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

1313 Sherman Street, Room 215
Denver, CO 80203

December 3, 2018

Greg Lewicki and Associates, PLLC
Attn: Katie Todt
3375 W. Prowers Circle
Littleton, Colorado 80123

RE: Colorado Rose Red Granite Quarry, DRMS Permit Number M-1978-332
Amendment No. 2 (AM02) Application, Adequacy Review No. 4

Dear Ms. Todt,

The Colorado Division of Reclamation, Mining, and Safety (DRMS or Division) received your response to the Division's third adequacy review letter on November 15, 2018. Below is a list of the outstanding adequacy review items that will need to be addressed prior to the Division's approval of the amendment application. The items listed below are the original adequacy items identified followed by previous responses and your response to the item. If additional information or clarification is needed the Division's response will indicate this. DRMS is currently reviewing the Geotechnical Analysis submitted with your response letter. If adequacy review items pertaining to that analysis are identified they will be sent to you under a separate cover letter. Given that we are approaching the 365 day deadline to make a decision on this application, the Division wanted to send the currently identified adequacy review items in order to keep the process moving.

Rule 6.3.4 Exhibit D – Reclamation Plan

8. The applicants plan to close the mine openings using welded rebar cemented into place is not consistent with the standard adit closure practices. The Division recommends installing a grated adit closure with doors to allow the landowner access or a wire rope netting closure. Details regarding the specifications, materials required and the execution of these types of closures are available on the Division's website:
http://mining.state.co.us/Programs/Abandoned/Documents/General%20Bid%20Specifications.pdf

   This document is the General Bid Specifications guide that our Inactive Mine Program uses as a standard for mine closures similar to this. The Division would accept a plan for closure of the mine openings consistent with these standard practices.
   a. **Environment, Inc. Response:** I have reviewed the Bid Spec.s document to see what you were recommending. I do not have an alternative to present and think that the cost you have would average out to around $1.45 per square foot which seems reasonable to me. Im pretty sure that if mining ended prematurely the landowners would not want the

opening shut in. The Openings are not easily accessible from off-site and would require trespassing by anyone by the owners.

b. DRMS Response: Please clarify, is the applicant proposing a different closure method than that was originally proposed with the AM02 submittal? If a closure method is selected from the IMP guide, please indicate which closure method will be used.

c. **GLA Response 3:** The Operator wishes to utilize the 'Adit backfilling – Rockfill' method as defined on page 36/132 on the DRMS General Bid Specification guide detailed in your Adequacy Review dated June 18, 2018. Furthermore, the Rose Red Quarry wishes to remove the eastern most adit from their mine plan and will now and in the future operate using the two adits currently in place – Room #1 and Room #2 openings. Current calculations for backfill adit closure are detailed in the attached hand drawn schematic, pages 6 and 7, as well as the bulleted list below.

d. **DRMS Response:** The Division acknowledges the Operator is now planning to backfill the Room # 1 and Room #2 Adit with rockfill. To clarify, the "Adit Backfilling – Rockfill" is described on page 2-2 (page 36 of the PDF) of the General Bid Specification Document, dated March 2009. However, please clarify, page 132 of the PDF copy of this document is the Standard Drawing No. 12 for Concrete Block Bulkhead Seal Closure which is a different closure method than currently proposed?

9. The Division has conducted a reclamation cost estimate for the site and included the cost for installing three grated adit closures with doors for access. These costs are based on costs incurred by the Division's Inactive Mine Program for closing similar adits. The cost estimate included with the application did not take account of a cost for spreading soil material or conducting revegetation. The attached cost estimate includes costs for these tasks.

    a. **Environment Inc. Response:** The estimate did not include resoiling or revegetation because until all State and Local permitting is complete the quarry mining operation will not start as noted in the first sentence of the cost estimate presented. Prior to disturbing any new area that would require resoiling and revegetation the operator will notify the Division of a plan to increase the disturbed area and submit the necessary cost estimate to cover reclaiming the new disturbance area. This keeps the costs in line with covering only what reclamation is required at the one time on the existing 2 acres permit area. We wish to thank the staff for preparing the specification and cost for using a grated adit closure on each opening. Colorado Rose Red has incorporated this closure plan in the Exhibit D – Reclamation Plan we request that all resoiling and revegetation costs be removed from the Reclamation Cost amount until such time as it can be recalculated in the Technical Revision we propose to file prior to opening the surface quarry side of the operation.

    b. **DRMS Response:** A new reclamation cost estimate is enclosed. Please indicate if the applicant concurs with the estimate.

    c. **GLA Response 3:** See response to Rule 6.3.4 Exhibit D – Reclamation Plan #8 above for explanation of Adit backfilling – Rockfill cost estimate for two adits**.**

d. **DRMS Response:** Based on the Geotechnical Analysis, it appears the applicant now intends to move forward with the surface quarry operation. Given this, the Division has re-evaluated the reclamation cost estimate to account for the surface quarry operation and included the adit closure costs submitted with your response letter. The cost estimate is enclosed for your review. Please let me know if the applicant concurs with the estimate.

Rule 6.5 – Geotechnical Stability Exhibit

16. Page 67 of the stability analysis indicates an area of potential failure was estimated for the combination of Joint Orientation 6 and 7. The report shows an area where stabilization may become necessary if the excavation were extended in that direction. Please depict the location of this area on the Exhibit E-1 map. If this area will eventually be mined please indicate how this area will be stabilized to prevent failure or otherwise mitigated.
    a. **Environment Inc. Response:** I have added strike/dip line to Map Exhibit E-1 showing the location of Joint 7. No mining is planned in this area. The location of where joint 6 is has not been proved by GE as noted above.
    b. **DRMS Response:** The Division could not locate Joint 7 on the revised Exhibit E-1 Map or the strike and dip lines. Please revise the map to include these features.
    c. GLA Response 3: Map E-1 is replaced by GLA Map 'Colorado Rose Red – Gallery Map.' Fractures within the underground workings of the site as well as along the highwall above the entrance is included on the new GLA map. Discussion of potential fracture movements in included in the attached Geotechnical report generated by GLA titled "Geotechnical Analysis of the Colorado Rose Red Granite Quarry" dated November 2018. 'Colorado Rose Red Gallery Map' is located in Appendix 2 of the above listed report.
    d. DRMS Response: Map E-1 is the Pre-Mining Map that includes all the information required by Rule 6.3.5(2). This map also provides the mining plan for the proposed surface quarry. Upon review of new "Gallery Map", this map appears to depict the proposed underground workings. Given this, the new "Gallery Map" should likely replace the "Figure C" map that depicts the underground working originally submitted with the AM02 application and not Map E-1. Please confirm or clarify? If the "Gallery Map" is to replace Map E-1, please update this map to include all of the required information from Rule 6.3.5(2), this map should also include the details for the surface mining operation.

19. According to page 65 of the application the interior roofs of the 'rooms' were not included in the stability evaluation performed for this study. Please provide a geotechnical evaluation of geologic hazards associated with the existing and proposed underground roofs and 'rooms'. Based on this evaluation, where there is the potential for failure of any geologic structure caused or exacerbated by the existing and proposed underground mining operation please demonstrate that off-site areas will be protected with appropriate factors of safety incorporated into the analysis.

a. **Environment, Inc. Response:** The cost to obtain this type of analysis is beyond the means of Colorado Rose Red at this time. It is the Divisions speculation that there will be failure so having to prove there won't is ridicules. Colorado Rose Red is willing to take the risk and understands that if a failure occurs that affects areas outside the permit area they will be the responsible party. Also, the land surrounding the permit area where potential rock fall could end upis owned by Colorado Rose Red and ranges from 500 feet on the east and over 1000 on the south most of which is cover by large trees, so only their property would be impacted.
b. **DRMS Response:** The Division will not approve any additional underground mining without a geotechnical evaluation demonstrating off-site areas will be protected with appropriate factors of safety incorporated into the analysis in accordance with Rule 6.5(3). Here are the applicant's options:
    i. Provide the geotechnical evaluation.
    Or,
    ii. Commit to cease and desist from all underground mining operations and revise the proposed mining plan as such.
    iii. Please be aware that Colorado Rose Red's underground mining operation is currently out of compliance with the approved mining plan. The Division may take enforcement action if this adequacy issue is not addressed to the Division's satisfaction and underground mining continues.
c. **GLA Response 3:** Fractures along the interior roofs of the underground workings are included on GLA Map 'Colorado Rose Red – Gallery Map.' Underground fractures are discussed and evaluated in the attached Geotechnical report generated by GLA titled "Geotechnical Analysis of the Colorado Rose Red Granite Quarry" dated November 2018. See page 11 for safety factors and pillar design associated with the underground workings of the Rose Red Quarry. Additionally, see the 'Colorado Rose Red – Gallery Map' located in Appendix 2 of the above listed report to see changes to pillar design from the original map submission for AM-02. Changes to pillar design were required as mining has already cut into the previously designed pillar.
d. **DRMS Response:** Based on your response above, if mining has already cut into the previously designed pillars, how does the applicant plan on defining and maintaining the proposed pillars underground that are needed to maintain the proposed factors of safety? As underground mining progresses, the applicant must commit to submitting a detailed map of the location of the underground workings with the annual report.

20. Regarding the proposed quarry operations (separate from the underground dimensional stone operation), the stability analysis conducted by Ground Engineering and submitted should not be used to draw conclusions regarding the stability of the proposed future mine benches and highwalls. As indicated on page 67 of the report, the evaluation may not contain sufficient information for other purposes. Given this, please provide engineering stability analysis for the proposed final reclaimed slopes/highwalls. Based on this evaluation, where there is the potential

for failure of any geologic structure, demonstrate that off-site areas will be protected with appropriate factors of safety incorporated into the analysis.

a. **Environment, Inc. Response:** Ground engineering has been contacted and will not do that evaluation. Colorado Rose Red is in the process of finding someone that can address it but due to the financial state of the company it is proving impossible to find someone that will take the job on. We propose limiting the mines operation to no blasting or above ground quarrying until this can be addressed. At the current time Colorado Rose Red will not start the quarry operations until it has the proper county permits for a rock quarry have been obtained and those are on hold. They can, under the existing land use status continue to removed underground stone and remove the stone in the Spill areas without blasting. Processing can be done in the plant site area until the spill areas have been cleaned up. Colorado Rose Red will commit to filing a Technical Revision to address the structural stability for the new quarry highwalls prior to commencing blasting and mining on the surface quarry.
b. **DRMS Response:** The Division cannot conditionally approve the surface quarry as proposed. The applicant will need to provide the engineering stability analysis for the proposed reclaimed slopes/highwalls. If this cannot be done during this review process for this amendment application, please revise the proposed mining plan to remove the surface quarry operation. The applicant will need to submit a future amendment for the surface quarry operation. The Division would consider approval of a plan to finish mining in the former 111c area and surface removal of the "spill area" material at this time.
c. **GLA Response 3:** Surface fractures in the proposed drill and blast surface quarry are discussed and evaluated in the attached Geotechnical report generated by GLA titled "Geotechnical Analysis of the Colorado Rose Red Granite Quarry" dated November 2018. See page 5 for discussion on failure potential in the surface mining area as well as safety factors for mining in the same area of the Rose Red Quarry.
d. **DRMS Response:** The Division is currently reviewing the Geotechnical Analysis. If additional adequacy review issues are identified, they will be forwarded to you as soon as possible.

Adequacy Review No. 2 – Items identified in the DRMS letter dated January 29, 2018

<u>Rule 6.5 – Geotechnical Stability Exhibit</u>

1. As part of the additional information provided with GE's Report, it appears that Colorado Rose Red Granit Quarry is applying to blast within the quarry. It also appears that GE's slope stability evaluation does not consider dynamic loading in the Report. Please have GE reevaluate slope stability to include dynamic loading in which it may experience in the event of blasting.
    a. **Environment Inc. Response:** Ground engineering has been contacted and will not do that evaluation. We propose limiting the mines operations to no blasting

or above ground quarrying until this can be addressed and filing a Technical Revision for approval prior to commencing these activities.

b. **DRMS Response:** Similar to the items above, the Division will not conditionally approved the amendment application as proposed. The engineering/stability analysis will need to consider dynamic loading. Please either provide the required evaluation or revise the proposed mining plan to exclude the surface quarry and blasting.
c. **GLA Response 3:** Dynamic loading and failure thereof is the result of heavy weight applied to a surface that results in that surface's failure. Drilling and blasting, in this case, will not result in measureable or concerning dynamic loading as the rock mass to be liberated via drill and blast will remain in situ post blasting and will rest on intact granite bedrock – the exclusive bedrock and surfaces throughout the entire Rose Red Quarry. Simply put, drilled and blasted rock will have minimal movement during blasting and a lack of fail-able material and void space beneath the blast zone precludes dynamic loading from occurring onsite. However, slope stability analysis for the surface quarry operation is discussed on page 5 of the report "Geotechnical Analysis of the Colorado Rose Red Granite Quarry" dated November 2018.
e. **DRMS Response:** The Division is currently reviewing the Geotechnical Analysis. If additional adequacy review issues are identified, they will be forwarded to you as soon as possible.

3. Within the Report, only the results of the stability analysis have been provided. Please submit the model associated with each joint orientation analyzed in the Report.
    a. **Environment Inc. Response:** As noted before Ground Engineering will not provide additional information for their study. We have no way to generate the model used, or provide it as requested.
    b. **DRMS Response:** For any future analysis, the Division will need to evaluate the model used.
    c. **GLA Response 3:** See the associated appendices provided in report "Geotechnical Analysis of the Colorado Rose Red Granite Quarry" dated November 2018 for reference material and methods used in stability analysis.
    f. **DRMS Response:** The Division is currently reviewing the Geotechnical Analysis. If additional adequacy review issues are identified, they will be forwarded to you as soon as possible.

This concludes the Division's fourth adequacy review of the amendment application and revised material. The decision date for this application is December 27, 2018. If you have any questions feel free to contact me at (303) 866-3567, extension 8120 or Jared.Ebert@state.co.us.

Sincerely,

Jared Ebert
Environmental Protection Specialist III

Enclosure: *1.) DRMS Reclamation Cost Estimate, CIRCES Sheets dated December 3, 2018*

EC: Caleb Liesveld, Colorado Rose Red, Inc. Caleb@coloradorosered.com
Steve O'Brian, Environment, Inc. Environment-inc@outdrs.net

COST SUMMARY WORK

Task description: **Cost Summary**

Site: **Colorado Rose Red Pit** Permit Action: AM02_Adeq3 Permit/Job#: M1978332

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 12/3/2018 County: Larimer Filename: M332-000
User: JLE

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Backfill Room #1 and #2 Opening	MINESEAL	1	40.00	$8,091.30
002	Grade and shape parking areas	LOADER	1	1.27	$268.00
003	Spread Soil Over Bench Areas	LOADER	1	3.57	$752.00
004	Revegetation	REVEGE	1	2.08	$1,266.00
005	Mobilization	MOBILIZE	1	4.36	$1,599.00
		SUBTOTALS:		**51.28**	**$11,976**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$241.92
Performance bond:	1.05	Total =	$125.75
Job superintendent:	0.00	Total =	$0.00
Profit:	10.00	Total =	$1,197.60
		TOTAL O & P =	$1,565.27
		CONTRACT AMOUNT (direct + O & P) =	$13,541.27

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	0.00	Total =	0.00
Engineering work and/or contract/bid preparation:	4.25	Total =	$575.50
Reclamation management and/or administration:	5.00		$677.06
CONTINGENCY:	0.00	Total =	$0.00
		TOTAL INDIRECT COST =	$2,817.84
		TOTAL BOND AMOUNT (direct + indirect) =	**$14,793.84**

Proposed Bond Amount = $14,800.00

SAFEGUARDING UNDERGROUND OPENINGS

Task description: **Backfill Room #1 and #2 Opening**

Site: **Colorado Rose Red Pit** Permit Action: AM02_Adeq3 Permit/Job#: M1978332

PROJECT IDENTIFICATION

Task #: 001 State: Colorado Abbreviation: None

Date: 12/3/2018 County: Larimer Filename: M332-001

User: JLE

Agency or organization name: DRMS

UNIT COSTS

Opening Description	Dimensions	Closure Method	Quantity	Unit	Unit Cost	Total Cost
Room #1, backfill	15'x13'x51'	USER PROVIDED ITEM	1.00	EA	$3,508.90	$3,508.90
Room #2, backfill	15'x15'x51	USER PROVIDED ITEM	1.00	EA	$4,582.40	$4,582.40

Job Hours: **40.00** **Total Cost**: **$8,091.30**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **Grade and shape parking areas**

Site: **Colorado Rose Red Pit** Permit Action: AM02_Adeq3 Permit/Job#: M1978332

PROJECT IDENTIFICATION

Task #: 002 State: Colorado Abbreviation: None
Date: 12/3/2018 County: Larimer Filename: NA
User: JLE

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 988H Horsepower: 475
Attachment 1: ROPS Cab Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$87.28	NA
Operating Cost/Hour:	$86.99	100
Operator Cost/Hour:	$36.13	NA
Total Unit Cost/Hour:	$210.39	

Total Fleet Cost/Hour: $210.39

MATERIAL QUANTITIES

Initial volume: 1,120 CCY Swell factor: 1.000
Loose volume: **1,120** LCY

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

HOURLY PRODUCTION

Loader Cycle Time:

Unadjusted Basic Cycle Time (load, dump, maneuver): 0.575 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 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:	-0.060	minutes
	Adjusted Basic Cycle Time:	0.515	minutes

Rolling Resistance – Road Conditions

Haul:	Very hard, smooth, asphalt or concrete, no tire penetration 1.2
Return:	Very hard, smooth, asphalt or concrete, no tire penetration 1.2

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	60	0.00	1.20	1.20	0.0289	(Cat HB)
Return Route:	60	0.00	1.20	1.20	0.0291	(Cat HB)

Total Travel Time:	0.0580	minutes
Total Cycle Time:	**0.5730**	minutes

Load Bucket Capacity

Rated Capacity:	9.20	LCY (heaped)
Bucket Fill Factor:	1.100	Other - rock/dirt mixtures (100-120%) 1.100
Adjusted Capacity:	**10.12**	LCY

Job Condition Correction Factors
Site Altitude: 7040 feet

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

Unadjusted Hourly Unit Production:	1,059.74	LCY/Hour
Adjusted Hourly Unit Production:	879.58	LCY/Hour
Adjusted Hourly Fleet Production:	**879.58**	LCY/Hour

JOB TIME AND COST

Fleet size:	1	Loader(s)	Total job time:	**1.27**	Hours
Unit cost:	$0.239	/LCY	Total job cost:	**$268**	

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **Spread Soil Over Bench Areas**

Site: **Colorado Rose Red Pit** Permit Action: AM02_Adeq3 Permit/Job#: M1978332

PROJECT IDENTIFICATION

Task #: 003 State: Colorado Abbreviation: None
Date: 12/3/2018 County: Larimer Filename: NA
User: JLE

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 988H Horsepower: 475
Attachment 1: ROPS Cab Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$87.28	NA
Operating Cost/Hour:	$86.99	100
Operator Cost/Hour:	$36.13	NA
Total Unit Cost/Hour:	$210.39	

Total Fleet Cost/Hour: $210.39

MATERIAL QUANTITIES

Initial volume: 2,237 CCY Swell factor: 1.000
Loose volume: **2,237** LCY

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

HOURLY PRODUCTION

Loader Cycle Time:

Unadjusted Basic Cycle Time (load, dump, maneuver): 0.575 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 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:	-0.060	minutes
	Adjusted Basic Cycle Time:	0.515	minutes

Rolling Resistance – Road Conditions

Haul: Very hard, smooth, asphalt or concrete, no tire penetration 1.2
Return: Very hard, smooth, asphalt or concrete, no tire penetration 1.2

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	300	0.00	1.20	1.20	0.1444	(Cat HB)
Return Route:	300	0.00	1.20	1.20	0.1454	(Cat HB)

Total Travel Time: 0.2899 minutes
Total Cycle Time: **0.8049** minutes

Load Bucket Capacity

Rated Capacity: 9.20 LCY (heaped)
Bucket Fill Factor: 1.100 Other - rock/dirt mixtures (100-120%) 1.100
Adjusted Capacity: **10.12** LCY

Job Condition Correction Factors
Site Altitude: 7040 feet

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

Unadjusted Hourly Unit Production: 754.42 LCY/Hour
Adjusted Hourly Unit Production: 626.17 LCY/Hour
Adjusted Hourly Fleet Production: **626.17** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Loader(s) Total job time: **3.57** Hours

Unit cost: $0.336 /LCY Total job cost: **$752**

REVEGETATION WORK

Task description: **Revegetation**

Site: **Colorado Rose Red Pit** Permit Action: AM02_Adeq3 Permit/Job#: M1978332

PROJECT IDENTIFICATION

Task #: 004 State: Colorado Abbreviation: None
Date: 12/3/2018 County: Larimer Filename: M332-004
User: JLE

Agency 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)	$106.29
Total Tilling Cost/Acre	**$106.29**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Blue Grama - Hachita	1.00	16.32	$16.66
Beardless Wheatgrass - Whitmar	7.20	23.47	$62.64
Indian Ricegrass - Paloma	0.80	2.59	$7.80
Sheep Fescue - Covar	1.00	15.61	$5.36
Streambank Wheatgrass - Sodar	4.40	14.34	$27.41
Needlegrass, Green - Lodorm	3.00	12.47	$14.94
Totals Seed Mix	17.40	84.80	**$134.81**

Application

Description	Cost /Acre

Broadcast seeding [DMG]	$267.22
Total Seed Application Cost/Acre	**$267.22**

MULCHING and MISCELLANEOUS

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			$	$
Total Mulch Materials Cost/Acre				**$0.00**

Application

Description	Cost /Acre
	$
Total Mulch Application Cost/Acre	**$0.00**

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:	2.08	Cost /Acre:	$508.32
Estimated Failure Rate:	25%	Cost /Acre*:	$402.03
*Selected Replanting Work Items:	SEEDING		

Initial Job Cost:	**$1,057.31**
Reseeding Job Cost:	**$209.06**
Total Job Cost:	**$1,266**
Job Hours:	**2.08**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilization**

Site: **Colorado Rose Red Pit** Permit Action: AM02_Adeq3 Permit/Job#: M1978332

PROJECT IDENTIFICATION

Task #: 005 State: Colorado Abbreviation: None
Date: 12/3/2018 County: Larimer Filename: M332-005
User: JLE

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:	$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 988H	54.46	$87.28	$125.45	1	$212.73	$125.45	$250.00
Subtotals:					**$212.73**	**$125.45**	**$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	$47.74	2	$95.48	$95.48
Fuel Tanker, 6x4, 210 HP	$77.51	1	$77.51	$77.51
		Subtotals:	**$172.99**	**$172.99**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	LYONS	
Total one-way travel distance:	8.00	miles
Average Travel Speed:	8.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$1,252.94	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$345.98	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	1.00	1.00
Return Time (Hours):	1.00	1.00
Loading Time (Hours):	0.09	NA
Unloading Time (Hours):	0.09	NA
Subtotals:	2.18	2.00

JOB TIME AND COST

Total job time:	**4.36**	Hours
Total job cost:	**$1,599**	