2022 Winner of the Mid-Continent Abandoned Mine Land Reclamation Award

DNR Indiana Department of Natural Resources

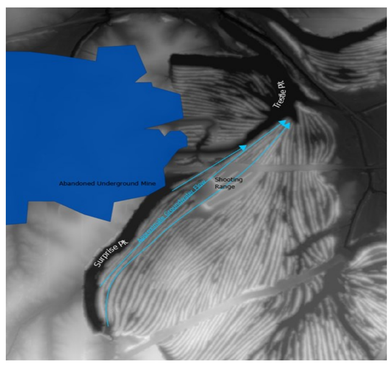
AML Site 2084, Surprise Pit

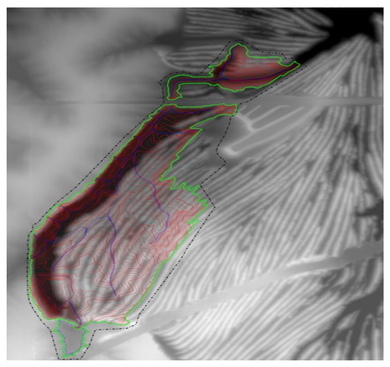
INDIANA DIVISION OF RECLAMATION

A Significant Safety Hazard To Visitors

This Project addressed 2,165 feet of dangerous highwall ranging from 26 to 52 feet in height on a final cut pit known as Surprise pit. The highwall was left by the Ayreshire #8 mine, operated by Ayreshire Colleries Group between 1934 and 1935. The area of concern spanned public and private land.

The highwall left by the Ayreshire #8 mine created significant safety hazard for property users and adjacent landowners. The public property is frequented by hunters and fishermen who enjoy the recreational opportunities in the area. The eroding undercut and unstable slopes presented a danger of falling or having rocks and debris falling onto a user of the pit below. In addition to the clear fall hazard, the erosion gulleys formed on the unstable highwall had attracted legacy waste dumping





Innovative Design Solutions

The final design utilized a naturalized drainage pattern that would feed water into 3 heavily compacted ponds built at an elevation much higher than the original pit and situated to minimize exposure to leak zones that would feed AMD seeps across the road. This helped move water across the surface without being impacted by acid producing materials in the spoil.

Construction: Unique Considerations

Much of the project area is located directly behind the popular Sugar Ridge Shooting Range. While there are large backstops and safety practices implemented at the range, personnel safety is of the upmost importance. Trajectory calculations were necessary to fully understand where the safety risks were on the project and mitigate those risks appropriately. Sugar Ridge personnel agreed to limit range hours to 9 a.m. to 5 p.m. Friday-Sunday. This allowed the AML contractor to develop a plan for working in questionable areas and have a high degree of confidence in personnel safety. This also facilitated incorporation of new-short range back stops into the grading plan for the project. This is an expansion that sportsmen had expressed a desire for. The AML program completed grading for the expansion while State Fish and Wildlife completed structural requirements.

Construction Challenges

Construction was complicated by drainage patterns on the site. Two large drainages entered the south end of Surprise pit while the entire area had to be dewatered through a culvert to be installed under the county road on the north end. To effectively convey water to the culvert, it would have to be temporarily impounded and then pumped after portions of site were completed. Wet weather kept the 131-acre drainage constantly feeding into the project area.

Preparing for Success

The AML program has learned from research, experience, and interaction with stakeholders that there are sometimes smaller problems with site management after construction. Numerous touches were added during the construction of this site to ease the management burden and ensure success.

- Wood Chips-All trees were chipped during clearing and chips incorporated into soil. Research performed by Purdue University has shown that incorporation of chips improves tree planting performance on Indiana AML sites.
- Raptor Perches- It has been shown that raptors can affect the population of animals most severely detrimental to tree survival.
- Beaver Exclusion Fence- Lake outlets all include wide and deep fenced area to help prevent beaver activity at the outlets of ponds. Removing beaver dams can be a daily management activity in this area.
- Fire Breaks- The project included warm season prairie plantings. Proper maintenance typically requires burning so prairie areas were separated from forest by naturalized drainage.