

2023 Sinkhole Filling AML Project Summary

Contractor Name: LeeRoy Fischer Construction, LLC

Contract Number: AM-885-23

Contract Bid Amount: \$47,311.25

Total Project Cost: \$48,911.25

- Locations:**
1. Two miles east of New Salem, ND, Section 15, T139N, R85W, Morton County
 2. One mile southeast and three miles west of Zap, ND, Sections 17 and 24, T144N, R89W, Mercer County
 3. Two miles northeast of Beulah, ND, Section 7, T144N, R87W, Mercer County.

2023 eAMLIS Project Information							
Project	Problem Area Number & Name	Project Start Date	Project End Date	Working Days	Project Cost	Estimated Population Impacted:	Acres Reclaimed
2023 Sinkhole Filling AML Project – Beulah Site	ND014 : Beulah PA	10/06/2023	10/13/2023	4	\$13,812.50	Estimated at 5 per site	0.05 Acres
2023 Sinkhole Filling AML Project – 2 Zap Sites	ND014 : Beulah PA	10/16/2023	11/10/2023	19	\$19,008.75	Estimated at 5 per site for a total of 10	0.26 Acres
2023 Sinkhole Filling AML Project – New Salem Site	ND054: New Salem PA	11/15/2023	11/22/2023	5	\$16,090.00	Estimated at 5 per site	0.05 Acres

AML Background

The Public Service Commission administers the Abandoned Mine Lands (AML) Program on behalf of the State of North Dakota. The State AML Program was approved by the U.S. Department of the Interior in 1981 under the authority of the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87, Title IV). Program funding comes from a federal reclamation fee on coal that has been mined in the United States since the late 1970's. These fees are placed into the AML fund and the money that North Dakota receives from this fund is used to eliminate existing and potential public hazards resulting from abandoned surface and underground coal mines.

AML sinkhole filling projects reduce the likelihood of death or injuries to property owners and the public. However, new hazardous sinkholes are reported each year. Sinkhole filling projects have been conducted annually in North Dakota and will likely continue into the foreseeable future. Some towns including Williston, Beulah, New Salem, and Garrison have abandoned underground mines within city limits and nearby developed property. The surface is inherently unstable and could collapse without warning. While most sinkholes in North Dakota occur in agricultural fields and pastures, the AML Division advises against the development of any land containing underground mines. Anyone with concerns or questions about historic coal mines in North Dakota may contact the Public Service Commission AML Division for further information.

Project Overview

In 2023 the PSC AML Division filled 49 sinkholes on four AML sites in the western half of North Dakota.

The AML Division follows these steps to reclaim sinkholes:

1. Remove and stockpile topsoil or other suitable plant growth material from around/within the sinkhole and borrow areas.
2. Excavate the sinkhole (as directed) with a backhoe or excavator.
3. Backfill the sinkhole with approved fill material; if trucks are used, compaction with a backhoe bucket and wheels is required between dumps. If a scraper is used, holes shall be ramped into and filled in such a way as to achieve maximum compaction.
4. Grade the area to blend with adjacent topography and re-establish drainage.
5. Respread topsoil evenly over disturbed areas and finish grade.
6. Till all areas with a Harley Box Rake (or equivalent equipment) sufficiently to break up all clods, prepare the seedbed, and cover all seed.
7. Seed the disturbed areas with the required mixture.
8. Fill material may be taken only from approved borrow areas determined in consultation with the property owner. Borrow areas are located as near as possible to the sinkholes, but haul distances may vary.

Beulah

One very large sinkhole was filled on this site between October 6th and 13th, 2023. The sinkhole opened up near a trail on the edge of a cropland field, northeast of Beulah (**Figure 1**). This sinkhole was approximately 30 feet in diameter and over 20 feet deep. It was so large, that pigeons had claimed it as a temporary home. Construction was initiated by salvaging topsoil from inside and around the sinkhole. Dirt was then trucked in from an offsite location and the excavator operator compacted it in lifts to reduce the chance of settling (**Figure 2**). Once the sinkhole was filled, the salvaged topsoil was respread, and the reclaimed area was returned to cropland production.



Figure 1: This large dangerous sinkhole opened up near a trail on the edge of a cropland field.



Figure 2: The sinkhole was filled and is about to be respread with topsoil.

New Salem

Fifteen sinkholes were filled in a cropland field between November 15 and November 22, 2023 (**Figures 3 and 4**). One sinkhole had developed in an area that was difficult to see, so it had not been previously reported or observed during site investigations. A change order was issued to account for the increased cost of filling the additional sinkhole. After all the sinkholes were filled, the borrow area was graded, tilled, and seeded (**Figure 5**).



Figure 3: *This sinkhole was located in the middle of cropland.*



Figure 4: Reclaimed sinkhole in cropland.



Figure 5: The borrow area after it was graded and seeded.

Zap

Thirty-three sinkholes were filled at two AML sites between October 16 and November 10, 2023 (**Figures 6 and 7**). Numerous sinkholes were over 10 feet deep, and many had small surface openings which made them difficult to see. Once all the sinkholes were filled, topsoil was respread, and the area was seeded with a native pasture seed mixture. During the process, a new sinkhole opened up from the weight of the contractor's payload (Figure 8). A change order was issued and the new sinkhole was filled.



Figure 6: This dangerous sinkhole developed in pastureland.

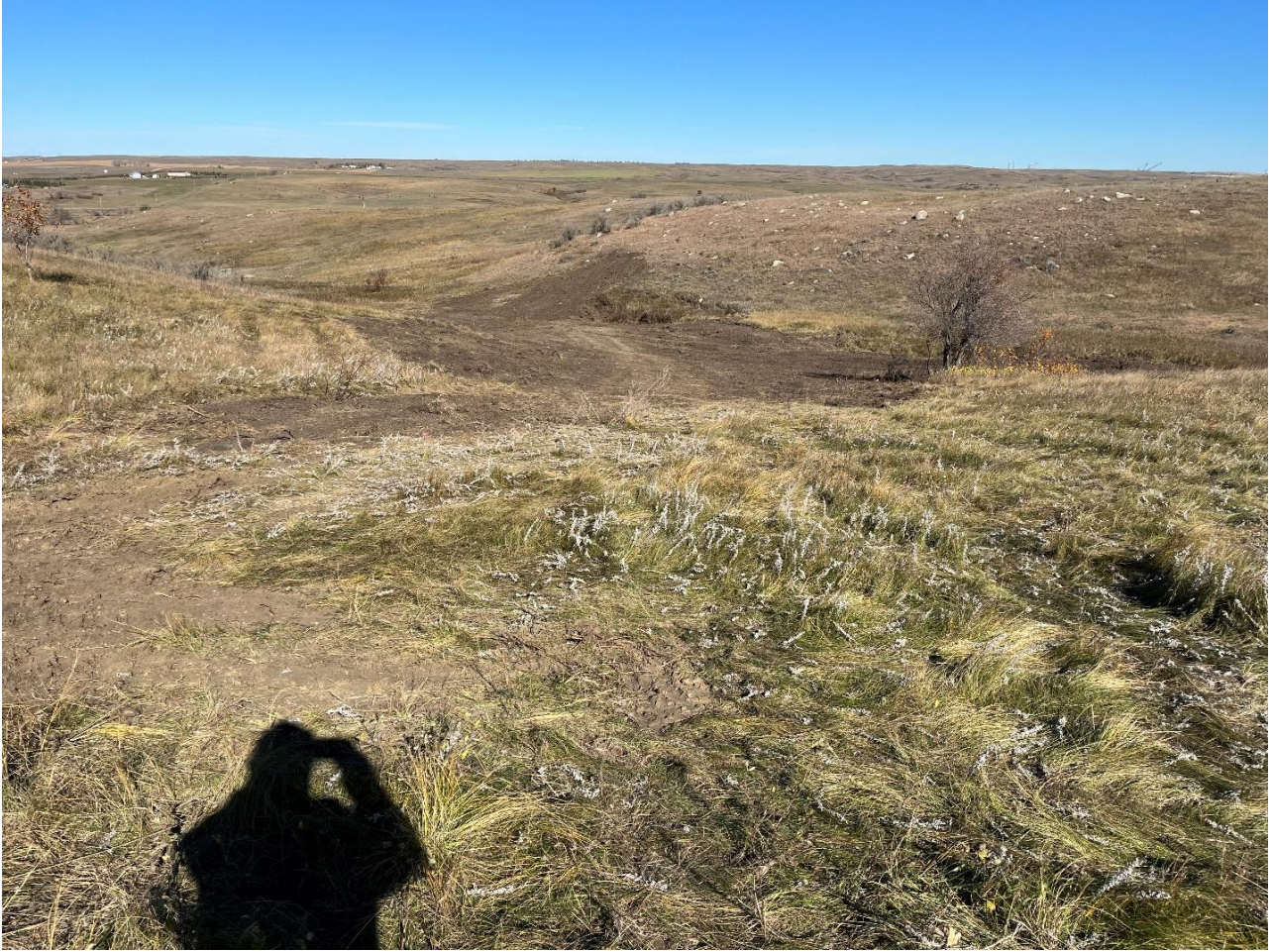


Figure 7: Pastureland area reclaimed where several sinkholes were filled by grading.

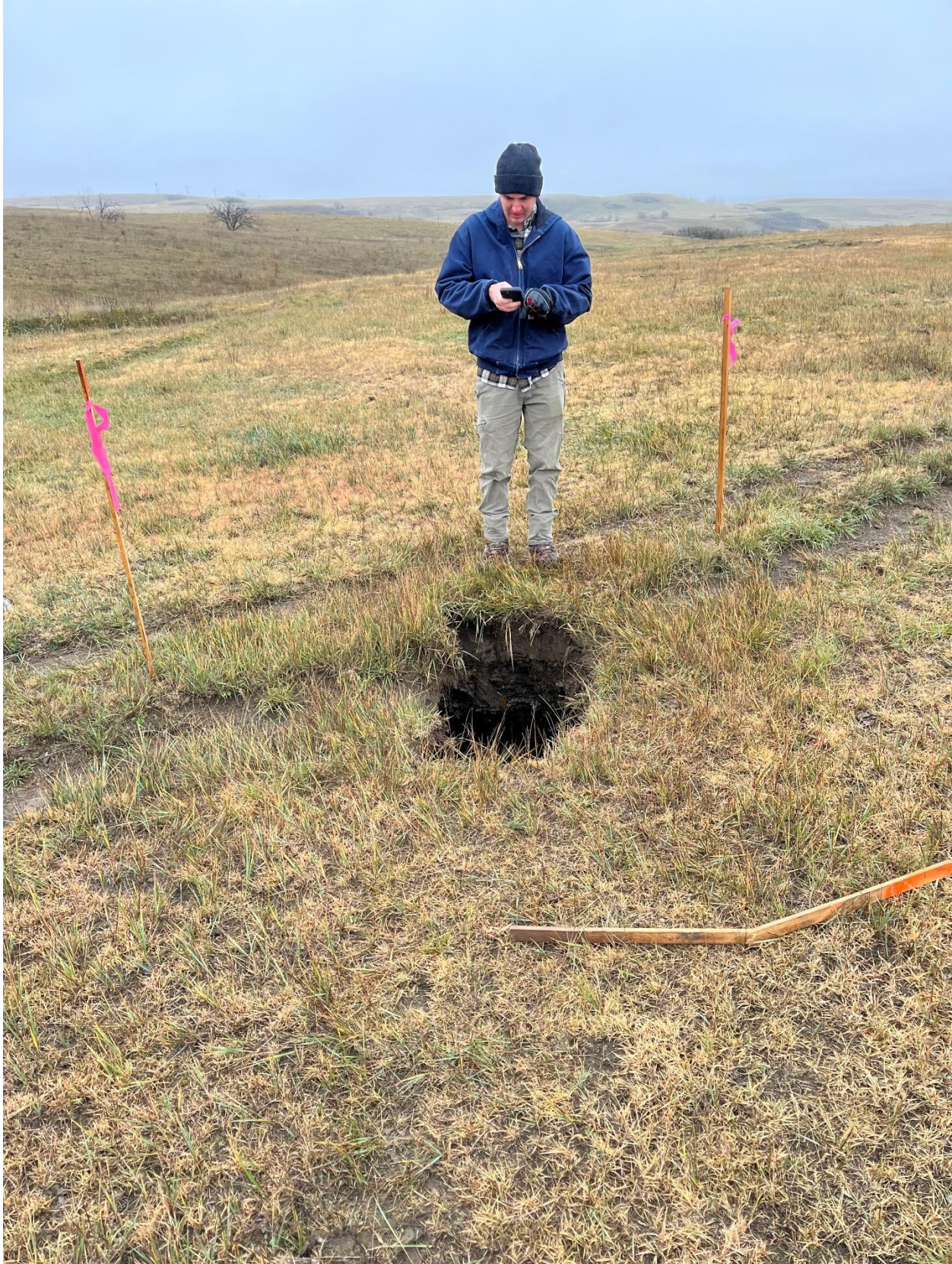


Figure 8: This new sinkhole opened up after the contractor drove over the area with his payload. PSC staff collect sinkhole GPS locations and other related information which are stored in a Geographic Information System database at the PSC.