December 23, 2015

Michael Anson
Moffat Limestone Company
P.O. Box 777
Craig, CO 81626

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

1313 Sherman Street, Room 215
Denver, CO 80203

RE: Juniper Quarry, Permit No. M-1982-141, Estimated Reclamation Costs Update

Dear Mr. Anson:

On November 24, 2015 the Division of Reclamation, Mining and Safety (Division) conducted a field inspection of the above mentioned site. During the inspection you expressed a desire to decrease Moffat Limestone Company's liabilities if possible. It was explained that typically the Division updates the reclamation cost estimate following a permit revision or a field inspection. Bond calculations are based on a combination of field observations and worst case scenario based on the approved reclamation permit. The calculations are based on what it would cost the State to hire a contractor to complete reclamation if an operator was unable to do so. Therefore, it is inherent that the costs will be more than what it costs the company to complete the required work.

In an effort to ensure the Financial Warranty for the above referenced site adequately reflects the actual current costs of fulfilling the requirements of the approved reclamation plan, the Colorado Division of Reclamation, Mining and Safety (Division) has updated the reclamation cost estimate (copy enclosed).

Division calculations estimate the cost to reclaim the above referenced site to be ***$209,714***. This is an increase of ***$55,309*** over the ***$151,838*** currently held by the Division. This estimate is based on conditions observed during the November 24, 2015 inspection.

On the inspection report it was noted that in several instances the actual disturbance was greater than what the mining and reclamation plans allowed. This inconsistency was cited as a problem, with the corrective actions to revise both plans. It is anticipated that pending the acceptance of the revisions the estimated liability may change. Please review the attached estimated bond and notes for input values there were changed to help guide you where ground conditions increased the liability as compared to the approved plan. Please review the enclosed figures as soon as possible and contact our office if any calculation errors are noted.

The operator should submit a Technical Revision, with the required $216 revision fee, to update and clarify the mining and reclamation plans by ***Thursday, March 10, 2016.***

If no Technical Revision to the mining and reclamation to resolve the inspection item is received by March 10, 2016 than it is the Divisions understanding that the operator has no objections to the bond calculated on December 8, 2015 for the amount of $209,714 according the current permit conditions. At that time a Notice for Surety Increase will be issued for the above amount as required by the Act and Rules. Additionally the Division may find one or more violations for non-compliance with State Statutes, Rules and Regulations, and/or conditions specified in your permit for this site.

In the estimated bond it was noted that needle and thread grass was significantly more per pound when compared to the other grass species in the approved mix. In an effort to decrease liabilities Moffat Limestone Company may wish to revise their seed mix. Needle and thread grass could be replaced /supplemented with a comparable perennial cool season grass such as green needlegrass, prairie Junegrass, or Sanberg bluegrass. Or replaced/supplemented with a forb/shrub species such as, rubber rabbitbrush, big sagebrush, silver sagebrush or four-wing saltbush. Please note that in general forbs/shrubs tend to be only marginally less expensive than needle and thread. The rates and relative ratios may be adjusted but the total pounds of PLS/Acre should remain at or above 33 LBS of PLS/Acre for drill seeded.

When reviewing input values and how the current bond was calculated you suggested a different method of reclamation for the north highwall of the main pit. Currently blasting would be required to achieve proper grade and you thought backfilling may be more cost effective. As a note consolidated material may be sloped near vertical with benches while unconsolidated material must be no steeper than a 3:1. The Division tried this scenario. The use of a dozer to backfill the necessary 86,234 CCY to fill the trench to a 3:1 was marginally more expensive. However such quantities of backfilling would also require compaction and transporting of material across the pit which made this a far more expensive route (forms attached). Additionally you would need to certify that the necessary volume of material was available on site for backfill at all times or else the cost of importing fill would also have to be factored in. For this reason the Division will continue to estimate the bond using blasting with some minor grading unless otherwise dictated in a technical revision.

As indicated above blasting accounts for a large portion of the bond liability. If the operator certifies that all slopes will be left in a manner where no blast or significant contouring would be required in the event of bond forfeiture that item could be eliminated from the bond estimate entirely. This would require the operator to continually leave consolidated rock slopes stable with benches to break up the large walls and no need for additional rock scaling. All non-consolidate material along the highwalls would be no steeper than a 3:1. Items such as topsoiling and slope reductions of processing areas and stockpiles would remain unchanged.

The Division acknowledges that this estimated bond increase is substantial and largely due to the previous company owners deviating from their approved plans. The Division will allow for the 2016 construction season to make changes in the field as well as potential technical revisions before a notice of surety increase may be issued. Division Staff will inspection the site on or after September 15, 2016. At that time, the Division will ensure the Financial Warranty for the above referenced site adequately reflects the actual current costs of fulfilling the requirements of the approved reclamation plan. Staff will take into account any reclamation progress as well as changes resulting from any approved technical revisions.

If you require additional information, or have questions or concerns, please feel free to contact me. Amy Yeldell at the Division of Reclamation, Mining and Safety, 1313 Sherman St., Room 215, Denver, CO 80203. Direct contact can be made by phone at 970-254-8511 or via email at amy.yeldell@ state.co.us

Sincerely,

Amy Yeldell
Environmental Protection Specialist
Department of Natural Resources
Division of Reclamation, Mining and Safety
Phone: (970) 254-8511
Fax: (970) 241-1516

Ec:
Russ Means, Senior EPS / Field Office Supervisor, Grand Junction DRMS

Enc:
Financial Warranty Cost Estimates

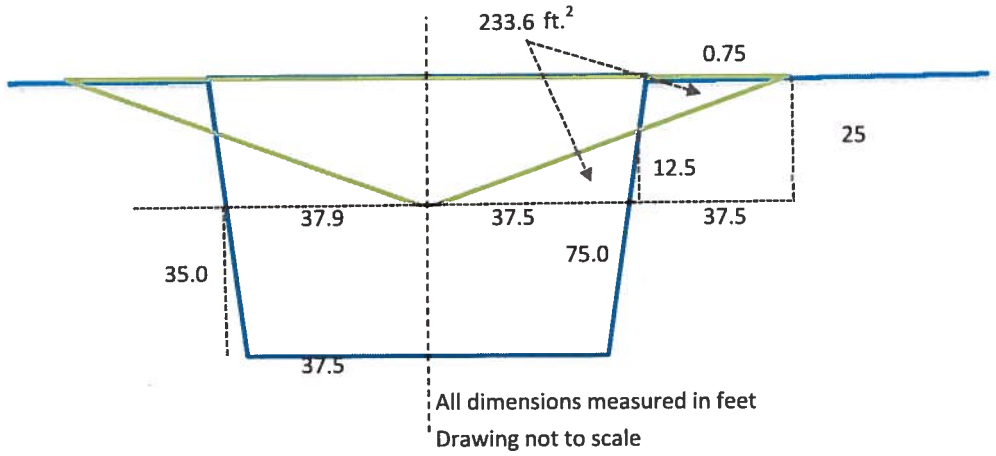
- Blasting + dozing ~ $30 K
- Backfill only ~$ 30K, plus transport 1/4 fill + compact 2/3 fill ~$ 22K.
  Additional mob of ~~equipment~~ equipment + support (water + grader) not accounted for.
- Would also need a TR to certify stockpiled volume available for fill always or would have to add the cost to buy + import needed fill.
- DRMS will use for banding blasting + some bench grading backfill unless permit revisons say otherwise. Must obtain 3:1 in non-consolidated material.

Trench/hole reduction - cut and fill

CN-1 Highwall reduction (grade Lower/north HW)

Top Width of Trench (ft.)	75.0	
Top Bottom of Trench (ft.)	75.0	
Length of Highwall (lft.)	750	
Trench Height (ft.)	60.00	
Initial Slope	0.01	H:1V
Desired Slope	3	H:1V

Top Cut & fill volume of material to be moved ($ft.^3$)	350,391
Top Cut & Fill Volume of material to be moved ($yd.^3$)	12,977
Bottom backfill volume of material to be moved ($ft.^3$)	1,977,938
Bottom backfill Volume of material to be moved ($yd.^3$)	73,257
Total volume of material to be moved ($ft.^3$)	**2,328,328**
Total Volume of material to be moved ($yd.^3$)	**86,234**



BULLDOZER WORK

Task description: **CN1-Highwall reduction (grade Lower/ north HW)**

Site: **Juniper Quarry** Permit Action: Test Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #:	08A	State:	Colorado	Abbreviation:	None
Date:	12/9/2015	County:	Moffat	Filename:	M141-08a
User:	ACY				

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$208.90**

MATERIAL QUANTITIES

Initial Volume:	86,234
Swell factor:	1.345
Loose volume:	**115,985** LCY

Source of estimated volume: Backfill highwall trench 75'W x 60"H X 750'L
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: Rock, well ripped or blasted 0.8

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5645

Adjusted unit production: 790.30 LCY/hr
Adjusted fleet production: **790.3** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.264/LCY

Total job time: **146.76** Hours
Total job cost: **$30,659**

COMPACTION WORK

Task description: **CN1-Compact north/lower highwall backfill**

Site: **Juniper Quarry** Permit Action: Test Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #:	08B	State:	Colorado	Abbreviation:	None
Date:	12/14/2015	County:	Moffat	Filename:	M141-08b
User:	ACY				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	CAT 825H	Horsepower:	354
Compactor Type:	Soil - tamping foot	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$62.10	NA
Operating Cost/Hour:	$116.14	100
Operator Cost/Hour:	$28.75	NA
Total Unit Cost/Hour:	$206.99	
Total Fleet Cost/Hour:	**$206.99**	

MATERIAL QUANTITIES

Loose volume:	57,490	LCY	Shrinkage factor:	0.875
Compacted volume:	**50,304**	CCY		

Source of estimated volume: 2/3 of backfill material needed for the trench
Source of estimated shrinkage factor: Cat Handbook

HOURLY PRODUCTION

Unadjusted hourly production = (W x S x L x C) / P

Compacted width per pass (W):	7.34	feet
Average Compactor Speed (S):	8.00	mph
Compacted thickness of each lift (L):	8.00	inches
Conversion Constant (C):	16.3	(5,280ft./12in./27cu.ft.)
Required number of machine passes (P):	2	passes
Unadjusted Hourly Unit Production:	3,828.54	CCY/hour

Job Condition Correction Factors — Site Altitude: 6,600 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.8300	multiplier

Adjusted Hourly Unit Production:	3,177.69	CCY/Hour
Adjusted Hourly Fleet Production:	**3,177.69**	CCY/Hour

JOB TIME AND COST

Fleet size:	1	Compactor(s)	Total job time:	**15.83**	Hours
Unit cost:	$0.065	per CCY	Total job cost:	**$3,277**	

TRUCK/LOADER TEAM WORK

Task description: **CN1-Transport backfill for lower/north HW**

Site: **Juniper Quarry** Permit Action: Test Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 08C State: Colorado Abbreviation: None
Date: 12/14/2015 County: Moffat Filename: M141-08c
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 730
-Loader:	CAT 972H
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance –Motor Grader:	NA
-Water Truck:	NA

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	$35.72	$38.44	NA	NA	NA	NA
Operating cost/hour:	$69.96	$68.95	NA	NA	NA	NA
Ripper op. cost/hour:	NA	$0.00	NA	NA	NA	NA
Operator cost/hour:	$26.72	$37.13	NA	NA	NA	NA
Unit Subtotals:	$132.40	$144.52	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work:	$409.32	Support:	$0.00	Maint:	$0.00

Total work team cost/hour: **$409.32**

MATERIAL QUANTITIES

Initial volume: 21,559 CCY Swell factor: 1.165
Loose volume: **25,116** LCY

Source of estimated volume: 1/4 of the backfill material needed to fill trench
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 2,900 Pounds/LCY
Description: Decomposed rock - 50% Rock, 50% Earth
Rated Payload: 62,000 Pounds
Payload Capacity: 21.38 LCY

Truck Bed (volume) Basis:

Struck Volume:	17.10	LCY
Heaped Volume:	22.10	LCY
Average Volume:	19.60	LCY
Adjusted Volume:	21.38	LCY

Final Truck Volume Based on Number of Loader Passes: **17.22** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	5.600	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**5.740**	LCY

Job Condition Corrections: Site Altitude (ft.): 6600 feet

	Truck	Loader	Source
Altitude Adj:	1.000	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.830**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 3 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA
Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.525 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material 1/8" to 3/4" diameter -0.02	-0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high and up 0.00	0.000	(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:	-0.100	minutes
	Adjusted Loader Cycle Time:	**0.425**	minutes
	Net Load Time per Truck:	**0.950**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.600	Minutes
Truck Load Time:	0.950	Minutes	Adjusted for site altitude:	0.950	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.000	Minutes

Truck Travel (Haul & Return) 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	200.00	-3.00	5.00	2.00	2733	0.430

Haul Time: **0.430** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	3.00	5.00	8.00	1903	0.199

Return Time: **0.199** minutes
Total Truck Cycle Time: **3.179** minutes

Loading Tool unit Production 666.58 LCY/Hour — Adjusted for job efficiency: 553.26 LCY/Hour

Truck Unit Production 325.01 LCY/Hour — Adjusted for job efficiency: 269.76 LCY/Hour

Optimal No. of Trucks: 2 Truck(s) — Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 539.51 LCY/Hour
Adjusted single truck/loader team production: 539.51 LCY/Hour
Adjusted multiple truck/loader team production: **539.51** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) — Total job time: **46.55** Hours

Unit cost: $0.759 /LCY — Total job cost: **$19,055**

December 8, 2015

Michael Anson
Moffat Limestone Company
P.O. Box 777
Craig, Co 81626

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

1313 Sherman Street, Room 215
Denver, CO 80203

RE: Juniper Quarry, Permit No. M-1982-141, Estimated Reclamation Costs Update

Task	Form Used	Change	Justification
01a	Demolish	-	Most scrap material removed from both sited. Only a few trailers remain
04a	Ripper	+	Larger compacted area needs ripped. 4 ac to 6 ac
05a	Loader	+	Larger disturbance 15 ac (including road) at 3" thick of topsoil. Previously estimated at 12 ac. Volume went form 4,840 CCY to 6,050 CCY
06a	Dozer	+	Updated volume to be handled from 4,840 CCY to 6,050 CCY
07a	Reveg	+	More disturbance needs seeded 12 ac to 15 ac
07a	Reveg	+	Add mulching, crimper, updated herbicide
08a	Blasting	-	Previously estimated at 1000 lft of highwall needs blasted, now estimated at 750 lft need blasted
09a	Dozer	-	Previously estimated at 500 lft needs blasting. Plus grading HW benches 500 lf x 25ft. Now no blasting required, instead dozer. Backfill 1400 lft @ 40ft H @ 1.5: to a 3:1 is 15,556 CCY
09b	Dozer	-	Less bench grading previously 1000 lft , now 750 lft
10a	Dozer	+	Lots of stockpiled and processing benches that would need graded. Approximated at 1500 lft averaging 40'H
11a	Ripper	+/-	Less site but more roads to be ripped, same area affected
12a	Loader	+	Larger disturbance 15 ac. At 3" thick of topsoil. Previously estimated at 15 ac. Volume went from 6,050 CCY to 10,890 CCY
13a	Dozer	+	Updated volume to be handled from 6,050 CCY to 10,890 CCY

14a	Reveg	+	More disturbance need seeded 15 ac to 27 ac
14a	Reveg	+	Add mulching, crimper, updated herbicide, more hours
15a	Mobilize	+	Add power mulcher
15a	Mobilize	+	Fleet size
16a	Mobilize	+	Secondary seeding mobilization required
	Project Management	-	Less hours overall because of larger fleet size. So superintendent cost decreased
	Project Management	+	Due to blasting engineering work may be necessary for slope stability.
	Project Management	+	Reclamation management % updated based on scale of project

Changes were based on field observations. Previous bond was calculated based on the worst case scenario of the approved reclamation plan. Actual disturbance is more than allowed in the approved plan.

Please feel free to contact me with any further questions. Amy Yeldell at the Division of Reclamation, Mining and Safety, 1313 Sherman St., Room 215, Denver, CO 80203. Direct contact can be made by phone at 970-254-8511 or via email at amy.yeldell@ state.co.us

Sincerely,

Amy Yeldell
Environmental Protection Specialist
Department of Natural Resources
Division of Reclamation, Mining and Safety
Phone: (970) 254-8511
Fax: (970) 241-1516

Ec:
Russ Means, Senior EPS / Field Office Supervisor, Grand Junction DRMS

COST SUMMARY WORK

Task description: **Review of bond post inspection**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-000
User: ACY

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01a	Removal of mining equipment and debris	DEMOLISH	1	8.00	$3,116.40
02a	AM1 Highwall Reduction	BLASTING	1	30.72	$10,302.00
03a	AM1 Highwall reduction (grade HW)	DOZER	2	2.84	$1,185.00
04a	AM1 Rip process area and access road	RIPPER	2	4.52	$2,014.00
05a	AM1 Distribute topsoil throughout disturbed area	LOADER	2	9.63	$2,784.00
06a	AM1 Spread topsoil	DOZER	2	4.13	$1,725.00
07a	AM1 Revegetate disturbed area	REVEGE	1	24.00	$25,494.00
08a	CN1 Highwall Reduction (Lower/North HW)	BLASTING	1	76.80	$25,750.00
09a	CN1 Highwall reduction (grade upper/ south HW)	DOZER	2	13.24	$5,531.00
09b	CN1 Highwall reduction (grade Lower/ north HW)	DOZER	2	9.45	$3,950.00
10a	CN1 Grade various processing benches	DOZER	2	15.13	$6,321.00
11a	CN1 Rip pit floor, process area and roads	RIPPER	2	3.89	$1,735.00
12a	CN1 Distribute topsoil throughout disturbed area	LOADER	2	27.67	$8,000.00
13a	CN1 Distribute topsoil throughout disturbed area	DOZER	2	7.43	$3,105.00
14a	CN1 Revegetate disturbed area	REVEGE	1	35.00	$45,889.00
15a	Mobilize reclamation crew and equipment	MOBILIZE	1	4.66	$6,224.00
16a	Secondary Mob of reclamation crew and equipment	MOBILIZE	1	1.33	$199.00
		SUBTOTALS:		**278.44**	**$153,324**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$3,097.14
Performance bond:	1.05	Total =	$1,609.90
Job superintendent:	139.22	Total =	$10,463.78
Profit:	10.00	Total =	$15,332.40
		TOTAL O & P =	$30,503.22
		CONTRACT AMOUNT (direct + O & P) =	$183,827.22

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	500.00	Total =	500.00
Engineering work and/or contract/bid preparation:	8.00	Total =	$14,706.18
Reclamation management and/or administration:	5.81		$10,680.36
CONTINGENCY:	0.00	Total =	$0.00
		TOTAL INDIRECT COST =	$56,389.76
		TOTAL BOND AMOUNT (direct + indirect) =	**$209,713.76**

DEMOLITION WORK

Task description: **Removal of mining equipment and debris**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 01A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-01a
User: ACY

Agency or organization name: DRMS

UNIT COSTS **Location adjustment: 91.30 %**

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Trailer and misc metal in AM-1	8'W x 20'L x 10'H	Loading and 5 mile haul, salvage allowed - Steel frame structures	59.30	CY	$9.48	$562.16
Remove 10,000 gallon fuel tank	10,000 gallon	Haul tank to certified salvage dump - 9,000 to 12,000 gal. tank	1.00	EA	$1,050.00	$1,050.00
Remove steel trailers in CN-1	150 CY	Loading and 5 mile haul, salvage allowed - Steel frame structures	150.00	CY	$9.48	$1,422.00
Remove misc. refuse/debris in CN-1	40 CY	Loading and 5 mile haul, salvage allowed - Steel frame structures	40.00	CY	$9.48	$379.20

Job Hours: **8.00** **Subtotal (unadjusted):** **$3,413.36** **Total Cost (adjusted for location):** **$3,116.40**

SURFACE BLASTING WORK

Task description: **AM-1 Highwall Reduction**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 02A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-02a
User: ACY

Agency or organization name: DRMS

BLAST AREA DIMENSIONS

		QUANTITY	UNIT
Blast Area Configuration:	Wedge-shaped mass (highwall reduction using balanced cut/fill)		
Blasting Method Description:	Conventional surface blast (fragmentation only)		
Highwall or Bench Face Angle:		0.00	h:1v
Regraded Slope Angle:		1.50	h:1v
Highwall or Bench Length:		300	feet
Highwall or Bench Width:		30	feet
Highwall or Bench Height:		40.0	feet
Depth to Base of Cut at Highwall:		20.0	feet

BLAST AREA VOLUMES

	QUANTITY	UNIT
Total Volume of Dimensional Mass to be Shot:	3,333	cubic yards
Blast Volume to Subdrill Grade and Blast Pattern Lines:	3,603	cubic yards
Blast Volume to Finish Grade and Blast Pattern Lines:	2,963	cubic yards
Remaining Volume Required to be Re-Shot or Ripped:	370	cubic yards

BLAST AREA DESIGN

	QUANTITY	UNIT
Recommended Blasthole Diameter:	2.940	inches
Selected Blasthole Diameter:	4.000	inches
Subdrilling Allowance:	2.4	feet
Blasthole Depth:	11.7	feet
Density of Rock:	Average Density Rock (ANFO Basis)	rock density
Burden to Charge Diameter Ratio:	25	times diameter
Burden:	8.0	feet
Spacing to Burden Ratio:	1.3	times burden
Spacing:	10.0	feet
Cubic Yards of Rock per Blasthole:	41.48	cubic yards
Powder Factor Description:	High	rock strength
Powder Factor:	1.000	pounds/cu. yd.
Density of Blasting Agent:	1.10	grams/cc
Quantity of Explosives per Blasthole:	41.48	POUNDS
Height of Powder Column:	6.92	feet
Height of Stemming per Blasthole:	4.81	feet
Stemming to Burden Ratio:	0.60	times burden
Quantity of Stemming per Blasthole:	0.0156	cubic yards
Number of Rows:	3	rows
Number of Blastholes per Row:	30	holes per row
Total Number of Blastholes:	90	holes
Total Length of all Blastholes:	1,056	feet

BLASTING MATERIALS QUANTITIES

	QUANTITY	UNIT
Total Quantity of Stemming Required:	1.40	cubic yards
Total Quantity of Explosives Required:	3,733	pounds
Total Quantity of det. cord/fuse/wire Required:	2,178	linear feet
Quantity of Blasting Caps per Blasthole:	1	cap(s)
Total Quantity of Blasting Caps Required:	90	caps
Quantity of Primers per Blasthole:	1	primer(s)
Total Quantity of Primers Required:	90	primers
Quantity of Delays per Blasthole:	1	delay(s)
Total Quantity of Delays Required:	93	delays

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Description
Drilling Equipment - Drill:	ATLAS COPCO ROC D7-11,4.0 in.
-Drill Pad Preparation:	Cat D8T - 8SU
Misc. Drill Support Equipment:	NA
Misc. Explosives Support Equipment:	NA
Explosives Delivery –Bulk Truck:	NA
-Cap Truck:	NA

Cost Breakdown:	Drilling Equipment	Drill Pad Preparation	Misc. Drill Support	Misc. Expl. Support	Explosives Delivery Bulk Truck	Explosives Delivery Cap Truck
	Drilling	Dozer				
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	$49.55	$62.67	NA	NA	NA	NA
Operating cost/hour:	$82.27	$108.22	NA	NA	NA	NA
Ripper op. cost/hour:	NA	$0.00	NA	NA	NA	NA
Operator cost/hour:	$0.00	$38.01	NA	NA	NA	NA
Unit Subtotals:	$131.83	$208.90	$0.00	$0.00	$0.00	$0.00
Number of Units:	1	1	0	0	0	0
Group Subtotals:	$131.83	$208.90	$0.00	$0.00	$0.00	$0.00

Total work team cost/hour: **$340.73**

MATERIALS COST

	Description	Unit	Unit Cost	Quantity	Total Cost
Blasting Agent:	Bulk ANFO high density (7,900-15,000 fps)	Pound	$0.340	3733.333	$1,269.33
Primers or Boosters:	Aluminized ANFO booster (electric or non-electric system)	Bag	$11.777	90.000	$1,059.93
Blasting Caps:	Electric cap, inst. (electric systems)	Each	$21.210	90.000	$1,908.90
Det. Cord, fuse, or wire:	Blasting wire, 12-14 gage (electric systems)	Linear foot	$0.088	2178.000	$191.66
Delays:	NO DELAY MATERIALS REQUIRED	NA	$0.000	93.000	$0.00
Miscellaneous:	Expl. magazine - agent (rental basis - meet MSHA req.)	Day	$6.106	0.000	$0.00
Drill bits:	Bit life = 1,400	Linear feet	$1,093.00	0.754	$824.43

Total Materials Cost: **$5,254.25**

DRILLING AND EXPLOSIVES PREPARATION TIME

Total Drilling Length:	1,056	linear feet
Unadjusted Drilling Rate:	112.00	feet/hour
Drilling Time:	14.81	hours

Job Condition Corrections:

Site Altitude:	6,600	feet
Altitude Adjustment:	0.95	(DRMS est.)
Job Efficiency Factor:	0.67	(CH. Exc. HB)
Adjusted Drilling Rate:	**71.29**	feet/hour
Explosives Prep. Time:	15.91	hours

JOB TIME AND COST

Total Job Time: **30.72** Hours

Unit cost: $2.859 per cu. yd. Total Job Cost: **$10,302**

BULLDOZER WORK

Task description: **AM1 Highwall reduction (grade HW)**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 03A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-03a
User: ACY

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$417.81**

MATERIAL QUANTITIES

Initial Volume: 3,333
Swell factor: 1.345
Loose volume: **4,483** LCY

Source of estimated volume: Cut and fill approx. 300 lft. x 40 ft. 0H:1V to 1.5H:1V
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: Rock, well ripped or blasted 0.8

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5645

Adjusted unit production: 790.30 LCY/hr
Adjusted fleet production: **1580.6** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.264/LCY

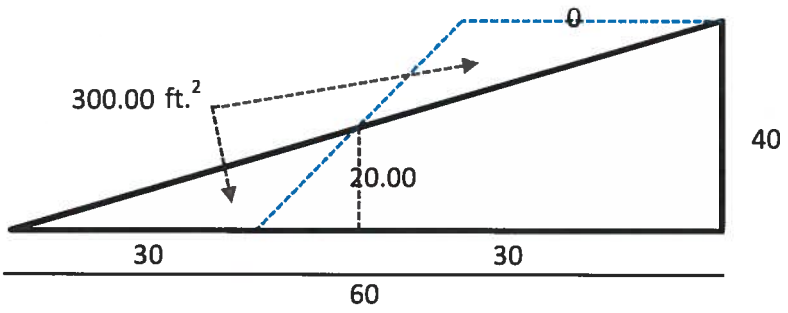
Total job time: **2.84** Hours
Total job cost: **$1,185**

Highwall reduction - cut and fill

AM-1 Highwall reduction (grade HW)

Highwall Height (ft.)	40.0	
Length of Highwall (lft.)	300	
Initial Slope	0.0	H:1V
Desired Slope	2	H:1V
Volume of material to be moved ($ft.^3$)	**90,000**	
Volume of material to be moved ($yd.^3$)	**3,333**	

All dimensions measured in feet
Drawing not to scale



BULLDOZER RIPPING WORK

Task description: **AM1 Rip process area and access road**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 04A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-04a
User: ACY

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:	$69.05	NA
Operating Cost/Hour:	$108.22	100
Ripper Operating Cost/Hour:	$7.46	100
Operator Cost/Hour:	$38.01	NA
Total Unit Cost/Hour:	$222.73	
Total Fleet Cost/Hour:	**$445.46**	

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 6.00 acres Rip Depth (ft): 2.00 Volume: 19,360 BCY or CCY

Source of estimated quantity: Field Estimates & Google Earth digitizing

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.56	mph
Average Ripping Width:	7.08	degrees
Average Ripping Length:	300.00	feet
Average Dozer Speed:	88.00	feet
Average Maneuver Time:	0.25	feet
Production per unit area:	0.800	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.800	Acres/hr
Site Altitude:	6,600	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.66	Acres/hr
Adjusted Hourly Fleet Production:	**1.33**	Acres/hr

JOB TIME AND COST

Fleet size: 2 Grader(s) Total job time: **4.52** Hours

Unit cost: $335.626 Per acre Total job cost: **$2,014**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **AM1 Distribute topsoil throughout disturbed area**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 05A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-05a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 972H Horsepower: 287
Attachment 1: ROPS Cab Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$38.44	NA
Operating Cost/Hour:	$68.95	100
Operator Cost/Hour:	$37.13	NA
Total Unit Cost/Hour:	$144.52	
Total Fleet Cost/Hour:	$289.04	

MATERIAL QUANTITIES

Initial volume: 6,050 CCY Swell factor: 1.000
Loose volume: **6,050** LCY

Source of estimated volume: 15 ac. disturbance x 3"
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.525 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material up to 1/8" diameter 0.02	0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high or less 0.01	0.010	(Cat HB)
Truck Ownership:	No adjustment - factor not applicable 0.00	0.000	(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:	-0.010	minutes
	Adjusted Basic Cycle Time:	0.515	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:	200	0.00	5.00	5.00	0.1844	(Cat HB)
Return Route:	200	0.00	5.00	5.00	0.1664	(Cat HB)

Total Travel Time:	0.3508	minutes
Total Cycle Time:	**0.8658**	minutes

Load Bucket Capacity

Rated Capacity:	5.60	LCY (heaped)
Bucket Fill Factor:	0.975	Loose material - uniform aggregates to 1/8" (95-100%) 0.975
Adjusted Capacity:	**5.46**	LCY

Job Condition Correction Factors
Site Altitude: 6600 feet

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

Unadjusted Hourly Unit Production:	378.36	LCY/Hour
Adjusted Hourly Unit Production:	314.04	LCY/Hour
Adjusted Hourly Fleet Production:	**628.08**	LCY/Hour

JOB TIME AND COST

Fleet size:	2	Loader(s)	Total job time:	**9.63**	Hours
Unit cost:	$0.460	/LCY	Total job cost:	**$2,784**	

BULLDOZER WORK

Task description: **AM1 Spread topsoil**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 06A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-06a
User: ACY

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$417.81**

MATERIAL QUANTITIES

Initial Volume: 6,050
Swell factor: 1.000
Loose volume: **6,050** LCY

Source of estimated volume: Task 05a
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 732.64 LCY/hr
Adjusted fleet production: **1465.28** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.285/LCY

Total job time: **4.13** Hours
Total job cost: **$1,725**

REVEGETATION WORK

Task description: **AM1 Revegetate disturbed area**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 07A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-07a
User: ACY

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			$	$
			Total Fertilizer Materials Cost/Acre	**$0.00**

Application

Description	Cost /Acre
	$
Total Fertilizer Application Cost/Acre	**$0.00**

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	$88.58
Total Tilling Cost/Acre	**$88.58**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indian Ricegrass - Nespar	6.00	19.42	$42.48
Thickspike Wheatgrass - Critana	5.50	19.44	$28.44
Western Wheatgrass - Arriba	8.00	20.20	$29.44
Needle and Thread	7.50	19.80	$352.43
Flax, Lewis Blue	1.00	6.63	$16.52
Winter Fat	1.00	2.55	$32.69
Bluebunch Wheatgrass - Goldar	4.00	12.86	$22.00
Totals Seed Mix	33.00	100.91	**$523.99**

Application

Description	Cost /Acre
Drill seeding (DRMS Cost Data)	$88.20
Total Seed Application Cost/Acre	**$88.20**

MULCHING and MISCELLANEOUS

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$265.00	$530.00
Herbicide - Glyphosate (Journey)@ 1.0 pt/ac	1.00	ACRE	$1.53	$1.53
Total Mulch Materials Cost/Acre				**$531.53**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$65.89
Weed spray, truck, non-aquatic area, nox. [DMG]	$61.49
Total Mulch Application Cost/Acre	**$127.38**

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: 15 Cost /Acre: $1,359.68
Estimated Failure Rate: 25% Cost /Acre*: $1,359.68
*Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **$20,395.20**
Reseeding Job Cost: **$5,098.80**
Total Job Cost: **$25,494**
Job Hours: **24.00**

SURFACE BLASTING WORK

Task description: **CN-1 Highwall Reduction (Lower/North HW)**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 08A State: Colorado Abbreviation: None
Date: 12/9/2015 County: Moffat Filename: M141-08a
User: ACY

Agency or organization name: DRMS

BLAST AREA DIMENSIONS

	QUANTITY	UNIT
Blast Area Configuration:	Wedge-shaped mass (highwall reduction using balanced cut/fill)	
Blasting Method Description:	Conventional surface blast (fragmentation only)	
Highwall or Bench Face Angle:	0.00	h:1v
Regraded Slope Angle:	1.50	h:1v
Highwall or Bench Length:	750	feet
Highwall or Bench Width:	30	feet
Highwall or Bench Height:	40.0	feet
Depth to Base of Cut at Highwall:	20.0	feet

BLAST AREA VOLUMES

	QUANTITY	UNIT
Total Volume of Dimensional Mass to be Shot:	8,333	cubic yards
Blast Volume to Subdrill Grade and Blast Pattern Lines:	9,007	cubic yards
Blast Volume to Finish Grade and Blast Pattern Lines:	7,407	cubic yards
Remaining Volume Required to be Re-Shot or Ripped:	926	cubic yards

BLAST AREA DESIGN

	QUANTITY	UNIT
Recommended Blasthole Diameter:	2.940	inches
Selected Blasthole Diameter:	4.000	inches
Subdrilling Allowance:	2.4	feet
Blasthole Depth:	11.7	feet
Density of Rock:	Average Density Rock (ANFO Basis)	rock density
Burden to Charge Diameter Ratio:	25	times diameter
Burden:	8.0	feet
Spacing to Burden Ratio:	1.3	times burden
Spacing:	10.0	feet
Cubic Yards of Rock per Blasthole:	41.48	cubic yards
Powder Factor Description:	High	rock strength
Powder Factor:	1.000	pounds/cu. yd.
Density of Blasting Agent:	1.10	grams/cc
Quantity of Explosives per Blasthole:	41.48	POUNDS
Height of Powder Column:	6.92	feet
Height of Stemming per Blasthole:	4.81	feet
Stemming to Burden Ratio:	0.60	times burden
Quantity of Stemming per Blasthole:	0.0156	cubic yards
Number of Rows:	3	rows
Number of Blastholes per Row:	75	holes per row
Total Number of Blastholes:	225	holes
Total Length of all Blastholes:	2,640	feet

BLASTING MATERIALS QUANTITIES

	QUANTITY	UNIT
Total Quantity of Stemming Required:	3.50	cubic yards
Total Quantity of Explosives Required:	9,333	pounds
Total Quantity of det. cord/fuse/wire Required:	5,405	linear feet
Quantity of Blasting Caps per Blasthole:	1	cap(s)
Total Quantity of Blasting Caps Required:	225	caps
Quantity of Primers per Blasthole:	1	primer(s)
Total Quantity of Primers Required:	225	primers
Quantity of Delays per Blasthole:	1	delay(s)
Total Quantity of Delays Required:	228	delays

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Description
Drilling Equipment - Drill:	ATLAS COPCO ROC D7-11,4.0 in.
-Drill Pad Preparation:	Cat D8T - 8SU
Misc. Drill Support Equipment:	NA
Misc. Explosives Support Equipment:	NA
Explosives Delivery –Bulk Truck:	NA
-Cap Truck:	NA

Cost Breakdown:	Drilling Equipment	Drill Pad Preparation	Misc. Drill Support	Misc. Expl. Support	Explosives Delivery Bulk Truck	Explosives Delivery Cap Truck
	Drilling	Dozer				
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	$49.55	$62.67	NA	NA	NA	NA
Operating cost/hour:	$82.27	$108.22	NA	NA	NA	NA
Ripper op. cost/hour:	NA	$0.00	NA	NA	NA	NA
Operator cost/hour:	$0.00	$38.01	NA	NA	NA	NA
Unit Subtotals:	$131.83	$208.90	$0.00	$0.00	$0.00	$0.00
Number of Units:	1	1	0	0	0	0
Group Subtotals:	$131.83	$208.90	$0.00	$0.00	$0.00	$0.00

Total work team cost/hour: **$340.73**

MATERIALS COST

	Description	Unit	Unit Cost	Quantity	Total Cost
Blasting Agent:	Bulk ANFO high density (7,900-15,000 fps)	Pound	$0.340	9333.333	$3,173.33
Primers or Boosters:	Aluminized ANFO booster (electric or non-electric system)	Bag	$11.777	225.000	$2,649.83
Blasting Caps:	Electric cap, inst. (electric systems)	Each	$21.210	225.000	$4,772.25
Det. Cord, fuse, or wire:	Blasting wire, 12-14 gage (electric systems)	Linear foot	$0.088	5405.400	$475.68
Delays:	NO DELAY MATERIALS REQUIRED	NA	$0.000	228.000	$0.00
Miscellaneous:	Expl. magazine - agent (rental basis - meet MSHA req.)	Day	$6.106	0.000	$0.00
Drill bits:	Bit life = 1,400	Linear feet	$1,093.00	1.886	$2,061.09

Total Materials Cost: **$13,132.18**

DRILLING AND EXPLOSIVES PREPARATION TIME

Total Drilling Length:	2,640	linear feet
Unadjusted Drilling Rate:	112.00	feet/hour
Drilling Time:	37.03	hours

Job Condition Corrections:

Site Altitude:	6,600	feet
Altitude Adjustment:	0.95	(DRMS est.)
Job Efficiency Factor:	0.67	(CH. Exc. HB)
Adjusted Drilling Rate:	**71.29**	feet/hour
Explosives Prep. Time:	39.78	hours

JOB TIME AND COST

Total Job Time: **76.81** Hours

Unit cost: $2.859 per cu. yd. Total Job Cost: **$25,750**

BULLDOZER WORK

Task description: **CN1-Highwall reduction (grade upper/ south HW)**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #:	09A	State:	Colorado	Abbreviation:	None
Date:	12/8/2015	County:	Moffat	Filename:	M141-09a
User:	ACY				

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$417.81**

MATERIAL QUANTITIES

Initial Volume:	15,556
Swell factor:	1.345
Loose volume:	**20,923** LCY

Source of estimated volume: Cut and fill approx. 1400 lft. x 40ft.
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: Rock, well ripped or blasted 0.8

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5645

Adjusted unit production: 790.30 LCY/hr
Adjusted fleet production: **1580.6** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.264/LCY

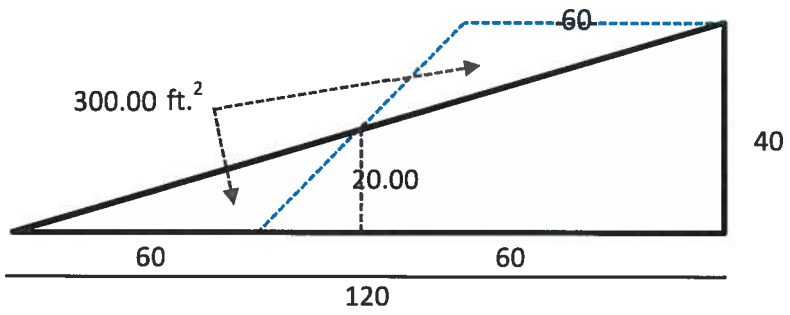
Total job time: **13.24** Hours
Total job cost: **$5,531**

Highwall reduction - cut and fill

CN-1 Highwall reduction (grade Upper/south HW)

Highwall Height (ft.)	40.0	
Length of Highwall (lft.)	1400	
Initial Slope	1.5	H:1V
Desired Slope	3	H:1V
Volume of material to be moved ($ft.^3$)	**420,000**	
Volume of material to be moved ($yd.^3$)	**15,556**	

All dimensions measured in feet
Drawing not to scale



BULLDOZER WORK

Task description: **CN1 Highwall reduction (grade Lower/ north HW)**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #:	09B	State:	Colorado	Abbreviation:	None
Date:	12/8/2015	County:	Moffat	Filename:	M141-09b
User:	ACY				

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$417.81**

MATERIAL QUANTITIES

Initial Volume:	11,111
Swell factor:	1.345
Loose volume:	**14,944** LCY

Source of estimated volume: Cut and fill approx. 750 lft. x 40 ft.
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: Rock, well ripped or blasted 0.8

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5645

Adjusted unit production: 790.30 LCY/hr
Adjusted fleet production: **1580.6** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.264/LCY

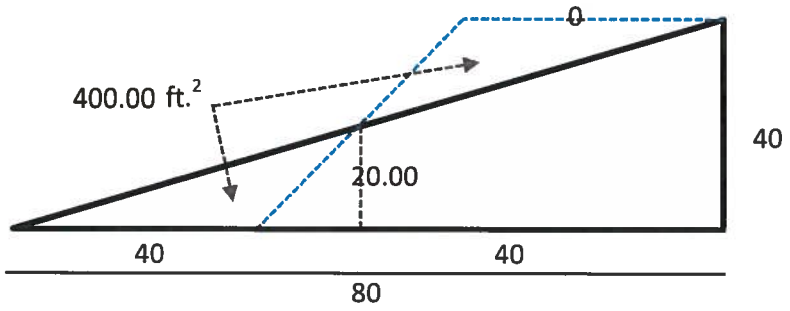
Total job time: **9.45** Hours
Total job cost: **$3,950**

Highwall reduction - cut and fill

CN-1 Highwall reduction (grade Lower/north HW)

Highwall Height (ft.)	40.0	
Length of Highwall (lft.)	750	
Initial Slope	0.0	H:1V
Desired Slope	2	H:1V
Volume of material to be moved ($ft.^3$)	**300,000**	
Volume of material to be moved ($yd.^3$)	**11,111**	

All dimensions measured in feet
Drawing not to scale



BULLDOZER WORK

Task description: **CN-1 Grade various processing benches**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #:	10A	State:	Colorado	Abbreviation:	None
Date:	12/8/2015	County:	Moffat	Filename:	M141-10a
User:	ACY				

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$417.81**

MATERIAL QUANTITIES

Initial Volume:	22,222
Swell factor:	1.345
Loose volume:	**29,889** LCY

Source of estimated volume: Grade benches, aprox 1500'L, avg 40' H
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: Consolidated stockpile 1.0

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7056

Adjusted unit production: 987.84 LCY/hr
Adjusted fleet production: **1975.68** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.211/LCY

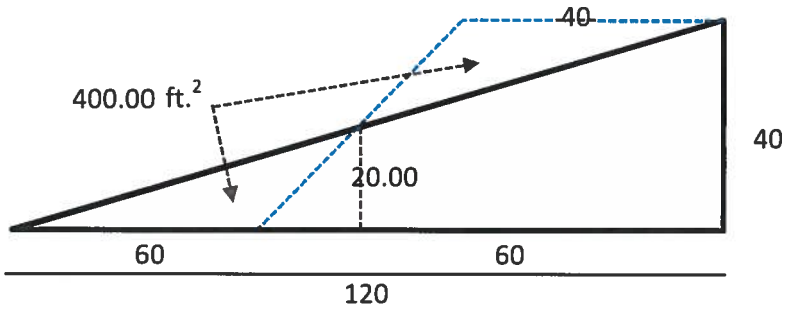
Total job time: **15.13** Hours
Total job cost: **$6,321**

Highwall reduction - cut and fill

CN-1 Highwall reduction (grade Lower/north HW)

Highwall Height (ft.)	40.0	
Length of Highwall (lft.)	1500	
Initial Slope	1.0	H:1V
Desired Slope	3	H:1V
Volume of material to be moved ($ft.^3$)	**600,000**	
Volume of material to be moved ($yd.^3$)	**22,222**	

All dimensions measured in feet
Drawing not to scale



BULLDOZER RIPPING WORK

Task description: **CN1 Rip pit floor, process area and roads**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 11A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-11a
User: ACY

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:	$69.05	NA
Operating Cost/Hour:	$108.22	100
Ripper Operating Cost/Hour:	$7.46	100
Operator Cost/Hour:	$38.01	NA
Total Unit Cost/Hour:	$222.73	
Total Fleet Cost/Hour:	**$445.46**	

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 5.00 acres Rip Depth (ft): 2.00 Volume: 16,133 BCY or CCY

Source of estimated quantity: Filed estimates adn Google Earth digitizing

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.56	mph
Average Ripping Width:	7.08	degrees
Average Ripping Length:	200.00	feet
Average Dozer Speed:	88.00	feet
Average Maneuver Time:	0.25	feet
Production per unit area:	0.773	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.773	Acres/hr
Site Altitude:	6,600	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.64	Acres/hr
Adjusted Hourly Fleet Production:	**1.28**	Acres/hr

JOB TIME AND COST

Fleet size: 2 Grader(s) Total job time: **3.90** Hours

Unit cost: $347.092 Per acre Total job cost: **$1,735**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **CN1 Distribute topsoil throughout disturbed area**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 12A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-12a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 972H Horsepower: 287
Attachment 1: ROPS Cab Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$38.44	NA
Operating Cost/Hour:	$68.95	100
Operator Cost/Hour:	$37.13	NA
Total Unit Cost/Hour:	$144.52	
Total Fleet Cost/Hour:	$289.04	

MATERIAL QUANTITIES

Initial volume: 10,890 CCY Swell factor: 1.000
Loose volume: **10,890** LCY

Source of estimated volume: 27 ac. x 3"
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.525 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material up to 1/8" diameter 0.02	0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high and up 0.00	0.000	(Cat HB)
Truck Ownership:	No adjustment - factor not applicable 0.00	0.000	(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:	0.505	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:	500	0.00	5.00	5.00	0.4611	(Cat HB)
Return Route:	500	0.00	5.00	5.00	0.4160	(Cat HB)

Total Travel Time:	0.8771	minutes
Total Cycle Time:	**1.3821**	minutes

Load Bucket Capacity

Rated Capacity:	5.60	LCY (heaped)
Bucket Fill Factor:	0.975	Loose material - uniform aggregates to 1/8" (95-100%) 0.975
Adjusted Capacity:	**5.46**	LCY

Job Condition Correction Factors
Site Altitude: 6600 feet

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

Unadjusted Hourly Unit Production:	237.03	LCY/Hour
Adjusted Hourly Unit Production:	196.74	LCY/Hour
Adjusted Hourly Fleet Production:	**393.48**	LCY/Hour

JOB TIME AND COST

Fleet size:	2	Loader(s)	Total job time:	**27.68**	Hours
Unit cost:	$0.735	/LCY	Total job cost:	**$8,000**	

BULLDOZER WORK

Task description: **CN1 Distribute topsoil throughout disturbed area**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 13A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-13a
User: ACY

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:	$62.67	NA
Operating Cost/Hour:	$108.22	100
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.01	NA

Total unit Cost/Hour: $208.90
Total Fleet Cost/Hour: **$417.81**

MATERIAL QUANTITIES

Initial Volume: 10,890
Swell factor: 1.000
Loose volume: **10,890** LCY

Source of estimated volume: Task 12a
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 732.64 LCY/hr
Adjusted fleet production: **1465.28** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.285/LCY

Total job time: **7.43** Hours
Total job cost: **$3,105**

REVEGETATION WORK

Task description: **CN1 Revegetate disturbed area**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 14A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-14a
User: ACY

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			$	$
			Total Fertilizer Materials Cost/Acre	**$0.00**

Application

Description	Cost /Acre
	$
Total Fertilizer Application Cost/Acre	**$0.00**

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	$88.58
Total Tilling Cost/Acre	**$88.58**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indian Ricegrass - Nespar	6.00	19.42	$42.48
Thickspike Wheatgrass - Critana	5.50	19.44	$28.44
Western Wheatgrass - Arriba	8.00	20.20	$29.44
Needle and Thread	7.50	19.80	$352.43
Flax, Lewis Blue	1.00	6.63	$16.52
Winter Fat	1.00	2.55	$32.69
Bluebunch Wheatgrass - Goldar	4.00	12.86	$22.00
Totals Seed Mix	33.00	100.91	**$523.99**

Application

Description	Cost /Acre
Drill seeding (DRMS Cost Data)	$88.20
Total Seed Application Cost/Acre	**$88.20**

MULCHING and MISCELLANEOUS

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$265.00	$530.00
Herbicide - Glyphosate (Journey)@ 1.0 pt/ac	1.00	ACRE	$1.53	$1.53
Total Mulch Materials Cost/Acre				**$531.53**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$65.89
Weed spray, truck, non-aquatic area, nox. [DMG]	$61.49
Total Mulch Application Cost/Acre	**$127.38**

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: 27 Cost /Acre: $1,359.68
Estimated Failure Rate: 25% Cost /Acre*: $1,359.68
*Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **$36,711.36**
Reseeding Job Cost: **$9,177.84**
Total Job Cost: **$45,889**
Job Hours: **35.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilize reclamation crew and equipment**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 15A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-15a
User: ACY

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:	$16.63	$18.37	$22.33
Operating Cost/Hour:	$44.38	$46.13	$50.07
Operator Cost/Hour:	$27.66	$27.66	$27.66
Helper Cost/Hour:	$0.00	$25.39	$25.39
Total Unit Cost/Hour:	$88.67	$117.55	$125.45

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	$65.28	$125.45	2	$381.46	$250.90	$500.00
CAT 972H	28.00	$36.70	$117.55	2	$308.50	$235.10	$500.00
ATLAS COPCO ROC D7-11,4.0 in.	0.00	$48.87	$88.67	1	$137.54	$88.67	$250.00
Subtotals:					**$827.50**	**$574.67**	**$1,250.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 1 T. Crew	$25.30	1	$25.30	$25.30
Drill/Broadcast Seeder with Tractor	$75.35	1	$75.35	$75.35
Power Mulcher (Reinco M90)	$48.76	1	$48.76	$48.76
Subtotals:			**$149.41**	**$149.41**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	CRAIG	
Total one-way travel distance:	30.00	miles
Average Travel Speed:	45.00	mph

Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$6,024.56
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$199.21

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.67	0.67
Return Time (Hours):	0.67	0.67
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	2.33	1.33

JOB TIME AND COST

Total job time:	**4.67**	Hours
Total job cost:	**$6,224**	

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Secondary Mob of reclamation crew and equipment**

Site: **Juniper Quarry** Permit Action: 2015-11 Inspection Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 16A State: Colorado Abbreviation: None
Date: 12/8/2015 County: Moffat Filename: M141-16a
User: ACY

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:	$16.63	$18.37	$22.33
Operating Cost/Hour:	$44.38	$46.13	$50.07
Operator Cost/Hour:	$27.66	$27.66	$27.66
Helper Cost/Hour:	$0.00	$25.39	$25.39
Total Unit Cost/Hour:	$88.67	$117.55	$125.45

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
Subtotals:					**$0.00**	**$0.00**	**$0.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 1 T. Crew	$25.30	1	$25.30	$25.30
Drill/Broadcast Seeder with Tractor	$75.35	1	$75.35	$75.35
Power Mulcher (Reinco M90)	$48.76	1	$48.76	$48.76
Subtotals:			**$149.41**	**$149.41**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	CRAIG	
Total one-way travel distance:	30.00	miles
Average Travel Speed:	45.00	mph

Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$0.00
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$199.21

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.67	0.67
Return Time (Hours):	0.67	0.67
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	2.33	1.33

JOB TIME AND COST

Total job time:	**1.33**	Hours
Total job cost:	**$199**	