

2021 Buechler/Velva Phase 2 Project Summary

Contractor: Martin Construction, Inc. of Dickinson ND

Contract Bid: \$351,347

Contract Cost: \$325,483

Contract Number: AM-848-21

2021 eAMLIS Project Information							
Project Type	Problem Area Name & Number	Project Start Date	Project End Date	Working Days	Project Cost	Estimate Population Impacted	Problem Reclaimed
Surface/Highwalls	ND004/Buechler Knorr	7/7/2021	10/1/2021	62	\$308,395	170, 10% of deer licenses in 2021	2800 ft of Highwall
Underground/Sinkholes	ND004/Buechler Knorr	8/16/2021	9/1/2021	13	\$17,088	170, 10% of deer licenses in 2021	4.7 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.

Site History

Historical mining occurred at different times at the three sites reclaimed in the Buechler/Velva Phase 2 AML Project. The Quist Site was an underground mine that operated in the early 1900s until around 1930. Mining at the Knorr Site began in the 1950s. The start date of the Lindahl Site is unknown, but a 1978 aerial photo shows mining at the Knorr and Lindahl Sites as complete. An area adjacent to the Lindahl site was reclaimed in 2010 and 2011. The entire area could not be addressed at this time due to limited funds.

Knorr Site Sec. 30-T152N-R81W

The Knorr Site was the most difficult of the three project areas. This site contained 1,600 feet of dangerous highwall that averaged 50 feet in high with no topsoil available for salvage. Erosional piping created dangerous holes and instability along the highwall. Cropland and several wooded draws surround the site. Two small ponds upstream of the highwall contained surface water from the large watershed. The design included back-sloping the southern highwalls and using the excess spoil material to backfill the highwall adjacent to the southern pond (**Figure 1**). A floating turbidity curtain was installed prior to construction in the southern pond to prevent sedimentation.

The reclamation of the Knorr Site began with the construction of ramps by a Cat D8 dozer to gain access to the highwalls on both sides of the drainage (**Figure 2**). Reclamation of the site was conducted exclusively with dozers due to the steepness and instability of the highwalls. A D8 was initially used and a smaller D6 dozer was brought in later to do the more precise grading (**Figure 3**). Reclamation of this site involved moving approximately 28,350 cubic yards of spoil material and replacing a 36-inch corrugated metal pipe that had been compromised by water erosion.

After grading was complete, Martin Construction hauled 2,350 cubic yards of manure to the site and spread it evenly. The area was then tilled to four inches and seeded. Finally, 1,360 feet of erosion control blanket was placed to stabilize steep slopes. Construction at this site was completed by October 1, 2021 (34 Days). A small slope failure on the steep, southern highwall occurred during construction and repair attempts failed. This area continues to settle and will be addressed once it has stabilized. The vegetative growth promoted by the incorporation of manure is clearly evident in an August 22, 2022 photo (**Figure 4**).

Lindahl Site Sec. 28-T152N-R81W

The Lindahl Site (**Figure 5**) is located approximately 2 miles southeast of the Knorr Site and at 14.5 acres was the largest of the un-reclaimed abandoned mines (**Figure 6**). The site contained 1,200 feet of dangerous highwall that was up to 40 feet in height. Erosion features 3 to 4 feet deep had developed in the main drainage along portions of the highwall. The site was partially reclaimed in 2010 and 2011.

The reclamation design for the site involved back-sloping the south highwall and filling it in with spoil material reclaimed from the northern spoil piles. Silt fences were installed before any construction activity to prevent any sediment from leaving the site. Several large trees were removed with a tree shredder (**Figure 7**) which reduced the standing trees to wood chips. Smaller wood chips were salvaged and incorporated into the topsoil.

The design also included constructing an engineered drainage channel to minimize erosion before the site is vegetated and ensure long-term stabilization. A concrete erosion control blanket was placed in the steeper areas of the drainage and an erosion control blanket was used to line the gentle slopes.

Reclamation began on July 7 and was complete by September 27, 2021 (58 Days). A total of 44,215 cubic yards of spoil material was used to fill the highwall. Over 7,600 cubic yards of topsoil was salvaged and respread. Once topsoil was respread, 1,325 cubic yards of manure were hauled to the site and spread over the area. The manure was tilled to a depth of 4 inches. The area was then fertilized and seeded with a native grass mix and oats cover crop (**Figure 8**).

Quist Site Sec. 1-T151N-R81W

The Quist Site (**Figure 9**) involved reclaiming approximately 90 sinkholes on a 4.7 acre tract (**Figure 10**). The sinkholes varied between 5 to 15 feet in depth and were up to 35 feet long and 20 feet wide.

The reclamation of the site involved stripping topsoil from the bottom of the sinkholes and then filling the excavated area to the approximate original contour with fill material taken from an adjacent spoil pile (**Figure 11**). Once the fill material was placed and compacted in the sinkholes the salvaged topsoil was respread. The area was seeded in late September with the native grass seed mix and then mulched and crimped. Construction on the Quist Site began on August 16, 2021, and was completed by September 1, 2021 (13 Days). A total of 4,890 cubic yards of soil was used to fill the sinkholes (**Figure 12**).

Project Statistics

- 2,800 lineal feet of highwall reclaimed
- 90 sinkholes reclaimed
- 74,918 cubic yards of earth moved
- 7,872 cubic yards of topsoil salvaged and respread
- 3,677 cubic yards of manure was added as a soil amendment
- Approximately 20 trees removed

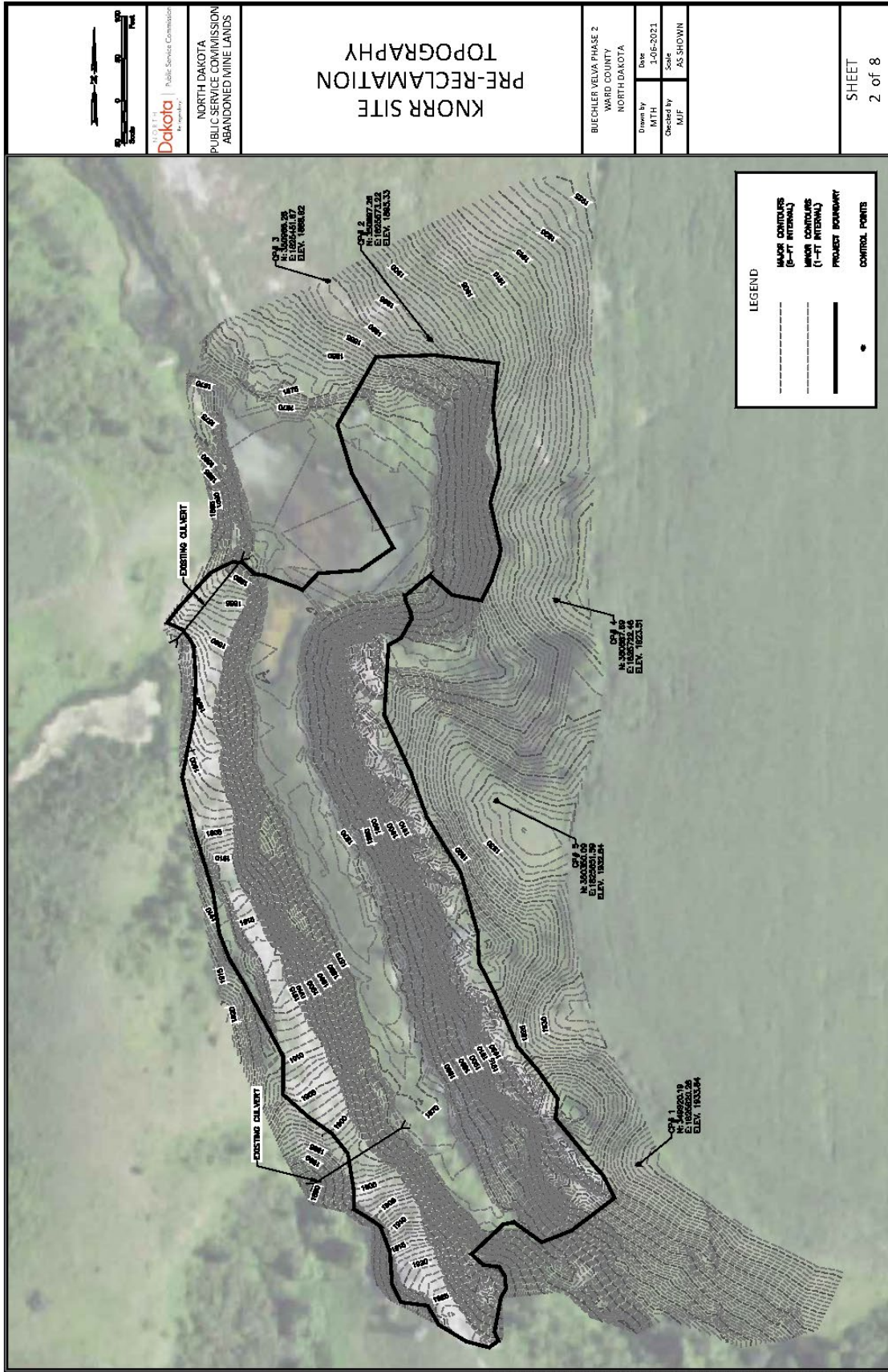


Figure 1: Knorr Site Pre-Reclamation Topography Map



Figure 2: Starting Reclamation of the Knorr Site.



Figure 3: Dozers Moving Spoil Material at the Knorr Site.



Figure 4: Completed reclamation at the Knorr Site on August 22, 2022.



Figure 5: *Lindahl site before reclamation.*

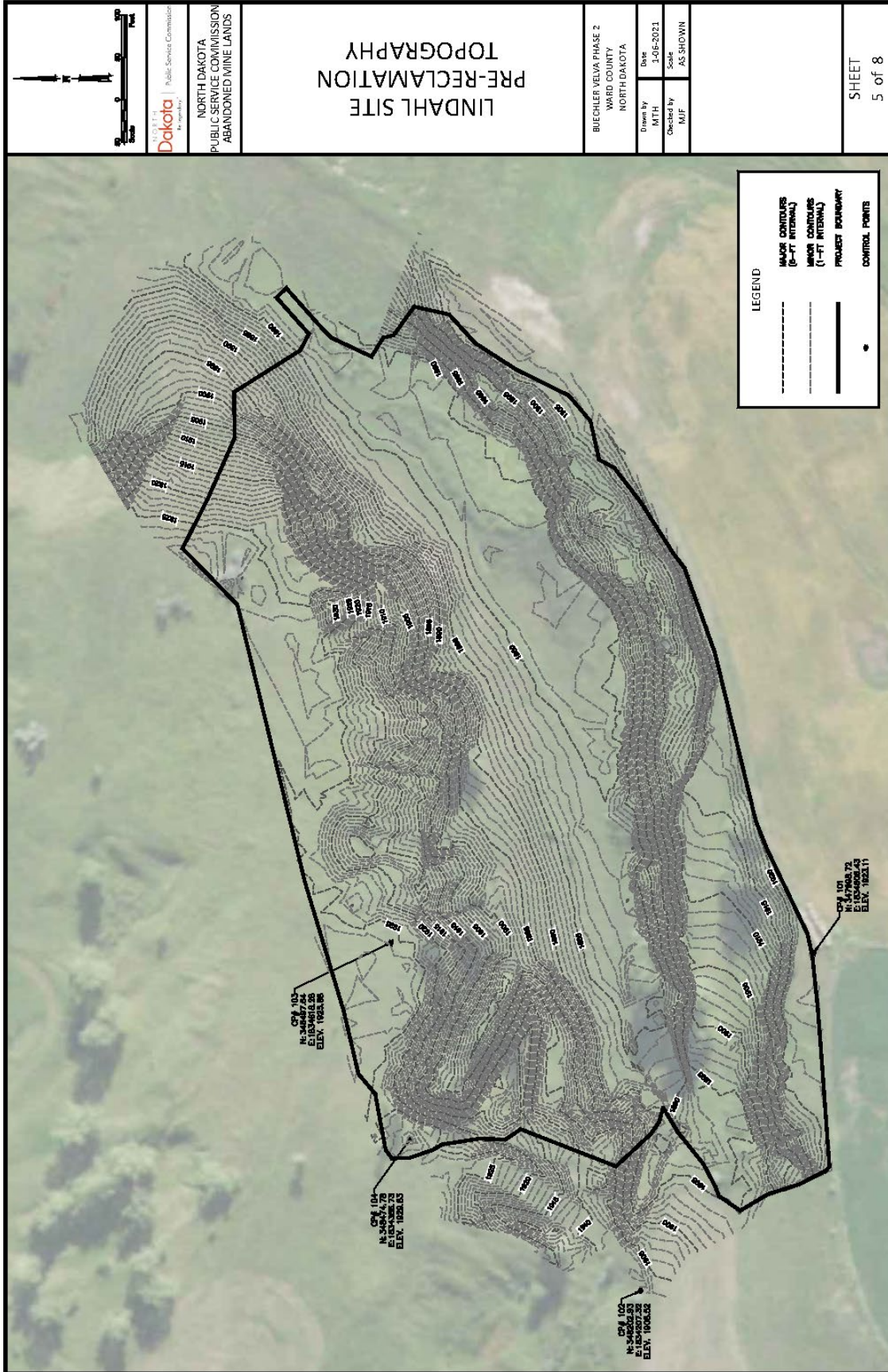


Figure 6: Lindahl Site - Pre-reclamation topography map.



Figure 7: Trees being shredded at the Lindahl Site.



Figure 8: *Lindahli Site after reclamation.*



Figure 9: *Quist Site before reclamation.*

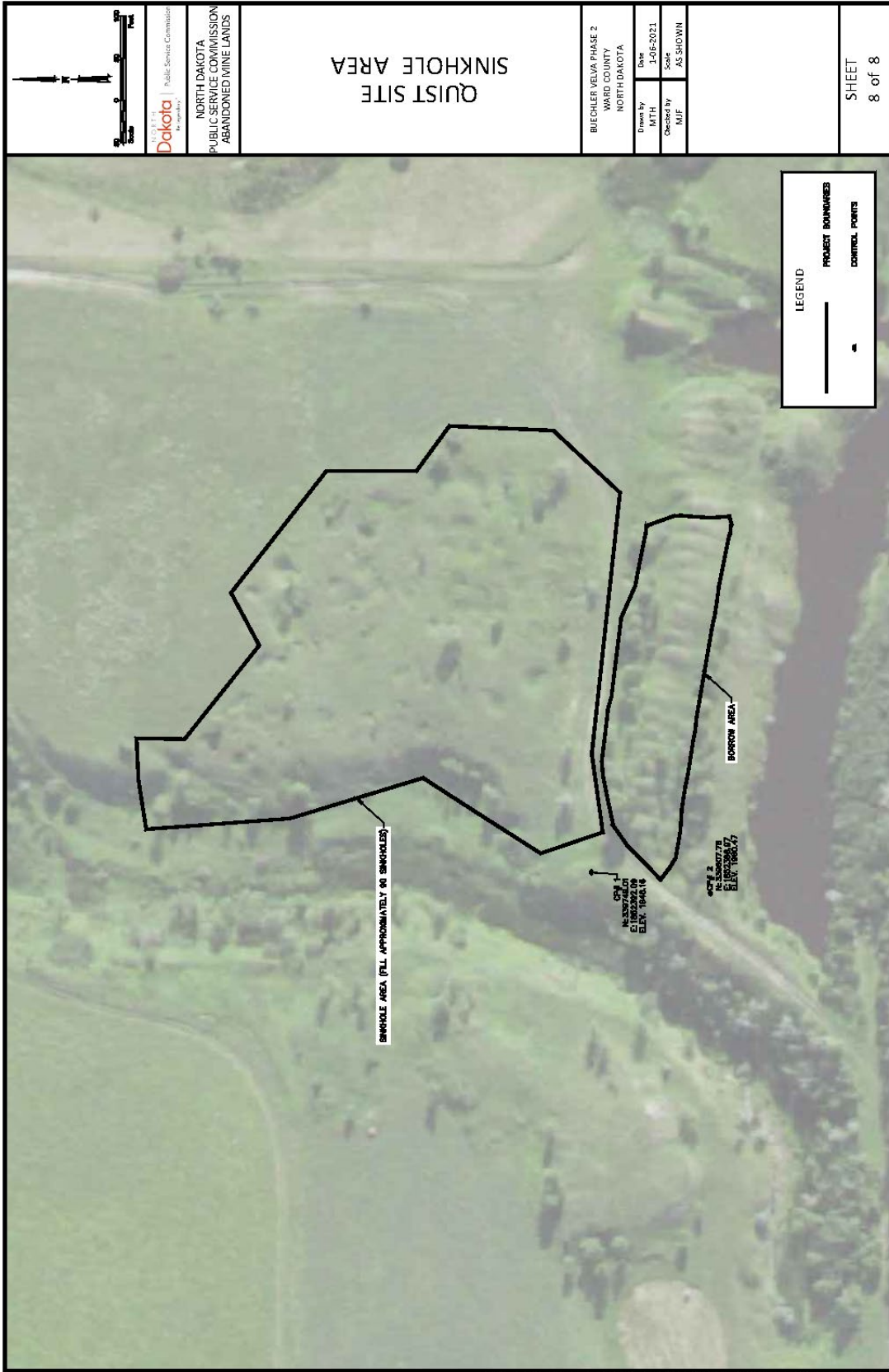


Figure 10: Quist Site - Pre-reclamation map



Figure 11: Sinkhole filling at the Quist Site.



Figure 12: Completed reclamation at the Quist Site.