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

July 2, 2021

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

Re: DDD, Permit No. M-1984-076, Corrective Action - Revised Bond Estimate

Mr. McGraw:

On July 1, 2021, the Division of Reclamation, Mining and Safety (Division) received your comments on the bond estimate provided with the Division's April 20, 2021 inspection report (related to Problem #2 cited for inadequate financial warranty). The Division has revised the bond estimate to incorporate some of your suggestions (see enclosed estimate).

Some of your suggestions included changing the type of equipment used for particular tasks to a smaller size (e.g., D8 dozer to a D6 dozer), which the Division did not implement for all relevant tasks because the suggested change actually increased the costs. The Division did reduce the size of the support equipment dozer for scraper tasks from a D8 dozer to a D6 dozer, reduced the grader size from a 16M to a 14M, changed the grader and water truck utilization for scraper tasks to 50%, used your volume estimates for backfilling the DEB ponds, and removed 300 feet from the DEB cut/fill highwalls task for the western pit highwall which is already graded to 3H:1V. The Division also used a larger sized loader (980H) per your suggestion. These changes did result in a reduction in costs. However, as we discussed on the phone earlier today, the recent annual update to our bond calculating software resulted in some slightly higher costs. Overall, the total bond amount was reduced from $325,670 (April 16, 2021 estimate) to $305,289 (July 2, 2021 estimate), which is a reduction of $20,381.

Please review the enclosed estimate and provide any comments by the corrective action deadline, by **July 2, 2021**. If additional time is needed to review the estimate, please submit an extension request no later than the current deadline. If you accept the revised estimate, please submit a statement of your acceptance and the Division will consider the Problem # 2 resolved and send a notice of surety increase for the amount shown in the revised estimate. The operator will have 60 days from the date of the surety increase notice to post the additional financial warranty.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger

Amy Eschberger
Environmental Protection Specialist

Encl: Division's revised bond estimate, dated 7/2/2021

Cc: Harold Stickler, General Shale Brick, Inc.
Michael Cunningham, DRMS

COST SUMMARY WORK

Task description: **Cost Summary**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: Rev 7/2/2021 County: Elbert Filename: M076-000
User: AME

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	DWR mine - Backfill eastern pit highwalls	DOZER	1	43.73	$10,337
002	DWR mine - Cut/fill pit highwalls	DOZER	1	11.07	$2,616
003	DWR mine - Backfill south pit with inert fill	LOADER	2	66.47	$23,406
004	DWR mine - Rip compacted areas	RIPPER	1	22.93	$5,997
005	DWR mine - Retopsoil 19.8 acres	SCRAPER1	1	22.39	$21,929
006	DWR mine - Revegetate 19.8 acres	REVEGE	1	9.90	$29,895
007	DEB mine - Backfill eastern pit highwalls	DOZER	1	9.84	$2,326
008	DEB mine - Cut/fill pit highwalls	DOZER	1	8.36	$1,977
009	DEB mine - Backfill pit with inert fill	LOADER	2	66.47	$23,406
010	DEB mine - Backfill eastern pond	LOADER	1	31.98	$5,631
011	DEB mine - Backfill western pond	LOADER	1	4.43	$781
012	DEB mine - Rip compacted areas	RIPPER	1	26.06	$6,816
013	DEB mine - Retopsoil 22.5 acres	SCRAPER1	1	34.61	$33,891
014	DEB mine - Revegetate 22.5 acres	REVEGE	1	11.25	$33,972
015	Mobilization/demobilization	MOBILIZE	1	14.37	$34,199
			SUBTOTALS:	**383.86**	**$237,179**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$4,791
Performance bond:	1.05	Total =	$2,490
Job superintendent:	150.00	Total =	$10,804
Profit:	10.00	Total =	$23,718
		TOTAL O & P =	$41,804
		CONTRACT AMOUNT (direct + O & P) =	$278,983

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	$500	Total =	$500
Engineering work and/or contract/bid preparation:	4.25	Total =	$11,857
Reclamation management and/or administration:	5.00		$13,949
CONTINGENCY:	0.00	Total =	$0
		TOTAL INDIRECT COST =	$68,110

TOTAL BOND AMOUNT (direct + indirect) = $305,289

BULLDOZER WORK

Task description: **DWR mine - Backfill eastern pit highwalls**

Site: **DDD**   Permit Action: 4/13/2021 Inspection-2   Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 001   State: Colorado   Abbreviation: None
Date: Rev 7/2/2021   County: Elbert   Filename: M076-001
User: AME

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:	$97.46	NA
Operating Cost/Hour:	$97.63	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: $236.39
Total Fleet Cost/Hour: **$236.39**

MATERIAL QUANTITIES

Initial Volume: 23,148
Swell factor: 1.125
Loose volume: **26,042** LCY

Source of estimated volume: East highwalls 1,000 ft L x 25 ft H
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 75 feet
Unadjusted hourly production: 1,017.1 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: 5 %
Average site altitude: 6,080 feet

Material weight: 2,650 lbs/LCY

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

Job Condition Correction Factor		Source
Operator Skill:	1.000	(EXCL.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.900	(SSD-FC)
Push gradient:	0.903	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5855

Adjusted unit production: 595.51 LCY/hr
Adjusted fleet production: **595.51** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.397/LCY

Total job time: **43.73** Hours
Total job cost: **$10,337**

BULLDOZER WORK

Task description: **DWR mine - Cut/fill pit highwalls**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #:	002	State:	Colorado	Abbreviation:	None
Date:	Rev 7/2/2021	County:	Elbert	Filename:	M076-002
User:	AME				

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:	$97.46	NA
Operating Cost/Hour:	$97.63	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: $236.39
Total Fleet Cost/Hour: **$236.39**

MATERIAL QUANTITIES

Initial Volume: 7,813
Swell factor: 1.250
Loose volume: **9,766** LCY

Source of estimated volume: North, West, and South Highwalls 1,350 ft L x 25 ft H
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 75 feet
Unadjusted hourly production: 1,017.1 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: -5 %
Average site altitude: 6,080 feet

Material weight: 2,650 lbs/LCY

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

Job Condition Correction Factor		Source
Operator Skill:	1.000	(EXCL.)
Material consistency:	0.900	(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: 0.8676

Adjusted unit production: 882.44 LCY/hr
Adjusted fleet production: **882.44** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.268/LCY

Total job time: **11.07** Hours
Total job cost: **$2,616**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **DWR mine - Backfill south pit with inert fill**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #:	003	State:	Colorado	Abbreviation:	None
Date:	Rev 7/2/2021	County:	Elbert	Filename:	M076-003
User:	AME				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	CAT 980H	Horsepower:	315
Attachment 1:	ROPS Cab	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$67.72	NA
Operating Cost/Hour:	$67.62	100
Operator Cost/Hour:	$40.71	NA
Total Unit Cost/Hour:	$176.05	

Total Fleet Cost/Hour: $352.09

MATERIAL QUANTITIES

Initial volume:	22,500	CCY	Swell factor:	1.000
Loose volume:	**22,500**	LCY		

Source of estimated volume: Per TR-2 max 45,000 tons inert fill on site at any time

Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Bank or broken material 0.04	0.040	(Cat HB)
Stockpile:	Dumped by truck 0.02	0.020	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders -0.04	-0.040	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)
	Net Cycle Time Adjustment:	-0.020	minutes
	Adjusted Basic Cycle Time:	0.530	minutes

Rolling Resistance – Road Conditions

Haul: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Return: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	800	3.00	5.00	8.00	0.8931	(Cat HB)
Return Route:	800	-3.00	5.00	2.00	0.5633	(Cat HB)

Total Travel Time:	1.4563	minutes
Total Cycle Time:	**1.9863**	minutes

Load Bucket Capacity

Rated Capacity:	7.50	LCY (heaped)
Bucket Fill Factor:	0.900	Rock - Poorly Blasted (85%-95%) 0.900
Adjusted Capacity:	**6.75**	LCY

Job Condition Correction Factors
Site Altitude: 6020 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Unadjusted Hourly Unit Production:	203.89	LCY/Hour
Adjusted Hourly Unit Production:	169.23	LCY/Hour
Adjusted Hourly Fleet Production:	**338.47**	LCY/Hour

JOB TIME AND COST

Fleet size:	2	Loader(s)	Total job time:	**66.48**	Hours
Unit cost:	$1.040	/LCY	Total job cost:	**$23,406**	

BULLDOZER RIPPING WORK

Task description: **DWR mine - Rip compacted areas**

Site: **DDD**

Permit Action: 4/13/2021 Inspection-2

Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 004
Date: Rev 7/2/2021
User: AME

State: Colorado
County: Elbert

Abbreviation: None
Filename: M076-004

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Ripper Attachment: 3-Shank Ripper

Horsepower: 310
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$97.46	NA
Operating Cost/Hour:	$97.63	100
Ripper Ownership Cost/Hour:	$15.19	NA
Ripper Operating Cost/Hour:	$9.94	100
Operator Cost/Hour:	$41.30	NA
Total Unit Cost/Hour:	$261.52	
Total Fleet Cost/Hour:	**$261.52**	

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA
Area: 15.80 acres

Bank Volume: NA BCY
Rip Depth (ft): 1.50

NA
Volume: 38,236 BCY or CCY

Source of estimated quantity: 21 acres disturbed - 1.2 acre pond - 4 acre pit

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.56	feet/pass
Average Ripping Width:	7.08	feet/pass
Average Ripping Length:	650.00	feet/pass
Average Dozer Speed:	88.00	feet/minute
Average Maneuver Time:	0.25	minutes/pass
Production per unit area:	0.830	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.830	Acres/hr
Site Altitude:	6,080	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.69	Acres/hr
Adjusted Hourly Fleet Production:	**0.69**	Acres/hr

JOB TIME AND COST

Fleet size: 1 Grader(s)

Total job time: **22.93** Hours

Unit cost: $379.580 Per acre

Total job cost: **$5,997**

SCRAPER TEAM WORK

Task description: **DWR mine - Retopsoil 19.8 acres**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 005 State: Colorado Abbreviation: None
Date: Rev 7/2/2021 County: Elbert Filename: M076-005
User: AME

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 14M
-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	NA	50	50
Ownership cost/hour:	$147.77	NA	$66.27	NA	$85.80	$11.70
Operating cost/hour:	$141.36	NA	$66.34	NA	$30.20	$9.00
%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:	$320.03	NA	$173.91	NA	$144.56	$20.70
Number of Units:	2	0	1	0	1	1
Group Subtotals:	Work:	$640.06	Support:	$173.91	Maint:	$165.26

Total work team cost/hour: **$979.23**

MATERIAL QUANTITIES

Initial volume: 26,619 CCY Swell factor: 1.215
Loose volume: **32,342** LCY

Source of estimated volume: 21 acres disturbed - 1.2 acre pond, 10 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: 6080 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	300.00	4.00	3.00	7.00	962	0.35

Haul Time: **0.35** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	-4.00	3.00	-1.00	2920	0.15

Return Time: **0.15** minutes

Total Scraper team cycle time: **2.00** minutes
Adjusted for job conditions: 722.10 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 1,444.20 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **1,444.20** LCY/Hour

Unadjusted unit production/hour: 870.00 LCY/Hour
Optimal Number of Scrapers per push dozer: ________

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **22.39** Hours

Unit cost: $0.678 /LCY Total job cost: **$21,929**

REVEGETATION WORK

Task description: **DWR mine - Revegetate 19.8 acres**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 006 State: Colorado Abbreviation: None
Date: Rev 7/2/2021 County: Elbert Filename: M076-006
User: AME

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Potassium nitrate, 13-46-0	87.00	pound	$1.33	$115.71
			Total Fertilizer Materials Cost/Acre	**$115.71**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$38.77
Total Fertilizer Application Cost/Acre	**$38.77**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Lovington	0.90	14.69	$14.38
Little Bluestem - Native	1.40	8.36	$18.99
Western Wheatgrass - Arriba	4.80	12.12	$31.20
Prairie Sandreed - Goshen	1.30	8.15	$13.46
Totals Seed Mix	8.40	43.31	**$78.03**

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	$307.02	$614.04
Total Mulch Materials Cost/Acre				**$614.04**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$71.57
Weed spray, hand, non-aquatic area, nox. [DMG]	$183.16
Total Mulch Application Cost/Acre	**$254.73**

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: 19.8
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,447.84
Cost /Acre*: $310.03

Initial Job Cost: **$28,667.23**
Reseeding Job Cost: **$1,227.72**
Total Job Cost: **$29,895**
Job Hours: **9.90**

BULLDOZER WORK

Task description: **DEB mine - Backfill eastern pit highwalls**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 007 State: Colorado Abbreviation: None
Date: Rev 7/2/2021 County: Elbert Filename: M076-007
User: AME

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:	$97.46	NA
Operating Cost/Hour:	$97.63	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: $236.39
Total Fleet Cost/Hour: **$236.39**

MATERIAL QUANTITIES

Initial Volume: 5,208
Swell factor: 1.125
Loose volume: **5,859** LCY

Source of estimated volume: East highwalls 225 ft L x 25 ft H
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 75 feet
Unadjusted hourly production: 1,017.1 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: 5 %
Average site altitude: 6,020 feet

Material weight: 2,650 lbs/LCY

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

Job Condition Correction Factor		Source
Operator Skill:	1.000	(EXCL.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.900	(SSD-FC)
Push gradient:	0.903	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5855

Adjusted unit production: 595.51 LCY/hr
Adjusted fleet production: **595.51** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.397/LCY

Total job time: **9.84** Hours
Total job cost: **$2,326**

BULLDOZER WORK

Task description: **DEB mine - Cut/fill pit highwalls**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #:	008	State:	Colorado	Abbreviation:	None
Date:	7/2/2021	County:	Elbert	Filename:	M076-008
User:	AME				

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:	$97.46	NA
Operating Cost/Hour:	$97.63	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: $236.39
Total Fleet Cost/Hour: **$236.39**

MATERIAL QUANTITIES

Initial Volume: 5,903
Swell factor: 1.250
Loose volume: **7,379** LCY

Source of estimated volume: North and South Highwalls 1,020 ft L x 25 ft H
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 75 feet
Unadjusted hourly production: 1,017.1 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: -5 %
Average site altitude: 6,020 feet

Material weight: 2,650 lbs/LCY

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

Job Condition Correction Factor		Source
Operator Skill:	1.000	(EXCL.)
Material consistency:	0.900	(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: 0.8676

Adjusted unit production: 882.44 LCY/hr
Adjusted fleet production: **882.44** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.268/LCY

Total job time: **8.36** Hours
Total job cost: **$1,977**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **DEB mine - Backfill pit with inert fill**

Site: **DDD**   Permit Action: 4/13/2021 Inspection-2   Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #:	009	State:	Colorado	Abbreviation:	None
Date:	Rev 7/2/2021	County:	Elbert	Filename:	M076-009
User:	AME				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	CAT 980H	Horsepower:	315
Attachment 1:	ROPS Cab	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$67.72	NA
Operating Cost/Hour:	$67.62	100
Operator Cost/Hour:	$40.71	NA
Total Unit Cost/Hour:	$176.05	

Total Fleet Cost/Hour: $352.09

MATERIAL QUANTITIES

Initial volume:	22,500	CCY	Swell factor:	1.000
Loose volume:	**22,500**	LCY		

Source of estimated volume: Per TR-2 max 45,000 tons inert fill on site at any time

Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Bank or broken material 0.04	0.040	(Cat HB)
Stockpile:	Dumped by truck 0.02	0.020	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders -0.04	-0.040	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)
	Net Cycle Time Adjustment:	-0.020	minutes
	Adjusted Basic Cycle Time:	0.530	minutes

Rolling Resistance – Road Conditions

Haul: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Return: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	800	3.00	5.00	8.00	0.8931	(Cat HB)
Return Route:	800	-3.00	5.00	2.00	0.5633	(Cat HB)

Total Travel Time:	1.4563	minutes
Total Cycle Time:	**1.9863**	minutes

Load Bucket Capacity

Rated Capacity:	7.50	LCY (heaped)
Bucket Fill Factor:	0.900	Rock - Poorly Blasted (85%-95%) 0.900
Adjusted Capacity:	**6.75**	LCY

Job Condition Correction Factors

Site Altitude: 6020 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Unadjusted Hourly Unit Production:	203.89	LCY/Hour
Adjusted Hourly Unit Production:	169.23	LCY/Hour
Adjusted Hourly Fleet Production:	**338.47**	LCY/Hour

JOB TIME AND COST

Fleet size:	2	Loader(s)	Total job time:	**66.48**	Hours
Unit cost:	$1.040	/LCY	Total job cost:	**$23,406**	

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **DEB mine - Backfill eastern pond**

Site: **DDD**

Permit Action: 4/13/2021 Inspection-2

Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 010
Date: Rev 7/2/2021
User: AME

State: Colorado
County: Elbert

Abbreviation: None
Filename: M076-010

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 980H
Attachment 1: ROPS Cab

Horsepower: 315
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$67.72	NA
Operating Cost/Hour:	$67.62	100
Operator Cost/Hour:	$40.71	NA
Total Unit Cost/Hour:	$176.05	

Total Fleet Cost/Hour: $176.05

MATERIAL QUANTITIES

Initial volume: 9,833 CCY
Loose volume: **11,455** LCY

Swell factor: 1.165

Source of estimated volume: Operator’s 7/1/21 estimate
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	Dumped by truck 0.02	0.020	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders -0.04	-0.040	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)

Net Cycle Time Adjustment: -0.040 minutes
Adjusted Basic Cycle Time: 0.510 minutes

Rolling Resistance – Road Conditions

Haul: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0
Return: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	350	3.00	5.00	8.00	0.3907	(Cat HB)
Return Route:	350	-3.00	5.00	2.00	0.2464	(Cat HB)

Total Travel Time:	0.6371	minutes
Total Cycle Time:	**1.1471**	minutes

Load Bucket Capacity

Rated Capacity:	7.50	LCY (heaped)
Bucket Fill Factor:	1.100	Other - rock/dirt mixtures (100-120%) 1.100
Adjusted Capacity:	**8.25**	LCY

Job Condition Correction Factors
Site Altitude: 6020 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Unadjusted Hourly Unit Production:	431.51	LCY/Hour
Adjusted Hourly Unit Production:	358.15	LCY/Hour
Adjusted Hourly Fleet Production:	**358.15**	LCY/Hour

JOB TIME AND COST

Fleet size:	1	Loader(s)	Total job time:	**31.98**	Hours
Unit cost:	$0.492	/LCY	Total job cost:	**$5,631**	

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **DEB mine - Backfill western pond**

Site: **DDD**

Permit Action: 4/13/2021 Inspection-2

Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 011
Date: Rev 7/2/2021
User: AME

State: Colorado
County: Elbert

Abbreviation: None
Filename: M076-011

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 980H
Attachment 1: ROPS Cab

Horsepower: 315
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$67.72	NA
Operating Cost/Hour:	$67.62	100
Operator Cost/Hour:	$40.71	NA
Total Unit Cost/Hour:	$176.05	

Total Fleet Cost/Hour: $176.05

MATERIAL QUANTITIES

Initial volume: 1,482 CCY
Loose volume: **1,727** LCY

Swell factor: 1.165

Source of estimated volume: Operator’s 7/1/21 estimate
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	Dumped by truck 0.02	0.020	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders -0.04	-0.040	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)
	Net Cycle Time Adjustment:	-0.040	minutes
	Adjusted Basic Cycle Time:	0.510	minutes

Rolling Resistance – Road Conditions

Haul: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0
Return: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	300	3.00	5.00	8.00	0.3349	(Cat HB)
Return Route:	300	-3.00	5.00	2.00	0.2112	(Cat HB)

Total Travel Time:	0.5461	minutes
Total Cycle Time:	**1.0561**	minutes

Load Bucket Capacity

Rated Capacity:	7.50	LCY (heaped)
Bucket Fill Factor:	1.100	Other - rock/dirt mixtures (100-120%) 1.100
Adjusted Capacity:	**8.25**	LCY

Job Condition Correction Factors
Site Altitude: 6020 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Unadjusted Hourly Unit Production:	468.70	LCY/Hour
Adjusted Hourly Unit Production:	389.02	LCY/Hour
Adjusted Hourly Fleet Production:	**389.02**	LCY/Hour

JOB TIME AND COST

Fleet size:	1	Loader(s)	Total job time:	**4.44**	Hours
Unit cost:	$0.453	/LCY	Total job cost:	**$781**	

BULLDOZER RIPPING WORK

Task description: **DEB mine - Rip compacted areas**

Site: **DDD** | Permit Action: 4/13/2021 Inspection-2 | Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #:	012	State:	Colorado	Abbreviation:	None
Date:	Rev 7/2/2021	County:	Elbert	Filename:	M076-012
User:	AME				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D8T - 8SU	Horsepower:	310
Ripper Attachment:	3-Shank Ripper	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$97.46	NA
Operating Cost/Hour:	$97.63	100
Ripper Ownership Cost/Hour:	$15.19	NA
Ripper Operating Cost/Hour:	$9.94	100
Operator Cost/Hour:	$41.30	NA
Total Unit Cost/Hour:	$261.52	
Total Fleet Cost/Hour:	**$261.52**	

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic:	NA		Bank Volume:	NA	BCY	NA	
Area:	18.00	acres	Rip Depth (ft):	1.50	Volume:	43,560	BCY or CCY

Source of estimated quantity: 22.5 ac disturbed - 3.2 ac pit - 0.95 ac pond - 0.35 ac pond

HOURLY PRODUCTION

Seismic:

Seismic Velocity:	NA	feet/second

Area:

Average Ripping Depth:	2.56	feet/pass
Average Ripping Width:	7.08	feet/pass
Average Ripping Length:	700.00	feet/pass
Average Dozer Speed:	88.00	feet/minute
Average Maneuver Time:	0.25	minutes/pass
Production per unit area:	0.832	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.832	Acres/hr
Site Altitude:	6,020	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.69	Acres/hr
Adjusted Hourly Fleet Production:	**0.69**	Acres/hr

JOB TIME AND COST

Fleet size:	1	Grader(s)	Total job time:	**26.06**	Hours
Unit cost:	$378.692	Per acre	Total job cost:	**$6,816**	

SCRAPER TEAM WORK

Task description: **DEB mine - Retopsoil 22.5 acres**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 013 State: Colorado Abbreviation: None
Date: Rev 7/2/2021 County: Elbert Filename: M076-013
User: AME

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 14M
-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	NA	50	50
Ownership cost/hour:	$147.77	NA	$66.27	NA	$85.80	$11.70
Operating cost/hour:	$141.36	NA	$66.34	NA	$30.20	$9.00
%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:	$320.03	NA	$173.91	NA	$144.56	$20.70
Number of Units:	2	0	1	0	1	1
Group Subtotals:	Work:	$640.06	Support:	$173.91	Maint:	$165.26

Total work team cost/hour: **$979.23**

MATERIAL QUANTITIES

Initial volume: 30,249 CCY Swell factor: 1.215
Loose volume: **36,753** LCY

Source of estimated volume: 22.5 acres disturbed, 10 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: 6020 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	700.00	5.00	3.00	8.00	783	0.91

Haul Time: **0.91** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	700.00	-5.00	3.00	-2.00	2920	0.31

Return Time: **0.31** minutes

Total Scraper team cycle time: **2.72** minutes
Adjusted for job conditions: 530.96 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 1,061.91 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **1,061.91** LCY/Hour

Unadjusted unit production/hour: 639.71 LCY/Hour
Optimal Number of Scrapers per push dozer: ____

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **34.61** Hours

Unit cost: $0.922 /LCY Total job cost: **$33,891**

REVEGETATION WORK

Task description: **DEB mine - Revegetate 22.5 acres**

Site: **DDD**

Permit Action: 4/13/2021 Inspection-2

Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 014
Date: Rev 7/2/2021
User: AME

State: Colorado
County: Elbert

Abbreviation: None
Filename: M076-014

Agency or organization name: DRMS

FERTILIZING

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
Potassium nitrate, 13-46-0	87.00	pound	$1.33	$115.71
			Total Fertilizer Materials Cost/Acre	**$115.71**

Application

Description	**Cost /Acre**
Tractor towed spreader (MEANS 32 01 90.13 0120)	$38.77
Total Fertilizer Application Cost/Acre	**$38.77**

TILLING

Description	**Cost /Acre**
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	**Rate – PLS LBS / Acre**	**Seeds per SQ. FT**	**Cost /Acre**
Blue Grama - Lovington	0.90	14.69	$14.38
Little Bluestem - Native	1.40	8.36	$18.99
Western Wheatgrass - Arriba	4.80	12.12	$31.20
Prairie Sandreed - Goshen	1.30	8.15	$13.46
Totals Seed Mix	8.40	43.31	**$78.03**

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	$307.02	$614.04
Total Mulch Materials Cost/Acre				**$614.04**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$71.57
Weed spray, hand, non-aquatic area, nox. [DMG]	$183.16
Total Mulch Application Cost/Acre	**$254.73**

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: 22.5
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,447.84
Cost /Acre*: $310.03

Initial Job Cost: **$32,576.40**
Reseeding Job Cost: **$1,395.14**
Total Job Cost: **$33,972**
Job Hours: **11.25**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilization/demobilization**

Site: **DDD** Permit Action: 4/13/2021 Inspection-2 Permit/Job#: M1984076

PROJECT IDENTIFICATION

Task #: 015 State: Colorado Abbreviation: None
Date: Rev 7/2/2021 County: Elbert Filename: M076-015
User: AME

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:	$21.28	$37.94	$47.67
Operating Cost/Hour:	$26.55	$50.48	$56.21
Operator Cost/Hour:	$20.54	$20.54	$20.54
Helper Cost/Hour:	$0.00	$23.53	$23.53
Total Unit Cost/Hour:	$68.37	$132.49	$147.95

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	47.71	$97.46	$132.49	1	$229.95	$132.49	$250.00
Cat D8T - 8SU (w/Attach)	53.08	$112.65	$147.95	1	$260.60	$147.95	$250.00
CAT 14M	23.57	$85.80	$68.37	2	$308.34	$136.74	$500.00
Cat 631G	52.50	$147.77	$147.95	2	$591.44	$295.90	$500.00
CAT 980H	33.12	$67.72	$132.49	2	$400.42	$264.98	$500.00
Drill/Broadcast Seeder with Tractor	25.00	$7.98	$68.37	1	$76.35	$68.37	$500.00
Cat D6T LGP	26.87	$66.27	$132.49	1	$198.76	$132.49	$250.00
				Subtotals:	**$2,065.86**	**$1,178.92**	**$2,750.00**

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.	$29.70	1	$29.70	$29.70
Light Duty Pickup, 4x4, 3/4 T.	$12.93	1	$12.93	$12.93
		Subtotals:	**$42.63**	**$42.63**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	AURORA	
Total one-way travel distance:	26.75	miles
Average Travel Speed:	45.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$34,148.00	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$50.68	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.59	0.59
Return Time (Hours):	0.59	0.59
Loading Time (Hours):	3.00	NA
Unloading Time (Hours):	3.00	NA
Subtotals:	7.19	1.19

JOB TIME AND COST

Total job time: **14.38** Hours

Total job cost: **$34,199**