COST SUMMARY WORK

Task description: **Post inspection update 03-20-18**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: ACY State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-ACY
User: ACY

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01a	Structure Removal	DEMOLISH	1	5.00	$956.22
02a	Excavate outlets structure	DOZER	1	4.44	$1,065.00
02b	Excavate inlet structure	DOZER	1	4.44	$1,065.00
03a	Provided 1540 c.y. of 2 ft D50 riprap delivered to site	NA	5	8.00	$0.00
03b	Provided 1540 c.y. of 2 ft D50 riprap delivered to site	NA	5	8.00	$0.00
04a	Place riprap on outlet structure	EXCAVATE	1	17.40	$1,748.00
04b	Place riprap on inlet structure	EXCAVATE	1	17.40	$1,748.00
05a	Dewater 35 ac pit with11 ft water depth for grading	PUMPING	1	744.63	$19,651.00
06a	backfill 4500' max of pit slopes	SCRAPER1	1	109.90	$37,190.00
06b	backfill material to create wetlands	SCRAPER1	1	31.10	$10,525.00
07a	Rip compacted areas prior to topsoil replacement	RIPPER	1	43.70	$10,757.00
08a	Apply topsoil to 4500 LF of pit slopes	SCRAPER1	1	3.31	$1,120.00
09a	Apply topsoil to 29 ac facilities and perimeter road	SCRAPER1	1	37.98	$12,854.00
10a	Reveg disturbed areas	REVEGE	1	60.00	$73,845.00
11a	Initial mobilization	MOBILIZE	1	2.57	$5,305.00
12a	Secondary mobilization	MOBILIZE	1	2.57	$1,514.00
13a	Install wetlands exclusion fencing	SITEMAINTENANCE	1	80.00	$7,050.00
		SUBTOTALS:		**1180.44**	**$186,393**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$3,765.14
Performance bond:	1.05	Total =	$1,957.13
Job superintendent:	200.00	Total =	$14,610.00
Profit:	10.00	Total =	$18,639.30
		TOTAL O & P =	$38,971.57
		CONTRACT AMOUNT (direct + O & P) =	$225,364.57

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	500.00	Total =	500.00
Engineering work and/or contract/bid preparation:	4.25	Total =	$9,577.99
Reclamation management and/or administration:	5.00		$11,268.23
CONTINGENCY:	0.00	Total =	$0.00
		TOTAL INDIRECT COST =	$60,317.79
		TOTAL BOND AMOUNT (direct + indirect) =	**$246,710.79**

No increase issued bond close

DEMOLITION WORK

Task description: **Structure Removal**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 01A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-01a
User: ACY

Agency or organization name: DRMS

UNIT COSTS **Location adjustment: 95.50 %**

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Scale foundation and slabs	80' L x 12'W	Demo. and on-site disposal in existing pit, 10 in. thick - Max. 10,000 ft. haul	960.00	SF	$1.04	$1,001.28

Job Hours: **5.00** **Subtotal (unadjusted)**: **$1,001.28** **Total Cost (adjusted for location)**: **$956.22**

BULLDOZER WORK

Task description: **Excavate outlets structure**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #:	02A	State:	Colorado	Abbreviation:	None
Date:	3/27/2018	County:	Mesa	Filename:	M025-02a
User:	ACY				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D9T - 9SU
Horsepower:	405
Blade Type:	Semi-Universal
Attachment:	3-shank ripper
Shift Basis:	1 per day
Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$100.59	NA
Operating Cost/Hour:	$87.23	100
Ripper own. Cost/Hour:	$10.94	NA
Ripper op. Cost/Hour:	$0.68	10
Operator Cost/Hour:	$40.52	NA

Total unit Cost/Hour: $239.96
Total Fleet Cost/Hour: **$239.96**

MATERIAL QUANTITIES

Initial Volume:	2,555
Swell factor:	1.180
Loose volume:	**3,015** LCY

Source of estimated volume: Outlet details in permit (TR-2 estimate)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 2,110.5 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: 0 %
Average site altitude: 4,490 feet

Material weight: 2,400 lbs/LCY

Weight description: Clay and gravel - Dry

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.600	(FND-SF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.958	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.3220

Adjusted unit production: 679.58 LCY/hr
Adjusted fleet production: **679.58** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.353/LCY

Total job time: **4.44** Hours
Total job cost: **$1,065**

BULLDOZER WORK

Task description: **Excavate inlet structure**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #:	02B	State:	Colorado	Abbreviation:	None
Date:	3/27/2018	County:	Mesa	Filename:	M025-02b
User:	ACY				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D9T - 9SU
Horsepower:	405
Blade Type:	Semi-Universal
Attachment:	3-shank ripper
Shift Basis:	1 per day
Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$100.59	NA
Operating Cost/Hour:	$87.23	100
Ripper own. Cost/Hour:	$10.94	NA
Ripper op. Cost/Hour:	$0.68	10
Operator Cost/Hour:	$40.52	NA

Total unit Cost/Hour: $239.96
Total Fleet Cost/Hour: **$239.96**

MATERIAL QUANTITIES

Initial Volume:	2,555
Swell factor:	1.180
Loose volume:	**3,015** LCY

Source of estimated volume: Outlet details in permit (TR-2 estimate)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 2,110.5 LCY/hr

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: 0 %
Average site altitude: 4,490 feet

Material weight: 2,400 lbs/LCY

Weight description: Clay and gravel - Dry

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.600	(FND-SF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.958	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.3220

Adjusted unit production: 679.58 LCY/hr
Adjusted fleet production: **679.58** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.353/LCY

Total job time: **4.44** Hours
Total job cost: **$1,065**

HYDRAULIC EXCAVATOR WORK

Task description: **Place riprap on outlet structure**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 04A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-04a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat 320D L 9'-6" Stick
Attachment 1: ROPS Cab

Horsepower: 148
Weight (MT): 21.55
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$31.02	NA
Operating Cost/Hour:	$32.50	100
Operator Cost/Hour:	$36.93	NA
Total Unit Cost/Hour:	$100.45	

Total Fleet Cost/Hour: $100.45

MATERIAL QUANTITIES

Initial volume: 1,540 CCY Swell factor: 1.000
Loose volume: **1,540** LCY

Source of estimated volume: Outlet structure design (TR-2 estimate)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Excavator Cycle Time (load bucket, swing loaded, dump bucket, swing empty):

Basic Job Condition Description: SEVERE
Secondary Job Condition within Basic Description: SEVERE
Cycle Time Value: 0.390 minutes

Load Bucket Capacity

Bucket Size Class: Medium

Rated Capacity: 1.54 LCY (heaped)
Bucket Fill Factor: 0.450 Rock - Poorly blasted (40% - 50%) 0.450
Adjusted Capacity: **0.69** LCY

Job Condition Correction Factors Site Altitude: 4490 feet

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

Unadjusted Hourly Unit Production: 106.62 LCY/Hour
Adjusted Hourly Unit Production: 88.49 LCY/Hour
Adjusted Hourly Fleet Production: **88.49** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Excavator Total job time: **17.40** Hours

Unit cost: $1.135 /LCY Total job cost: **$1,748**

HYDRAULIC EXCAVATOR WORK

Task description: **Place riprap on inlet structure**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 04B State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-04b
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat 320D L 9'-6" Stick
Attachment 1: ROPS Cab

Horsepower: 148
Weight (MT): 21.55
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$31.02	NA
Operating Cost/Hour:	$32.50	100
Operator Cost/Hour:	$36.93	NA
Total Unit Cost/Hour:	$100.45	

Total Fleet Cost/Hour: $100.45

MATERIAL QUANTITIES

Initial volume: 1,540 CCY Swell factor: 1.000
Loose volume: **1,540** LCY

Source of estimated volume: Outlet structure design (TR-2 estimate)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Excavator Cycle Time (load bucket, swing loaded, dump bucket, swing empty):

Basic Job Condition Description: SEVERE
Secondary Job Condition within Basic Description: SEVERE
Cycle Time Value: 0.390 minutes

Load Bucket Capacity

Bucket Size Class: Medium

Rated Capacity: 1.54 LCY (heaped)
Bucket Fill Factor: 0.450 Rock - Poorly blasted (40% - 50%) 0.450
Adjusted Capacity: **0.69** LCY

Job Condition Correction Factors Site Altitude: 4490 feet

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

Unadjusted Hourly Unit Production: 106.62 LCY/Hour
Adjusted Hourly Unit Production: 88.49 LCY/Hour
Adjusted Hourly Fleet Production: **88.49** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Excavator Total job time: **17.40** Hours

Unit cost: $1.135 /LCY Total job cost: **$1,748**

PUMPING WORK

Task description: **Dewater 35 ac pit with 11 ft water depth for grading**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 05A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-05a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

	Description	Quantity
Make and Model:	Centrifugal pump - 200M, 10 in.	1
Attachment 1:	Suction hose - 6 in. diam., 25 ft.	2
Attachment 2:	Discharge hose - 6 in. D., 25 ft.	4
Labor Unit 1:	Pump operator	0

Horsepower: 70
Shift Basis: 1 per day
Weight: 1.95
(US Tons)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$9.49	NA
Operating Cost/Hour:	$16.90	100
Operator Cost/Hour:	$0.00	NA
Total Unit Cost/Hour:	$26.39	

Total Fleet Cost/Hour: $26.39

PUMPING QUANTITIES

Initial Pond Volume: 125,444,088.00
Final Pond Volume: **125,444,088.00** gallons
Total Pond Inflow Surface Area: 2,300 Sq. ft.
Total Pond Inflow Volume per Hour: 202.17 gallons

Conversion factor: 1.0000
Unit inflow rate in gph/sq. ft.: 0.0879

Source of estimated volume: Assume 2300'L x 10'H river side pit slope

PUMPING TIME

Maximum Pump Capacity:	200,000	gph/pump
Estimated Suction Head:	15	feet
Estimated Discharge Head:	20	feet
Total Head:	35	feet
CPB Pump Capacity:	150,000	gph/pump
Site Altitude:	4,490	feet

Adjusted Pumping Capacity:	150,000	gph
Initial Unadjusted Pumping Time:	836.29	hours
Inflow during Initial Pumping:	169,074	gallons
Net Unadjusted Pumping Time:	837.42	Hours
Altitude Adjustment Factor:	0.9700	(3% rule)
Pump Efficiency Factor:	0.9167	(55 min./hr.)
Total Adjusted Pumping Time:	744.63	hours

JOB TIME AND COST

Total job time: **744.63** Hours

Unit cost: $0.000156 /Gallon Total job cost: **$19,651**

SCRAPER TEAM WORK

Task description: **Backfill 4500' max of pit slopes**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 06A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-06a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
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	NA	NA	NA	NA	NA
Ownership cost/hour:	$143.40	NA	NA	NA	NA	NA
Operating cost/hour:	$153.53	NA	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	NA	NA	NA
Ripper op. cost/hour:	NA	NA	NA	NA	NA	NA
Operator cost/hour:	$41.46	NA	NA	NA	NA	NA
Unit Subtotals:	$338.39	NA	NA	NA	NA	NA
Number of Units:	1	0	0	0	0	0
Group Subtotals:	Work:	$338.39	Support:	$0.00	Maint:	$0.00

Total work team cost/hour: **$338.39**

MATERIAL QUANTITIES

Initial volume: 64,000 CCY Swell factor: 1.000
Loose volume: **64,000** LCY

Source of estimated volume: Max 4500 LF of 16 Ft highwall backfilled to 3:1
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,400 lbs/LCY
Material description: Clay and gravel - Dry
Rated Payload: 81,600 pounds
Payload Capacity: 34.00 LCY

Scraper Bowl (volume) Basis:

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

Cycle Time:

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

Job Condition Correction: Site Altitude: 4490 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: 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	900.00	0.00	5.00	5.00	1867	0.60

Haul Time: **0.60** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	0.00	5.00	5.00	2795	0.48

Return Time: **0.48** minutes

Total Scraper team cycle time: **2.48** minutes
Adjusted for job conditions: 582.34 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 582.34 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **582.34** LCY/Hour

Unadjusted unit production/hour: 701.61 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **109.90** Hours

Unit cost: $0.581 /LCY Total job cost: **$37,190**

SCRAPER TEAM WORK

Task description: **Backfill material to create wetlands**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 06B State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-06b
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
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	NA	NA	NA	NA	NA
Ownership cost/hour:	$143.40	NA	NA	NA	NA	NA
Operating cost/hour:	$153.53	NA	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	NA	NA	NA
Ripper op. cost/hour:	NA	NA	NA	NA	NA	NA
Operator cost/hour:	$41.46	NA	NA	NA	NA	NA
Unit Subtotals:	$338.39	NA	NA	NA	NA	NA
Number of Units:	1	0	0	0	0	0
Group Subtotals:	Work:	$338.39	Support:	$0.00	Maint:	$0.00

Total work team cost/hour: **$338.39**

MATERIAL QUANTITIES

Initial volume: 14,444 CCY Swell factor: 1.000
Loose volume: **14,444** LCY

Source of estimated volume: Assume 650' x 60' x 10'
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Scraper Bowl (volume) Basis:

Material weight: 2,400 lbs/LCY
Material description: Clay and gravel - Dry
Rated Payload: 81,600 pounds
Payload Capacity: 34.00 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: 0.60 Minutes

Job Condition Correction: Site Altitude: 4490 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: 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	1600.00	0.00	5.00	5.00	1867	0.98

Haul Time: **0.98** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1600.00	0.00	5.00	5.00	2795	0.73

Return Time: **0.73** minutes

Total Scraper team cycle time: **3.11** minutes
Adjusted for job conditions: 464.37 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 464.37 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **464.37** LCY/Hour

Unadjusted unit production/hour: 559.49 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **31.10** Hours

Unit cost: $0.729 /LCY Total job cost: **$10,525**

BULLDOZER RIPPING WORK

Task description: **Rip compacted areas prior to topsoil replacement**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 07A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-07a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D9T - 9SU Horsepower: 405
Ripper Attachment: 3-Shank Ripper Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$100.59	NA
Operating Cost/Hour:	$87.23	100
Ripper Ownership Cost/Hour:	$10.94	NA
Ripper Operating Cost/Hour:	$6.82	100
Operator Cost/Hour:	$40.52	NA
Total Unit Cost/Hour:	$246.10	

Total Fleet Cost/Hour: **$246.10**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 31.00 acres Rip Depth (ft): 2.00 Volume: 100,027 BCY or CCY

Source of estimated quantity: 29 ac facilities, 2 ac pit slopes

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.00	mph
Average Ripping Width:	7.67	degrees
Average Ripping Length:	250.00	feet
Average Dozer Speed:	88.00	feet
Average Maneuver Time:	0.25	feet
Production per unit area:	0.855	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production: 0.855 Acres/hr

Site Altitude:	4,490	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Adjusted Hourly Unit Production: 0.71 Acres/hr
Adjusted Hourly Fleet Production: **0.71** Acres/hr

JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: **43.71** Hours

Unit cost: $346.993 Per acre Total job cost: **$10,757**

SCRAPER TEAM WORK

Task description: **Apply topsoil to 4500 LF of pit slopes**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 08A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-08a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
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	NA	NA	NA	NA	NA
Ownership cost/hour:	$143.40	NA	NA	NA	NA	NA
Operating cost/hour:	$153.53	NA	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	NA	NA	NA
Ripper op. cost/hour:	NA	NA	NA	NA	NA	NA
Operator cost/hour:	$41.46	NA	NA	NA	NA	NA
Unit Subtotals:	$338.39	NA	NA	NA	NA	NA
Number of Units:	1	0	0	0	0	0
Group Subtotals:	Work:	$338.39	Support:	$0.00	Maint:	$0.00

Total work team cost/hour: **$338.39**

MATERIAL QUANTITIES

Initial volume: 1,943 CCY Swell factor: 1.000
Loose volume: **1,943** LCY

Source of estimated volume: 4500' LF x 20' W covered with 7" ot topsoil
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: 0.60 Minutes

Job Condition Correction: Site Altitude: 4490 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: 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	900.00	0.00	5.00	5.00	1867	0.58

Haul Time: **0.58** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	900.00	0.00	5.00	5.00	2795	0.48

Return Time: **0.48** minutes

Total Scraper team cycle time: **2.46** minutes
Adjusted for job conditions: 587.07 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 587.07 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **587.07** LCY/Hour

Unadjusted unit production/hour: 707.32 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **3.31** Hours

Unit cost: $0.576 /LCY Total job cost: **$1,120**

SCRAPER TEAM WORK

Task description: **Apply topsoil to 29 ac facilities and perimeter road**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 09A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-09a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
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	NA	NA	NA	NA	NA
Ownership cost/hour:	$143.40	NA	NA	NA	NA	NA
Operating cost/hour:	$153.53	NA	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	NA	NA	NA
Ripper op. cost/hour:	NA	NA	NA	NA	NA	NA
Operator cost/hour:	$41.46	NA	NA	NA	NA	NA
Unit Subtotals:	$338.39	NA	NA	NA	NA	NA
Number of Units:	1	0	0	0	0	0
Group Subtotals:	Work:	$338.39	Support:	$0.00	Maint:	$0.00

Total work team cost/hour: **$338.39**

MATERIAL QUANTITIES

Initial volume: 27,292 CCY Swell factor: 1.000
Loose volume: **27,292** LCY

Source of estimated volume: 29 ac facilities and perimeter rd covered with 7" to topsoil
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

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

Scraper Bowl (volume) Basis:

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

Cycle Time:

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

Job Condition Correction: Site Altitude: 4490 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: 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	400.00	0.00	5.00	5.00	1867	0.31

Haul Time: **0.31** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	400.00	0.00	5.00	5.00	2795	0.30

Return Time: **0.30** minutes

Total Scraper team cycle time: **2.01** minutes
Adjusted for job conditions: 718.51 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 718.51 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **718.51** LCY/Hour

Unadjusted unit production/hour: 865.67 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **37.98** Hours

Unit cost: $0.471 /LCY Total job cost: **$12,854**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Initial mobilization**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 11A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-11a
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
Submersible pump - 460v, 8 in.	0.70	$5.50	$88.67	1	$94.17	$88.67	$250.00
Cat D9T - 9SU	66.13	$111.53	$125.45	1	$236.98	$125.45	$250.00
Cat 320D L 9'-6" Stick	23.70	$31.02	$88.67	1	$119.69	$88.67	$250.00
Cat 637G	57.28	$143.40	$125.45	1	$268.85	$125.45	$250.00
Drill/Broadcast Seeder with Tractor	25.00	$12.22	$88.67	1	$100.89	$88.67	$250.00
Power Mulcher (Bowie LD-90)	6.00	$7.03	$88.67	1	$95.70	$88.67	$250.00
Subtotals:			**$916.28**		**$605.58**		**$1,500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Generic 10-12 cy, 6x4	$83.91	1	$83.91	$83.91
Light Duty Pickup, 4x4, 1 T. Crew	$47.96	1	$47.96	$47.96

Subtotals:	**$131.87**	**$131.87**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	GRAND JUNCTION	
Total one-way travel distance:	5.00	miles
Average Travel Speed:	35.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$5,267.38	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$37.68	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.14	0.14
Return Time (Hours):	0.14	0.14
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	1.29	0.29

JOB TIME AND COST

Total job time:	**2.57**	Hours
Total job cost:	**$5,305**	

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Secondary mobilization**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 12A State: Colorado Abbreviation: None
Date: 3/27/2018 County: Mesa Filename: M025-12a
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
Drill/Broadcast Seeder with Tractor	25.00	$12.22	$88.67	1	$100.89	$88.67	$250.00
Power Mulcher (Bowie LD-90)	6.00	$7.03	$88.67	1	$95.70	$88.67	$250.00
Subtotals:					**$196.59**	**$177.34**	**$500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 1 T. Crew	$47.96	1	$47.96	$47.96
Subtotals:			**$47.96**	**$47.96**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	GRAND JUNCTION	
Total one-way travel distance:	5.00	miles
Average Travel Speed:	35.00	mph

Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$1,500.02
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$13.70

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.14	0.14
Return Time (Hours):	0.14	0.14
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	1.29	0.29

JOB TIME AND COST

Total job time:	**2.57**	Hours
Total job cost:	**$1,514**	

SITE MAINTENANCE

Task description: **Install wetlands exclusion fencing**

Site: **Soaring Eagle Gravel Pit** Permit Action: 2018-03 Permit/Job#: M1999025

PROJECT IDENTIFICATION

Task #: 13A State: Colorado Abbreviation: None
Date: 3/29/2018 County: Mesa Filename: M025-13a
User: ACY

Agency or organization name: DRMS

UNIT COSTS

Maintenance Item	Hours per Year	Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Install Wetlands Fencing	80.00	Fencing, barbed wire, - 3 strand	5,000.00	LF	$1.41	$7,050.00

Job Hours: 80.00 **Total Cost: $7,050.00**