



Overview of Cabot-Koppers Superfund Site

Presented to
University of Florida Environmental Law Class
Professor Mary Jane Angelo

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Presented by

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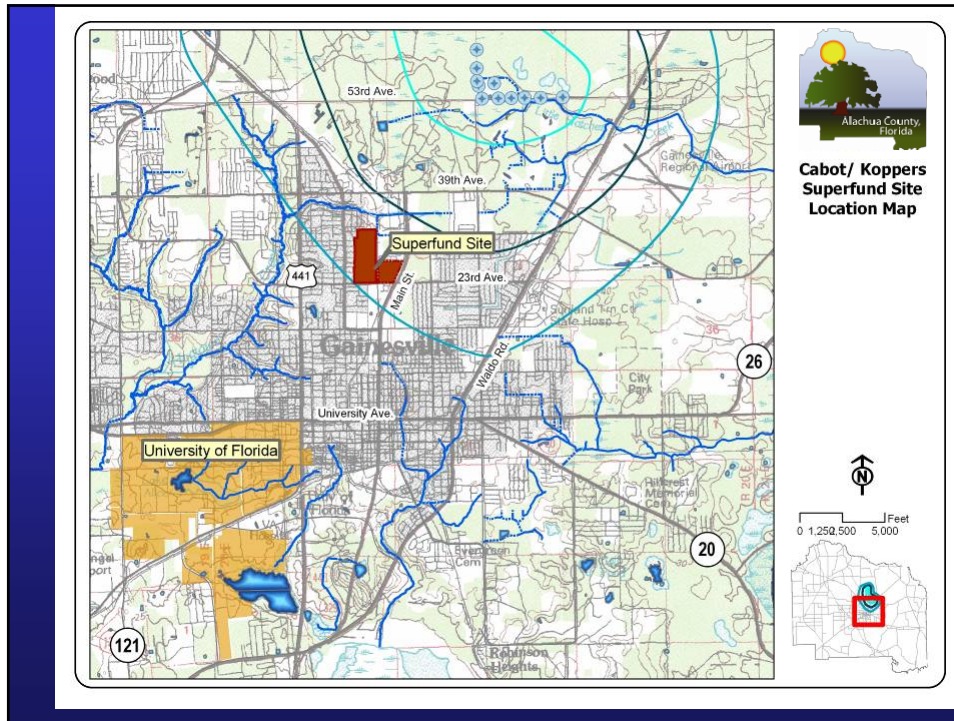


EPA Superfund Process

CERCLA (Comprehensive Environmental Response, Compensation and Liability Act)

- **Preliminary Assessment / Site Inspection (PA/SI)**
 - Investigate site conditions
- **Hazard Ranking System (HRS) Scoring**
 - Determine if risks significant to place site on the National Priorities List (NPL)
- **NPL Site Listing Process**
 - List of most serious sites identified for possible long-term cleanup
- **Remedial Investigation/ Feasibility Study (RI/FS)**
 - Determines nature and extent of contamination, risks to human health, remediation alternatives
- **Record of Decision (ROD)**
 - Explains and documents cleanup alternatives selected by USEPA
- **Remedial Design / Remedial Action (RD/RA)**
 - Prepare and implement plans for selected site remedies
- **Construction Completion**
 - Identifies completion of cleanup activities
- **Post Construction Completion**
 - Ensures remedies selected provide long-term protection of human health and the environment.

Source EPA



Cabot-Koppers Superfund Site Site History

Alachua County, Florida

Koppers Site --90 acres

- Wood treating since 1916
- Four areas of concern
 - 2 wastewater ponds
 - Former cooling pond /process area
 - Drip Track Area
- Listed Superfund Site -- 1983
- Beazer purchases Koppers (1988)
- Plant operation sold to Koppers
- Beazer retained environmental liability

Cabot-Koppers Superfund Site *Koppers Chemicals of Concern*



- **Creosote - DNAPL – Dense Non-Aqueous Phase Liquid**
 - Napthalene
 - Benzene
 - Carcinogenic aromatic chemicals (PAHs)
 - Phenols
- Pentachlorophenol
 - Chlorinated phenols
 - Dioxin
- CCA
 - Arsenic

DNAPL tends to move down vertically in environment

Cabot-Koppers Superfund Site *Former Koppers North Lagoon Area*



Cabot-Koppers Superfund Site
Former Koppers South Lagoon Area



Cabot-Koppers Superfund Site
Former Koppers Drip Track Area



Cabot-Koppers Superfund Site Former Koppers Cooling Pond/ Process Areas



Cabot-Koppers Superfund Site Site History



Cabot Site --49 acres

- History of pine tar & charcoal production
- Pine tar/pine oil production by Cabot since 1945
- Product isolation in 3 unlined lagoons (1949)
- Cabot sold site (1967)
- Developer breaches product lagoons – 1970's
- Pine tars and oils discharged to wetlands and creek



Cabot-Koppers Superfund Site Site History



Cabot Site

- Remaining lagoon sludges mixed with site soils (1970)
- Shopping center built on site
- Stormwater ponds built on top of former lagoons
- Malodorous leachate appears in Main Street ditch



Cabot-Koppers Superfund Site Cabot Chemicals of Concern



- Pine tars / oils
 - Phenols
 - Terpenes (pine compounds) (odorous)
 - Napthalenes
- Tars, Diesel and Creosote – Northeast Lagoon
 - Napthalenes
 - Phenols
 - Hydrocarbons

Cabot-Koppers Superfund Site
Former Cabot Site –Current View



Cabot-Koppers Superfund Site
Former Cabot Lagoons Area – Current View



Cabot-Koppers Superfund Site Key Participants in Process



Regulators

- US EPA Region 4 - Primary Decision Maker and Site Manager (EPA)
- Florida Dept. of Environmental Protection (FDEP)
- Alachua County Environmental Protection Dept. (ACEPD)

Principal Responsible Parties (PRPs)

- Beazer East, Inc. – Koppers Site (Beazer)
- Cabot Corporation – Cabot Site (Cabot)

Stakeholders and Interested Parties

- City of Gainesville/Gainesville Regional Utilities (GRU)
- Local Community and Elected Officials
- Koppers Industries
- Alachua County Health Department
- Surrounding Neighborhood

Status of Cabot and Koppers Sites in Superfund Process



- Preliminary Assessment / Site Inspection (PA/SI)
- Hazard Ranking System (HRS) Scoring
- NPL Site Listing Process <<Both Sites here in 1983!!>>
- Remedial Investigation/ Feasibility Study (RI/FS) << Koppers Site is here (2007)>>
- Record of Decision (ROD)
- Remedial Design / Remedial Action (RD/RA)
- Construction Completion
- Post Construction Completion << Cabot Site is here (2007)>>

Cabot-Koppers Superfund Site



Regulatory Actions

- **1983** - Sites (Cabot/ Koppers) placed on NPL Superfund list
- **1985-1987**- FDEP installs leachate collection system on Cabot site; conducts initial remedial investigation (RI)
- **1988** – Beazer and Cabot sign Consent Order with USEPA to complete RI, develop Feasibility Study (FS) for remedial alternatives
- **1990**-- EPA Record of Decision (ROD) for combined sites – Remedies selected [Link:http://cfpub.epa.gov/superrods/schrods.cfm](http://cfpub.epa.gov/superrods/schrods.cfm)
- **1991-1995**-- Cabot signs Consent Order with EPA, implements ROD remedial actions at the Cabot site
- **1991** – Beazer agrees to implement ROD at Koppers site in response to EPA unilateral administrative order
- **1994** – Beazer implements shallow groundwater recovery remedy for Koppers site

Cabot- Koppers Superfund Site Remedial Actions Implemented Cabot Site



- Soil contamination below direct contact health risk levels
- Contaminated soils in NE Lagoon partially removed
- Shallow groundwater containment system installed along N. Main St.
- Discharge of contaminated water to city sewer
- Concrete lining of N. Main St. ditch
- Groundwater containment system continues to operate
- Site in Post Construction Phase – monitoring

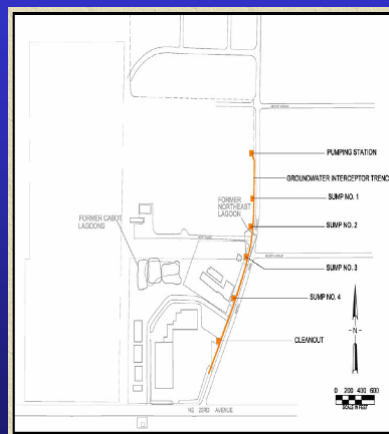


Fig. Source: Cabot Briefing to EPA Jan 27, 2005

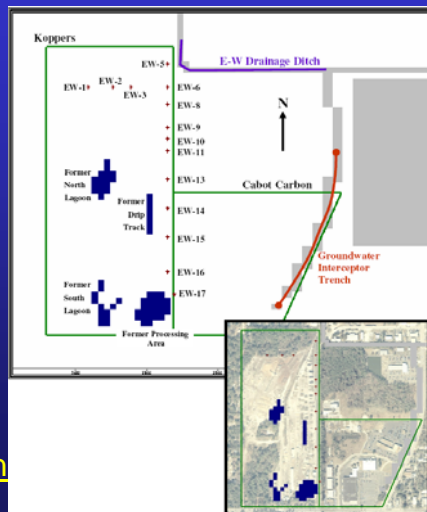
Cabot-Koppers Superfund Site Remedial Actions Implemented Cabot Site – Main St. Ditch and Ground Water Interceptor System



Cabot-Koppers Superfund Site Remedial Actions Implemented Koppers Site



- Boundary extraction wells
– To contain shallow groundwater
- Groundwater treatment
– To reduce arsenic, PAHs
- Discharge to city sewer
- Intended to prevent offsite migration
- Recent data -- boundary wells not capturing all contamination



Source: WHI Technical Memorandum No.2



Cabot-Koppers Superfund Site
Preliminary Remedial Actions Implemented
Boundary Well System at Koppers Site



Cabot-Koppers Superfund Site
Preliminary Remedial Actions Implemented
Koppers- Groundwater Treatment System



Cabot- Koppers Superfund Site Regulatory Actions (cont'd)



- 1999 -- Amended FS for Koppers Site produced by EPA due to additional contamination found
- 2001 -- Amended ROD for Koppers soil remedy proposed by EPA
- 2001-- EPA presents proposed Amended ROD to local community
- 2001 -- Local community rejects EPA proposed solutions – asks for further investigation of underlying Hawthorn group formations
- 2002 – EPA requests additional investigation of deeper soil and groundwater zones by Beazer

Cabot-Koppers Superfund Site Koppers Site 2001 Amended ROD Original Assumptions and Remedial Plans



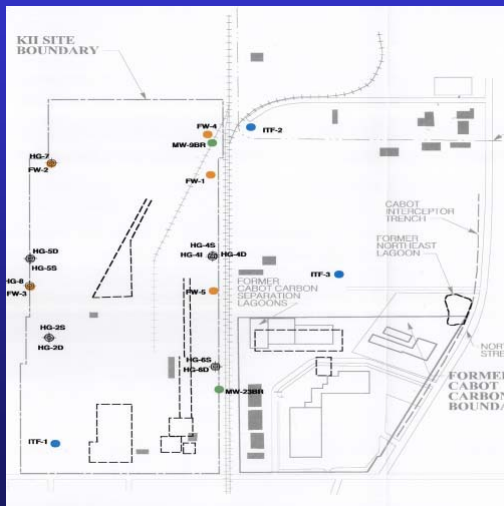
- Surficial groundwater contamination
 - Continue boundary groundwater extraction system
 - Surface soil direct contact threat
 - Remove surface soils and cap source areas
 - Hawthorn Group clays under source areas prevent migration to lower aquifers
 - Solidify and stabilize source areas, horizontal flow barriers, rely on clays to prevent downward migration.
-
- ***RECENT INVESTIGATIONS HAVE CONFIRMED THAT ORIGINAL ASSUMPTIONS WERE INCORRECT AND CONTAMINANTS HAVE MIGRATED TO DEEPER HAWTHORN AND FLORIDAN AQUIFER ZONES UNDER THE SITE***

Cabot-Koppers Superfund Site

Koppers Site -Additional Investigations (2002-2004)



- Deeper wells installed into Hawthorn Group Formation
- Wells installed in two zones
 - 40-50 ft BLS
 - 95-105ft BLS



Source TRC, Inc

Cabot-Koppers Superfund Site

Monitor Well Sampling at Koppers Site



Cabot-Koppers Superfund Site

Koppers Site -Additional Investigations (2002-2004)



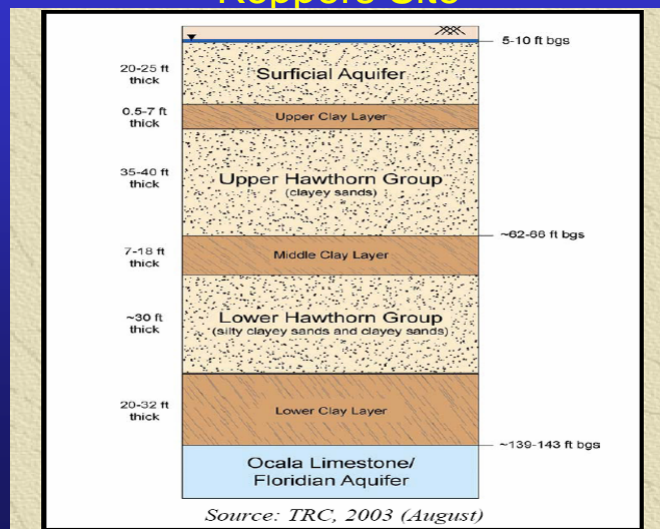
- Wells installed into upper Floridan Aquifer
- Shallow upper Floridan wells
– 145 – 155 ft BLS



Source TRC, Inc

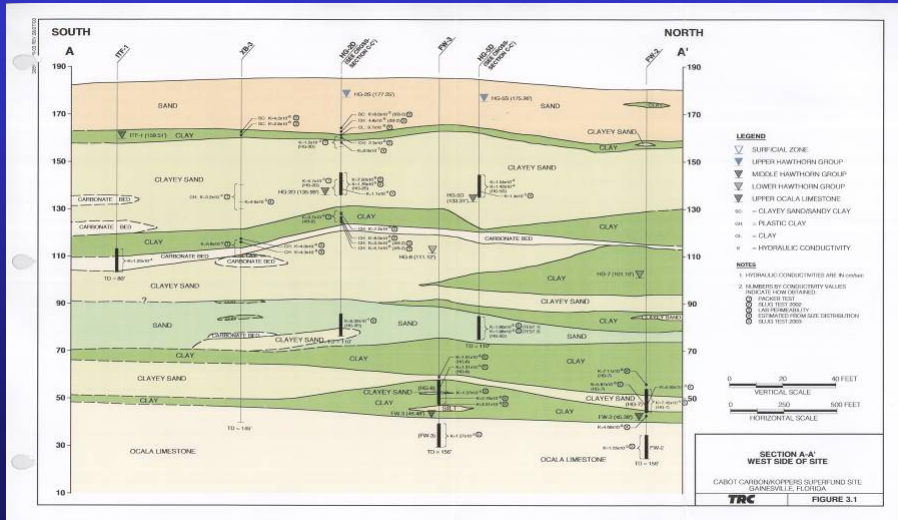
Cabot-Koppers Superfund Site

Simplified Geologic Cross Section Koppers Site

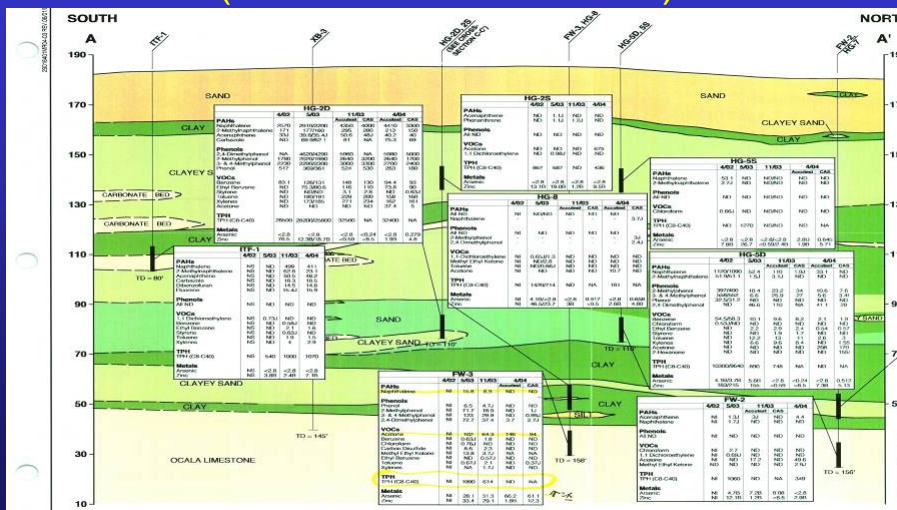




Cabot-Koppers Superfund Site More Realistic Cross Section of Koppers Site

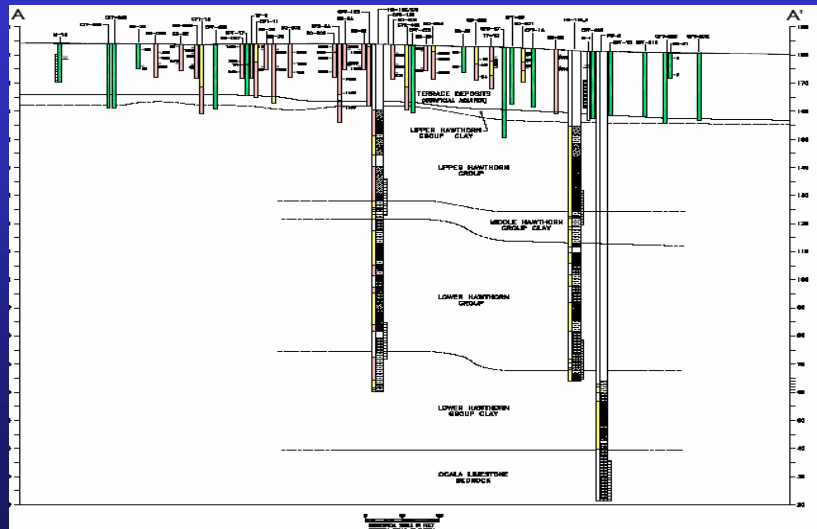


Cabot-Koppers Superfund Site Contaminants Found in Deeper Aquifers (Hawthorn and Floridan)



Source TRC, Inc

Cabot-Koppers Superfund Site Cross Section of North Lagoon



Source TRC, Inc

Cabot-Koppers Superfund Site Koppers Site Borings Indicate Creosote Contamination in Upper Hawthorn



Cabot-Koppers Superfund Site
Koppers Site DNAPL Recovery
from Hawthorn Group Formations



Cabot-Koppers Superfund Site

Results of Additional Investigations (2002-2004)



- Original assumptions about site geology are incorrect.
 - **Hawthorn clay not a barrier to migration of creosote**
 - **Free product creosote and groundwater contamination in intermediate Hawthorn Formations (40-90ft bls)**
 - **Groundwater contamination in Floridan Aquifer (130 ft bls)**
 - Napthalene (1200 ug/L) in Floridan near North Lagoon
 - Clean-up standard (14 ug/L)
- Migration of contamination to City well field possible

Cabot-Koppers Superfund Site
Additional Activities at Koppers Site
(2002-2005)

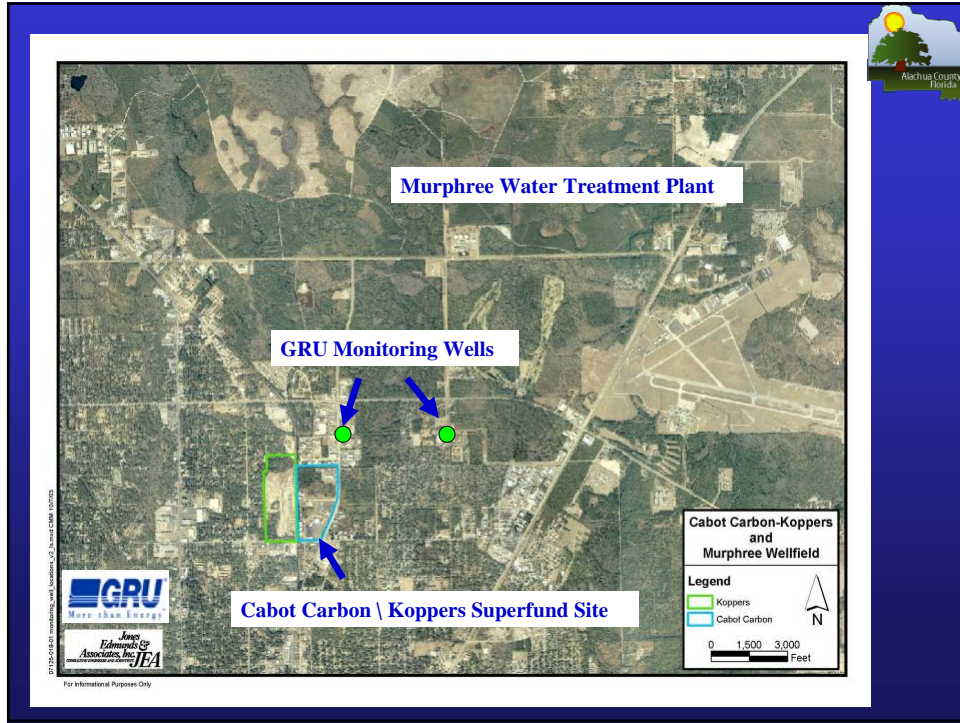


- Develop Revised FS -- Beazer
- Investigate source removal options -- Beazer
- Immediate interim remedial actions requested – City/County
- Sentinel wells between site and City wellfield -- GRU
- Technical experts hired to review Beazer data -- GRU
- Groundwater modeling study -- Beazer
- Pilot remedies & interim remedial actions evaluated – Beazer
- Additional Floridan aquifer monitoring -- Beazer

Cabot-Koppers Superfund Site
Additional Activities at Koppers Site
(2005-2006)



- Beazer Groundwater model predicts no threat to wellfield. City and County disagree.
- GRU experts indicate that groundwater contamination travel time to wellfield could be as low as 4 to 5 years.
- GRU experts recommend multilevel Floridan monitoring wells on site and near source areas
- EPA orders Beazer to install and sample multilevel Floridan wells on site
- Beazer performs additional source sampling for Risk Assessment and setting clean-up goals for soils



Cabot - Koppers Superfund Site Recent Groundwater Results

NAPHTHALENE (ppb)(micrograms /Liter)

Depth (Feet BLS)	Well FW6	Well FW12B	Well FW20B	Well FW21B	Well FW22B	Well FW23B
160'-170'	390	38	720	1600	ND	3.5
180'-190'	12	140	170	ND	ND	1.1
200'-210'	430	ND	67	ND	ND	ND
220'-230'	610	ND	1.3	ND	ND	ND

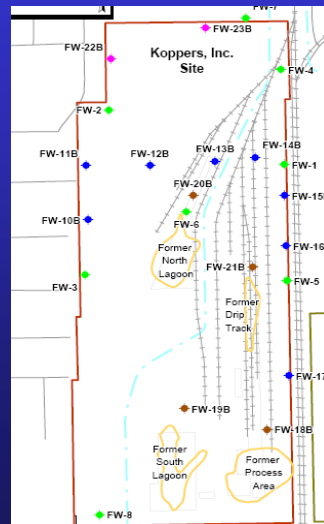
Florida DEP Clean-up Standard: 14 ppb

ACENAPHTHENE (ppb)(micrograms /Liter)

Depth (Feet BLS)	Well FW6	Well FW12B	Well FW20B	Well FW21B	Well FW22B	Well FW23B
160'-170'	62	0.7	65	110	11	0.7
180'-190'	0.6	40	36	19	0.4	0.4
200'-210'	35	0.2	37	18	0.6	0.6
220'-230'	55	0.1	ND	9.1	ND	ND

Florida DEP Clean-up Standard: 20 ppb

- Contamination at > 200ft BLS confirmed on-site
- Boundary wells show lower level contamination



Cabot-Koppers Superfund Site Soil Sampling for Risk Assessment



- Supplemental Soil Sampling –Fall 2006
 - Arsenic, Dioxin, Creosote components, Pentachlorophenol
- Source areas are known to be heavily contaminated.
- Outside source area zones
 - 0 - 6" and 6" to 2ft zones primarily
- Establish direct contact risk, leaching risk
- Evaluate airborne risks from dust
- Establish clean-up criteria for soils
- Issues
 - Industrial vs Residential standards
 - Removal of source material
 - Engineering controls and restrictions on site.

Cabot-Koppers Superfund Site Current Activities and Issues



- Additional Floridan Wells at Boundary
 - Investigate deeper zones at 350 ft BLS for contamination
 - Test hydraulic properties of Floridan zones
- EPA needs to decide on extent of threat to wellfield
- Containment of Floridan contamination needs evaluation
- Intermediate Hawthorn aquifer needs further investigation
- Soil testing to establish clean-up standards for soils
- Pilot study to test source removal from Hawthorn
- Upgrade of boundary well containment system
- Complete revised feasibility study / remedial alternatives
- County, City and GRU continue to urge expedited actions



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