



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

1313 Sherman Street, Room 215  
Denver, CO 80203

October 23, 2020

***RE: C Road Pit, Permit No. M-2016-050, TR-1 Reclamation Cost Estimate***

Dear Mr. Doody:

This reclamation cost update was in response a Technical Revision (TR-1). There have been no surety increases since the permit issuance in 2016. It is Division policy to periodically update its costs to ensure that the Financial Warranty adequately, reflects the actual current cost of fulfilling the requirements of the approved reclamation plan.

Below is a table summarizing input values that have been updated in this calculation. This table does not account for price changes resulting from inflation or other RS Means cost changes. Bond calculations are based on a combination of field observations and worst case scenario based on the approved reclamation permit.

Task	Form Used	Change	Justification
06a	Grader	-	Exhibit L states that pit floor will be approx. 37 acres, not the full 40 ac max disturbance
08a	Grader	-	Exhibit L states that pit floor will be approx. 37 acres, not the full 40 ac max disturbance
09a	Reveg	+	Exhibit L states that slopes are approx. 7 acres, not 5 acres as previously calculated
10 a/b	Mob	+	Added time for loading/unloading equipment, 0.5 hr standard Added secondary mob for reveg equipment
Indirect Costs			Only the 10% profit was calculated for indirect costs on previous calculations, this has been updated to reflect the standard indirect costs



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 303-866-3567 Ext 8183 or via email at amy.yeldell@state.co.us

Sincerely,



**Amy Yeldell**  
Environmental Protection Specialist

Ec:  
Travis Marshall, Senior EPS, Grand Junction DRMS

## COST SUMMARY WORK

Task description: TR-1 Inflation Calc Update

Site: C Road Pit

Permit Action: TR-1

Permit/Job#: M2016050

### PROJECT IDENTIFICATION

Task #: ACY

State: Colorado

Abbreviation: None

Date: 10/23/2020

County: Mesa

Filename: M505-000

User: ACY

Agency or organization name: DRMS

### TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01a	Reduce highwall 3:1	DOZER	1	345.19	\$84,923
02a	Place topsoil above highwall slopes	SCRAPER1	1	4.18	\$3,869
03a	Push topsoil down regraded slopes	DOZER	1	3.45	\$849
04a	Remove and spread visual berm material	DOZER	1	61.37	\$15,097
05a	Place topsoil above highwall slopes	SCRAPER1	1	77.64	\$71,936
06a	Spread overburden on pit floor 18"	GRADER	1	26.91	\$3,206
07a	Spread topsoil on overburden	SCRAPER1	1	77.64	\$71,936
08a	Spread topsoil on pit floor	GRADER	1	26.91	\$3,206
09a	Reveg pit slopes (non-cropland)	REVEGE	1	16.00	\$3,637
10a	Initial Mobilization	MOBILIZE	1	3.00	\$4,615
10b	Secondary Mobilization	MOBILIZE	1	3.00	\$760
<b><u>SUBTOTALS:</u></b>				<b>645.29</b>	<b>\$264,034</b>

### INDIRECT COSTS

#### OVERHEAD AND PROFIT:

Liability insurance: 2.02  
Performance bond: 1.05  
Job superintendent: 322.65  
Profit: 10.00

Total = \$5,333

Total = \$2,772

Total = \$22,440

Total = \$26,403

TOTAL O & P = \$56,949

CONTRACT AMOUNT (direct + O & P) = \$320,983

#### LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs): \$500  
Engineering work and/or contract/bid preparation: 4.25  
Reclamation management and/or administration: 5.00

Total = \$500

Total = \$13,642

Total = \$16,049

CONTINGENCY: 0.00

Total = \$0

TOTAL INDIRECT COST = \$87,140

TOTAL BOND AMOUNT (direct + indirect) = \$351,174

**TOTAL BOND AMOUNT (Rounded) = \$351, 000**

**BULLDOZER WORK**Task description: **Reduce highwall 3:1**Site: **C Road Pit**Permit Action: **TR-1**Permit/Job#: **M2016050****PROJECT IDENTIFICATION**Task #: **01A**State: **Colorado**Abbreviation: **None**Date: **10/23/2020**County: **Mesa**Filename: **M505-01a**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:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$116.22	NA
Operating Cost/Hour:	\$89.77	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$40.04	NA

Total unit Cost/Hour: **\$246.02**Total Fleet Cost/Hour: **\$246.02****MATERIAL QUANTITIES**Initial Volume: **203,141**Swell factor: **1.000**Loose volume: **203,141 LCY**Source of estimated volume: **Division of Reclamation, Mining & Safety**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: **-10 %**Average site altitude: **4,700 feet**Material weight: **2,400 lbs/LCY**Weight description: **Clay and gravel - Dry****Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.100	(50% SL)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.958	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5786

Adjusted unit production: 588.49 LCY/hr

Adjusted fleet production: **588.49** LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)

Unit cost: \$0.418/LCY

Total job time: **345.19** Hours

Total job cost: **\$84,923**

**SCRAPER TEAM WORK**Task description: Place topsoil above highwall slopesSite: C Road PitPermit Action: TR-1Permit/Job#: M2016050**PROJECT IDENTIFICATION**Task #: 02AState: ColoradoAbbreviation: NoneDate: 10/23/2020County: MesaFilename: M050-02aUser: ACYAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 627G w/push-pull
-Dozer:	Cat D8T - 8SU
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance -Motor Grader:	NA
-Water Truck:	NA

**Cost Breakdown:****Scraper Work Team****Support Equipment****Maintenance Equipment**

	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	\$130.45	\$116.22	NA	NA	NA	NA
Operating cost/hour:	\$162.77	\$89.77	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Ripper op. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Operator cost/hour:	\$47.07	\$40.04	NA	NA	NA	NA
Unit Subtotals:	\$340.28	\$246.02	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$926.58		Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: **\$926.58****MATERIAL QUANTITIES**Initial volume: 2,666

CCY

Swell factor: 1.215Loose volume: 3,239

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>1,600 lbs/LCY</u>	Struck Volume:	<u>15.70</u>	LCY
Material description:	<u>Top Soil</u>	Heaped Volume:	<u>22.00</u>	LCY
Rated Payload:	<u>52,800 pounds</u>	Average Volume:	<u>18.85</u>	LCY
Payload Capacity:	<u>33.00 LCY</u>	Adjusted Capacity:	<u>18.85</u>	LCY

Cycle Time:Scraper Loading Time: 0.90 MinutesManeuver and Spread Time: 0.60 MinutesJob Condition Correction:

Site Altitude: 4700 feet

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

Travel Time:Road Condition: Packed snow 2.5Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	1.00	2.50	3.50	2665	0.50

Haul Time: 0.50 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	-1.00	2.50	1.50	2905	0.42

Return Time: 0.42 minutesTotal Scraper team cycle time: 2.42 minutesAdjusted for job conditions: 775.81 LCY/HourSelected Number of Scrapers: 2 Scraper(s)Adjusted single scraper team (unit) hourly production: 775.81 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 775.81 LCY/HourUnadjusted unit production/hour: 934.71 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 4.18 HoursUnit cost: \$1.194 /LCYTotal job cost: \$3,869

**BULLDOZER WORK**Task description: Push topsoil down regraded slopesSite: C Road Pit Permit Action: TR-1 Permit/Job#: M2016050**PROJECT IDENTIFICATION**

Task #: 03A State: Colorado Abbreviation: None  
 Date: 10/23/2020 County: Mesa Filename: M050-03a  
 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:**

		<u>Utilization %</u>
Ownership Cost/Hour:	<u>\$116.22</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$89.77</u>	<u>100</u>
Ripper own. Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Ripper op. Cost/Hour:	<u>\$0.00</u>	<u>0</u>
Operator Cost/Hour:	<u>\$40.04</u>	<u>NA</u>

Total unit Cost/Hour: \$246.02  
 Total Fleet Cost/Hour: \$246.02

**MATERIAL QUANTITIES**

Initial Volume: 4,063  
 Swell factor: 1.000  
 Loose volume: 4,063 LCY

Source of estimated volume: Exhibit L  
 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: Loose stockpile 1.2

Average push gradient: -10 %  
 Average site altitude: 4,700 feet

Material weight: 1,600 lbs/LCYWeight description: Top Soil**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	<u>0.750</u>	<u>(AVG.)</u>
Material consistency:	<u>1.200</u>	<u>(CAT HB)</u>
Dozing method:	<u>1.100</u>	<u>(50% SL)</u>
Visibility:	<u>1.000</u>	<u>(AVG.)</u>



Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 1.1580

Adjusted unit production: 1,177.80 LCY/hr

Adjusted fleet production: **1177.8** LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)

Unit cost: \$0.209/LCY

Total job time: **3.45** Hours

Total job cost: **\$849**

**BULLDOZER WORK**Task description: Remove and spread visual berm materialSite: C Road Pit Permit Action: TR-1 Permit/Job#: M2016050**PROJECT IDENTIFICATION**

Task #: 04A State: Colorado Abbreviation: None  
 Date: 10/23/2020 County: Mesa Filename: M050-04a  
 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:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$116.22	NA
Operating Cost/Hour:	\$89.77	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$40.04	NA

Total unit Cost/Hour: \$246.02  
 Total Fleet Cost/Hour: \$246.02

**MATERIAL QUANTITIES**

Initial Volume: 60,231  
 Swell factor: 1.000  
 Loose volume: 60,231 LCY

Source of estimated volume: Exhibit L  
 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: -10 %  
 Average site altitude: 4,700 feet

Material weight: 1,600 lbs/LCYWeight description: Top Soil**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.100	(50% SL)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.9650

Adjusted unit production: 981.50 LCY/hr

Adjusted fleet production: **981.5** LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)

Unit cost: \$0.251/LCY

Total job time: **61.37** Hours

Total job cost: **\$15,097**

**SCRAPER TEAM WORK**Task description: **Place topsoil above highwall slopes**Site: **C Road Pit**Permit Action: TR-1Permit/Job#: M2016050**PROJECT IDENTIFICATION**Task #: 05AState: ColoradoAbbreviation: NoneDate: 10/23/2020County: MesaFilename: M050-05aUser: ACYAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 627G w/push-pull
-Dozer:	Cat D8T - 8SU
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance -Motor Grader:	NA
-Water Truck:	NA

**Cost Breakdown:****Scraper Work Team****Support Equipment****Maintenance Equipment**

	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	\$130.45	\$116.22	NA	NA	NA	NA
Operating cost/hour:	\$162.77	\$89.77	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Ripper op. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Operator cost/hour:	\$47.07	\$40.04	NA	NA	NA	NA
Unit Subtotals:	\$340.28	\$246.02	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$926.58		Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: **\$926.58****MATERIAL QUANTITIES**Initial volume: 60,231

CCY

Swell factor: 1.000Loose volume: **60,231**

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>1,600 lbs/LCY</u>	Struck Volume:	<u>15.70</u>	LCY
Material description:	<u>Top Soil</u>	Heaped Volume:	<u>22.00</u>	LCY
Rated Payload:	<u>52,800 pounds</u>	Average Volume:	<u>18.85</u>	LCY
Payload Capacity:	<u>33.00 LCY</u>	Adjusted Capacity:	<b><u>18.85</u></b>	LCY

Cycle Time:Scraper Loading Time: 0.90 MinutesManeuver and Spread Time: 0.60 MinutesJob Condition Correction:

Site Altitude: 4700 feet

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

Travel Time:Road Condition: Packed snow 2.5

## Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	1.00	2.50	3.50	2665	0.50

Haul Time: 0.50 minutes

## Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	-1.00	2.50	1.50	2905	0.42

Return Time: 0.42 minutesTotal Scraper team cycle time: 2.42 minutesAdjusted for job conditions: 775.81 LCY/HourSelected Number of Scrapers: 2 Scraper(s)Adjusted single scraper team (unit) hourly production: 775.81 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 775.81 LCY/HourUnadjusted unit production/hour: 934.71 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 77.64 HoursUnit cost: \$1.194 /LCYTotal job cost: \$71,936

## MOTOR GRADER WORK

Task description: Spread overburden on pit floor 18"

Site: C Road Pit

Permit Action: TR-1

Permit/Job#: M2016050

### PROJECT IDENTIFICATION

Task #: 06A

State: Colorado

Abbreviation: None

Date: 10/23/2020

County: Mesa

Filename: M050-06a

User: ACY

Agency or organization name: DRMS

### HOURLY EQUIPMENT COST

Basic Machine: CAT 120M

Horsepower: 138

Ripper Attachment: \_\_\_\_\_

Shift Basis: 1 per day

Data Source: (CRG)

#### Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	\$38.18	NA
Operating Cost/Hour:	\$34.06	100
Ripper Ownership Cost/Hour:	\$0.00	NA
Ripper Operating Cost/Hour:	\$0.00	
Operator Cost/Hour:	\$46.87	NA
Total Unit Cost/Hour:	\$119.11	
Total Fleet Cost/Hour:	<b>\$119.11</b>	

### MATERIAL QUANTITIES

Total Area to be graded or ripped: 37.00 acres

Source of estimated acreage: Permit App

### HOURLY PRODUCTION

Average Grader Speed:	<u>1.50</u>	mph
Selected Application:	<u>Finish grading (0-2.5 mph) - 1.5</u>	
Selected Blade Angle:	<u>30</u>	degrees
Effective Blade Length:	<u>10.40</u>	feet
Width of blade overlap per pass:	<u>2.00</u>	feet
Net grading or ripping width per pass:	<u>8.40</u>	feet
Unadjusted Hourly Unit Production:	<u>1.5273</u>	acres/hour

#### Job Condition Correction Factors

Site Altitude: 4700 feet

		Source
Altitude Adj:	<u>1.00</u>	(CAT HB)
Job Efficiency:	<u>0.90</u>	(1sh/d, fav.)
Net Correction:	<u>0.9000</u>	multiplier

Adjusted Hourly Unit Production: 1.3745 acres/Hour

Adjusted Hourly Fleet Production: 1.3745 acres/Hour

### JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: 26.92 Hours

Unit cost: \$86.65 per acre Total job cost: \$3,206

**SCRAPER TEAM WORK**Task description: **Spread topsoil on overburden**Site: **C Road Pit**Permit Action: TR-1Permit/Job#: M2016050**PROJECT IDENTIFICATION**Task #: 07AState: ColoradoAbbreviation: NoneDate: 10/23/2020County: MesaFilename: M050-07aUser: ACYAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 627G w/push-pull
-Dozer:	Cat D8T - 8SU
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance -Motor Grader:	NA
-Water Truck:	NA

**Cost Breakdown:****Scraper Work Team****Support Equipment****Maintenance Equipment**

	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	\$130.45	\$116.22	NA	NA	NA	NA
Operating cost/hour:	\$162.77	\$89.77	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Ripper op. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Operator cost/hour:	\$47.07	\$40.04	NA	NA	NA	NA
Unit Subtotals:	\$340.28	\$246.02	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$926.58		Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: **\$926.58****MATERIAL QUANTITIES**Initial volume: 60,231

CCY

Swell factor: 1.000Loose volume: **60,231**

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>1,600 lbs/LCY</u>	Struck Volume:	<u>15.70</u>	LCY
Material description:	<u>Top Soil</u>	Heaped Volume:	<u>22.00</u>	LCY
Rated Payload:	<u>52,800 pounds</u>	Average Volume:	<u>18.85</u>	LCY
Payload Capacity:	<u>33.00 LCY</u>	Adjusted Capacity:	<b><u>18.85</u></b>	LCY

Cycle Time:Scraper Loading Time: 0.90 MinutesManeuver and Spread Time: 0.60 MinutesJob Condition Correction:

Site Altitude: 4700 feet

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

Travel Time:Road Condition: Packed snow 2.5

## Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	1.00	2.50	3.50	2665	0.50

Haul Time: 0.50 minutes

## Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	-1.00	2.50	1.50	2905	0.42

Return Time: 0.42 minutesTotal Scraper team cycle time: 2.42 minutesAdjusted for job conditions: 775.81 LCY/HourSelected Number of Scrapers: 2 Scraper(s)Adjusted single scraper team (unit) hourly production: 775.81 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 775.81 LCY/HourUnadjusted unit production/hour: 934.71 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 77.64 HoursUnit cost: \$1.194 /LCYTotal job cost: \$71,936



## MOTOR GRADER WORK

Task description: Spread topsoil on pit floor

Site: C Road Pit

Permit Action: TR-1

Permit/Job#: M2016050

### PROJECT IDENTIFICATION

Task #: 08A

State: Colorado

Abbreviation: None

Date: 10/23/2020

County: Mesa

Filename: M050-08a

User: ACY

Agency or organization name: DRMS

### HOURLY EQUIPMENT COST

Basic Machine: CAT 120M

Horsepower: 138

Ripper Attachment: \_\_\_\_\_

Shift Basis: 1 per day

Data Source: (CRG)

#### Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	\$38.18	NA
Operating Cost/Hour:	\$34.06	100
Ripper Ownership Cost/Hour:	\$0.00	NA
Ripper Operating Cost/Hour:	\$0.00	
Operator Cost/Hour:	\$46.87	NA
Total Unit Cost/Hour:	\$119.11	
Total Fleet Cost/Hour:	<b>\$119.11</b>	

### MATERIAL QUANTITIES

Total Area to be graded or ripped: 37.00 acres

Source of estimated acreage: Permit app

### HOURLY PRODUCTION

Average Grader Speed:	<u>1.50</u>	mph
Selected Application:	<u>Finish grading (0-2.5 mph) - 1.5</u>	
Selected Blade Angle:	<u>30</u>	degrees
Effective Blade Length:	<u>10.40</u>	feet
Width of blade overlap per pass:	<u>2.00</u>	feet
Net grading or ripping width per pass:	<u>8.40</u>	feet
Unadjusted Hourly Unit Production:	<u>1.5273</u>	acres/hour

#### Job Condition Correction Factors

Site Altitude: 4700 feet

		Source
Altitude Adj:	<u>1.00</u>	(CAT HB)
Job Efficiency:	<u>0.90</u>	(1sh/d, fav.)
Net Correction:	<u>0.9000</u>	multiplier

Adjusted Hourly Unit Production: 1.3745 acres/Hour

Adjusted Hourly Fleet Production: **1.3745** acres/Hour

### JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: **26.92** Hours

Unit cost: \$86.65 per acre Total job cost: **\$3,206**

**REVEGETATION WORK**Task description: Reveg pit slopes (non-cropland)Site: C Road PitPermit Action: TR-1Permit/Job#: M2016050**PROJECT IDENTIFICATION**Task #: 09AState: ColoradoAbbreviation: NoneDate: 10/23/2020County: MesaFilename: M050-09aUser: ACYAgency or organization name: DRMS**FERTILIZING****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			\$	\$
			<b>Total Fertilizer Materials Cost/Acre</b>	<b>\$0.00</b>

**Application**

Description	Cost /Acre
	\$
<b>Total Fertilizer Application Cost/Acre</b>	<b>\$0.00</b>

**TILLING**

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	\$107.16
<b>Total Tilling Cost/Acre</b>	<b>\$107.16</b>

**SEEDING**

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indian Ricegrass - Paloma	1.13	3.66	\$12.57
Sand Dropseed	0.13	15.52	\$1.27
Crested Wheatgrass - Standard	1.25	5.74	\$5.19
Galleta	1.50	5.48	\$33.53
Western Wheatgrass - Native	1.00	2.53	\$6.00
<b>Totals Seed Mix</b>	<b>5.01</b>	<b>32.92</b>	<b>\$58.55</b>

**Application**

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Description	Cost /Acre
Broadcast seeding [DMG]	\$267.22
<b>Total Seed Application Cost/Acre</b>	<b>\$267.22</b>

**MULCHING and MISCELLANEOUS****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			\$	\$
<b>Total Mulch Materials Cost/Acre</b>				<b>\$0.00</b>

**Application**

Description	Cost /Acre
	\$
<b>Total Mulch Application Cost/Acre</b>	<b>\$0.00</b>

**NURSERY STOCK PLANTING**

Common Name	No / Acre	Type and Size	Planting Cost	Fertilizer Pellet Cost	Cost /Acre
					\$
<b>Totals Nursery Stock Cost / Acre</b>					<b>\$0.00</b>

**JOB TIME AND COST**

No. of Acres: 7  
 Estimated Failure Rate: 20%  
 \*Selected Replanting Work Items: TILLING,SEEDING

Cost /Acre: \$432.93  
 Cost /Acre\*: \$432.93

Initial Job Cost: **\$3,030.51**  
 Reseeding Job Cost: **\$606.10**  
 Total Job Cost: **\$3,637**  
 Job Hours: **16.00**

**EQUIPMENT MOBILIZATION/DEMOBILIZATION**Task description: **Initial Mobilization**Site: **C Road Pit**Permit Action: **TR-1**Permit/Job#: **M2016050****PROJECT IDENTIFICATION**Task #: **10A**State: **Colorado**Abbreviation: **None**Date: **10/23/2020**County: **Mesa**Filename: **M050-10a**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:**

<b>Available Rig Capacities</b>	<b>0-25 Tons</b>	<b>26-50 Tons</b>	<b>51+ Tons</b>
Ownership Cost/Hour:	\$17.20	\$29.63	\$38.69
Operating Cost/Hour:	\$26.56	\$47.02	\$55.69
Operator Cost/Hour:	\$23.63	\$23.63	\$23.63
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$67.39	\$123.81	\$141.54

**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	\$116.22	\$123.81	1	\$240.03	\$123.81	\$250.00
CAT 120M	15.53	\$38.18	\$67.39	1	\$105.57	\$67.39	\$250.00
Cat 627G w/push-pull	43.48	\$130.45	\$123.81	2	\$508.52	\$247.62	\$250.00
Drill/Broadcast Seeder with Tractor	25.00	\$6.72	\$67.39	1	\$74.11	\$67.39	\$250.00

Subtotals: **\$928.23** **\$506.21** **\$1,000.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 3/4 T.	\$41.46	2	\$82.92	\$82.92

Subtotals: **\$82.92** **\$82.92**

**EQUIPMENT HAUL DISTANCE and Time**

Nearest Major City or Town within project area region:	GRAND JUNCTION, CO	
Total one-way travel distance:	<u>10.00</u>	miles
Average Travel Speed:	<u>40.00</u>	mph
Total Non-Roadable Mob/Demob Cost *	\$4,573.68	
** two round trips with haul rig:		
Total Roadable Mob/Demob Cost **	<u>\$41.46</u>	
** one round trip, no haul rig:		

**Transportation Cycle Time:**

	Non- Roadable Equipment	Roadable Equipment
Haul Time (Hours):	<u>0.25</u>	<u>0.25</u>
Return Time (Hours):	<u>0.25</u>	<u>0.25</u>
Loading Time (Hours):	<u>0.50</u>	<u>NA</u>
Unloading Time (Hours):	<u>0.50</u>	<u>NA</u>
Subtotals:	<u>1.50</u>	<u>0.50</u>

**JOB TIME AND COST**

Total job time: 3.00 Hours

Total job cost: \$4,615

**EQUIPMENT MOBILIZATION/DEMOBILIZATION**Task description: Secondary MobilizationSite: C Road PitPermit Action: TR-1Permit/Job#: M2016050**PROJECT IDENTIFICATION**Task #: 10BState: ColoradoAbbreviation: NoneDate: 10/23/2020County: MesaFilename: M050-10bUser: ACYAgency or organization name: DRMS**EQUIPMENT TRANSPORT RIG COST**Shift basis: 1 per dayCost Data Source: CRG DataTruck 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:**

<b>Available Rig Capacities</b>	<b>0-25 Tons</b>	<b>26-50 Tons</b>	<b>51+ Tons</b>
Ownership Cost/Hour:	\$17.20	\$29.63	\$38.69
Operating Cost/Hour:	\$26.56	\$47.02	\$55.69
Operator Cost/Hour:	\$23.63	\$23.63	\$23.63
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$67.39	\$123.81	\$141.54

**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
Drill/Broadcast Seeder with Tractor	25.00	\$6.72	\$67.39	1	\$74.11	\$67.39	\$250.00

Subtotals: **\$74.11** **\$67.39** **\$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, 3/4 T.	\$41.46	2	\$82.92	\$82.92

Subtotals: **\$82.92** **\$82.92**

**EQUIPMENT HAUL DISTANCE and Time**

Nearest Major City or Town within project area region:	GRAND JUNCTION, CO	
Total one-way travel distance:	10.00	miles
Average Travel Speed:	40.00	mph
Total Non-Roadable Mob/Demob Cost *	\$718.97	
** two round trips with haul rig:		
Total Roadable Mob/Demob Cost **	\$41.46	
** one round trip, no haul rig:		

**Transportation Cycle Time:**

	Non- Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.25	0.25
Return Time (Hours):	0.25	0.25
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	1.50	0.50

**JOB TIME AND COST**

Total job time:	3.00	Hours
Total job cost:	\$760	