



June 10th, 2021

Clint Chisler
Reclamation Soil Scientist
Mining and Minerals Division
Mining Act Reclamation Program
Via email at: Clinton.chisler@state.nm.us

Subject: Modification Application for Quarry Design Limit Expansion at GCC Rio Grande Tijeras Mine and Mill (Permit BE001RE)

Dear Mr. Chisler:

GCC Rio Grande, Inc. ("GCC") requests a modification to the Tijeras Mine and Mill Permit No. BE001RE in accordance with the provisions of the New Mexico Mining Act, Sections 69-36-1 through 69-36-20, NMSA 1978 and the New Mexico Mining Act Rules. In summary, GCC would like to increase the extent of the design limits of the Tijeras Mine and Mill by approximately 210.17 acres.

Details and further discussion relevant to the proposed permit modification is provided in this application. A summary of the existing permit and background information for the Tijeras Mine and Mill is presented in Section 1, Sections 2 and 3 provide justification that the proposed changes at the Tijeras facility require a modification rather than a revision of the existing permit and check off application requirements. Sections 4 and 5 describes the reclamation plans for the proposed increases and the associated financial assurance estimate. Attached to this letter is a Financial Assurance Estimate (FAE) describing Closeout Plan liability for these additional units.

1. Facility Background and Relevant Permitting History

The Tijeras Mine and Mill permit area consists of approximately 2,219 acres and is located at approximately 35.07171° North Latitude, 106.39780° West Longitude. The Tijeras Mine and Mill has been in operation since 1959 at 11783 State Highway 337, Tijeras, New Mexico, 87509. Ideal Basic Industries began construction and development of the site in 1958. Holnam, Inc. acquired the property and its operations in 1990. In 1995, GCC Rio Grande purchased the site and the facility.

The New Mexico Mining Act, enacted in 1993 at 69-36-1 et seq., NMSA, required existing mining operations to submit a permit application and a closeout plan. A permit application was submitted, and the agency issued MMD Permit #BE001RE on May 23, 1996. This permit authorizes the permittee to conduct mining and reclamation operations at the facility. The required closeout plan was submitted to MMD as an amendment to MMD Permit #BE001RE. On June 30, 1998, MMD issued Permit Revision 98-1 approving the closeout plan and incorporating it as a permit requirement. On September 12, 2007, MMD approved Permit Modification 06-1, codifying the current design limits of Tijeras Mine and Mill. Finally, in August of this this year. On July 6, 2015, MMD issued permit modification 14-01, for financial assurance replacement. On August 19, 2015, MMD requested an update to the closeout plan and financial assurance for #BER001RE. On November 06, 2016, MMD approved Permit Modification 16-2 for new units in Quarries 357NE, 357NW and 19N totaling an additional 86.2 acres; On June 1 2017, MMD issued Permit Modification 17-1, which was a modification to the FA instrument replacement. On October 10, 2019, MMD issued Permit Modification 18-1, which approved the new mine closeout plan

and associated financial assurance. On July 15, 2020, MMD issued Permit Modification 20-1, which defined exploration activities and off-spec coal management. On May 17, 2021, MMD issued Permit Modification 21-1, which increase the total allowable hole depth for exploration drilling activities.

2. Justification that Proposed Changes Require a Modification

Section 19.10.5.505 of the New Mexico Administrative Code (NMAC) differentiates between the requirements for hard rock permit modifications and hard rock permit revisions. Applicable portions of the NMAC from Section 19.10.5.505 are included below in bold, followed by an explanation in red of why the Tijeras facility's proposed mining and reclamation changes necessitate a permit modification, as opposed to a permit revision.

(1) The Director shall consider the following factors and their level of impact to determine whether a permit modification would have a significant environmental impact:

(a) Whether the proposed change would authorize an expansion of design limits beyond that currently authorized by the permit that:

(i) Would be located in or is expected to have a direct surface impact on wetlands, springs, perennial or intermittent streams, lakes, rivers, reservoirs or riparian areas.

No tributary water courses, wetlands, wells, springs, stock water ponds, reservoirs, perennial or intermittent streams and ditches on the affected land and on adjacent lands will be affected by the proposed mining operations.

(ii) Is expected to have a direct impact on ground water that has a total dissolved solids concentration of less than 10,000 mg/l.

There are no known water tables within the vertical profile of the area to be mined. Therefore, there will be no direct impacts to any groundwater.

(iii) Is expected to result in point or non-point source surface or subsurface releases of acid or other toxic substances from the permit area.

There will not be any new point sources created by proposed changes to the mining and closure plans. Therefore, no new sources of potential release of acid or toxic forming materials into the hydrologic system at the quarry will occur.

(iv) Would be located in designated critical habitat areas as determined in accordance with the federal Endangered Species Act of 1973 or in areas determined by the Department of Game and Fish likely to result in an adverse impact on an endangered species designated in accordance with the Wildlife Conservation Act, Sections 17-2-37 through 17-2-46 NMSA 1978 or by the State Forestry Division for the Endangered Plants Act, Section 75-6-1 NMSA 1978.

Based on the information available from the U.S. Fish and Wildlife Service, no critical habitat areas are located within the proposed new units.

(v) Would adversely impact cultural resources listed on either the National Register of Historic Places or the State Register of Cultural Properties.

There are no cultural resources identified on either the National Register of Historic Places or the New Mexico State Register of Cultural Properties in the proposed mining site. All proposed activities take place within the disturbed or affected mining areas currently identified and approved in Permit No. BE001RE.

(vi) Would be located in a known cemetery or other burial ground.

None of the proposed mining or reclamation activities are located in a known cemetery or burial ground.

(vii) Would be located in an area designated as a Federal Wilderness Area, Wilderness Study Area, Area of Critical Environmental Concern, or an area within the national Wild and Scenic River System.

Proposed mining and reclamation activities will not occur in a Federal Wilderness Area, Wilderness Study Area, Area of Critical Environmental Concern, or an area within the national Wild and Scenic River System.

(b) Whether the proposed change would result in a significant increase in the amount of financial assurance as determined by the Director; or

Proposed modifications do not result in a significant change in the financial assurance. A Financial Assurance Evaluation, that describes close out plan liability for the modified mining and reclamation plans is provided in this document below.

(c) Whether the proposed change would significantly depart from the nature or scale of the permit.

New mining and financial assurance modifications described in this application will occur within the currently approved permit boundary for Permit No. BE001RE. Therefore, changes described in this modification are not significantly different from the approved permit.

3. Application Checklist

19.10.5.502 PERMIT APPLICATION REQUIREMENTS:

A. A minimum of six copies of each application for a permit under this Part shall be submitted to the Director. The Director may require additional copies for distribution by the Director to other governmental agencies with an interest in, or jurisdiction over, elements of the proposed operation.

This application will be submitted electronically; one paper copy will be submitted to your office for MMD file per conversation.

B. All information submitted to the Director shall be made available for public inspection and copying at the Director's office, except as designated confidential. Information in the application which the applicant desires to keep confidential shall be clearly indicated and submitted separately from the rest of the application.

(1) If the operator designates as confidential an exploration map, financial information, information concerning the grade or location of ore reserves or trade secret information, the Director shall maintain the information as confidential and not subject to public records or disclosure laws.

(2) If a request is made for public review of the information held confidential, the Director shall notify the operator and provide a reasonable opportunity for substantiation of the claim that public disclosure of the information could harm the competitive position of the operator. If the claim is not substantiated to the satisfaction of the Director, the information shall be released.

(3) When a request is made for public review of information designated as confidential, the Director shall attempt to notify the operator within 24 hours of the request, and shall provide written notification by certified mail.

There is no information designated as confidential in current modification effort.

C. Each application shall be signed by an applicant or authorized agent of the applicant for the operation with the following certification made:

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals responsible for obtaining the information, I believe the submitted information is true, accurate, and complete.

Please see certification and signature in Section 6 below.

D. Each application under this Part shall be in a format acceptable to the Director and contain the following:

(1) The name of the applicant to whom the permit will be issued.

GCC Rio Grande, Inc. (GCC)

(2) A map(s) and list, including names and addresses, of all owners of surface and mineral estates within the proposed permit area, as shown by the most recent county assessor's property tax schedule.

GCC owns all of the surface estate within the proposed permit boundary except for the United States Forest Service (USFS) property in the southeast portion of the permit boundary (see attached map, *Surface/Mineral Estate Ownership [from Special Warranty Deed]*) and the small rectangular-shaped notch in the northeast ¼ of Section 28. In the southeast portion of the Tijeras Mine and Mill, GCC maintains the indicated mining claims with the BLM annually. The small portion in the NE section of the proposed permit boundary represents a past encroachment onto USFS property. The area was mined for limestone and subsequently reclaimed; although the dates are uncertain, historical aerial photography indicates surface disturbance in the area in May of 1991. Supporting documentation for these delineations are included as attachments to the application for the modification submitted by GCC in August 2016.

(3) A statement of the basis on which the applicant has the right to enter the property to conduct the mining and reclamation. The applicant will allow the Director to examine, if necessary, the documents which establish such basis.

Rio Grande Portland Cement Corp C/O Mexcement Inc. (GCC) retains both surface and mineral estate ownership; see item D (2) above and see attached map, *Surface/Mineral Estate Ownership (from Special Warranty Deed)*.

(4) The site assessment previously submitted pursuant to Section 69-36-5 of the Act shall be considered part of the application. If information in the site assessment requires updates to provide information necessary for evaluation of the permit or if the site-specific conditions at the time of the assessment significantly deviate from conditions at the time of submittal of the permit application, such updated information or deviations must be described in the application.

No updates to the site assessment are needed, as site specific conditions have not significantly deviated.

(5) A map(s) showing all existing and proposed pits, shafts, adits, stockpiles, waste units, impoundments, leach piles, processing facilities, and support facilities such as office buildings. The map(s) shall identify the proposed permit area and design limits of each unit of the operation.

This information is described in the narrative and shown on Figure 2 of the Quarry Design Limits Map

(6) A description of undisturbed vegetation including a comprehensive list of species and their relative abundance with regards to cover and production.

These data were collected and summarized in "GCC Rio Grande Inc., Tijeras Limestone Quarry, Vegetation Test Plots, 2008 Final Monitoring Report" by Habitat Management, Inc. and are incorporated by reference in the GCC Tijeras Mine and Mill Closeout Plan

(7) Evidence that other applicable state and federal permits to be obtained either have been or will be issued before the activities subject to those permits begin.

GCC Rio Grande was issued an update Title V operating permit on July 28, 2017. Information in Section 6 of the 2019 GCC Tijeras Mine and Mill Closeout Plan, Environmental Standards Compliance contains additional details.

(8) The applicant shall designate an agent and provide the agent's street address for the service of notices and orders in writing from the Director. This information shall be kept current if a permit is granted.

GCC Rio Grande Inc.'s agent in the matter is Samantha Kretz, Environmental Engineer, 11783 State Hwy 337 South, Tijeras, NM, 87059.

(9) A copy of the proposed form of notices required under 19.10.9 NMAC.

This application is for a permit modification only.

(10) A permit fee as determined pursuant to 19.10.2 NMAC

The required modification fee of \$1000 is enclosed.

(11) Any additional information necessary for evaluation of the permit application as required by the Director.

See Sections 4 through 5 below.

E. To avoid duplication and conflicting requirements, the applicant may include information from environmental permits relevant to the application. Permits issued by other governmental agencies shall be accepted by the Director to the extent such permits satisfy the requirements of the Act and 19.10 NMAC.

This information is detailed in Section 6 of the 2019 GCC Tijeras Mine and Mill Closeout Plan, Environmental Standards Compliance.

F. Where physically separate but interrelated mining operations are located in close proximity to each other and are under the control of the same owner or operator, the applicant may request or the Director may determine to issue one permit for all of the operations and require only one permit application and closeout plan.

The proposed permit modification comprises all mining operations within the proposed permit boundary; no other operations in close proximity are proposed to be considered.

4. New Units – Mining and Reclamation Plan

4.1 Resource Extraction

GCC uses limestone, marls and clay for production of cement from the Madera Formation. The formation contains several bed of limestone, siltstone, sandstone, marls and interbedded clays. GCC proposes to extract material from all New Units totaling 210.17 acres (see figure 2, *Quarry Design Limits*):

Existing Quarries	Size (acres)
Quarry 2	9.97
Quarry 4	21.62
Quarry 6(West Cap)	16.13
Quarry 8(East Cap)	18.90
Quarry 10(East Cap)	51.93
Quarry 15	58.53
Quarry 18(19N)	9.19

New Quarry	Size (acres)
Quarry 17	23.90

In each of the proposed current and new mining units, the extraction process will proceed in the typical manner: the active quarry face is cleared of vegetation, then drilled and blasted; then rock of usable size (not larger than six cubic feet) is trucked downhill to the crusher. Oversized rock is left in the quarry for downsizing or potential later use in reclamation.

4.2 Reclamation

Reclamation in each of the new units will proceed as described with recreation and wildlife habitat identified as post-mining land uses; i.e. geomorphic grading and backfilling, soil cover excavation, stockpiling, and placement, surface water runoff and erosion control, and revegetation will be implemented according to the methods described in the *2019 Closeout Plan, GCC Rio Grande – Tijeras Mine and Mill*.

4.2.1 Post-mining topography

The limestone members that are quarried for cement production are oriented such that quarrying advances along dip slopes, leaving behind a surface which is similar to, but lower than, the original ground surface. Therefore, very little backfilling or other earthfill will be needed to recreate original surface forms. Some sections may require some shape modification to achieve the goals of geomorphic reclamation, i.e. to create functional watershed systems like those that develop naturally; to produce landforms that do not require on-going maintenance to prevent erosion; and to produce a finished site that is in a stable hydrologic equilibrium that minimizes soil erosion, is visually appealing, and promotes a self-sustaining ecosystem. Geomorphic techniques will also be applied in operating quarries, where nearly all Redbed materials will be excavated to allow the quarrying of the upper portion of the Knobby Member of the Madera Formation. Precise terrain modification needs will be determined when quarrying has exposed the final rock surfaces.

4.2.2 Highwalls

Highwalls (vertical or very steep slopes 20 feet or more in height) will be created by operations in all quarries in competent limestone that should support vertical faces without substantial raveling or risk of mass movement. These should fit in well with the numerous natural cliffs that form the local Sandia and Manzano limestone mountain scarps and provide ample raptor habitat. Thus, highwalls may be left behind when the limestone quality is inadequate for the cement manufacturing process.

4.2.3 Reclamation Standards for New Units

As set forth in Subsection A of 19.10.5.507 NMAC, the permit area will be reclaimed to a condition that allows for re-establishment of a self-sustaining ecosystem appropriate for the life zone of the surrounding areas following closure unless conflicting with the approved post-mining land use. The Closeout Plan will be updated to meet the site-specific characteristics of the mining operation and the site, including the New Units presented in this modification request.

Additionally, Quarry 17 is new discrete excavation unit located within the existing Tijeras Mine and Mill permit boundary that exceed the design limits as codified in Modification 06-1 and 16-2. Therefore, GCC will comply with the standards and requirements set forth in paragraphs A through E of Section 19.10.5.508 New Units of the NMAC. Site-specific characteristics, including the existing mining operation, will be considered in applying the standards and requirements.

5. Financial Assurance Estimate

Included with this modification application is a spreadsheet that details the calculation of the estimated financial assurance to complete the reclamation of current quarry expansion and new unit Quarry 17 described above. The proposed amount is \$1,195,049.00.

6. Permit Application Certification

GCC Rio Grande, Inc.
Tijeras Mine and Mill

I certify that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals responsible for obtaining the information, I believe the submitted information is true, accurate, and complete.


Samantha Kretz, GCC Tijeras


Date

Please don't hesitate to contact me if you have any questions or require any additional information.

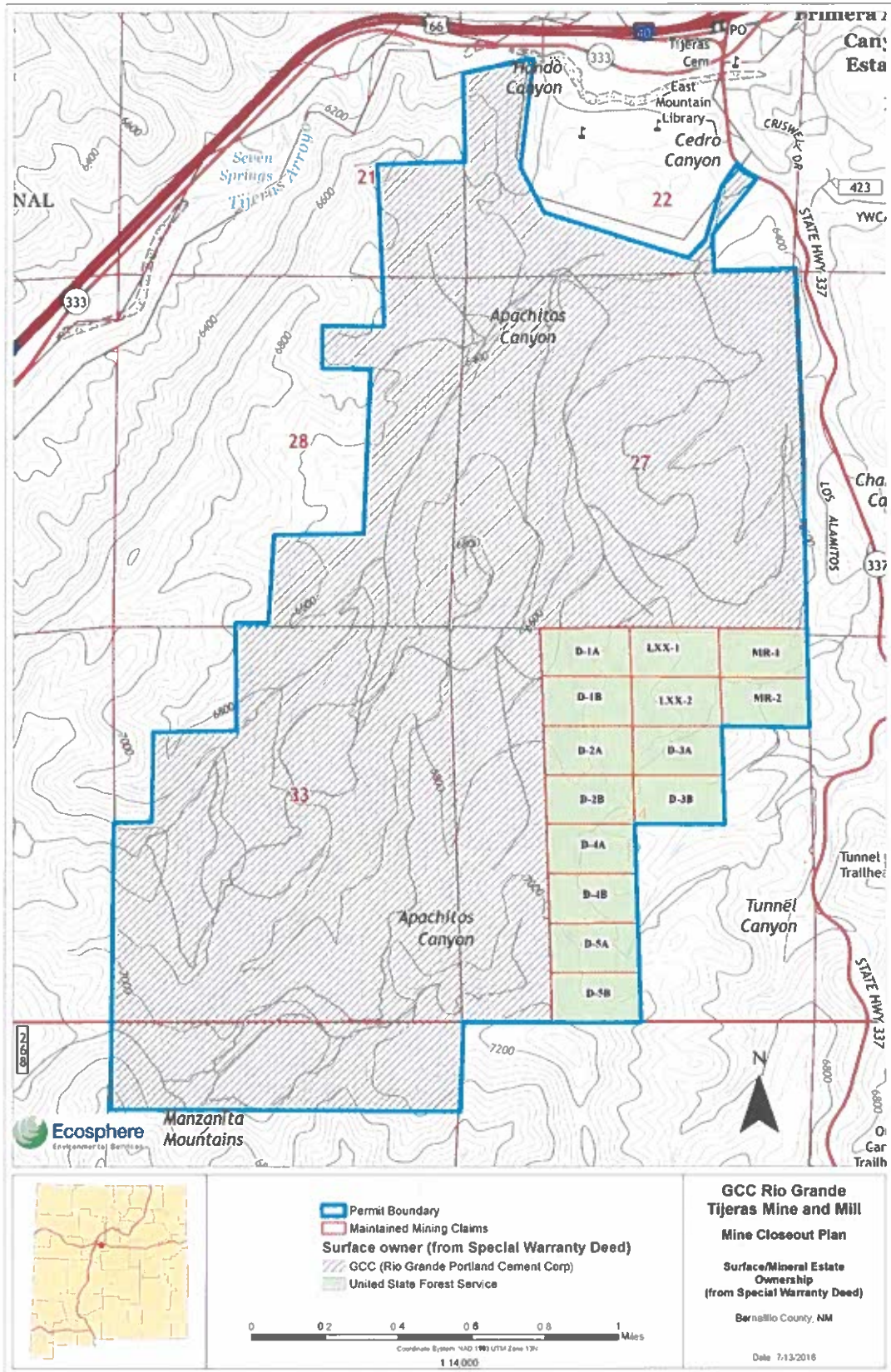
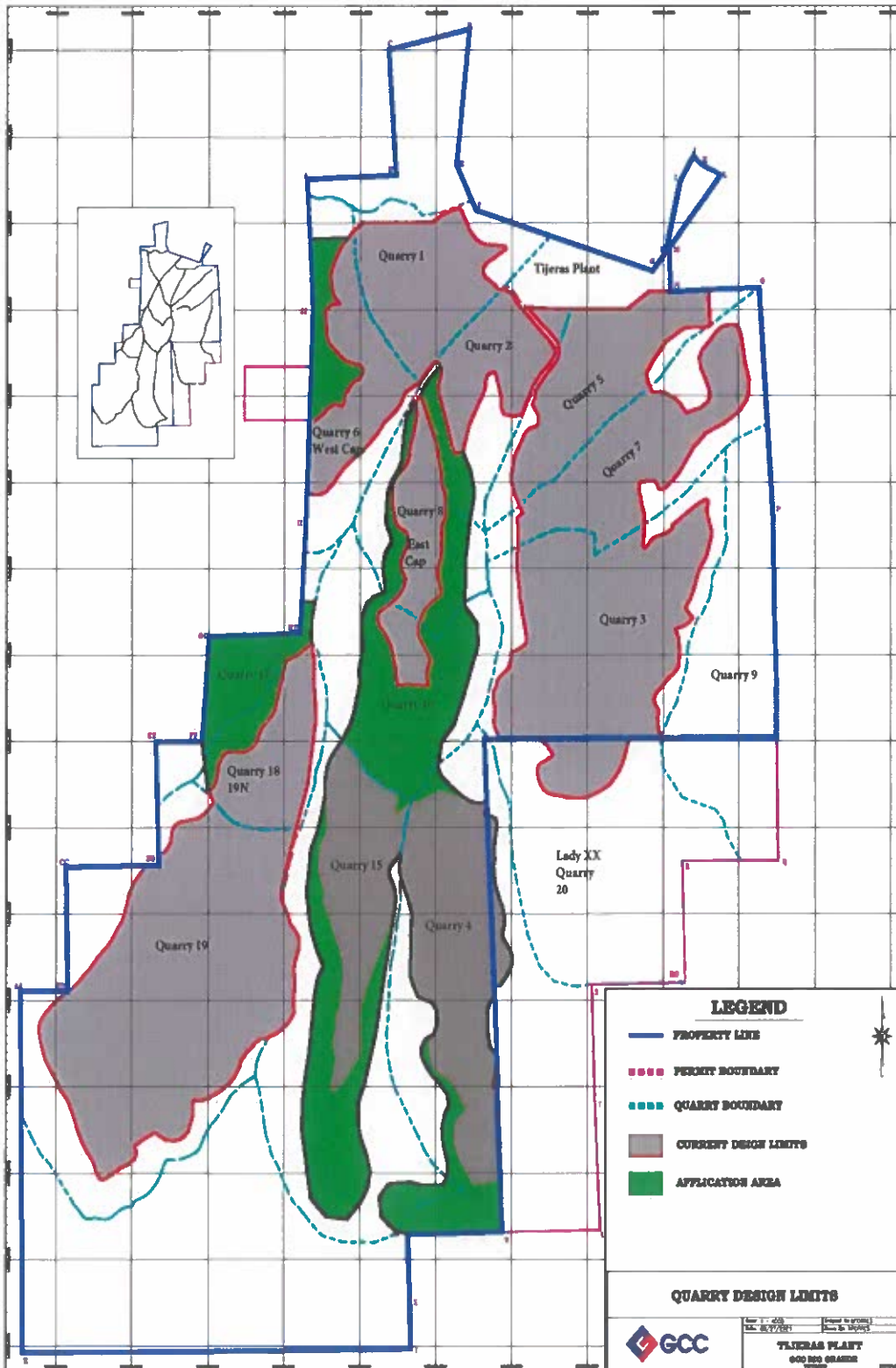


Figure 1: GCC Rio Grande Tijeras Mine and Mill

Figure 2: Quarry Design Limits





GCC Rio Grande, Inc.
 11783 Highway 337
 Tijeras, NM 87059-0100

Check Number 000000389
 Check Date 06/10/2021
 Stub 1 of 1

Payee: NEW MEXICO MINING & MINERALS
 ON
 1220 ST. FRANCIS DRIVE
 SANTA FE NM 87505

Date of Inv	Doc Number	Your Invoice No	Text	Discount	Net Amount
06/02/2021	T900001889	06022021		0.00	1,000.00
Additional Remarks:			Total		1,000.00



GCC Rio Grande, Inc.
 11783 Highway 337
 Tijeras, NM 87059-0100

JP MORGAN CHASE BANK, N.A.
 New York, NY

4-2/210

ONE THOUSAND*****

Pay to the order of:
 NEW MEXICO MINING & MINERALS DIVISI
 ON
 1220 ST. FRANCIS DRIVE
 SANTA FE NM 87505

PAYEE	CHECK DATE	CHECK NUMBER	AMOUNT
600982	06/10/2021	000000389	\$****1,000.00

Oliver C.

Yoon

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
General Information

Tijeras Cement Plant

06/10/21

Applicant	GCC Rio Grande, Inc. PO Box 100 Tijeras, NM 87059-0100	Contact: Samantha Kretz 505/286-6081
Permit Number	BE001RE	
Number of Acres	210.17 acres (est. New Unit disturbance)	
Type of Operation	Cement/Regular/Existing	
Location	Bernalillo County	
Prepared by	Mauro Torres	
Recommended Bond	\$1,195,049	

Describe worst-case reclamation scenario:

Earthmoving

Scrapers transport redbed from locations where exposed to all areas
Local haul by dozers in each New Unit to cover edges and steep areas

Grading

Dozers spread, grade, and shape redbed soil

Revegetation

Reveg all disturbed areas (seeding, monitoring, etc.)

Other

Mobilization is 2% on 1-5% range due to close proximity to
Albuquerque where contractors and equipment are available.

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Structure Demolition and Disposal Cost Summary

Tijeras Cement Plant
Worksheet #2
06/10/21

NOT USED

BOND AMOUNT CALCULATION
 New Mexico Mining and Minerals Division
Material Handling Plan Summary Sheet

Tijeras Cement Plant
 Worksheet #3
 06/10/21

Item	Description	Volume (cy)	Origin	Destination	Haul Distance (ft)	Grade	Equipment	
1	Move Redbed	29,983.42	Quarries 3, 5 & 7	Quarry 2	0	10%	CAT 631-G	
2	Move Redbed	-	Quarries 3, 5 & 7	Quarry 3	0	0%	CAT 631-G	
3	Move Redbed	128,700.87	Quarries 3, 5 & 7	Quarry 4	5,000	10%	CAT 631-G	
4	Move Redbed	-	Quarries 3, 5 & 7	Quarry 5	500	0%	CAT 631-G	
5	Move Redbed	96,367.80	Quarries 3, 5 & 7	Quarry 6 - West Cap	7,000	5%	CAT 631-G	
6	Move Redbed	-	Quarries 3, 5 & 7	Quarry 7	500	0%	CAT 631-G	
7	Move Redbed	92,286.36	Quarries 3, 5 & 7	Quarry 8 - East Cap	5,000	5%	CAT 631-G	
8	Move Redbed	240,140.41	Quarries 3, 5 & 7	Quarry 10	3,500	5%	CAT 631-G	
9	Move Redbed	94,664.31	Quarries 3, 5 & 7	Quarry 15	4,000	5%	CAT 631-G	
10	Move Redbed	113,692.46	Quarries 3, 5 & 7	Quarry 17	6,000	5%	CAT 631-G	
11	Move Redbed	31,815.71	Quarries 3, 5 & 7	Quarry 18	7,000	10%	CAT 631-G	
12	Move Redbed	21,552.08	Quarries 3, 5 & 7	Quarry 19	11,000	10%	CAT 631-G	
13	Move Redbed	-	Quarries 3, 5 & 7	Exploration Drill Pads	5,000	10%	CAT 631-G	
		849,203	loose cy	=	679,363	bank cy		
14	Move Redbed	2,998.34	Quarries 3, 5 & 7	Quarry 2	300	10%	CAT D-8T Dozer w/SU Blade	10%
15	Move Redbed	-	Quarries 3, 5 & 7	Quarry 3	300	10%	CAT D-8T Dozer w/SU Blade	10%
16	Move Redbed	12,870.09	Quarries 3, 5 & 7	Quarry 4	300	10%	CAT D-8T Dozer w/SU Blade	10%
17	Move Redbed	-	Quarries 3, 5 & 7	Quarry 5	300	10%	CAT D-8T Dozer w/SU Blade	10%
18	Move Redbed	9,636.78	Quarries 3, 5 & 7	Quarry 6 - West Cap	300	10%	CAT D-8T Dozer w/SU Blade	10%
19	Move Redbed	-	Quarries 3, 5 & 7	Quarry 7	300	10%	CAT D-8T Dozer w/SU Blade	10%
20	Move Redbed	9,228.64	Quarries 3, 5 & 7	Quarry 8 - East Cap	300	10%	CAT D-8T Dozer w/SU Blade	10%
21	Move Redbed	24,014.04	Quarries 3, 5 & 7	Quarry 10	300	10%	CAT D-8T Dozer w/SU Blade	10%
22	Move Redbed	9,466.43	Quarries 3, 5 & 7	Quarry 15	300	10%	CAT D-8T Dozer w/SU Blade	10%
23	Move Redbed	11,369.25	Quarries 3, 5 & 7	Quarry 17	300	10%	CAT D-8T Dozer w/SU Blade	10%
24	Move Redbed	3,181.57	Quarries 3, 5 & 7	Quarry 18	300	10%	CAT D-8T Dozer w/SU Blade	10%
25	Move Redbed	2,155.21	Quarries 3, 5 & 7	Quarry 19	300	10%	CAT D-8T Dozer w/SU Blade	10%
26	Move Redbed	-	Quarries 3, 5 & 7	Exploration Drill Pads	300	10%	CAT D-8T Dozer w/SU Blade	10%

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Earthwork Quantity Worksheet

Tijeras Cement Plant
Worksheet #4
06/10/21

NOT USED

Description: Spread 20% redbed in steep areas of Quarry 2 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 2*

Volume	2,998 cy	Time	33 hours
		Productivity	90 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.55	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	250 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 4 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 3*

Volume	0 cy	Time	0 hours
		Productivity	208 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.80	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	400 cy/hr	direct drive trans.	1.00

Description: Spread 10% redbed in Quarry 6 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 4*

Volume	12,870 cy	Time	26 hours
		Productivity	502 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	1.10	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 8 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 5*

--

Volume	0 cy	Time	0 hours
		Productivity	90 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.55	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	250 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 10 after scrapers

Equipment: **CAT D-8T Dozer w/SU Blade - Quarry 6**

Volume	9,637 cy	Time	41 hours
		Productivity	235 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	400 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 15 after scrapers

Equipment: **CAT D-8T Dozer w/SU Blade - Quarry 7**

Volume	0 cy	Time	0 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 17 after scrapers

Equipment: **CAT D-8T Dozer w/SU Blade - Quarry 8**

Volume	9,229 cy	Time	22 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr

soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 18 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 10*

Volume	24,014 cy	Time	59 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 19 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 15*

Volume	9,466 cy	Time	23 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 18 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 17*

Volume	11,369 cy	Time	28 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 18 after scrapers

Equipment: *CAT D-8T Dozer w/SU Blade - Quarry 18*

Volume	3,182 cy	Time	8 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

Description: Spread 20% redbed in steep areas of Quarry 18 after scrapers

Equipment: **CAT D-8T Dozer w/SU Blade - Quarry 19**

Volume	2,155 cy	Time	5 hours
		Productivity	410 cy/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	0.90	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
normal production	700 cy/hr	direct drive trans.	1.00

BOND AMOUNT CALCULATION
 New Mexico Mining and Minerals Division
Productivity and Hours Required for Dozer Use---Grading

Tijeras Cement Plant
 Worksheet #6
 06/10/21

Description: Grade, shape, and compact Plant Area

Equipment: D8R w/ SU blade - Plant Area

Area	0 ac	Time	0 hours
		Productivity	2.24 ac/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	1.10	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
effective blade width	12.9 feet	direct drive trans.	1.00
speed	2 miles/hr		

Description: Grade, shape, and compact Disposal Area

Equipment: D8R w/ SU blade - Disposal Area

Area	0 ac	Time	0 hours
		Productivity	2.24 ac/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	1.10	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
effective blade width	12.9 feet	direct drive trans.	1.00
speed	2 miles/hr		

Description: Grade, shape, and compact Quarry Area, including exploration drill pads

Equipment: D8R w/ SU blade - Exploration Drill Pads

Area	0.0 ac	Time	0.0 hours
		Productivity	2.24 ac/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	1.10	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
effective blade width	12.9 feet	direct drive trans.	1.00
speed	2 miles/hr		

Description: Grade, shape, and compact Haul & Access Roads

Equipment: D8R w/ SU blade - Haul & Access Roads

Area	0 ac	Time	0 hours
		Productivity	2.24 ac/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	1.10	work hour	50 min/hr
soil weight correction	2648 lb/cy	visibility	1.00
prod. method/blade	1.00	elevation	1.00
effective blade width	12.9 feet	direct drive trans.	1.00
speed	2 miles/hr		

Description: Spread and track-in rock, all Sections
(except Plant)

Equipment: D8R w/ SU blade - rock, all Sections
(except Plant)

Area	210 ac	Time	96 hours
		Productivity	2.20 ac/hr-dozer
PERFORMANCE FACTORS			
material	1.20	operator	0.75
grade	1.10	work hour	50 min/hr
soil weight correction	2700 lb/cy	elevation	1.00
prod. method/blade	1.00	elevation	1.00
effective blade width	12.9 feet	direct drive trans.	1.00
speed	2 miles/hr		

BOND AMOUNT CALCULATION
 New Mexico Mining and Minerals Division
**Productivity and Hours Required for
 Ripper-Equipped Dozer Use**

Tijeras Cement Plant
 Worksheet #7
 06/10/21

Description: Rip redbed for scraper transport

Equipment: D8R w/ multi-shank ripper

	Area Volume	0 ac 300 cy	Time Productivity	0 hours 4.25 ac/hr-dozer
PERFORMANCE FACTORS				
ripping length		1,000 ft	turn time	0.25 min/pass
ripper penetration		30.7 in	work hour	50 min/hr
pocket spacing		43.0 in		
no. of pockets		3		

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Productivity and Hours Required for Loader Use

Tijeras Cement Plant
Worksheet #8
06/10/21

NOT USED

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Productivity and Hours Required for Truck Use

Tijeras Cement Plant
Worksheet #9
06/10/21

NOT USED

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division

Tijeras Cement Plant
Worksheet #10

Productivity for Hydraulic Excavator Use (Backhoe or Power Shovel) 06/10/21

NOT USED

Description: Spread redbed in Quarry 1

Equipment: **CAT 631-G - Quarry 2**

Volume	29,983 cy	Time	60 hours
		Productivity	500 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	31 cy	loaded trip time	1.00 min
grade (loaded)	10 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	500 ft	return trip time	0.30 min
work hour	50 min		

Description: Spread redbed in West Cap

Equipment: **CAT 631-G - Quarry 3**

Volume	0 cy	Time	0 hours
		Productivity	500 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	31 cy	loaded trip time	1.00 min
grade (loaded)	10 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	500 ft	return trip time	0.30 min
work hour	50 min		

Description: Haul from West Cap and spread redbed in Quarry 2

Equipment: **CAT 631-G - Quarry 4**

Volume	128,701 cy	Time	698 hours
		Productivity	184 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	31 cy	loaded trip time	4.75 min
grade (loaded)	10 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	2,500 ft	return trip time	1.00 min
work hour	50 min		

Description: Spread redbed in Quarry 2

Equipment: **CAT 631-G - Quarry 5**

Volume	0 cy	Time	0 hours
		Productivity	529 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	1.00 min
grade (loaded)	10 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	500 ft	return trip time	0.30 min
work hour	50 min		

Description: Spread redbed in Quarry 4

Equipment: *CAT 631-G - Quarry 6*

Volume	96,368 cy	Time	182 hours
		Productivity	529 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	1.00 min
grade (loaded)	10 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	500 ft	return trip time	0.30 min
work hour	50 min		

Description: Spread redbed in Quarry 6

Equipment: *CAT 631-G - Quarry 7*

Volume	0 cy	Time	0 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 8

Equipment: *CAT 631-G - Quarry 8*

Volume	92,286 cy	Time	161 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 10

Equipment: CAT 631-G - Quarry 10

Volume	240,140 cy	Time	419 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 15

Equipment: CAT 631-G - Quarry 15

Volume	94,664 cy	Time	165 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 17

Equipment: CAT 631-G - Quarry 17

Volume	113,692 cy	Time	198 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 18

Equipment: CAT 631-G - Quarry 18

Volume	31,816 cy	Time	56 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min

heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 19

Equipment: *CAT 631-G - Quarry 19*

Volume	21,552 cy	Time	38 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

Description: Spread redbed in Quarry 19

Equipment: *CAT 631-G - Quarry 20*

Volume	0 cy	Time	0 hours
		Productivity	573 cy/hr-scraper
PERFORMANCE FACTORS			
struck capacity	21 cy	load time	0.60 min
heaped capacity	34 cy	loaded trip time	0.60 min
grade (loaded)	0 %	manuever and	0.70 min
rolling resistance	3 %	spread time	
haul distance	1,200 ft	return trip time	0.50 min
work hour	50 min		

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Productivity and Hours Required for Motorgrader Use---Grading

Tijeras Cement Plant
Worksheet #12
06/10/21

NOT USED

Total Cost \$442,848

Equipment Type	Owning and Operating Cost (\$/hr)	Labor Cost (\$/hr)	Time Req'd (hrs)	Total Cost (\$)	Total Production	Prod. Unit	Unit Cost (\$/unit)
Dozers-Earthmoving							
CAT D-8T Dozer w/SU Blade - Quarry 2	131.43	35.00	33	5,571		2,998 cy	1.86
CAT D-8T Dozer w/SU Blade - Quarry 3	131.43	35.00	0	0		0 cy	#DIV/0!
CAT D-8T Dozer w/SU Blade - Quarry 4	131.43	35.00	26	4,270		12,870 cy	0.33
CAT D-8T Dozer w/SU Blade - Quarry 5	131.43	35.00	0	0		0 cy	#DIV/0!
CAT D-8T Dozer w/SU Blade - Quarry 6	131.43	35.00	41	6,839		9,637 cy	0.71
CAT D-8T Dozer w/SU Blade - Quarry 7	131.43	35.00	0	0		0 cy	#DIV/0!
CAT D-8T Dozer w/SU Blade - Quarry 8	131.43	35.00	22	3,742		9,229 cy	0.41
CAT D-8T Dozer w/SU Blade - Quarry 10	131.43	35.00	59	9,738		24,014 cy	0.41
CAT D-8T Dozer w/SU Blade - Quarry 15	131.43	35.00	23	3,839		9,466 cy	0.41
CAT D-8T Dozer w/SU Blade - Quarry 17	131.43	35.00	28	4,611		11,369 cy	0.41
CAT D-8T Dozer w/SU Blade - Quarry 18	131.43	35.00	8	1,290		3,182 cy	0.41
CAT D-8T Dozer w/SU Blade - Quarry 19	131.43	35.00	5	874		2,155 cy	0.41
Dozers-Grading							
D8R w/ SU blade - Plant Area	131.43	35.00	0	0		0 ac	#DIV/0!
D8R w/ SU blade - Disposal Area	131.43	35.00	0	0		0 ac	#DIV/0!
D8R w/ SU blade - Exploration Drill Pads	131.43	35.00	0	0		0 ac	#DIV/0!
D8R w/ SU blade - Haul & Access Roads	131.43	35.00	0	0		0 ac	#DIV/0!
D8R w/ SU blade - rock, all Sections	131.43	35.00	96	15,895		210 ac	75.63
Rippers							
D8R w/ multi-shank ripper	106.67	35.00	0	0		0 ac	#DIV/0!
D8R w/ multi-shank ripper	106.67	35.00	0	10		0 ac	133.34
Loaders							
	0	106.67	35.00	0	0	0 cy	#DIV/0!
Trucks							
	0	95.87	35.00	0	0	0 cy	#DIV/0!
Scrapers							
CAT 631-G - Quarry 2	160.31	35.00	60	11,712		29,983 cy	0.39
CAT 631-G - Quarry 3	160.31	35.00	0	0		0 cy	#DIV/0!
CAT 631-G - Quarry 4	160.31	35.00	698	136,318		128,701 cy	1.06
CAT 631-G - Quarry 5	160.31	35.00	0	0		0 cy	#DIV/0!
CAT 631-G - Quarry 6	160.31	35.00	182	35,590		96,368 cy	0.37
CAT 631-G - Quarry 7	160.31	35.00	0	0		0 cy	#DIV/0!
CAT 631-G - Quarry 8	160.31	35.00	161	31,461		92,286 cy	0.34
CAT 631-G - Quarry 10	160.31	35.00	419	81,865		240,140 cy	0.34
CAT 631-G - Quarry 15	160.31	35.00	165	32,272		94,664 cy	0.34
CAT 631-G - Quarry 17	160.31	35.00	198	38,758		113,692 cy	0.34
CAT 631-G - Quarry 18	160.31	35.00	56	10,846		31,816 cy	0.34
CAT 631-G - Quarry 19	160.31	35.00	38	7,347		21,552 cy	0.34
			2,259	\$442,848			
Total Labor Cost				\$79,053			

Data Source:

Cost Reference Construction Equipment Ownership and Operating Expense Schedule Region VI, US Army Corps of Engineers No. 2016
 2019 GCC Operator Labor hourly plus 40% benefits

BOND AMOUNT CALCULATION
 New Mexico Mining and Minerals Division
Revegetation Costs

Tijeras Cement Plant
 Worksheet #14
 06/10/21

Description:

Apply seed mix to areas and chain and plow.

Location Adjust.	Albuq.	101.7%
Total Cost		\$142,518

Area	Area (acres)	Unit Cost (\$/acre)	Subtotal Cost (\$)
Quarry 2	9.98	540	5,384
Quarry 4	2.15	540	1,160
Quarry 6	29.87	540	16,115
Quarry 8	30.44	540	16,423
Quarry 10	74.71	540	40,307
Quarry 15	43.58	540	23,512
Quarry 17	35.20	540	18,991
Quarry 18	9.86	540	5,320
Quarry 19	6.69	540	3,609
Potential interseeding	4.2	313	1,315
Annual monitoring		8,000	8,000
Total	242.48		140,136

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Other Reclamation Activity Costs

Tijeras Cement Plant
Worksheet #15
06/10/21
0

NOT USED

BOND AMOUNT CALCULATION
 New Mexico Mining and Minerals Division
Reclamation Bond Summary

Tijeras Cement Plant
 Worksheet #16
 06/10/21

DIRECT COSTS	Facility and Structure Removal		\$0
	Earthmoving		\$442,848
	Revegetation @ percent bonded	160%	\$228,029
	Other		\$0
		Subtotal	
	Cost Escalation Period (years)	5	
	Cost Escalation Rate	2.2%	
	Adjusted Subtotal		\$746,164
INDIRECT COSTS	Construction Indirect Costs	60%	\$447,698.68
	Liability Insurance (1.5% of \$74,632 labor costs)		\$1,186
TOTAL BOND AMOUNT			\$1,195,049