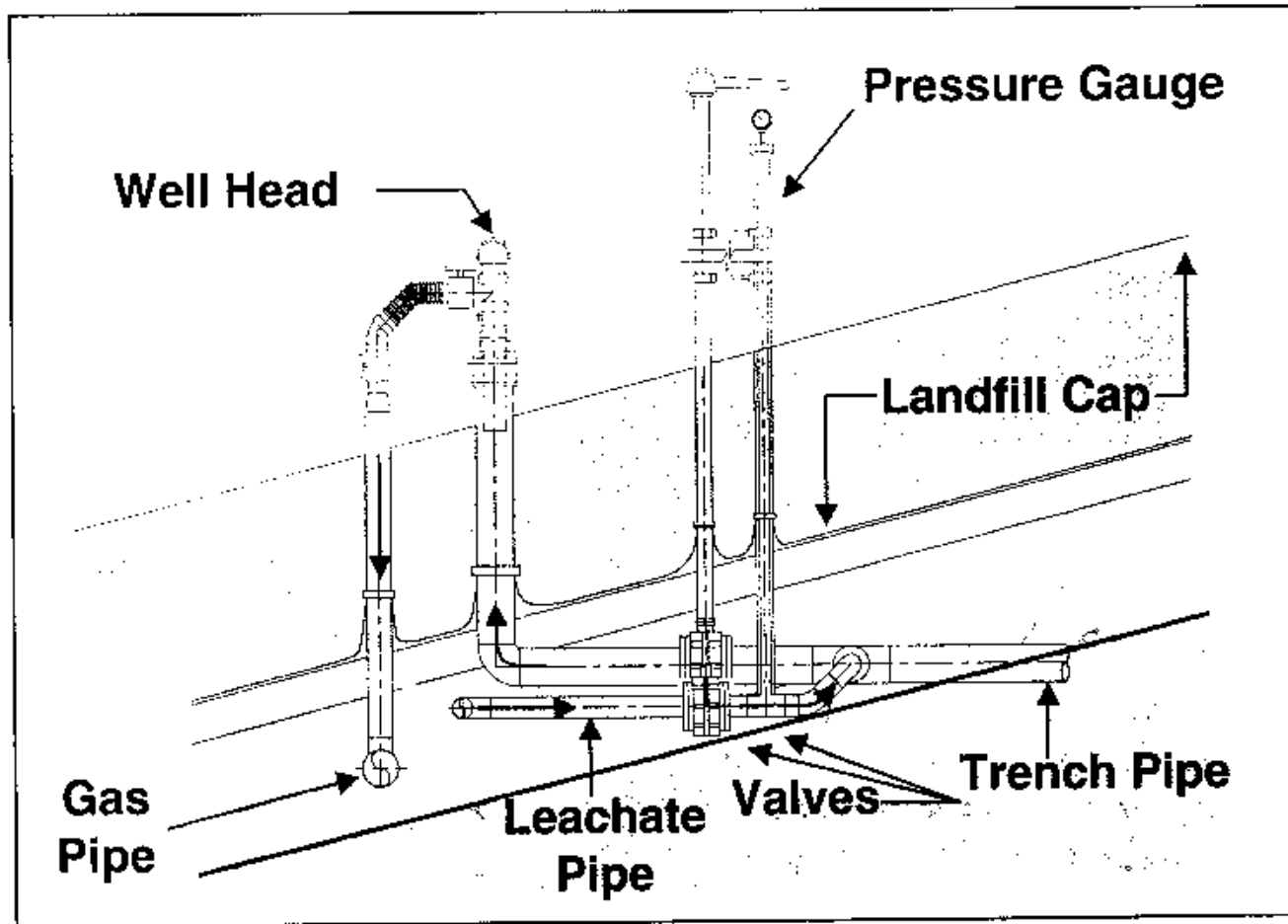
# Trench Construction



# Trench Construction



# Piping Connection to Trench







# Horizontal Trenches and Pressure Injection

## ■ Contained System

- No Exposure to Operators
- Avoid Contamination of Storm Runoff
- Not Dependent on Weather

## ■ No Interference with Disposal Operation

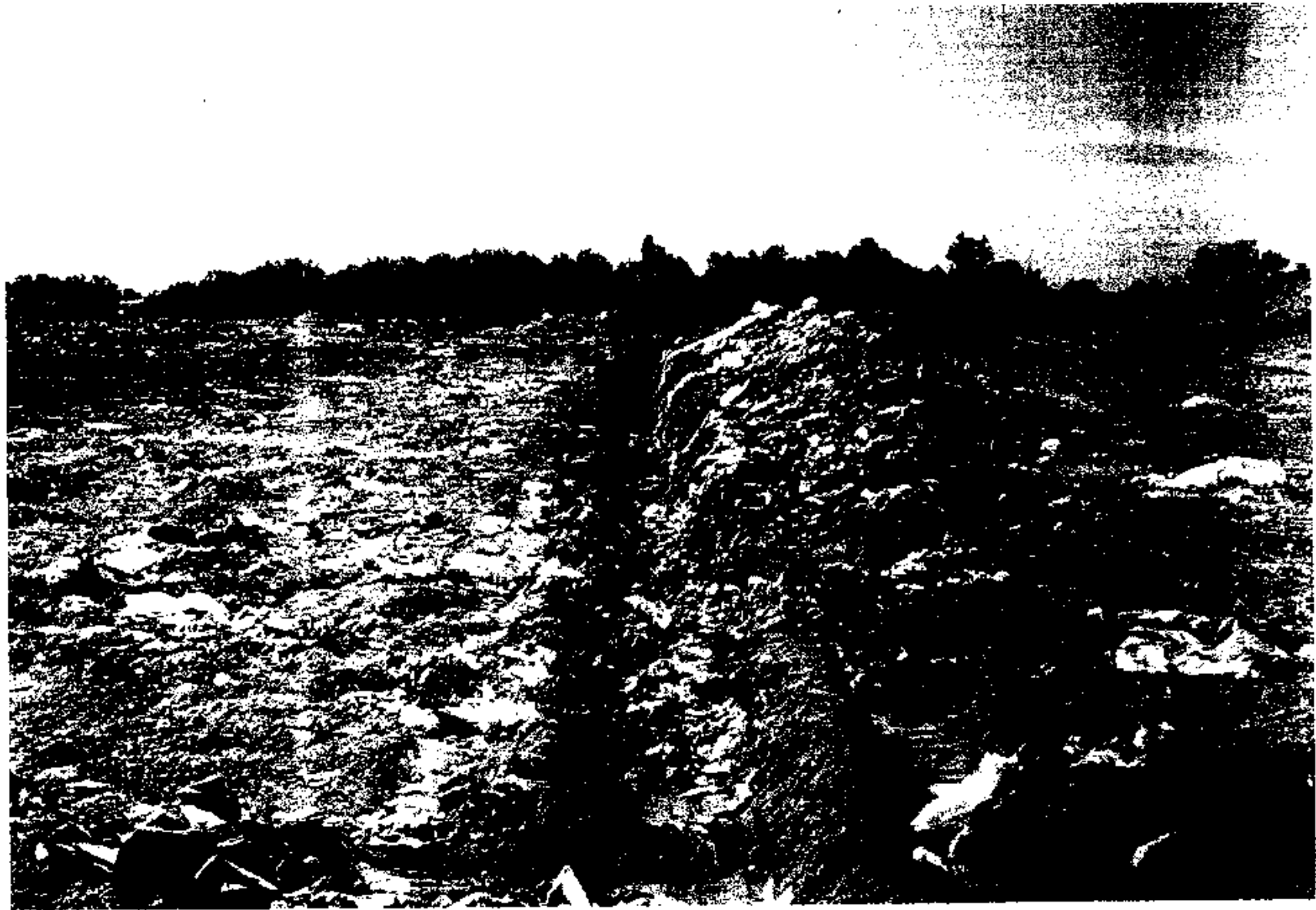
- More Even Compaction
- Greater Flexibility for Trench Layout
- Less Prone to Damage

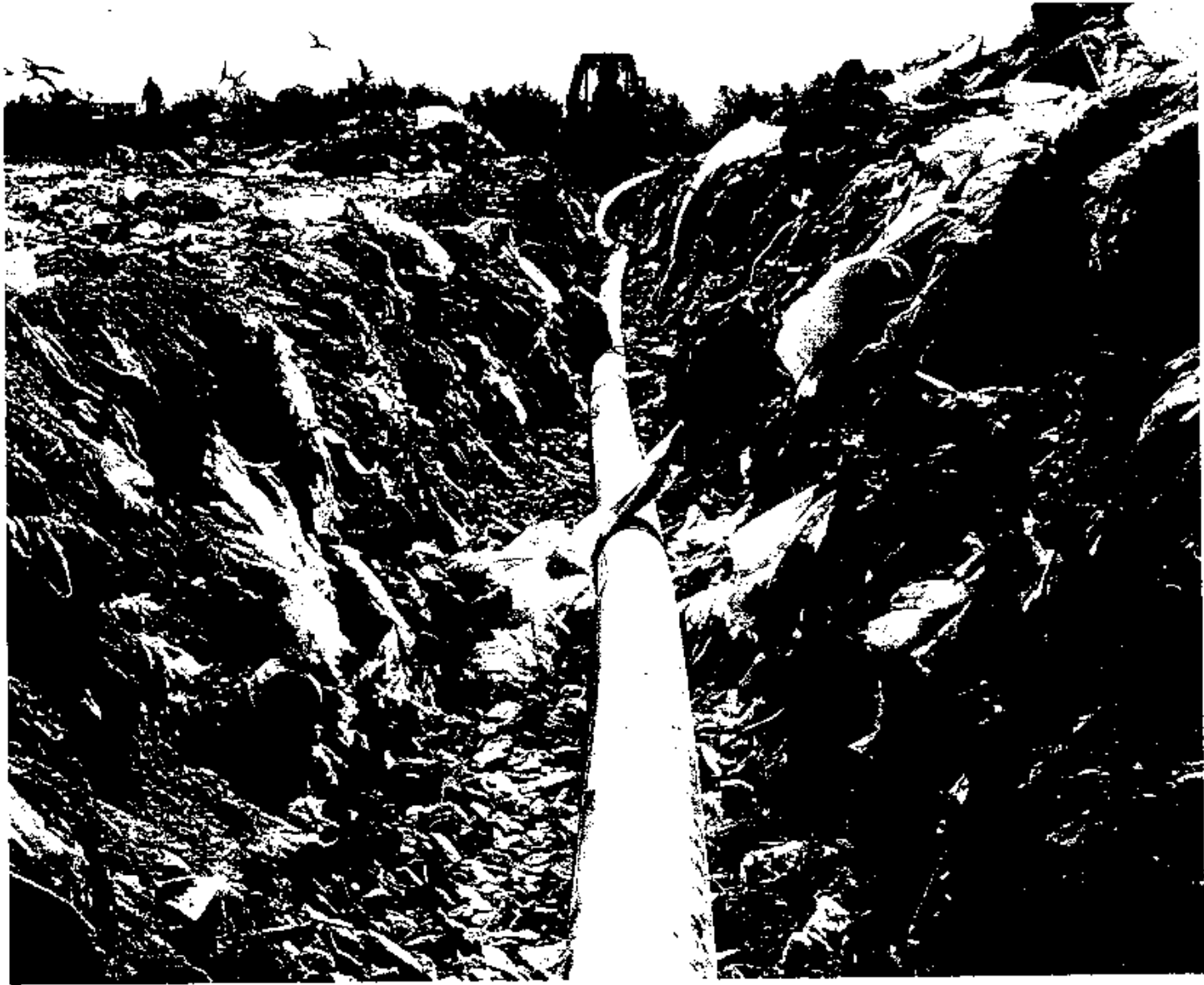
## ■ More Thorough Wetting of Waste

- Tighter Spacing
- Better Lateral Dispersion
- Less Prone to Clogging

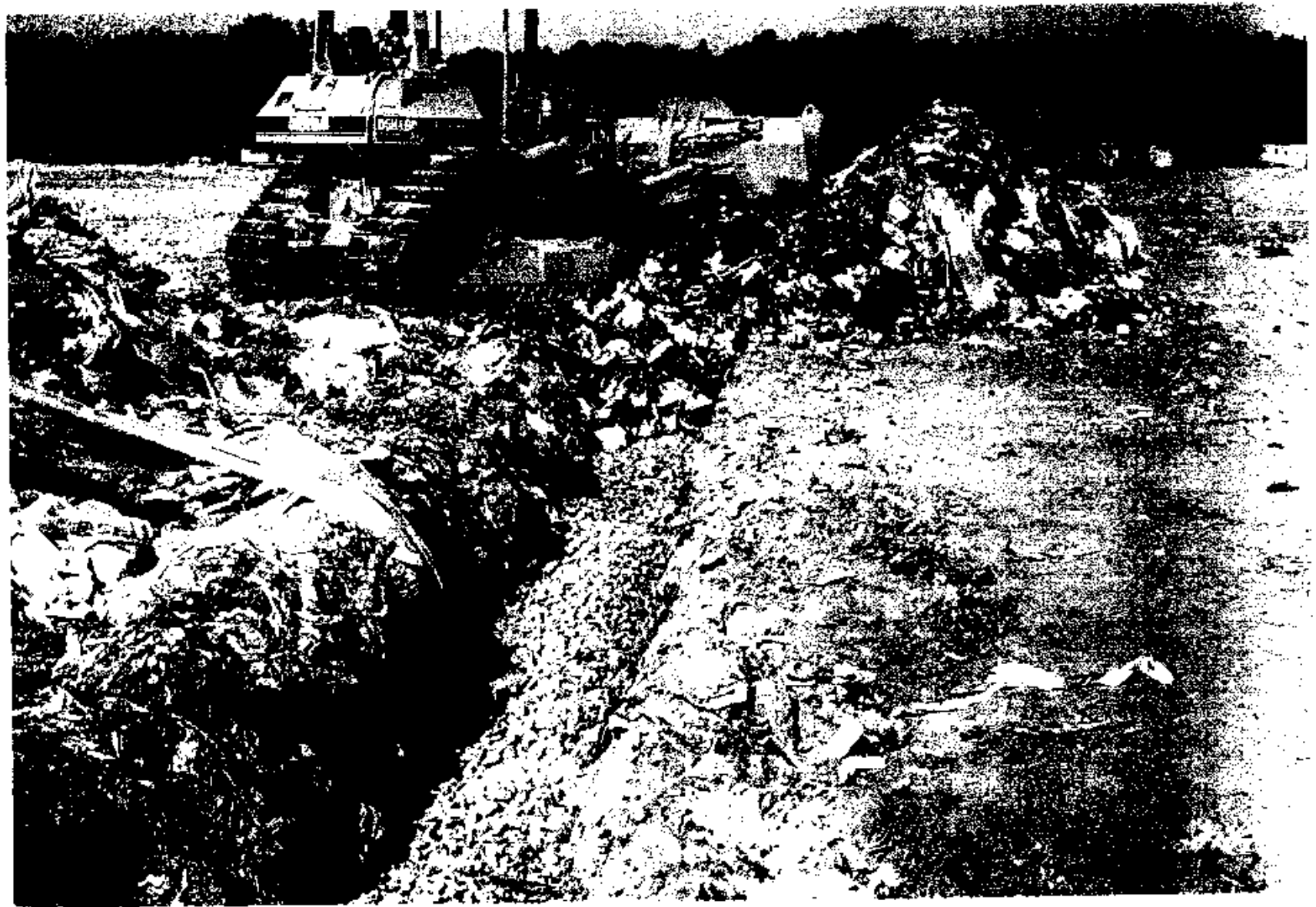
## ■ Gas Collection

- Active During Operation
- Odor Control









# **Project XL Criteria**

- **Superior Environmental Performance**
- **Flexibility and Other Benefits**
- **Stakeholder Involvement**
- **Innovation or Pollution Prevention**
- **Transferability**
- **Feasibility**
- **Evaluation, Monitoring, and Accountability**
- **Shifting of Risk Burden**

# **Superior Environmental Performance**

**Accelerated Decomposition of Waste will:**

- **Maximize Protection to Groundwater**

1. **Quickly Stabilize Leachate**
2. **Prevent “Dry Tomb” Scenario**

- **Shortens LFG Generation Period**

1. **Increased Energy Potential**
2. **Better LFG Control**

**Alternative Liner will:**

- **Decrease Leakage Potential**

- **Improve Constructibility**

# **Flexibility and Other Benefits**

- **System can be used for Recirculation, Gas Collection, or Both**
- **Gas Collection Operation is more Flexible**
- **Cost Savings**
  1. **Installation of Trenches by LF Staff**
  2. **Avoid Importing/Augmenting Clay**
  3. **Additional Capacity Through Settlement and Mining**



# **Stakeholder Involvement**

- **North Carolina Department of Environment and Natural Resources**
- **Buncombe County Environmental Affairs Board**
- **Neighborhood Citizens**

# **Innovation or Pollution Preventions**

- **Stabilization of Waste and Leachate**
- **Recovery of Landfill Gas**
  1. **Early Startup**
  2. **Combined Systems**

# Transferability

- **Applicable at any MSW Landfill Facility**
- **Can be installed by onsite Staff**
- **Costs are offset by Benefits**

# Feasibility

- Self Funded
- Bioreactor Experience
- State Regulatory Approval

# **Evaluation, Monitoring and Accountability**

- **Monitor Leachate Quality**
- **Survey Settlement Plates**
- **Measure Recirculation Quantities**
- **Monitor Leak Detection Sump**

# Shifting of Risk Burden

- **Contained System Protects Operators**
- **Faster Waste Decomposition**
- **Early Start-up of Gas Collection System**
- **No Head Buildup on Liner System**

# Site Investigation Methods

- 137 borings and/or piezometers and 15 monitoring wells installed using hollow-stem augers, air rotary and core drilling methods
- Fracture Trace Analysis/Geologic Mapping
- Geophysical Surveys
  - VLF
  - Seismic Refraction
- 2 Aquifer Performance Tests along with numerous slug tests

# **Site Geology/Hydrogeology**

- **Underlain by northeast sequence of migmatitic biotite hornblende gneiss**
- **Groundwater generally occurs within fractures except in lower elevations**
- **Groundwater flow is controlled by those areas of higher fracture density found in the drainage features**



# **Groundwater Monitoring Network**

- **17 monitoring wells will be located around Cells 1 - 5**
- **Nested wells are located in preferential flow pathways downgradient of each cell.**
- **Alternate monitoring system underlies sump area of each cell**

# Other Issues

- **Location of Nearby Residents/Wells**
- **Demographic/Economic Data**
- **Other receptors - e.g., wetlands, streams, etc.....**