COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

MINERALS PROGRAM INSPECTION REPORT
PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME: Fox #1 Clay Mine	**MINE/PROSPECTING ID#:** M-1977-219	**MINERAL:** Clay, sandstone, and borrow material	**COUNTY:** Pueblo
INSPECTION TYPE: Monitoring	**WEATHER:** Clear	**INSP. DATE:** March 28, 2023	**INSP. TIME:** 12:00
OPERATOR: Summit Brick & Tile Co.	**OPERATOR REPRESENTATIVE:** Julie Welte	**TYPE OF OPERATION:** 112c - Construction Regular Operation	

REASON FOR INSPECTION: Normal I&E Program	**BOND CALCULATION TYPE:** Complete Bond	**BOND AMOUNT:** $213,000.00
DATE OF COMPLAINT: NA	**POST INSP. CONTACTS:** None	**JOINT INSP. AGENCY:** None
INSPECTOR(S): Amber Michels	**INSPECTOR'S SIGNATURE:** 	**SIGNATURE DATE:** April 25, 2023

The following inspection topics were identified as having Problems or Possible Violations. OPERATORS SHOULD READ THE FOLLOWING PAGES CAREFULLY IN ORDER TO ASSURE COMPLIANCE WITH THE TERMS OF THE PERMIT AND APPLICABLE RULES AND REGULATIONS. If a Possible Violation is indicated, you will be notified under separate cover as to when the Mined Land Reclamation Board will consider possible enforcement action.

INSPECTION TOPIC: Backfilling & Grading

PROBLEM: The length of the highwalls measured at the site exceed what is allowed under the approved mining and reclamation plan. This is a problem at this time for failure to perform the reclamation prescribed by the reclamation plan in accordance with C.R.S. 34-32.5-116(1). Therefore, the current mine plan and reclamation plan needs to be updated and clarified pursuant to C.R.S. 34-32.5-112 (1)(c)(VI) and 34-32.5-112(2)(b). The Operator must provide sufficient information to describe or identify how the Operator intends to conduct the operation.

CORRECTIVE ACTIONS: The Operator shall submit a Technical Revision, with the required $216 revision fee, to update and clarify the current approved mining and reclamation plan to reflect existing and proposed activities by the corrective action date. Or, the Operator may backfill and grade a portion of the existing highwall that is in excess of the 1000 foot maximum length allowed by the mining and reclamation plan.

CORRECTIVE ACTION DUE DATE: 5/28/23

OBSERVATIONS

The Fox #1 Clay Mine was inspected by Amber Michels with the Division of Reclamation, Mining and Safety (Division/DRMS). This inspection was conducted as a routine monitoring inspection. The site was previously inspected by the Division on October 24, 2017 as a pre-operational inspection in response to an Amendment Application (AM3). Accompanying me during the inspection was Julie Welte of Summit Brick & Tile Co., Kerry McKlem and Mark Jesik. The weather was clear and cool.

The Fox #1 Clay Mine is located in Pueblo County approximately 17 miles south-west of Pueblo, Colorado and 4 miles northeast of Beulah, Colorado. The Fox #1 Clay Mine is a 1,046.8 acre 112c Construction Materials Reclamation Permit with a maximum allowed disturbance of 40 (+/-) acres. The primary commodities being mined at the site are clay, sandstone, and borrow material extracted from the Glencairn Formation of the Dakota Sandstone Group. The approved post-mining land use is rangeland.

Availability Of Records:
The Operator was asked if they had the blasting records available on-site for the past three years in accordance to their approved mining plan. They said that they do keep those records, and that they would verify their location onsite. Upon follow up correspondence, the Operator stated that the records kept for the past three years are kept in a folder in the shipping container office located at the mine and are available upon request.

Acid And Toxic Materials:
Fuel is stored on-site. The Operator stated that approximately two years ago, a new double-walled fuel tank with a concrete berm was installed. The fuel storage was observed during the inspection (Photo 10) and appears to be in good condition.

Backfilling and Grading:
The current mining plan states that the maximum length that will require sloping is 1,000 linear feet. During the inspection, the observed highwalls in the active mining areas were measured using Esri Field Maps (Photos 11-13, 21-24, and 31-34; Maps 1, 3, & 4). The length of the highwalls measured during the inspection equaled 2,477 feet. Post inspection, 401 additional feet were measured using Google Earth for an area that was inaccessible during the inspection (Photo 17 and 22; Maps 1 & 3) as well an estimated 59 feet of historic highwall that has recently been blasted (Photo 7; Maps 1 &3). The total highwall length determined for the site is currently 2,937 feet. A problem is cited at the beginning of this report regarding this issue. The Operator will need to submit a technical revision to allow for a greater maximum highwall length by the corrective action date. Alternatively, the Operator may choose to reclaim 1,937 feet of the currently exposed highwalls and backfill and grade them to a 3H:1V slope.

In the south-west portion of Area A, reclamation has recently begun. The Operator stated that they have recently graded this area and have yet to seed it (Photos 26 and 27). No slopes greater than 3H:1V were observed. Additionally, a clay stockpile that was not labeled on the Operator's most recent annual report was observed. The Operator stated that the pile had been placed in this area after the annual map was submitted (Photo 27). All observed product stockpiles onsite appeared to be well maintained and stable (Photos 2, 6, and

27-30).

Excess Spoil and Dev. Waste:
Woody debris was observed along the working area in the north-west portion of Area A (Photo 18). When asked about this, the Operator stated that that material was stockpiled while clearing the pit area and that it is systematically transported off-site to be used as firewood for their neighbors. The Operator reiterated that no woody debris is or has been used for backfill, complying with Rule 3.1.9(2).

Explosives:
The areas that have been blasted since the last inspection are within Area A and Area B. Blasting in Area B has recently begun, and when asked if they have notified persons within a half-mile radius before commencing, per the currently approved Blasting Plan requirements, they stated that they have. Kerry McKlem, who also accompanied us during the inspection, confirmed that he had received notice of upcoming blasting activities that were to be conducted within a half-mile of his property.

The area in Area B that has recently been blasted is the historic highwall that had been left from a 1976 pre-law mining operation (Photos 7 and 8). The observed piles of sandstone are resultant of the Operator's blasting the sandstone cliffs for the extraction of clay. Because the Operator is blasting previously existing highwalls, the newly affected highwall length has been incorporated into the reclamation costs.

Financial Warranty:
The current bond held by the Division for this site is in the amount of $213,000. The Division updated the cost estimate to reflect current conditions and the required surety is in the amount of $711,088 a difference of $498,088. The Division's cost estimate is enclosed with this report. The Operator will have 14 days (May 12, 2023), from the issuance of this report to submit any questions on the cost estimate. If no questions are received, the Division will issue a surety increase notice for the difference. The Operator will have 60 days from the date of the notice to submit and obtain acceptance of the increase from the Division in accordance with Rule 4.2.1(2).

Fish and Wildlife:
During the amendment review process, the Operator was asked to explain how they would comply with recommendations from Colorado Parks and Wildlife (CPW) regarding the protection of raptors on site. Within the Operator's second adequacy response, they state that upon further discussion with CPW, the Operator would be responsible for making observations in the field to "identify and locate active nests, nightly roosts, and active hunting areas that may exist in the area to be disturbed and take the appropriate actions to prevent their disturbance". When asked if the Operator has observed any raptors in the area, they stated that they have not. The Division reminds the Operator that if raptor sites are observed, the Operator has committed to contact CPW to assess possible impacts mining activities may have on the site. If mining is determined to have an impact on the raptor sites, the Division advises the Operator to confer with CPW and discuss strategies for mitigation.

Hydrologic Balance:
The Division did not observe any water on-site during this inspection.

Gen. Compliance With Mine Plan:

In the Operator's 2023 Annual Report, submitted March 9, 2023, they stated that 39.8 acres are currently disturbed. Using Google Earth and field observations, the Division estimates the current disturbance to be around 41.6 acres. The Operator is currently approved to disturb a maximum of 40 (+/-) acres at a time. The Operators will be required to submit a Technical Revision to allow for a greater amount of maximum disturbance than what is currently approved if they anticipate disturbing more land. Alternatively, the Operators may reclaim existing areas and request an acreage release in accordance with Rule 4.17.1. However, until the Division approves a release, no additional land is approved to be disturbed at this time.

On the 2023 Annual Report Map (see Map 2), Areas E1 and E2 are labeled as potential mining areas. The Division's 2017 inspection report states that the canyon and drainage areas that cut through the mine site (Wales Canyon and Galbeth Creek) were not proposed to be mined and represent breaks in the mining area. When asked, the Operator stated that they'd follow up with the map preparer and ask why E1 and E2 were listed as potential mining areas. Upon following up, the Operator stated that their map preparer informed them that areas E1 and E2 are not actually part of the drainage ways of Galbeth Creek or Wales Canyon. She then said the preparer stated that in the field it is easier to see this, and it's more difficult on the topographical map due to the large contour intervals. The Operator reiterated that their approved mining plan states that all surface drainage ways will remain in their current state, and that they will adhere to this requirement when they mine near the drainage ways in the future.

The Division reminds the Operator that their mining plan also states that "no highwalls or backfilled slopes are planned on the sides where the mining can daylight out into the canyons that bisect several of the areas within the property". Additionally, in their approved Water Information Exhibit G narrative, they state the canyon areas will not be changed by mining. Prior to creating disturbance within Areas E1 and E2, the Operator will have to ensure their mining procedure will comply with the requirements approved in their mining plan.

Roads:

The entrance road and internal roads are well maintained. The currently approved reclamation plan allows for all on-site roads to remain upon releasing the Operator of reclamation responsibility.

Reclamation Success:

At this time, of the 8.7 acre backfilled and 6.2 acre graded areas marked as reclaimed on the 2023 annual report that were observed during the inspection, most appear to not yet be eligible for release. They appear to comply with the reclamation plan thus far, but they've yet to be sufficiently revegetated. However, the area north of the mine sign at the site entrance may soon be, if not already, eligible for a release request (Photo 1).

Signs and Markers:

A mine sign in compliance with Rule 3.1.12 was observed on the north side of the entrance road (Photo 1).

Topsoil:

Four topsoil piles were observed onsite (Maps 2 and 3: Photos 2, 3, 8, 9, 15, 19 and 20). All four of the piles appeared to be in stable configurations and vegetated to reduce erosion in compliance with Rule 3.1.9. Additionally, all four piles are located up-gradient of drainage pathways as approved in the Operator's mining

plan.

This concludes the Division's Inspection Report; a few maps displaying topics discussed during the inspection and a subset of corresponding photographs that were taken during the time of the inspection are included below. If you need additional information or have any questions, please contact me by email at amber.michels@state.co.us or by telephone at (720) 836-0967.

Inspection Contact Address
Julie Welte
Summit Brick & Tile Co.
601 East 13th Street
Pueblo, CO 81002

Enclosure: DRMS 2023 Cost Estimate

CC: Matthew Welte, Summit Brick & Tile Co.
Jared Ebert, DRMS

GENERAL INSPECTION TOPICS

The following list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each

(AR) RECORDS---------- Y	(FN) FINANCIAL WARRANTY-------- Y	(RD) ROADS---------- Y
(HB) HYDROLOGIC BALANCE---------- Y	(BG) BACKFILL & GRADING---------- PB	(EX) EXPLOSIVES--------- Y
(PW) PROCESSING WASTE/TAILING---- N	(SF) PROCESSING FACILITIES------- N	(TS) TOPSOIL---------- Y
(MP) GENL MINE PLAN COMPLIANCE- Y	(FW) FISH & WILDLIFE---------- Y	(RV) REVEGETATION---- N
(SM) SIGNS AND MARKERS---------- Y	(SP) STORM WATER MGT PLAN---- N	(RS) RECL PLAN/COMP-- Y
(ES) OVERBURDEN/DEV. WASTE--------- Y	(SC) EROSION/SEDIMENTATION--- N	(ST) STIPULATIONS------- N
(AT) ACID OR TOXIC MATERIALS------- Y	(OD) OFF-SITE DAMAGE----------N	

Y = Inspected / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

PHOTOGRAPHS

Photo 1: Mine sign located to the north of the entrance road. The area behind the mine sign has been reclaimed.

Photo 2: Looking west at product stock piles and topsoil pile #4 from the entrance road.

Photo 3: Looking southwest at topsoil piles #3 and #4 from the entrance road.

Photo 4: Looking east from an internal road at pit berms.

Photo 5: Looking east from an internal road at active pit.

Photo 6: Looking west from internal road at sandstone stockpiles.

Photo 7: Looking north from newly disturbed area at the historic highwalls.

Photo 8: Looking west at rubble piles resultant from blasting the historic topsoil piles.

Photo 9: Looking southwest at topsoil pile #1 located along the western side of Area A.

Photo 10: Looking north at the double-walled fuel tank with concrete berm.

Photo 11: Looking north at the top of the pit area. Photo taken where the high wall measurement for this section began.

Photo 12: Looking north-east from the top of the pit area.

Photo 13: Looking west from the top of the pit area. Photo taken at the extent of the highwall measurement during the inspection for this pit.

Photo 14: Looking south-west into pit in photos 10-13.

Photo 15: Looking south-east at the path up onto topsoil pile #2.

Photo 16: Looking south-east at the pits adjacent to those in photos 10-14. Arrow points to the middle-most highwall measured (featured in photos 21-22).

Photo 17: Looking west across south-east portion of the pit in photos 10-14. The yellow arrows point to the section of highwall that was inaccessible to measure in the field (in blue on Maps 1 and 3).

Photo 18: Looking west from the top of the highwall located near the south-east side of topsoil pile #2 at woody debris.

Photo 19: Looking north at topsoil pile #2 from top of the highwall.

Photo 20: Looking south-east from top of the highwall, looking at topsoil pile #3.

Photo 21: Looking south-east from middle highwall.

Photo 22: Looking northwest at the measured middle section of the highwall. The arrow points to the east edge of the unmeasured section (blue on Maps 1 and 3).

Photo 23: Entrance to south-west pit area, looking south.

Photo 24: Highwall used to measure average highwall height. An 11.5" x 10" binder was used for scale, the highwall was approximately 18' tall.

Photo 25: Looking west along the south-west pit's highwall.

Photo 26: Looking at east across the recently reclaimed area in Area A.

Photo 27: Looking north from the recently reclaimed land in Area A. A new clay stockpile was placed shortly before the Division's inspection.

Photo 28: Looking west at clay stockpiles seen on Maps 2 and 3.

Photo 29: Looking west at a clay stockpile seen on Maps 2 and 3.

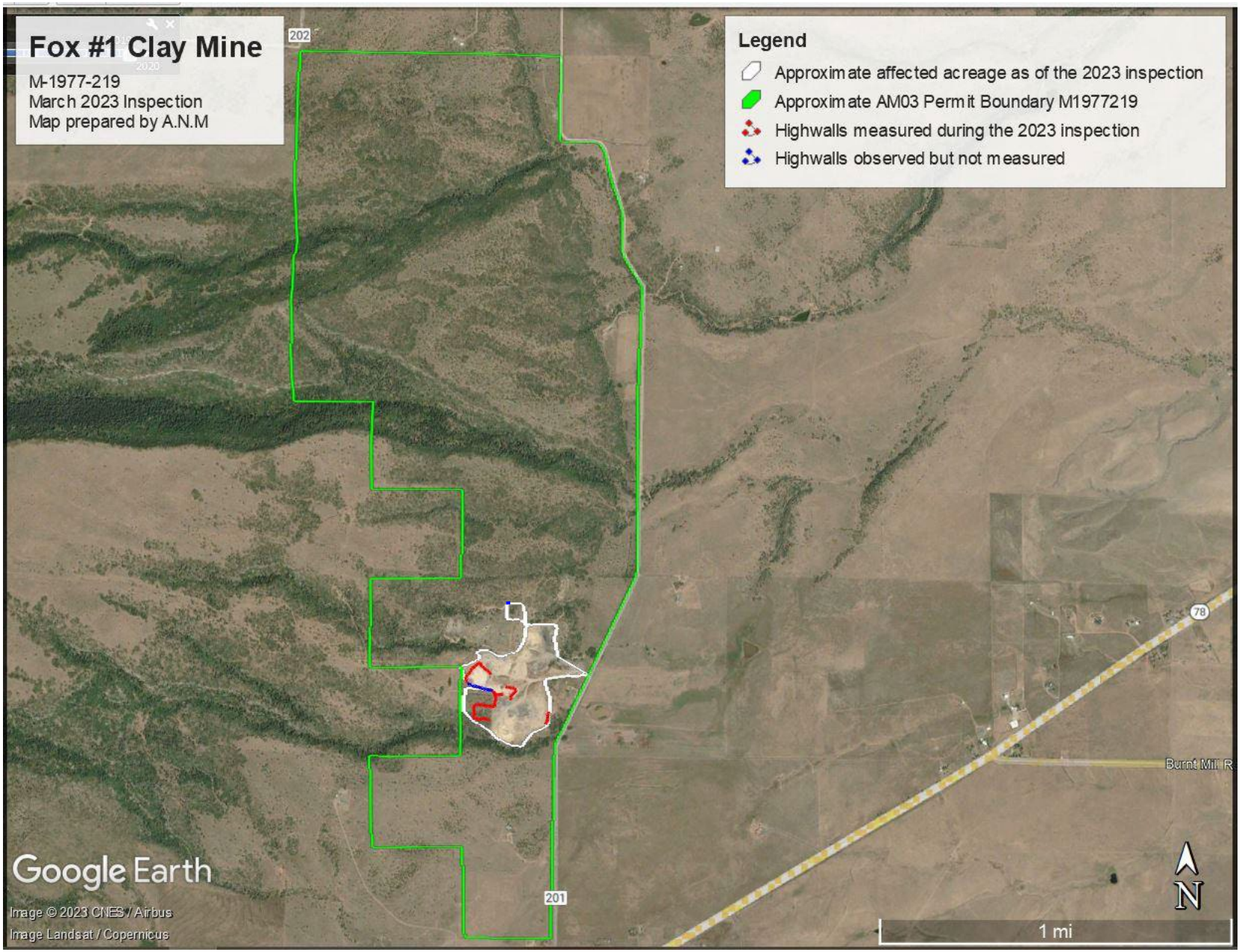
Photo 30: Looking north-west at a clay stockpile seen on Maps 2 and 3.

Photo 31: Looking north-east at eastern-most pit area.

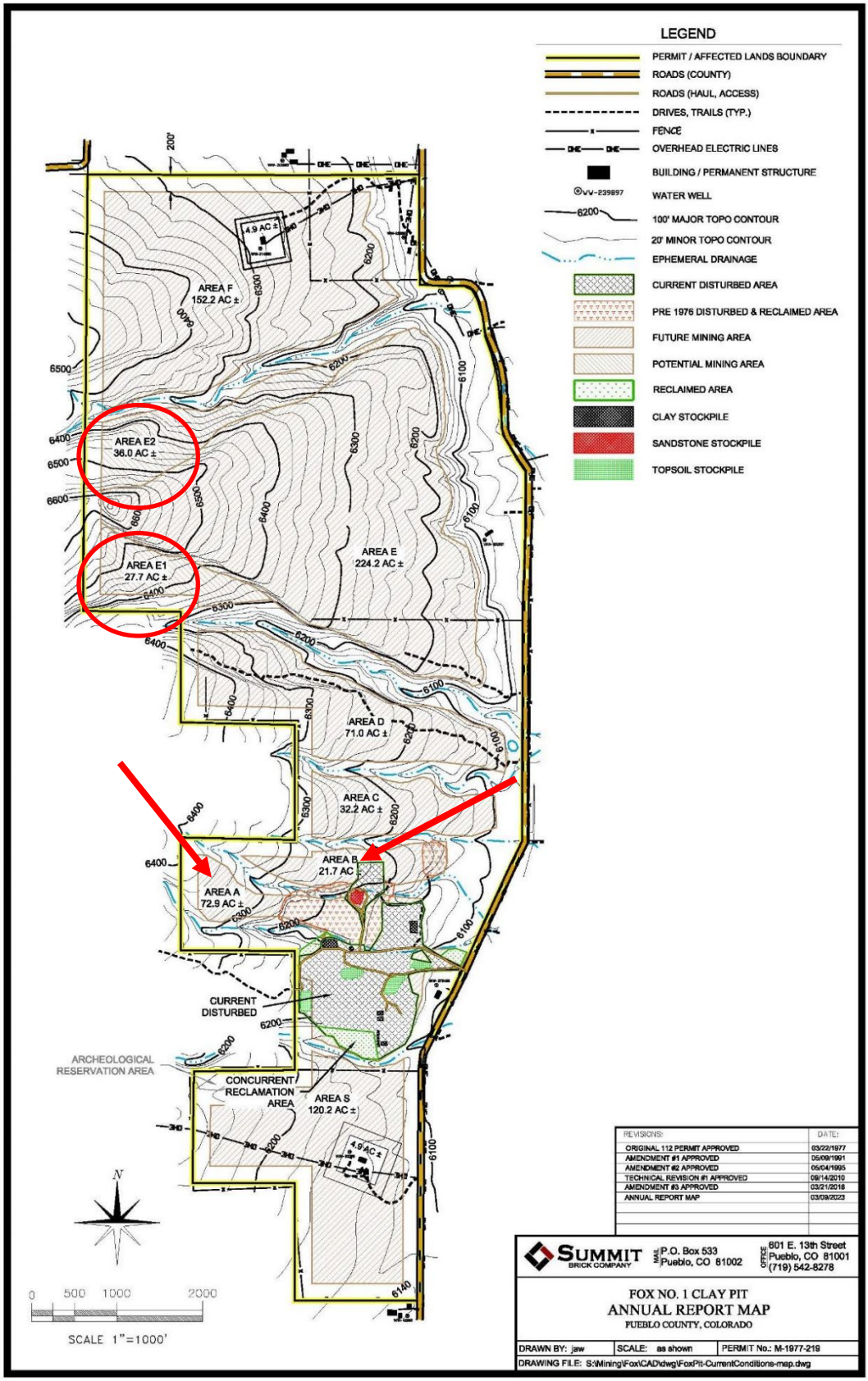
Photo 32: Looking east at eastern-most pit area and highwall.

Photo 33: Looking south-east across eastern-most pit area.

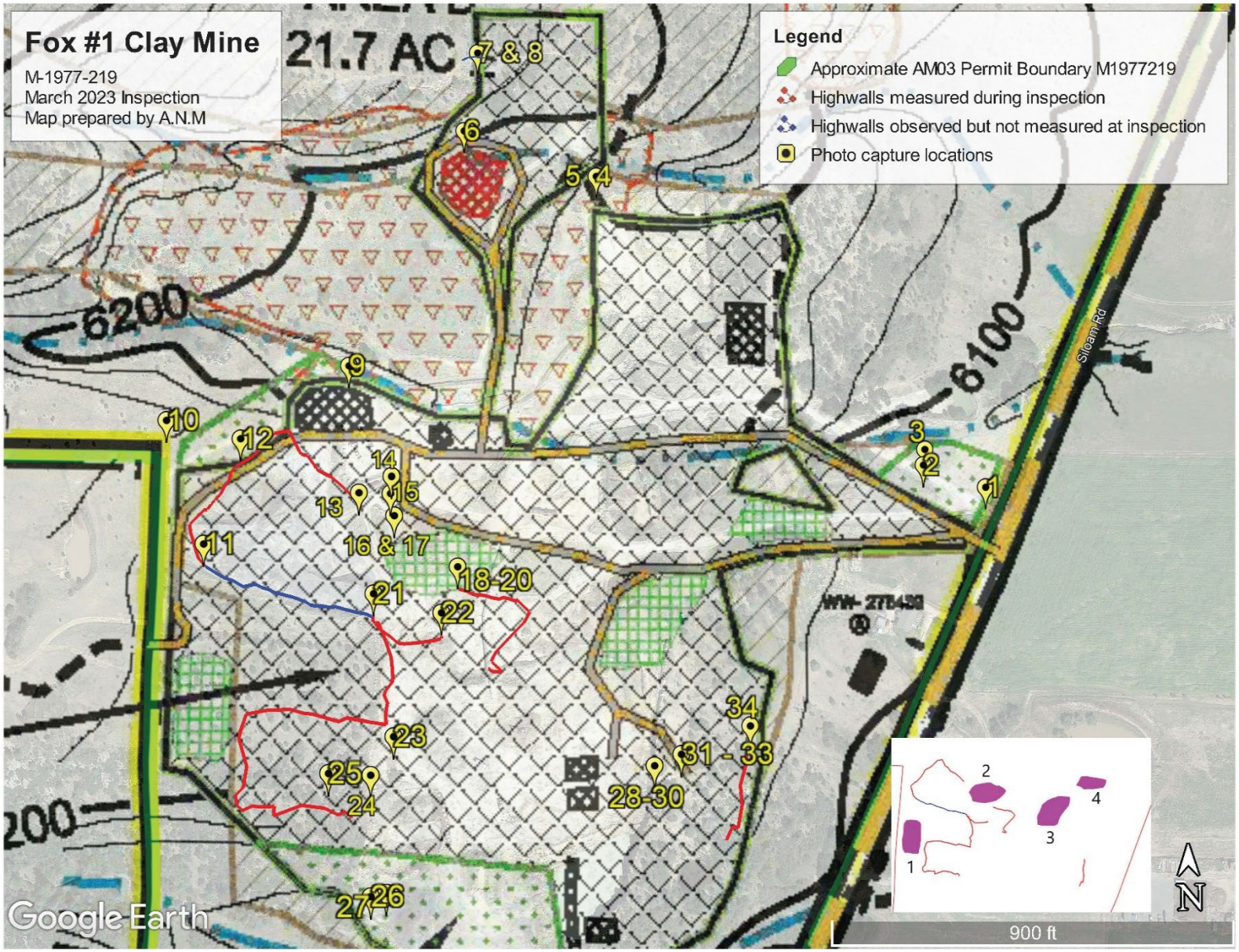
Photo 34: Looking south along eastern-most pit's highwall.



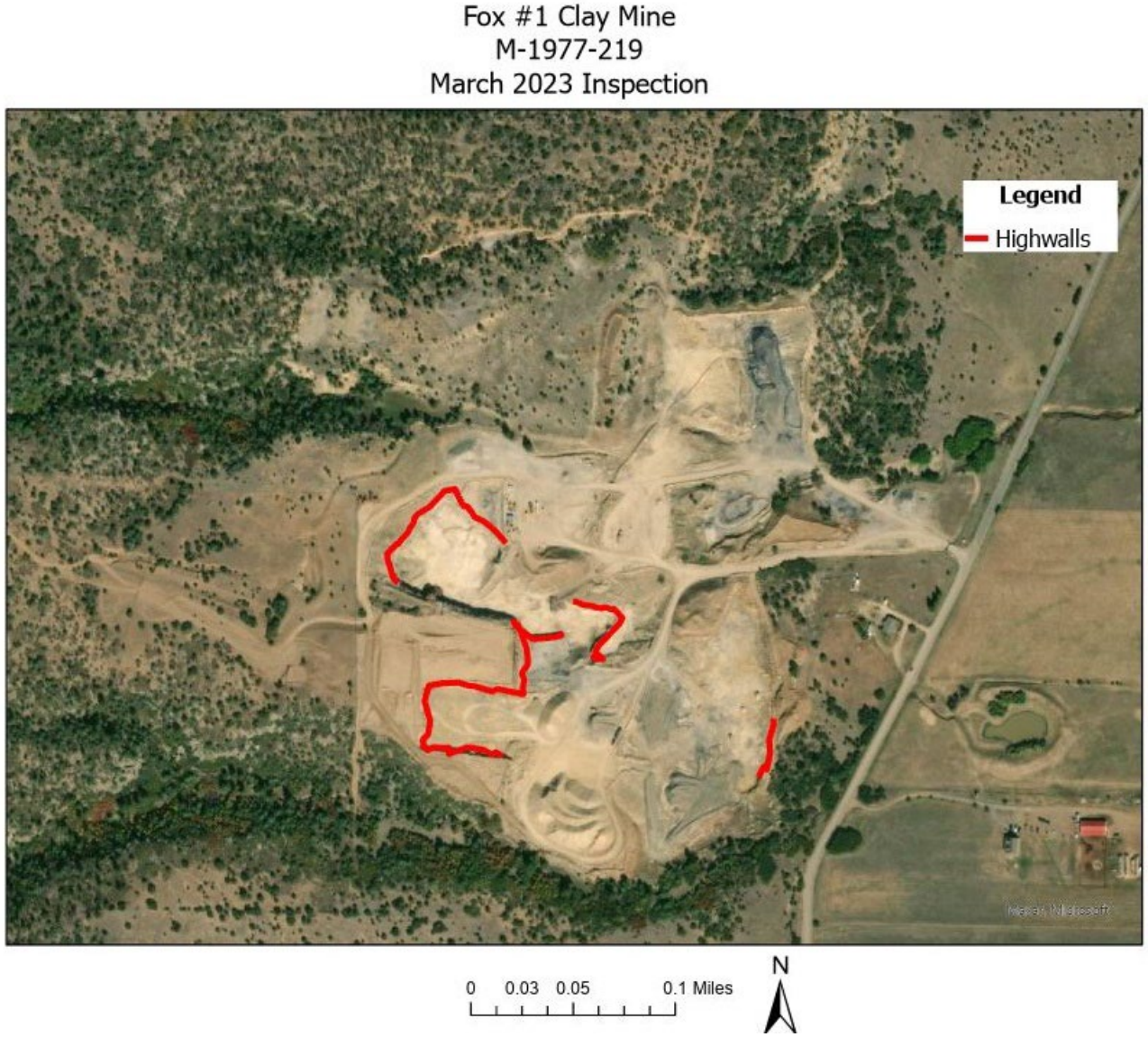
Map 1: Map generated in Google Earth Pro showing the approximate permit boundary, the field and Google Earth Pro measured highwall lengths, and the estimated current disturbance measured from field observations and Google Earth Pro.



Map 2: A copy of the Operator's 2023 Annual Report map edited to highlight the inspected mining Areas. The arrows indicate the current areas that have been disturbed by mining operations. Encircled are Areas E1 and E2 that are labeled as "potential mining areas" by the Operator.



Map 3: Map generated in Google Earth Pro using geolocation provided from the photos taken during the inspection and an image overlay using Area A and Area B from the 2023 Annual Report Map as reference. The picture in the bottom left identifies the topsoil piles and their referenced numbers used throughout the report. **7 & 8 markers moved to location the photo was zoomed to, photo taken on internal road near marker 6's location.*



Map 4: Map generated in ArcPro. Esri Field Maps was used during the inspection the map the extent of the current highwalls. ArcPro has a more recent imagery of the mine site than available in Google Earth Pro.

COST SUMMARY WORK

Task description:

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 4/24/2023 County: Pueblo Filename: M219-000
User: ANM

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Doze overburden (Zone 1) off highwall	DOZER	1	3.23	$897
002	Backfill remaining highwall	SCRAPER1	1	96.11	$420,412
003	Replace root zone material	SCRAPER1	1	8.49	$37,139
004	Replace growth medium (topsoil)	SCRAPER1	1	3.84	$16,785
005	Revegetate 40 acres	REVEGE	1	40.00	$57,513
006	Mob/Demob of Reclamation Equipment	MOBILIZE	1	10.18	$37,117
	SUBTOTALS:			**161.85**	**$569,863**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$11,511
Performance bond:	1.05	Total =	$5,984
Job superintendent:	80.93	Total =	$6,080
Profit:	10.00	Total =	$56,986
		TOTAL O & P =	$80,561
		CONTRACT AMOUNT (direct + O & P) =	$650,424

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	$500	Total =	$500
Engineering work and/or contract/bid preparation:	4.25	Total =	$27,643
Reclamation management and/or administration:	5.00		$32,521
CONTINGENCY:	0.00	Total =	$0
		TOTAL INDIRECT COST =	$141,225
		TOTAL BOND AMOUNT (direct + indirect) =	**$711,088**

BULLDOZER WORK

Task description: **Doze overburden (Zone 1) off highwall**

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 001 State: Colorado Abbreviation: None
Date: 4/20/2023 County: Pueblo Filename: 001
User: ANM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: 3-shank ripper
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$124.85	NA
Operating Cost/Hour:	$97.63	100
Ripper own. Cost/Hour:	$13.10	NA
Ripper op. Cost/Hour:	$1.83	25
Operator Cost/Hour:	$40.04	NA

Total unit Cost/Hour: $277.44
Total Fleet Cost/Hour: **$277.44**

MATERIAL QUANTITIES

Initial Volume: 2,323
Swell factor: 1.330
Loose volume: **3,090** LCY

Source of estimated volume: Application: 9' highwall to 3H:1V and 2,937ft hw(2023 ins)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 1,400.0 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: -30 %
Average site altitude: 6,200 feet

Material weight: 2,900 lbs/LCY

Weight description: Decomposed rock - 50% Rock, 50% Earth

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.200	(SLOT)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(SSD-AC)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.793	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.6828

Adjusted unit production: 955.92 LCY/hr

Adjusted fleet production: **955.92** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: $0.290/LCY

Total job time: **3.23** Hours

Total job cost: **$897**

SCRAPER TEAM WORK

Task description: **Backfill remaining highwall**

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 002 State: Colorado Abbreviation: None
Date: 4/20/2023 County: Pueblo Filename: 002
User: ANM

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	Cat D8T - 8SU
Road Maintenance –Motor Grader:	CAT 140M
-Water Truck:	Water Tanker, 2,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	100	100	50	50
Ownership cost/hour:	$264.49	NA	$124.85	$124.85	$75.87	$10.28
Operating cost/hour:	$296.10	NA	$97.63	$97.63	$26.91	$10.16
%Utilization-ripper:	NA	NA	25	25	25	NA
Ripper own. cost/hour:	NA	NA	$13.10	$13.10	$2.84	$0.00
Ripper op. cost/hour:	NA	NA	$1.83	$1.83	$0.63	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$0.00
Unit Subtotals:	$607.66	NA	$277.44	$277.44	$153.12	$20.44
Number of Units:	6	0	1	1	1	1
Group Subtotals:	Work:	$3,645.96	Support:	$554.88	Maint:	$173.56

Total work team cost/hour: **$4,374.40**

MATERIAL QUANTITIES

Initial volume: 302,878 CCY Swell factor: 1.165
Loose volume: **352,853** LCY

Source of estimated volume: 2,937'L (2023 isnp) x 45' H to 3H:1V minus (application)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,900 lbs/LCY
Material description: Decomposed rock - 50% Rock, 50% Earth
Rated Payload: 81,600 pounds
Payload Capacity: 28.14 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **28.14** LCY

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 6200 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:

Road Condition: Hard, smooth, stabilized, surfaced, watered, maintained 2.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	-1.00	2.00	1.00	2952	0.48

Haul Time: **0.48** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	1.00	2.00	3.00	2949	0.41

Return Time: **0.41** minutes

Total Scraper team cycle time: **2.29** minutes
Adjusted for job conditions: 611.91 LCY/Hour
Selected Number of Scrapers: 6 Scraper(s)
Adjusted single scraper team (unit) hourly production: 3,671.45 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **3,671.45** LCY/Hour

Unadjusted unit production/hour: 737.24 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **96.11** Hours

Unit cost: $1.191 /LCY Total job cost: **$420,412**

SCRAPER TEAM WORK

Task description: **Replace root zone material**

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 003 State: Colorado Abbreviation: None
Date: 4/20/2023 County: Pueblo Filename: M219-003
User: ANM

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	Cat D8T - 8SU
Road Maintenance –Motor Grader:	CAT 140M
-Water Truck:	Water Tanker, 2,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	100	100	50	50
Ownership cost/hour:	$264.49	NA	$124.85	$124.85	$75.87	$10.28
Operating cost/hour:	$296.10	NA	$97.63	$97.63	$26.91	$10.16
%Utilization-ripper:	NA	NA	25	25	25	NA
Ripper own. cost/hour:	NA	NA	$13.10	$13.10	$2.84	$0.00
Ripper op. cost/hour:	NA	NA	$1.83	$1.83	$0.63	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$0.00
Unit Subtotals:	$607.66	NA	$277.44	$277.44	$153.12	$20.44
Number of Units:	6	0	1	1	1	1
Group Subtotals:	Work:	$3,645.96	Support:	$554.88	Maint:	$173.56

Total work team cost/hour: **$4,374.40**

MATERIAL QUANTITIES

Initial volume: 32,267 CCY Swell factor: 1.000
Loose volume: **32,267** LCY

Source of estimated volume: Application: 6” root zone, 40 acres
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,650 lbs/LCY
Material description: Decomposed rock - 25% Rock, 75% Earth
Rated Payload: 81,600 pounds
Payload Capacity: 30.79 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **29.00** LCY

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 6200 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:

Road Condition: Hard, smooth, stabilized, surfaced, watered, maintained 2.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	-1.00	2.00	1.00	2952	0.47

Haul Time: **0.47** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	1.00	2.00	3.00	2949	0.41

Return Time: **0.41** minutes

Total Scraper team cycle time: **2.28** minutes
Adjusted for job conditions: 633.42 LCY/Hour
Selected Number of Scrapers: 6 Scraper(s)
Adjusted single scraper team (unit) hourly production: 3,800.53 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **3,800.53** LCY/Hour

Unadjusted unit production/hour: 763.16 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **8.49** Hours

Unit cost: $1.151 /LCY Total job cost: **$37,139**

SCRAPER TEAM WORK

Task description: **Replace growth medium (topsoil)**

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 004 State: Colorado Abbreviation: None
Date: 4/24/2023 County: Pueblo Filename: 004
User: ANM

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	Cat D8T - 8SU
Road Maintenance –Motor Grader:	CAT 140M
-Water Truck:	Water Tanker, 2,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	100	100	50	50
Ownership cost/hour:	$264.49	NA	$124.85	$124.85	$75.87	$10.28
Operating cost/hour:	$296.10	NA	$97.63	$97.63	$26.91	$10.16
%Utilization-ripper:	NA	NA	25	25	25	NA
Ripper own. cost/hour:	NA	NA	$13.10	$13.10	$2.84	$0.00
Ripper op. cost/hour:	NA	NA	$1.83	$1.83	$0.63	$0.00
Operator cost/hour:	$47.07	NA	$40.04	$40.04	$46.87	$0.00
Unit Subtotals:	$607.66	NA	$277.44	$277.44	$153.12	$20.44
Number of Units:	6	0	1	1	1	1
Group Subtotals:	Work:	$3,645.96	Support:	$554.88	Maint:	$173.56

Total work team cost/hour: **$4,374.40**

MATERIAL QUANTITIES

Initial volume: 14,843 CCY Swell factor: 1.000
Loose volume: **14,843** LCY

Source of estimated volume: Adequacy Response #2: 2.7" root zone, 40 acres
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 1,600 lbs/LCY
Material description: Top Soil
Rated Payload: 81,600 pounds
Payload Capacity: 51.00 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **29.00** LCY

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 6200 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:

Road Condition: Hard, smooth, stabilized, surfaced, watered, maintained 2.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	-1.00	2.00	1.00	2952	0.43

Haul Time: **0.43** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	1.00	2.00	3.00	2949	0.41

Return Time: **0.41** minutes

Total Scraper team cycle time: **2.24** minutes
Adjusted for job conditions: 644.73 LCY/Hour
Selected Number of Scrapers: 6 Scraper(s)
Adjusted single scraper team (unit) hourly production: 3,868.39 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **3,868.39** LCY/Hour

Unadjusted unit production/hour: 776.79 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **3.84** Hours

Unit cost: $1.131 /LCY Total job cost: **$16,785**

REVEGETATION WORK

Task description: **Revegetate 40 acres**

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 005 State: Colorado Abbreviation: None
Date: 4/24/2023 County: Pueblo Filename: 005
User: ANM

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Ammonium nitrate, 33-0-0	121.00	pound	$0.37	$44.77
Triple superphosphate, 0-46-0	87.00	pound	$0.47	$40.89
			Total Fertilizer Materials Cost/Acre	**$85.66**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$39.64
Total Fertilizer Application Cost/Acre	**$39.64**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Hachita	0.25	4.08	$3.99
Sand Dropseed	0.03	3.58	$0.29
Sideoats Grama - Butte	3.19	10.47	$28.71
Western Wheatgrass - Arriba	7.20	18.18	$46.80
Needlegrass, Green - Lodorm	0.48	1.99	$5.65
Totals Seed Mix	11.15	38.31	**$85.45**

Application

Description	Cost /Acre
Drill Seeding (DRMS Survey Cost)	$232.00
Total Seed Application Cost/Acre	**$232.00**

MULCHING and MISCELLANEOUS

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre

Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$421.36	$842.72
Total Mulch Materials Cost/Acre				**$842.72**

Application

Description	**Cost /Acre**
Crimping, with tractor {DMG survey data}	$73.00
Total Mulch Application Cost/Acre	**$73.00**

JOB TIME AND COST

No. of Acres:	40	Cost /Acre:	$1,358.47
Estimated Failure Rate:	25%	Cost /Acre*:	$317.45
*Selected Replanting Work Items:	SEEDING		

Initial Job Cost:	**$54,338.80**
Reseeding Job Cost:	**$3,174.50**
Total Job Cost:	**$57,513**
Job Hours:	**40.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mob/Demob of Reclamation Equipment**

Site: **Fox #1 Clay Mine** Permit Action: 2023 Inspection Permit/Job#: M1977219

PROJECT IDENTIFICATION

Task #: 006 State: Colorado Abbreviation: None
Date: 4/24/2023 County: Pueblo Filename: 006
User: ANM

Agency or organization name: DRMS

EQUIPMENT TRANSPORT RIG COST

Shift basis: 1 per day
Cost Data Source: CRG Data

Truck Tractor Description: GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED, 400 HP (2ND HALF, 2006)

Truck Trailer Description: GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT TRAILER (25T, 50T, AND 100T)

Cost Breakdown:

Available Rig Capacities	**0-25 Tons**	**26-50 Tons**	**51+ Tons**
Ownership Cost/Hour:	$15.25	$23.06	$37.58
Operating Cost/Hour:	$25.26	$30.83	$51.41
Operator Cost/Hour:	$27.71	$27.71	$27.71
Helper Cost/Hour:	$0.00	$20.22	$20.22
Total Unit Cost/Hour:	$68.22	$101.82	$136.92

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D8T - 8SU	53.08	$137.95	$136.92	2	$549.74	$273.84	$250.00
Cat 637G	57.28	$264.49	$136.92	6	$2,408.46	$821.52	$1,500.00
CAT 140M	16.68	$78.71	$68.22	1	$146.93	$68.22	$250.00
Drill/Broadcast Seeder with Tractor	25.00	$6.25	$68.22	2	$148.94	$136.44	$250.00
Power Mulcher (Bowie LD-90)	6.00	$14.79	$68.22	1	$83.01	$68.22	$250.00
Subtotals:					**$3,337.08**	**$1,368.24**	**$2,500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Water Tanker, 2,500 Gal.	$30.60	1	$30.60	$30.60
Light Duty Pickup, 4x4, 3/4 T.	$87.03	1	$87.03	$87.03
Lube Truck, 4x2, 190 HP	$76.19	1	$76.19	$76.19
Fuel Tanker, 4x2, 170 HP	$69.51	1	$69.51	$69.51
Subtotals:			**$263.33**	**$263.33**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	PUEBLO, CO	
Total one-way travel distance:	30.00	miles
Average Travel Speed:	55.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$36,829.72	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$287.27	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.55	0.55
Return Time (Hours):	0.55	0.55
Loading Time (Hours):	2.00	NA
Unloading Time (Hours):	2.00	NA
Subtotals:	5.09	1.09

JOB TIME AND COST

Total job time: **10.18** Hours

Total job cost: **$37,117**