# Panel Discussion: Dealing with an Aluminum Waste Reaction at Countywide Landfill


March 2006

N

# AERIAL VIEW

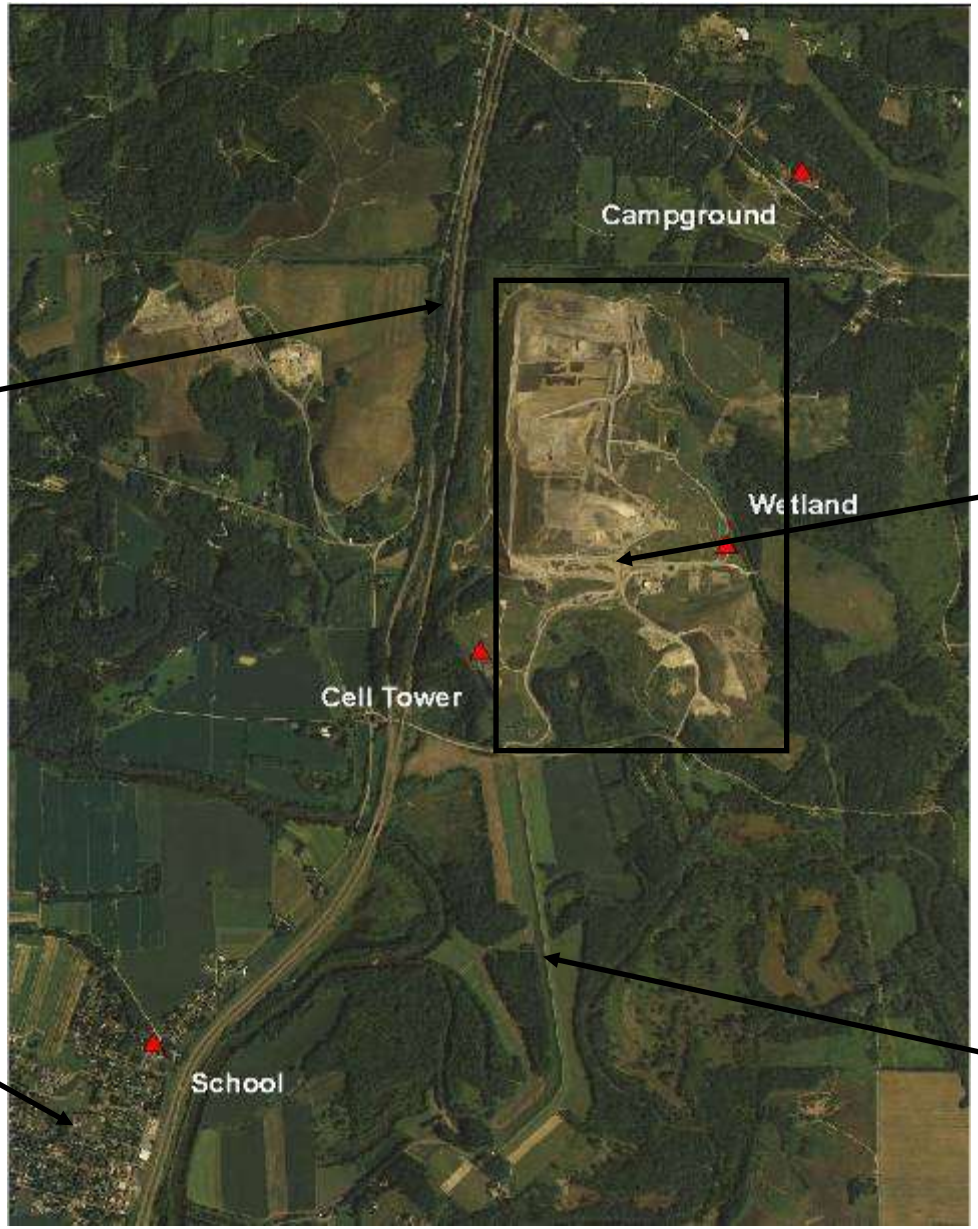
# PID Monitoring

# Personnel Protection While Drilling

# Drilling with Carbon Filters

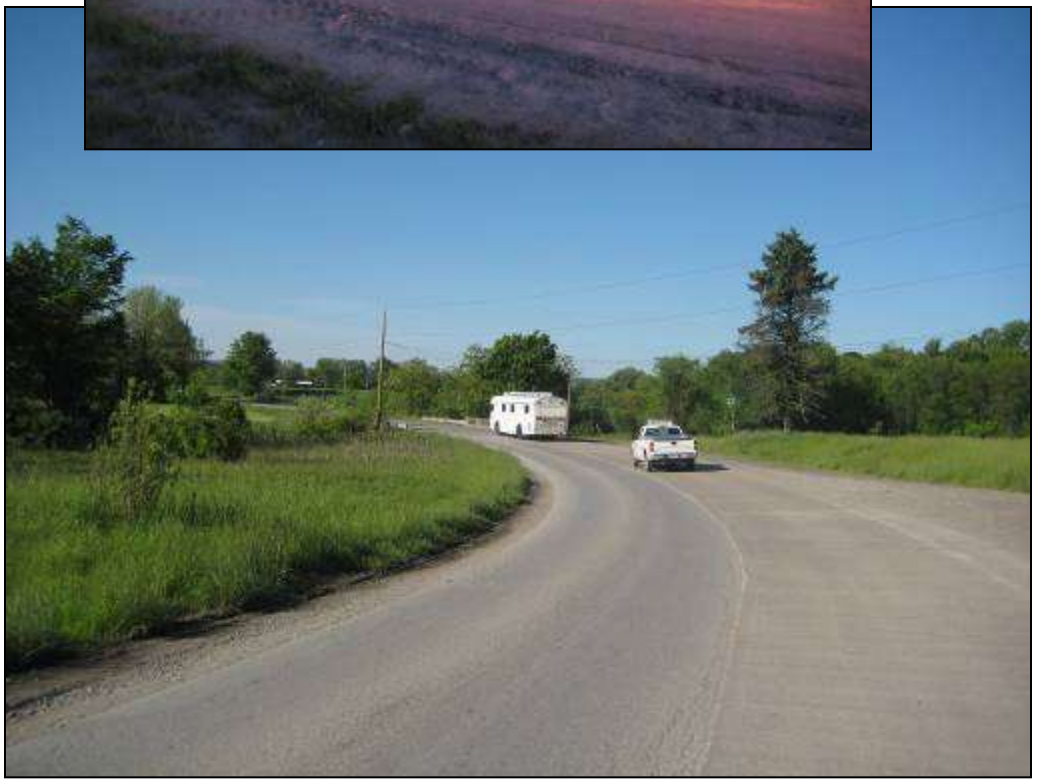
# Use of Vacuum Box to Reduce Odors

# Pre Fabricated Steel Wells


N
Akron - 25mi
Campground
I-77
Wetland
Countywide Recycling & Disposal Facility
Columbus
120 mi
Cell Tower
Air Monitoring Location
Bolivar, OH
Pop = 5400
School
US ACE
Bolivar Dam

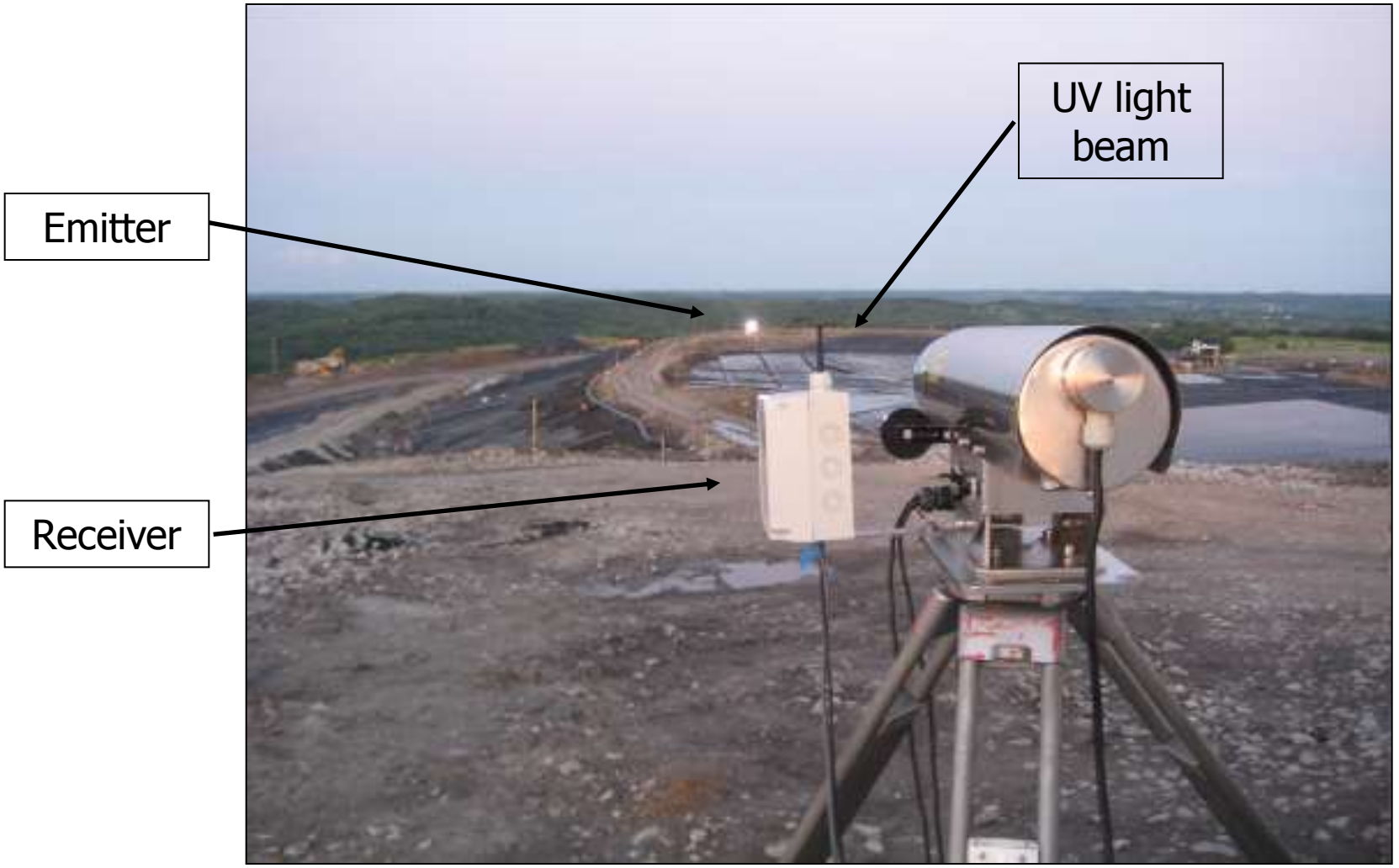
# Community Air Monitors

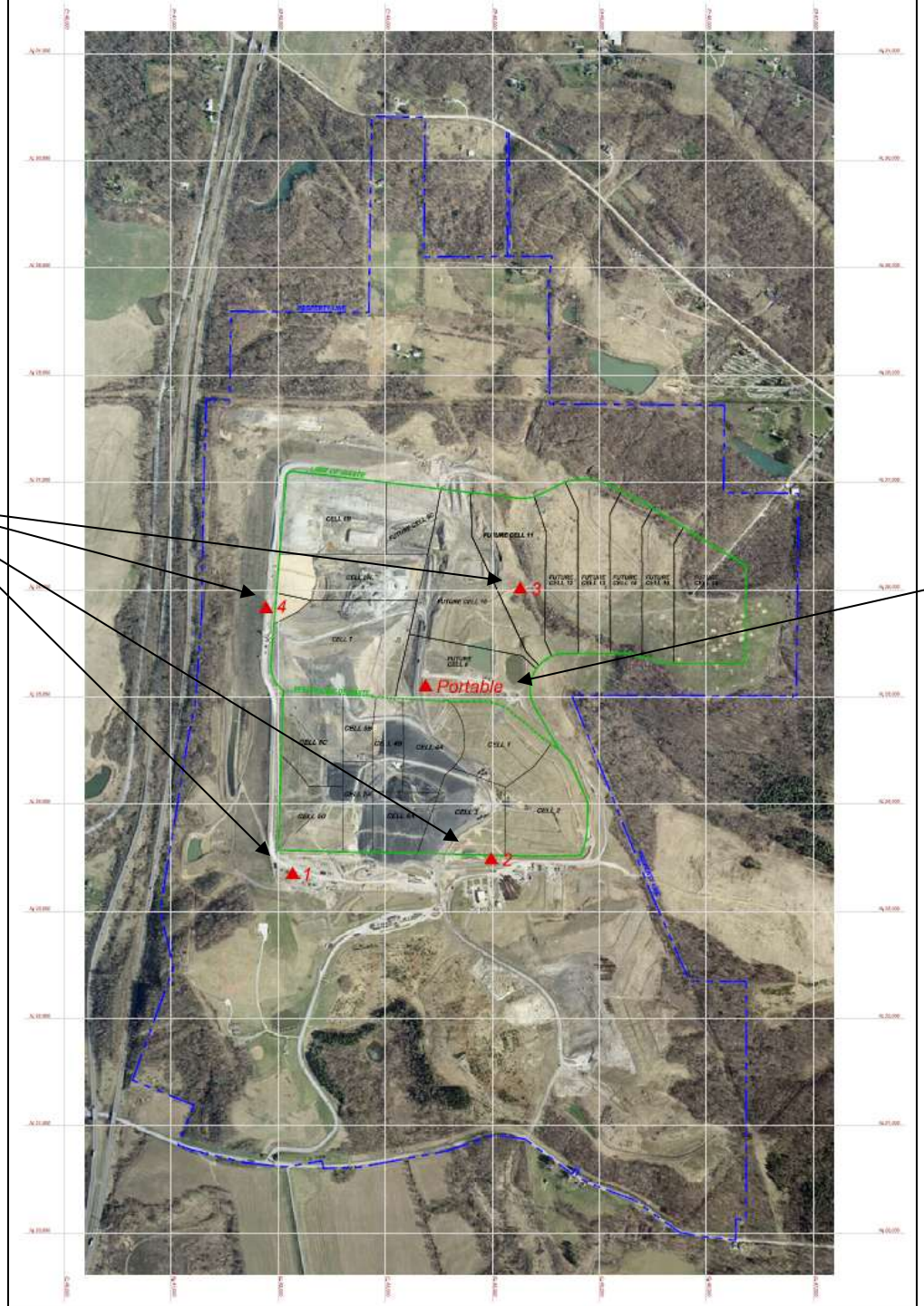
# Trace Atmospheric Gas Analyzer (TAGA) Bus



# UV DOAS

## Ultraviolet Light Differential Optical Absorption Spectrometry




4 perimeter
1 portable
Onsite monitoring network
N
1
2
3
4
Portable


Site 4

# Odor ID/Characterization

**1) ID compound(s) present in odor**

**2) Determine harmful levels**

**3) Monitor for them**

- Extensive data sets were available
  - Leachate, gas, community & onsite monitors, UV DOAS, TAGA
  - ATSDR, ODH, USDA assistance

# Screening

- Approach
  - Nasal Ranger, odor complaints, smoke testing, expert panel
- 6 different odors
    - Working face
    - Landfill gas
    - Leachate
    - ‘Reaction’ gas
    - Deodorizer
    - Excavated waste

# Community - Nasal Ranger

# ‘Normal’ Landfill Gas

- ½ methane ($CH_4$)
- ½ carbon dioxide ($CO_2$)
- Other
  - Water, oxygen, nitrogen, sulfur
  - **N**on-**M**ethane **O**rganic **C**ompounds
    - Odor causing (very distinct)

=> Landfill gas from certain areas was atypical

# Sampling

- U.S. EPA / START
  - 10 SUMMAs (TO-15, TO-11A)
  - Focus on VOCs
  - Very low BTEX levels (< 5ppb)
- TICs
  - **Volatile Sulfur Compounds**
    - Hydrogen sulfide, dimethlyl sulfide, dimethyl disulfide, methyl mercaptan (rotten eggs, animal manure)
  - **Volatile Fatty Acids**
    - Typical in landfill gas, leachate
    - Result from microbial degradation processes
    - Acetic, propionic, butyric acids (vinegar, swiss cheese, sweat, rancid butter, vomit)
  - **Aldehydes & Ketones**
    - Formaldehyde, acetaldehyde
    - Acetone (nail polish remover, paint thinner)

# Early Remedial Alternative Evaluations

1. Best Case – STOP THE REACTION(S)!!
   a) Inject substance to stop $2Al+6H_2O$=> $2Al(OH)_3+H_2$+Heat Reaction
   b) Inject Fire Suppression Foams to deprive oxygen
   c) Inject inert gas or circulate “cool” material to effect heat transfer

2. Partial or Full Excavation (600,000 tons dross, 13,000,000 CY waste!!)

3. Additional Capping and Continued Best Collection Efforts

# Team Countywide
# Basic Assumptions

- Everyone has a role to play and value to add to the overall project

- It is better to share information, coordinate efforts and work together to resolve issues that may arise

- Resolving issues requires a team effort, with everyone bringing their respective information, talents and ideas to the table

# Fundamentals

- Honesty - Be honest with yourself and with each other. The trust that has emerged within the Team has made it stronger

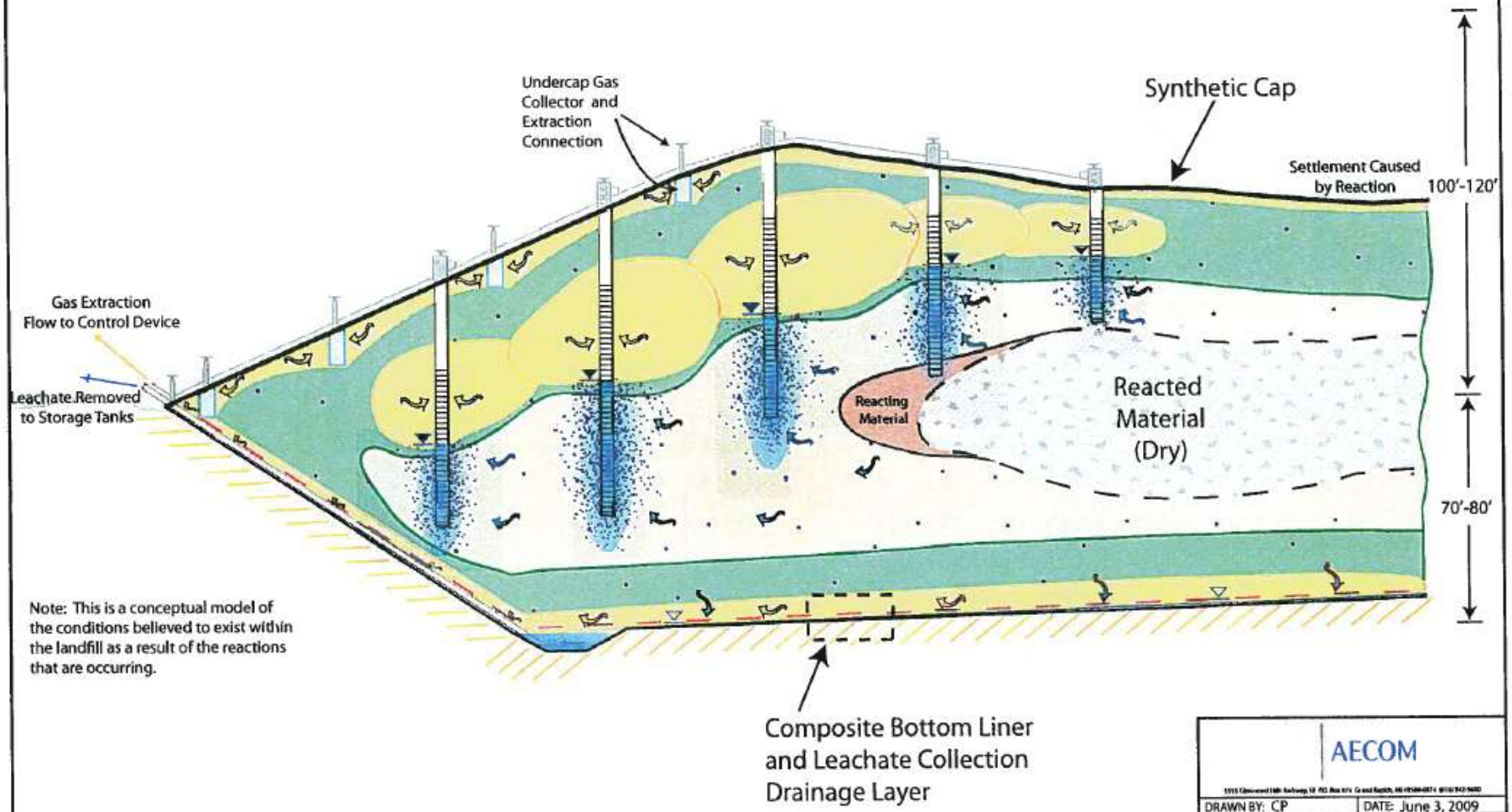
- Accountability – Make yourself and other Team members accountable to meet timelines, respect commitments and respect the needs other Team members

- No B.S. – Stay on point and stick with the facts. If you suspect BS, call it out right away and resolve the issue

# Fundamentals (cont)

- Openness – Be candid and open with your thoughts, ideas and feelings about the topic at hand or something that may be bothering you

- Questions – There are no stupid questions.  No matter what the question, if it is important to you, don’t wait – ASK IT NOW




AECOM

| | |
|---|---|
| DRAWN BY: CP | DATE: June 3, 2009 |
| CHECKED BY: | EDITED BY: |
| FILE NAME: CWFIG3.pdf | |

Figure 3

Reaction Schematic

| | |
|---|---|
| PROJECT NUMBER 103345 | SCALE: Not to Scale |

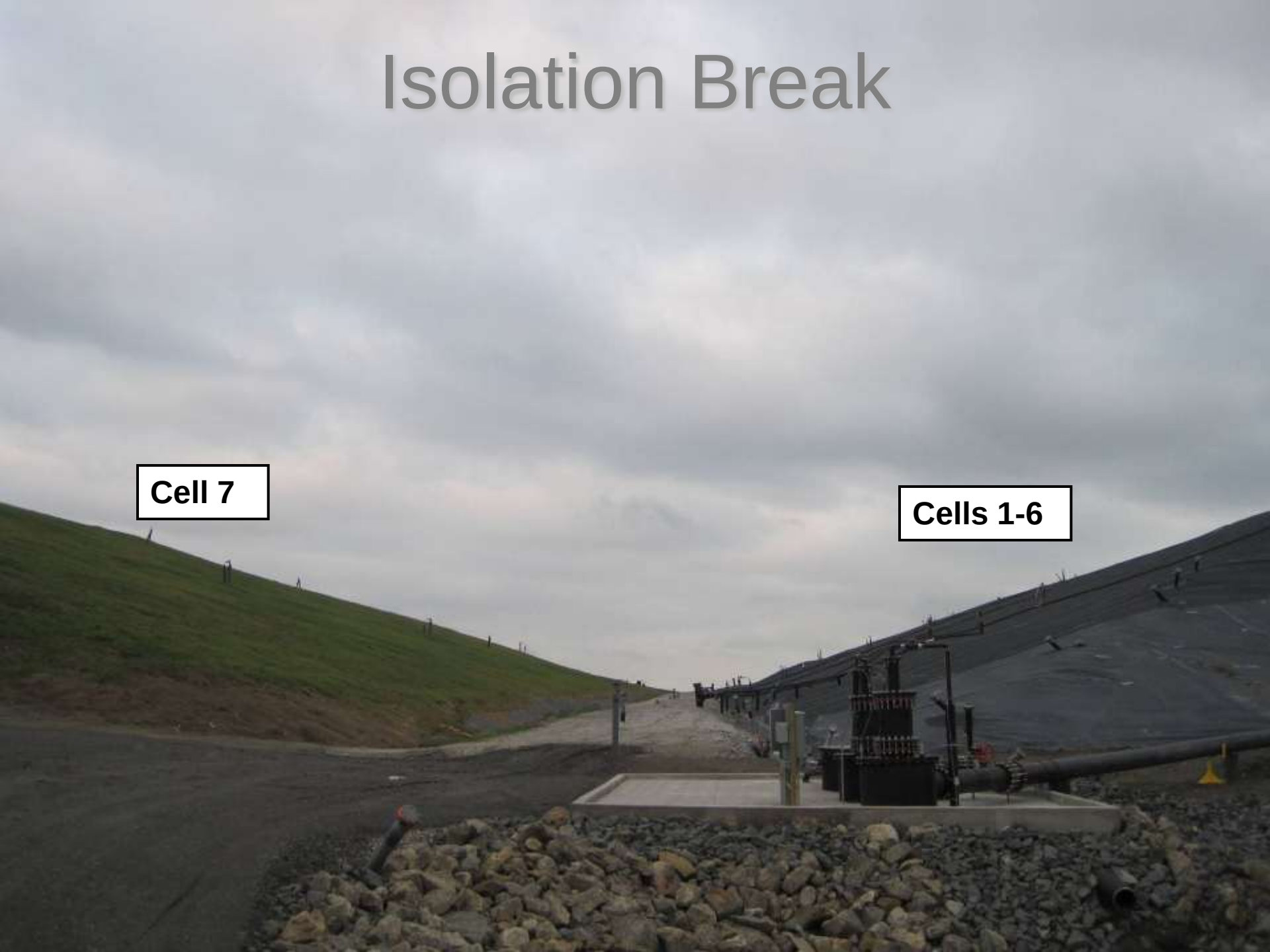
# Response Strategy

- Isolate and contain reaction/fire
- Control escape of gas, odor & liquid
- Reduce infiltration of $O_2$ & $H_2O$
- Stabilize reaction area

# Relief Well

# Major Renovation to LFG Collection System

# Isolation Break



# New Sumps For Isolation Break

# Sump Install at Iso Break

# Capping Completed


Cell 8
Cell 7
Cells 1-6

# Current Site Management

- OM&M Plan for remediation area
  - Covers all controls placed to contain reaction
    - Leachate, gas, liner, surface water controls
    - Includes financial assurance
    - Oversight, enforcement by Ohio EPA
- Republic O&M Team
    - Remediation Area Manager
    - 4 technicians
- Team Countywide meetings – monthly

# O M & M Plan

1) Maintain engineered components which control gas, condensate, leachate, pressure & oxygen/water intrusion

2) Prevent release of odors, gases & leachate

3) Maintain slope stability and containment until the reaction runs its course

4) Final closure & post-closure monitoring of remediation area