



July 22, 2022

Angela Bellantoni
Ranch Land LLC dba Pioneer Sand Co Inc
630 Plaza Drive
Suite 150
Highlands Ranch, CO 80129

**Re: Ranch Land Rock Pit #2 - File No. M-2003-021
Ranch Land LLC dba Pioneer Sand Co Inc
Technical Revision (TR-1)
Future Phases Map**

Dear Angela Bellantoni:

On July 22, 2022 the Division of Reclamation, Mining and Safety concluded its review of the Technical Revision application submitted to the Division on May 25, 2022, addressing the following:

Future Phases Map

The decision reached by the Division is: approve.

The terms of Technical Revision No. 1 approved by the Division are hereby incorporated into Permit No. M-2003-021. All other conditions and requirements of Permit No. M-2003-021 remain in full force and effect.

Bond Held:	\$192,337.00
Change in Liability:	\$0.00
Revised Liability ¹ :	\$192,337.00
Prior Permit Acreage:	930.00
Change in Permit Acreage:	0.00
Prior Affected Acreage:	930.00
Change in Affected Acreage:	0.00
Maximum Allowed Affected Acreage at one time:	60.00

(1) Note: The reclamation cost estimate attached to the January 28, 2022 inspection report did not include details of Task 004 (revege for 40 acres). The complete detailed cost estimate is attached for your records.



Angela Bellantoni

July 22, 2022

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If you have any questions, please contact me by telephone at (303) 866-3567 x 8169, or by email at Tim.cazier@state.co.us.

Sincerely,

A handwritten signature in blue ink, appearing to read "Tim Cazier".

Timothy A. Cazier, P.E.
Environmental Protection Specialist

cc: Angela Bellantoni, Ph.D.

M-GR-04-revised

COST SUMMARY WORK

Task description: Cost Summary Sheet

Site: Ranch Land Rock Pit #2

Permit Action: 2022 Update

Permit/Job#: M2003021

PROJECT IDENTIFICATION

Task #: 000

State: Colorado

Abbreviation: None

Date: 3/30/2022

County: Fremont

Filename: M021-000

User: TC1

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
002	Replace Topsoil	TRUCK1	1	78.72	\$29,984
003	Grade Topsoil	DOZER	1	11.08	\$3,422
004	Reseed Disturbed 40 acre phase	REVEGE	1	100.00	\$59,136
005	Mob/demob equipment	MOBILIZE	1	11.77	\$9,463
104	Reseed 25% of Phase 1 Area	REVEGE	1	6.00	\$3,802
304	Reseed Disturbed Phase 3 Area	REVEGE	1	50.00	\$32,821
A03	Push down highwalls	DOZER	1	12.58	\$3,883
<u>SUBTOTALS:</u>				270.15	\$142,511

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	\$2,879
Performance bond:	1.05	Total =	\$1,496
Job superintendent:	207.07	Total =	\$14,915
Profit:	10.00	Total =	\$14,251
		TOTAL O & P =	\$33,541
		CONTRACT AMOUNT (direct + O & P) =	\$176,052

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	\$0	Total =	\$0
Engineering work and/or contract/bid preparation:	4.25	Total =	\$7,482
Reclamation management and/or administration:	5.00		\$8,803

CONTINGENCY: 0.00 Total = \$0

TOTAL INDIRECT COST = \$49,826

TOTAL BOND AMOUNT (direct + indirect) = \$192,337

TRUCK/LOADER TEAM WORKTask description: **Replace Topsoil**Site: **Ranch Land Rock Pit #2**Permit Action: 2022 UpdatePermit/Job#: M2003021**PROJECT IDENTIFICATION**Task #: 002State: ColoradoAbbreviation: NoneDate: 3/28/2022County: FremontFilename: M021-002User: TC1Agency 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 980H
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	85	NA	NA	NA	NA
Ownership cost/hour:	\$27.72	\$67.72	NA	NA	NA	NA
Operating cost/hour:	\$47.23	\$57.48	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	\$165.90	NA	NA	NA	NA
Number of Units:	2	1	0	0	0	0
Group Subtotals:	Work: \$380.88		Support: \$0.00		Maint: \$0.00	

Total work team cost/hour: **\$380.88****MATERIAL QUANTITIES**Initial volume: 32,267

CCY

Swell factor: 1.215Loose volume: **39,204**

LCY

Source of estimated volume: Calculated from 6/25/2003 - original app. (6" over 40Ac.)Source of estimated swell factor: Cat HandbookMaterial Purchase Cost: \$0.00Total Cost: \$0.00**HOURLY PRODUCTION****Truck Capacity:**Truck Payload (weight) Basis:Material weight: 1,600

Pounds/LCY

Description: Top SoilRated Payload: 50,300

Pounds

Payload Capacity: 31.44

LCY

Truck Bed (volume) Basis:

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

Final Truck Volume Based on Number of Loader Passes: 12.75 LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	0.850	Hard, tough clay (80% - 90%) 0.850
Adjusted Capacity:	6.375	LCY

Job Condition Corrections:

Site Altitude (ft.): 5350 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: 2 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): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high and up 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:		-0.060	minutes
Adjusted Loader Cycle Time:		0.490	minutes
Net Load Time per Truck:		0.590	minutes

Truck Cycle Time:

Truck Exchange Time:	0.50	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Load Time:	0.590	Minutes	Adjusted for site altitude:	0.590	Minutes
Truck Maneuver and Dump Time:	0.90	Minutes	Adjusted for site altitude:	0.900	Minutes

Truck Travel (Haul & Return) Time:

Road Condition: Rutted dirt, little maintenance, no water, 2" tire

penetration 5.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	500.00	1.00	5.00	6.00	1855	0.349

Haul Time: 0.349 minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	500.00	-1.00	5.00	4.00	2849	0.211

Return Time: 0.211 minutes

Total Truck Cycle Time: 2.550 minutes

Loading Tool unit

Production 701.83 LCY/Hour

Adjusted for job efficiency: 582.52 LCY/Hour

Truck Unit Production

300.00 LCY/Hour

Adjusted for job efficiency: 249.00 LCY/Hour

Optimal No. of Trucks: 2 Truck(s)

Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 498.00 LCY/Hour

Adjusted single truck/loader team production: 498.00 LCY/Hour

Adjusted multiple truck/loader team production: 498.00 LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s)

Total job time: 78.72 Hours

Unit cost: \$0.765 /LCY

Total job cost: \$29,984

BULLDOZER WORKTask description: **Grade Topsoil**Site: **Ranch Land Rock Pit #2**Permit Action: **2022 Update**Permit/Job#: **M2003021****PROJECT IDENTIFICATION**Task #: **003**State: **Colorado**Abbreviation: **None**Date: **3/28/2022**County: **Fremont**Filename: **Xxx**User: **TC1**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:	\$126.01	NA
Operating Cost/Hour:	\$141.41	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:	\$308.72	
Total Fleet Cost/Hour:	\$308.72	

MATERIAL QUANTITIESInitial Volume: **8,000**Swell factor: **1.000**Loose volume: **8,000 LCY**Source of estimated volume: **Calculation - original application**Source of estimated swell factor: **Cat Handbook****HOURLY PRODUCTION**Average push distance: **200 feet**Unadjusted hourly
production: **700.0 LCY/hr**Materials consistency description: **Loose stockpile 1.2**Average push
gradient: **0 %**Average site altitude: **5,350 feet**Material weight: **1,600 lbs/LCY**Weight description: **Top Soil**

Job Condition Correction Factor

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.200	(SLOT)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 1.0312

Adjusted unit
production: 721.84 LCY/hr
Adjusted fleet
production: **721.84** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: \$0.428/LCY

Total job time: **11.08** Hours
Total job cost: **\$3,422**

REVEGETATION WORKTask description: Reseed Disturbed 40 acre phaseSite: Ranch Land Rock Pit #2Permit Action: 2022 UpdatePermit/Job#: M2003021PROJECT IDENTIFICATIONTask #: 004State: ColoradoAbbreviation: NoneDate: 3/28/2022County: FremontFilename: YyyUser: TC1Agency or organization name: DRMSFERTILIZING**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
Chisel plowing {DMG}	\$96.50
Total Tilling Cost/Acre	\$96.50

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Hachita	0.60	9.79	\$9.59
Indian Ricegrass - Nespar	1.25	4.05	\$11.09
Little Bluestem - Camper	1.00	5.97	\$12.58
Sideoats Grama - Butte	2.25	7.39	\$20.25
Thickspike Wheatgrass - Critana	1.10	3.89	\$7.56
Needle and Thread	1.50	3.96	\$62.78
Rose, Wood's	0.50	0.00	\$10.25
Saltbush, Four Wing	0.50	0.69	\$6.25
Sumac, Skunkbrush	1.00	0.47	\$21.00
Totals Seed Mix	9.70	36.20	\$161.35

Application

Description	Cost /Acre
Drill seeding (MEANS 32 92 19.13 0020)	\$440.00
Total Seed Application Cost/Acre	\$440.00

MULCHING and MISCELLANEOUS**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Straw, delivered {MEANS 31 25 14.16 1200}	1.00	TON	\$307.02	\$307.02
Total Mulch Materials Cost/Acre				\$307.02

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$71.57
Power mulcher (MEANS 32 91 13.16 0350)	\$106.29
Total Mulch Application Cost/Acre	\$177.86

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	Cost /Acre:	\$1,182.73
Estimated Failure Rate:	25%	Cost /Acre*:	\$1,182.73
*Selected Replanting Work Items:	TILLING,SEEDING,MULCHING		
Initial Job Cost:	\$47,309.20		
Reseeding Job Cost:	\$11,827.30		
Total Job Cost:	\$59,136		
Job Hours:	100.00		

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: Mob/demob equipmentSite: Ranch Land Rock Pit #2Permit Action: 2022 UpdatePermit/Job#: M2003021**PROJECT IDENTIFICATION**Task #: 005State: ColoradoAbbreviation: NoneDate: 3/28/2022County: FremontFilename: MmmUser: TC1Agency or organization name: DRMS**EQUIPMENT TRANSPORT RIG COST**Shift basis: 1 per dayCost Data Source: CRG DataTruck 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 D9T - 9SU	60.01	\$126.01	\$147.95	1	\$273.96	\$147.95	\$250.00
CAT 980H	33.12	\$67.72	\$132.49	1	\$200.21	\$132.49	\$250.00
Drill/Broadcast Seeder with Tractor	25.00	\$7.98	\$68.37	1	\$76.35	\$68.37	\$250.00
Power Mulcher (Bowie LD-90)	6.00	\$14.98	\$68.37	1	\$83.35	\$68.37	\$250.00
Subtotals:					\$633.87	\$417.18	\$1,000.00

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Generic 12-18 cy, 6x4	\$106.86	2	\$213.72	\$213.72
Subtotals:			\$213.72	\$213.72

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	<u>CAÑON CITY</u>	
Total one-way travel distance:	<u>20.00</u>	miles
Average Travel Speed:	<u>45.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$9,272.97</u>
** two round trips with haul rig:	
Total Roadable Mob/Demob Cost **	<u>\$189.97</u>
** one round trip, no haul rig:	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.44	0.44
Return Time (Hours):	0.44	0.44
Loading Time (Hours):	2.50	NA
Unloading Time (Hours):	2.50	NA
Subtotals:	5.89	0.89

JOB TIME AND COST

Total job time:	<u>11.78</u>	Hours
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Total job cost:	<u>\$9,463</u>
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REVEGETATION WORKTask description: Reseed 25% of Phase 1 AreaSite: Ranch Land Rock Pit #2Permit Action: 2022 UpdatePermit/Job#: M2003021**PROJECT IDENTIFICATION**Task #: 104State: ColoradoAbbreviation: NoneDate: 3/30/2022County: FremontFilename: M021-104User: TC1Agency 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
	\$
Total Tilling Cost/Acre	\$0.00

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Hachita	0.60	9.79	\$9.59
Indian Ricegrass - Nespar	1.25	4.05	\$11.09
Little Bluestem - Camper	1.00	5.97	\$12.58
Sideoats Grama - Butte	2.25	7.39	\$20.25
Thickspike Wheatgrass - Critana	1.10	3.89	\$7.56
Needle and Thread	1.50	3.96	\$62.78
Rose, Wood's	0.50	0.00	\$10.25
Saltbush, Four Wing	0.50	0.69	\$6.25
Sumac, Skunkbrush	1.00	0.47	\$21.00
Totals Seed Mix	9.70	36.20	\$161.35

Application

Description	Cost /Acre
Drill seeding (MEANS 32 92 19.13 0020)	\$440.00
Total Seed Application Cost/Acre	\$440.00

MULCHING and MISCELLANEOUS**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Straw, delivered {MEANS 31 25 14.16 1200}	1.00	TON	\$307.02	\$307.02
Total Mulch Materials Cost/Acre				\$307.02

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$71.57
Power mulcher (MEANS 32 91 13.16 0350)	\$106.29
Total Mulch Application Cost/Acre	\$177.86

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: 2.8 Cost /Acre: \$1,086.23
 Estimated Failure Rate: 25% Cost /Acre*: \$1,086.23
 *Selected Replanting Work Items: SEEDING,MULCHING

Initial Job Cost: **\$3,041.44**
 Reseeding Job Cost: **\$760.36**
 Total Job Cost: **\$3,802**
 Job Hours: **6.00**

REVEGETATION WORKTask description: Reseed Disturbed Phase 3 AreaSite: Ranch Land Rock Pit #2Permit Action: 2022 UpdatePermit/Job#: M2003021**PROJECT IDENTIFICATION**Task #: 304State: ColoradoAbbreviation: NoneDate: 3/30/2022County: FremontFilename: M021-304User: TC1Agency 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
Chisel plowing {DMG}	\$96.50
Total Tilling Cost/Acre	\$96.50

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Hachita	0.60	9.79	\$9.59
Indian Ricegrass - Nespar	1.25	4.05	\$11.09
Little Bluestem - Camper	1.00	5.97	\$12.58
Sideoats Grama - Butte	2.25	7.39	\$20.25
Thickspike Wheatgrass - Critana	1.10	3.89	\$7.56
Needle and Thread	1.50	3.96	\$62.78
Rose, Wood's	0.50	0.00	\$10.25
Saltbush, Four Wing	0.50	0.69	\$6.25
Sumac, Skunkbrush	1.00	0.47	\$21.00
Totals Seed Mix	9.70	36.20	\$161.35

Application

Description	Cost /Acre
Drill seeding (MEANS 32 92 19.13 0020)	\$440.00
Total Seed Application Cost/Acre	\$440.00

MULCHING and MISCELLANEOUS**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Straw, delivered {MEANS 31 25 14.16 1200}	1.00	TON	\$307.02	\$307.02
Total Mulch Materials Cost/Acre				\$307.02

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$71.57
Power mulcher (MEANS 32 91 13.16 0350)	\$106.29
Total Mulch Application Cost/Acre	\$177.86

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: 22.2 Cost /Acre: \$1,182.73
 Estimated Failure Rate: 25% Cost /Acre*: \$1,182.73
 *Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **\$26,256.61**
 Reseeding Job Cost: **\$6,564.15**
 Total Job Cost: **\$32,821**
 Job Hours: **50.00**

BULLDOZER WORKTask description: **Push down highwalls**Site: **Ranch Land Rock Pit #2**Permit Action: **2022 Update**Permit/Job#: **M2003021****PROJECT IDENTIFICATION**Task #: **A03**State: **Colorado**Abbreviation: **None**Date: **3/28/2022**County: **Fremont**Filename: **M021-A03**User: **TC1**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:	\$126.01	NA
Operating Cost/Hour:	\$141.41	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: **\$308.72**Total Fleet Cost/Hour: **\$308.72****MATERIAL QUANTITIES**Initial Volume: **13,267**Swell factor: **1.000**Loose volume: **13,267 LCY**Source of estimated volume: **1,120 feet of highwall, ~30 ft high (see Task A03.1)**Source of estimated swell factor: **Cat Handbook****HOURLY PRODUCTION**Average push distance: **75 feet**Unadjusted hourly production: **1,514.3 LCY/hr**Materials consistency description: **Loose stockpile 1.2**Average push gradient: **-10 %**Average site altitude: **5,350 feet**Material weight: **2,900 lbs/LCY**Weight description: **Decomposed rock - 50% Rock, 50% Earth**

Job Condition Correction Factor

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.200	(SLOT)
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:	0.793	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.6966

Adjusted unit
production: 1,054.86 LCY/hr

Adjusted fleet
production: **1054.86** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: \$0.293/LCY

Total job time: **12.58** Hours

Total job cost: **\$3,883**

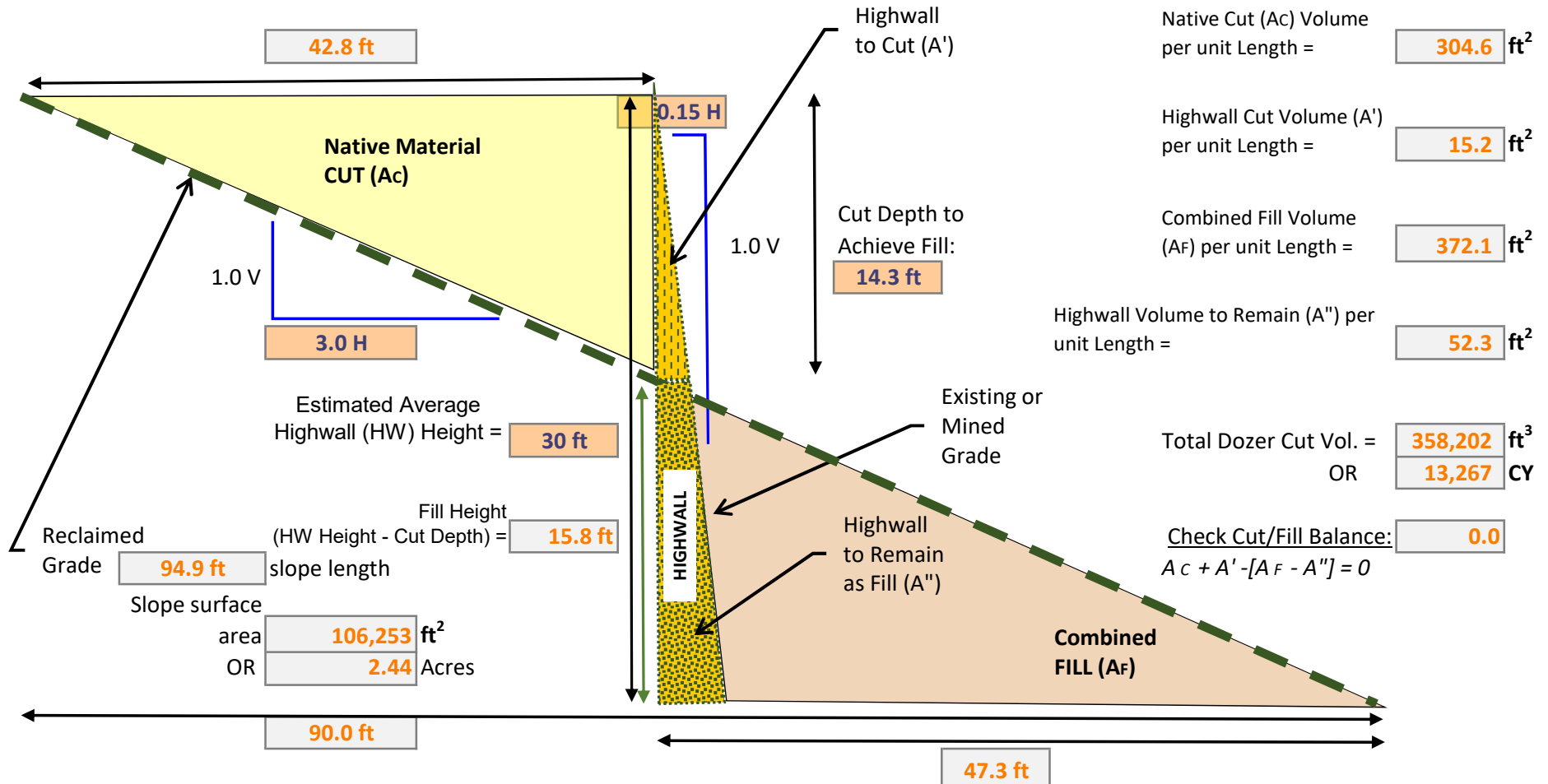
Task # A03.1 Highwall Backfill Volume Estimate

PROJECT: Ranch Land Rock Pit #2
PERMIT No.: M-2003-021
HIGHWALL LOCATION: 2021 Google Earth Highwall

LEGEND

Input

Result



HIGHWALL CUT - FILL VOLUME ESTIMATE