



STATE OF  
COLORADO

Zuber - DNR, Rob <rob.zuber@state.co.us>

---

## Bennett's Gravel, TR5, Cost Estimate

1 message

---

**Zuber - DNR, Rob** <rob.zuber@state.co.us>

Fri, Feb 18, 2022 at 11:35 AM

To: Jim Doody <Jim.Doody@peakreadymix.com>, Ben Langenfeld <benl@lewicki.biz>, Michael Cunningham - DNR <michaela.cunningham@state.co.us>

Hello, Jim and Ben

Please see that attached letter and Reclamation Cost Estimate. Since the inspection last year, the costs decreased considerably.

Rob

Rob Zuber, P.E.  
Environmental Protection Specialist  
Active Mines Regulatory Program



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

*I am working remotely and can be reached by cell at 720.601.2276.*

**Physical Address:**

1313 Sherman Street, Room 215  
Denver, CO 80203

**Mailing Address:**

Division of Reclamation, Mining and Safety, Room 215  
1001 East 62nd Avenue  
Denver, CO 80216

[rob.zuber@state.co.us](mailto:rob.zuber@state.co.us) | <http://drms.colorado.gov>



**Bennetts\_Gravel\_TR5\_RCE\_letter\_with\_Enclosure.pdf**  
2628K



February 18, 2022

Jim Doody and Jon Mueller  
Elam Construction, Inc.  
556 Struthers Ave.  
Grand Junction, CO 81501

**Re: Bennett's Gravel Pit, Permit M-1979-166, TR-05, Reclamation Cost Estimate**

Dear Sirs:

The Division has reviewed your Technical Revision No. 5 (TR-05) application from Lewicki & Associates and the responses to Division adequacy items (letters from Lewicki and Associates dated 31 January 2022, 9 February 2022, and 11 February 2022). All adequacy items have been addressed.

Based on the TR-05 submittal (including DRMS adequacy items and responses from Lewicki & Associates), the reclamation cost estimate for the Bennett's Gravel Pit has been revised. The following is a summary of the parameters that were used to develop this estimate.

**Dewatering the Pits**

- The area to dewater is 9.5 acres. This is based on Exhibit L.
- The depth of water is 25 feet. This is based on Exhibit L.
- Based on the area and depth, the volume of water to be pumped is 237.5 acre-feet.

**Hauling Fill Material and Backfilling/Grading**

- The average haul distance from the soil storage pile to the Phase 1 pit is 600 feet. This is based on Exhibit L.
- The length of highwall used in the estimate is 2,000 feet. This is based on Exhibit E text.
- The cross-sectional area for backfilling the pit slopes is 338 square feet. This is based on Map C-2.
- Based on the length and area above, the volume is 25,037 cubic yards.

**Hauling and Spreading Gravel on Industrial Area**

- The average haul distance from the pit is 600 feet. This is based on the assumption that the distance is the same as for hauling fill material.
- The area to cover is 9.9 acres. This is based on Exhibit L.
- The depth of gravel is 5 inches. This is based on Exhibit L.
- Based on the area and depth, the volume of gravel is 6,655 cubic yards.

**Hauling and Spreading Topsoil**

- The average haul distance from the topsoil storage pile to the Phase 1 pit is 600 feet. This is based on Exhibit L.
- The depth of topsoil will be 6 inches. This is based on Exhibit E.
- The area that requires topsoil is 10.1 acres. This is based on Exhibit E.



- Based on the area and depth above, the volume is 8,147 cubic yards.

**Revegetation**

- The area that requires seeding is 10.1 acres. This is based on Exhibit E. The Division has estimated that one acre of this is for the pond slopes, and the rest is for flat areas above the slopes.

The total amount is \$145,798. The entire reclamation cost estimate from the DRMS cost estimating software (CIRCES) is attached.

If you have any comments or questions, please contact me at [Rob.Zuber@state.co.us](mailto:Rob.Zuber@state.co.us) or by calling (720) 601-2276.

Thank you,



Robert D. Zuber, P.E.  
Environmental Protection Specialist

Enclosure

Cc: Michael Cunningham, DRMS; Ben Langenfeld, Lewicki & Associates

## COST SUMMARY WORK

Task description: Cost Summary

Site: Bennett's Gravel Pit

Permit Action: TR5

Permit/Job#: M1979166

### PROJECT IDENTIFICATION

Task #: 01

State: Colorado

Abbreviation: None

Date: 2/18/2022

County: Delta

Filename: M166-01

User: RDZ

Agency or organization name: DRMS

### TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01A	Dewater Pit before Slope Reclamation	PUMPING	1	393.95	\$40,427
02A	Haul backfill material to pit slopes	TRUCK1	1	56.88	\$21,081
02B	Push Material to Backfill Slopes	DOZER	2	14.74	\$6,970
03A	Excavate and transport gravel from pit to processing area	TRUCK1	1	19.39	\$7,185
03B	Spread gravel over process / stockpile area	DOZER	1	21.58	\$5,101
05A	Haul topsoil material	TRUCK1	1	26.44	\$9,800
05B	Spread topsoil over upper pond slope and flat areas	DOZER	1	6.63	\$1,566
06A	Revegetate flat surfaces	REVEGE	1	8.00	\$5,120
06B	Revegetate pit slopes above water	REVEGE	1	4.00	\$594
08A	Mobilization	MOBILIZE	1	2.40	\$4,952
<b><u>SUBTOTALS:</u></b>				<b>554.01</b>	<b>\$102,796</b>

### INDIRECT COSTS

#### OVERHEAD AND PROFIT:

Liability insurance: 2.02

Total = \$2,076

Performance bond: 1.05

Total = \$1,079

Job superintendent: 300.00

Total = \$21,609

Profit: 10.00

Total = \$10,280

TOTAL O & P = \$35,044

CONTRACT AMOUNT (direct + O & P) = \$137,840

#### LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs): \$500

Total = \$500

Engineering work and/or contract/bid preparation: 0.00

Total = \$0

Reclamation management and/or administration: 5.41

\$7,457

CONTINGENCY: 0.00

Total = \$0

TOTAL INDIRECT COST = \$43,002

**TOTAL BOND AMOUNT (direct + indirect) = \$145,798**

## PUMPING WORK

Task description: Dewater Pit before Slope Reclamation

Site: Bennett's Gravel Pit

Permit Action: TR5

Permit/Job#: M1979166

### PROJECT IDENTIFICATION

Task #: 01A

State: Colorado

Abbreviation: None

Date: 2/18/2022

County: Delta

Filename: M166-01A

User: RDZ

Agency or organization name: DRMS

### HOURLY EQUIPMENT COST

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

Horsepower: 70

Shift Basis: 3 per day

Weight: 1.95

(US Tons)

#### Cost Breakdown:

	Utilization %
Ownership Cost/Hour:	<u>\$37.86</u>
Operating Cost/Hour:	<u>\$37.08</u>
Operator Cost/Hour:	<u>\$27.68</u>
Total Unit Cost/Hour:	<u>\$102.62</u>

Total Fleet Cost/Hour: \$102.62

### PUMPING QUANTITIES

Initial Pond Volume:	<u>237.50</u>		Conversion factor:	<u>325850.5800</u>
Final Pond Volume:	<u>77,389,512.75</u>	gallons		
Total Pond Inflow Surface Area:	<u>15,600</u>	Sq. ft.	Unit inflow rate in gph/sq. ft.:	<u>0.3516</u>
Total Pond Inflow Volume per Hour:	<u>5,484.96</u>	gallons		

Source of estimated volume: Assume 9.5 acre pit with 26' deep water

### PUMPING TIME

Maximum Pump Capacity:	<u>200,000</u>	gph/pump
Estimated Suction Head:	<u>25</u>	feet
Estimated Discharge Head:	<u>15</u>	feet
Total Head:	<u>40</u>	feet
CPB Pump Capacity:	<u>90,000</u>	gph/pump
Site Altitude:	<u>4,930</u>	feet
Adjusted Pumping Capacity:	<u>180,000</u>	gph
Initial Unadjusted Pumping Time:	<u>429.94</u>	hours
Inflow during Initial Pumping:	<u>2,358,213</u>	gallons
Net Unadjusted Pumping Time:	<u>443.04</u>	Hours
Altitude Adjustment Factor:	<u>0.9700</u>	(3% rule)
Pump Efficiency Factor:	<u>0.9167</u>	(55 min./hr.)
Total Adjusted Pumping Time:	<u>393.95</u>	hours

### JOB TIME AND COST

Total job time: 393.95 Hours

Unit cost: \$0.000507 /Gallon

Total job cost: \$40,427

**TRUCK/LOADER TEAM WORK**Task description: **Haul backfill material to pit slopes**Site: **Bennett's Gravel Pit**Permit Action: **TR5**Permit/Job#: **M1979166****PROJECT IDENTIFICATION**Task #: **02A**State: **Colorado**Abbreviation: **None**Date: **2/18/2022**County: **Delta**Filename: **M166-02A**User: **RDZ**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**Shift basis: **1 per day**

	Equipment Description
Truck Loader Team -Truck:	Generic 12-18 cy, 6x4
-Loader:	CAT 966H high lift
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:	\$27.72	\$59.72	NA	NA	NA	NA
Operating cost/hour:	\$47.23	\$55.20	NA	NA	NA	NA
%Utilization-ripper:	NA	0	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:	\$32.54	\$40.71	NA	NA	NA	NA
Unit Subtotals:	\$107.49	\$155.63	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$370.61		Support: \$0.00		Maint: \$0.00	

Total work team cost/hour: **\$370.61****MATERIAL QUANTITIES**Initial volume: **25,037**

CCY

Swell factor: **1.000**Loose volume: **25,037**

LCY

Source of estimated volume: **Exhibit E and Map C-2**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: **2,400**

Pounds/LCY

Description: **Sand - Dry, loose**Rated Payload: **50,300**

Pounds

Payload Capacity: **20.96**

LCY

Truck Bed (volume) Basis:

Struck Volume:	12.00	LCY
Heaped Volume:	18.00	LCY
Average Volume:	15.00	LCY
Adjusted Volume:	18.00	LCY

Final Truck Volume Based on Number of Loader Passes: 17.50 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	5.000	LCY (heaped)
Bucket Fill Factor:	0.875	Blasted rock - well blasted (80 - 95%) 0.875
Adjusted Capacity:	<b>4.375</b>	LCY

Job Condition Corrections:

Site Altitude (ft.): 4930 feet

	Truck	Loader	Source
Altitude Adj:	1.000	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	<b>0.830</b>	<b>0.830</b>	

Loading Tool Cycle Time:

Number of Loading Tool Passes Required to Fill Truck: 4 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): 0.500 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Stockpile:	No adjustment - factor not applicable 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:	Small target 0.04	0.040	(Cat HB)
	Net Cycle Time Adjustment:	-0.040	minutes
	Adjusted Loader Cycle Time:	<b>0.460</b>	minutes
	Net Load Time per Truck:	<b>1.480</b>	minutes

Truck Cycle Time:

Truck Exchange Time:	0.50	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Load Time:	1.480	Minutes	Adjusted for site altitude:	1.480	Minutes
Truck Maneuver and Dump Time:	0.90	Minutes	Adjusted for site altitude:	0.900	Minutes

Truck Travel (Haul & Return) Time:  
maintained 3.0

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered,

## Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	0.00	3.00	3.00	2824	0.268
2	300.00	0.00	3.00	3.00	2824	0.106

Haul Time: **0.374** minutes

## Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	0.00	3.00	3.00	2874	0.140
2	300.00	0.00	3.00	3.00	2874	0.104

Return Time: **0.244** minutesTotal Truck Cycle Time: **3.498** minutes

Loading Tool unit  
 Production 530.30 LCY/Hour      Adjusted for job efficiency: 440.15 LCY/Hour  
 Truck Unit Production 300.17 LCY/Hour      Adjusted for job efficiency: 249.14 LCY/Hour  
 Optimal No. of Trucks: 2 Truck(s)      Selected Number of Trucks: 2 Truck(s)  
                                  Adjusted hourly truck team production: 498.28 LCY/Hour  
                                  Adjusted single truck/loader team production: 440.15 LCY/Hour  
                                  Adjusted multiple truck/loader team production: **440.15** LCY/Hour

**JOB TIME AND COST**

Fleet size: 1 Team(s)      Total job time: **56.88** Hours  
 Unit cost: \$0.842 /LCY      Total job cost: **\$21,081**



**BULLDOZER WORK**Task description: **Push Material to Backfill Slopes**Site: **Bennett's Gravel Pit**Permit Action: **TR5**Permit/Job#: **M1979166****PROJECT IDENTIFICATION**Task #: **02B**State: **Colorado**Abbreviation: **None**Date: **2/18/2022**County: **Delta**Filename: **M166-02B**User: **RDZ**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:	\$97.46	NA
Operating Cost/Hour:	\$97.63	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$41.30	NA

Total unit Cost/Hour: **\$236.39**Total Fleet Cost/Hour: **\$472.78****MATERIAL QUANTITIES**Initial Volume: **25,037**Swell factor: **1.060**Loose volume: **26,539 LCY**Source of estimated volume: **Division of Reclamation, Mining & Safety**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: **Partly consolidated stockpile 1.1**Average push gradient: **-10 %**Average site altitude: **4,930 feet**Material weight: **2,400 lbs/LCY**Weight description: **Sand - Dry, loose****Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.100	(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:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.958	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.6429

Adjusted unit production: 900.06 LCY/hr

Adjusted fleet production: **1800.12** LCY/hr

### **JOB TIME AND COST**

Fleet size: 2 Dozer(s)

Unit cost: \$0.263/LCY

Total job time: **14.74** Hours

Total job cost: **\$6,970**

**TRUCK/LOADER TEAM WORK**Task description: Excavate and transport gravel from pit to processing areaSite: Bennett's Gravel PitPermit Action: TR5Permit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 03AState: ColoradoAbbreviation: NoneDate: 2/18/2022County: DeltaFilename: M166-03AUser: RDZAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Shift basis: 1 per day

Equipment Description	
Truck Loader Team -Truck:	Generic 12-18 cy, 6x4
-Loader:	CAT 966H high lift
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:	\$27.72	\$59.72	NA	NA	NA	NA
Operating cost/hour:	\$47.23	\$55.20	NA	NA	NA	NA
%Utilization-ripper:	NA	0	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:	\$32.54	\$40.71	NA	NA	NA	NA
Unit Subtotals:	\$107.49	\$155.63	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$370.61		Support: \$0.00		Maint: \$0.00	

Total work team cost/hour: \$370.61**MATERIAL QUANTITIES**Initial volume: 6,655

CCY

Swell factor: 1.120Loose volume: 7,454

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat HandbookMaterial Purchase Cost: \$0.00Total Cost: \$0.00**HOURLY PRODUCTION****Truck Capacity:**Truck Payload (weight) Basis:Material weight: 3,250

Pounds/LCY

Description: Gravel - PitrunRated Payload: 50,300

Pounds

Payload Capacity: 15.48

LCY

Truck Bed (volume) Basis:

Struck Volume:	12.00	LCY
Heaped Volume:	18.00	LCY
Average Volume:	15.00	LCY
Adjusted Volume:	15.48	LCY

Final Truck Volume Based on Number of Loader Passes: 13.13 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	5.000	LCY (heaped)
Bucket Fill Factor:	0.875	Blasted rock - well blasted (80 - 95%) 0.875
Adjusted Capacity:	<b>4.375</b>	LCY

Job Condition Corrections:

Site Altitude (ft.): 4930 feet

	Truck	Loader	Source
Altitude Adj:	1.000	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	<b>0.830</b>	<b>0.830</b>	

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): 0.500 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material 6" and over diameter 0.03	0.030	(Cat HB)
Stockpile:	Dumped by truck 0.02	0.020	(Cat HB)
Truck Ownership:	Independently owned trucks 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:		0.050	minutes
Adjusted Loader Cycle Time:		<b>0.550</b>	minutes
Net Load Time per Truck:		<b>1.200</b>	minutes

Truck Cycle Time:

Truck Exchange Time:	0.50	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Load Time:	1.200	Minutes	Adjusted for site altitude:	1.200	Minutes
Truck Maneuver and Dump Time:	0.90	Minutes	Adjusted for site altitude:	0.900	Minutes

Truck Travel (Haul & Return) Time:  
penetration 8.0

Road Condition: Soft, rutted dirt, no maintenance or water, 4" tire

## Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	-15.00	8.00	-7.00	2367	0.126
2	400.00	0.00	8.00	8.00	1381	-0.571

Haul Time: **-0.445** minutes

## Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	400.00	0.00	8.00	8.00	2202	0.204
2	200.00	15.00	8.00	23.00	768	0.363

Return Time: **0.567** minutesTotal Truck Cycle Time: **2.722** minutes

Loading Tool unit  
 Production 463.24 LCY/Hour      Adjusted for job efficiency: 384.49 LCY/Hour  
 Truck Unit Production 289.31 LCY/Hour      Adjusted for job efficiency: 240.13 LCY/Hour  
 Optimal No. of Trucks: 2 Truck(s)      Selected Number of Trucks: 2 Truck(s)  
                                  Adjusted hourly truck team production: 480.25 LCY/Hour  
                                  Adjusted single truck/loader team production: 384.49 LCY/Hour  
                                  Adjusted multiple truck/loader team production: **384.49** LCY/Hour

**JOB TIME AND COST**

Fleet size: 1 Team(s)      Total job time: **19.39** Hours  
 Unit cost: \$0.964 /LCY      Total job cost: **\$7,185**

**BULLDOZER WORK**Task description: Spread gravel over process / stockpile areaSite: Bennett's Gravel PitPermit Action: TR5Permit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 03BState: ColoradoAbbreviation: NoneDate: 2/18/2022County: DeltaFilename: M166-03BUser: RDZAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8SUHorsepower: 310Blade Type: Semi-UniversalAttachment: NAShift Basis: 1 per dayData Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$97.46	NA
Operating Cost/Hour:	\$97.63	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$41.30	NA

Total unit Cost/Hour: \$236.39Total Fleet Cost/Hour: **\$236.39****MATERIAL QUANTITIES**Initial Volume: 6,655Swell factor: 1.000Loose volume: **6,655 LCY**Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 100 feetUnadjusted hourly production: 852.6 LCY/hrMaterials consistency description: Loose stockpile 1.2Average push gradient: 0 %Average site altitude: 4,930 feetMaterial weight: 2,850 lbs/LCYWeight description: Gravel - Dry (1/4" - 2" diam.)**Job Condition Correction Factor**

		<u>Source</u>
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:	0.600	(FND-SF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.807	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.3617

Adjusted unit production: 308.39 LCY/hr

Adjusted fleet production: **308.39** LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)

Unit cost: \$0.767/LCY

Total job time: **21.58** Hours

Total job cost: **\$5,101**

TRUCK/LOADER TEAM WORKTask description: Haul topsoil materialSite: Bennett's Gravel PitPermit Action: TR5Permit/Job#: M1979166PROJECT IDENTIFICATIONTask #: 05AState: ColoradoAbbreviation: NoneDate: 2/18/2022County: DeltaFilename: M166-05AUser: RDZAgency or organization name: DRMSHOURLY EQUIPMENT COSTShift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 12-18 cy, 6x4
-Loader:	CAT 966H high lift
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:	\$27.72	\$59.72	NA	NA	NA	NA
Operating cost/hour:	\$47.23	\$55.20	NA	NA	NA	NA
%Utilization-ripper:	NA	0	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:	\$32.54	\$40.71	NA	NA	NA	NA
Unit Subtotals:	\$107.49	\$155.63	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$370.61		Support: \$0.00		Maint: \$0.00	

Total work team cost/hour: \$370.61MATERIAL QUANTITIESInitial volume: 8,147

CCY

Swell factor: 1.429Loose volume: 11,639

LCY

Source of estimated volume: Exhibit E and Exhibit LSource of estimated swell factor: Cat HandbookMaterial Purchase Cost: \$0.00Total Cost: \$0.00HOURLY PRODUCTIONTruck Capacity:

Truck Payload (weight) Basis:

Material weight: 1,600

Pounds/LCY

Description: Top SoilRated Payload: 50,300

Pounds

Payload Capacity: 31.44

LCY



Truck Bed (volume) Basis:

Struck Volume:	12.00	LCY
Heaped Volume:	18.00	LCY
Average Volume:	15.00	LCY
Adjusted Volume:	18.00	LCY

Final Truck Volume Based on Number of Loader Passes: 17.50 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	5.000	LCY (heaped)
Bucket Fill Factor:	0.875	Blasted rock - well blasted (80 - 95%) 0.875
Adjusted Capacity:	<b>4.375</b>	LCY

Job Condition Corrections:

Site Altitude (ft.): 4930 feet

	Truck	Loader	Source
Altitude Adj:	1.000	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	<b>0.830</b>	<b>0.830</b>	

Loading Tool Cycle Time:

Number of Loading Tool Passes Required to Fill Truck: 4 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): 0.500 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Stockpile:	No adjustment - factor not applicable 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:	Small target 0.04	0.040	(Cat HB)
	Net Cycle Time Adjustment:	-0.040	minutes
	Adjusted Loader Cycle Time:	<b>0.460</b>	minutes
	Net Load Time per Truck:	<b>1.480</b>	minutes

Truck Cycle Time:

Truck Exchange Time:	0.50	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Load Time:	1.480	Minutes	Adjusted for site altitude:	1.480	Minutes
Truck Maneuver and Dump Time:	0.90	Minutes	Adjusted for site altitude:	0.900	Minutes

Truck Travel (Haul & Return) Time:  
maintained 3.0

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered,

## Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	0.00	3.00	3.00	2824	0.268
2	300.00	0.00	3.00	3.00	2824	0.106

Haul Time: **0.374** minutes

## Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	300.00	0.00	3.00	3.00	2874	0.140
2	300.00	0.00	3.00	3.00	2874	0.104

Return Time: **0.244** minutesTotal Truck Cycle Time: **3.498** minutes

Loading Tool unit  
 Production 530.30 LCY/Hour      Adjusted for job efficiency: 440.15 LCY/Hour  
 Truck Unit Production 300.17 LCY/Hour      Adjusted for job efficiency: 249.14 LCY/Hour  
 Optimal No. of Trucks: 2 Truck(s)      Selected Number of Trucks: 2 Truck(s)  
                                  Adjusted hourly truck team production: 498.28 LCY/Hour  
                                  Adjusted single truck/loader team production: 440.15 LCY/Hour  
                                  Adjusted multiple truck/loader team production: **440.15** LCY/Hour

**JOB TIME AND COST**

Fleet size: 1 Team(s)      Total job time: **26.44** Hours  
 Unit cost: \$0.842 /LCY      Total job cost: **\$9,800**

**BULLDOZER WORK**Task description: Spread topsoil over upper pond slope and flat areasSite: Bennett's Gravel PitPermit Action: TR5Permit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 05BState: ColoradoAbbreviation: NoneDate: 2/18/2022County: DeltaFilename: M166-05BUser: RDZAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8SUHorsepower: 310Blade Type: Semi-UniversalAttachment: NAShift Basis: 1 per dayData Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$97.46	NA
Operating Cost/Hour:	\$97.63	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$41.30	NA

Total unit Cost/Hour: \$236.39Total Fleet Cost/Hour: **\$236.39****MATERIAL QUANTITIES**Initial Volume: 8,147Swell factor: 1.000Loose volume: **8,147 LCY**Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 50 feetUnadjusted hourly production: 1,400.0 LCY/hrMaterials consistency description: Partly consolidated stockpile 1.1Average push gradient: -5 %Average site altitude: 4,930 feetMaterial weight: 1,600 lbs/LCYWeight description: Top Soil**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.100	(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:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8783

Adjusted unit production: 1,229.62 LCY/hr

Adjusted fleet production: **1229.62** LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)

Unit cost: \$0.192/LCY

Total job time: **6.63** Hours

Total job cost: **\$1,566**

**REVEGETATION WORK**Task description: Revegetate flat surfacesSite: Bennett's Gravel PitPermit Action: TR5Permit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 06AState: ColoradoAbbreviation: NoneDate: 2/18/2022County: DeltaFilename: M166-06AUser: RDZAgency 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)	\$114.56
<b>Total Tilling Cost/Acre</b>	<b>\$114.56</b>

**SEEDING**

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alkali Sacaton	0.50	19.51	\$14.24
Sand Dropseed	0.20	23.88	\$1.95
Crested Wheatgrass - Nordan	2.00	9.18	\$7.80
Tall Wheatgrass - Jose	5.00	9.07	\$16.88
<b>Totals Seed Mix</b>	<b>7.70</b>	<b>61.64</b>	<b>\$40.86</b>

**Application**

Description	Cost /Acre
-------------	------------

Drill Seeding (DRMS Survey Cost)	\$232.00
<b>Total Seed Application Cost/Acre</b>	<b>\$232.00</b>

## MULCHING and MISCELLANEOUS

## Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
	1.00		\$0.00	\$0.00
<b>Total Mulch Materials Cost/Acre</b>				<b>\$0.00</b>

## Application

Description	Cost /Acre
Weed spray, truck, aquatic area, nox. [DMG]	\$62.72
<b>Total Mulch Application Cost/Acre</b>	<b>\$62.72</b>

## 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:	9.1	Cost /Acre:	\$450.14
Estimated Failure Rate:	25%	Cost /Acre*:	\$450.14
*Selected Replanting Work Items:	TILLING,SEEDING,MULCHING		
Initial Job Cost:	\$4,096.27		
Reseeding Job Cost:	\$1,024.07		
Total Job Cost:	\$5,120		
Job Hours:	8.00		

REVEGETATION WORKTask description: Revegetate pit slopes above waterSite: Bennett's Gravel PitPermit Action: TR5Permit/Job#: M1979166PROJECT IDENTIFICATIONTask #: 06BState: ColoradoAbbreviation: NoneDate: 2/18/2022County: DeltaFilename: M166-06BUser: RDZAgency or organization name: DRMSFERTILIZING**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)	\$114.56
<b>Total Tilling Cost/Acre</b>	<b>\$114.56</b>

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Red Top	0.30	34.37	\$2.36
Reed Canarygrass - VNS	5.30	61.57	\$26.24
<b>Totals Seed Mix</b>	<b>5.60</b>	<b>95.93</b>	<b>\$28.60</b>

**Application**

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
	1.00		\$0.00	\$0.00
<b>Total Mulch Materials Cost/Acre</b>				<b>\$0.00</b>

**Application**

Description	Cost / Acre
Weed spray, hand, aquatic area, nox. [DMG]	\$183.16
<b>Total Mulch Application Cost/Acre</b>	<b>\$183.16</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: 1 Cost /Acre: \$593.54  
 Estimated Failure Rate: 0% Cost /Acre\*: \$593.54  
 \*Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **\$593.54**  
 Reseeding Job Cost: **\$0.00**  
 Total Job Cost: **\$594**  
 Job Hours: **4.00**



**EQUIPMENT MOBILIZATION/DEMOBILIZATION**Task description: **Mobilization**Site: **Bennett's Gravel Pit**Permit Action: **TR5**Permit/Job#: **M1979166****PROJECT IDENTIFICATION**Task #: **08A**State: **Colorado**Abbreviation: **None**Date: **2/18/2022**County: **Delta**Filename: **M166-08A**User: **RDZ**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:	\$21.28	\$37.94	\$47.67
Operating Cost/Hour:	\$26.55	\$50.48	\$56.21
Operator Cost/Hour:	\$20.54	\$20.54	\$20.54
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$68.37	\$132.49	\$147.95

**NON ROADABLE EQUIPMENT:**

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D8T - 8SU	47.71	\$97.46	\$132.49	2	\$459.90	\$264.98	\$500.00
CAT 966H	25.80	\$59.72	\$68.37	1	\$128.09	\$68.37	\$250.00
Centrifugal pump - 200M, 10 in.	1.95	\$18.13	\$68.37	2	\$173.00	\$136.74	\$500.00
Drill/Broadcast Seeder with Tractor	25.00	\$7.98	\$68.37	1	\$76.35	\$68.37	\$250.00

Subtotals: **\$837.34** **\$538.46** **\$1,500.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 3/4 T.	\$12.93	1	\$12.93	\$12.93

Subtotals: **\$12.93** **\$12.93**

**EQUIPMENT HAUL DISTANCE and Time**

Nearest Major City or Town within project area region: DELTA  
 Total one-way travel distance: 4.00 miles  
 Average Travel Speed: 40.00 mph

Total Non-Roadable Mob/Demob Cost \*  
 \*\* two round trips with haul rig: \$4,949.84  
 Total Roadable Mob/Demob Cost \*\*  
 \*\* one round trip, no haul rig: \$2.59

**Transportation Cycle Time:**

	Non- Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.10	0.10
Return Time (Hours):	0.10	0.10
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	1.20	0.20

**JOB TIME AND COST**

Total job time: 2.40 Hours

Total job cost: \$4,952