




MINERALS PROGRAM INSPECTION REPORT
PHONE: (303) 866-3567

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

MINE NAME: Bennett's Gravel Pit	MINE/PROSPECTING ID#: M-1979-166	MINERAL: Sand and gravel	COUNTY: Delta
INSPECTION TYPE: Monitoring	INSPECTOR(S): Robert Zuber, P.E.	INSP. DATE: August 17, 2021	INSP. TIME: 07:00
OPERATOR: Elam Construction, Inc.	OPERATOR REPRESENTATIVE: Jim Doody, Jon Mueller	TYPE OF OPERATION: 112c - Construction Regular Operation	

REASON FOR INSPECTION: Normal I&E Program	BOND CALCULATION TYPE: Complete Bond	BOND AMOUNT: \$147,436.09
DATE OF COMPLAINT: NA	POST INSP. CONTACTS: None	JOINT INSP. AGENCY: None
WEATHER: Clear	INSPECTOR'S SIGNATURE: 	SIGNATURE DATE: September 9, 2021

The following inspection topics were identified as having Problems or Possible Violations. OPERATORS SHOULD READ THE FOLLOWING PAGES CAREFULLY IN ORDER TO ASSURE COMPLIANCE WITH THE TERMS OF THE PERMIT AND APPLICABLE RULES AND REGULATIONS. If a Possible Violation is indicated, you will be notified under separate cover as to when the Mined Land Reclamation Board will consider possible enforcement action.

INSPECTION TOPIC: Financial Warranty

PROBLEM/POSSIBLE VIOLATION: Problem: The financial warranty is not adequate to reclaim the site in accordance with the approved reclamation plan. This is a failure to maintain the proper financial warranty amount to complete reclamation of the affected lands pursuant to C.R.S. 34-32.5-117(4)(b) of the Act.

CORRECTIVE ACTIONS: The operator shall review the enclosed update of the Reclamation Cost Estimate and write a letter to the Division listing any questions and/or comments regarding the details of the estimate. This letter must be received by the Division by the corrective action due date. If the letter is not received by that date, the Division will initiate the surety increase process, and the operator will have 60 days from the date on the surety increase notice to post the additional financial warranty.

CORRECTIVE ACTION DUE DATE: 11/05/21

INSPECTION TOPIC: Hydrologic Balance

PROBLEM/POSSIBLE VIOLATION: Problem: The Division has no evidence that the Operator has a substitute water supply plan or approved water augmentation plan for the exposed groundwater at the site. This is a problem related to 34-32.5-116(4)(h) of the Colorado Revised Statutes and 3.1.6(1)(a) of the Construction Materials Rules and Regulations governing injury to existing water rights.

CORRECTIVE ACTIONS: The Operator shall do one of the following by the corrective action date:

- Demonstrate that the operation is in compliance with the Office of the State Engineer.
- Post additional bond for backfilling the pits to at least two feet above the groundwater surface until an augmentation plan is approved.
- Submit a Technical Revision to install a slurry wall or clay liner. After approved, the structure will need to be constructed.

CORRECTIVE ACTION DUE DATE: 12/10/21

INSPECTION TOPIC: Gen. Compliance With Mine Plan

PROBLEM/POSSIBLE VIOLATION: Problem: Several cars and axels appear to be within the boundary of the site, by the entrance. Jon Mueller suggested that these are not within the boundary and that the Annual Report Map may be incorrect.

CORRECTIVE ACTIONS: There are three options to address this problem.

Have the vehicles and axels removed from the permit area.

Write a letter to the Division stating that removal of these vehicles should be included in the cost estimate for site reclamation.

Demonstrate (with photographs, maps, or other evidence) that the vehicles and axels are not in the actual permit area, and (as necessary) write a Technical Revision to update maps for the site, including the Mining Plan Map and the Reclamation Plan Map.

CORRECTIVE ACTION DUE DATE: 12/10/21

INSPECTION TOPIC: Roads

PROBLEM/POSSIBLE VIOLATION: Problem: A road between the pond (mining area) and the river has recently been improved. In addition to being a road, this structure acts as a berm between the river and the pond. This road is not shown on the Mining Plan Map, Exhibit C. The current mine plan needs to be updated and clarified pursuant to C.R.S. 34-32.5-112 (1)(c)(VI).

CORRECTIVE ACTIONS: The operator shall submit a Technical Revision (TR), with the required \$216 revision fee, to update and clarify the current approved mine plan to reflect existing and proposed activities by the corrective action date. This TR can be combined with any other TR submitted in relation to this inspection report (for example, a change in the permit boundary on associated maps).

CORRECTIVE ACTION DUE DATE: 12/10/21

INSPECTION TOPIC: Revegetation

PROBLEM/POSSIBLE VIOLATION: Problem: There are state-listed noxious weeds present on site. This is a problem for failure to employ weed control methods for state listed noxious weed species within the permitted area, and to reduce the spread of weeds to nearby areas as required by Section 3.1.10 (6) of the rule.

CORRECTIVE ACTIONS: Implement approved weed control plan and provide proof to the Division that this has been done.

CORRECTIVE ACTION DUE DATE: 12/10/21

INSPECTION TOPIC: Signs & Markers

PROBLEM/POSSIBLE VIOLATION: Problem: The affected area boundary markers were not observed per the requirements of Rule 3.1.12.

CORRECTIVE ACTIONS: The boundaries of the affected area must be marked by monuments or other markers that are clearly visible and adequate to delineate such boundaries.

CORRECTIVE ACTION DUE DATE: 12/10/21

INSPECTION TOPIC: Topsoil

PROBLEM/POSSIBLE VIOLATION: Problem: The topsoil stockpiles do not have established vegetation on them and are therefore susceptible to erosion. Rule 3.1.9(1) states if topsoil is not replaced into the backfill area within a time short enough to avoid deterioration of the topsoil, vegetative cover or other means shall be employed so that the topsoil is protected from erosion.

CORRECTIVE ACTIONS: The operator shall seed the stockpiles with the seed mix that was submitted as part of the approved Reclamation Plan. If no seed mix has been provided, the operator shall submit a seed mix for approval as a technical revision to the permit along with the appropriate \$216 revision fee to the Division by the corrective action date. The Operator shall demonstrate compliance by submitting seed tags, a bill of sale or photographs of seeding activities. The Operator may also request a follow up inspection.

CORRECTIVE ACTION DUE DATE: 12/10/21

OBSERVATIONS

Rob Zuber of DRMS inspected Bennett's Gravel Pit on August 17, 2021. Two representatives of Elam Construction were present: Jim Doody and Jon Mueller. The site is a 112C operation (DRMS Permit Number M-1979-166) that is currently active. At the time of the inspection, the crushing equipment was operating.

The permit area is 32.6 acres. The approved area for disturbance is 29 acres.

The weather was clear except for smoke from Western U.S. wildfires, and the temperature was warm.

Availability Of Records:

Some issues with the records in the files for the Bennett's Gravel Pit were identified before and during the inspection. Per Jon Mueller, the map in the Annual Report is not accurate, namely the permit boundary may be off. If this is true, the correct map should be used in future annual reports.

Another issue is the Reclamation Plan Map (exhibit F from TR-1 in Division files). Because TR-1 was not approved by the Division, the Operator needs to send a letter to the Division indicating that this map illustrates accurately the current reclamation plan.

Financial Warranty:

The Division has updated the Reclamation Cost Estimate for the Bennett's Gravel Pit and is including it with this inspection report as an enclosure. The new estimate is \$237,023. The existing financial warranty of \$147,436 was not found to be adequate to complete reclamation at the site. The majority of the increase in the cost estimate is related to the addition of a new task to haul material to the pit slopes.

Hydrologic Balance:

There was no indication that runoff from the site is causing problems in the Gunnison River, which is less than 30 feet from the mining area.

Sufficient documentation was not found regarding exposed groundwater at the site. The Operator has documentation of a well permit, but a well permit does not convey a water right. During a Division search of records related to this permit, no augmentation plan was found. The Operator must address this problem as discussed in the Problems section of this report.

Gen. Compliance With Mine Plan:

Several cars and axels appear to be within the boundary of the site, by the entrance. Jon Mueller suggested that these are not within the boundary and that the Annual Report Map may be incorrect. This issue should be addressed as detailed in the list of problems section of this report.

Roads:

A road between the pond (mining area) and the river has recently been improved. In addition to being a road, this structure acts as a berm between the river and the pond. This road is not shown on the Mining Plan Map, Exhibit C. A Technical Revision is required to update the map.

Reclamation Success:

The reclaimed area near the southwest corner of the site is in acceptable condition except for the weeds mentioned in the Revegetation section of this report.

Revegetation:

Many weeds were seen around the site: knapweed, tamarisk, Russian olive, and mullein. These should be treated per the approved Weed Control Plan.

Support Facilities On-site:

There is no fuel storage at this site.

Signs and Markers:

Very few markers were seen around the affected area. These need to be installed.

Topsoil:

The topsoil pile south of the entrance is not protected with vegetation or BMPs. This problem needs to be addressed by Elam Construction.

PHOTOGRAPHS



Vehicles and car parts near the entrance to the site, next to soil piles



Mining area with pumps



Improved road between the pit and the Gunnison River



Reclaimed portion of pond slopes – note noxious trees and stockpiles of material on north side of pond

GENERAL INSPECTION TOPICS

The following list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each

(AR) RECORDS----- <u>Y</u>	(FN) FINANCIAL WARRANTY----- <u>PB</u>	(RD) ROADS----- <u>PB</u>
(HB) HYDROLOGIC BALANCE----- <u>PB</u>	(BG) BACKFILL & GRADING----- <u>N</u>	(EX) EXPLOSIVES----- <u>NA</u>
(PW) PROCESSING WASTE/TAILING---- <u>Y</u>	(SF) PROCESSING FACILITIES----- <u>Y</u>	(TS) TOPSOIL----- <u>PB</u>
(MP) GENL MINE PLAN COMPLIANCE- <u>PB</u>	(FW) FISH & WILDLIFE----- <u>Y</u>	(RV) REVEGETATION---- <u>PB</u>
(SM) SIGNS AND MARKERS----- <u>PB</u>	(SP) STORM WATER MGT PLAN---- <u>NA</u>	(RS) RECL PLAN/COMP-- <u>Y</u>
(ES) OVERBURDEN/DEV. WASTE----- <u>Y</u>	(SC) EROSION/SEDIMENTATION--- <u>Y</u>	(ST) STIPULATIONS----- <u>NA</u>
(AT) ACID OR TOXIC MATERIALS----- <u>N</u>	(OD) OFF-SITE DAMAGE----- <u>Y</u>	

Y = Inspected / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

Inspection Contact Address

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

Enclosure: Reclamation Cost Estimate

CC: Michael Cunningham, Clayton Wein, Travis Marshall, DRMS

Reclamation Cost Estimate

COST SUMMARY WORK

Task description: Update of RCE for 2021 Inspection

Site: Bennett's Gravel Pit

Permit Action: 2021 Inspection

Permit/Job#: M1979166

PROJECT IDENTIFICATION

Task #: 001

State: Colorado

Abbreviation: None

Date: 9/1/2021

County: Delta

Filename: M166-001

User: RDZ

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01A	Dewater Pit for Slope Reduction	PUMPING	1	387.50	\$39,765
02A	Haul backfill material to pit slopes	TRUCK1	1	223.51	\$82,836
02B	Push Material to Backfill Slopes	DOZER	2	73.12	\$34,568
03A	Excavate and transport gravel from pit to processing area	TRUCK1	1	18.53	\$6,868
04A	Spread gravel over process / stockpile area	DOZER	1	21.80	\$5,153
05A	Spread topsoil over pond perimeter above water level	DOZER	1	12.95	\$3,061
06A	Revegetate flat surfaces of excavation area	REVEGE	1	8.00	\$1,688
07A	Revegetate pit slopes above water	REVEGE	1	4.00	\$445
08A	Mobilization	MOBILIZE	1	2.40	\$4,952
<u>SUBTOTALS:</u>				751.81	\$179,336

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance: 2.02

Total = \$3,623

Performance bond: 1.05

Total = \$1,883

Job superintendent: 300.00

Total = \$21,609

Profit: 10.00

Total = \$17,934

TOTAL O & P = \$45,048

CONTRACT AMOUNT (direct + O & P) = \$224,384

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

\$12,139

CONTINGENCY: 0.00

Total = \$0

TOTAL INDIRECT COST = \$57,687

TOTAL BOND AMOUNT (direct + indirect) = \$237,023

PUMPING WORK

Task description: Dewater Pit for Slope Reduction

Site: Bennett's Gravel Pit

Permit Action: 2021 Inspection

Permit/Job#: M1979166

PROJECT IDENTIFICATION

Task #: 01A

State: Colorado

Abbreviation: None

Date: 8/31/2021

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:	<u>70</u>	
Shift Basis:	<u>3 per day</u>	
Weight:	<u>1.95</u>	
	(US Tons)	

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	<u>\$37.86</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$37.08</u>	<u>100</u>
Operator Cost/Hour:	<u>\$27.68</u>	<u>NA</u>
Total Unit Cost/Hour:	<u>\$102.62</u>	

Total Fleet Cost/Hour: \$102.62

PUMPING QUANTITIES

Initial Pond Volume:	<u>76,122,225.00</u>		Conversion factor:	<u>1.0000</u>
Final Pond Volume:	<u>76,122,225.00</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>422.90</u>	hours
Inflow during Initial Pumping:	<u>2,319,596</u>	gallons
Net Unadjusted Pumping Time:	<u>435.79</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>387.50</u>	hours

JOB TIME AND COST

Total job time: 387.50 Hours

Unit cost: \$0.000507 /Gallon

Total job cost: \$39,765

TRUCK/LOADER TEAM WORKTask description: Haul backfill material to pit slopesSite: Bennett's Gravel PitPermit Action: 2021 InspectionPermit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 02AState: ColoradoAbbreviation: NoneDate: 9/2/2021County: DeltaFilename: M166-02AUser: 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-riper:	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: 101,606

CCY

Swell factor: 1.000Loose volume: 101,606

LCY

Source of estimated volume: Task 02ASource of estimated swell factor: Cat HandbookMaterial Purchase Cost: \$0.00Total Cost: \$0.00**HOURLY PRODUCTION****Truck Capacity:**Truck Payload (weight) Basis:Material weight: 2,400

Pounds/LCY

Description: Sand - Dry, looseRated 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: 13.88 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	<u>5.000</u>	LCY (heaped)
Bucket Fill Factor:	<u>0.925</u>	Loose material - 1/8" to 3/8" (90 - 95%) 0.925
Adjusted Capacity:	<u>4.625</u>	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:	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): 0.500 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:		0.460	minutes
Net Load Time per Truck:		1.020	minutes

Truck Cycle Time:

Truck Exchange Time:	<u>0.50</u>	Minutes	Adjusted for site altitude:	<u>0.500</u>	Minutes
Truck Load Time:	<u>1.020</u>	Minutes	Adjusted for site altitude:	<u>1.020</u>	Minutes
Truck Maneuver and Dump Time:	<u>0.90</u>	Minutes	Adjusted for site altitude:	<u>0.900</u>	Minutes

Truck Travel (Haul & Return) Time:

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

maintained 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	0.00	3.00	3.00	2824	0.232
2	200.00	0.00	3.00	3.00	2824	0.071

Haul Time: **0.303** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	200.00	0.00	3.00	3.00	2874	0.105
2	200.00	0.00	3.00	3.00	2874	0.070

Return Time: **0.175** minutes

Total Truck Cycle Time: **2.898** minutes

Loading Tool unit

Production	<u>547.70</u>	LCY/Hour	Adjusted for job efficiency:	<u>454.59</u>	LCY/Hour
Truck Unit Production	<u>287.27</u>	LCY/Hour	Adjusted for job efficiency:	<u>238.43</u>	LCY/Hour

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

Adjusted hourly truck team production:	<u>476.86</u>	LCY/Hour
Adjusted single truck/loader team production:	<u>454.59</u>	LCY/Hour
Adjusted multiple truck/loader team production:	<u>454.59</u>	LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **223.51** Hours

Unit cost: \$0.815 /LCY Total job cost: **\$82,836**

BULLDOZER WORKTask description: **Push Material to Backfill Slopes**Site: **Bennett's Gravel Pit**Permit Action: **2021 Inspection**Permit/Job#: **M1979166****PROJECT IDENTIFICATION**Task #: **02B**State: **Colorado**Abbreviation: **None**Date: **9/2/2021**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: **101,606**Swell factor: **1.110**Loose volume: **112,783 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: **2,800 lbs/LCY**Weight description: **Clay - Natural bed****Job Condition Correction Factor****Source**

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:	0.821	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5509

Adjusted unit
production: 771.26 LCY/hr
Adjusted fleet
production: **1542.52** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: \$0.307/LCY

Total job time: **73.12** Hours
Total job cost: **\$34,568**

TRUCK/LOADER TEAM WORKTask description: Excavate and transport gravel from pit to processing areaSite: Bennett's Gravel PitPermit Action: 2021 InspectionPermit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 03AState: ColoradoAbbreviation: NoneDate: 9/1/2021County: 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-riper:	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: 6,722

CCY

Swell factor: 1.060Loose volume: 7,125

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:	<u>5.000</u>	LCY (heaped)
Bucket Fill Factor:	<u>0.875</u>	Blasted rock - well blasted (80 - 95%) 0.875
Adjusted Capacity:	<u>4.375</u>	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:	0.830	0.830	

Loading Tool Cycle Time:

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

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:		0.550	minutes
Net Load Time per Truck:		1.200	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:

Road Condition: Soft, rutted dirt, no maintenance or water, 4" tire penetration 8.0

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** minutes

Total 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: **18.53** Hours

Unit cost: \$0.964 /LCY Total job cost: **\$6,868**

BULLDOZER WORKTask description: **Spread gravel over process / stockpile area**Site: **Bennett's Gravel Pit**Permit Action: 2021 InspectionPermit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 04AState: ColoradoAbbreviation: NoneDate: 9/1/2021County: DeltaFilename: M166-04AUser: 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:	<u>\$97.46</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$97.63</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>\$41.30</u>	<u>NA</u>

Total unit Cost/Hour: \$236.39Total Fleet Cost/Hour: **\$236.39****MATERIAL QUANTITIES**Initial Volume: 6,722Swell factor: 1.000Loose volume: **6,722 LCY**Source of estimated volume: Division of Reclamation, Mining & Safety

Source of estimated swell

factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 100 feet

Unadjusted hourly

production: 852.6 LCY/hrMaterials consistency description: Loose stockpile 1.2

Average push

gradient: 0 %Average site altitude: 4,930 feetMaterial weight: 2,850 lbs/LCYWeight description: Gravel - Dry (1/4"-2" diam.)Job Condition Correction FactorSource

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: **21.80** Hours
 Total job cost: **\$5,153**

BULLDOZER WORKTask description: Spread topsoil over pond perimeter above water levelSite: Bennett's Gravel PitPermit Action: 2021 InspectionPermit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 05A
Date: 9/1/2021
User: RDZState: Colorado
County: DeltaAbbreviation: None
Filename: M166-05AAgency 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:	\$236.39	

MATERIAL QUANTITIESInitial Volume: 2,895
Swell factor: 1.000
Loose volume: **2,895 LCY**Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 350 feet
Unadjusted hourly production: 233.3 LCY/hrMaterials consistency description: Loose stockpile 1.2Average push gradient: -5 %
Average site altitude: 4,930 feetMaterial weight: 1,600 lbs/LCYWeight description: Top SoilJob Condition Correction FactorSource

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:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.9582

Adjusted unit
production: 223.55 LCY/hr
Adjusted fleet
production: **223.55** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: \$1.057/LCY

Total job time: **12.95** Hours
Total job cost: **\$3,061**

REVEGETATION WORKTask description: Revegetate flat surfaces of excavation areaSite: Bennett's Gravel PitPermit Action: 2021 InspectionPermit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 06AState: ColoradoAbbreviation: NoneDate: 9/1/2021County: DeltaFilename: M166-06AUser: RDZAgency 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
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	\$114.56
Total Tilling Cost/Acre	\$114.56

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
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
Totals Seed Mix	7.70	61.64	\$40.86

Application

Description	Cost /Acre
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Drill Seeding (DRMS Survey Cost)	\$232.00
Total Seed Application Cost/Acre	\$232.00

MULCHING and MISCELLANEOUS**Materials**

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

Application

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

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: 3 Cost /Acre: \$450.14
 Estimated Failure Rate: 25% Cost /Acre*: \$450.14
 *Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **\$1,350.42**
 Reseeding Job Cost: **\$337.61**
 Total Job Cost: **\$1,688**
 Job Hours: **8.00**

REVEGETATION WORKTask description: Revegetate pit slopes above waterSite: Bennett's Gravel PitPermit Action: 2021 InspectionPermit/Job#: M1979166**PROJECT IDENTIFICATION**Task #: 07AState: ColoradoAbbreviation: NoneDate: 9/1/2021County: DeltaFilename: M166-07AUser: RDZAgency 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
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	\$114.56
Total Tilling Cost/Acre	\$114.56

SEEDING

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

Application

Description	Cost /Acre
Broadcast seeding [DMG]	\$267.22

Total Seed Application Cost/Acre	\$267.22
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MULCHING and MISCELLANEOUS**Materials**

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

Application

Description	Cost /Acre
Weed spray, hand, aquatic area, nox. [DMG]	\$183.16
Total Mulch Application Cost/Acre	\$183.16

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: 0.75 Cost /Acre: \$593.54
 Estimated Failure Rate: 0% Cost /Acre*: \$593.54
 *Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **\$445.16**
 Reseeding Job Cost: **\$0.00**
 Total Job Cost: **\$445**
 Job Hours: **4.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: **Mobilization**Site: **Bennett's Gravel Pit**Permit Action: **2021 Inspection**Permit/Job#: **M1979166****PROJECT IDENTIFICATION**Task #: **08A**State: **Colorado**Abbreviation: **None**Date: **9/1/2021**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:**

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	\$21.28	\$37.94	\$47.67
Operating Cost/Hour:	\$26.55	\$50.48	\$56.21
Operator Cost/Hour:	\$20.54	\$20.54	\$20.54
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$68.37	\$132.49	\$147.95

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D8T - 8SU	47.71	\$97.46	\$132.49	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 * \$4,949.84
 * two round trips with haul rig:
 Total Roadable Mob/Demob Cost ** \$2.59
 ** one round trip, no haul rig:

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