



Missouri
Department of
Natural Resources



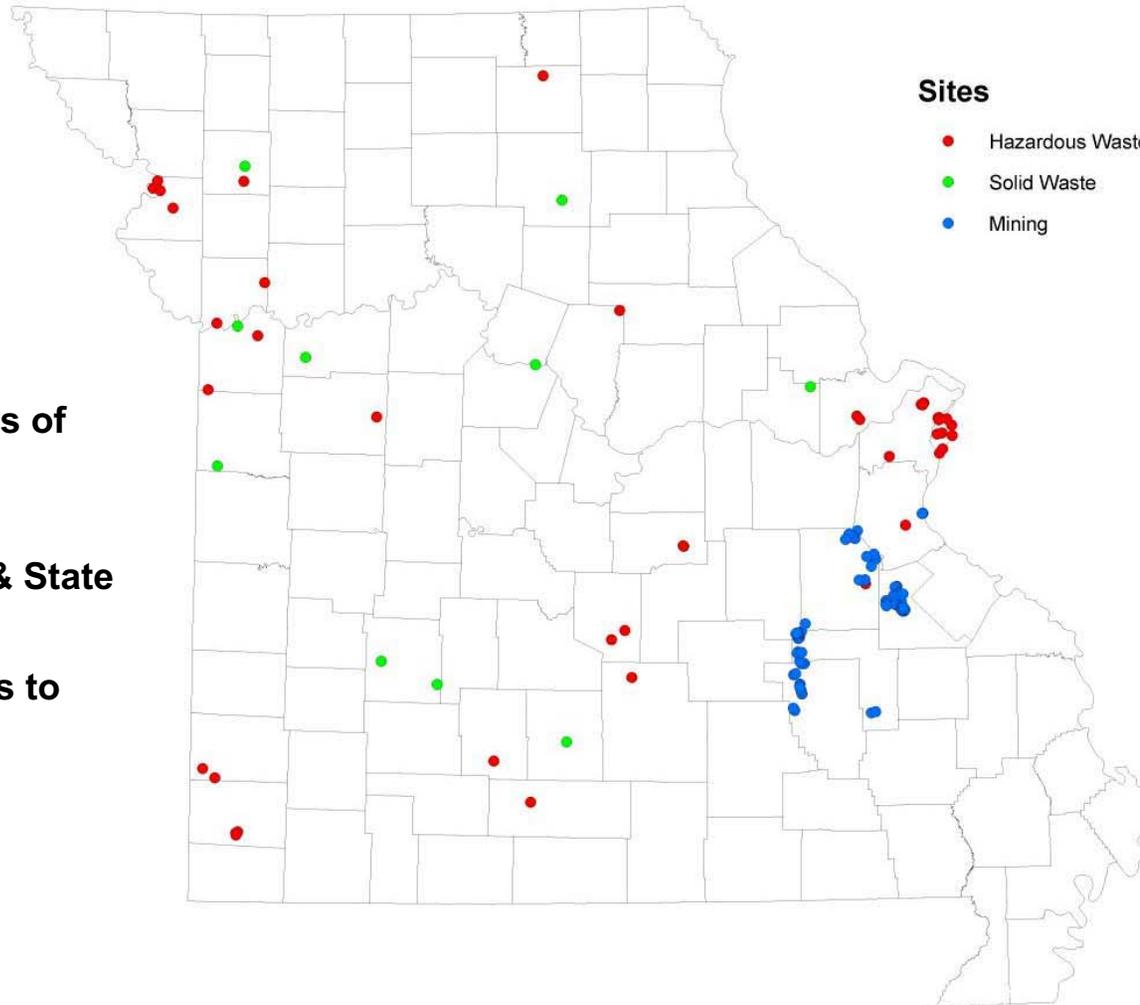
HSI PILOT PROJECT

SITE DEVELOPMENT



SITE DEVELOPMENT

HSI Project



OBJECTIVES

- Identify Groupings of Diverse Sites & Objectives
- Support Federal & State Projects
- Spread Groupings to avoid Weather Cancellations



WRIGHT CITY LANDFILL

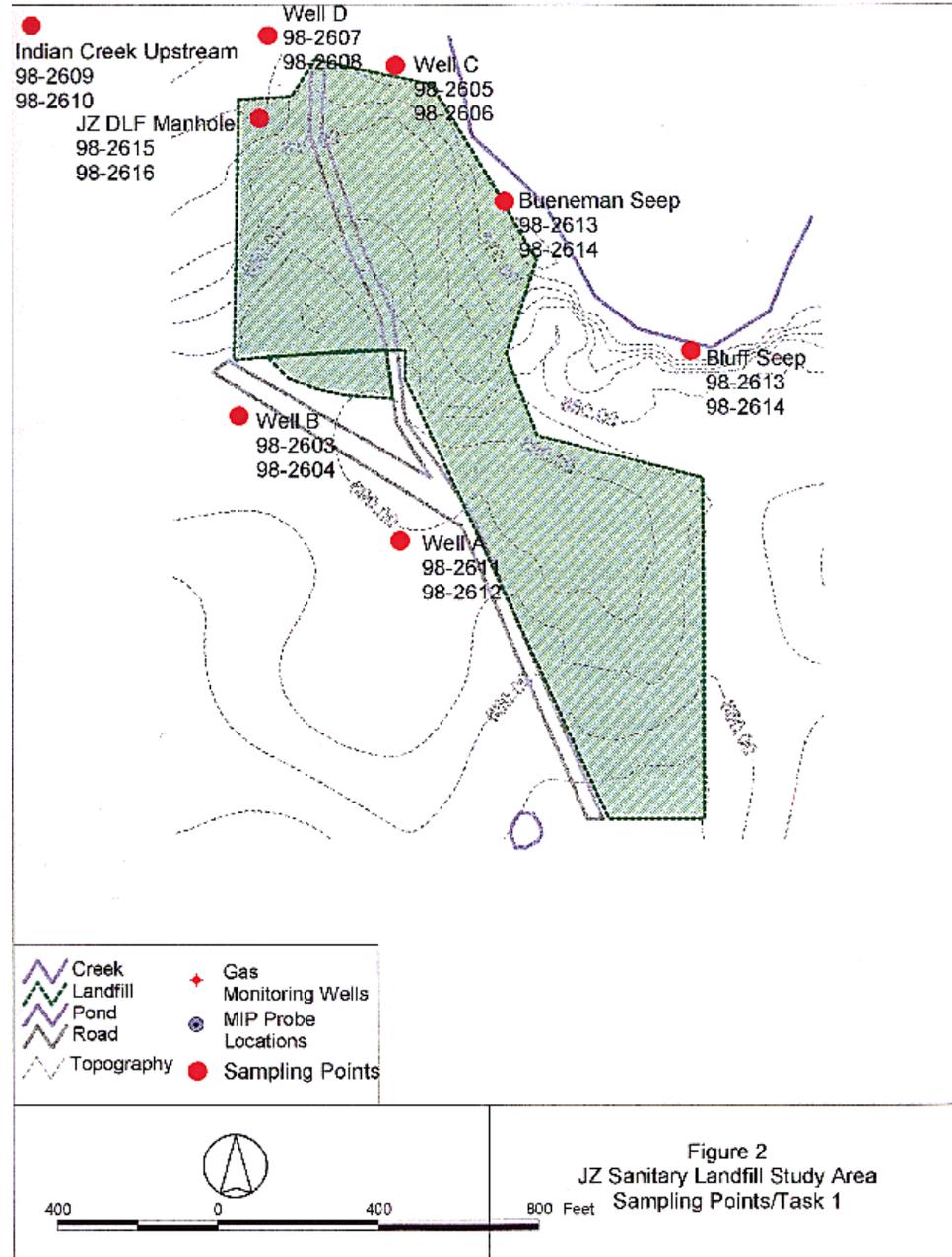
CONTAMINATION SEEPS & METHANE GAS

Frank Dolan, Engineering, SWMP



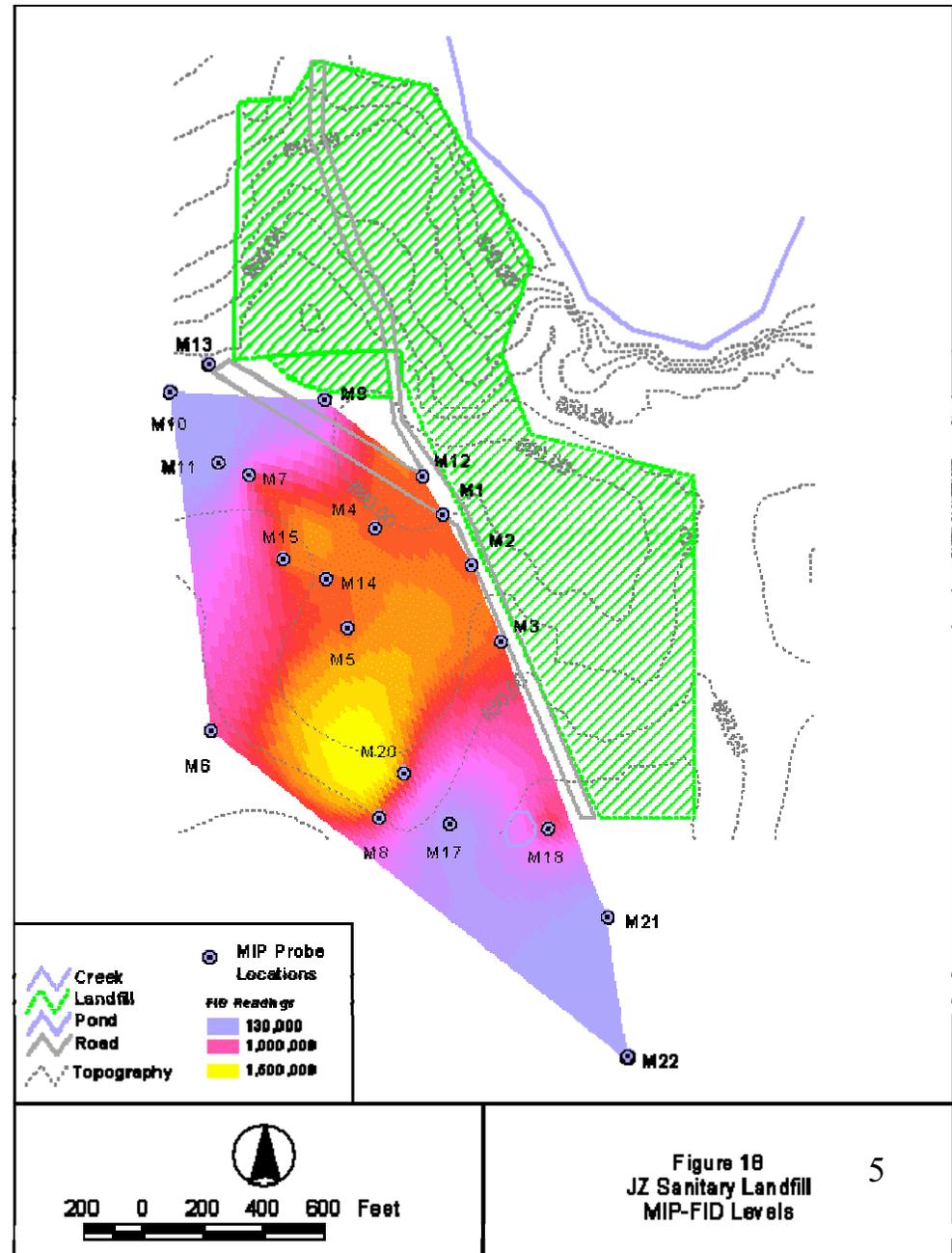
SITE OVERVIEW

Landfill Seep





Methane Modeling





HSI OBJECTIVE

- **Identify Additional Seeps**
- **Compare Methane Model With Anomalies or Potential Methane Indicators in the Defined Area**
- **Look for Other Areas Where Methane May Be Venting Using Indicators From Known Area**



POTOSI AREA

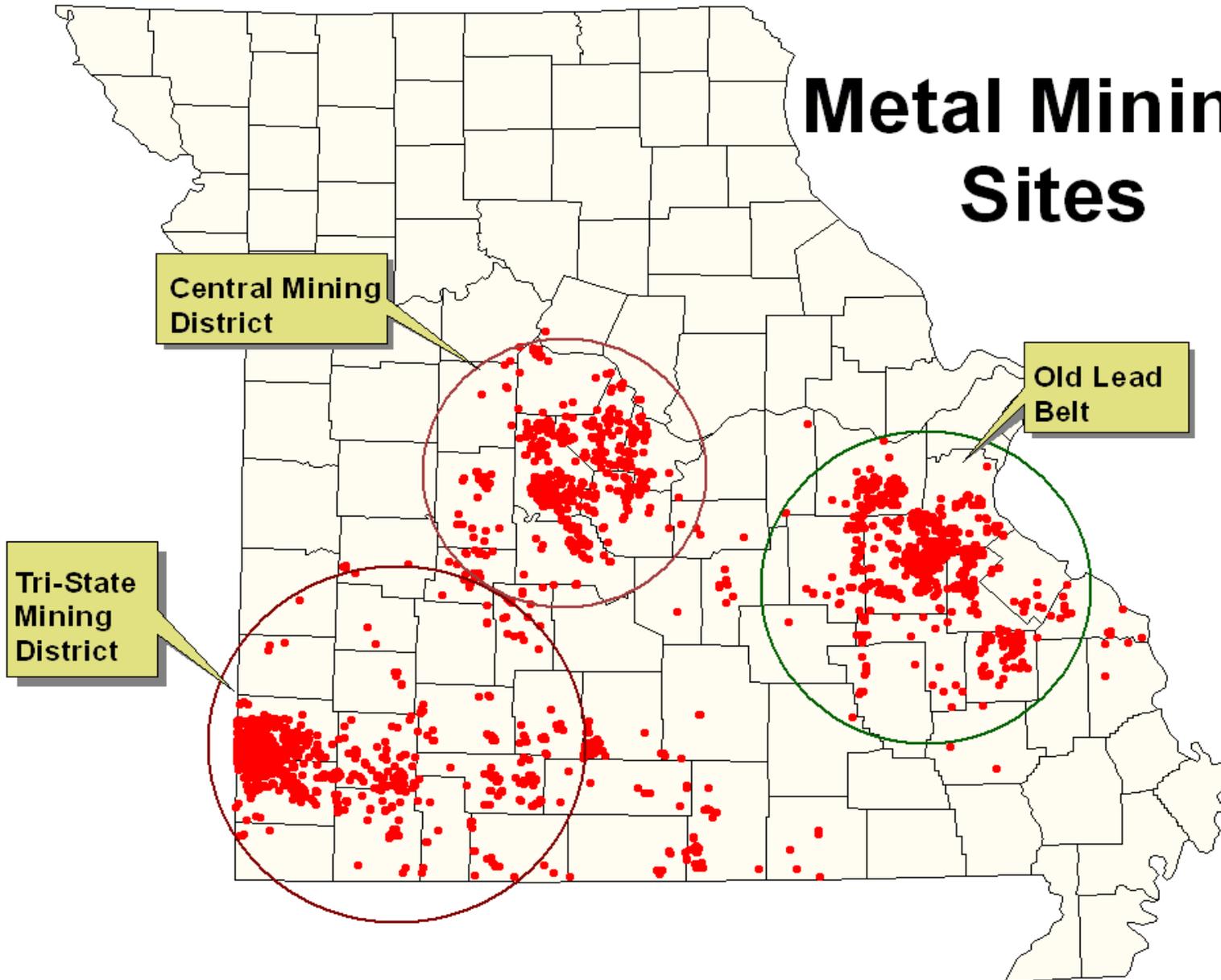
Abandoned Mine Activity & Mine Waste In Residential Areas

Dave Mosby, Superfund, HWP



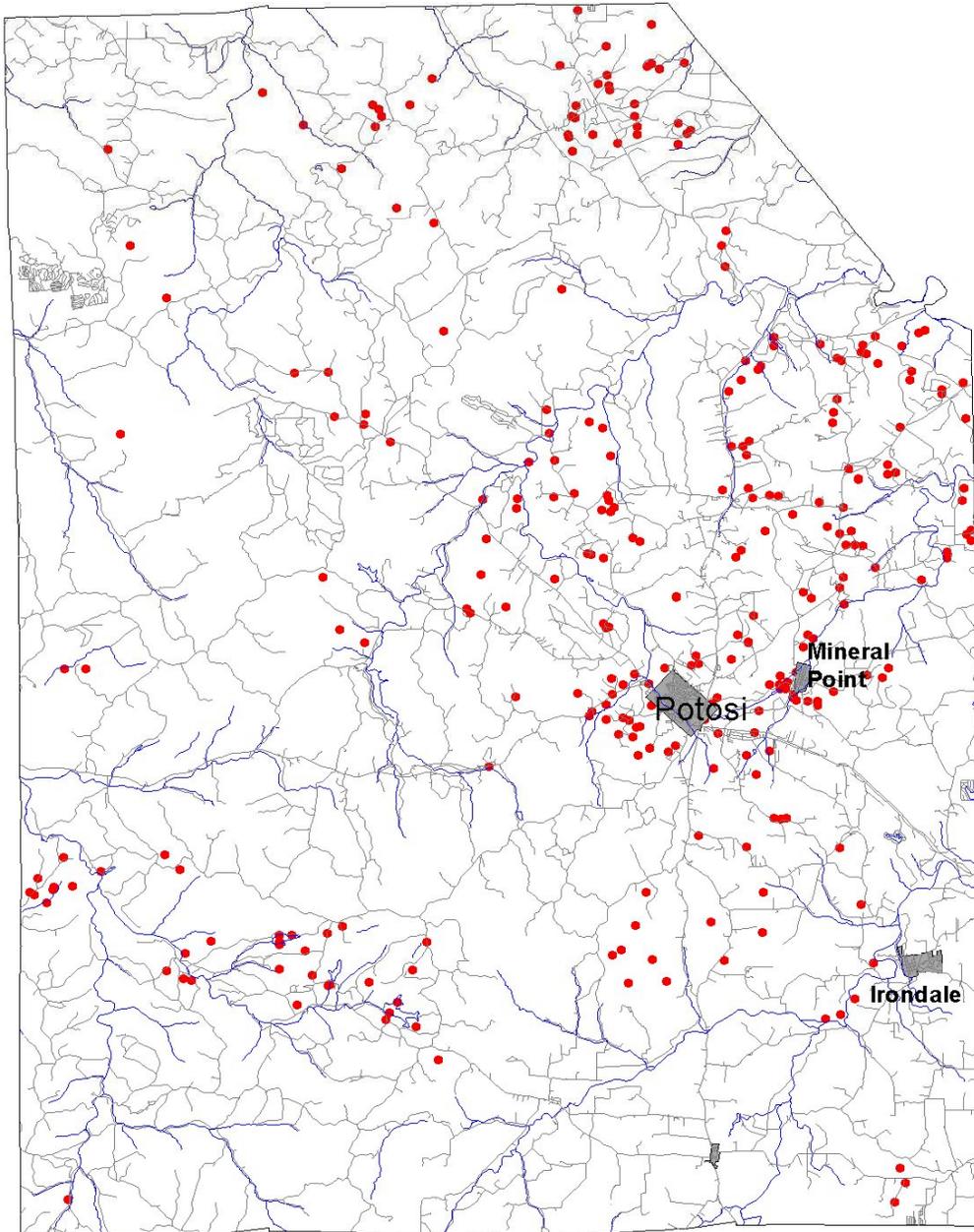
SITE OVERVIEW

Metal Mining Sites





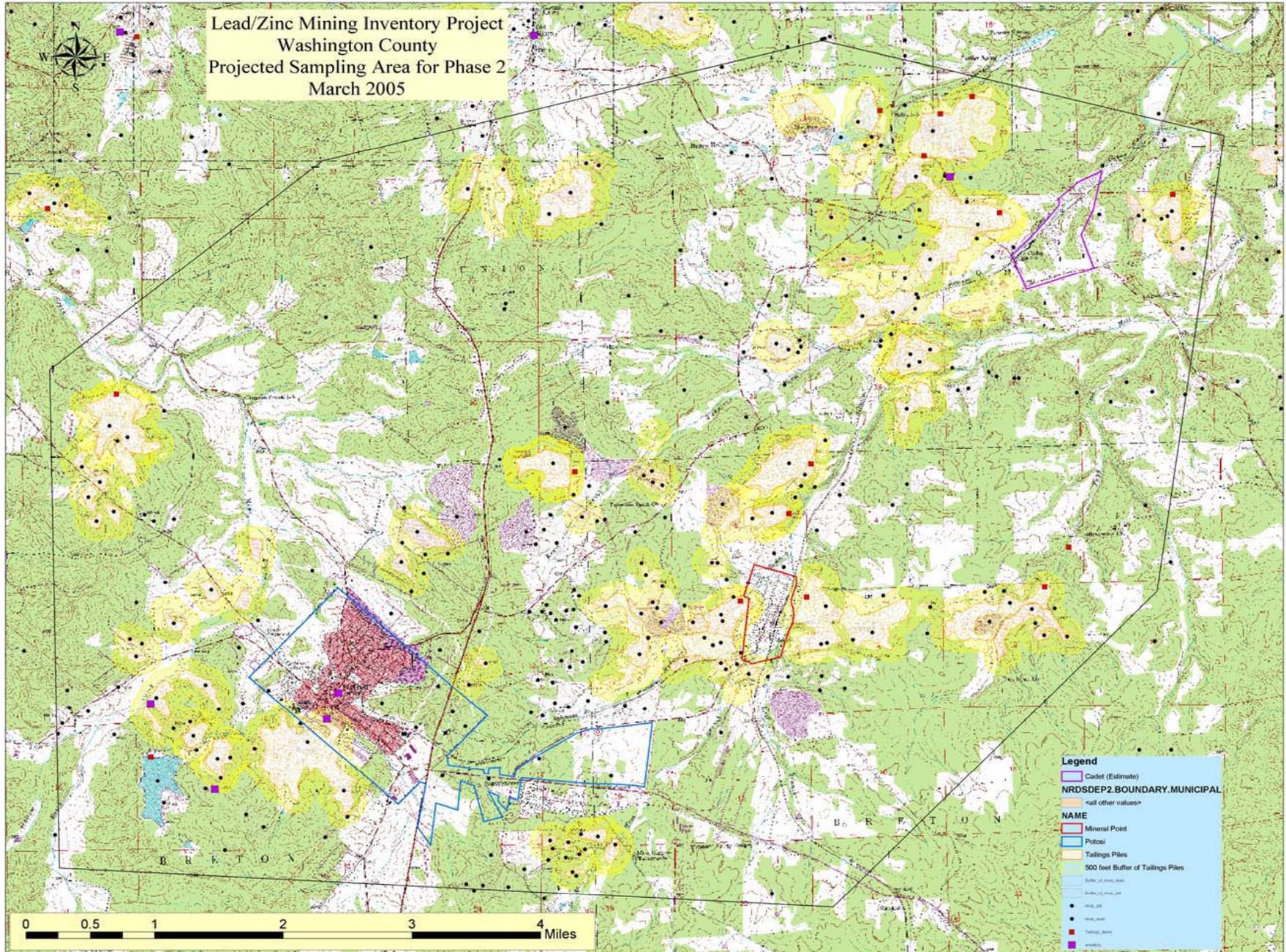
SITE OVERVIEW



Washington County

Sites where past prospecting, mining, milling, or smelting operations have occurred

SITE OVERVIEW





CONTAMINATION & CONDITIONS

- **Site**
 - **Contaminants**
 - Lead
 - Barium
 - Other metals
 - **Conditions**
 - Large mined areas
 - Large uncontrolled tailings deposits
 - Residential and other development pressure



HSI OBJECTIVE

- **Extent of Contamination In Residential Areas**
- **Location of Abandoned Mining Activity in the Surrounding Area**
- **Potential ecological impacts in aquatic & terrestrial environments**



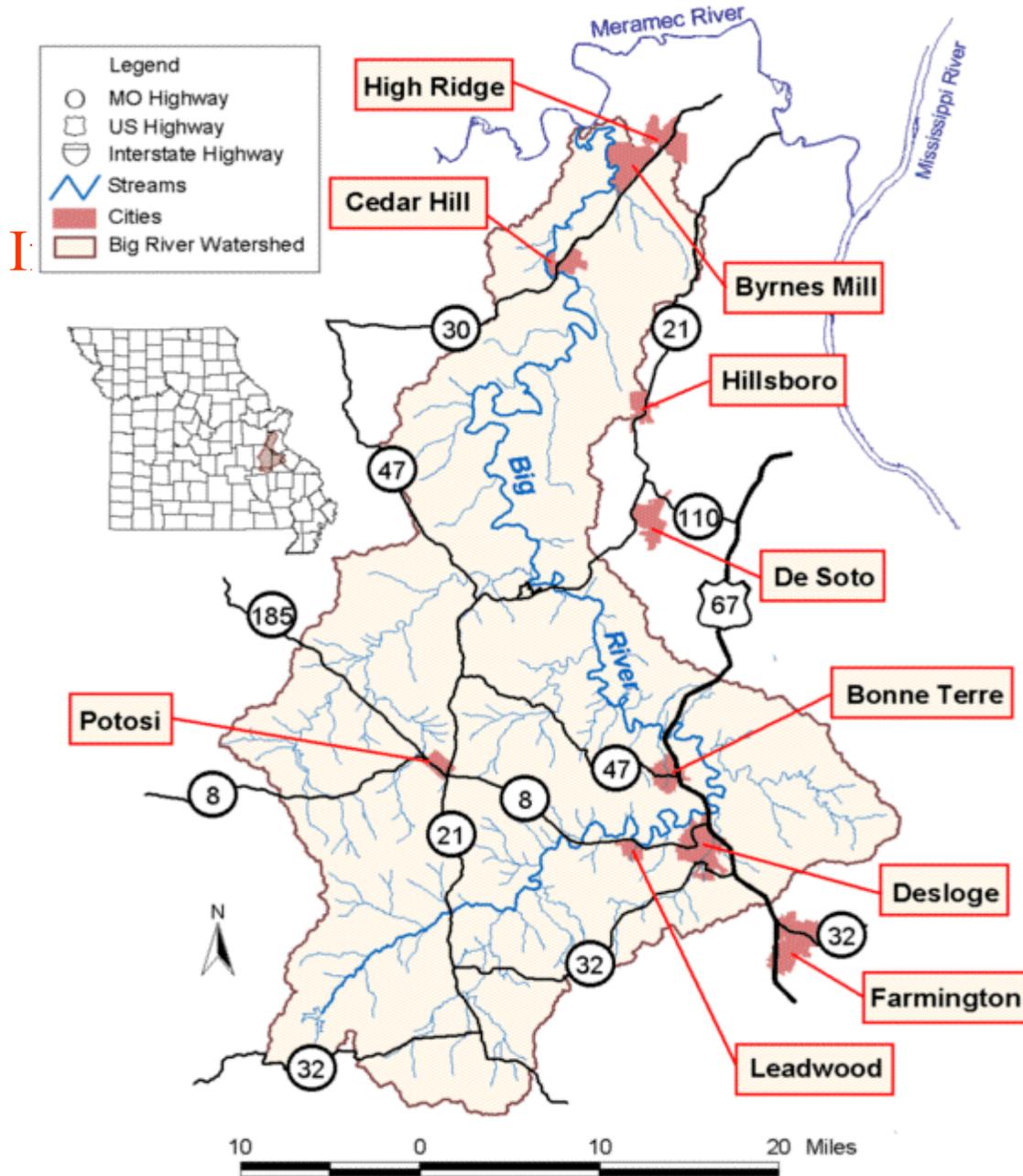
BIG RIVER

Downstream Contamination From Tailings Piles

Bob Hinkson, Superfund, HWP

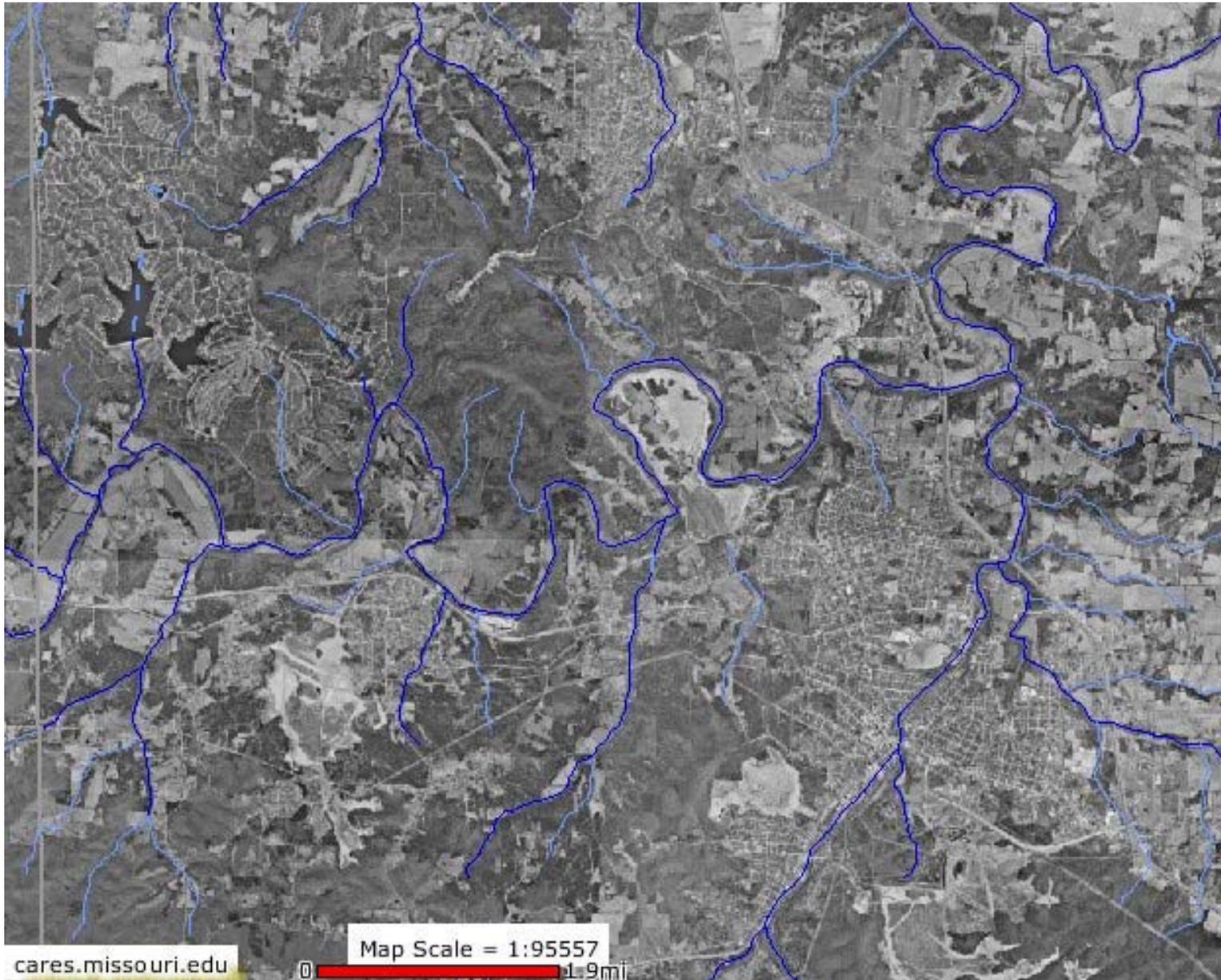


SITE OVERVIEW





SITE OVERVIEW



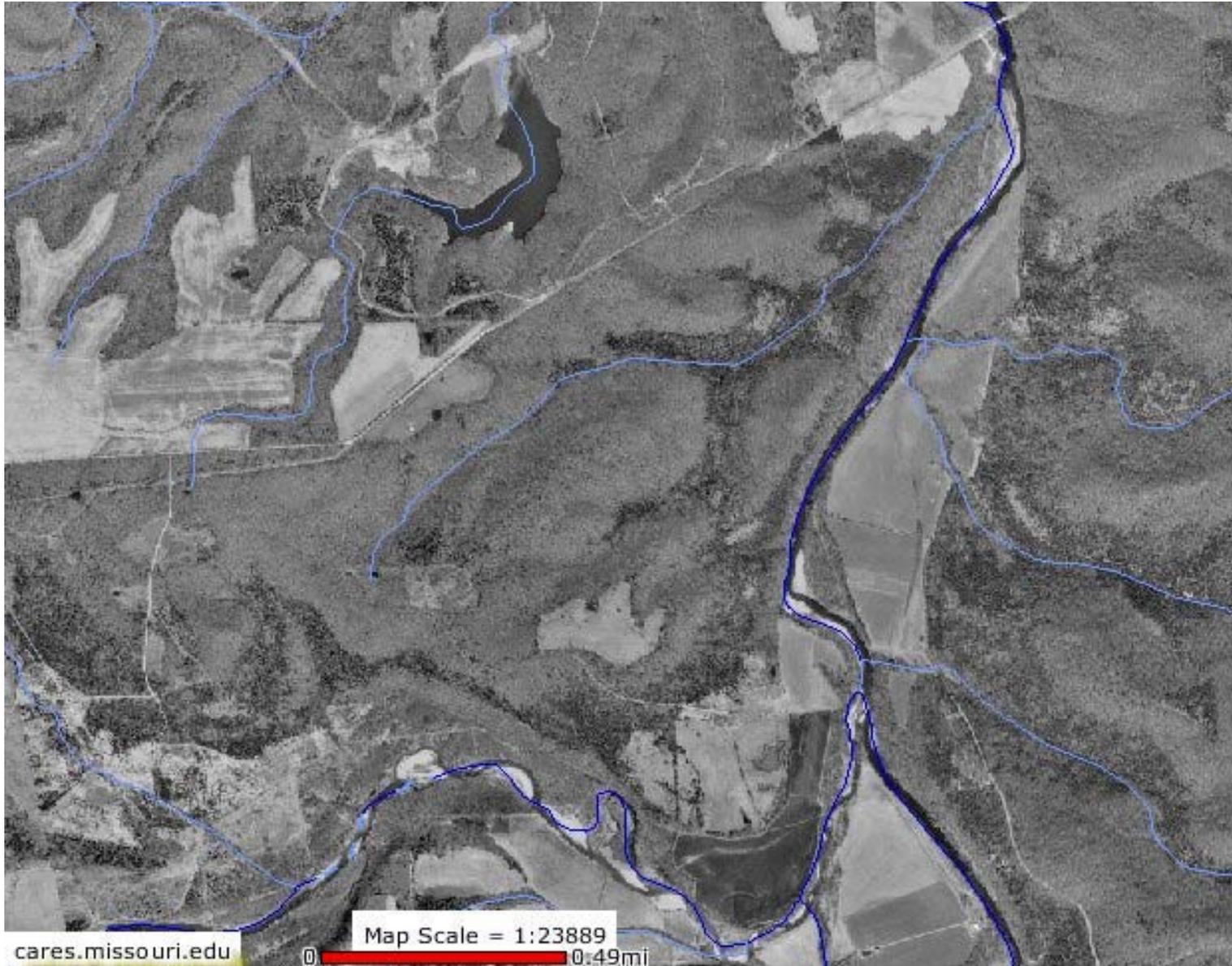


SITE OVERVIEW





SITE OVERVIEW





CONTAMINATION & CONDITIONS

- **Site**
 - **Contaminants**
 - Lead
 - Cadmium
 - Zinc
 - Other metals
 - **Conditions**
 - Six large tailings piles & contamination from other lead production & transportation processes
 - Big River sediment impacts miles downstream
- **Other Sites in the Area**
 - **Contaminants**
 - Metals from Washington County impact Big River through tributary streams (Mineral Fork, Mill Creek, others)
 - **Conditions**
 - Large areas mined for lead & barite
 - Large areas of uncontrolled tailings disposal



HSI OBJECTIVE

- **Detect & define extent of metals contamination in soil & downstream sediment**
- **Locate contaminant hot spots in soil & sediment**



ONGOING INVESTIGATION AT THE SITE

- **DNR Studies**
 - **Biological Assessment & Fine Sediment Studies: Flat River Creek (2001) & Lower Big River (2002-2003) for CWA 303(d) listing**
 - **Others?**
- **Federal Studies**
 - **PRPs have an agreement with EPA to conduct a RI/FS, including characterization of Big River sediments**
 - **EPA conducting ecological risk assessment**
 - **Others?**



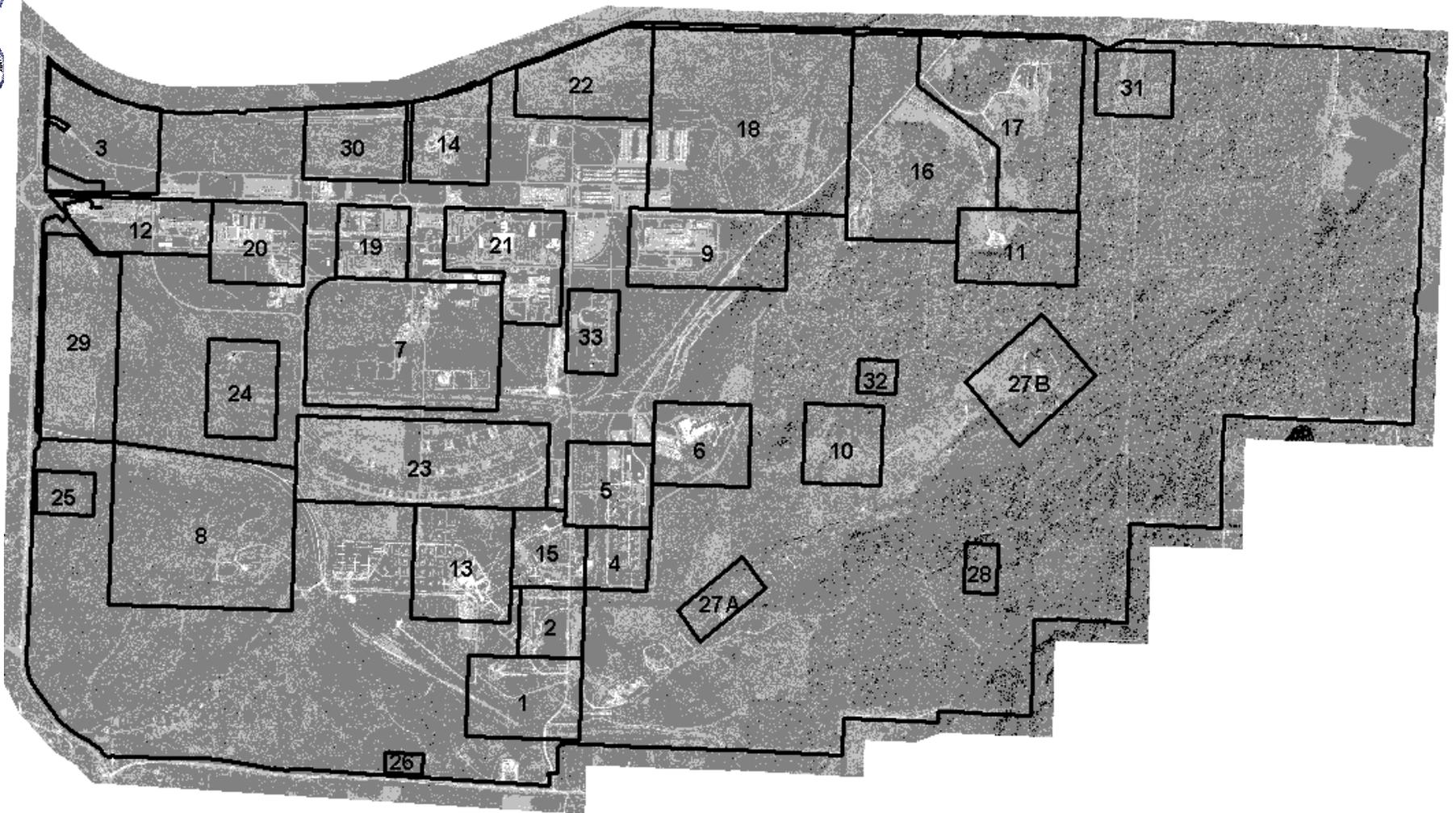
LAKE CITY ARMY AMMUNITION PLANT

Lead Sludge, Solvent Pits & Other Surface Contamination

Scott Honig, Federal Facilities, HWP



SITE OVERVIEW





CONTAMINATION & CONDITIONS

- **General Plant Wide- Active, NPL facility, Jackson County, MO**
 - **Contaminants**
 - **Metals (specifically Pb), Chlorinated Solvents, PAHs, Explosives**
 - **Conditions**
 - **3,935 Acres - operations at LCAAP include small arms manufacturing, storage, test firing, and waste treatment**
- **Northeast Corner Operable Unit**
 - **Contaminants**
 - **VOCs, Petroleum, PCBs, explosives**
 - **Conditions**
 - **Surface, Subsurface, Groundwater, and surface water (Seeps)**
 - **Oil & Solvent Pits, Burning Grounds, Landfills**
- **Area 18 Operable Unit**
 - **Contaminants**
 - **Pb (0-2 ft), VOCs, PCBs, explosives**
 - **Conditions**
 - **Surface, Subsurface, Groundwater**
 - **Solvent Pits, Sludge, Burning Pits**



HSI OBJECTIVE

- **Define Extent of Lead Sludge Distribution**
- **Extent of Known and Location of Other Solvent Pits**
- **Extent of Seeps in the NECOU (Abandoned Landfill, Surface Water Features)**
- **Limitation - active facility (security)**



ONGOING INVESTIGATION AT THE SITE

- **DOD Remediation**
 - All three operable units are in the Remedial Investigation/Feasibility Study phase of CERCLA.
 - Housekeeping EE/CA (Removal) Surface debris and metal contamination (Pb).
 - Area 10 Sand Piles EE/CA (Removal) - Pb and DU.
 - Sump EE/CA (Removal)



HEMATITE RADIOACTIVE SITE

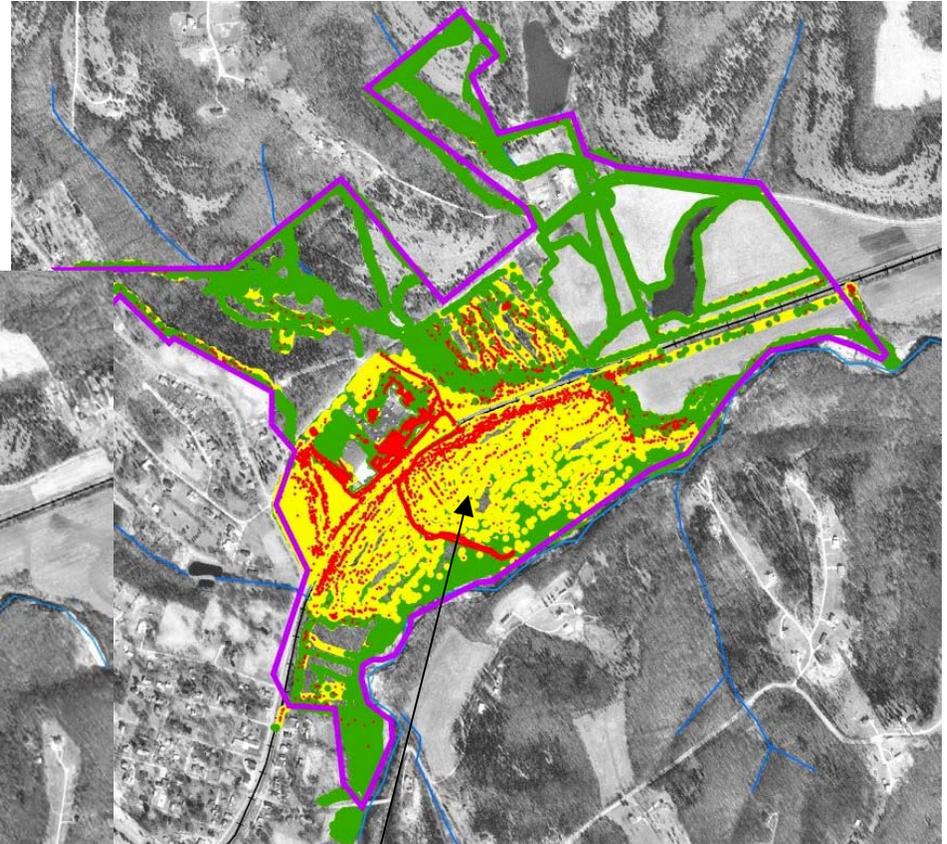
RADIOLOGICAL DUST & WASTE PITS

Ben Moore, Federal Facilities, HWP



SITE OVERVIEW

Abandoned Plant & Waste Pits



Radiation Level Data



CONTAMINATION & CONDITIONS

- **Site**
 - **Contaminants in Surface Soil**
 - Uranium at Various Levels of ^{235}U Enrichment (5% to ??%)
 - **Contaminants in Subsurface Soil & Groundwater**
 - Trichloroethene & Degredation Products
 - Tetrachloroethene & Degredation Products
 - Uranium and Technetium
 - **Conditions**
 - ~ 12 Open Acres Sampled w/ Known Surface & Subsurface Conc.
 - ~ 50 Wooded Acres Sampled w/ Known Surface & Subsurface Conc.
- **Other Sites in the area if needed**
 - Nearby Open Acreage Recently Sampled for Background Conc.
 - Adjacent Railroad Ballast @ Elevated Natural Radiological Conc.
 - Approximately 7 mi. from Doe Run Herculanium Lead Smelter



HSI OBJECTIVE

- **Identify Contaminant Signature Evidenced in Surface Soil Spectra & Extend Knowledge to Unsampled Areas**
- **Identify Contaminant Signature Evidenced in Vegetation Spectra & Extend Knowledge to Unsampled Areas**
- **Identify Additional Waste Pits On or Around the Facility**



ONGOING INVESTIGATION AT THE SITE

- **Currently in CERCLA RI/FS Phase**
 - **Surface, Subsurface, & Groundwater Data Available**
 - **Additional Borings &/or Sampling may be Indicated**
 - **Treatability Study will Include Waste Characterization**
 - **Additional Background Sampling may be Needed**
- **Site may be Divided into Multiple Operable Units**
 - **Additional Sampling Anticipated for at least Some OUs**
 - **Additional Characterization When Burial Pits Excavated**



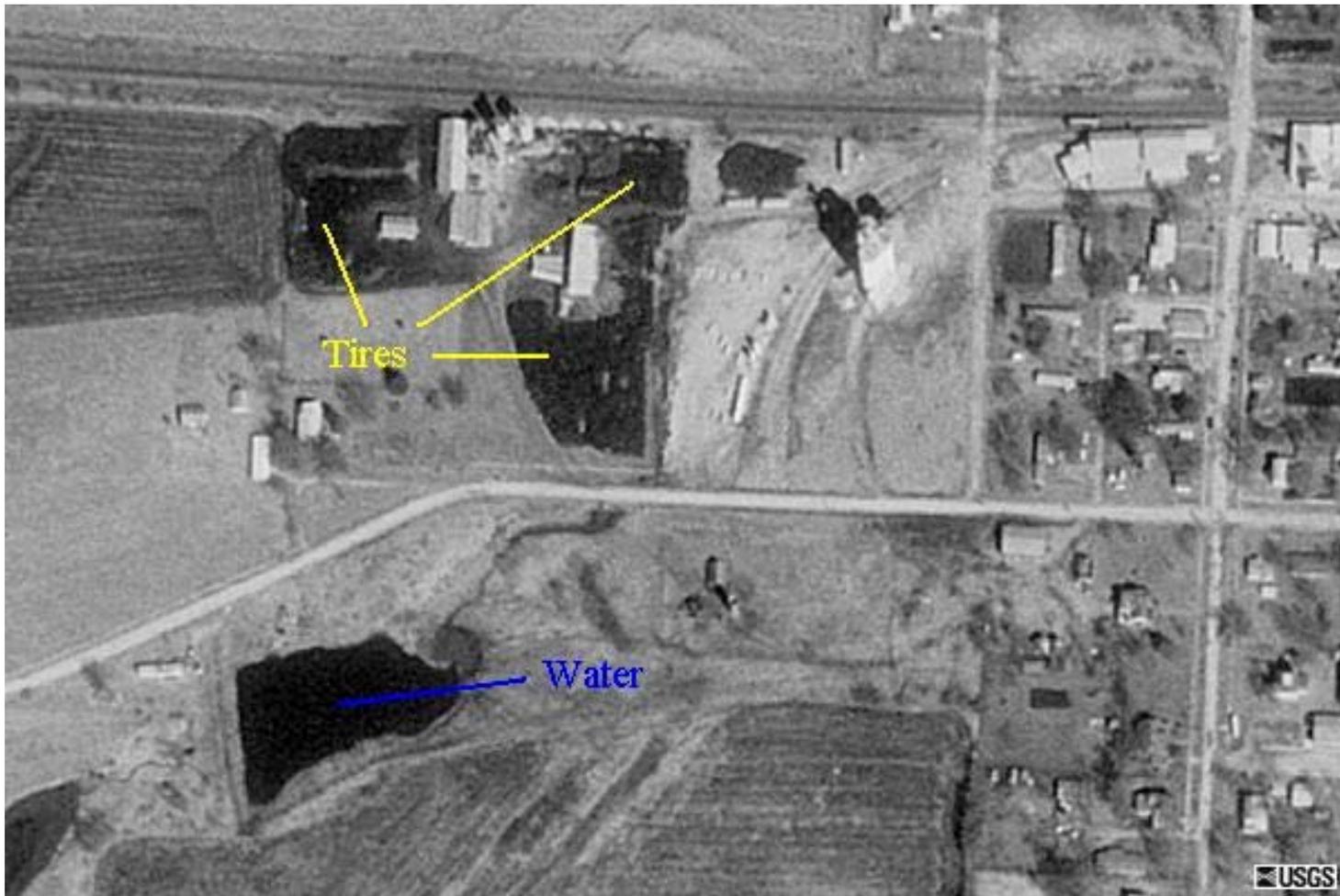
TIRE DUMPS



Kirk Mitchell, Enforcement, SWMP

SITE OVERVIEW

- High altitude photo of a Missouri waste tire processing facility
- Note textural & shading differences between water and tires





HSI OBJECTIVE

- **Locate Illegal Tire Dumps**
 - Under Vegetation
 - Field Screening for Suspect Areas
- **Concurrent with Other Field Screening**
 - Abandoned Mines
 - Land Disturbance



ONGOING INVESTIGATION

- **Waste Tire Management**
 - **Recycling and Disposal**



ENVIRONMENTAL EMERGENCY RESPONSE

Environmental Service Program, HWP



AD HOC TARGETS - EER





ST LOUIS AREA

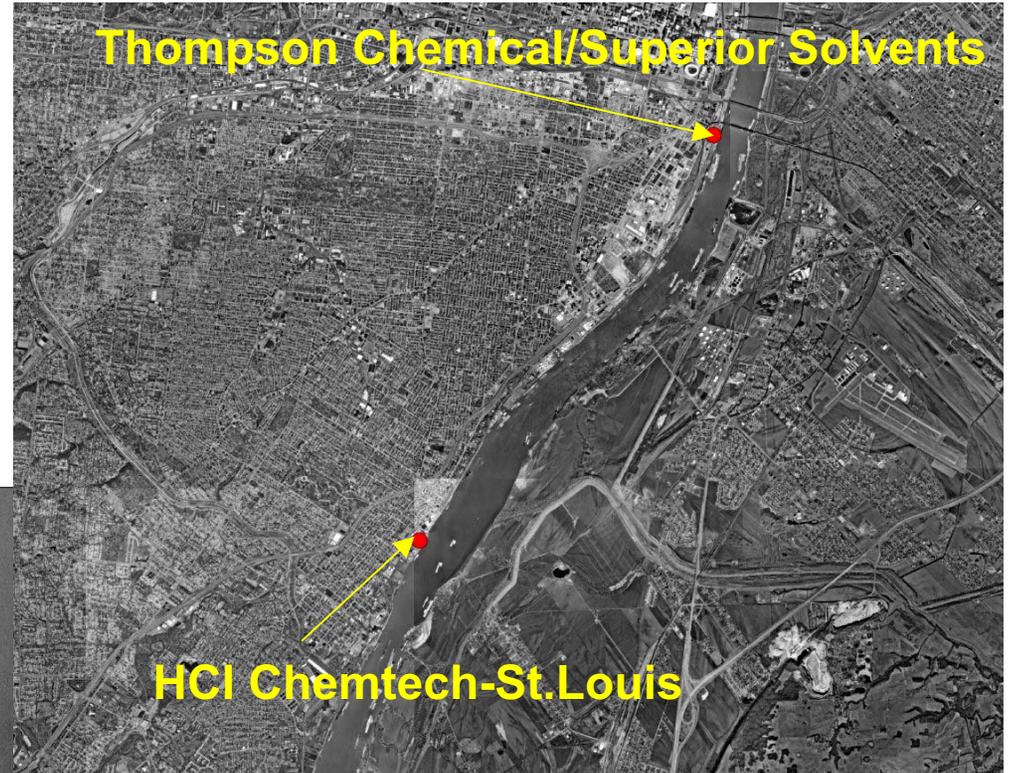
Flood-Borne

Industrial Contamination

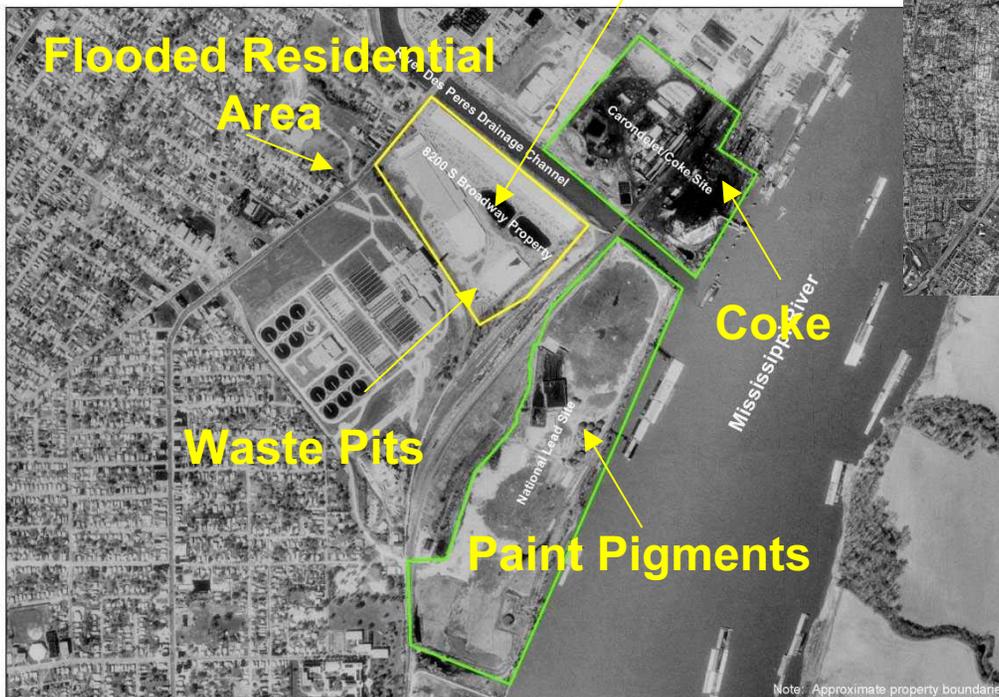
Superfund & Federal Facilities, HWP



SITE OVERVIEW



8200 South Broadway Property
National Geospatial-Intelligence Agency (NGA)





CONTAMINATION & CONDITIONS

- **Thompson Chemical/Superior Solvents**
 - **Contaminants**
 - Polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), dioxin, semi-VOCs
 - **Conditions**
 - Above & underground contamination, river flora & fauna exposed, seeps in creeks and river
- **HCI Chemtech - St. Louis**
 - **Contaminants**
 - Toluene, arsenic, & other PAHs
 - **Conditions**
 - Potential release during floods and rising ground water
- **National Geospatial - Intelligence Agency**
 - **Contaminants**
 - Metals, solvents, petroleum
 - **Conditions**
 - Flooded buildings with containers of hazardous materials & hazardous waste dumping area



HSI OBJECTIVE

- **Identify Mixtures of Contaminants After Floods**
- **Locate Hot Spots for Designated Chemicals**
- **Locate Pools of Contamination Deposited in Backwater Areas**
- **Locate Hazardous Materials Containers and Gas Tanks**



ONGOING INVESTIGATION AT THE SITE

- **Thompson Chemical/superior Solvents**
 - **Engineering Evaluation/Cost Analysis (EE/CA) for Remediation**
- **HCI Chemtech-St. Louis**
 - **EE/CA to Stop Impacted Groundwater from Entering the River**
- **National Geospatial-Intelligence Agency (NGA)**
 - **Remedial Investigation to Characterize Nature and Extent of Contaminants**



Tyson Valley Powder Farm

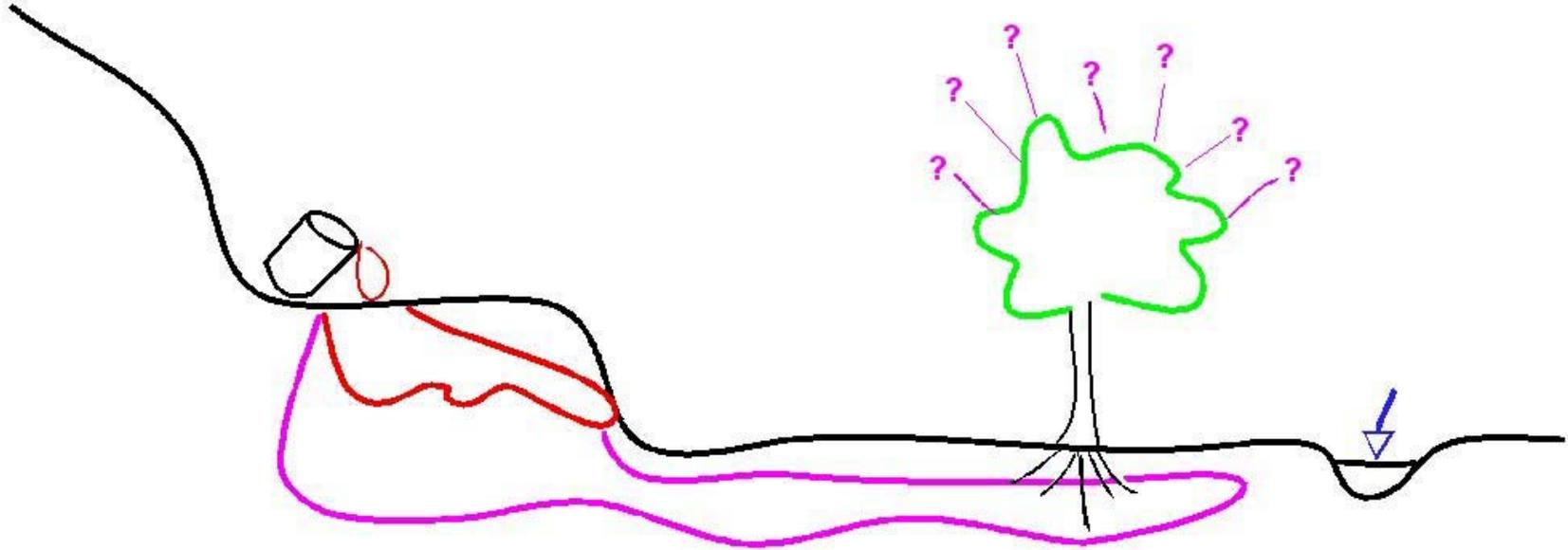
Formally Used Defense Site (FUDS)

**Ex Small Arms Ammunition Firing
Range and Storage Facility**

Branden Doster, Federal Facilities Section, HWP



SITE OVERVIEW



Not to scale



SITE OVERVIEW





CONTAMINATION & CONDITIONS

- **Site**
 - **Contaminants**
 - Explosives, Solvents, Metals
 - **Conditions**
 - Soil and Groundwater contamination



HSI OBJECTIVE

- **Extent of Groundwater Contamination in Floodplain**
 - **Vegetation in floodplain may provide hyperspectral signature of solvents**



ONGOING INVESTIGATION AT THE SITE

- **United State Corps of Engineers FUDS**
 - **Draft Remedial Investigation Report**
 - **Solvent groundwater plume mostly defined in floodplain**