



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Vapor Intrusion Assessment at the Mound, Ohio, Site

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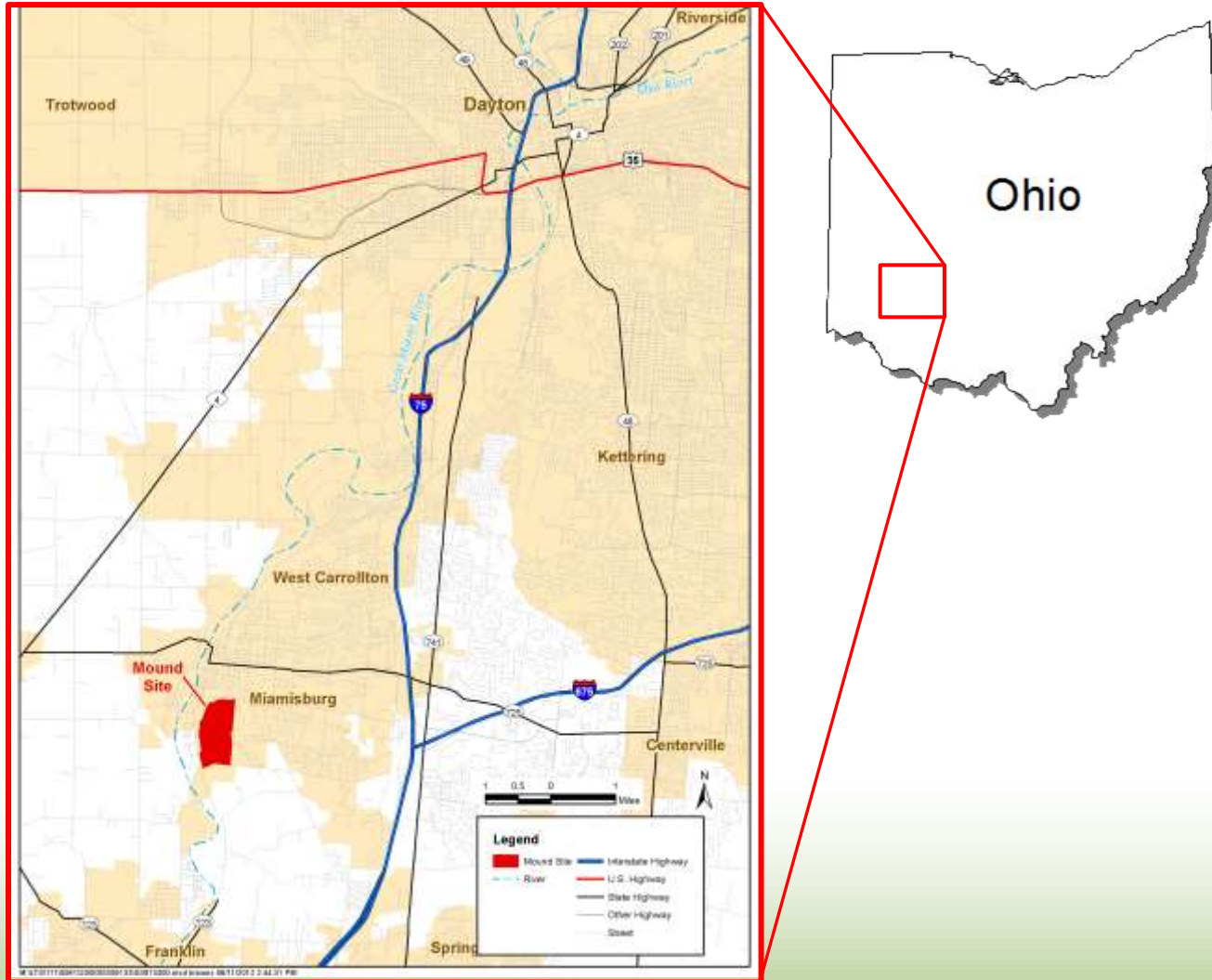
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Mound Site Location



Background

- Mound operated from 1948-2003 as an integrated research, development, and production facility to support the nation's energy and weapons programs
 - Employed 2,500 employees in 120 buildings on 306 acres
 - Stable isotope separation, fossil fuels research, tritium recovery, radioisotope thermoelectric generators
- Named to National Priority List (1989) due to volatile organic compound contamination in groundwater
 - Tripartite Federal Facility Agreement between DOE, the U.S. Environmental Protection Agency (EPA), and Ohio EPA
 - Record of Decision includes Institutional Controls and Pump & Treat remedy



Mound Site in 1988 during peak employment

Remediation and Reuse

- CERCLA cleanup completed in 2006
 - 14 million cubic feet of soil waste was removed and disposed of
 - Remediated to industrial/commercial reuse standards
- Additional cleanup conducted 2006–2010 with congressional and American Reinvestment and Recovery Act of 2009 funding
 - OU-1 landfill excavated
- Mound Development Corporation manages industrial/commercial reuse of the site as the Mound Business Park

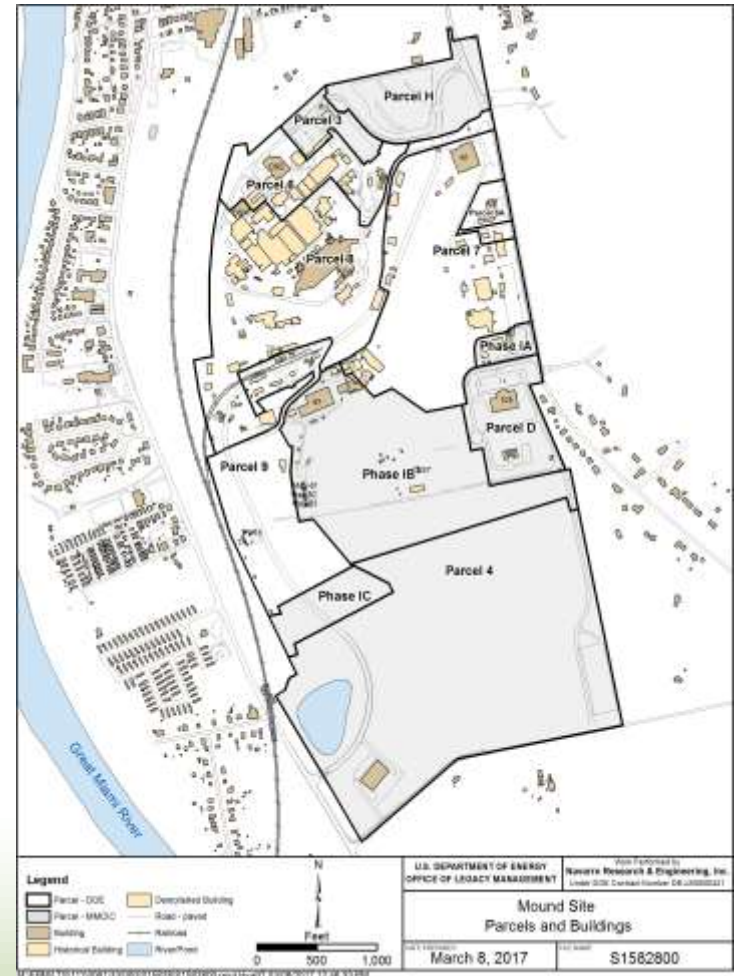


Why Vapor Intrusion at Mound?

- Outcome of the fourth CERCLA Five-Year Review in 2016
 - Vapor intrusion was never evaluated in the Residual Risk Evaluation process as a potential exposure pathway for the Mound site
 - Vapor-forming chemicals present in the subsurface at the Mound site
 - Available information was not sufficient to evaluate whether all conditions of vapor intrusion were present under current or reasonably expected future conditions
 - **Recommendation:** conduct a vapor intrusion assessment to determine whether complete exposure pathways are present or could be present in the future

Vapor Intrusion Approach

- Work Plan (**completed**)
 - Phase 1: Preliminary Screening and Assessment Report (**in process**)
 - Phase 2: Vapor Source Characterization and Building Foundation Assessment
 - Phase 3: Near-Building and Indoor Air Quality Determination (**if required**)
- Final Summary Report



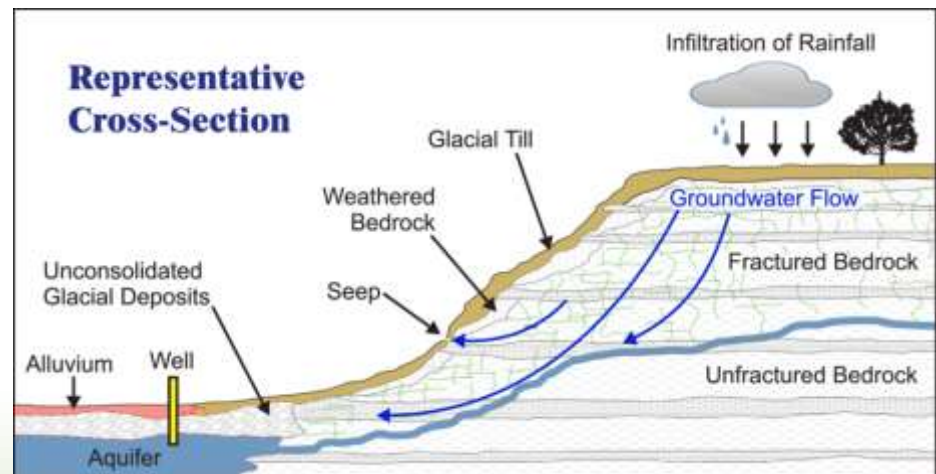
Phase 1: Preliminary Screening and Assessment Report

- Initial conceptual site model
 - Reviewed 134 documents from historical Mound record
 - Sources of contamination, remedial actions, use of most current data
 - Dominating geological features
 - Current and future land use
 - Traditional building designs
 - Building slope threshold of 20%
- Screening of historical soil, groundwater, and soil-gas data



Phase I: Preliminary Screening and Assessment Report

- Screening levels obtained from the vapor intrusion screening level (VISL) calculator
 - VISL calculator allows for inputs of site-specific data. Assumptions used for the Mound site:
 - Exposure scenario, commercial (present and future on-site land use)
 - Target risk for carcinogens = 1×10^{-6}
 - Target hazard quotient for noncarcinogens = 0.1
 - In situ groundwater temperature = 15 °C



Phase 1: Preliminary Screening and Assessment Report (continued)

- Preliminary screening results
 - Soil
 - Identified general areas of detections in soil
 - Historical data representing soils left in place were used
 - Retained any data with results above the detection limit
 - Main categories of contaminants:
 - ✓ Volatile organic compounds
 - ✓ Benzene, toluene, ethylbenzene, and xylenes
 - ✓ Polychlorinated biphenyls/polyaromatic hydrocarbons
 - ✓ Mercury



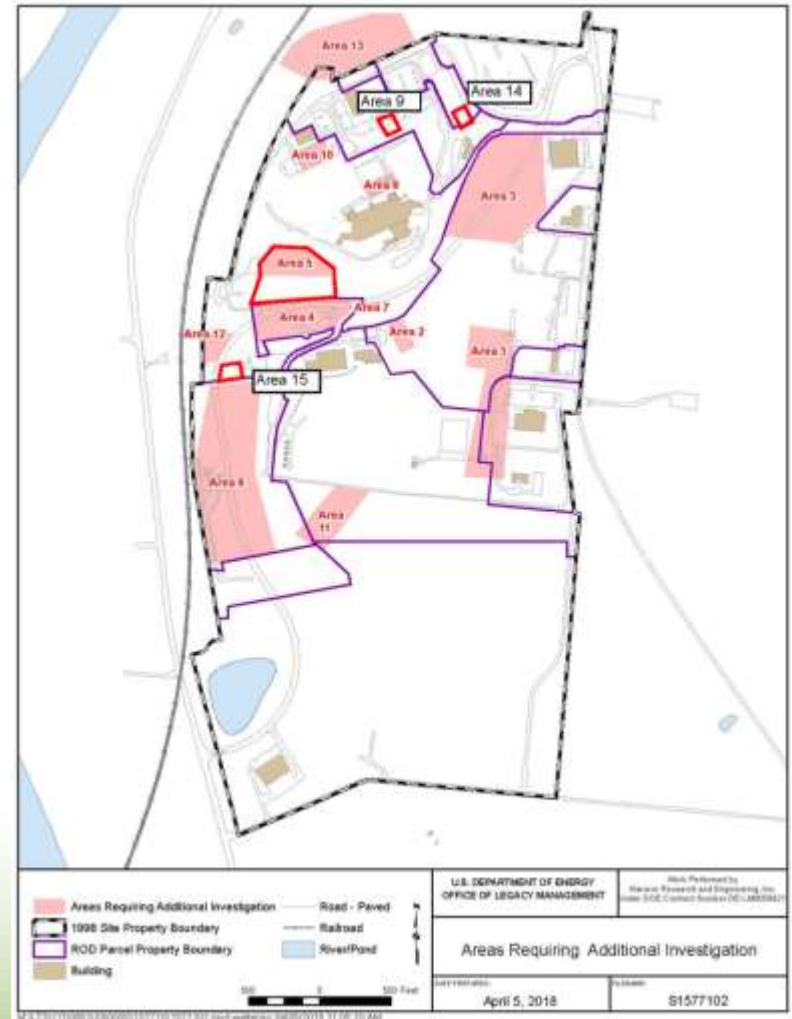
Phase 1: Preliminary Screening and Assessment Report (continued)

- Preliminary screening results (continued)
 - Groundwater
 - Focus on 2015–2016 data
 - Primary contaminants that exceeded VISL: trichloroethene (TCE) and vinyl chloride
 - Soil-gas
 - Primary contaminants that exceeded VISL: TCE and dichloroethene



Phase 1: Preliminary Screening and Assessment Report (continued)

- Preliminary screening results (continued)
 - Fifteen areas identified as potential vapor sources
 - Two areas (6 and 13) not retained
 - Ongoing groundwater remedy
 - Slopes >20%
 - Mercury eliminated from further investigation
 - Not attributable to Mound site



Path Forward

- Finalize Phase 1 Assessment Report
 - Regulator approval
- Develop Sampling and Analysis and Quality Assurance Plans
 - Regulator approval
- Communicate with property owners and lessees
 - Possible of perception that CERCLA cleanup was not completed
- Conduct Phase 2: Vapor Source Characterization and Building Foundation Assessment (anticipated spring 2019)
 - Soil-gas sampling at Phase I identified locations
 - Utilize data to update conceptual site model
- Determine if Phase 3 (sub-slab/indoor air) is necessary
- Final report and recommendations for addressing VI if necessary