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

February 2, 2024

Jason McGraw
General Shale Brick, Inc.
1845 W. Dartmouth Ave.
Denver, CO 80110

Re: Navajo Clay Pit, Permit No. M-1993-004, Technical Revision No. 3 (TR-03) Approval, Update mining and reclamation plans and maps and include the importation of scrap brick for reclamation.

Dear Mr. McGraw:

On February 2, 2024, the Division of Reclamation Mining and Safety (Division) concluded its review and approved the Technical Revision application submitted to the Division on October 3, 2023, addressing the following:

Update mining and reclamation plans and maps and include the importation of scrap brick for reclamation.

On February 2, 2024, the Division of Reclamation, Mining and Safety (Division) increased the current Financial Warranty for the Navajo Clay Pit to $178,032.00, in accordance with Rule 4.2.1 and C.R.S. 34-32.5-117. This is an increase of $129,735.00 from the currently held Financial Warranty of $48,297.00. The Division ordered amendment of the current Financial Warranty, or submittal of a new Financial Warranty reflecting the increase, within 60 days from the date of this letter, due by April 1, 2024. The revision will not be final until the bond is received and approved by the Division.

If you have any questions regarding submittal of the Financial Warranty, please contact our Financial Warranty Specialist, Sara Stevenson-Benn, by telephone at (303) 866-3567 ext. 8148 or by email at sara.stevenson-benn@state.co.us. All Financial Warranty forms are available on our website at: https://drms.colorado.gov/forms/minerals-program-forms.

If you require additional information, or have questions or concerns, please feel free to contact me by phone at (303) 866-3567, ext. 8147, or by email at joel.renfro@state.co.us.

Sincerely,

Joel Renfro

Environmental Protection Specialist

Enclosed:
Divisions bond estimate

Cc:
Amy Eschberger, DRMS
Sara Stevenson-Benn, DRMS
Harold Stickler, General Shale Brick, Inc.

COST SUMMARY WORK

Task description: **Cost Estimate Updated for TR-03**

Site: **Navajo Clay Pit** Permit Action: TR-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 2/2/2024 3:12:10 PM County: Elbert Filename: M004-000
User: JR2

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Backfill pit with overburden	DOZER	1	49.47	$21,105
002	Push check dam bricks into pit	DOZER	1	1.03	$440
003	Haul and fill pit with remaining scrap brick	SCRAPER1	1	0.54	$920
004	Cut and fill remaining highwalls to 3H:1V	DOZER	1	23.72	$10,121
005	Scrape overburden from stockpile pad and fill pit	SCRAPER1	1	18.52	$31,300
006a	Rip compacted areas	GRADER	1	10.55	$1,850
007	Retopsoil pit area	SCRAPER1	1	6.62	$11,193
008	Retopsoil stockpile area	SCRAPER1	1	4.19	$7,074
009	Retopsoil access road	SCRAPER1	1	4.32	$4,459
010	Revegetate 20 acres	REVEGE	1	25.00	$39,004
011	Mobilization/demobilization of equipment	MOBILIZE	1	8.20	$17,689
		SUBTOTALS:		**152.16**	**$145,155**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$2,932
Performance bond:	1.05	Total =	$1,524
Job superintendent:	76.08	Total =	$4,951
Profit:	10.00	Total =	$14,516
		TOTAL O & P =	$23,923
		CONTRACT AMOUNT (direct + O & P) =	$169,078

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	$500	Total =	$500
Engineering work and/or contract/bid preparation:	0.00	Total =	$0
Reclamation management and/or administration:	5.00		$8,454
CONTINGENCY:	0.00	Total =	$0
		TOTAL INDIRECT COST =	$32,877
		TOTAL BOND AMOUNT (direct + indirect) =	**$178,032**

BULLDOZER WORK

Task description: **Backfill pit with overburden**

Site: **Navajo Clay Pit** Permit Action: TR-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #:	001	State:	Colorado	Abbreviation:	None
Date:	2/2/2024	County:	Elbert	Filename:	M004-001
	3:10:52 PM				
User:	JR2				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

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

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$241.38	NA
Operating Cost/Hour:	$143.92	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$41.30	NA

Total unit Cost/Hour: $426.60
Total Fleet Cost/Hour: **$426.60**

MATERIAL QUANTITIES

Initial Volume:	20,167
Swell factor:	1.125
Loose volume:	**22,688** LCY

Source of estimated volume: 1.25ac pit x 10ft
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 150 feet
Unadjusted hourly production: 634.3 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: -5 %
Average site altitude: 6,150 feet

Material weight: 2,650 lbs/LCY

Weight description: Decomposed rock - 25% Rock, 75% Earth

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.200	(SLOT)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	1.000	(DOZ-OC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7230

Adjusted unit production: 458.60 LCY/hr

Adjusted fleet production: **458.6** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: $0.930/LCY

Total job time: **49.47** Hours

Total job cost: **$21,105**

BULLDOZER WORK

Task description: **Push check dam bricks into pit**

Site: **Navajo Clay Pit** Permit Action: TR-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #:	002	State:	Colorado	Abbreviation:	None
Date:	2/2/2024	County:	Elbert	Filename:	M004-002
	3:10:09 PM				
User:	JR2				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

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

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$241.38	NA
Operating Cost/Hour:	$143.92	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$41.30	NA

Total unit Cost/Hour: $426.60
Total Fleet Cost/Hour: **$426.60**

MATERIAL QUANTITIES

Initial Volume:	231
Swell factor:	1.000
Loose volume:	**231** LCY

Source of estimated volume: Estimated 25 check dams + additional 25% volume of OB
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 200 feet
Unadjusted hourly production: 491.9 LCY/hr

Materials consistency description: Rock, avg. ripped or blasted 0.7

Average push gradient: -5 %
Average site altitude: 6,150 feet

Material weight: 2,950 lbs/LCY

Weight description: Slag - broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.700	(CAT HB)
Dozing method:	1.200	(SLOT)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	1.000	(DOZ-OC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.780	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4548

Adjusted unit production: 223.72 LCY/hr
Adjusted fleet production: **223.72** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $1.907/LCY

Total job time: **1.03** Hours
Total job cost: **$440**

SCRAPER TEAM WORK

Task description: **Haul and fill pit with remaining scrap brick**

Site: **Navajo Clay Pit** Permit Action: Tr-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 003 State: Colorado Abbreviation: None
Date: 2/2/2024 3:08:45 PM County: Elbert Filename: M004-003
User: JR2

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 631G
-Dozer:	NA
Support Equipment -Load Area:	Cat D6T LGP
-Dump Area:	NA
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	50	NA	50	50
Ownership cost/hour:	$341.67	NA	$127.53	NA	$83.57	$11.35
Operating cost/hour:	$285.26	NA	$41.57	NA	$28.78	$11.46
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Operator cost/hour:	$30.90	NA	$41.30	NA	$28.56	$0.00
Unit Subtotals:	$657.83	NA	$210.40	NA	$140.90	$22.81
Number of Units:	2	0	1	0	1	1
Group Subtotals:	Work:	$1,315.66	Support:	$210.40	Maint:	$163.71

Total work team cost/hour: **$1,689.77**

MATERIAL QUANTITIES

Initial volume: 500 CCY Swell factor: 1.000
Loose volume: **500** LCY

Source of estimated volume: Operator will import 500 cy of scrap brick for pit backfill
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,950 lbs/LCY
Material description: Slag - broken
Rated Payload: 81,600 pounds
Payload Capacity: 27.66 LCY

Scraper Bowl (volume) Basis:

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY
Adjusted Capacity: **27.66** LCY

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.70 Minutes

Job Condition Correction: Site Altitude: 6150 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: Rutted dirt, little maintenance, no water, 2" tire penetration 5.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	700.00	5.00	5.00	10.00	638	1.12

Haul Time: **1.12** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	700.00	-5.00	5.00	0.00	2937	0.38

Return Time: **0.38** minutes

Total Scraper team cycle time: **3.00** minutes
Adjusted for job conditions: 459.17 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 918.35 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **918.35** LCY/Hour

Unadjusted unit production/hour: 553.22 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **0.54** Hours

Unit cost: $1.840 /LCY Total job cost: **$920**

BULLDOZER WORK

Task description: **Cut and fill remaining highwalls to 3H:1V**

Site: **Navajo Clay Pit** Permit Action: TR-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #:	004	State:	Colorado	Abbreviation:	None
Date:	2/2/2024	County:	Elbert	Filename:	M004-004
	3:07:44 PM				
User:	JR2				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

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

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$241.38	NA
Operating Cost/Hour:	$143.92	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$41.30	NA

Total unit Cost/Hour: $426.60
Total Fleet Cost/Hour: **$426.60**

MATERIAL QUANTITIES

Initial Volume:	7,500
Swell factor:	1.125
Loose volume:	**8,438** LCY

Source of estimated volume: 900 ft L x 30 ft H, 1H:1V to 3H:1V Slopes
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 200 feet
Unadjusted hourly production: 491.9 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: -5 %
Average site altitude: 6,150 feet

Material weight: 2,650 lbs/LCY

Weight description: Decomposed rock - 25% Rock, 75% Earth

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.200	(SLOT)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	1.000	(DOZ-OC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7230

Adjusted unit production: 355.64 LCY/hr

Adjusted fleet production: **355.64** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: $1.200/LCY

Total job time: **23.72** Hours

Total job cost: **$10,121**

SCRAPER TEAM WORK

Task description: **Scrape overburden from stockpile pad and fill pit**

Site: **Navajo Clay Pit** Permit Action: Tr-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 005 State: Colorado Abbreviation: None
Date: 2/2/2024 3:06:05 PM County: Elbert Filename: M004-005
User: JR2

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 631G
-Dozer:	NA
Support Equipment -Load Area:	Cat D6T LGP
-Dump Area:	NA
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	50	NA	50	50
Ownership cost/hour:	$341.67	NA	$127.53	NA	$83.57	$11.35
Operating cost/hour:	$285.26	NA	$41.57	NA	$28.78	$11.46
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Operator cost/hour:	$30.90	NA	$41.30	NA	$28.56	$0.00
Unit Subtotals:	$657.83	NA	$210.40	NA	$140.90	$22.81
Number of Units:	2	0	1	0	1	1
Group Subtotals:	Work:	$1,315.66	Support:	$210.40	Maint:	$163.71

Total work team cost/hour: **$1,689.77**

MATERIAL QUANTITIES

Initial volume: 16,456 CCY Swell factor: 1.125
Loose volume: **18,513** LCY

Source of estimated volume: 3.4 ac area x 3 ft depth
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Scraper Bowl (volume) Basis:

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

Struck Volume: 24.00 LCY
Heaped Volume: 34.00 LCY
Average Volume: 29.00 LCY

Payload Capacity: 30.79 LCY Adjusted Capacity: **29.00** LCY

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.70 Minutes

Job Condition Correction: Site Altitude: 6150 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: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	5.00	3.00	8.00	783	1.05

Haul Time: **1.05** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	-5.00	3.00	-2.00	2920	0.34

Return Time: **0.34** minutes

Total Scraper team cycle time: **2.89** minutes
Adjusted for job conditions: 499.72 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 999.45 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **999.45** LCY/Hour

Unadjusted unit production/hour: 602.08 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **18.52** Hours

Unit cost: $1.691 /LCY Total job cost: **$31,300**

MOTOR GRADER WORK

Task description: **Rip compacted areas**

Site: **Navajo Clay Pit** Permit Action: Tr-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 006A State: Colorado Abbreviation: None
Date: 2/2/2024 3:05:09 PM County: Elbert Filename: M004-006a
User: JR2

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 140M Horsepower: 183
Ripper Attachment: Multi-Shank Ripper Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$83.57	NA
Operating Cost/Hour:	$57.55	100
Ripper Ownership Cost/Hour:	$3.09	NA
Ripper Operating Cost/Hour:	$2.57	100
Operator Cost/Hour:	$28.56	NA
Total Unit Cost/Hour:	$175.34	

Total Fleet Cost/Hour: **$175.34**

MATERIAL QUANTITIES

Total Area to be graded or ripped: 13.70 acres

Source of estimated acreage: 16 ac total disturbance - 2 ac pit floor - 0.3 ac pond

HOURLY PRODUCTION

Average Grader Speed: 1.50 mph
Selected Application: Ripping (0-3 mph) - 1.50
Selected Blade Angle: 30 degrees
Effective Blade Length: 10.40 feet
Width of blade overlap per pass: 2.00 feet
Net grading or ripping width per pass: 8.40 feet
Unadjusted Hourly Unit Production: 1.5273 acres/hour

Job Condition Correction Factors Site Altitude: 6150 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.85	(1sh/d, mod.)
Net Correction:	0.8500	multiplier

Adjusted Hourly Unit Production: 1.2982 acres/Hour
Adjusted Hourly Fleet Production: **1.2982** acres/Hour

JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: **10.55** Hours

Unit cost: $135.07 per acre Total job cost: **$1,850**

SCRAPER TEAM WORK

Task description: **Retopsoil pit area**

Site: **Navajo Clay Pit** Permit Action: Tr-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 007 State: Colorado Abbreviation: None
Date: 2/2/2024 3:04:08 PM County: Elbert Filename: M004-007
User: JR2

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 631G
-Dozer:	NA
Support Equipment -Load Area:	Cat D6T LGP
-Dump Area:	NA
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	50	NA	50	50
Ownership cost/hour:	$341.67	NA	$127.53	NA	$83.57	$11.35
Operating cost/hour:	$285.26	NA	$41.57	NA	$28.78	$11.46
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Operator cost/hour:	$30.90	NA	$41.30	NA	$28.56	$0.00
Unit Subtotals:	$657.83	NA	$210.40	NA	$140.90	$22.81
Number of Units:	2	0	1	0	1	1
Group Subtotals:	Work:	$1,315.66	Support:	$210.40	Maint:	$163.71

Total work team cost/hour: **$1,689.77**

MATERIAL QUANTITIES

Initial volume: 5,163 CCY Swell factor: 1.215
Loose volume: **6,273** LCY

Source of estimated volume: Pit area = 4.8 ac x 8 in depth
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: 0.70 Minutes

Job Condition Correction: Site Altitude: 6150 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: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	5.00	3.00	8.00	783	1.17

Haul Time: **1.17** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	-5.00	3.00	-2.00	2920	0.38

Return Time: **0.38** minutes

Total Scraper team cycle time: **3.05** minutes
Adjusted for job conditions: 473.51 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 947.02 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **947.02** LCY/Hour

Unadjusted unit production/hour: 570.49 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **6.62** Hours

Unit cost: $1.784 /LCY Total job cost: **$11,193**

SCRAPER TEAM WORK

Task description: **Retopsoil stockpile area**

Site: **Navajo Clay Pit** Permit Action: Tr-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 008 State: Colorado Abbreviation: None
Date: 2/2/2024 3:02:55 PM County: Elbert Filename: M004-008
User: JR2

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 631G
-Dozer:	NA
Support Equipment -Load Area:	Cat D6T LGP
-Dump Area:	NA
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	50	NA	50	50
Ownership cost/hour:	$341.67	NA	$127.53	NA	$83.57	$11.35
Operating cost/hour:	$285.26	NA	$41.57	NA	$28.78	$11.46
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Operator cost/hour:	$30.90	NA	$41.30	NA	$28.56	$0.00
Unit Subtotals:	$657.83	NA	$210.40	NA	$140.90	$22.81
Number of Units:	2	0	1	0	1	1
Group Subtotals:	Work:	$1,315.66	Support:	$210.40	Maint:	$163.71

Total work team cost/hour: **$1,689.77**

MATERIAL QUANTITIES

Initial volume: 5,001 CCY Swell factor: 1.215
Loose volume: **6,076** LCY

Source of estimated volume: Stockpile area = (6.5 ac - 0.3 ac pond) x 6 in depth
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: 0.70 Minutes

Job Condition Correction: Site Altitude: 6150 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: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	1.00	3.00	4.00	1667	0.23

Haul Time: **0.23** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	-1.00	3.00	2.00	2914	0.26

Return Time: **0.26** minutes

Total Scraper team cycle time: **1.99** minutes
Adjusted for job conditions: 725.73 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 1,451.46 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **1,451.46** LCY/Hour

Unadjusted unit production/hour: 874.37 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **4.19** Hours

Unit cost: $1.164 /LCY Total job cost: **$7,074**

SCRAPER TEAM WORK

Task description: **Retopsoil access road**

Site: **Navajo Clay Pit** Permit Action: Tr-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 009 State: Colorado Abbreviation: None
Date: 2/2/2024 3:01:11 PM County: Elbert Filename: M004-009
User: JR2

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 631G
-Dozer:	NA
Support Equipment -Load Area:	Cat D6T LGP
-Dump Area:	NA
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	50	NA	50	50
Ownership cost/hour:	$341.67	NA	$127.53	NA	$83.57	$11.35
Operating cost/hour:	$285.26	NA	$41.57	NA	$28.78	$11.46
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$0.00	$0.00
Operator cost/hour:	$30.90	NA	$41.30	NA	$28.56	$0.00
Unit Subtotals:	$657.83	NA	$210.40	NA	$140.90	$22.81
Number of Units:	1	0	1	0	1	1
Group Subtotals:	Work:	$657.83	Support:	$210.40	Maint:	$163.71

Total work team cost/hour: **$1,031.94**

MATERIAL QUANTITIES

Initial volume: 2,581 CCY Swell factor: 1.215
Loose volume: **3,136** LCY

Source of estimated volume: Access road = 3.2 ac x 6 in depth
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Scraper Bowl (volume) Basis:

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

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: 0.70 Minutes

Job Condition Correction: Site Altitude: 6150 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: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	1.00	3.00	4.00	1667	0.23

Haul Time: **0.23** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	-1.00	3.00	2.00	2914	0.26

Return Time: **0.26** minutes

Total Scraper team cycle time: **1.99** minutes
Adjusted for job conditions: 725.73 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 725.73 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **725.73** LCY/Hour

Unadjusted unit production/hour: 874.37 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **4.32** Hours

Unit cost: $1.422 /LCY Total job cost: **$4,459**

REVEGETATION WORK

Task description: **Revegetate 20 acres**

Site: **Navajo Clay Pit** Permit Action: TR-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 010 State: Colorado Abbreviation: None
Date: 2/2/2024 2:37:34 PM County: Elbert Filename: M004-010
User: JR2

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Potassium nitrate, 13-46-0	40.00	pound	$0.68	$27.20
			Total Fertilizer Materials Cost/Acre	**$27.20**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$41.82
Total Fertilizer Application Cost/Acre	**$41.82**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$112.82
Weed control spraying (MEANS 31 31 16.13 3100)	$338.80
Total Tilling Cost/Acre	**$451.62**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Switchgrass - Blackwell	1.35	12.06	$15.53
Blue Grama - Lovington	0.30	4.90	$4.79
Sideoats Grama - Vaughn	0.90	2.95	$7.54
Western Wheatgrass - Arriba	3.20	8.08	$20.80
Prairie Sandreed - Goshen	1.95	12.22	$20.18
Totals Seed Mix	7.70	40.21	**$68.84**

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
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$429.79	$859.57
Total Mulch Materials Cost/Acre				**$859.57**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$74.46
Weed spray, hand, aquatic area, annuals [DMG]	$119.47
Total Mulch Application Cost/Acre	**$193.93**

NURSERY STOCK PLANTING

Common Name	No / Acre	Type and Size	Planting Cost	Fertilizer Pellet Cost	Cost /Acre
					$
Totals Nursery Stock Cost / Acre					**$0.00**

JOB TIME AND COST

No. of Acres: 20
Estimated Failure Rate: 25%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,874.98
Cost /Acre*: $300.84

Initial Job Cost: **$37,499.60**
Reseeding Job Cost: **$1,504.20**
Total Job Cost: **$39,004**
Job Hours: **25.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilization/demobilization of equipment**

Site: **Navajo Clay Pit** Permit Action: TR-03 Permit/Job#: M1993004

PROJECT IDENTIFICATION

Task #: 011 State: Colorado Abbreviation: None
Date: 2/2/2024 2:58:27 PM County: Elbert Filename: M004-011
User: JR2

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:	$20.26	$36.04	$47.05
Operating Cost/Hour:	$39.51	$76.08	$82.85
Operator Cost/Hour:	$22.52	$22.52	$22.52
Helper Cost/Hour:	$0.00	$23.53	$23.53
Total Unit Cost/Hour:	$82.29	$158.17	$175.95

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	$255.49	$175.95	1	$431.44	$175.95	$250.00
Drill/Broadcast Seeder with Tractor	25.00	$6.73	$82.29	1	$89.02	$82.29	$250.00
Cat 631G	52.50	$341.67	$175.95	2	$1,035.24	$351.90	$500.00
CAT 140M	16.68	$83.57	$82.29	1	$165.86	$82.29	$250.00
Cat D6T LGP	26.87	$127.53	$158.17	1	$285.70	$158.17	$250.00
Subtotals:					**$2,007.26**	**$850.60**	**$1,500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 3/4 T.	$15.83	1	$15.83	$15.83
Water Tanker, 2,500 Gal.	$34.27	1	$34.27	$34.27
Subtotals:			**$50.10**	**$50.10**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	AURORA	
Total one-way travel distance:	40.00	miles
Average Travel Speed:	50.00	mph

Total Non-Roadable Mob/Demob Cost * ‘* two round trips with haul rig:	$17,608.88
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$80.16

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.80	0.80
Return Time (Hours):	0.80	0.80
Loading Time (Hours):	1.25	NA
Unloading Time (Hours):	1.25	NA
Subtotals:	4.10	1.60

JOB TIME AND COST

Total job time:	**8.20**	Hours
Total job cost:	**$17,689**	