South Dayton Dump & Landfill Site Review and Discussion

June 23, 2014

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Worldwide Engineering, Environmental, Construction and IT Services

Meeting Objective

Review the Conceptual Site Model, discuss completion of the remedial investigation and feasibility study.

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Agenda

- **Conceptual Site Model**
  - Site Characterization
    - Soil
    - Groundwater
  - Risks and Data Gaps
- Site History
- Path forward

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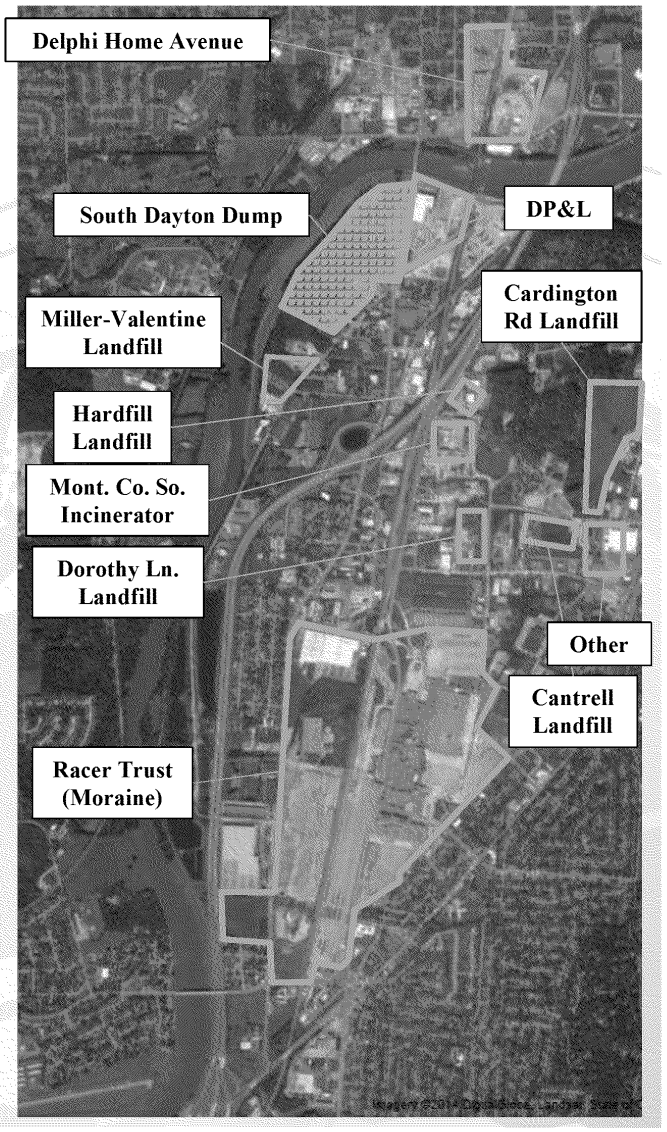
Regional Overview & Known Cleanup Sites

- Multiple RCRA, NPL or listed sites located in Dayton and Moraine
- DNAPL, LNAPL, soil, groundwater, vapor concerns
- Groundwater VOC impacts are a regional issue



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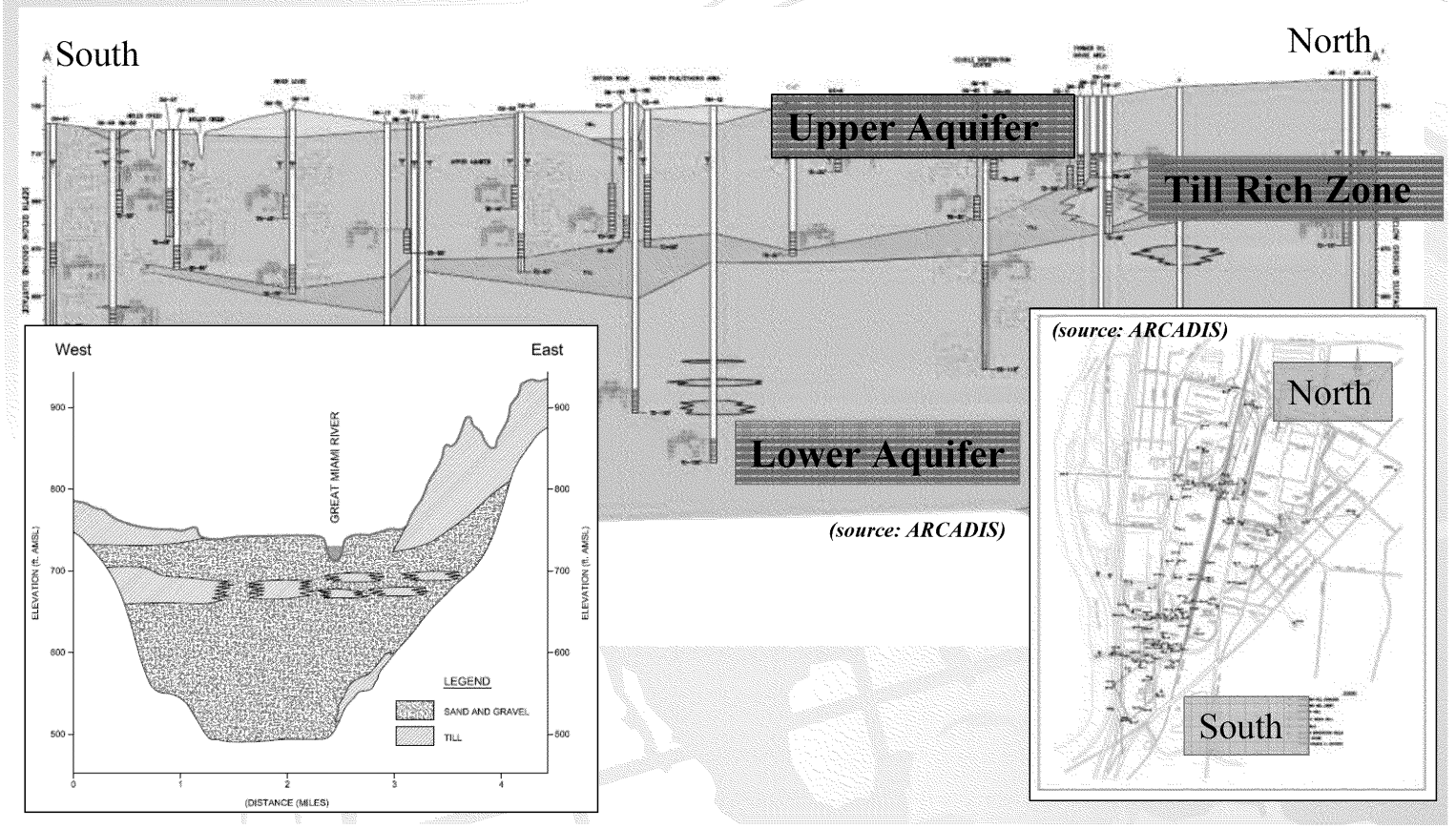
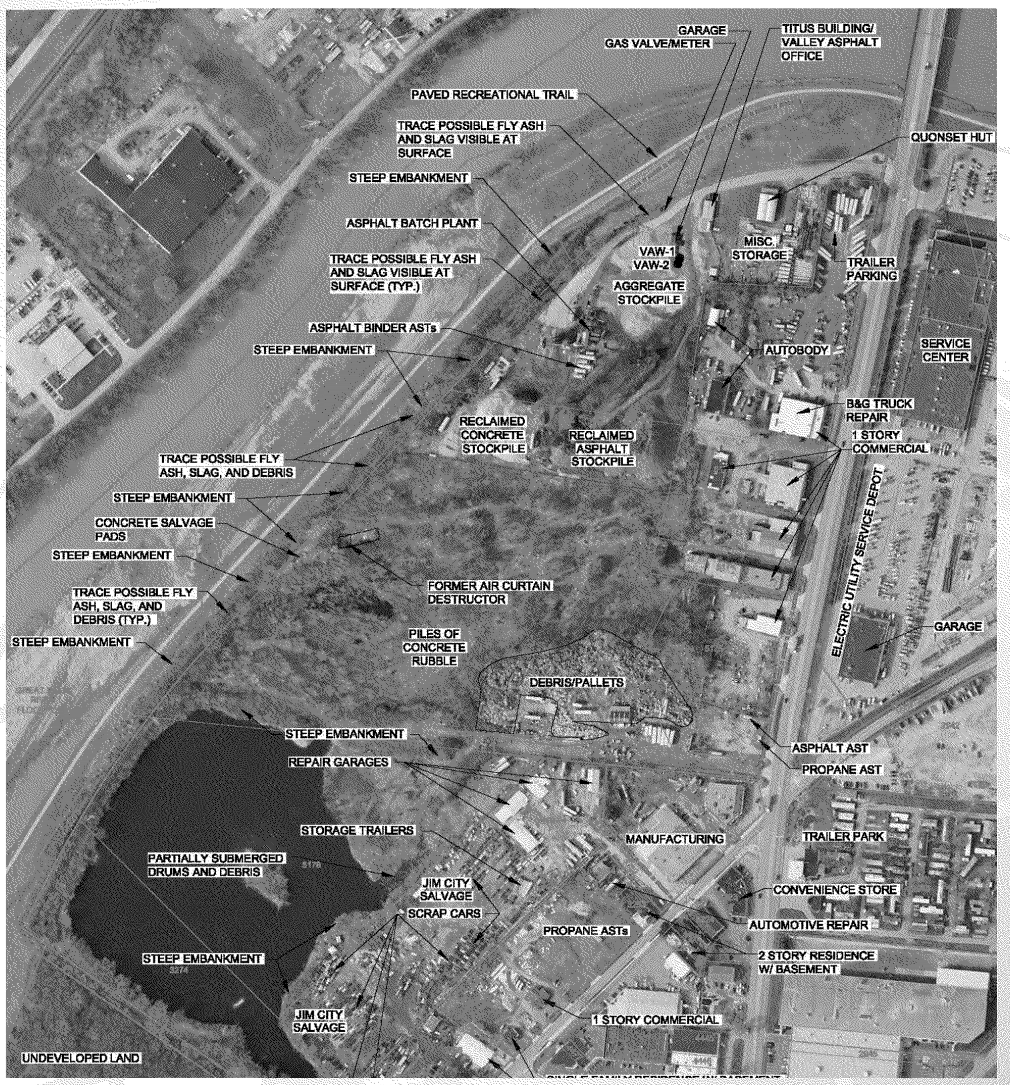
Typical Geologic Cross-Section

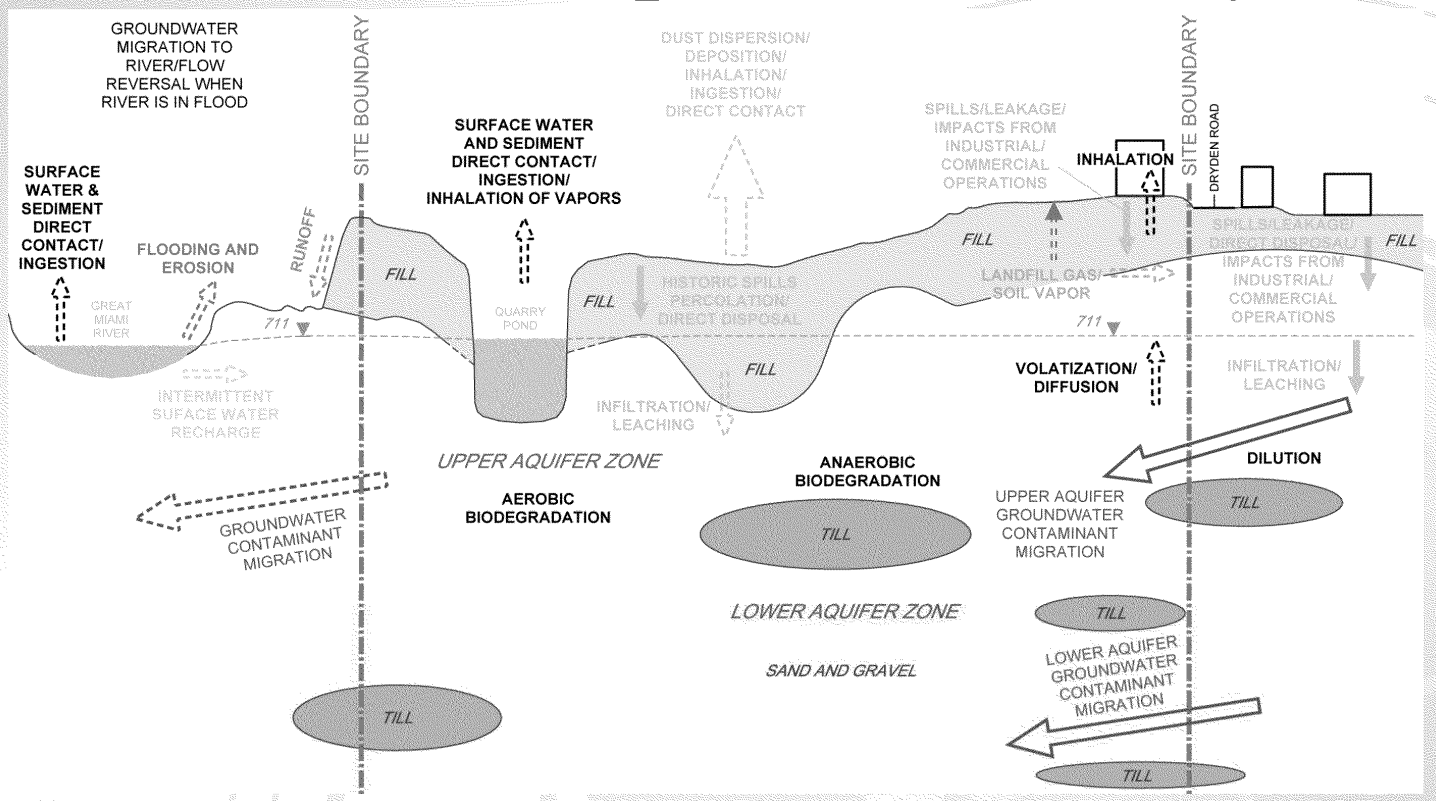
South of Site



Site Overview



Potential Exposure Pathways



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Conceptual Site Model (CSM)

- Vapor intrusion issues effectively mitigated
- Soil impacts
  - primarily due to metals (lead, arsenic, copper)
- Isolated Upper Aquifer groundwater impacts (limited areas, low concentrations)
  - Primarily benzene, TCE, vinyl chloride
- Regional contamination of Lower Aquifer
  - Primarily benzene, cis-1,2-DCE, vinyl chloride
  - Upgradient, cross-gradient sources, widespread

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Soil Characterization

- Most waste composed of fly ash, foundry sands, metal shavings, plaster/chalk-like materials, and construction and demolition debris.
- VOCs, dioxins, asbestos, and radionuclides not significant soil contaminants
- SVOCs: primarily, PAHs
- Metals: primarily, Copper, Lead, Arsenic
- PCBs: Aroclors 1242, 1248, 1254, and 1260
  - PCBs present in a few discrete areas

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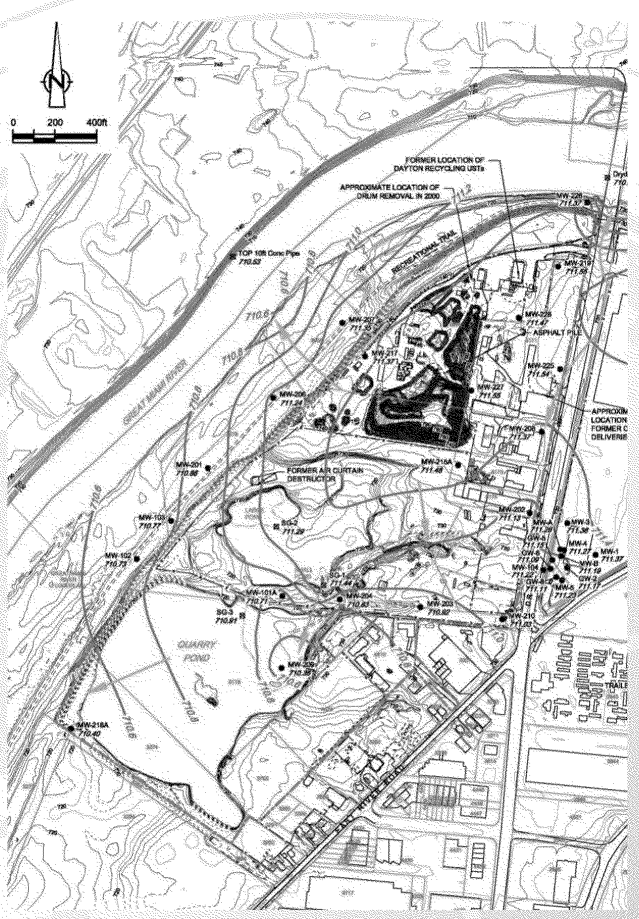

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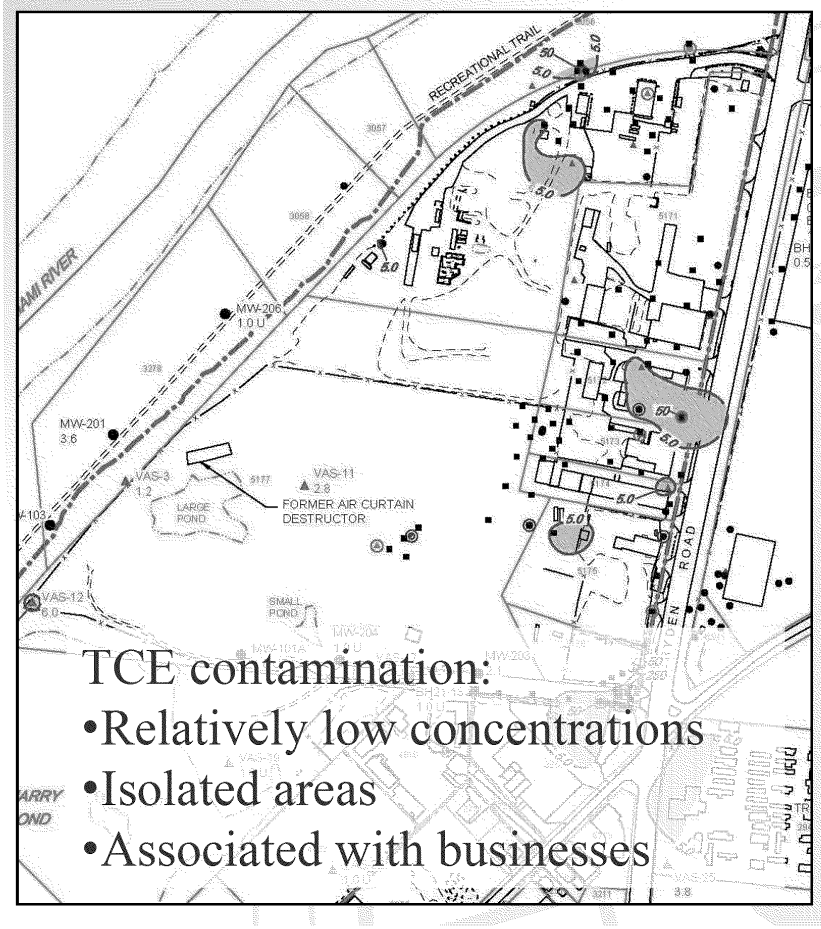
TCE in Groundwater

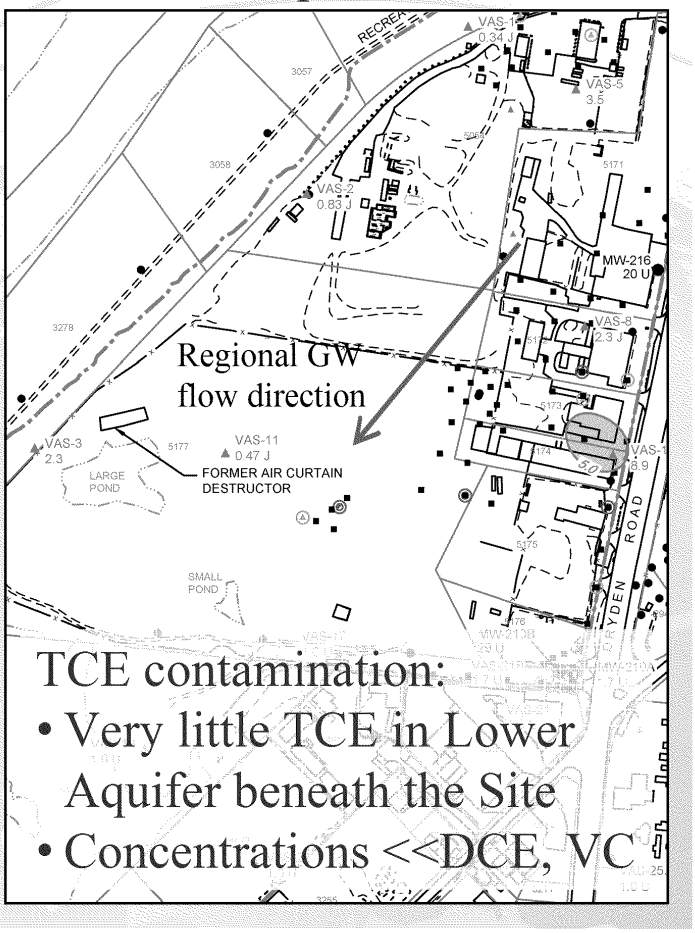
Upper Aquifer Zone



TCE contamination:

- Relatively low concentrations
- Isolated areas
- Associated with businesses

Lower Aquifer Zone

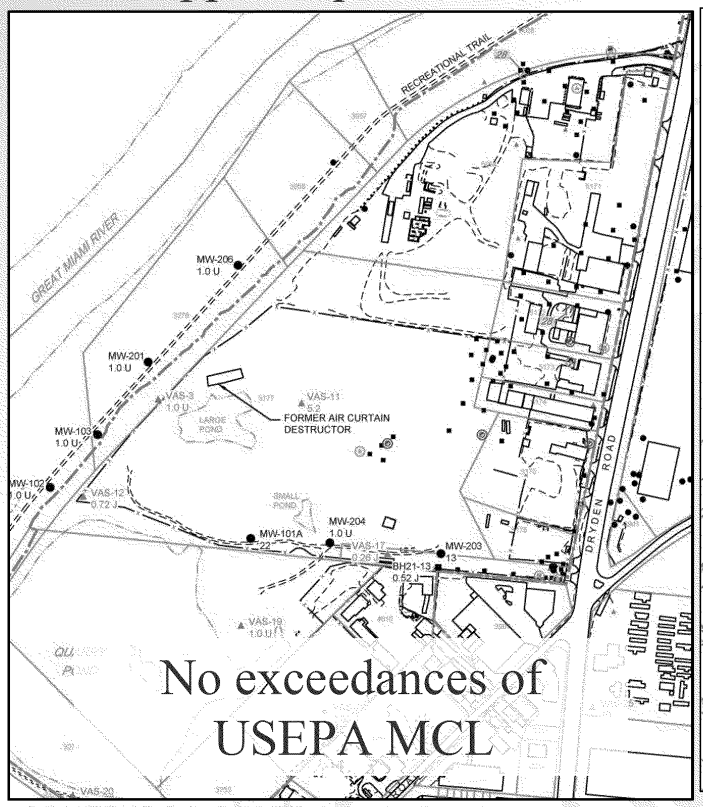


TCE contamination:

- Very little TCE in Lower Aquifer beneath the Site
- Concentrations <<DCE, VC

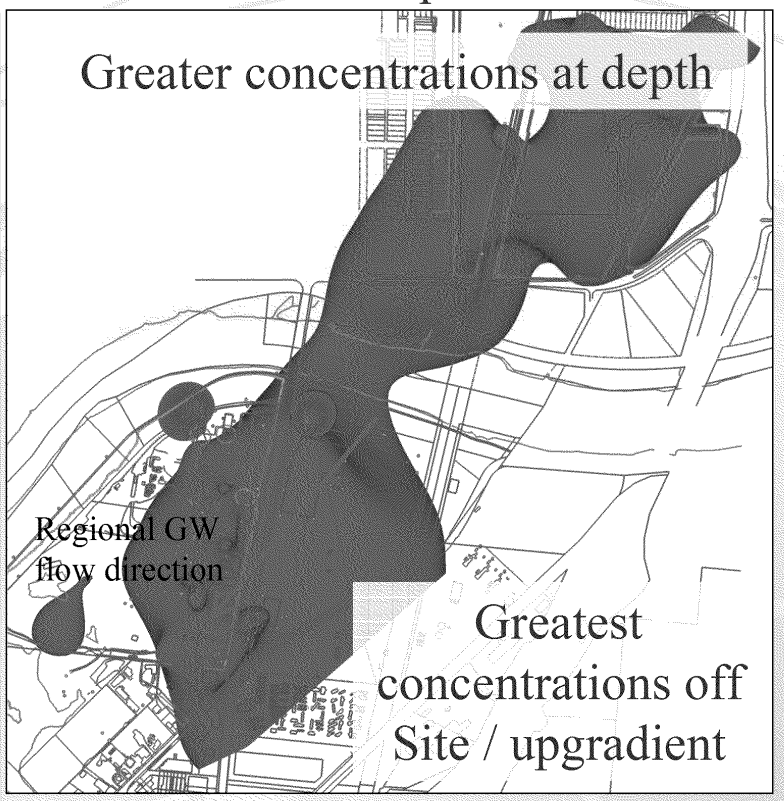
cis-1,2-DCE in Groundwater

Upper Aquifer Zone



No exceedances of USEPA MCL

Lower Aquifer Zone



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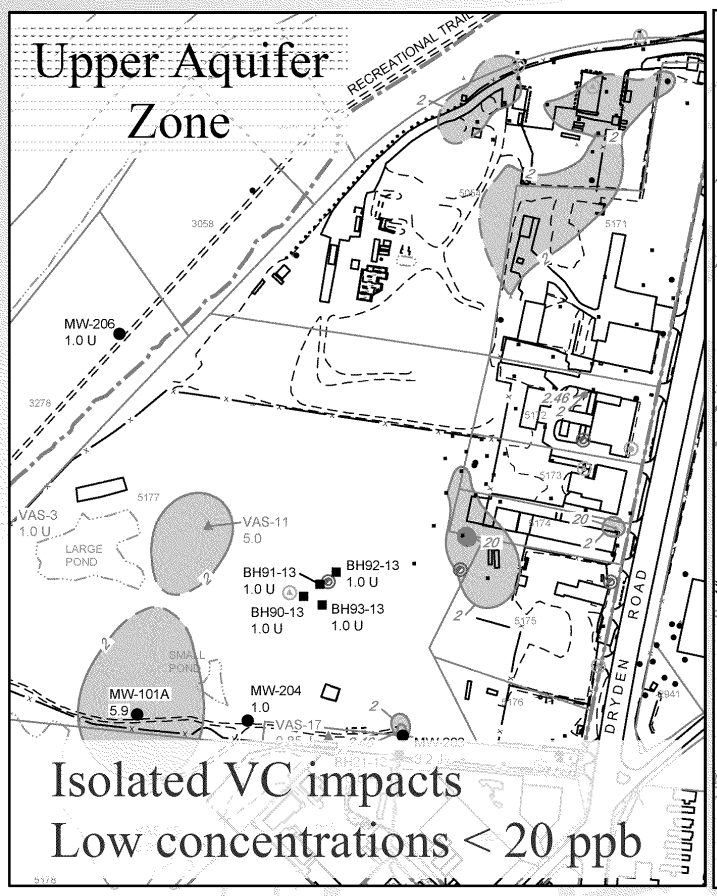
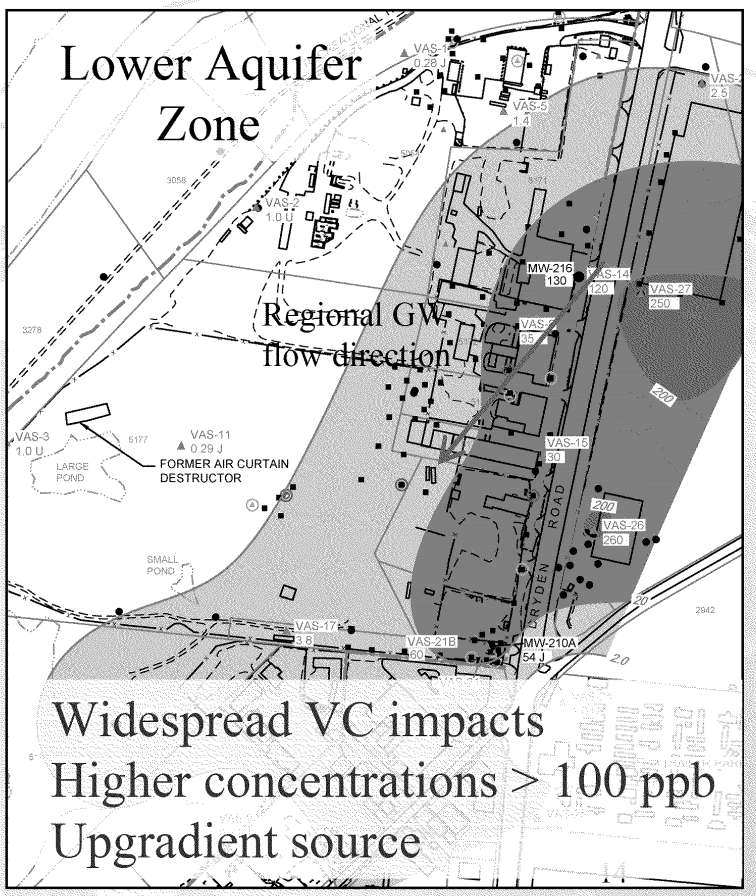
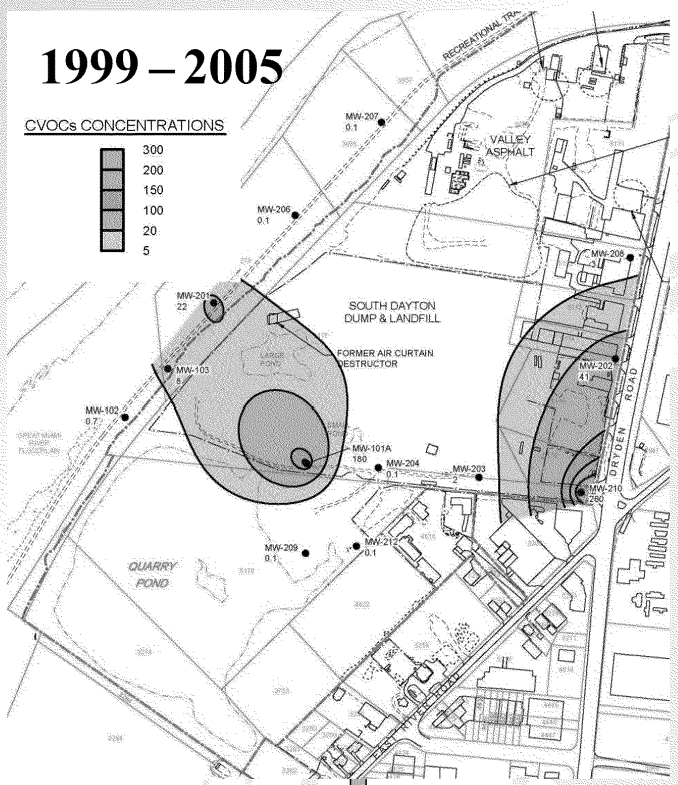
Vinyl Chloride in Groundwater

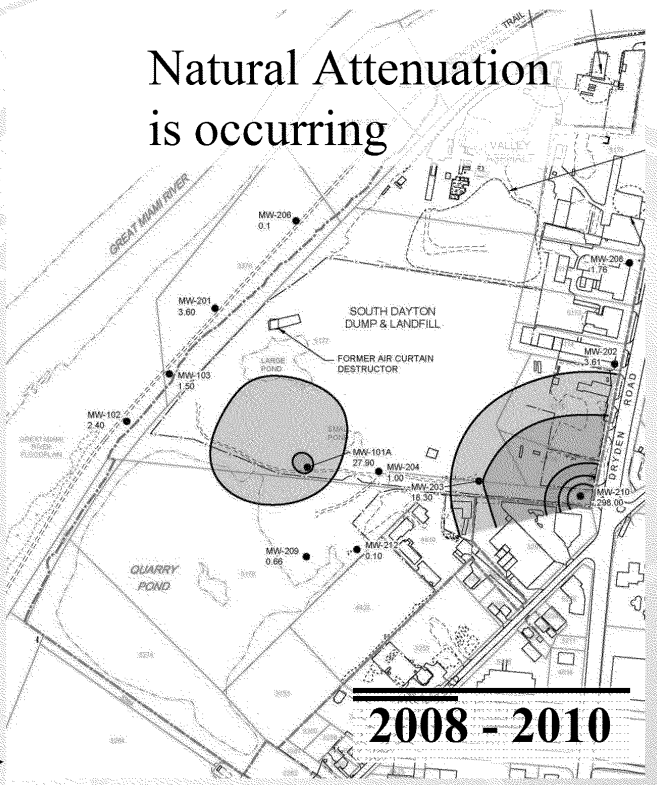




CVOCs Over Time



Natural Attenuation is occurring



2008 - 2010

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Attenuation Behavior

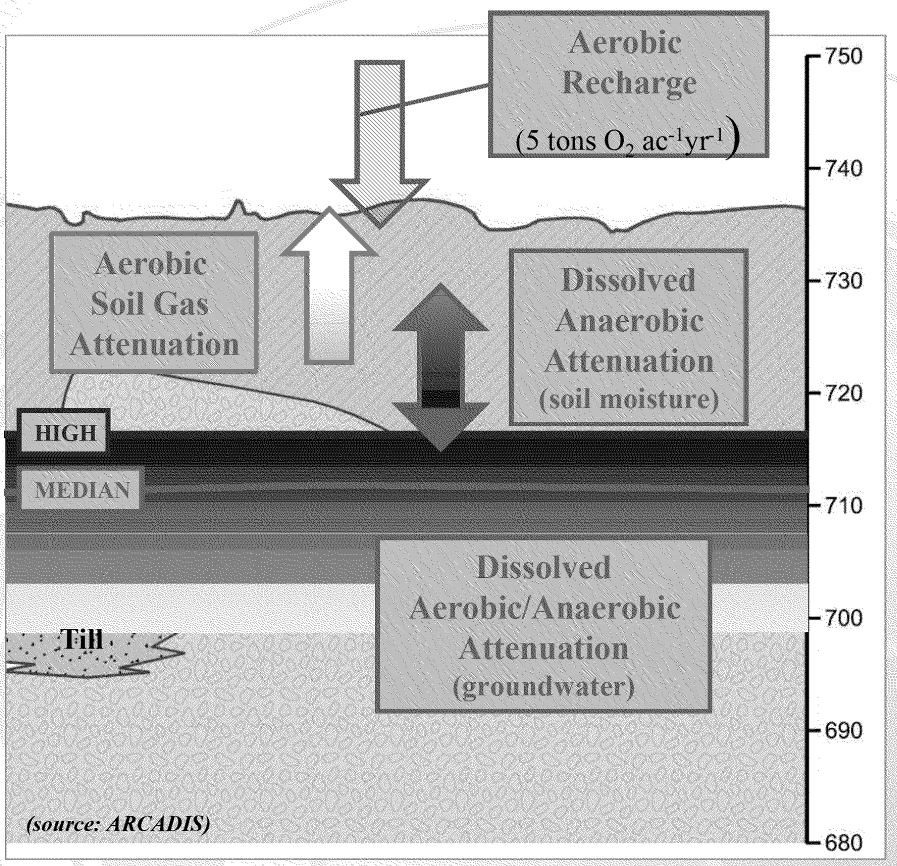
Primary Mechanisms:

Vadose Zone Attenuation

- **Aerobic**: methane, BTEX, vinyl chloride
- **Anaerobic**: BTEX, TCE, cis-1,2-DCE

Shallow Aquifer Attenuation

- **Aerobic**: influx of dissolved oxygen from river and upgradient groundwater – controls site periphery
- **Anaerobic**: submerged organic waste serves as electron donor for solvents



What is the source of Area GW contamination?

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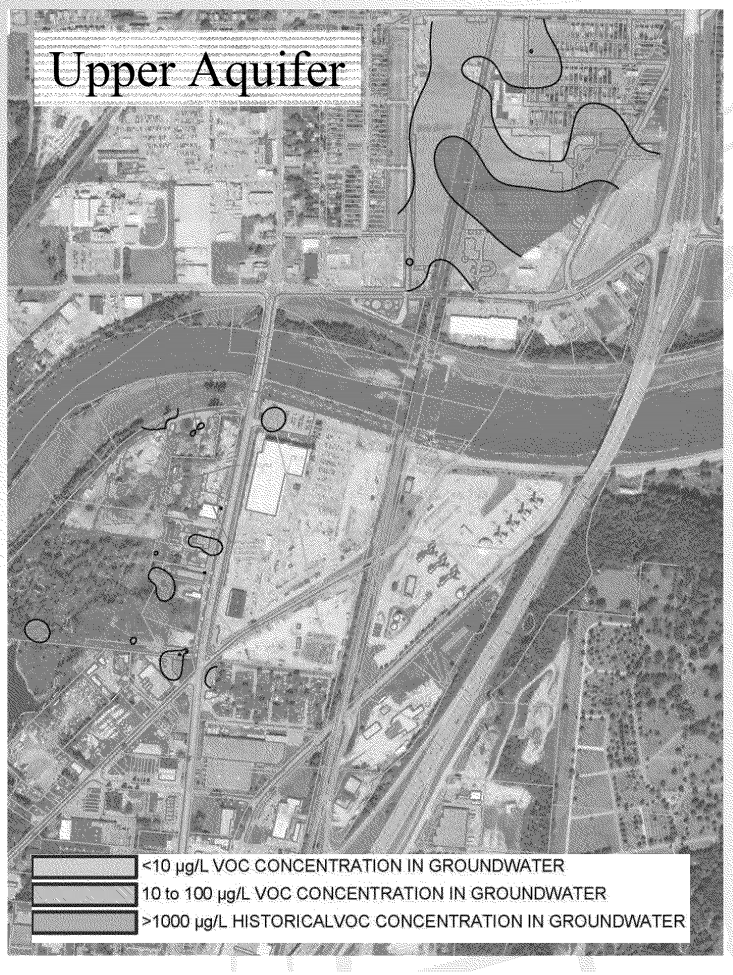
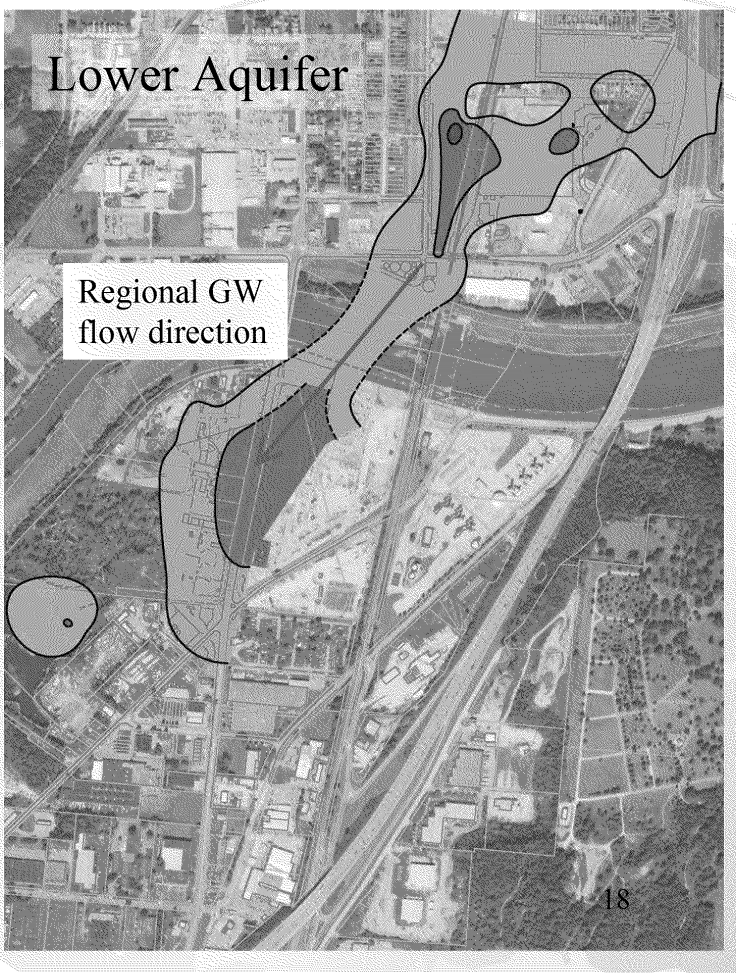
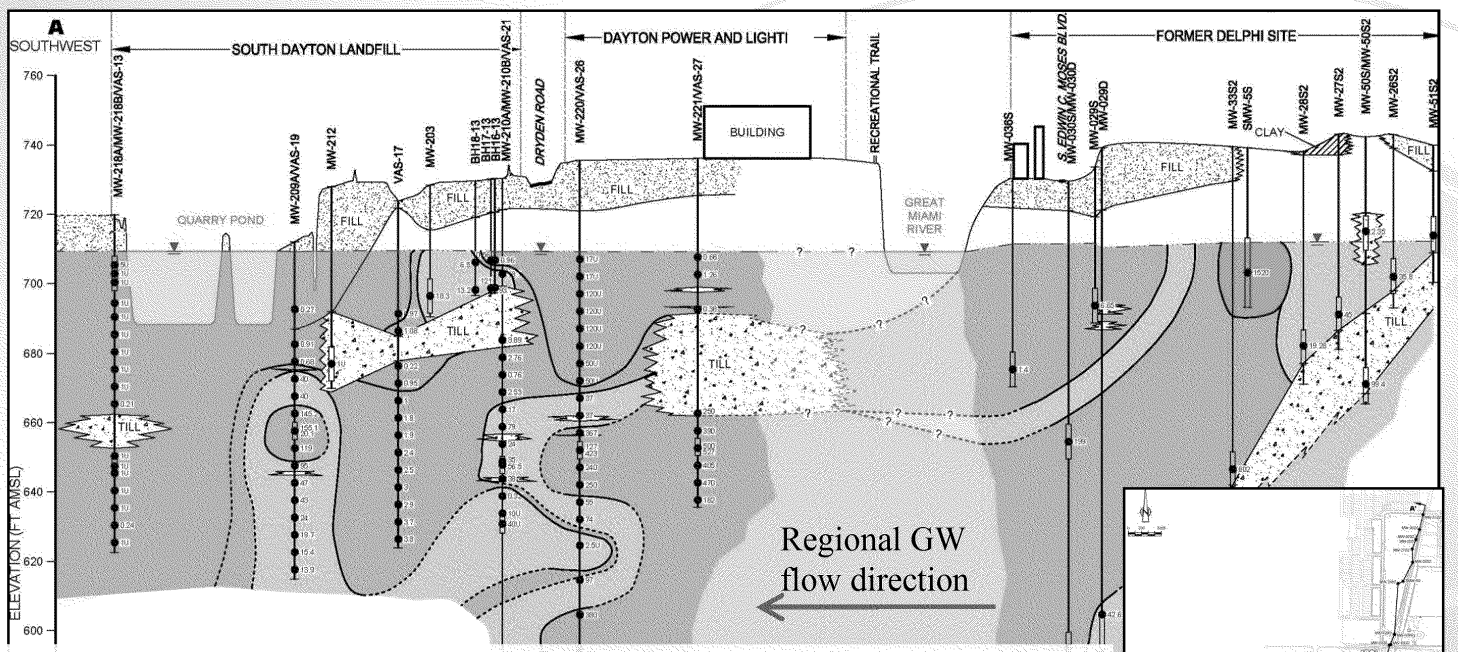
CVOCs On Site vs Delphi



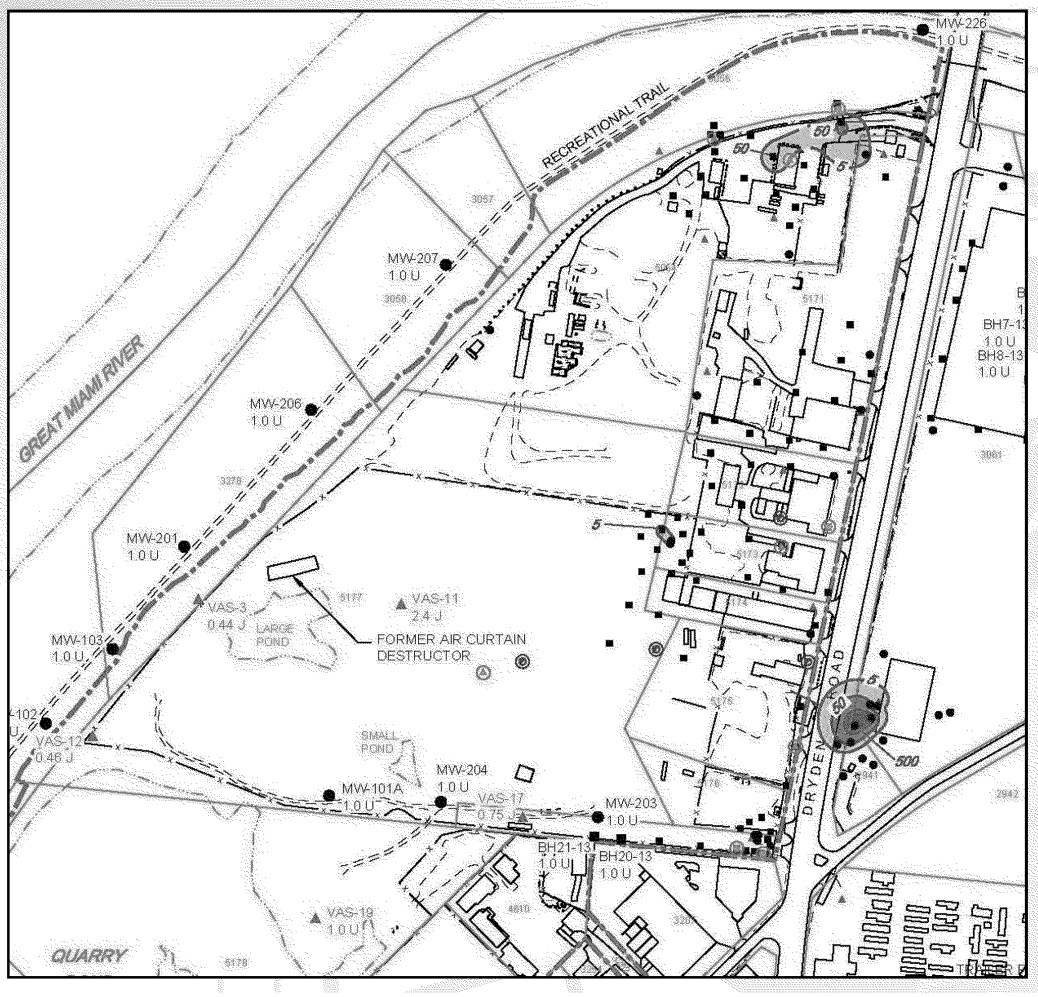


Vertical CVOC Distribution



- Significant upgradient plume from Delphi
- No on-Site source of comparable concentration
- GMR not a barrier to migration

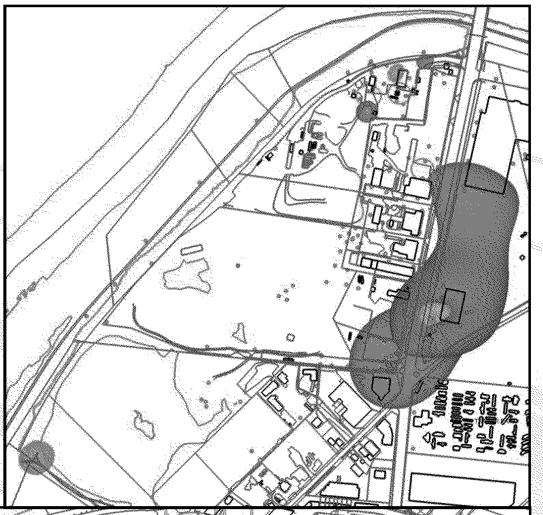
Benzene - Upper Aquifer

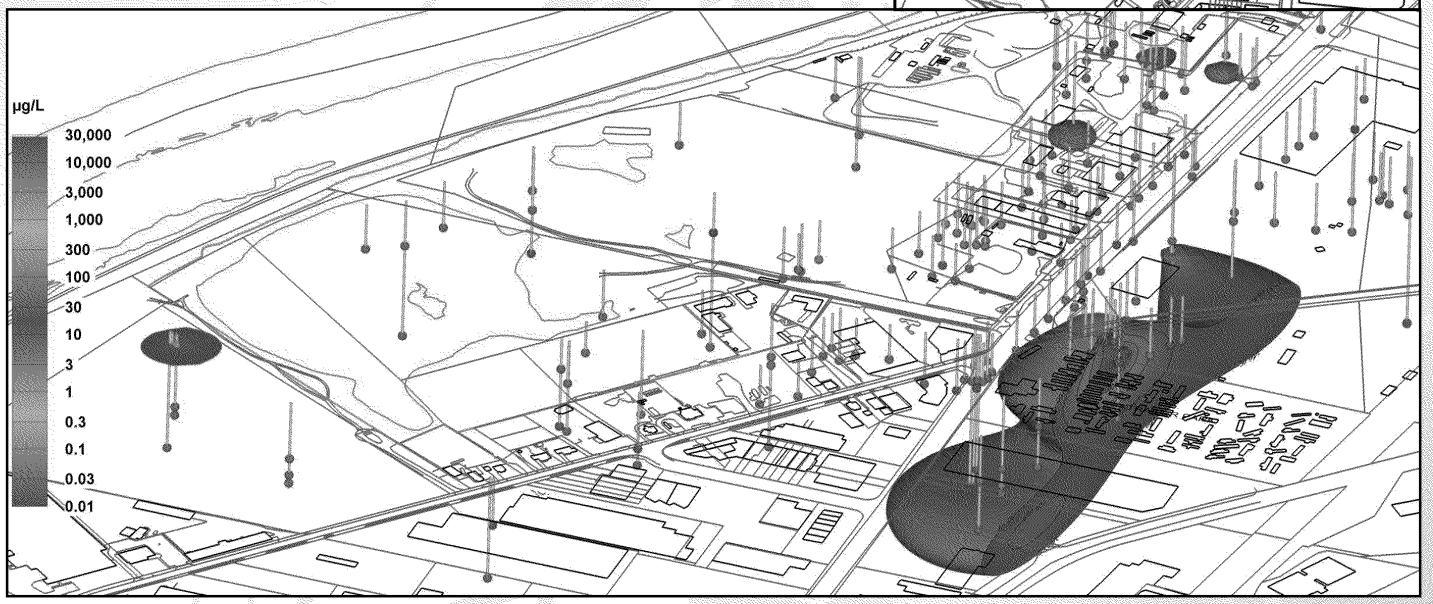


- Greatest on-Site concentration of benzene is at northern Site boundary
- Concentrations on DP&L >> on-Site

BTEX in Groundwater

- Isolated BTEX in on Site shallow groundwater
- Greatest concentrations on DP&L site
- Deeper BTEX issue likely from DP&L





Groundwater Summary

- No evidence of ongoing leaching of contaminants from the Site to groundwater
- Off-Site sources of benzene and CVOCs present
- Localized areas of TCE impact in Upper Aquifer but not Lower Aquifer
- No Upper Aquifer DCE impacts, only localized VC impacts, but widespread DCE and VC impacts in Lower Aquifer from off-Site sources
- Localized areas of benzene in Upper Aquifer, widespread impacts in Lower Aquifer from off-Site sources

Groundwater Summary

- VI risks from groundwater mitigated
- Upper Aquifer impacts are localized with relatively low concentrations and TCE impacts are primarily related to businesses
- Natural attenuation of CVOCs is occurring
- Residual NAPL identified in localized areas on Site and adjacent to DP&L

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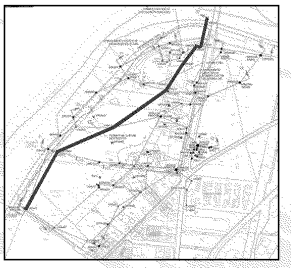
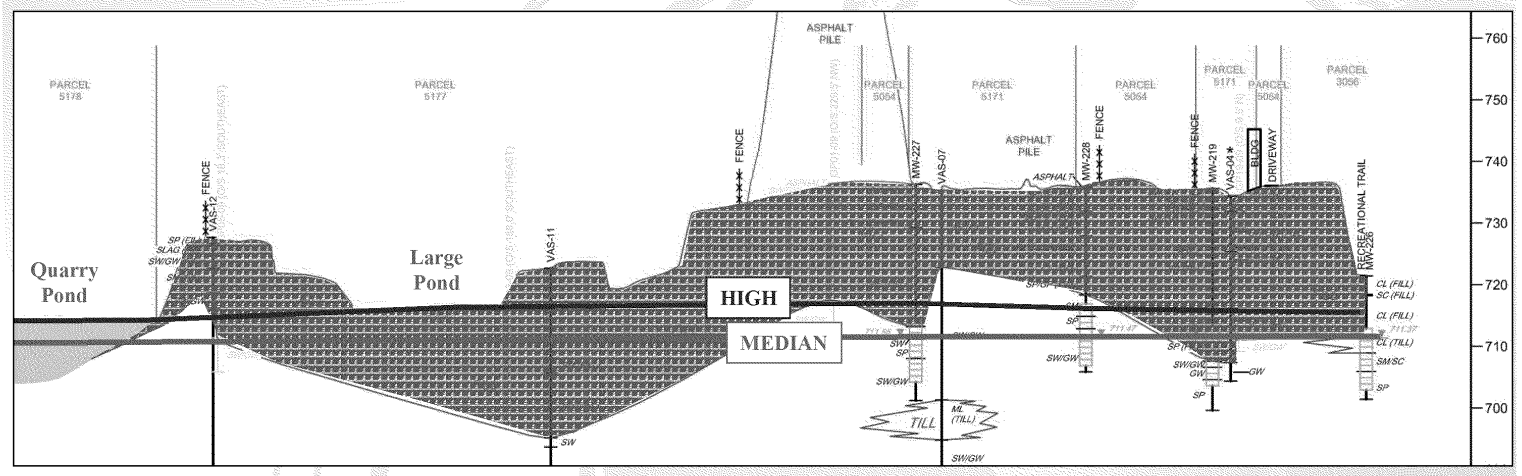
Soil Impacts

- Exposure to soils
  - Impermeable cap not necessary to eliminate direct exposure
  - Installation of cover material/augmentation of existing cover material where direct exposure risks are present
- Leaching to groundwater not occurring
  - Impermeable cap not necessary to prevent leaching and will retard natural attenuation
  - Groundwater data indicate leaching is not occurring
  - ~1/3rd of waste below water table and has been there for up to 60 years

Waste Distribution

- >35 feet in total depth
- Present above and below shallow groundwater
- ~37 million cubic feet (< 5% industrial waste)





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Soil Data Gaps

- Characterization of fill and soil material and quality on Southern Parcels
- Determination of presence or absence of non-native material at base of Quarry Pond
- Off-Site soil remains to be characterized
  - Primarily in the GMR floodplain

Soil Vapor Summary

- VI risks have been mitigated
  - GW exceedances of Vapor Intrusion Screening Levels (VISLs) in many areas
  - Methane was an issue in two isolated areas
  - SS concentrations > ODH screening levels beneath 4 buildings
  - SSDS installation mitigated indoor air VOC issues and sub-slab methane issues
- VI and methane issues may be exacerbated if an impermeable cap is constructed

Groundwater Summary

- Not practicable, necessary, or appropriate to contain all on-Site groundwater
- Objective for groundwater is "control" of contaminant flux across Site boundary
- Leaching to groundwater is not occurring, based on extensive groundwater data
- No mobile NAPL identified
- Localized VOC source areas identified
  - Natural attenuation evident from data
  - Appear suitable for in-situ treatment and MNA

Groundwater Data Gaps

- Characterization of GW conditions below fill and at Site boundaries especially in the south
- Additional characterization of TCE and benzene:
  - TCE and benzene in north toward GMR
  - TCE below the water table near MW-210 in south
  - TCE along eastern Site boundary
- Additional characterization to confirm sources of Lower Aquifer groundwater contamination are off Site

General Data Gaps

- Remaining localized geophysical anomaly on Valley Asphalt property
- Characterization of sediment and surface water (Quarry Pond and GMR)

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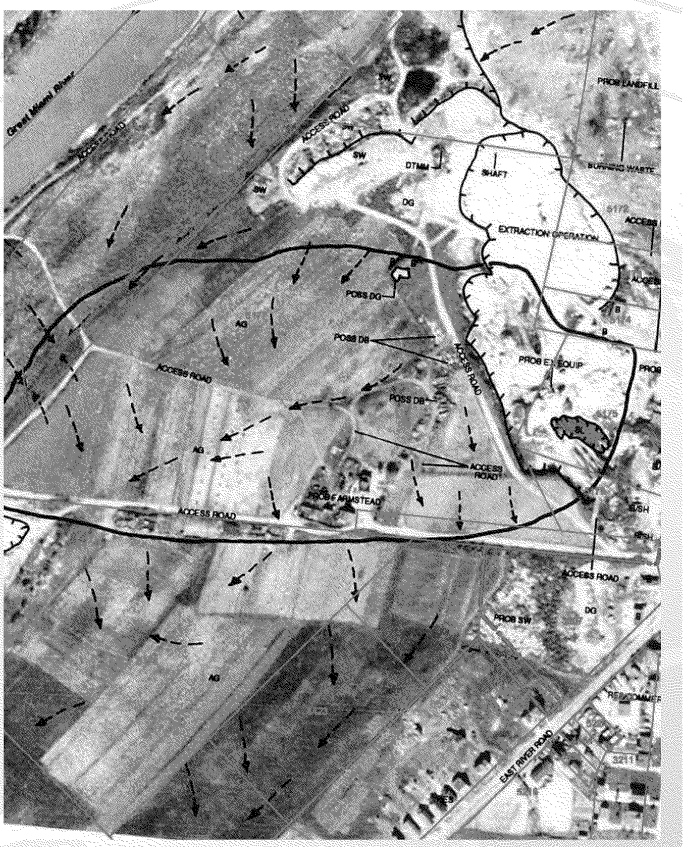

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Site & Landfill Permit History

1940

1950

1960

1970

1940	Gravel Pit operations commence Landfilling commences in north of Site (Parcels 5054 and 5171), waste reportedly burned
1955	Putrescible MSW no longer accepted. Landfilling in north and east (Parcels 5171-4, 5177, 5054) Buildings constructed
1967	Accepting solid fill material and combustible material
1970	Air Curtain Destructor built Landfilling in center of Site (Parcel 5177)

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Site & Landfill Permit History

1970 | 1980 | 1990 | 2000

1975	Accepting demolition waste. Listed as closed landfill
1976	Household wastes no longer included on permits Salvageable wastes and wastes for burning accepted Some filling evident in south of Site (Parcel 5178)
1987	Accepting CDD and inert fill only. Filling in center of Site (Parcel 5177)
1990	No longer accepting fly ash.
1996	Site no longer receiving fill of any type

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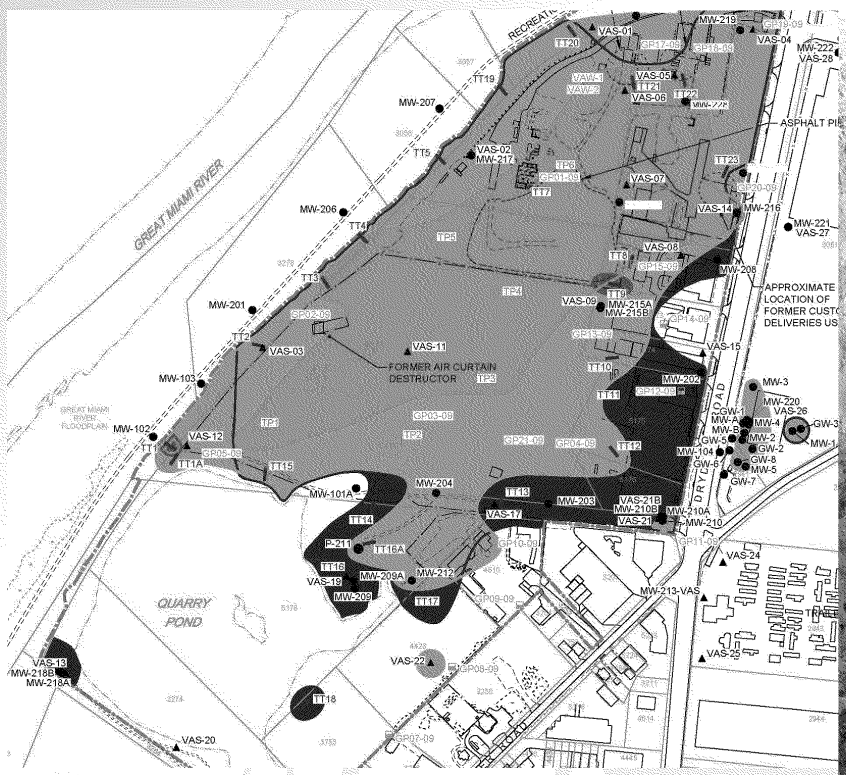
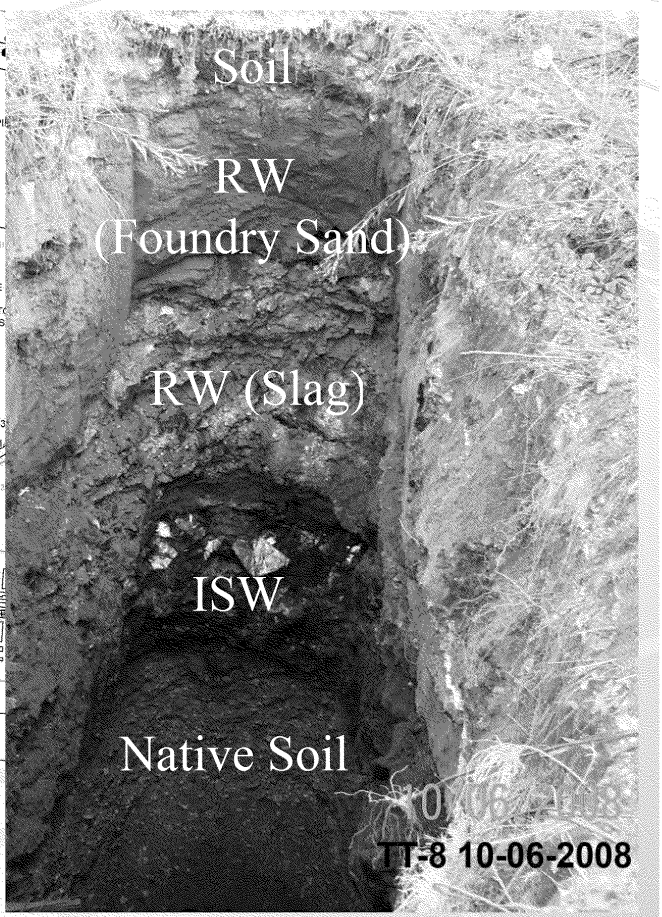
Waste Types at Site (OAC 3745)





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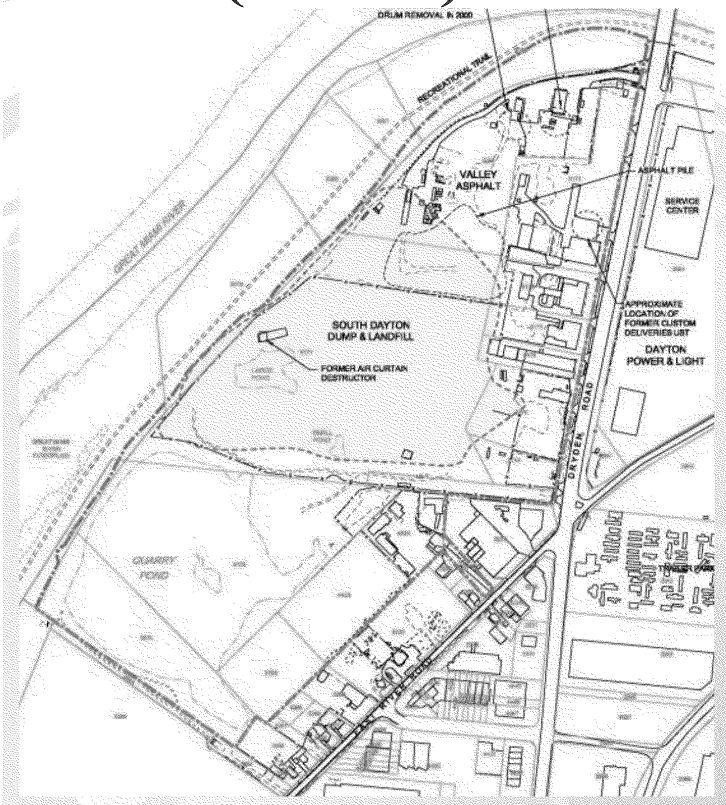
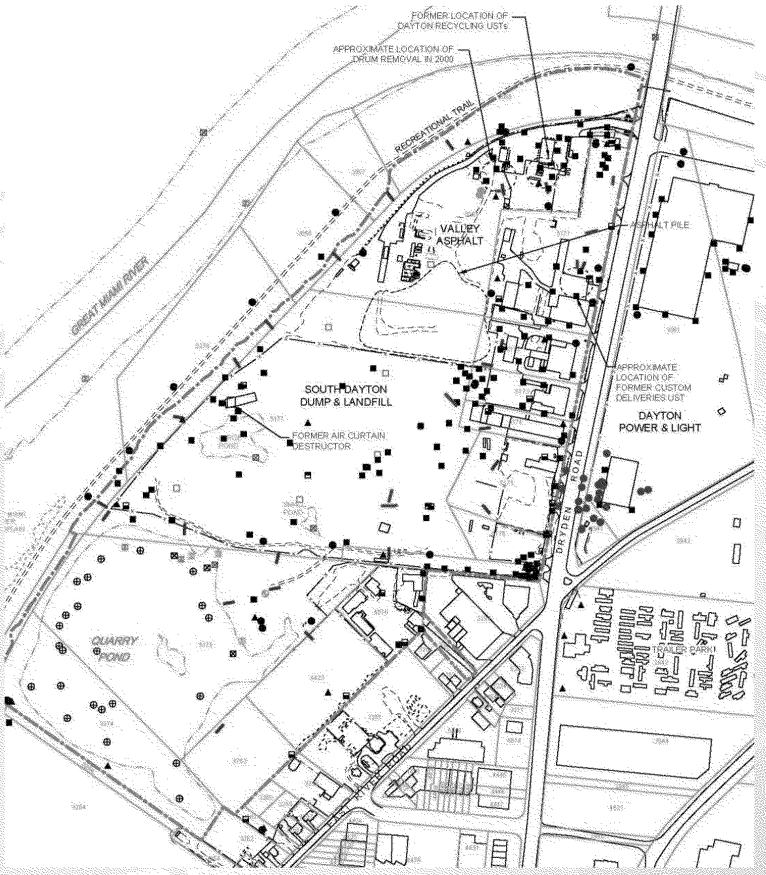
Administrative Settlement Agreement and Order on Consent (ASAOC) and Statement of Work (SOW)

- Negotiated from Nov. 2005 to Mar. 2006
- Identified landfill boundary (see inset)
- Identified the use of a presumptive remedy solely for direct contact risks associated with landfill contents
- Traditional RI/FS for remaining media and areas



- Since ASAOC was signed 8 years ago, significant investigation has been completed
- Based on Site history and numerous investigations, PR approach is not appropriate



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Path Forward

- Complete RI with limited investigation of landfill contents
- Complete/update RA as new data are obtained
- Revise CSM as needed with new data
- Complete FS, including, as appropriate, options for :
  - Localized in-situ groundwater treatment
  - MNA
  - Alternative cover

Thank you

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