

Mine Pools and CHIA Analysis

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CHIA Issues

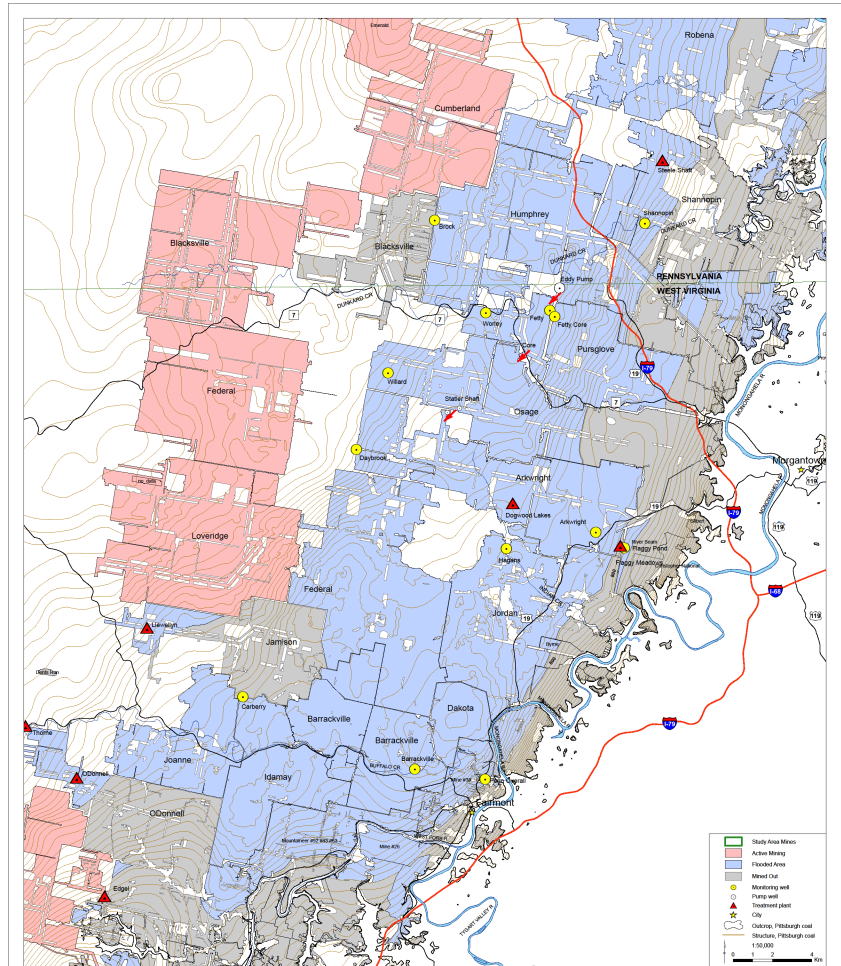
- Mine pools and material damage
- Mine pools and watershed analysis and inter-basin transfer
- Mine pools and UIC
- Mine pools and oil and gas interaction
- Mine pools as a resource

Material Damage

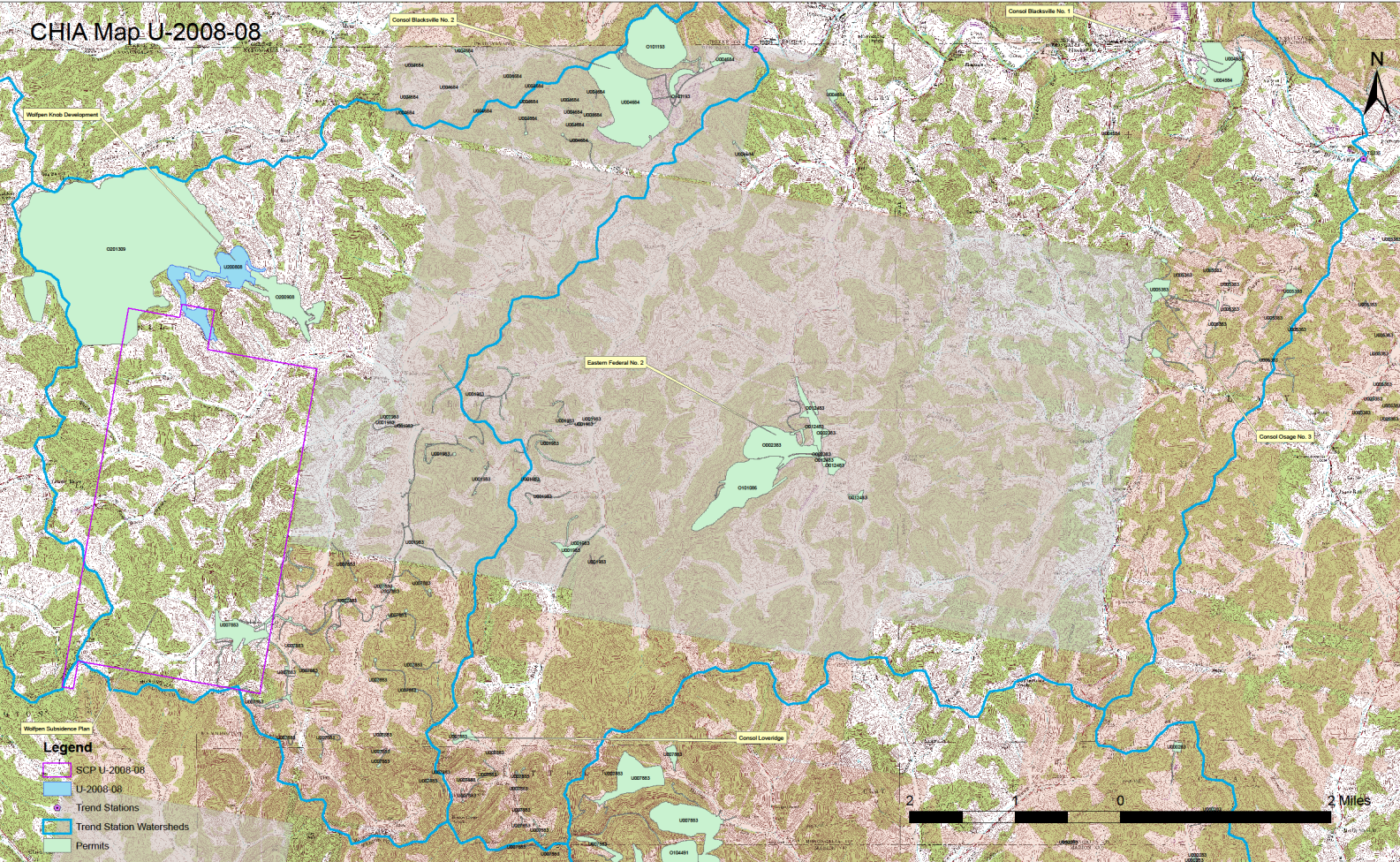
- Where do you apply Material Damage Criteria?
 - Natural discharge
 - Pumped discharge
 - In pool criteria
 - Non-point source seepage
 - Above ground
 - Mine to mine

Watershed Analysis and Inter-basin Transfer

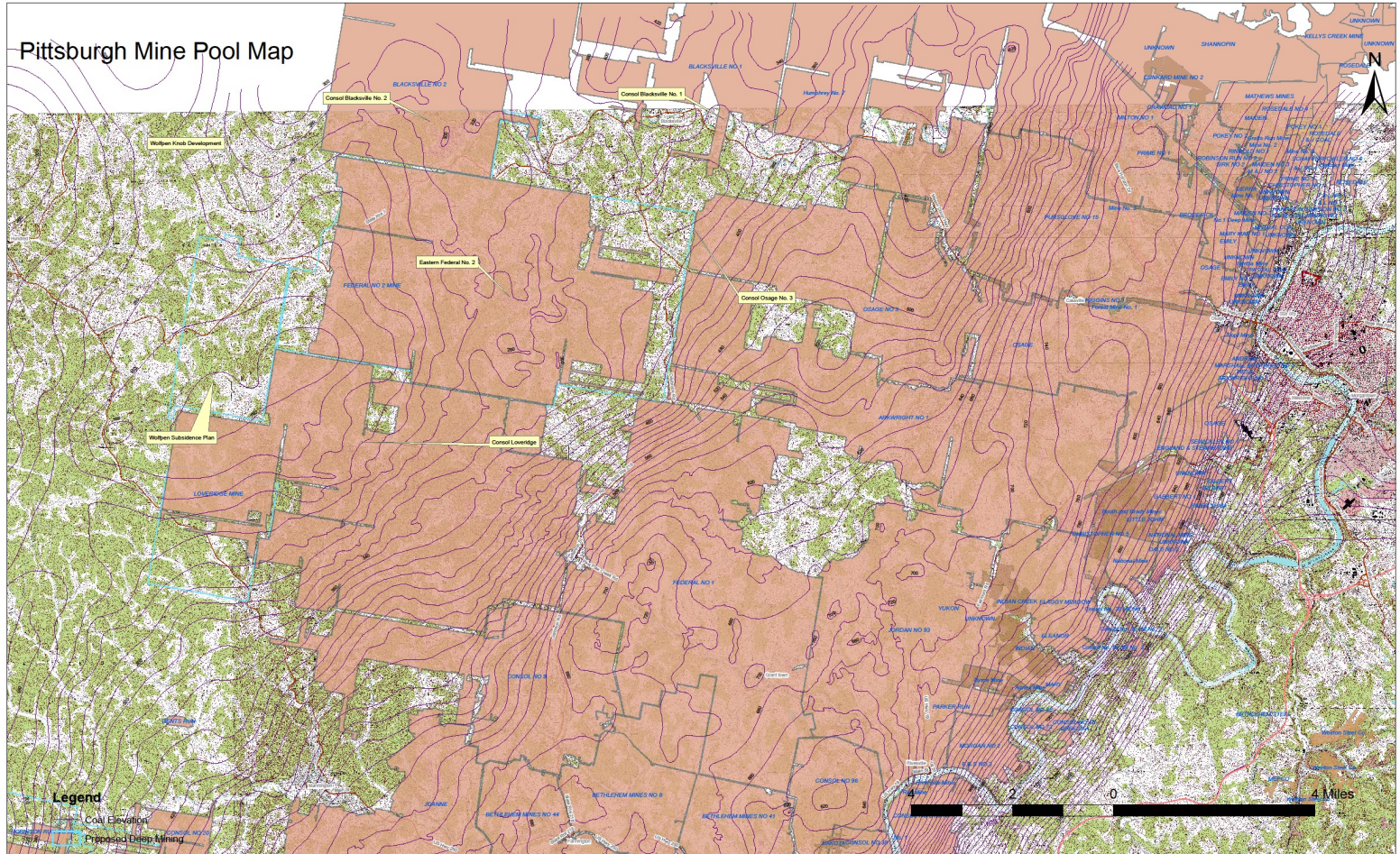
- Pittsburgh Coal seam
- An inter-basin nightmare



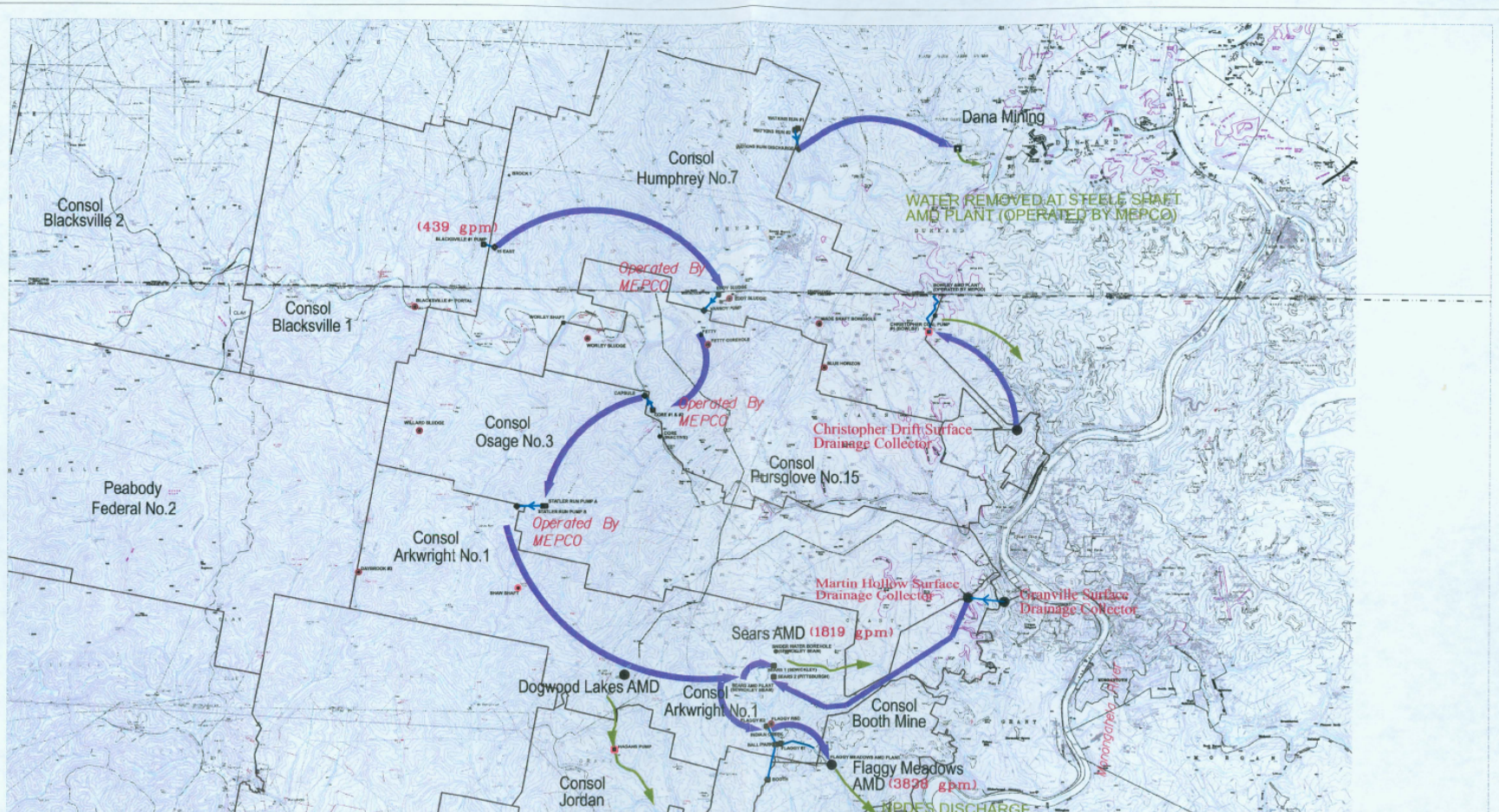
General Watershed HUC Analysis



You are here



Time analysis and prediction



Legend

- Mine Water Flow Direction
- Pumping Well
- Injection Borehole
- Monitoring Borehole
- UIC Point (Underground Injection Control)
- NPDES Surface Water Discharge (National Pollution Discharge Elimination System)
- Pumpover - Arrowhead Shows Flow Direction in Pipeline
- 3838 gpm 2008 Average Pumping Rate (gallons per minute)

Scale: 0 2000 4000 8000

Prepared For: PENNSYLVANIA DEP

Map Reference: This exhibit was prepared based on a reproduction of a drawing provided by CONSOL Energy Inc.

Scale: 11-16-2009

Mine Water Handling Map Morganstown Pool

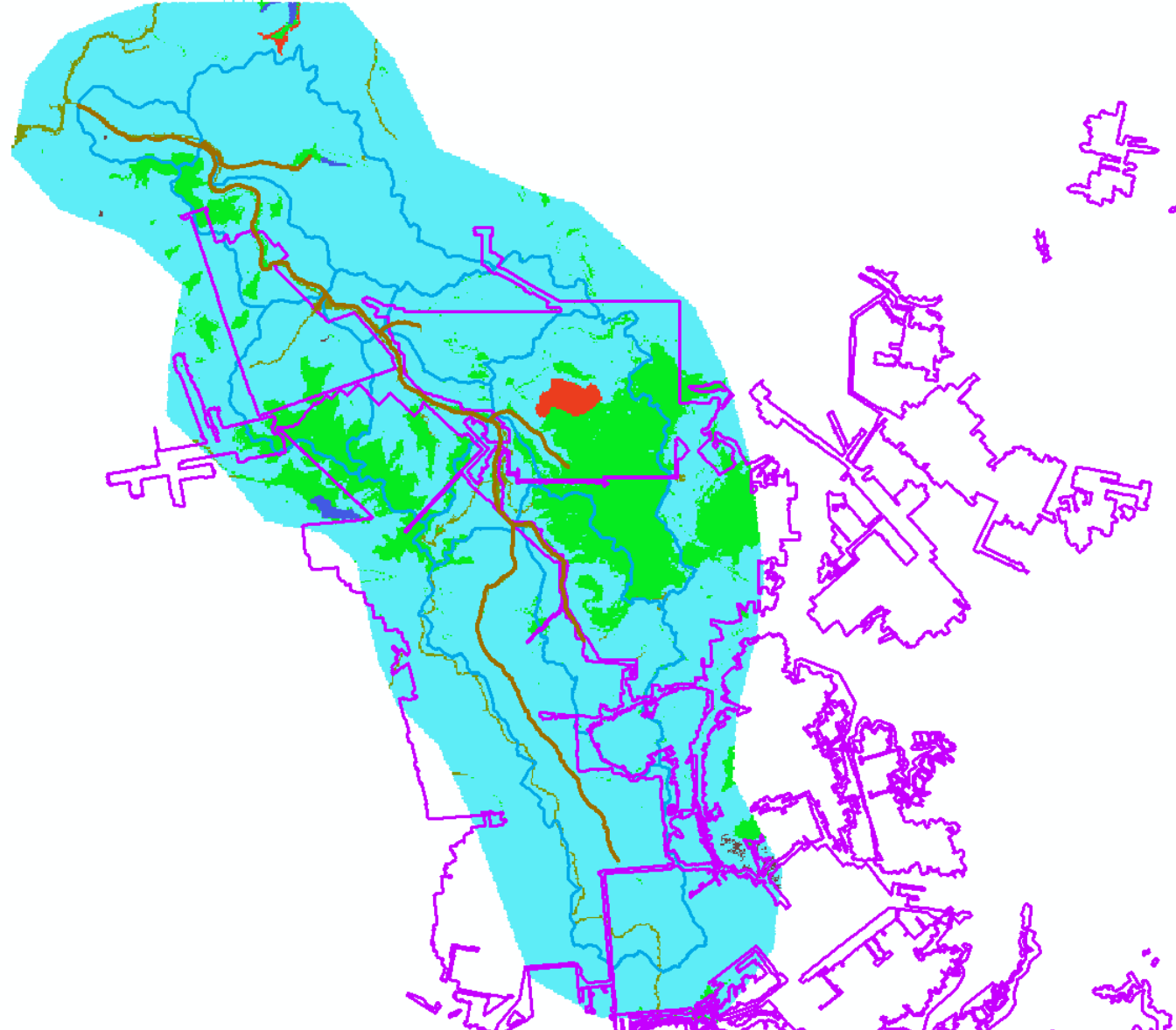
1) Flaggy Meadows (Oct 2011), Christopher Drift (Oct 2011), Granville (Oct 2011) and Martin Hollow (Oct 2011) are all part of UIC Permit No. 1018-00-001.
2) Background map derived from USGS 7.5 Topo quadr: Blacksville, Greenbush, Mannington, Osage, Valley Grove, Westmoren Morgantown North, Morgantown South and Howards WV.

File Name: G:\CH\LAND\BATHING\000001_00000000_CADD\LAND\PROCES\1_A\DWG\0001\TOWNSHIP_DEP_REQUEST.DWG

Inputs verses outputs

- To conduct a full CHIA analysis
 - All major inputs into the mine pool system
 - All major outputs from the mine pool system

West Fork of the Coal River

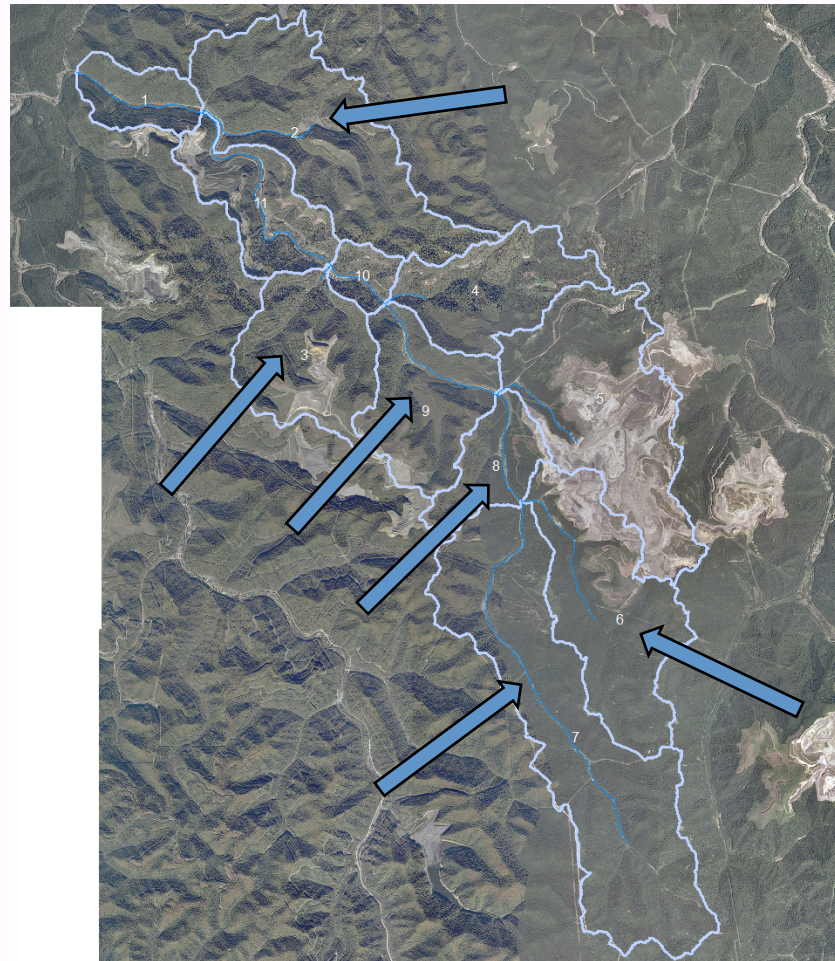


Inputs and outputs to the CHIA model

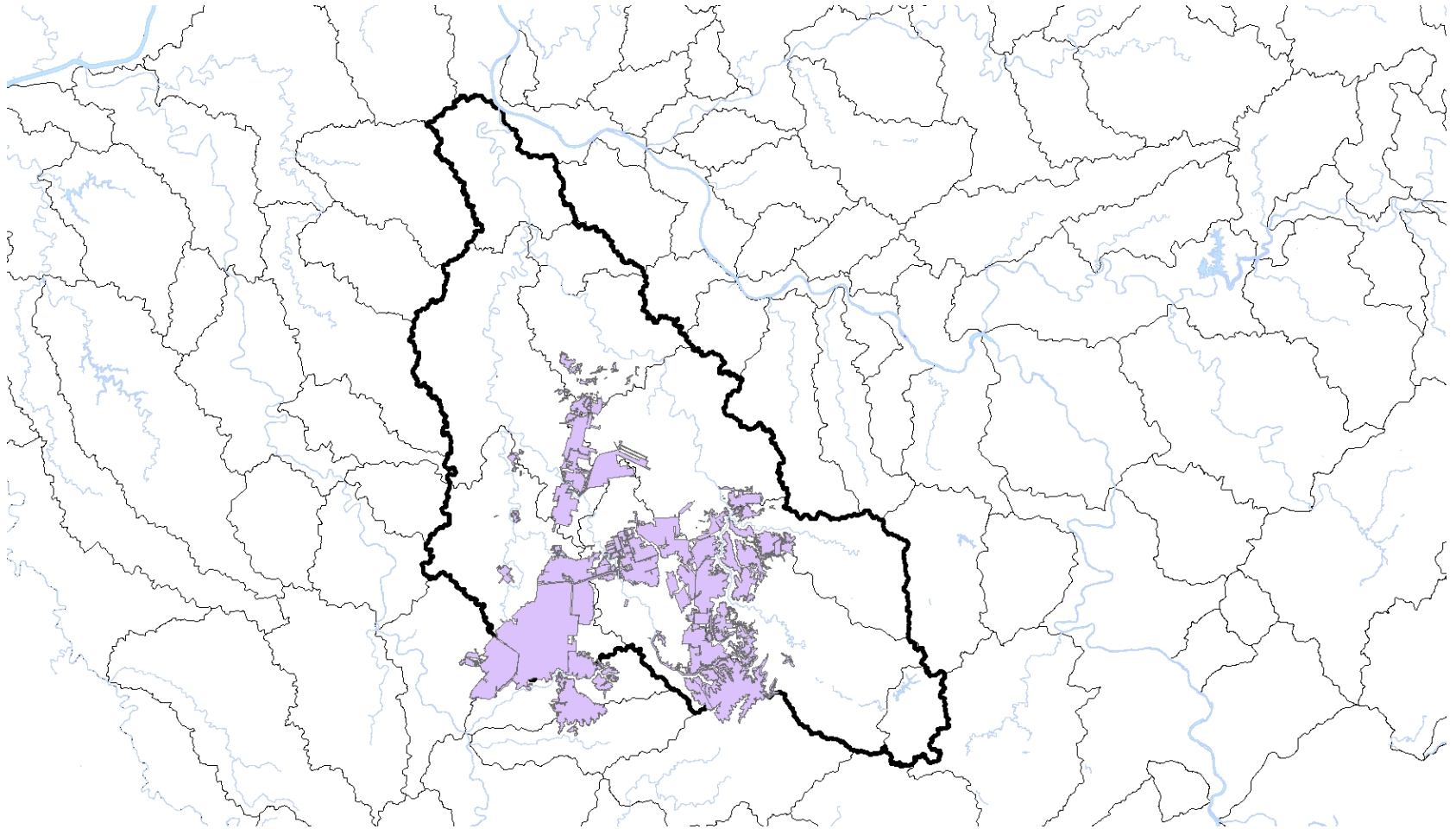
RCHRES	Flow (ac-ft/hr)	TDS (mg/L)	Sampled Site
2	0.28	613	Brown's Branch Impound pond inlet
3	0.29	NA	Still Hollow
6	0.22	1108	Surface Mine discharge + Matt's Creek above S-5020-07
7	0.37	172	West Fork, above Matts Creek
8	0.28	1163	Underground mine Pumped discharge
9	1.38	1282	Spruce Lick Impoundment #1 and #2

User's steps:

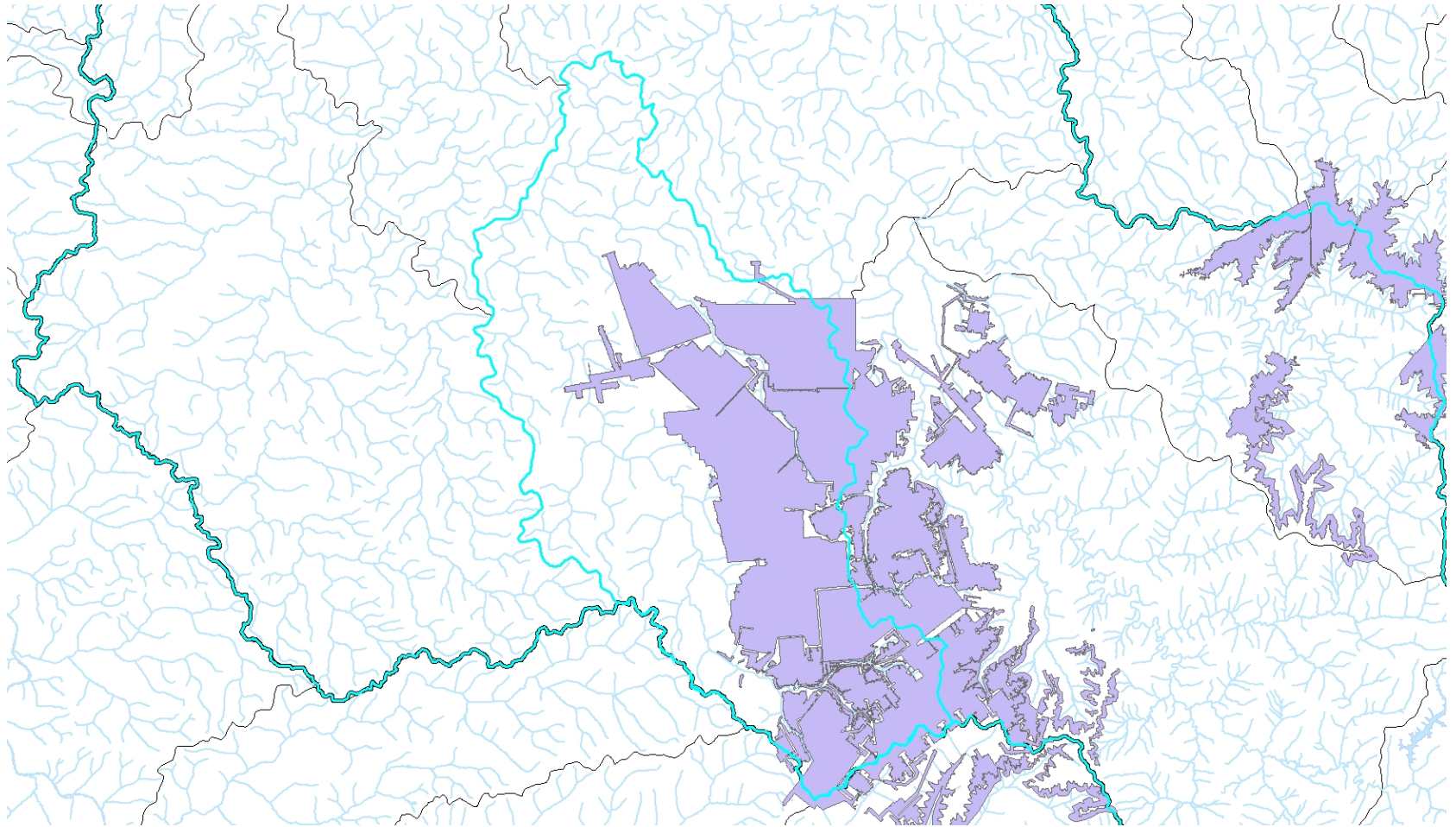
1. Select TS
2. Input flow and concentration/load (point sources)
3. Input mine acreage
4. Simulate baseline vs. proposed mine(s)
5. Compare output



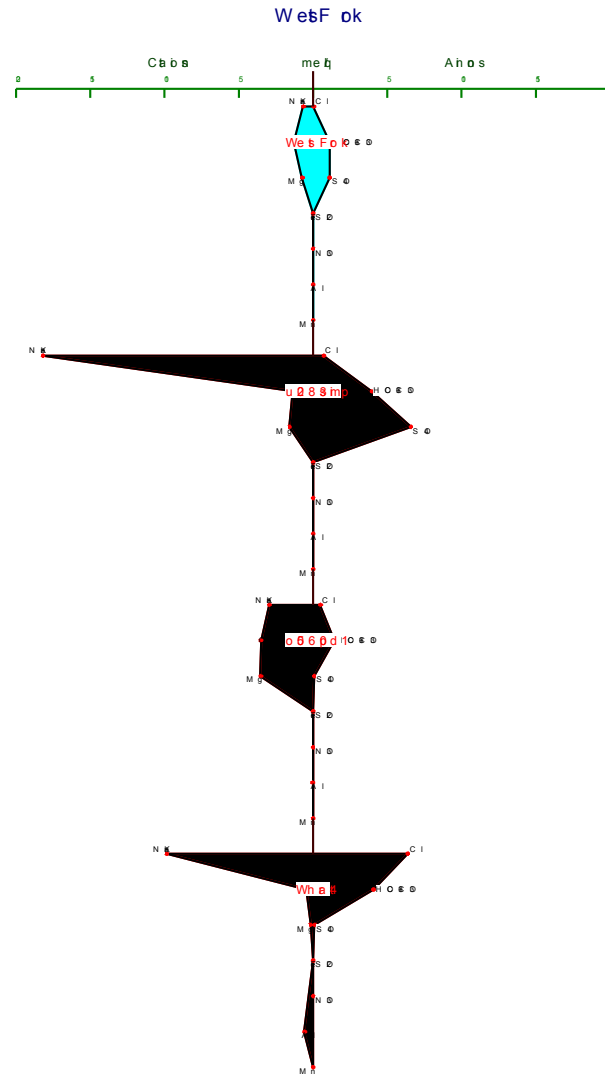
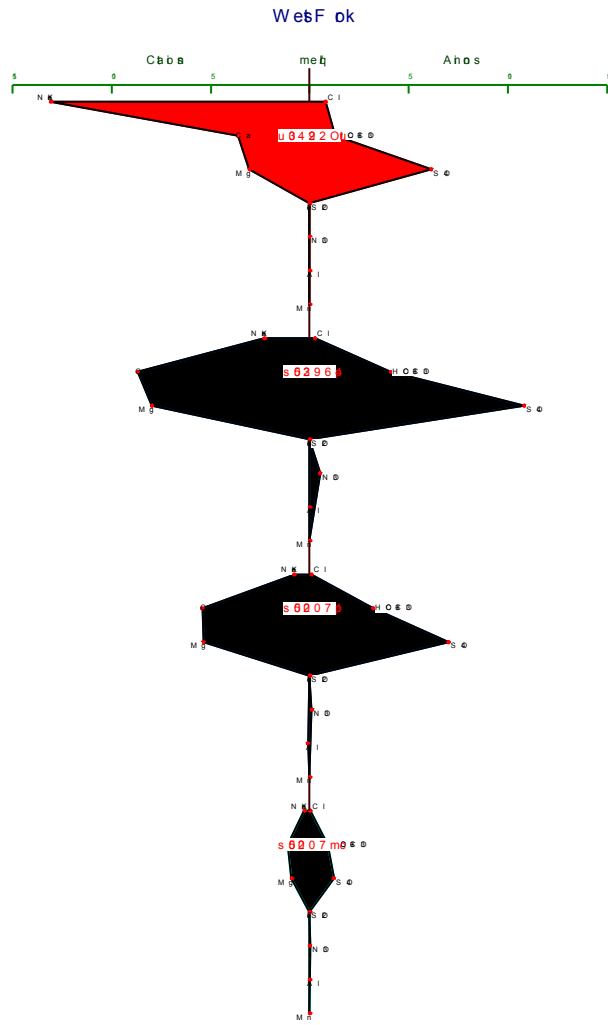
No. 2 Gas



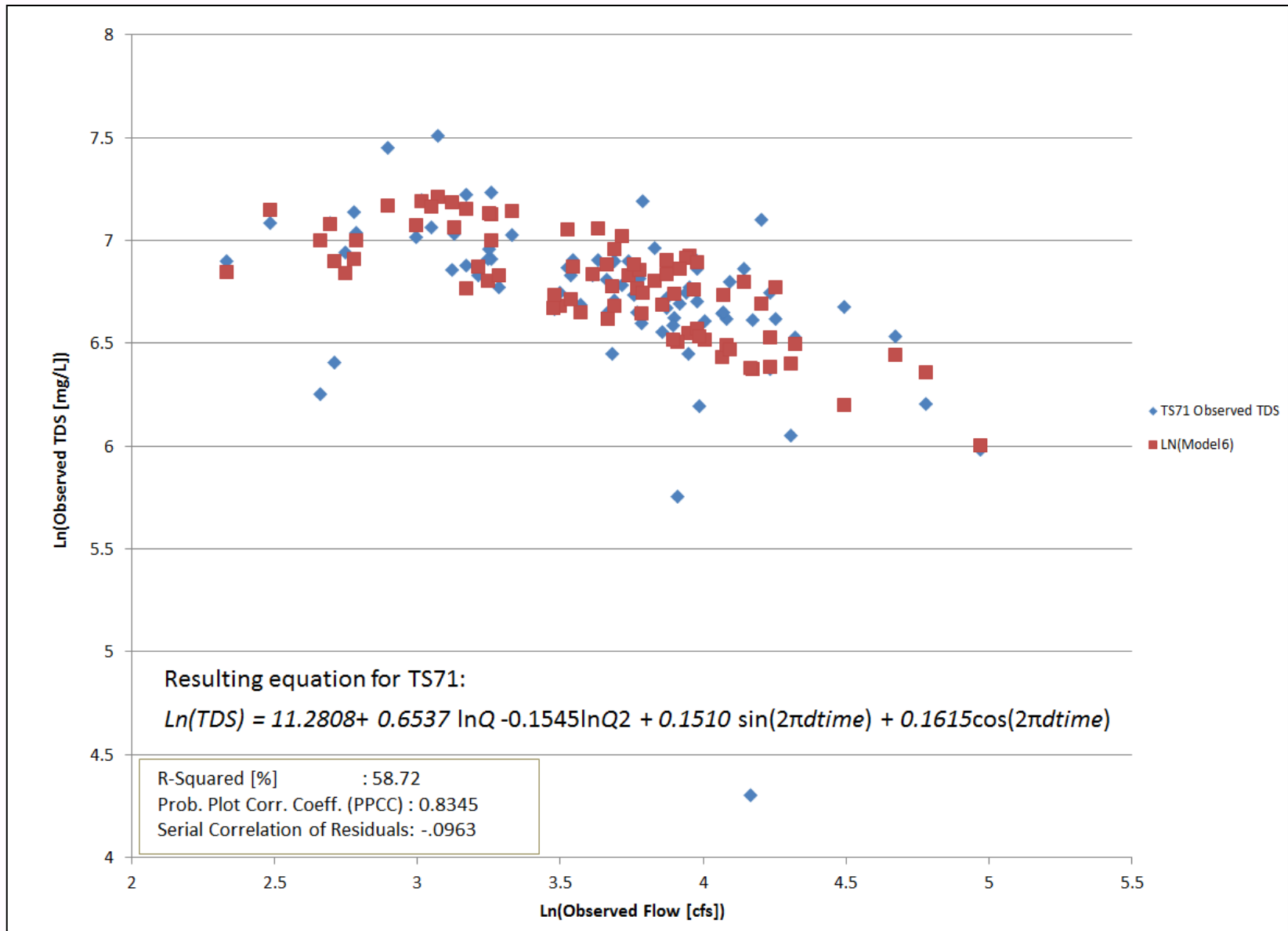
West Fork of Pond



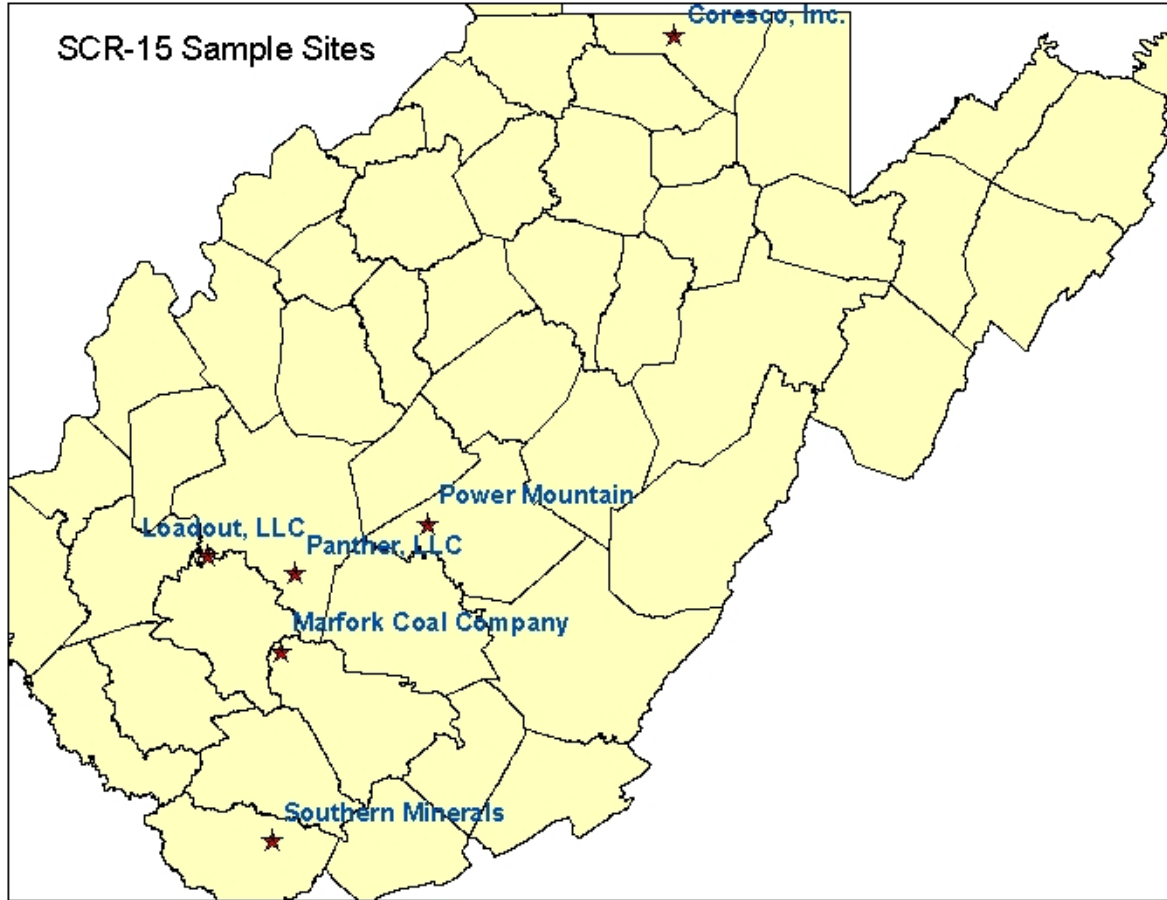
West Fork STIFF

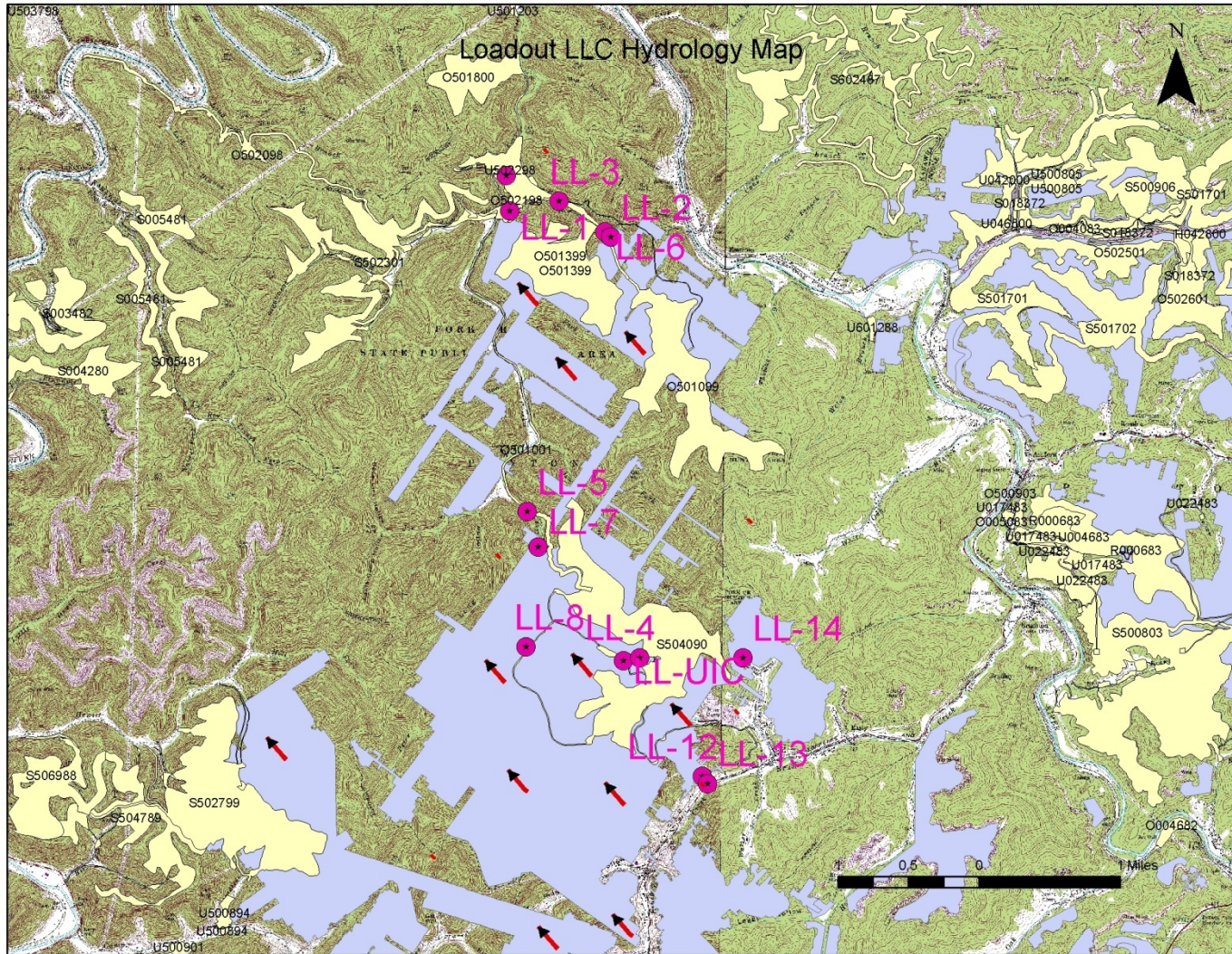


Water Quality Calibration – Method #1

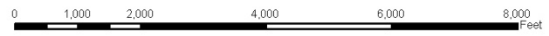
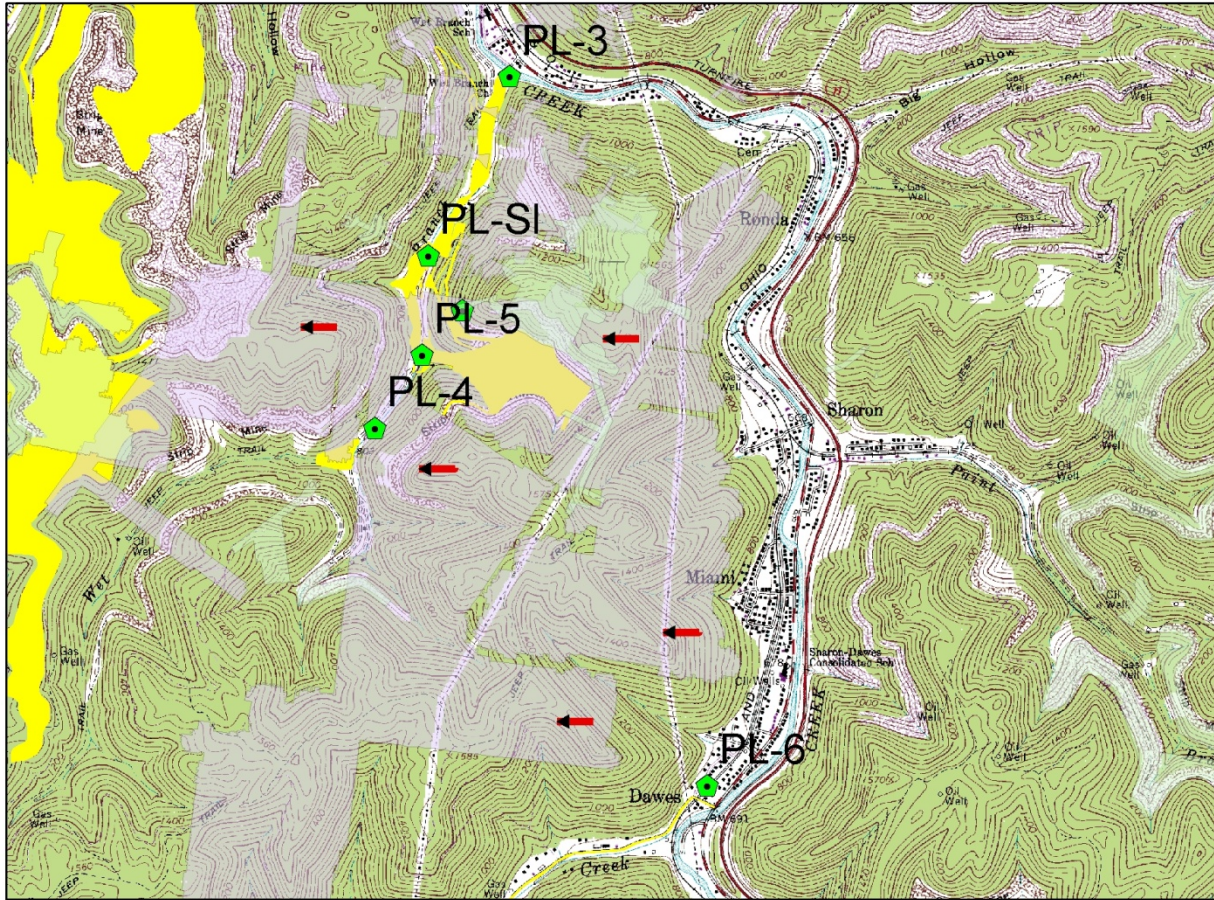


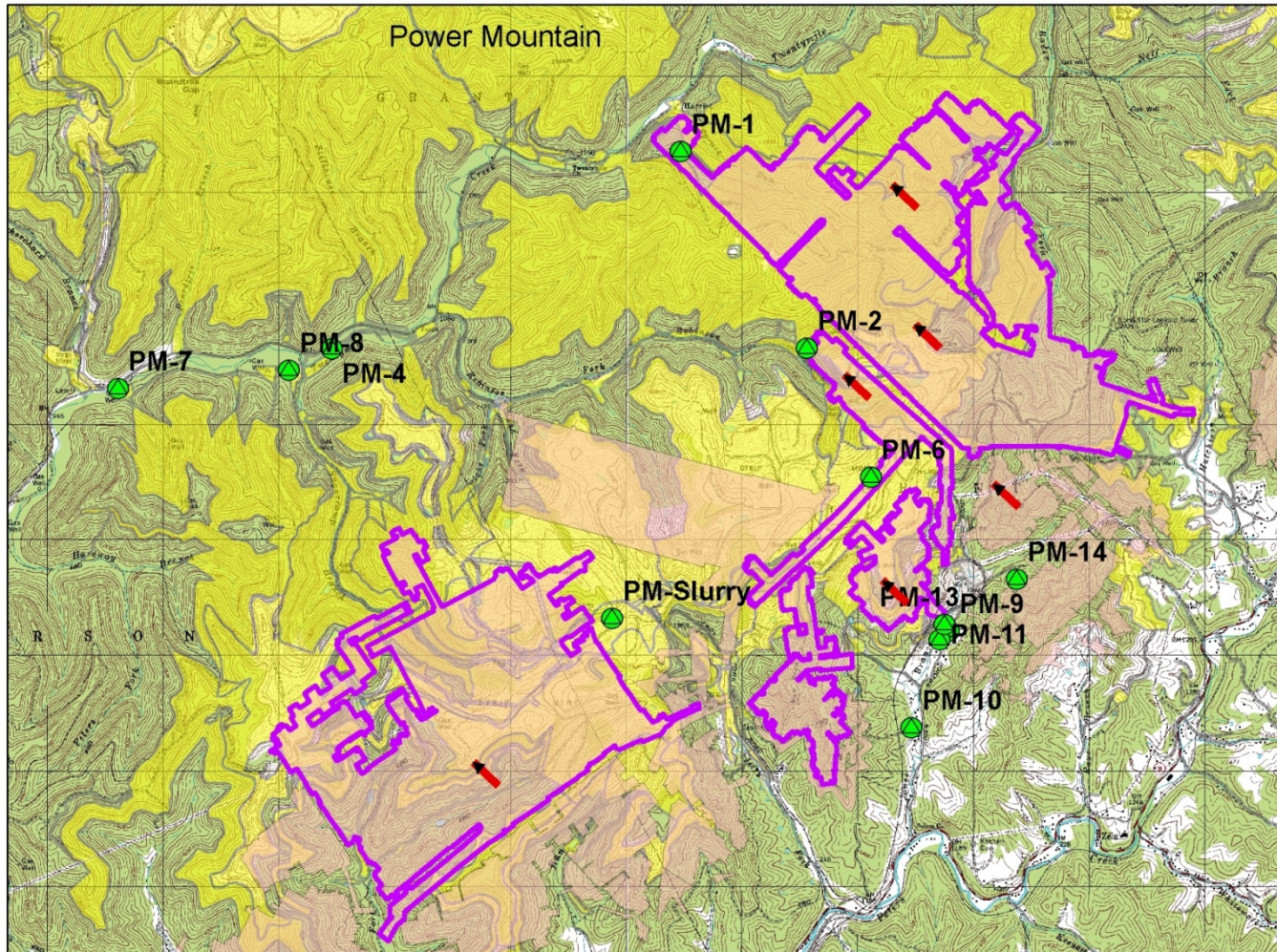
UIC and Mine Pools





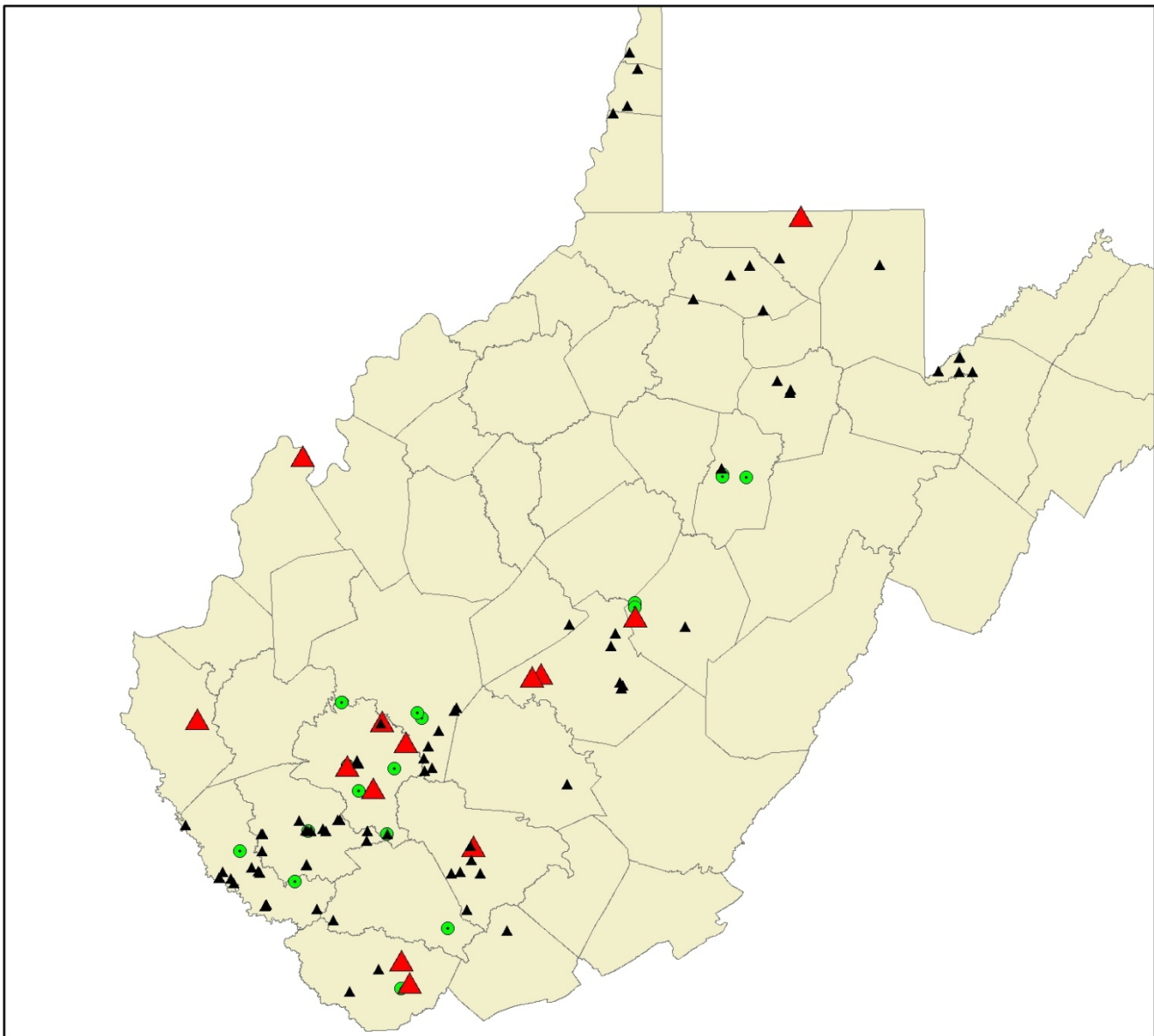
Panther Sample Sites





west virginia department of environmental protection

Promoting a Healthy Environment



UIC Slurry Sites

Modern and historic underground injection of coal slurry sites in West Virginia

Legend

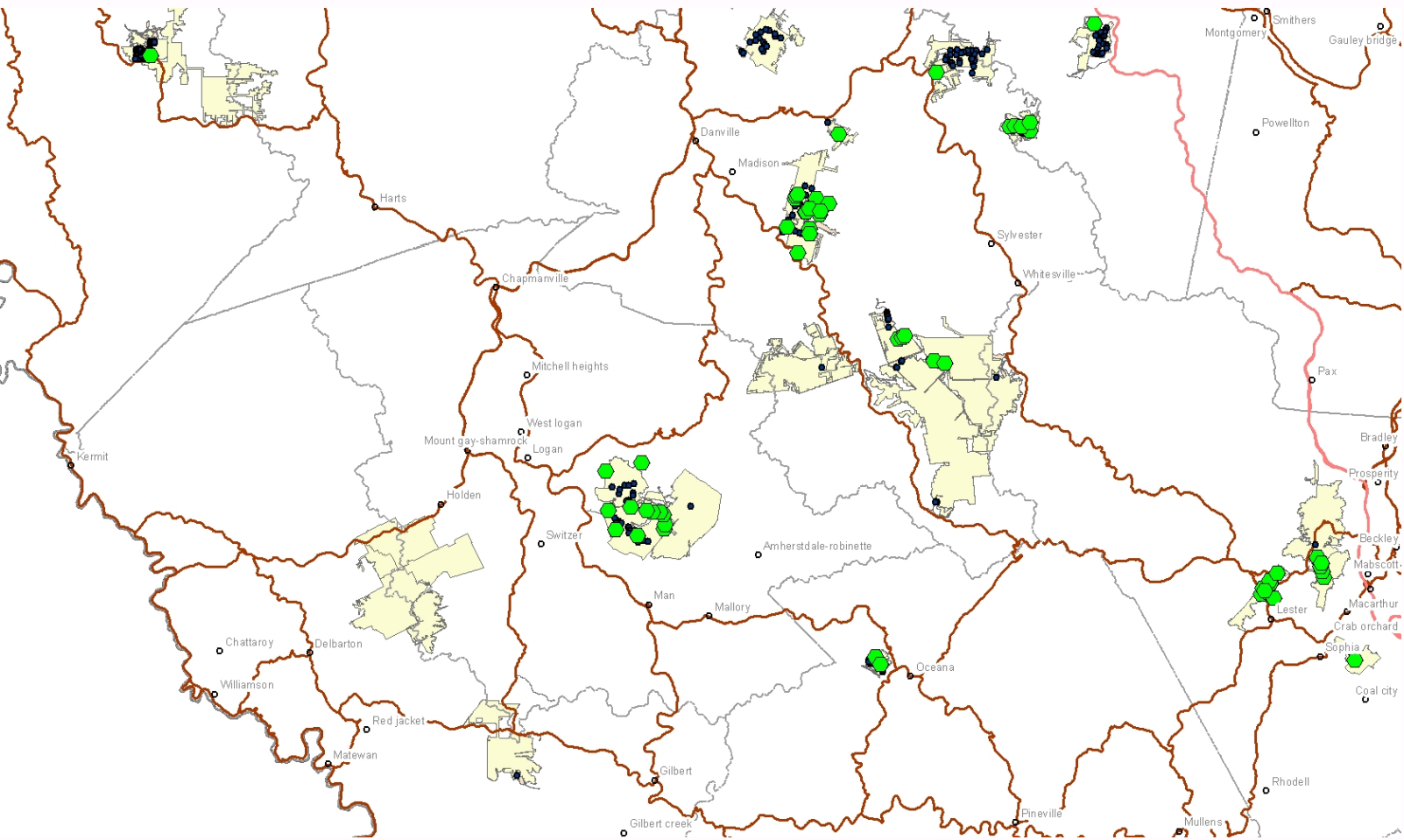
- ▲ Historic UIC slurry sites 60-80's
- Modern slurry UIC sites**
- Modern Status**
- Inactive Slurry Sites
- ▲ Active Slurry Sites
- county

WVDEP, Nick Schaer
3/18/2009



West Virginia Division of Environmental Protection





west virginia department of environmental protection

Promoting a Healthy Environment

ADTI Mine Pool Section

Problem Summaries - Acid Drainage Technology Initiative - Windows Internet Explorer

http://acid drainage.com/problem_summaries.cfm

ADTI white papers

ADTI white papers

Problem Summaries - Acid Drainage Technology Initiative



Acid Drainage Technology Initiative

Problem Summaries

Critical Technical Issues, Priorities and Plans for Coal Mine Acid Drainage Technology

White Papers by Coal Mining Sector of the Acid Drainage Technology Initiative

January 18, 2006
Version 1.01

WHITE PAPERS (Former White Paper Topic Numbers in Parentheses)

CCB -- Coal Combustion By-Products Technical Group

- CCB-1 CCB: Risk Assessment Methods (Topic 10)
- CCB-2 Placement of CCBs at Coal Mines - Documentation of Benefits and Impacts (Topic 11)

PT -- Passive Treatment Technical Group

- PT-1 Passive Treatment: Long-term Performance Evaluation and Metrics (Topic 7)
- PT-2 Passive Treatment: Reasons for Success and Failure (Topic 8)
- PT-3 Passive Treatment: Improved Methods (Topic 9)
- PT-4 In Situ Treatment: Alkaline Amendments, Foundation Drains and Reactive Barriers (Topic 12b)
- PT-5 Coal Refuse Reclamation - Capping / Barriers and Improved Methods (Topic 13)
- PT -- Passive Treatment Technical Group (Advances in Passive Treatment of Coal Mine Drainage 1998-2009, by Art Rose)

WQ -- Water Quality Technical Group

- WQ-1 Manganese Treatment Standard (Topic 1)
- WQ-2 Contaminant Loading: Prediction of Contaminant Concentrations from Underground Mines (Topics 2 and 6)
- WQ-3 Treatment for Non-Conventional Constituents (Topic 14)
- WQ-4 Prediction and Treatment of Selenium (Topic 14a)

UGM -- Underground Mining Technical Group

- UGM-1 Contaminant Loading: Predict Hydrologic Budget of Underground Mines (Topic 3)
- UGM-2 Predicting Long-term AMD: Discharge from Flooded Underground Mines (Topic 4)
- UGM-3 Predicting Long-term AMD from Above Drainage Underground Mines (Topic 5)
- UGM-4 Treatment Methods for Large UG Discharges (Topic 16)

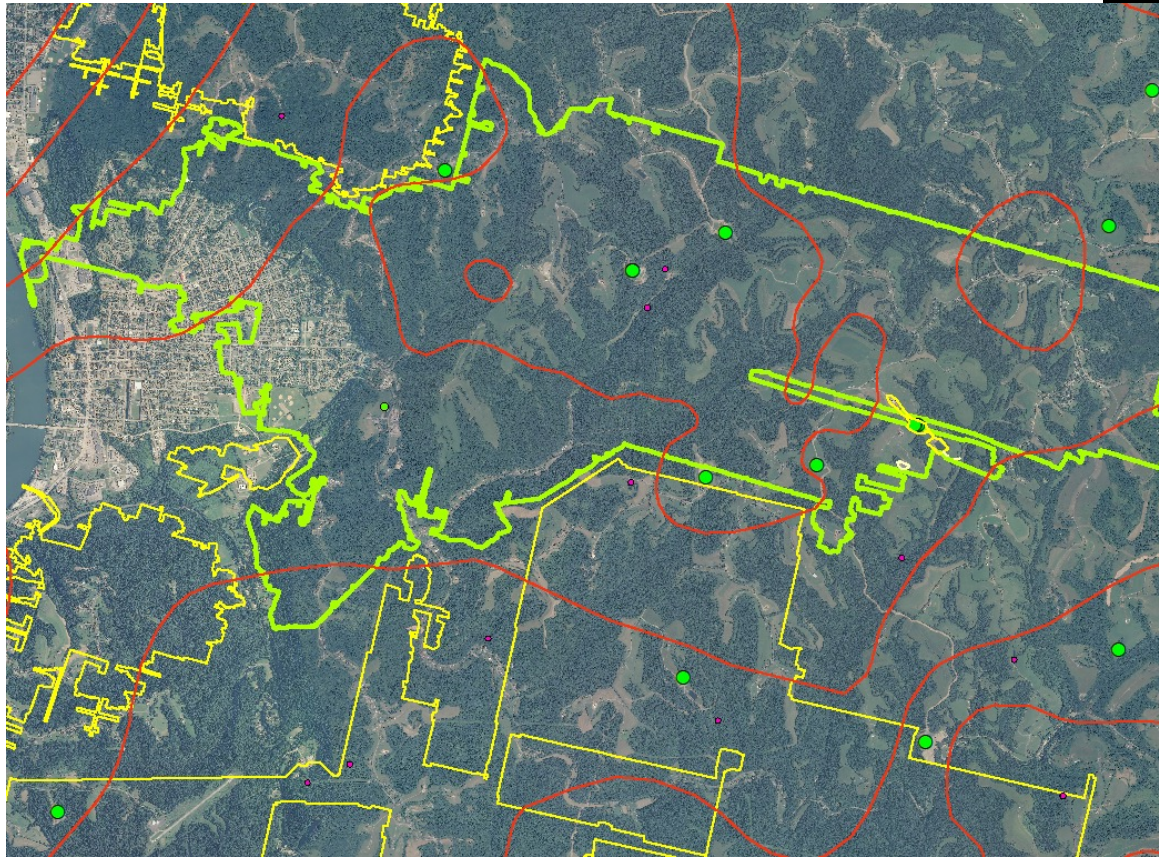
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Best matches for ADTI white papers

- ADTI Mission Statement... [Jump to text](#)
- White Papers by Coal Mining Sector of the Acid Drainage Technology Initiative. January 18, 2006. Version 1.01... [Jump to text](#)


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Mine Pool/Oil and Gas Interactions

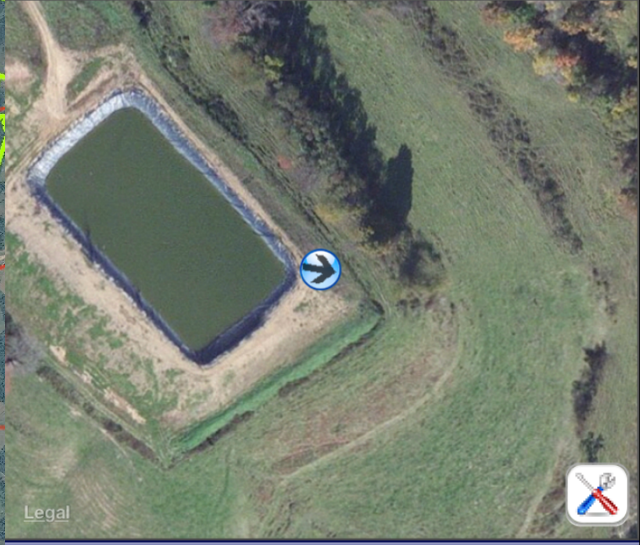


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GeoJot+ Album (54) 37 of 54



Latitude	N39° 54' 42.1"
Longitude	W80° 39' 5.9"
Accuracy	+/- 16 ft
Altitude	1240 ft
Direction	100° E
Date / Time	10/9/13 11:28 AM



Legal

Photo Map Attributes

1X

Mine Pools as Resource

