



Abandoned Mine Land Program 2016 Annual Accomplishments Report

1970s Imagery Provides a Window into the Past

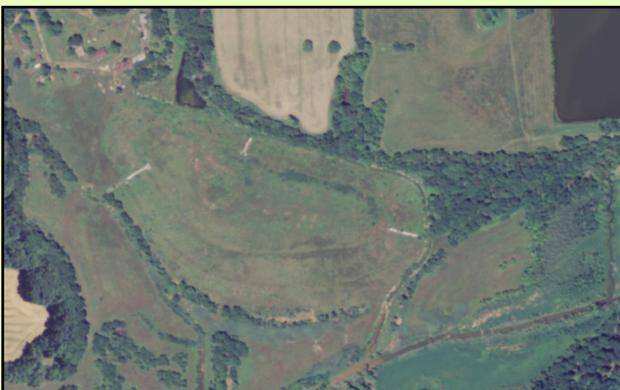
The Abandoned Mine Land Program now has instant access to a uniquely valuable source of historical aerial photography that will soon cover the entire coal region. This is thanks to the helpful and collaborative nature of the GIS community in Indiana.

GIS Specialist Jill Flachskam attended a GIS Users' Group meeting in July 2014, where she heard a presentation from INDOT Photogrammetrist Chip Campbell. He mentioned a project involving aerial imagery from the late 1970s. Since the Surface Mining Control and Reclamation Act was enacted in 1977, this imagery would show all pre-law coal mines in their original condition.

While the image tiles were available to share, Campbell also planned to mosaic and georeference the images for GIS applications. AML was the first program to express a specific need for the imagery, so he offered to work on the coal counties first. Progress quickened in summer 2016, when interns from Indiana's Geographic Information Office began working on the project.



With 15 of 18 counties complete, DNR GIS Coordinator Mike Martin has published an image service so that the layer is visible in ArcGIS Desktop and ArcGIS Online applications. The imagery will be used to refine the locations of reclaimed features and to confirm eligibility for future work. It also provides a unique perspective on the early challenges of the AML program and its many accomplishments.



Aerial photography from 1979 (above) shows the original condition of the gob pile and slurry pond at Site 319 Vandalia. The same site in 2014 (below) shows the impact of reclamation work.

2016 Project Summary

Project Type	Total	Funds Applied
AML	7	\$7,341,000.06
Emergency	10	\$46,598.40
STRC&D	1	\$3,891.48
Tree Planting	7	\$77,136.05
Unit Price Contract	35	\$323,633.63
Construction Total	60	\$7,792,259.61
Special Services	6	\$292,499.91
Grand Total	66	\$8,084,759.53

These figures represent all Abandoned Mine Land Reclamation projects that received funds in 2016.

The Special Services category includes research, mapping, design, and special grant-funded projects.

AML Projects

Site: 882 Snow Hill

Location: Fayette Twp., Vigo Co.

Cost: \$1,929,372.35

Dates: 12/15/2015 - 12/16/2016

Problem Description: Two steep and unstable coal refuse piles on either side of North Coal Creek were causing sedimentation and acid mine drainage problems. The pH of the creek was significantly impaired during low flow, while rain events caused flooding that blew out a section of Pennington Road.

Reclamation: To minimize water infiltration, the tops of the refuse piles were capped with a geomembrane plastic liner typically used in the landfill industry. The liner was then covered in 3 feet of soil. Regrading was performed to reduce runoff, and a new storm water control system consisting of diversion berms and ditches was installed.

The Flexamat® ditch liner contains concrete blocks to prevent erosion. Finally, a wetland was created at the south end of the project. The design utilized riprap cross-berms to add alkalinity and sediment traps to collect iron precipitate.



Snow Hill was the first AML project in the state to use either the geomembrane cap (left) or the Flexamat® ditch liner (below).



Other AML Projects

146	Davis Cemetery
978	Enos Gob Pile**
2083	Sugar Ridge Area 2
2148	McElroy Subdivision Grouting
2219	CR 750N Grouting
2251	CR 1100W Grouting

** Ongoing Project

Emergency Projects

Site: 3074 Davis Subsidence

Location: Washington Twp., Daviess County

Cost: \$3,709.95

Date: 3/22/2016



A backhoe fills the subsidence with aggregate material. The excavated soil forms a pile behind the equipment.

Problem Description: A dangerous opening 5 feet in diameter and 8 feet deep appeared next to a home in Sundale Trailer Court.

Reclamation: The opening was excavated to a stable base and backfilled with approximately 45 tons of aggregate.

Other Emergencies

3071	State Street Subsidence
3072	Beadle Subsidence #3
3073	Urban Subsidence #3
3075	Althoff Subsidence
3076	Padgett Subsidence
3077	McCain Subsidence
3078	Maden Subsidence #3
3079	Phillips Subsidence #2
3080	Hill Subsidence

Unit Price Contract Projects

Site: 2262 GSSF Red Lake Subsidences

Location: Jefferson Twp., Sullivan Co.

Cost: \$21,387.70

Dates: 2/16/2016 - 3/22/2016

Problem Description: Two subsidences near a horse trail in the Greene-Sullivan State Forest were discovered by Division of Forestry Wildlife Biologist Scott Haulton, who was conducting an acoustical survey at a nearby bat gate at Site 735. He determined that one of the new openings also had bats.



Reclamation: After a deep excavation, a 40-foot 48" culvert was installed in the larger opening. To preserve bat access, 4" angle steel cross bars were bolted onto the end. The smaller opening was backfilled using traditional methods.

An opening into the mine works (above right) was equipped with a gated culvert (above left) for bat utilization.

Sycamore Trails RC&D

Site: 2524 Alexander Subsidences

Location: Van Buren Twp., Clay Co.

Cost: \$3,891.48

Date: 9/22/2016

Problem Description: Several sags from 12" to 24" deep impacted a residential yard.

Reclamation: Three of the larger areas were excavated and determined to have stable material. Because heavy rock was not needed to maintain the integrity of the site, fill material was used to grade the sags to positive drainage. The landowner performed the revegetation as his match for the program.

Other Unit Price Contract Projects

57	Carlisle
172	New Wilson*
358	North Creek*
879	Froderman Subsidences*
979	Enos East Wetland*
985	Old Erin Coal - Prechtel Pit*
989	Clark/Russo Subsidence*
1084	Three States - Hilsmeier*
1101	Blackfoot Tipple*
2001	Raibley Emergency Maintenance*
2049	Justin McNeely Openings*
2066	Tammy Turpin Openings
2066	Tammy Turpin Openings*
2126	Deschamp - VO*
2201	Boonville Airport*
2221	Bender Subsidence #4
2234	Teague Subsidence*
2238	Rogers Sag Subsidence*
2245	Geneva Hills Subsidence
2246	Paul Johnson Subsidence*
2257	Miles Subsidence
2262	GSSF Red Lake Subsidences*
2265	Jackson Subsidence
2266	Mager Subsidences
2268	Dello Subsidence
2269	Wright Subsidences
2271	Burns Subsidence
2274	Hendrix Subsidence
2275	Beadle #3 Emergency Maintenance*
2280	Byers Subsidence
2281	Doug's Auto Seep
2283	Pfafflin Subsidence
2285	Bethell Subsidence
2286	Schwenk Subsidence #4

* Maintenance Project

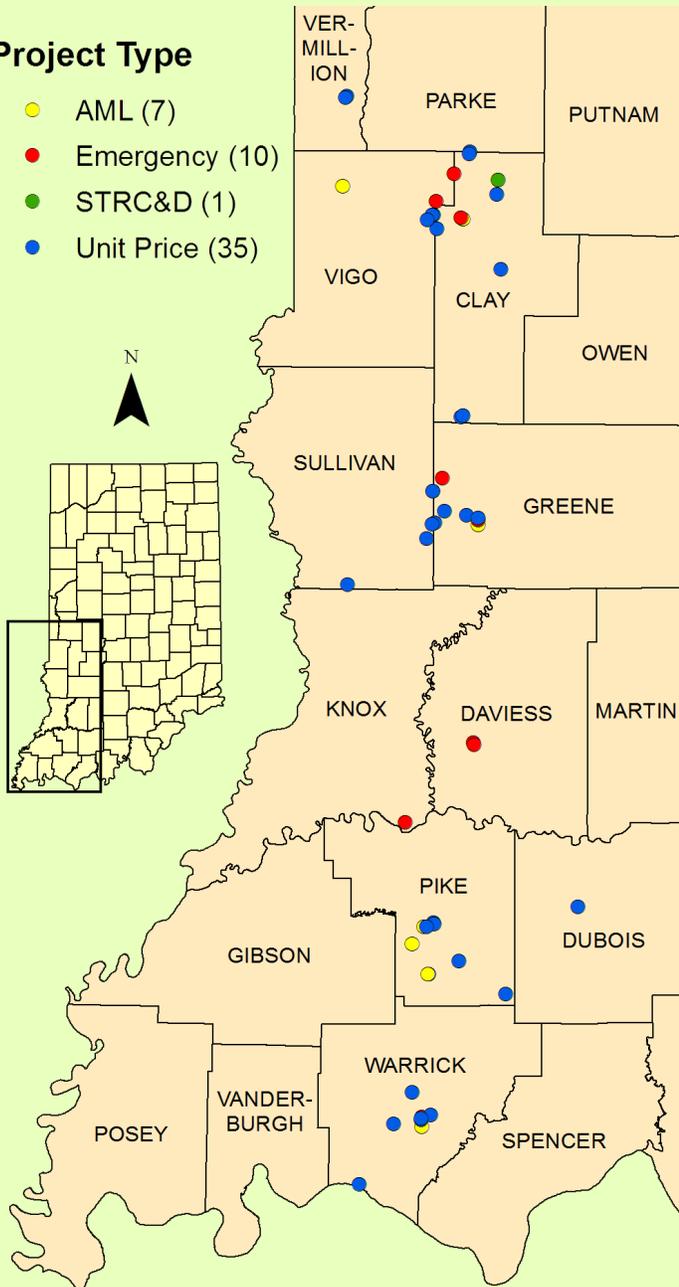


Soil material and tree roots were excavated to determine the stability of a large sag.

2016 Project Locations

Project Type

- AML (7)
- Emergency (10)
- STRC&D (1)
- Unit Price (35)



Special Services Contract Projects

The final **Coal Mine Information System** contract with the Indiana Geological Survey (IGS) was completed after all documents and data were successfully transitioned to Indiana DNR. Further data updates and public inquiries will be the responsibility of Reclamation staff.



The public web map showing the locations of current and historical coal mines is now hosted by the official DNR ArcGIS Online account at dnrmaps.dnr.in.gov/apps/cmis.htm.

IGS researchers presented the final results of their hydrologic studies at **Site 287 Friar Tuck** and **Site 2052 Minnehaha Slurry**.

Cardno ATC managed the installation of both the geomembrane cap and the ditch liner at **Site 882 Snow Hill**.

Cardno ATC performed **investigative drilling** monitoring well installation and abandonment.

Purdue University compared survival rates of **bare root and container seedlings** on reclaimed sites in this ongoing project.

Williams Aerial & Mapping collected digital **aerial photography** at multiple AML sites.

Staff Awards

Outstanding Achievement:

Jill Flachskam, GIS Inventory Specialist
Chris Hostetler, Chief Engineer

Staff News

Kelsey Pearman accepted the position of Reclamation Wildlife Biologist. Her last day with AML was July 15.

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Tree Plantings

Site	Name	Acres	# Trees
807	Selsam Pit	2	1,600
888	Log Cabin Coal - Riggs	4	3,300
978	Enos South Portion	19	15,400
1023	Sun Mining - Carbon #2	2.5	2,100
2007	Mark Luff	40	32,300
2012	Powder Mill	20	16,000
2162	Webber Dangerous Highwall	25	22,200
Total		112.5	92,900