Geologic Map of Alabama

- Coastal Plain
- Piedmont
- Valley and Ridge
- Highland Rim
- Karst areas
STATE OF ALABAMA
UST RELEASE INCIDENT UNIVERSE

TOTAL # OF UST RELEASE INCIDENTS = 5,200

4238, 82%

537, 10%

102, 2%

40, 1%

283, 5%

- APPROVED CORRECTIVE ACTION PLAN
- MONITORING
- INVESTIGATION
- INACTIVE
- CLEANUP COMPLETE
OPEN UST RELEASE INCIDENT UNIVERSE

NUMBER OF OPEN RELEASE INCIDENTS = 962

- APPROVED CORRECTIVE ACTION PLAN
- MONITORING
- INVESTIGATION
- INACTIVE

- 537, 56%
- 283, 29%
- 102, 11%
- 40, 4%
AGE OF CURRENT ACOR SITES

Average cleanup time = 8 years
What does it cost?
* ASTSWMO Fund Survey

Based on FY18 data, the average cost for cleanup of funded sites:

National Average*:
- AST = $118,627
- UST = $142,219

Alabama Average*:
- AST = $178,064
- UST = $183,516
3 QUESTIONS

? How do we increase the number of cleanups?

? How do we decrease the cleanup time?

? What are we not doing that we should be doing?
HIGH RESOLUTION SITE CHARACTERIZATION

- Over 63 HRSCs have been performed
- Spent over $2.5 million on this technique
- Average cost is $42,000 per evaluation
- Information is VALUABLE
4 Examples of Application of High Resolution Site Characterization

- Multiple Sources - Theodore
- Vertical Extent of Contamination - Glencoe
- Old Releases, define the source area - Tuscaloosa
- Large Release(s) - Spanish Fort
Are there multiple sources?

- Theodore, Alabama
Figure 10

Western Boundary Transect A-A, Loga

SAI Theodore Exxon

February 2016

High Resolution Assessment

10-ft BGS

20-ft BGS

PID Response in Higher Permeability Zone

PID Response

HPT Pressure

SB-2 GRO DRO (mg/kg)
15-ft: 9.7 ND
16-ft: 160 59
17-ft: 25 130
18-ft: 49 59
19-ft: 20 9.4

SB-3 GRO DRO (mg/kg)
15-ft: 3400 260
16-ft: 2000 320
17-ft: 5100 940
18-ft: 230 150
19-ft: 64 5
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>SM</td>
<td>Asphalt</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>Grey and red silty sand - moist</td>
</tr>
<tr>
<td>6.3</td>
<td>CL</td>
<td>Grey and red silty clay - moist</td>
</tr>
<tr>
<td>13.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79.6</td>
<td>SM</td>
<td>Grey silty sand - saturated at 17'</td>
</tr>
<tr>
<td>159.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20.3</td>
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</table>

**Remarks:**
- Bentonite
- Filter Sand
- Neat Cement
. “The highest concentrations of contaminants in groundwater monitoring wells are off site both to the north (MW-12) and to the south (MW-20). These do not appear to have originated on the property itself, based on significantly lower MIP-PID responses and groundwater concentrations in monitoring wells near the tank enclosure and service island.”
Old Incident (1991)

- Tuscaloosa, Alabama
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Shelby Tube</th>
<th>Auger Cuttings</th>
<th>Std. Penetration Test (Split Spoon Sample)</th>
<th>Water First Noted</th>
<th>Static Water Level</th>
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<tbody>
<tr>
<td>5</td>
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<td></td>
<td>X</td>
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<tr>
<td>20</td>
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</tbody>
</table>

**LOGGED BY** 11" O.D. Hollow Stem: 4' to 20'

- 4" Asphalt
- Loose orange SILTY SAND (SM)
- Dark orange SILTY CLAY (CL) w/sandy CLAY charcoal lens
  -- trace of sand and gravel
- Loose brown CLAYEY SAND (SC) w/gravel
- Loose dark orange course SAND (SP)
- -- gray, tan and orange
- Gray CLAYEY SAND (SC)
  Boring TP-1 was terminated at 20 feet.

**NOTE:** No geotechnical laboratory testing performed. Soil classifications are based upon visual, field observations and should be considered as such.
Vertical Extent of Contamination

- Glencoe, Alabama
<table>
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<tr>
<th>Chemical of Concern (mg/L)</th>
<th>MW-14D</th>
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<tbody>
<tr>
<td>Benzene</td>
<td>0.0028</td>
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<tr>
<td>Total BTEX</td>
<td>0.2006</td>
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<tr>
<td>MTBE</td>
<td>BDL</td>
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</table>

<table>
<thead>
<tr>
<th>Chemical of Concern (mg/L)</th>
<th>MW-13D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene</td>
<td>1.76</td>
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<tr>
<td>Total BTEX</td>
<td>1.6918</td>
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<tr>
<td>MTBE</td>
<td>0.0413</td>
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</table>

**Legend:**
- MW-3: SHALLOW MONITORING WELL
- MW-13D: DEEP MONITORING WELL

[Diagram showing monitoring wells and test results]
Large Releases at Site

Spanish Fort, Alabama
Additional HRSC Information
Example – Use of vertical screening distances to tell if inhalation pathways are complete

LIF log, shows LNAPL

Pathway for inhalation from soil may be complete since <15’ between the surface and soil with LNAPL.

Pathway for inhalation from groundwater may not be complete since >15’ between the surface and groundwater with LNAPL.
Thank You!

Enjoy the Workshop!!