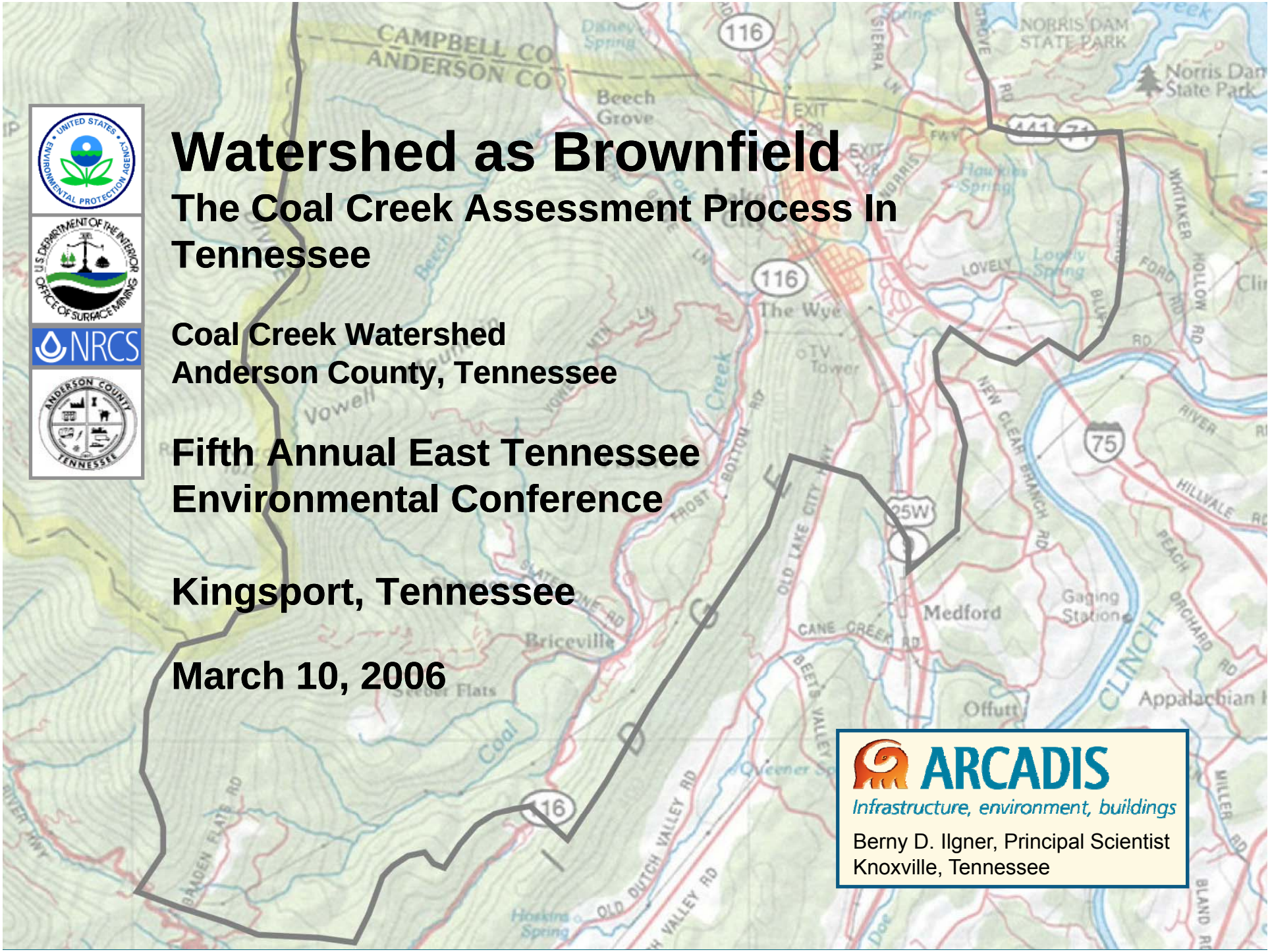


Watershed as Brownfield

The Coal Creek Assessment Process In Tennessee

Coal Creek Watershed
Anderson County, Tennessee

Fifth Annual East Tennessee Environmental Conference

Kingsport, Tennessee

March 10, 2006

ARCADIS
Infrastructure, environment, buildings
Berny D. Ilgner, Principal Scientist
Knoxville, Tennessee

Team / Acknowledgments

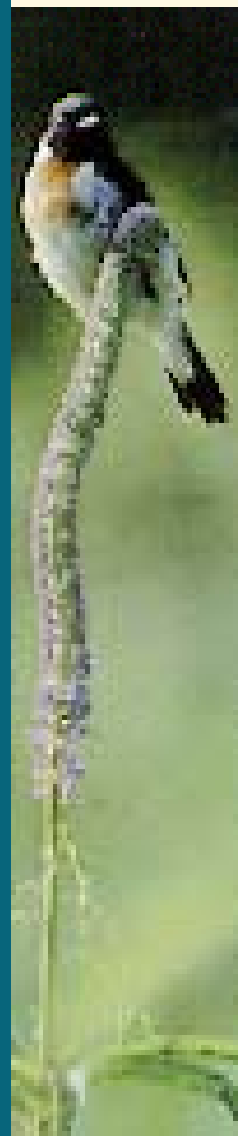
- Beverly Williams – EPA Region 4
- Allan Comp, PhD – Office of Surface Mining
- Andy Shivas – State of Tennessee
- Alan Neal – National Resources Conversation Service
- Brian Jenks – Anderson County, Tennessee
- Dan Jones / Jason Bulluck - ARCADIS
- Barry Thacker / Carol Moore – Coal Creek Watershed Foundation / Trout Unlimited

ARCADIS

Objective and Process

Utilize Brownfield process to facilitate economic recovery of the watershed area.

- **Conduct Phase I Assessment**
- **Conduct Phase II Assessments of priority sites targeted for redevelopment**
- **Develop a strategic plan for cleanup and redevelopment of priority sites**
- **Actively engage community members in the process**



ARCADIS

Mine Scarred Lands (MSL)

- MSL added to Small Business Liability Relief and Brownfields Revitalization Act of 2002
- MSL includes lands, associated waters, and surrounding watershed where extraction, beneficiation or processing of ores and minerals (including coal) has occurred
- MSL considered Brownfield even if chemical contaminants are not primary barriers to revitalization

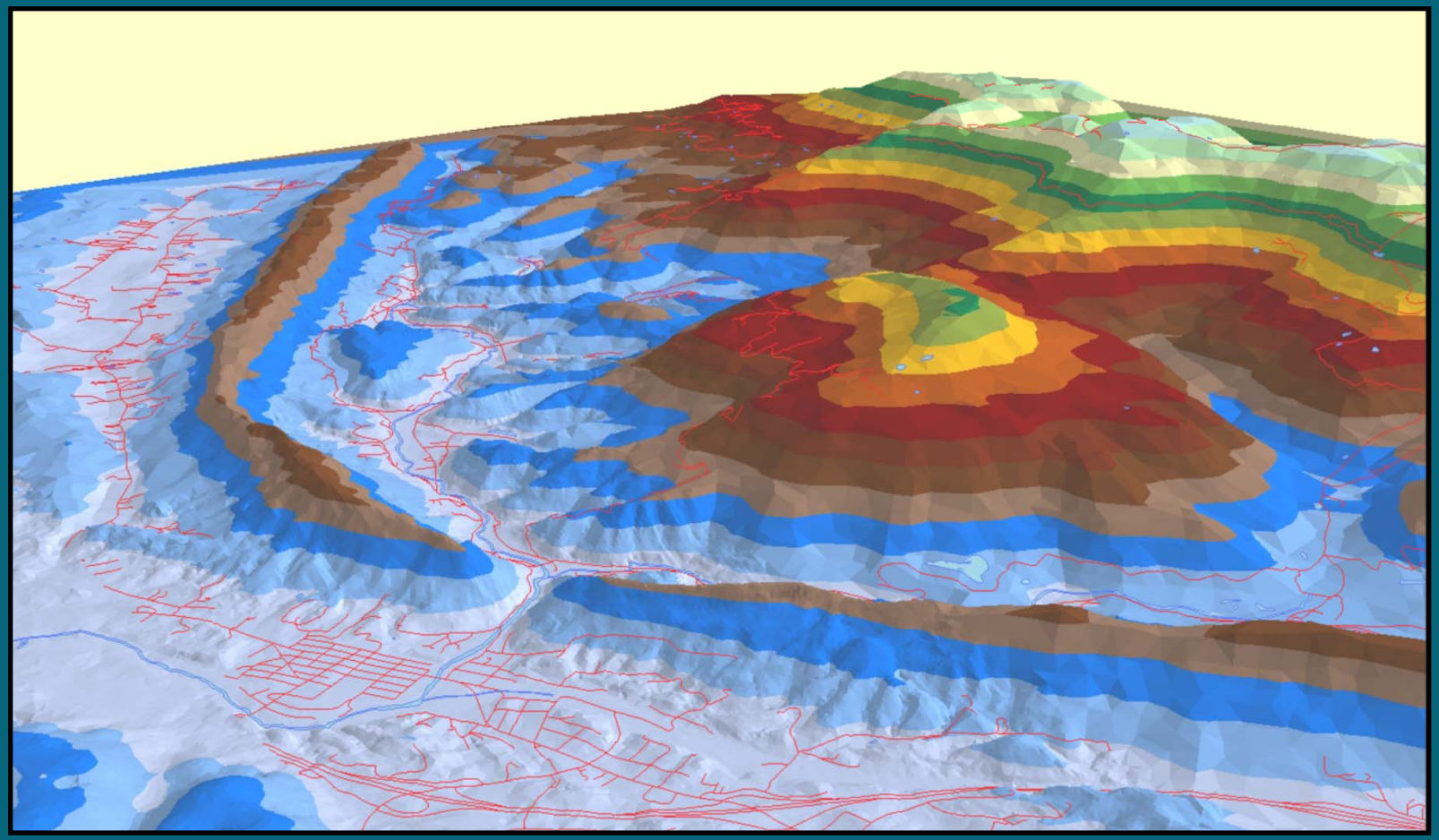
ARCADIS

Characteristics of MSL Watersheds

- Negative perception as blighted communities
- Degradation of aquatic ecosystems by Acid Mine Drainage (AMD)
- Visual and chemical impacts of spoil piles
- Increased erosion
- Limited infrastructure and level land to redevelop
- Access to land limited

ARCADIS

Coal Creek Watershed 3D



ARCADIS

Coal Creek Watershed Background

- Community built on coal, now in decline
- Socio-economically disadvantaged
- Lack of medical care
- Abandoned mine lands (AMLs) left un-reclaimed
- Adverse impact to local environment
- Negative perception of area as contaminated
- Coal Creek 303d listed as partially impaired

ARCADIS

Birth of the Coal Creek Watershed Foundation (CCWF)

- Conservation goal (Trout Unlimited)
- Watershed problems realized
- Hidden resources uncovered (rich mining history)
- Local communities mobilized to redevelop through tourism-based economic recovery
- Successes communicated (website, newspaper exposure)

ARCADIS

Community Activism (CCWF)

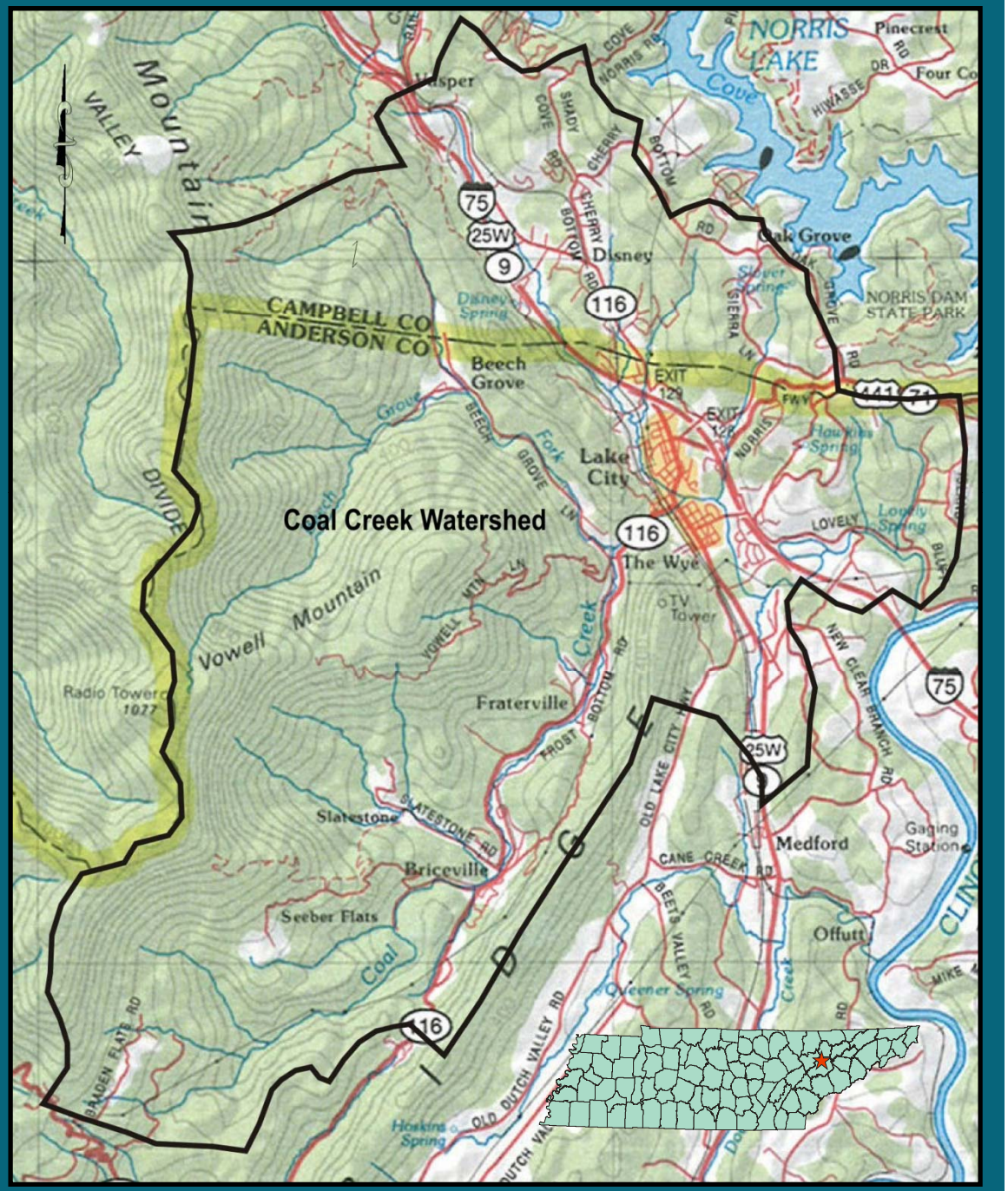
- Stream bank stabilization projects
- Dead wood removal events
- Annual Coal Creek Health Days
- CCWF Scholarships Program (annually)
- River cleanup events
- Coal Creek Miners Festivals (annual event)

ARCADIS

Coal Creek Watershed

- Communities
- 36 square miles
- Coal Creek Wars
- Termination of Convict Labor System
- Mine Explosions
- Mine Safety Improvements
- Tourism economy

ARCADIS



Challenges

- How does the economic development model / revitalization need to differ for a watershed versus an urban site?
- How can Brownfields be applied to non-point sources, and still be a catalyst for economic recovery?
- How can these environmental impacts be quantified?
- How do you approach properties of interest if most available land is controlled by an uninterested corporation?

ARCADIS

Project Vision

- Revitalization of the watershed must address the basic socio-economic conditions of its people
- Build community consensus
- Identify watershed resources and amenities
- Select target sites for redevelopment
- Integrate area resources into overall economic recovery model

ARCADIS

Project Approach

- Gather available information on watershed (USGS, OSM, FWS, TDEC, TVA, CCWF, Anderson County, Chamber of Commerce)
- Conduct watershed-wide analysis first, then site specific Phase 1 / 2 environmental assessment
- Remove uncertainty of watershed conditions
- Identify barriers to revitalization from historic land use
- Correct sites that contribute to watershed degradation

ARCADIS

Data Acquisition (Phase I)

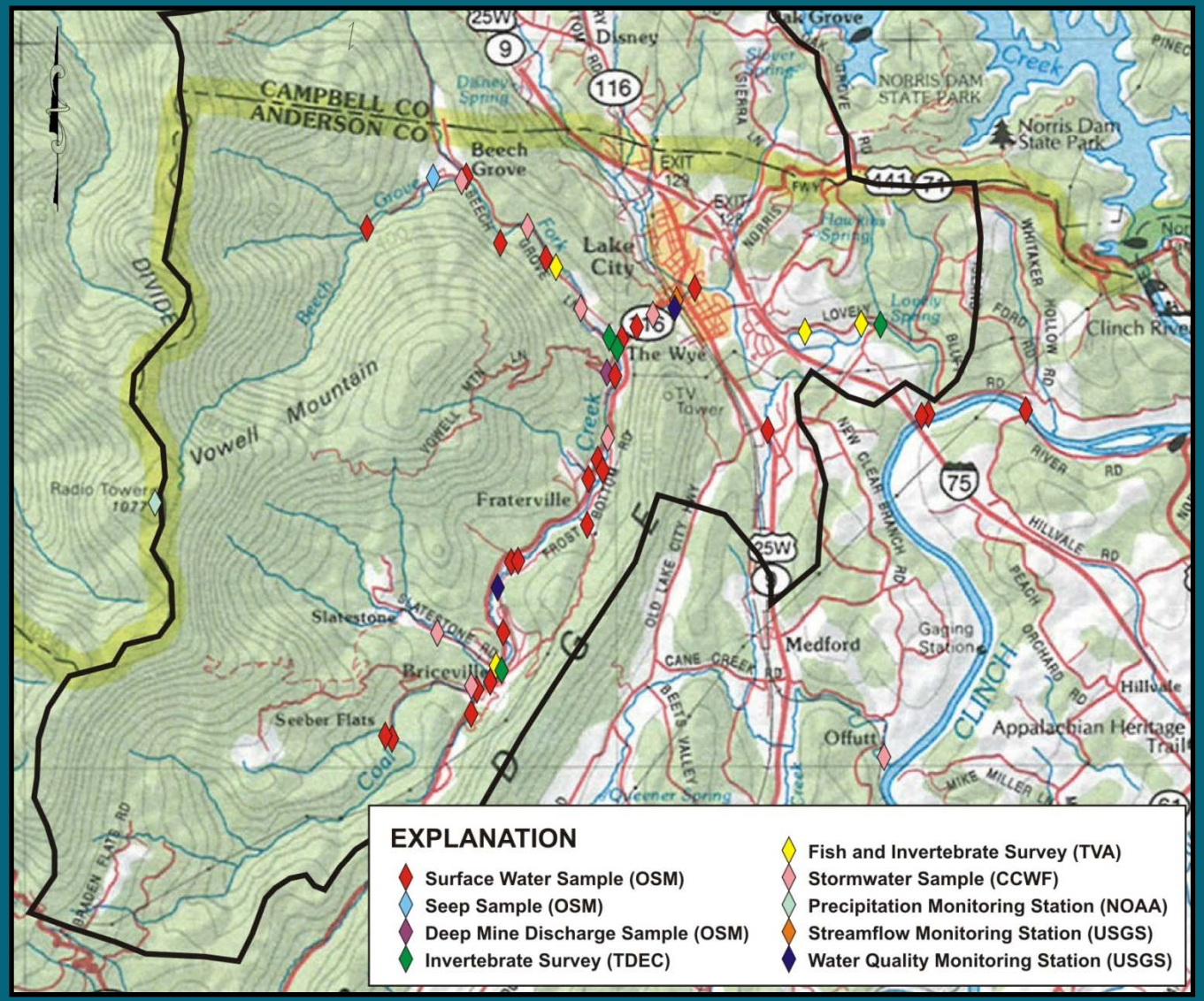
Collect readily available information including...

- Cultural
- Historical
- Water quality
- Hydrological
- Geological
- Ecological
- Socio-economic
- Landownership

ARCADIS

Environmental Conditions

- Mines
  - Strip
  - Deep
- Water quality
  - chemical
  - physical
- Biological
  - fish
  - benthic invertebrates
- Data distribution (concentrated along main creeks)



ARCADIS

Environmental Conditions

- Strip benches and deep mine portals throughout watershed (numerous non-point sources)
- Some flooding corrected (303d listing due to siltation removed)
- Water chemistry indicates generally acceptable water quality (24 samples collected seasonally)
- pH: 4.5 - 8.4, ave 7.0, upper tributary reaches low,
- TSS: 2 - 300 mg/L, ave 5, elevated post storm,
- Alkalinity: 20 – 270 mg/L, increases in lower stream reaches.

ARCADIS

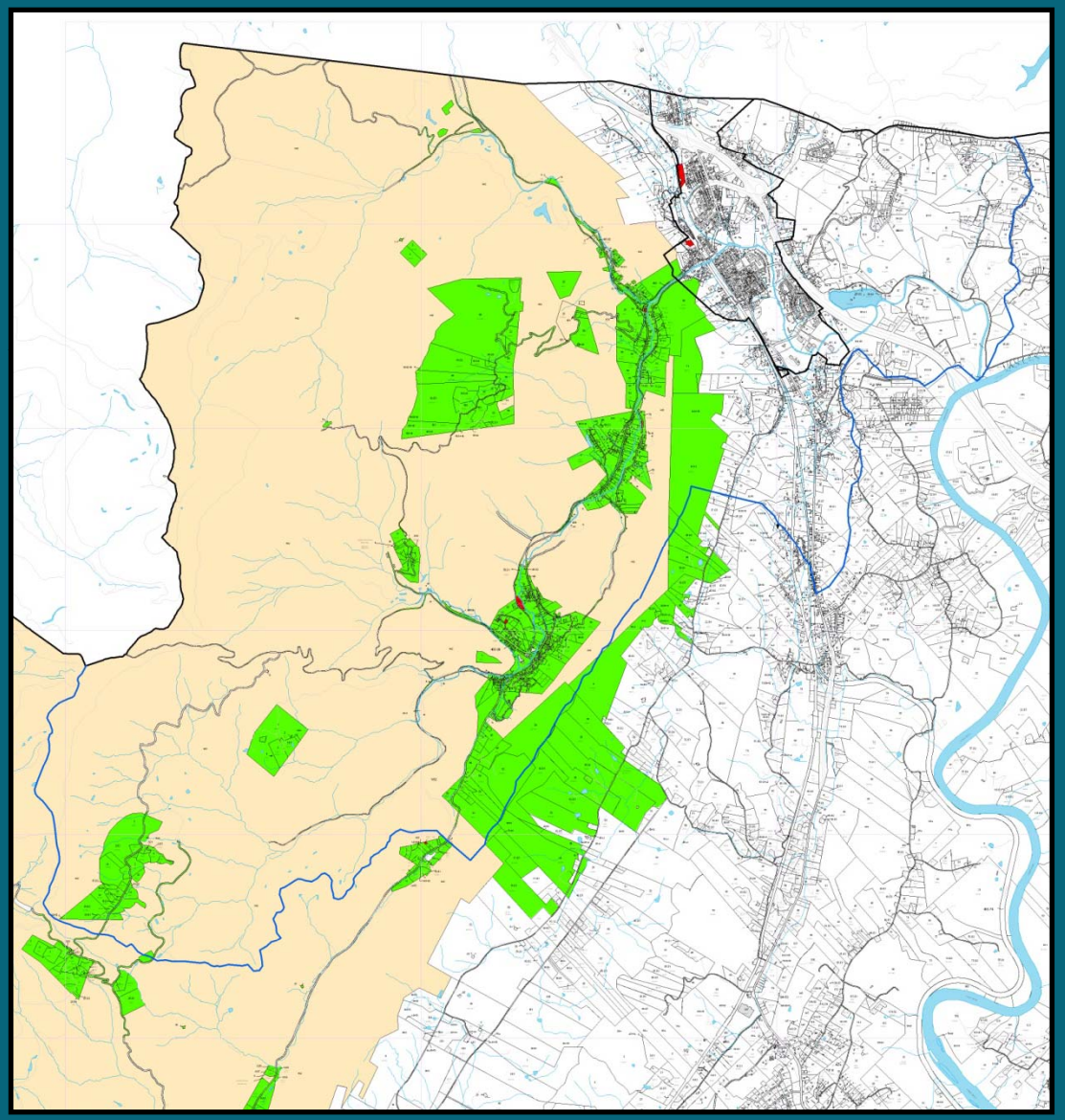
Environmental Conditions (cont.)

- Biological monitoring demonstrates imperiled aquatic communities (primarily pollution tolerant species)
- Terrestrial and aquatic habitats degraded throughout watershed
- Habitat requirements for macroinvertrabrates typically not met
- IBI (Index of Biological Integrity) and EPT surveys typically in the poor to fair range
- Coal Creek 303d listed as partially impaired based on pathogens (must reduce by 56%)

ARCADIS

Property Ownership

- Most property owned by land company
- Few public property tracts



ARCADIS

Coal Creek Watershed Resources

- Ecological
- Scenic
- Cultural
- Historical

ARCADIS

Ecological Resources

- Floristically and faunally diverse ecoregion
- Many small wetlands throughout watershed
- Area nominated as an Important Bird Area (avifaunally diverse)
- Strip benches new bird habitat
- Rebound of ecological resources can occur as watershed conditions improve

ARCADIS

Scenic Resources

- Cross Mountain
  - Air Radar Station historic site
  - Bird watching
- ATV trails
  - Winrock / Royal Blue connection
- Hiking trails (e.g. Cumberland Trail)
- Windmills (TVA green power)

ARCADIS

Scenic Resources

ARCADIS

Cultural / Historical Resources

- Historic buildings
- Two NRHP structures
- Coal Creek Miners Memorial Highway
- Cemeteries (mine disaster fatalities)
- Portals of historic mines
- Historic sites
- Archeological (potential Native American sites)

ARCADIS

Priority Site Screening Criteria

A property may be chosen if it…

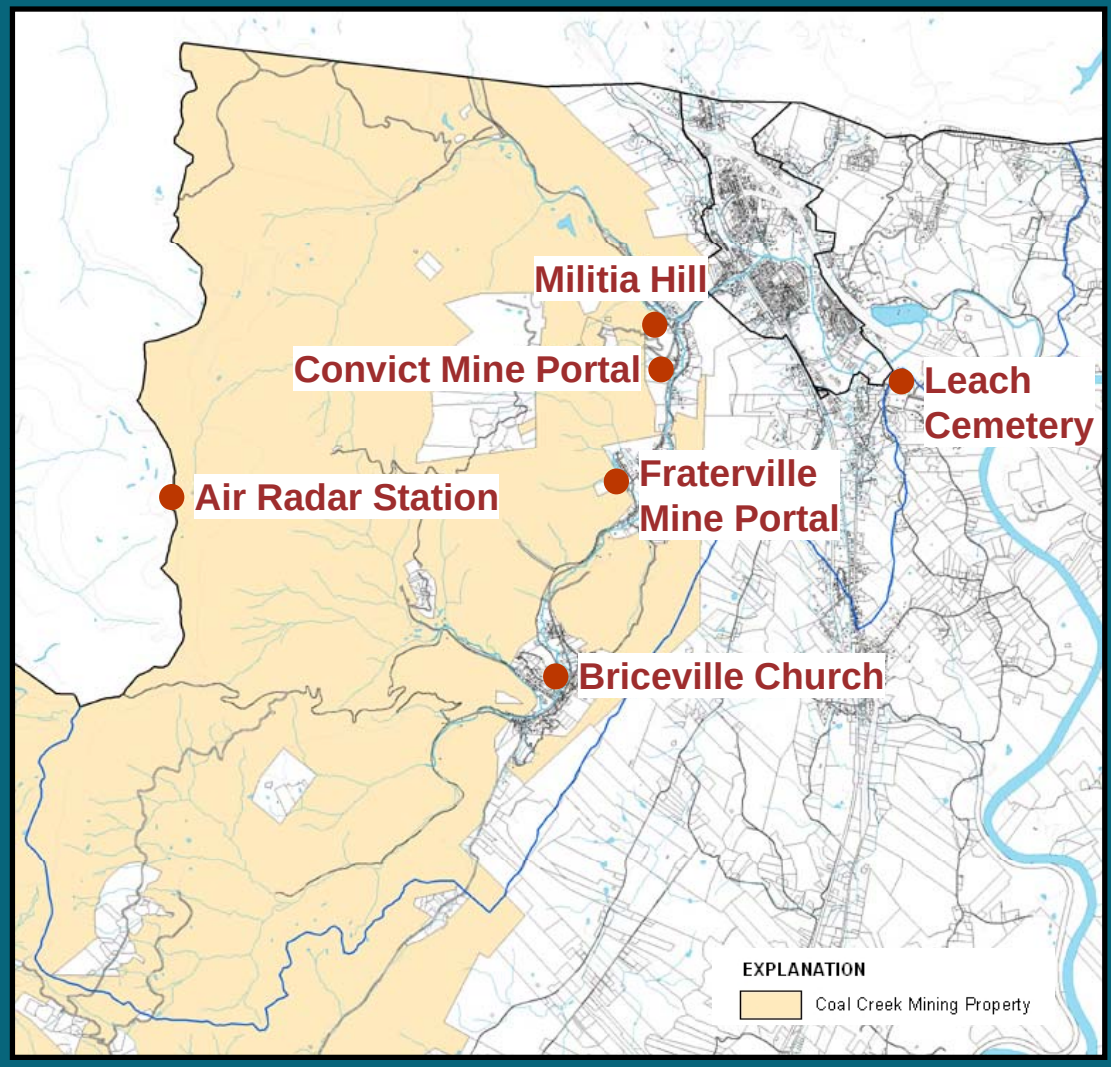
- **is a source of AMD,**
- **has visual or chemical contamination,**
- **contributes to erosion or siltation,**
- **has historically / culturally important features,**
- **has potential to build tourism infrastructure, or**
- **has ecological important features.**

NOTE: Preference given to property held by a private owner if targeted for redevelopment.

ARCADIS

Sites of Interest

- Briceville Church
- Miners' Circle in Leach Cemetery
- Militia Hill
- Fraterville Mine
- Cross Mountain Mine
- Old Convict Mine
- Air Radar Station



ARCADIS

Fraterville Miners' Circle in Leach Cemetery

SOURCE: www.coalcreekaml.com

ARCADIS

Briceville Community Church

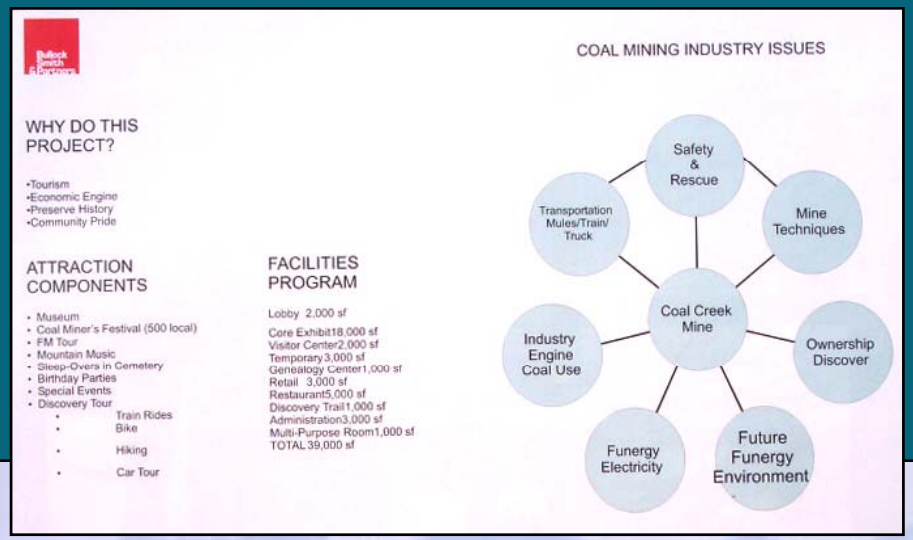
SOURCE: www.coalcreekaml.com

ARCADIS

Air Radar Station Site

ARCADIS

Conceptual Plan for Coal Miners' Museum



SOURCE: *www.coalcreekaml.com*

ARCADIS

Path Forward

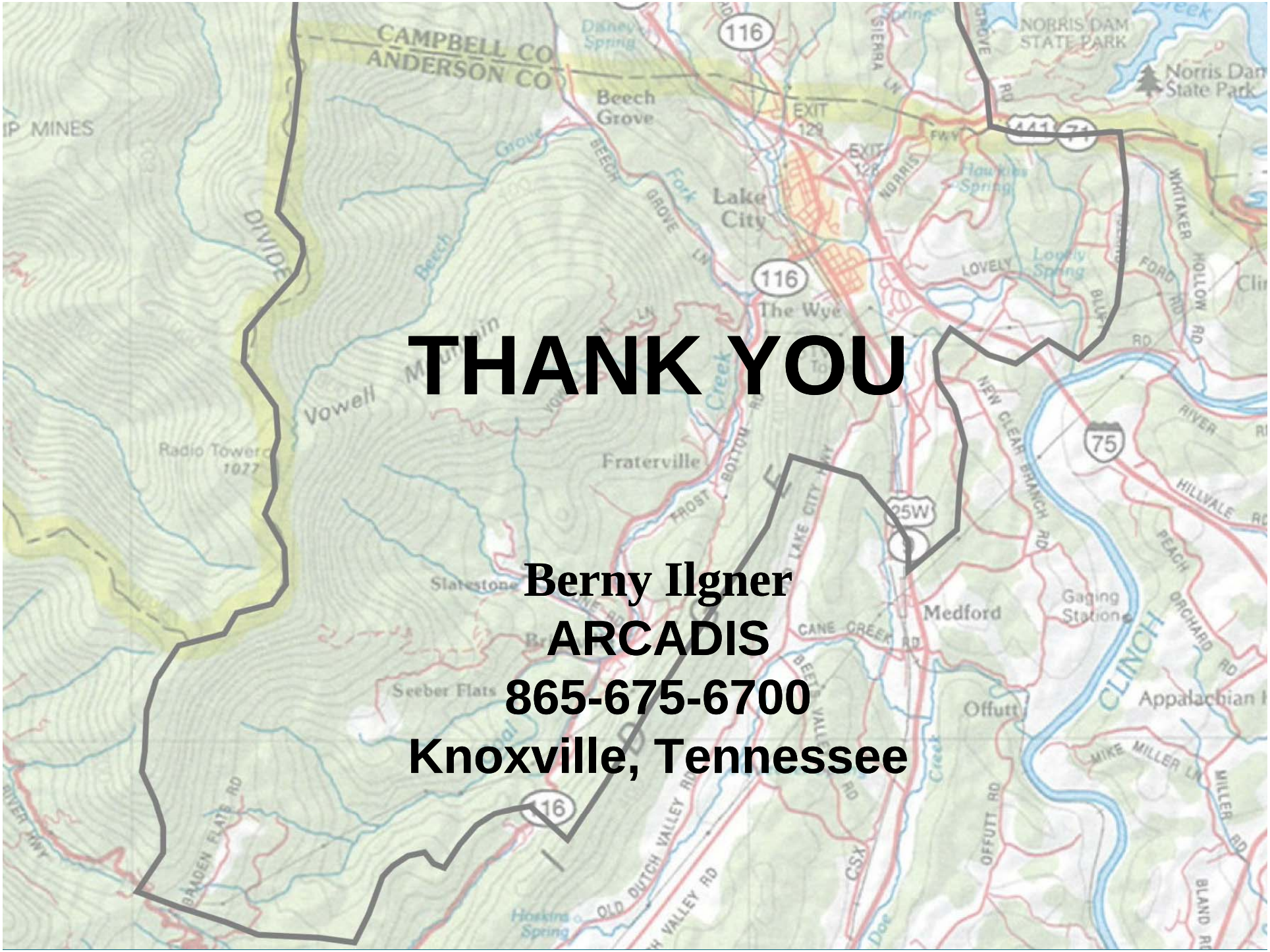
- Data collection (biological, infrared photography, stream flow)
- Watershed wide assessment (Integrated GIS-based evaluation)
- Phase I assessment of target properties
- Phase II assessments of target properties, if necessary
- Natural Heritage Corridor consideration
- Public meeting

ARCADIS

Revitalization Realized

- Economic development model based on resources designed for entire watershed, not just a specific site.
- Brownfields used to remove negative perception through integrated understanding of watershed and corrective actions.
- Environmental impacts quantified by conducting GIS based / infrared aerial photography for watershed analysis.
- Bring everyone to the table as stakeholders.

ARCADIS



THANK YOU

Berny Ilgner
ARCADIS
865-675-6700
Knoxville, Tennessee