



STATE OF
COLORADO

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

Western Sugar cost estimate

1 message

Zuber - DNR, Rob <rob.zuber@state.co.us>
To: Garrett Varra <gvarra@raptormaterialsllc.com>

Wed, Aug 16, 2023 at 10:07 AM

Hi, Garrett -

Attached is my update of the reclamation cost estimate for the Western Sugar Reclamation Land Development Project, permit M-2010-049. Please look this over during the next 2 - 3 weeks, and let me know if there are issues with my estimate that you want to discuss.

If I do not hear from you by 9/8/2023, we will initiate the Surety Increase process.

Thanks,
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 | <http://drms.colorado.gov>



DRMS_Rec_Cost_Estimate_Western_Sugar_M2010049.pdf
1539K

COST SUMMARY WORK

Task description: Cost Summary

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 7/12/2023 County: Weld Filename: M049-000
User: RDZ

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01A	Dewatering - Tract A	PUMPING	1	167.02	\$20,048
01B	Backfill highwall - Tract A	DOZER	2	21.41	\$18,885
02A	Dewatering - Tract C	PUMPING	1	179.29	\$21,520
02B	Backfill highwall - Tract C	DOZER	2	25.19	\$22,218
03A	Dewatering - Tract D	PUMPING	1	17.81	\$713
03B	Haul material from nearby (within 1 mile) to fill Tract D	TRUCK1	1	52.72	\$34,160
03C	Backfill highwall - Tract D	DOZER	2	21.37	\$18,856
04A	Compaction of slopes	COMPACT	2	20.98	\$12,432
05A	Replace topsoil - 40.06 acres, 6", all tracts	SCRAPER1	1	68.85	\$38,449
06A	Revegetation of all disturbed areas - 40.06 acres	REVEGE	1	40.00	\$35,724
07A	Road grading	GRADER	1	2.67	\$586
08A	Repair and grade embankment failure	DOZER	1	36.01	\$15,317
08B	Excavate for weir construction	TRUCK1	1	40.26	\$27,075
08C	Place bedding material for riprap on weir	TRUCK1	1	11.37	\$6,219
08D	Place riprap on weir	EXCAVATE	1	12.83	\$2,725
10A	Equipment Mobilization/Demobilization	MOBILIZE	1	3.57	\$14,528
<u>SUBTOTALS:</u>				721.35	\$289,455

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	\$5,847
Performance bond:	1.05	Total =	\$3,039
Job superintendent:	367.80	Total =	\$23,936
Profit:	10.00	Total =	\$28,946
		TOTAL O & P =	\$61,768
		CONTRACT AMOUNT (direct + O & P) =	\$351,223

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:	5.00		\$17,561
CONTINGENCY:	0.00	Total =	\$0

TOTAL INDIRECT COST = \$79,829

TOTAL BOND AMOUNT (direct + indirect) = \$369,284

PUMPING WORK

Task description: Dewatering - Tract A

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 01A
Date: 7/12/2023
User: RDZ

State: Colorado
County: Weld

Abbreviation: None
Filename: M049-01A

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

	Description	Quantity
Make and Model:	Centrifugal pump - 200M, 10 in.	3
Attachment 1:	Suction hose - 6 in. diam., 25 ft.	3
Attachment 2:	Discharge hose - 6 in. D., 25 ft.	3
Labor Unit 1:	Pump operator	0
Horsepower:	<u>70</u>	
Shift Basis:	<u>1 per day</u>	
Weight:	<u>1.95</u>	
	(US Tons)	

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	<u>\$54.75</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$65.28</u>	<u>100</u>
Operator Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Total Unit Cost/Hour:	<u>\$120.03</u>	
Total Fleet Cost/Hour:	<u>\$120.03</u>	

PUMPING QUANTITIES

Initial Pond Volume:	<u>100,000,000.00</u>		Conversion factor:	<u>1.0000</u>
Final Pond Volume:	<u>100,000,000.00</u>	gallons		
Total Pond Inflow Surface Area:	<u>22,000</u>	Sq. ft.	Unit inflow rate in gph/sq. ft.:	<u>0.3516</u>
Total Pond Inflow Volume per Hour:	<u>7,735.20</u>	gallons		

Source of estimated volume: Division Estimate

PUMPING TIME

Maximum Pump Capacity:	<u>200,000</u>	gph/pump
Estimated Suction Head:	<u>15</u>	feet
Estimated Discharge Head:	<u>5</u>	feet
Total Head:	<u>20</u>	feet
CPB Pump Capacity:	<u>180,000</u>	gph/pump
Site Altitude:	<u>4,600</u>	feet
Adjusted Pumping Capacity:	<u>540,000</u>	gph
Initial Unadjusted Pumping Time:	<u>185.19</u>	hours
Inflow during Initial Pumping:	<u>1,432,444</u>	gallons
Net Unadjusted Pumping Time:	<u>187.84</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>167.03</u>	hours

JOB TIME AND COST

Total job time: 167.03 Hours

Unit cost: \$0.000198 /Gallon

Total job cost: \$20,048

BULLDOZER WORKTask description: **Backfill highwall - Tract A**Site: **Western Sugar Reclamation
Land Development Project**Permit Action: **2023 Update**Permit/Job#: **M2010049****PROJECT IDENTIFICATION**Task #: **01B**
Date: **7/12/2023**
User: **RDZ**State: **Colorado**
County: **Weld**Abbreviation: **None**
Filename: **M049-01B**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**Basic Machine: **Cat D9T - 9SU**
Horsepower: **405**
Blade Type: **Semi-Universal**
Attachment: **NA**
Shift Basis: **1 per day**
Data Source: **(CRG)****Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$238.76	NA
Operating Cost/Hour:	\$162.29	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$40.04	NA

Total unit Cost/Hour: **\$441.09**
Total Fleet Cost/Hour: **\$882.17****MATERIAL QUANTITIES**Initial Volume: **64,600**
Swell factor: **1.000**
Loose volume: **64,600 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: **2,110.5 LCY/hr**Materials consistency description: **Loose stockpile 1.2**Average push gradient: **-10 %**
Average site altitude: **4,600 feet**Material weight: **2,650 lbs/LCY**Weight description: **Decomposed rock - 25% Rock, 75% Earth****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:	0.900	(SSD-FC)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7149

Adjusted unit production: 1,508.80 LCY/hr

Adjusted fleet production: **3017.6 LCY/hr**

JOB TIME AND COST

Fleet size: 2 Dozer(s)

Unit cost: \$0.292/LCY

Total job time: **21.41** Hours

Total job cost: **\$18,885**

PUMPING WORK

Task description: Dewatering - Tract C

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 02A
Date: 7/12/2023
User: RDZ

State: Colorado
County: Weld

Abbreviation: None
Filename: M049-02A

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

	Description	Quantity
Make and Model:	Centrifugal pump - 200M, 10 in.	3
Attachment 1:	Suction hose - 6 in. diam., 25 ft.	3
Attachment 2:	Discharge hose - 6 in. D., 25 ft.	3
Labor Unit 1:	Pump operator	0
Horsepower:	<u>70</u>	
Shift Basis:	<u>1 per day</u>	
Weight:	<u>1.95</u>	
	(US Tons)	

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	<u>\$54.75</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$65.28</u>	<u>100</u>
Operator Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Total Unit Cost/Hour:	<u>\$120.03</u>	
Total Fleet Cost/Hour:	<u>\$120.03</u>	

PUMPING QUANTITIES

Initial Pond Volume:	<u>107,000,000.00</u>		Conversion factor:	<u>1.0000</u>
Final Pond Volume:	<u>107,000,000.00</u>	gallons		
Total Pond Inflow Surface Area:	<u>27,000</u>	Sq. ft.	Unit inflow rate in gph/sq. ft.:	<u>0.3516</u>
Total Pond Inflow Volume per Hour:	<u>9,493.20</u>	gallons		

Source of estimated volume: Division Estimate

PUMPING TIME

Maximum Pump Capacity:	<u>200,000</u>	gph/pump
Estimated Suction Head:	<u>15</u>	feet
Estimated Discharge Head:	<u>5</u>	feet
Total Head:	<u>20</u>	feet
CPB Pump Capacity:	<u>180,000</u>	gph/pump
Site Altitude:	<u>4,600</u>	feet
Adjusted Pumping Capacity:	<u>540,000</u>	gph
Initial Unadjusted Pumping Time:	<u>198.15</u>	hours
Inflow during Initial Pumping:	<u>1,881,060</u>	gallons
Net Unadjusted Pumping Time:	<u>201.63</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>179.29</u>	hours

JOB TIME AND COST

Total job time: 179.29 Hours

Unit cost: \$0.000198 /Gallon

Total job cost: \$21,520

BULLDOZER WORKTask description: **Backfill highwall - Tract C**Site: **Western Sugar Reclamation
Land Development Project**Permit Action: **2023 Update**Permit/Job#: **M2010049****PROJECT IDENTIFICATION**Task #: **02B**State: **Colorado**Abbreviation: **None**Date: **7/12/2023**County: **Weld**Filename: **M049-02B**User: **RDZ**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**Basic Machine: **Cat D9T - 9SU**Horsepower: **405**Blade Type: **Semi-Universal**Attachment: **NA**Shift Basis: **1 per day**Data Source: **(CRG)****Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$238.76	NA
Operating Cost/Hour:	\$162.29	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$40.04	NA

Total unit Cost/Hour: **\$441.09**Total Fleet Cost/Hour: **\$882.17****MATERIAL QUANTITIES**Initial Volume: **76,000**Swell factor: **1.000**Loose volume: **76,000 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: **2,110.5 LCY/hr**Materials consistency description: **Loose stockpile 1.2**Average push gradient: **-10 %**Average site altitude: **4,600 feet**Material weight: **2,650 lbs/LCY**Weight description: **Decomposed rock - 25% Rock, 75% Earth****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:	0.900	(SSD-FC)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7149

Adjusted unit production: 1,508.80 LCY/hr

Adjusted fleet production: **3017.6 LCY/hr**

JOB TIME AND COST

Fleet size: 2 Dozer(s)

Unit cost: \$0.292/LCY

Total job time: **25.19 Hours**

Total job cost: **\$22,218**

PUMPING WORK

Task description: Dewatering - Tract D

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 03A State: Colorado Abbreviation: None
Date: 7/12/2023 County: Weld Filename: M049-03A
User: RDZ

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.	1
Attachment 2:	Discharge hose - 6 in. D., 25 ft.	1
Labor Unit 1:	Pump operator	0
Horsepower:	<u>70</u>	
Shift Basis:	<u>1 per day</u>	
Weight:	<u>1.95</u>	
	(US Tons)	

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	<u>\$18.25</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$21.76</u>	<u>100</u>
Operator Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Total Unit Cost/Hour:	<u>\$40.01</u>	
Total Fleet Cost/Hour:	<u>\$40.01</u>	

PUMPING QUANTITIES

Initial Pond Volume:	<u>4,000,000.00</u>		Conversion factor:	<u>1.0000</u>
Final Pond Volume:	<u>4,000,000.00</u>	gallons		
Total Pond Inflow Surface Area:	<u>4,000</u>	Sq. ft.	Unit inflow rate in gph/sq. ft.:	<u>0.3516</u>
Total Pond Inflow Volume per Hour:	<u>1,406.40</u>	gallons		

Source of estimated volume: Division Estimate

PUMPING TIME

Maximum Pump Capacity:	<u>200,000</u>	gph/pump
Estimated Suction Head:	<u>10</u>	feet
Estimated Discharge Head:	<u>5</u>	feet
Total Head:	<u>15</u>	feet
CPB Pump Capacity:	<u>201,000</u>	gph/pump
Site Altitude:	<u>4,600</u>	feet
Adjusted Pumping Capacity:	<u>201,000</u>	gph
Initial Unadjusted Pumping Time:	<u>19.90</u>	hours
Inflow during Initial Pumping:	<u>27,988</u>	gallons
Net Unadjusted Pumping Time:	<u>20.04</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>17.82</u>	hours

JOB TIME AND COST

Total job time: 17.82 Hours

Unit cost: \$0.000177 /Gallon

Total job cost: \$713

TRUCK/LOADER TEAM WORKTask description: Haul material from nearby (within 1 mile) to fill Tract DSite: Western Sugar Reclamation
Land Development ProjectPermit Action: 2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**

Task #: 03B State: Colorado Abbreviation: None
 Date: 7/12/2023 County: Weld Filename: M049-03B
 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:	Water Tanker, 2,500 Gal.

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	100
Ownership cost/hour:	\$26.39	\$65.69	NA	NA	NA	\$11.35
Operating cost/hour:	\$64.76	\$48.09	NA	NA	NA	\$22.92
%Utilization-ripper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	NA	NA	NA	\$0.00
Ripper op. cost/hour:	NA	\$0.00	NA	NA	NA	\$0.00
Operator cost/hour:	\$24.82	\$35.97	NA	NA	NA	\$0.00
Unit Subtotals:	\$115.97	\$149.75	NA	NA	NA	\$34.27
Number of Units:	4	1	0	0	0	1
Group Subtotals:	Work: \$613.63		Support: \$0.00		Maint: \$34.27	

Total work team cost/hour: \$647.90**MATERIAL QUANTITIES**

Initial volume: 24,000 CCY Swell factor: 1.000
 Loose volume: 24,000 LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
 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: 2,650 Pounds/LCY
 Description: Decomposed rock - 25% Rock, 75% Earth
 Rated Payload: 50,300 Pounds

Payload Capacity: 18.98 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: 14.63 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	<u>5.000</u>	LCY (heaped)
Bucket Fill Factor:	<u>0.975</u>	Loose material - uniform aggregates to 1/8" (95-100%) <u>0.975</u>
Adjusted Capacity:	<u>4.875</u>	LCY

Job Condition Corrections:

Site Altitude (ft.): 4600 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:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Operation:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Dump Target:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Net Cycle Time Adjustment:		0.000	minutes
Adjusted Loader Cycle Time:		0.500	minutes
Net Load Time per Truck:		1.100	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>1.100</u>	Minutes	Adjusted for site altitude:	<u>1.100</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:
penetration 1.2

Road Condition: Very hard, smooth, asphalt or concrete, no tire

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	5000.00	0.00	1.20	1.20	2895	1.860

Haul Time: **1.860** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	5000.00	0.00	1.20	1.20	2913	1.751

Return Time: **1.751** minutesTotal Truck Cycle Time: **6.111** minutes

Loading Tool unit

Production	<u>548.44</u>	LCY/Hour	Adjusted for job efficiency:	<u>455.20</u>	LCY/Hour
Truck Unit Production	<u>143.59</u>	LCY/Hour	Adjusted for job efficiency:	<u>119.18</u>	LCY/Hour

Optimal No. of Trucks:	<u>4</u>	Truck(s)	Selected Number of Trucks:	<u>4</u>	Truck(s)
------------------------	----------	----------	----------------------------	----------	----------

Adjusted hourly truck team production:	<u>476.73</u>	LCY/Hour
Adjusted single truck/loader team production:	<u>455.20</u>	LCY/Hour
Adjusted multiple truck/loader team production:	<u>455.20</u>	LCY/Hour

JOB TIME AND COST

Fleet size:	<u>1</u>	Team(s)	Total job time:	<u>52.72</u>	Hours
-------------	----------	---------	-----------------	---------------------	-------

Unit cost:	<u>\$1.423</u>	/LCY	Total job cost:	<u>\$34,160</u>
------------	----------------	------	-----------------	------------------------

BULLDOZER WORKTask description: **Backfill highwall - Tract D**Site: **Western Sugar Reclamation
Land Development Project**Permit Action: **2023 Update**Permit/Job#: **M2010049****PROJECT IDENTIFICATION**Task #: **03C**
Date: **7/12/2023**
User: **RDZ**State: **Colorado**
County: **Weld**Abbreviation: **None**
Filename: **M049-03C**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**Basic Machine: **Cat D9T - 9SU**
Horsepower: **405**
Blade Type: **Semi-Universal**
Attachment: **NA**
Shift Basis: **1 per day**
Data Source: **(CRG)****Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$238.76	NA
Operating Cost/Hour:	\$162.29	100
Ripper own. Cost/Hour:	\$0.00	NA
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$40.04	NA

Total unit Cost/Hour: **\$441.09**
Total Fleet Cost/Hour: **\$882.17****MATERIAL QUANTITIES**Initial Volume: **64,500**
Swell factor: **1.000**
Loose volume: **64,500 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: **2,110.5 LCY/hr**Materials consistency description: **Loose stockpile 1.2**Average push gradient: **-10 %**
Average site altitude: **4,600 feet**Material weight: **2,650 lbs/LCY**Weight description: **Decomposed rock - 25% Rock, 75% Earth****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:	0.900	(SSD-FC)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7149

Adjusted unit production: 1,508.80 LCY/hr

Adjusted fleet production: **3017.6 LCY/hr**

JOB TIME AND COST

Fleet size: 2 Dozer(s)

Unit cost: \$0.292/LCY

Total job time: **21.37 Hours**

Total job cost: **\$18,856**

COMPACTION WORK

Task description: Compaction of slopes

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 04A State: Colorado Abbreviation: None
Date: 7/12/2023 County: Weld Filename: M049-04A
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 815F Horsepower: 240
Compactor Type: Soil - tamping foot Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

Ownership Cost/Hour:	\$147.57	Utilization %
Operating Cost/Hour:	\$117.19	NA
Operator Cost/Hour:	\$31.50	100
Total Unit Cost/Hour:	\$296.26	NA
Total Fleet Cost/Hour:	\$592.53	

MATERIAL QUANTITIES

Loose volume: 205,000 LCY Shrinkage factor: 0.900
Compacted volume: 184,500 CCY
Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated shrinkage factor: Cat Handbook

HOURLY PRODUCTION

Unadjusted hourly production = $(W \times S \times L \times C) / P$

Compacted width per pass (W): 6.50 feet
Average Compactor Speed (S): 5.00 mph
Compacted thickness of each lift (L): 10.00 inches
Conversion Constant (C): 16.3 (5,280ft./12in./27cu.ft.)
Required number of machine passes (P): 1 passes
Unadjusted Hourly Unit Production: 5,297.50 CCY/hour

Job Condition Correction Factors

Site Altitude: 4,600 feet

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

Adjusted Hourly Unit Production: 4,396.93 CCY/Hour
Adjusted Hourly Fleet Production: 8,793.85 CCY/Hour

JOB TIME AND COST

Fleet size: 2 Compactor(s) Total job time: 20.98 Hours
Unit cost: \$0.067 per CCY Total job cost: \$12,432

SCRAPER TEAM WORKTask description: **Replace topsoil - 40.06 acres, 6", all tracts**Site: **Western Sugar Reclamation
Land Development Project**Permit Action: 2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**Task #: 05A
Date: 7/13/2023
User: RDZState: Colorado
County: WeldAbbreviation: None
Filename: M049-05AAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 627G
-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:	\$230.18	NA	NA	NA	NA	NA
Operating cost/hour:	\$281.21	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:	\$47.07	NA	NA	NA	NA	NA
Unit Subtotals:	\$558.46	NA	NA	NA	NA	NA
Number of Units:	1	0	0	0	0	0
Group Subtotals:	Work: \$558.46		Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: **\$558.46****MATERIAL QUANTITIES**Initial volume: 32,315 CCY Swell factor: 1.000
Loose volume: 32,315 LCYSource of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

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

Cycle Time:Scraper Loading Time: 0.70 MinutesManeuver and Spread Time: 0.60 MinutesJob Condition Correction:

Site Altitude: 4600 feet

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

Travel Time:Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	600.00	0.00	3.00	3.00	2824	0.38

Haul Time: 0.38 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	600.00	0.00	3.00	3.00	2874	0.32

Return Time: 0.32 minutesTotal Scraper team cycle time: 2.00 minutesAdjusted for job conditions: 469.37 LCY/HourSelected Number of Scrapers: 1 Scraper(s)Adjusted single scraper team (unit) hourly production: 469.37 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 469.37 LCY/HourUnadjusted unit production/hour: 565.50 LCY/Hour

Optimal Number of Scrapers per push dozer: _____

JOB TIME AND COSTFleet size: 1 Team(s)Total job time: 68.85 HoursUnit cost: \$1.190 /LCYTotal job cost: \$38,449

REVEGETATION WORKTask description: Revegetation of all disturbed areas - 40.06 acresSite: Western Sugar Reclamation
Land Development ProjectPermit Action: 2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**Task #: 06A
Date: 7/13/2023
User: RDZState: Colorado
County: WeldAbbreviation: None
Filename: M049-06AAgency 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)	\$112.82
Total Tilling Cost/Acre	\$112.82

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alkali Sacaton	0.01	0.39	\$0.28
Switchgrass - Blackwell	0.90	8.04	\$10.35
Blue Grama - Lovington	0.20	3.26	\$3.20
Indian Ricegrass - Native	1.90	6.15	\$12.35
Sand Dropseed	0.01	1.19	\$0.10
Kentucky Bluegrass - Ginger	0.05	2.47	\$0.16
Little Bluestem - Pastura	0.70	4.18	\$9.44
Sideoats Grama - Vaughn	1.80	5.91	\$15.08
Strawberry Clover (coated)	0.10	0.68	\$0.63

Smooth Brome - Manchar	0.10	0.33	\$0.33
Sheep Fescue - Covar	0.40	6.24	\$2.44
Tall Wheatgrass - Jose	1.10	1.99	\$3.71
Totals Seed Mix	7.27	40.84	\$58.06

Application

Description	Cost /Acre
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
			\$	\$
Total Mulch Materials Cost/Acre				\$0.00

Application

Description	Cost /Acre
Weed spray, hand, aquatic area, annuals [DMG]	\$119.47
Weed spray, hand, aquatic area, nox. [DMG]	\$183.16
Weed spray, truck, non-aquatic area, nox. [DMG]	\$62.72
Weed spray, truck, non-aquatic areas, ann. [DMG]	\$22.81
Total Mulch Application Cost/Acre	\$388.16

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:	40.06	Cost /Acre:	\$791.04
Estimated Failure Rate:	25%	Cost /Acre*:	\$402.88
*Selected Replanting Work Items:	TILLING,SEEDING		
Initial Job Cost:	\$31,689.06		
Reseeding Job Cost:	\$4,034.84		
Total Job Cost:	\$35,724		
Job Hours:	40.00		

MOTOR GRADER WORK

Task description: Road grading

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 07A State: Colorado Abbreviation: None
Date: 7/13/2023 County: Weld Filename: M049-07A
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 14M Horsepower: 259
Ripper Attachment: Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	<u>\$149.33</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$23.20</u>	<u>25</u>
Ripper Ownership Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Ripper Operating Cost/Hour:	<u>\$0.00</u>	
Operator Cost/Hour:	<u>\$46.87</u>	<u>NA</u>
Total Unit Cost/Hour:	<u>\$219.40</u>	
Total Fleet Cost/Hour:	<u>\$219.40</u>	

MATERIAL QUANTITIES

Total Area to be graded or ripped: 4.60 acres

Source of estimated acreage: Exhibit D - Mining Plan

HOURLY PRODUCTION

Average Grader Speed: 6.25 mph
Selected Application: Road maintenance (3-9.5 mph) - 6.25
Selected Blade Angle: 30 degrees
Effective Blade Length: 12.10 feet
Width of blade overlap per pass: 2.00 feet
Net grading or ripping width per pass: 10.10 feet
Unadjusted Hourly Unit Production: 7.6515 acres/hour

Job Condition Correction Factors

Site Altitude: 4600 feet

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

Adjusted Hourly Unit Production: 6.8864 acres/Hour
Adjusted Hourly Fleet Production: 6.8864 acres/Hour

JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: 2.67 Hours

Unit cost: \$31.86 per acre Total job cost: \$586

BULLDOZER WORKTask description: **Repair and grade embankment failure**Site: **Western Sugar Reclamation
Land Development Project**Permit Action: 2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**Task #: 08A
Date: 7/19/2023
User: RDZState: Colorado
County: WeldAbbreviation: None
Filename: M049-08AAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	<u>\$241.38</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$143.92</u>	<u>100</u>
Ripper own. Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Ripper op. Cost/Hour:	<u>\$0.00</u>	<u>0</u>
Operator Cost/Hour:	<u>\$40.04</u>	<u>NA</u>
Total unit Cost/Hour:	<u>\$425.34</u>	
Total Fleet Cost/Hour:	<u>\$425.34</u>	

MATERIAL QUANTITIESInitial Volume: 13,000
Swell factor: 1.000
Loose volume: **13,000 LCY**Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hrMaterials consistency description: Loose stockpile 1.2Average push gradient: 10 %
Average site altitude: 4,658 feetMaterial weight: 3,400 lbs/LCYWeight description: Sand and gravel - Wet**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	<u>1.000</u>	<u>(EXCL.)</u>
Material consistency:	<u>1.200</u>	<u>(CAT HB)</u>
Dozing method:	<u>1.000</u>	<u>(GEN.)</u>

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	0.786	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.676	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4234

Adjusted unit production: 360.99 LCY/hr

Adjusted fleet production: **360.99** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: \$1.178/LCY

Total job time: **36.01** Hours

Total job cost: **\$15,317**

TRUCK/LOADER TEAM WORKTask description: **Excavate for weir construction**Site: **Western Sugar Reclamation
Land Development Project**

Permit Action:

2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**Task #: 08BState: ColoradoAbbreviation: NoneDate: 7/19/2023County: WeldFilename: M049-08BUser: RDZAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 5-6 cy, 4x2
-Loader:	CAT 950H
Support Equipment -Load Area:	NA
-Dump Area:	Cat D8T - 8SU
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	90	NA	NA
Ownership cost/hour:	\$12.22	\$49.32	NA	\$241.38	NA	NA
Operating cost/hour:	\$31.22	\$39.80	NA	\$129.53	NA	NA
%Utilization-ripper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	NA	\$0.00	NA	NA
Ripper op. cost/hour:	NA	\$0.00	NA	\$0.00	NA	NA
Operator cost/hour:	\$24.82	\$35.97	NA	\$40.04	NA	NA
Unit Subtotals:	\$68.26	\$125.09	NA	\$410.94	NA	NA
Number of Units:	2	1	0	1	0	0
Group Subtotals:	Work: \$261.61		Support: \$410.94		Maint: \$0.00	

Total work team cost/hour: **\$672.55****MATERIAL QUANTITIES**Initial volume: 7,510

CCY

Swell factor: 1.124Loose volume: **8,438**

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: 2,900

Pounds/LCY

Description: Sand and gravel - DryRated Payload: 16,600

Pounds

Payload Capacity: 5.72 LCY

Truck Bed (volume) Basis:

Struck Volume: 5.00 LCY
 Heaped Volume: 6.00 LCY
 Average Volume: 5.50 LCY
 Adjusted Volume: 5.72 LCY

Final Truck Volume Based on Number of Loader Passes: 3.98 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	<u>4.300</u>	LCY (heaped)
Bucket Fill Factor:	<u>0.925</u>	Loose material - 1/8" to 3/8" (90 - 95%) 0.925
Adjusted Capacity:	<u>3.978</u>	LCY

Job Condition Corrections:

Site Altitude (ft.): 4658 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: 1 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 1/8" to 3/4" diameter -0.02	-0.020	(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:	Nominal target 0.00	0.000	(Cat HB)
Net Cycle Time Adjustment:		-0.100	minutes
Adjusted Loader Cycle Time:		0.400	minutes
Net Load Time per Truck:		0.100	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>0.100</u>	Minutes	Adjusted for site altitude:	<u>0.100</u>	Minutes
Truck Maneuver and Dump Time:	<u>0.80</u>	Minutes	Adjusted for site altitude:	<u>0.800</u>	Minutes

Truck Travel (Haul & Return) Time:
penetration 4.0

Road Condition: Rutted dirt, little maintenance, no water, 1" tire

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	500.00	0.00	4.00	4.00	2665	0.285

Haul Time: **0.285** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	500.00	0.00	4.00	4.00	2849	0.205

Return Time: **0.205** minutesTotal Truck Cycle Time: **1.890** minutes

Loading Tool unit

Production 397.75 LCY/Hour Adjusted for job efficiency: 330.13 LCY/HourTruck Unit Production 126.27 LCY/Hour Adjusted for job efficiency: 104.80 LCY/HourOptimal No. of Trucks: 3 Truck(s) Selected Number of Trucks: 2 Truck(s)Adjusted hourly truck team production: 209.61 LCY/HourAdjusted single truck/loader team production: 209.61 LCY/HourAdjusted multiple truck/loader team production: **209.61** LCY/Hour**JOB TIME AND COST**Fleet size: 1 Team(s) Total job time: **40.26** HoursUnit cost: \$3.209 /LCY Total job cost: **\$27,075**

TRUCK/LOADER TEAM WORKTask description: Place bedding material for riprap on weirSite: Western Sugar Reclamation
Land Development ProjectPermit Action: 2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**

Task #: 08C State: Colorado Abbreviation: None
 Date: 7/19/2023 County: Weld Filename: M049-08C
 User: RDZ

Agency or organization name: DRMS**HOURLY EQUIPMENT COST**Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 5-6 cy, 4x2
-Loader:	Cat 320D L 9'-6" Stick
Support Equipment -Load Area:	CAT 950H
-Dump Area:	Cat 320D L 9'-6" Stick
Road Maintenance -Motor Grader:	NA
-Water Truck:	NA

Cost Breakdown:**Truck/Loader Team****Support Equipment****Maintenance Equipment**

	Truck	Excavator	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	50	100	50	NA	NA
Ownership cost/hour:	\$12.22	\$70.85	\$49.32	\$70.85	NA	NA
Operating cost/hour:	\$31.22	\$25.01	\$39.80	\$25.01	NA	NA
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	\$0.00	\$0.00	NA	NA
Ripper op. cost/hour:	NA	\$0.00	\$0.00	\$0.00	NA	NA
Operator cost/hour:	\$24.82	\$46.87	\$35.97	\$46.87	NA	NA
Unit Subtotals:	\$68.26	\$142.73	\$125.09	\$142.73	NA	NA
Number of Units:	2	1	1	1	0	0
Group Subtotals:	Work: \$279.25		Support: \$267.82		Maint: \$0.00	

Total work team cost/hour: \$547.07**MATERIAL QUANTITIES**

Initial volume: 2,500 CCY Swell factor: 1.000
 Loose volume: 2,500 LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
 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: 16,600 Pounds

Payload Capacity: 6.92 LCY

Truck Bed (volume) Basis:

Struck Volume: 5.00 LCY
 Heaped Volume: 6.00 LCY
 Average Volume: 5.50 LCY
 Adjusted Volume: 6.00 LCY

Final Truck Volume Based on Number of Loader Passes: 6.01 LCY

Loading Tool Capacity

Bucket Size Class: Medium

Rated Capacity:	<u>1.540</u>	LCY (heaped)
Bucket Fill Factor:	<u>0.975</u>	Loose material - uniform aggregates to 1/8" (95-100%) <u>0.975</u>
Adjusted Capacity:	<u>1.502</u>	LCY

Job Condition Corrections:

Site Altitude (ft.): 4658 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: 4 passes

Excavators and Front Shovels:

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

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): NA minutes

Cycle Time Factors		Factor (min.)	Source
Material:	NA	NA	(Cat HB)
Stockpile:	NA	NA	(Cat HB)
Truck Ownership:	NA	NA	(Cat HB)
Operation:	NA	NA	(Cat HB)
Dump Target:	NA	NA	(Cat HB)
Net Cycle Time Adjustment:		NA	minutes
Adjusted Loader Cycle Time:		0.167	minutes
Net Load Time per Truck:		0.601	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>0.601</u>	Minutes	Adjusted for site altitude:	<u>0.601</u>	Minutes
Truck Maneuver and Dump Time:	<u>0.80</u>	Minutes	Adjusted for site altitude:	<u>0.800</u>	Minutes

Truck Travel (Haul & Return) Time:
maintained 2.0

Road Condition: Hard, smooth, stabilized, surfaced, watered,

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	2.00	2.00	2868	0.445

Haul Time: **0.445** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	2.00	2.00	2905	0.374

Return Time: **0.374** minutesTotal Truck Cycle Time: **2.720** minutes

Loading Tool unit

Production 327.30 LCY/Hour Adjusted for job efficiency: 271.66 LCY/HourTruck Unit Production 132.49 LCY/Hour Adjusted for job efficiency: 109.96 LCY/HourOptimal No. of Trucks: 2 Truck(s) Selected Number of Trucks: 2 Truck(s)Adjusted hourly truck team production: 219.93 LCY/HourAdjusted single truck/loader team production: 219.93 LCY/HourAdjusted multiple truck/loader team production: **219.93** LCY/Hour**JOB TIME AND COST**Fleet size: 1 Team(s) Total job time: **11.37** HoursUnit cost: \$2.488 /LCY Total job cost: **\$6,219**

HYDRAULIC EXCAVATOR WORK

Task description: Place riprap on weir

Site: Western Sugar Reclamation
Land Development Project

Permit Action: 2023 Update

Permit/Job#: M2010049

PROJECT IDENTIFICATION

Task #: 08D
Date: 7/19/2023
User: RDZ

State: Colorado
County: Weld

Abbreviation: None
Filename: M049-08D

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat 324D L 9'-8" Stick
Attachment 1: ROPS Cab

Horsepower: 194
Weight (MT): 24.85
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	<u>\$99.66</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$65.77</u>	<u>100</u>
Operator Cost/Hour:	<u>\$46.87</u>	<u>NA</u>
Total Unit Cost/Hour:	<u>\$212.30</u>	
Total Fleet Cost/Hour:	<u>\$212.30</u>	

MATERIAL QUANTITIES

Initial volume: 6,875 CCY Swell factor: 1.000
Loose volume: 6,875 LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

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

Basic Job Condition Description: EXCELLENT
Secondary Job Condition within Basic Description: EXCELLENT
Cycle Time Value: 0.187 minutes

Load Bucket Capacity

Rated Capacity: 2.98 LCY (heaped)
Bucket Fill Factor: 0.675 Rock - Well blasted (60% - 75%) 0.675
Adjusted Capacity: 2.01 LCY

Bucket Size Class: Large

Job Condition Correction Factors

Site Altitude: 4658 feet

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

Unadjusted Hourly Unit Production: 645.40 LCY/Hour
Adjusted Hourly Unit Production: 535.68 LCY/Hour
Adjusted Hourly Fleet Production: 535.68 LCY/Hour

JOB TIME AND COST

Fleet size: 1 Excavator Total job time: 12.83 Hours

Unit cost: \$0.396 /LCY Total job cost: \$2,725

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: Equipment Mobilization/DemobilizationSite: Western Sugar Reclamation
Land Development ProjectPermit Action: 2023 UpdatePermit/Job#: M2010049**PROJECT IDENTIFICATION**

Task #: 10A State: Colorado Abbreviation: None
 Date: 8/15/2023 County: Weld Filename: M049-10A
 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:	\$20.26	\$36.04	\$47.05
Operating Cost/Hour:	\$39.51	\$76.08	\$82.85
Operator Cost/Hour:	\$22.52	\$22.52	\$22.52
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$82.29	\$158.17	\$175.95

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
Centrifugal pump - 200M, 10 in.	1.95	\$16.59	\$82.29	3	\$296.64	\$246.87	\$250.00
Cat D9T - 9SU	65.36	\$259.02	\$175.95	2	\$869.94	\$351.90	\$500.00
Cat 627G	41.80	\$230.18	\$158.17	1	\$388.35	\$158.17	\$250.00
CAT 14M	23.57	\$149.33	\$82.29	1	\$231.62	\$82.29	\$250.00
CAT 966H high lift	25.80	\$65.69	\$82.29	1	\$147.98	\$82.29	\$250.00
CAT 815F	22.88	\$147.57	\$82.29	2	\$459.72	\$164.58	\$500.00
Drill/Broadcast Seeder with Tractor	25.00	\$6.73	\$82.29	1	\$89.02	\$82.29	\$250.00
Cat 324D L 9'-8" Stick	27.33	\$99.66	\$158.17	1	\$257.83	\$158.17	\$250.00

Subtotals: **\$2,741.10** **\$1,326.56** **\$2,500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Water Tanker, 2,500 Gal.	\$34.27	1	\$34.27	\$34.27

Generic 12-18 cy, 6x4	\$115.97	4	\$463.88	\$463.88
Subtotals:			\$498.15	\$498.15

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	<u>GREELEY</u>	
Total one-way travel distance:	<u>5.00</u>	miles
Average Travel Speed:	<u>35.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$14,385.49</u>
-------------------------------------	--------------------

 ** two round trips with haul rig:

Total Roadable Mob/Demob Cost **	<u>\$142.33</u>
----------------------------------	-----------------

 ** one round trip, no haul rig:

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	<u>0.14</u>	<u>0.14</u>
Return Time (Hours):	<u>0.14</u>	<u>0.14</u>
Loading Time (Hours):	<u>0.75</u>	<u>NA</u>
Unloading Time (Hours):	<u>0.75</u>	<u>NA</u>
Subtotals:	<u>1.79</u>	<u>0.29</u>

JOB TIME AND COST

Total job time:	<u>3.57</u>	Hours
-----------------	-------------	-------

Total job cost:	<u>\$14,528</u>
-----------------	-----------------