

Department of Natural Resources

1313 Sherman Street, Room 215 Denver, CO 80203

April 28, 2015

Mr. Jason Burkey Oldcastle SW Group, Inc. dba United Companies of Mesa County 2273 River Road Grand Junction, CO 81502

Re: Cerise Mine, Permit No. M-2010-058, Technical Revision Approval, Revision No. TR-1

Dear Mr. Burkey:

On April 28, 2015 the Division of Reclamation, Mining and Safety approved the Technical Revision application submitted to the Division on March 19, 2015, addressing the following:

To reflect reduced ongoing disturbance and changes to facility layouts.

The terms of the Technical Revision No. 1 approved by the Division are hereby incorporated into Permit No. M-2010-058. All other conditions and requirements of Permit No. M-2010-058 remain in full force and effect.

The estimated liability amount of \$645,511.90 is less than the \$1,107,856.00 performance bond currently held. If you have not already done so, please revise the corporate surety with Fidelity and Deposit Company of Maryland.

If you have any questions, please contact me.

Sincerely,

Stephanie J. Mitchell

**Environmental Protection Specialist** 

CC: Russ Means, DRMS
Barbara Coria, DRMS
Ben Langenfeld, Greg Lewicki and Associates, PLLC

Enclosure: TR01 Bond Calculation



### **COST SUMMARY WORK**

Cerise I	Mine		Permit Action:	Technical Revision 01	Permit/J	ob#: <u>M2010058</u>
PROJEC	T IDENTIFICA	TION				
Task #:		State:	Colorado	A	abbreviation:	None
		State: County:	Colorado Garfield	A	Abbreviation: Filename:	None M058-00

### TASK LIST (DIRECT COSTS)

Task		Form	Fleet	Task	
rusk	Description	Used	Size	Hours	Cost
01	Placement of reclamation fill	DOZER	2	448.71	\$227,707.00
02	Topsoil application	DOZER	2	29.65	\$15,048.00
03	Mobilize reclamation crew/equipment	MOBILIZE	] 1	2.88	\$4,788.00
04	Native seed mix	REVEGE	] 1	16.00	\$29,089.00
05	Placement of reclamation fill	SCRAPER1	1	489.48	\$287,562.00
06	Topsoil application	SCRAPER1	1	38.53	\$22,635.00
		\$586,829			

### **INDIRECT COSTS**

#### **OVERHEAD AND PROFIT:**

Liability insurance:0.00%Total =\$0.00Performance bond:0.00%Total =\$0.00Job superintendent:0.00 hrsTotal =\$0.00

Profit: 10.00% Total = \$58,682.90

TOTAL O & P = \$58,682.90 CONTRACT AMOUNT (direct + O & P) = \$645,511.90

#### LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs): 0.00 Total = 0.00Engineering work and/or contract/bid preparation: 0.00% Total = 0.00Reclamation management and/or administration: 0.00% \$0.00

CONTINGENCY: 0.00 Total = \$0.00

TOTAL INDIRECT COST = \$58,682.90

TOTAL BOND AMOUNT (direct + indirect) = \$645,511.90

# **COST SUMMARY WORK**

ask description:	Total costs direct					
Site: Cerise M	ine		Permit Action:	Technical Revision 01	Permit/Job#:	M2010058
PROJECT	<u> IDENTIFICATI</u>	ION				
Task #:	00	State:	Colorado		Abbreviation:	None
Date:	4/28/2015	County:	Garfield		Filename:	M058-00
User:	SJM	-			au	

# TASK LIST (DIRECT COSTS)

Agency or organization name: \_\_DRMS

Task	Description	Form Used	Fleet Size	Task Hours	Cost	
01	Placement of reclamation fill	DOZER	2	448.71	\$227,707.00	
02	Topsoil application	DOZER	2	29.65	\$15,048.00	
03	Mobilize reclamation crew/equipment	MOBILIZE	1	2.88	\$4,788.00	
04	Native seed mix	REVEGE	1	16.00	\$29,089.00	
05	Placement of reclamation fill	SCRAPER1	1	489.48	\$287,562.00	
06	Topsoil application	SCRAPER1	1	38.53	\$22,635.00	
	SUBTOTALS: 1025.25					

# **BULLDOZER WORK**

Task description:		Placeme	ent of recl	amation fil	l			
Cerise Mine			Permit Action: _T		Technical Revision 01	Permit/Job#:	M2010058	
PROJECT IDE	ENTIFIC	CATION	<u> </u>					
Task #: 01			State:	Colorado		Abbreviation:	None	
Date: 4/28	8/2015		County:	Garfield		Filename:	M058-01	
User: SJN	Л					-		
Agency	or organi	zation nar	ne: DR	MS				
HOURLY EQ	UIPMEN	NT COS	Γ					
Basic Machine		D9T - 9U			_			
Horsepower				1-57				
Blade Type		ersal						
Attachment Shift Basis								
Data Source	- A							
		J)			_			
Cost Breakdown:					V)			
0 1: 0	/T T		<b></b>		<u>Utilization %</u>			
Ownership Cost			\$72.57		NA 100			
Operating Cost			\$143.16		100			
Ripper op. Cost	_		\$0.00		0			
Operator Cost	Hour:		\$38.01		NA			
T-4-1 4 O4/11	our:	\$253.73						
Total unit Cost/H	oui.	\$433.13						
Total Fleet Cost/I	Hour:	\$507.47 TIES						
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat	375,00 1.000 375,00 275,00 375,00	\$507.47  TIES  96  96 LCY  ne:			ion, Mining & Safety			
MATERIAL Q Initial Volume: Swell factor: Loose volume:	375,00 1.000 375,00 275,00 375,00	\$507.47  TIES  96  96 LCY  ne:	Division (		ion, Mining & Safety			
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat	375,0° 1.000 375,0° ted volumeted swell :	\$507.47  TIES  96  96 LCY  ne: factor:			ion, Mining & Safety			
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat HOURLY PRO	DUANTI  375,0  1.000  375,0  ted volumed swell stance:	\$507.47  TIES  96  96 LCY  ne: factor:  ION			ion, Mining & Safety			
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat	DUANTI  375,0  1.000  375,0  ted volumed swell stance:	\$507.47  TIES  96  96 LCY  ne: factor:  ION  13	Cat Hand	book	ion, Mining & Safety			
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat HOURLY PRO	375,0° 1.000 375,0° ted volumed swell:  ODUCT	\$507.47  TIES  96  96 LCY  ne: factor:  ION  13	Cat Hand 35 feet 044.4 LC	book				
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat HOURLY PRO Average push dis Unadjusted hourl	375,00 1.000 375,00 ted volumeted swell:  ODUCT: stance: y product ency described:	\$507.47  TIES  96  96 LCY  ne: factor:  ION  13	Cat Hand 35 feet 044.4 LC Loose s	book Y/hr				
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat Source of estimat Mourly Pro Average push dis Unadjusted hourl Materials consisted Average push gra	375,00 1.000 375,00 ted volumeted swell:  ODUCT: stance: y product ency described:	\$507.47  TIES  96  96 LCY  ne: factor:  ION  tion:1;  cription:	Cat Hand 35 feet 044.4 LC Loose s	book Y/hr				
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat Source of estimat HOURLY PRO Average push dis Unadjusted hourl Materials consiste Average push gra Average site altit	Hour:  375,0  1.000  375,0  ted volumeted swell:  tance: y product ency description	\$507.47  TIES  96  96 LCY  10	Cat Hand 35 feet 044.4 LC Loose s	Y/hr stockpile 1,2				
MATERIAL Q Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat HOURLY PRO Average push dis Unadjusted hourl Materials consiste Average push gra Average site altit Material weight: Weight description	DUANTI  375,0  1.000  375,0  ted volumed swell:  tance: y product ency description: ude:  on:	\$507.47  TIES  96  96 LCY  96: factor:  ION  13  tion: 10 % 6,300 fee  2,700 lb: Earth - V  Factor	Cat Hand 35 feet 044.4 LC Loose s et	Y/hr stockpile 1,2	Source			
MATERIAL O Initial Volume: Swell factor: Loose volume: Source of estimat Source of estimat HOURLY PRO Average push dis Unadjusted hourl Materials consiste Average push gra Average site altit Material weight: Weight description Job Condition Co	DUANTI  375,0  1.000  375,0  ted volumed swell:  tance: y product ency description: on: orrection: Operator S	\$507.47  TIES  96  96 LCY  10	Cat Hand 35 feet 044.4 LC Loose s et  S/LCY  Wet excave	Y/hr stockpile 1.2	Source (AVG.)			
MATERIAL O Initial Volume: Swell factor: Loose volume: Source of estimate Source of estimate HOURLY PRO Average push dis Unadjusted hourl Materials consiste Average push gra Average site altite Material weight: Weight description O Materia	DUANTI  375,0  1.000  375,0  ted volumed swell:  brance: by product  ency description:  correction:  perator S  consister  consister	\$507.47  TIES  96  96 LCY  10	Cat Hand  35 feet  044.4 LC  Loose s  et  Vet excave  0.	Y/hr stockpile 1.2 ated 750 200	Source (AVG.) (CAT HB)			
MATERIAL O Initial Volume: Swell factor: Loose volume: Source of estimate Source of estimate HOURLY PRO Average push dis Unadjusted hourl Materials consiste Average push gra Average site altite Material weight: Weight description O Materia	DUANTI  375,0  1.000  375,0  ted volumed swell:  tance: y product ency description: on: orrection: Operator S	\$507.47  TIES  96  96 LCY  10	Cat Hand  35 feet 044.4 LC  Loose s  et  Vet excave  0. 1.	Y/hr stockpile 1.2	Source (AVG.)			

Spoil pile:	0.800	(FND-RF)
Push gradient:	0.786	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.852	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4002

Adjusted unit production: 41
Adjusted fleet production: 83

417.97 LCY/hr

835.94 LCY/hr

# **JOB TIME AND COST**

Fleet size: 2 Dozer(s)

Unit cost: \$0.607/LCY

Total job time: 448.71 Hours

Total job cost: \$227,707

Job efficiency:

0.830

(1 SHIFT/DAY)

### **BULLDOZER WORK**

Task description: Topsoil application Site: Cerise Mine Permit Action: Technical Revision 01 Permit/Job#: M2010058 PROJECT IDENTIFICATION Task #: 02 State: Colorado Abbreviation: None Date: 4/28/2015 County: Garfield Filename: M058-02 User: **SJM** Agency or organization name: **DRMS HOURLY EQUIPMENT COST** Basic Machine: Cat D9T - 9U Horsepower: 405 Blade Type: Universal Attachment: NA Shift Basis: 1 per day Data Source: (CRG) Cost Breakdown: Utilization % Ownership Cost/Hour: \$72.57 NA Operating Cost/Hour: \$143.16 100 Ripper op. Cost/Hour: 0 \$0.00 Operator Cost/Hour: \$38.01 NA Total unit Cost/Hour: \$253.73 Total Fleet Cost/Hour: \$507.47 **MATERIAL QUANTITIES** Initial Volume: 29,525 Swell factor: 1.000 Loose volume: 29,525 LCY Source of estimated volume: Division of Reclamation, Mining & Safety Source of estimated swell factor: Cat Handbook **HOURLY PRODUCTION** Average push distance: 200 feet Unadjusted hourly production: 737.1 LCY/hr Materials consistency description: Loose stockpile 1.2 Average push gradient: 10 % Average site altitude: 6,300 feet Material weight: 1,600 lbs/LCY Weight description: Top Soil Job Condition Correction Factor Source Operator Skill: 0.750 (AVG.) Material consistency: 1.200 (CAT HB) Dozing method: 1.000 (GEN.) Visibility: 1.000 (AVG.)

Spoil pile:	0.800	(FND-RF)
Push gradient:	0.786	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction:

0.6754

Adjusted unit production:

497.84 LCY/hr

Adjusted fleet production:

995.68 LCY/hr

# **JOB TIME AND COST**

Fleet size:

2 Dozer(s)

Unit cost:

\$0.510/LCY

Total job time:

**29.65** Hours

Total job cost:

\$15,048

# **EQUIPMENT MOBILIZATION/DEMOBILIZATION**

Task description:

Mobilize reclamation crew/equipment

Site: Cerise Mine

Permit Action: Technical Revision 01

Permit/Job#: M2010058

PROJECT IDENTIFICATION

Task #:

03

State:

**DRMS** 

County:

Colorado

Abbreviation:

None

Date: User:

4/28/2015 SJM

Garfield

Filename:

M058-03

Agency or organization name:

**EQUIPMENT TRANSPORT RIG COST** 

Shift basis:

1 per day

Cost Data Source:

**CRG** Data

Truck Tractor Description:

GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED,

400 HP (2ND HALF, 2006)

Truck Trailer Description:

GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT TRAILER

(25T, 50T, AND 100T)

#### Cost Breakdown:

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	\$16.63	\$18.37	\$22.33
Operating Cost/Hour:	\$44.38	\$46.13	\$50.07
Operator Cost/Hour:	\$27.66	\$27.66	\$27.66
Helper Cost/Hour:	\$0.00	\$25.39	\$25.39
Total Unit Cost/Hour:	\$88.67	\$117.55	\$125.45

#### **NON ROADABLE EQUIPMENT:**

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat 627G w/push- pull	42.04	\$57.56	\$117.55	2	\$350.22	\$235.10	\$500.00
Cat D9R - 9U (2005)	61.26	\$49.19	\$125.45	2	\$349.27	\$250.90	\$500.00
Drill/Broadcast Seeder with Tractor	25.00	\$39.59	\$88.67	1	\$128.26	\$88.67	\$250.00

Subtotals: \$827.75 \$574.67 \$1,250.00

#### **ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 1 T. Crew	\$20.91	1	\$20.91	\$20.91

Subtotals:

\$20.91

\$20.91

# **EQUIPMENT HAUL DISTANCE and Time**

Nearest Major City or Town within project area region: GLENWOOD SPRINGS

Total one-way travel distance: 10.00 miles

Average Travel Speed: 45.00 mph

Total Non-Roadable Mob/Demob Cost \*

'\* two round trips with haul rig:

Total Roadable Mob/Demob Cost \*\*

\*\* one round trip, no haul rig:

\$4,778.80

\$9.29

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.22	0.22
Return Time (Hours):	0.22	0.22
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	1.44	0.44

# **JOB TIME AND COST**

Total job cost: 2.89 Hours

Total job cost: \$4,788

# **REVEGETATION WORK**

Task description:

Native seed mix

Site: Cerise Mine

Permit Action: Technical Revision 01

Permit/Job#: M2010058

# **PROJECT IDENTIFICATION**

Task #: Date: 04 4/28/2015

State: County: Colorado

Garfield

Abbreviation:

Filename:

None

M058-04

User: SJM

Agency or organization name: DRMS

# **FERTILIZING**

#### Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
0-20-20, 4-8-12, 10-10-10	40.00	pound	\$0.21	\$8.44
		:	Total Fertilizer Materials	
			Cost/Acre	\$8.44

# Application

Description		Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)		\$52.71
	Total Fertilizer Application Cost/Acre	\$52.71

### **TILLING**

Description  Disa harmoning (" does (MEANS 22.01.12.22.6100)		Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)		\$98.01
	Total Tilling Cost/Acre	\$98.01

# **SEEDING**

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Bluebunch Wheatgrass - Secar	3.00	9.64	\$20.52
Blue Grama - Native	4.50	73.45	\$46.58
Indian Ricegrass - Native	3.00	9.71	\$20.22
Slender Wheatgrass - Native	7.50	27.38	\$16.88
Western Wheatgrass - Native	7.50	18.94	\$22.80
Needlegrass, Green - Lodorm	4.50	18.70	\$24.26
Totals Seed Mix	30.00	157.82	\$151.25

**Application** 

Description	Cost /Acre

Drill seeding (DRMS Cost Data)		\$88.20
	Total Seed Application Cost/Acre	\$88.20

### **MULCHING and MISCELLANEOUS**

#### Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	\$265.00	\$530.00
Total Mulch Materials Cost/Acre				\$530.00

**Application** 

Description		Cost /Acre
Crimping, with tractor {DMG survey data}		\$65.89
	Total Mulch Application Cost/Acre	\$65.89

### **NURSERY STOCK PLANTING**

Common Name	No / Acre	Type and Size	Planting Cost	Fertilizer Pellet Cost	Cost /Acre
					\$
		Tota	lls Nursery Stoo	ek Cost / Acre	\$0.00

### **JOB TIME AND COST**

No. of Acres: 23.4

Cost /Acre: \$994.50

Estimated Failure Rate: 25%

Cost /Acre\*:

\$994.50

\*Selected Replanting Work Items: FERTILIZING, TILLING, SEEDING, MU

**LCHING** 

Initial Job Cost: \$23,271.30

Reseeding Job Cost: \$5,817.83

Total Job Cost: \$29,089 Job Hours: 16.00

# **SCRAPER TEAM WORK**

				-				
Task description:	Placement	of recla	mation fi	11				
Site: Cerise Mine		Permi	t Action:	Technical Revi	sion 01 Pe	rmit/Job#:	M2010	058
PROJECT IDEN	<u> </u>							
Task #: 05 Date: 4/28/20 User: SJM			Colorado Garfield			eviation: _ ilename: _	None M058-0	5
Agency or o	organization name:	DRM	IS	10				
HOURLY EQUIP	PMENT			COSTS	hift basis: 1 per	<u>day</u>		
			Equipm	ent Description				
		Scraper:		7G w/push-pull				
		-Dozer:	NA					
Suppo	ort Equipment -Loa		NA					
Poad Ma	intenance –Motor	p Area:	NA NA					
Road Ma		Truck:	NA					
Cost Breakdown:	Scraper Wo	rk Team		Support Equi	pment	Main	itenance l	Equipment
	Scraper	Do	zer	Load Area	Dump Area	Motor	Grader	Water Truck
%Utilization-machine:	100	N	A	NA	NA	N.	A	NA
Ownership cost/hour:	\$72.62	N	A	NA	NA	N.	A	NA
Operating cost/hour:	\$187.56	N	Α	NA	NA	N.	A	NA
Ripper op. cost/hour:	NA	N	A	NA	NA	N.	A	NA
Operator cost/hour:	\$33.56	N	Α	NA	NA	N.	A	NA

NA

0

Support:

Total work team cost/hour: \$587.48

Unit Subtotals:

Number of Units:

Group Subtotals:

#### **MATERIAL QUANTITIES**

Initial volume: 138,904 CCY Swell factor: 1.000

NA

0

\$587.48

Loose volume: 138,904 LCY

\$293.74

2

Work:

Source of estimated volume: Division of Reclamation, Mining & Safety

Source of estimated swell factor: Cat Handbook

#### **HOURLY PRODUCTION**

### Scraper Bowl (volume) Basis:

NA

0

\$0.00

Material weight:2,700 lbs/LCYStruck Volume:15.70LCYMaterial description:Earth - Wet excavatedHeaped Volume:22.00LCYRated Payload:52,800 poundsAverage Volume:18.85LCYPayload Capacity:19.56 LCYAdjusted Capacity:18.85LCY

NA

0

Maint:

NA

0

\$0.00

Site Altitude: 6300 feet

Cycle Time:

Scraper Loading Time: Maneuver and Spread Time: 0.90 Minutes 0.60 Minutes

Job Condition Correction:

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.820	D.T.A.	

Travel 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	1000.00	-4.00	3.00	-1.00	2938	0.41

Haul Time: 0.41 minutes

0.54 minutes

Return Route:

Seg#	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	4.00	3.00	7.00	2555	0.54

Total Scraper team cycle time:

Adjusted for job conditions:
Selected Number of Scrapers:
2 Scraper(s)
r team (unit) hourly production:
766.31 LCY/Hour

Return Time:

Adjusted single scraper team (unit) hourly production: 766.31 LCY/Hour Adjusted multiple scraper team (fleet) hourly production: 766.31 LCY/Hour

Unadjusted unit production/hour: 923.27 LCY/Hour Optimal Number of Scrapers per push dozer:

**JOB TIME AND COST** 

Fleet size: 1 Team(s) Total job time: 181.26 Hours

Unit cost: \$0.767 /LCY Total job cost: \$106,489

# **SCRAPER TEAM WORK**

Task descrip	tion:	Placement	of recla	mation fil	1				
Site: Cerise M	ine		Permi	t Action:	Technical Revi	sion 01 Pe	rmit/Job#:	M2010	058
PROJECT	IDENTI	FICATION							
Task #: Date: User:	05 4/28/201 SJM			Colorado Garfield			eviation: ilename:	None M058-0	5
Ag HOURLY		ganization name:	DRM	1S	COSTS	Shift basis: 1 per	day		_
				Equipme	ent Description				
		-5	Scraper:		G w/push-pull				
			-Dozer:	NA					
	Equipment -Loa	NA							
	-Dum	NA							
Road Maintenance –Motor Grader: -Water Truck:				NA					
		- w atei	r I ruck:	NA					
Cost Break	down:	Scraper Wo	rk Team		Support Equi	ipment	Mair	ntenance l	Equipment
		Scraper	Do	zer	Load Area	Dump Area		Grader	Water Truck
%Utilization-m	achine:	100	N	Α	NA	NA	N	Δ	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:	\$72.62	NA	NA	NA	NA	NA
Operating cost/hour:	\$187.56	NA	NA	NA	NA	NA
Ripper op. cost/hour:	NA	NA	NA	NA	NA	NA
Operator cost/hour:	\$33.56	NA	NA	NA	NA	NA
Unit Subtotals:	\$293.74	NA	NA	NA	NA	NA
Number of Units:	2	0	0	0	0	0
Group Subtotals:	Work:	\$587.48	Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: \$587.48

# **MATERIAL QUANTITIES**

Initial volume: 375,096 CCY Swell factor: 1.000

Loose volume: 375,096 LCY

Source of estimated volume: Division of Reclamation, Mining & Safety

Source of estimated swell factor: Cat Handbook

# **HOURLY PRODUCTION**

#### Scraper Bowl (volume) Basis:

Material weight:2,700 lbs/LCYStruck Volume:15.70LCYMaterial description:Earth - Wet excavatedHeaped Volume:22.00LCYRated Payload:52,800 poundsAverage Volume:18.85LCYPayload Capacity:19.56 LCYAdjusted Capacity:18.85LCY

Cycle Time:

Scraper Loading Time: Maneuver and Spread Time:

0.90 Minutes 0.60 Minutes

Job Condition Correction:

Site Altitude: 6300 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 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	-4.00	3.00	-1.00	2938	0.41

Haul Time: 0.41 minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res	Total Res	Velocity (fpm)	Travel Time (min)
1	1000.00	4.00	3.00	7.00	2555	0.54

Return Time: 0.54 minutes Total Scraper team cycle time: 2.45 minutes Adjusted for job conditions: 766.31 LCY/Hour Selected Number of Scrapers: 2 Scraper(s) Adjusted single scraper team (unit) hourly production: 766.31 LCY/Hour Adjusted multiple scraper team (fleet) hourly production: 766.31 LCY/Hour

Unadjusted unit production/hour:	923.27	LCY/Hou
Optimal Number of Scrapers per push dozer:		

**JOB TIME AND COST** 

 Fleet size:
 1
 Team(s)
 Total job time:
 489.48
 Hours

 Unit cost:
 \$0.767
 /LCY
 Total job cost:
 \$287,562