State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

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Deputy Cabinet Secretary

Fernando Martinez, Director
Mining and Minerals Division

December 12, 2013

Gilbert Tafoya, Lands Director
Pueblo of Santa Clara
P.O. Box 580
Española, NM 87532

RE: Comments on the Application for Permit Modification 13-1, Cullum Mine, Permit No. RA003ME

Dear Mr. Tafoya,

The New Mexico Mining and Minerals Division ("MMD") received a submittal entitled, "Permit # RA003ME Request for modification of closure plan", ("Application") for the Cullum Pumice Mine, dated September 20, 2013, from Azurite, Inc., on behalf of the Pueblo of Santa Clara. MMD is processing the Application under Permit Modification 13-1. On October 7, 2013, MMD received an e-mail from Azurite, Inc., with information in support of the Application that included a proposed reclamation seed mix. On November 5, 2013, MMD deemed the Application administratively complete and sent request for comment letters to other state agencies pursuant to 19.10.3.303.L and 19.10.5.505.B(3) NMAC.

On November 18, 2013, MMD conducted an inspection of the Cullum Mine with staff from the New Mexico Department of Game & Fish ("NMDG&F") and the Pueblo of Santa Clara. MMD has received comment letters from the New Mexico Environment Department ("NMED"), NMDG&F, the New Mexico Department of Cultural Affairs ("NMDCA"); and e-mails from the New Mexico Office of the State Engineer ("NMOSE"), and the New Mexico State Forestry Division ("NMSFD"). NMED, NMDCA and the NMOSE stated in their letters that did not have any comments on the Application. Copies of the comment letter from the NMDG&F and the e-mail from the NMSFD are attached. Please respond to these comments in addition to the following MMD comments:

1. Site History and Modification to Plan Objectives, states that in August, 2009, six 50 foot long vegetation transects were used to assess the vegetative cover at the Cullum Mine. Please provide a copy of the results of the vegetation survey including a map showing the locations of the vegetation transects, a description of the data collection methods and the analysis of the data collected.

2. Plan Modification Proposal and Justification, states that the Santa Clara Pueblo proposes to forego all highwall removal at the Cullum Mine. Condition 9.D of Permit No. RA003ME requires that all highwalls higher than 15 feet shall be contoured to a 3H:1V or flatter slope, unless approved otherwise by MMD. The Application provides several justifications to support leaving the highwalls in place. Among the justifications are:

    a. The highwalls appear to be structurally stable, without joint or cleavage planes of weakness, weathering, or deterioration.
    b. The highwalls are not incongruent with nearby natural rock faces and exposed bedrock of similar lithologies. The highwalls visually "fit in" with the existing surroundings.
    c. Efforts to re-contour the highwalls would negatively affect the established vegetation at the mine pit floor that has developed over the past 30 years.
    d. The Santa Clara Pueblo has acquired all lands contiguous to the mine permit area and maintains highly restricted access to that area so that the highwalls do not present a hazard to the public or the members of the Santa Clara Pueblo. In addition, the Application proposes signage warning of fall danger that will be posted above and below the highwalls at the mine.

    Condition 9.D of Permit RA003ME allows MMD to approve alternatives to contouring the highwalls to a 3H:1V slope. Based on the justifications provided in the Application, MMD will approve leaving the open pit highwalls in place.

3. Plan Modification and Detail, states that, "The overburden material is a course [coarse] soil and fines mixture derived from volcanic tuff, with < 5% rock fragments up to 2.5 cm diameter. Soils were sampled and composited for analysis." Please describe the soil analyses performed and provide a copy of the results of the soil samples analyses.

4. Plan Modification and Detail, states that, "The newly graded and contour furrowed slopes will be broadcast seeded with a grass mix at a rate of 20 PLS/acre and mulched with clean straw mulch at a rate of 3000#/acre." The seed mix proposed in the October 7, 2013 e-mail from Azurite, Inc. is composed of several grass and forb species.

    a. Please describe the equipment and methods to be used for the proposed broadcast seeding.
    b. MMD recommends using a seed mix composed of cool and warm season grasses, forbs and shrubs species. The seed mix approved in Permit No. RA003ME for the Cullum Mine includes three shrub species: Fringed sage *(Artemesia frigida)*, Winterfat *(Ceratoides lanata)*, and Apache plume *(Fallugia paradoxa)*. Please provide the rationale for excluding these species from the proposed seed mix. MMD recommends re-instating these shrub species into the proposed seed mix. In addition, please note

that Permit RA003ME specifically excludes rubber rabbitbrush *(Chrysothamnus nauseosus)* from the approved seed mix.

c. MMD currently does not support the use of Alfalfa *(Medicago sativa)*, Orchardgrass *(Dactylis glomerata)* or Yellow Sweet Clover *(Melilotus officinale)* in the reclamation seed mix.
d. MMD interprets that, "20 PLS/acre" is intended to mean 20 pounds ("#") of Pure Live Seed ("PLS") per acre. Please confirm that this is the intended, proposed seeding rate.
e. The Plan Modification and Detail proposes an application rate of straw mulch of 3000#/acre for the proposed re-graded overburden piles. The Fall-2013 sub-section in the Timetable for Reclamation Activities in the Reclamation Cost Estimates states that, "straw mulch [will be] applied at 2000#/acre" to the same areas. These statements are inconsistent with each other. Please clarify what the proposed straw mulch application rate will be for the re-graded overburden piles. In addition, MMD recommends the use of "certified weed free" mulch in mine reclamation. Please confirm that only certified weed free straw mulch will be used.
f. Please describe the equipment and methods to be used for the proposed straw mulch application.

5. Plan Modification and Detail, states the, "Additional broadcast seeding and mulching is expected for two years succeeding initial work scheduled for 2013." Does the Reclamation Cost Estimates include costs for the addition seeding and mulching in the two years after the initial seeding has been performed?

6. Plan Modification and Detail, states that, "Access road within the permit area will also be seeded and mulched to promote vegetation." Are the quantities of seed and mulch and the labor required for seeding & mulching the access roads included in the Reclamation Cost Estimates?

7. Plan Modification and Detail, states that, "A couple of small product piles within the pit area have "self-reclaimed" with now mature trees and shrubs near the base of the mostly grass covered mounds." Please note that MMD promotes the active revegetation of reclaimed mine sites in order to meet the revegetation standards of the MMD permit within a 12 year period. This period includes interseeding to establish plant diversity. MMD will not approve "self-reclaimed" or "self or naturally revegetated" reclamation plans for areas disturbed by mining.

8. Plan Modification and Detail, states that the contour furrows of the regraded overburden piles will be installed using a D-6 or smaller bulldozer. How will the bulldozer be mobilized into the areas of the overburden piles? The mine access road is rutted in some places and may need to be improved in order to accommodate a truck and trailer to bring the bulldozer into the area of the overburden piles. Alternately, if the reclamation plan includes regrading the access road using the dozer, prior to the road being seeded and mulched, are the costs for grading the access road included in the Reclamation Cost Estimates?

9. Plan Modification and Detail, and Timetable for Reclamation Activities-Fall-2013, states that fertilizer will be applied pursuant to the recommendations of the UNM soils laboratory. MMD discourages the use of fertilizers in mine reclamation as it encourages the growth of weedy annual plant species such as Russian thistle and kochia.

10. Plan Modification and Detail, states that, "Old mining equipment and all trash will be removed from the site." The Reclamation Cost Estimates does not apparently include the cost for these activities. Please revise the Reclamation Cost Estimates to include the third party costs for removal of the mining equipment and trash from the permit area.

11. Plan Modification and Detail, states that, "Signage (minimum of 16) warning of mining highwalls and fall danger will be posted above and below the areas in question." The Reclamation Cost Estimates do not apparently include the cost of the signage. Please revise the Reclamation Cost Estimates to include the proposed signage.

12. Plan Modification and Detail, states that, "Fences, locked gates, berms and oversized ditches will be maintained and continually used to support the restricted entry status of the property." The Reclamation Cost Estimates does not apparently include the costs to maintain these items during the period between mine reclamation and the termination of Permit No. RA003ME. Please revise the Reclamation Cost Estimate to include maintenance of these items. In addition, the 1999 Cullum Mine Revegetation Plan commits to fencing of the entire permit area in order to control livestock entry. Please clarify whether the fencing of the mine area after reclamation is planned, and if so, please include the fencing costs in the Reclamation Cost Estimates.

13. Reclamation Cost Estimates, do not provide sufficient detail including the specific direct costs (i.e., unit costs for the equipment, materials and labor) and indirect costs (i.e., demobilization, contingencies, profit and overhead, management fees, procurements costs, etc.) for a third party to perform the reclamation described in the Application. MMD requires that reclamation cost estimates are based on the costs for a third party to perform the proposed reclamation of the mine site. Please provide a cost estimate that includes these details. An example of a detailed third party reclamation cost estimate used by the No Agua Mine is attached for your review. MMD can furnish you an electronic copy of this cost estimate, upon request. MMD has also published Guidelines for Estimating Reclamation Costs for Part 3 – Minimal Impact Exploration and Minimal Impact Mining and Part 4 – Regular Exploration Permit Applications. As you are aware, the Cullum Mine is permitted as a Part 3 –Minimal Impact Existing Mining Operation. A copy of this guideline may be viewed and downloaded from the Mining Act Reclamation Program ("MARP") website at:

http://www.emnrd.state.nm.us/MMD/MARP/MARPGuidanceGuidelines.html

and clicking on the guideline under the Financial Assurance Guidance link. The guideline may be helpful in estimating the third party reclamation costs for the two overburden piles that are proposed to be regraded and seeded and the reclamation of the access road, however, the costs for broadcast seed application to the 35 acre mine area; fencing, if applicable; signage; vegetation and erosion monitoring and maintenance may need to be itemized separately and based on quoted third party costs.

14. Reclamation Cost Estimates, estimates that mobilizing and operating a bulldozer to finish grade specifications will cost $10,000.00. Please provide a breakdown of how this cost was estimated including unit costs and references such as RS Means Heavy Construction Cost Data Guide, if applicable.

15. Reclamation Cost Estimates, provides cost estimates for seed, mulch and the equipment and labor to apply the seed and mulch to 35 acres of reclamation. Please provide a breakdown of how this cost was estimated including unit costs.

16. Reclamation Cost Estimates, estimates the cost for procuring 150 # of seed and 10 tons (20,000 #) of mulch. The Timetable for Reclamation Activities, Fall-2013, states that the seed will be broadcast at a rate of 20 #/acre over the approximate two acres of regraded overburden piles and no less than 10 #/acre over the other approximate 35 acres of reclaimed mine area. Based on the amount of seed that is proposed to be seeded, 40 # for the regraded overburden piles and 350 # for the other mine areas, a total of 390 # of seed would be needed. However, the Reclamation Cost Estimate provides a cost estimate for only 150 # of seed. Please clarify this apparent discrepancy, and revise the Reclamation Cost Estimate as necessary. In addition, please reconcile the difference between the amount of straw mulch estimated in the Reclamation Cost Estimate (10 tons or 20,000 #) and the amount that is specified in the Plan Modification Detail: 3,000 #/acre over the two acres of regraded overburden piles and 1,500 to 2,000 #/acre over the remaining 35 acre mine area. Based on the estimate of straw mulch to be applied in the Plan Modification Detail, approximately 60,000 # to over 75,000 # of straw mulch would be needed.

17. Timetable for Reclamation Activities, states that in the years following the regrading and seeding of the overburden piles and the seeding of the 35 acres of other reclaimed areas (Fall-2013), that monitoring and maintenance including vegetation studies will be performed. The Reclamation Cost Estimates do not include the third party costs to perform these tasks. Please revise the estimate to include the third party costs for performing the monitoring and maintenance proposed in the Timetable for Reclamation Activities.

18. Timetable for Reclamation Activities, 2017, states that, "Results of field monitoring will be reviewed and an action plan drawn up, if needed, to address any parameters not meeting minimum [revegetation] ground cover specification (40 % cover) and species diversity requirements." The 1999 Cullum Mine

Revegetation plan that was approved under Permit No. RA003ME states that, Revegetation will be considered successful when 75% of the total cover listed in this [The NRCS Range Site Description "Gravelly Hills" WP-2] range site description is not significantly different from the on-site measurement of total plant cover at a 90% level of statistical confidence, and when this cover is composed of primarily non-invasive species." Please clarify whether the revegetation success standards proposed in the Application are consistent with the revegetation success standards of the 1999 Cullum Mine Revegetation Plan, or if the proposed revegetation success standards are different from the approved standards.

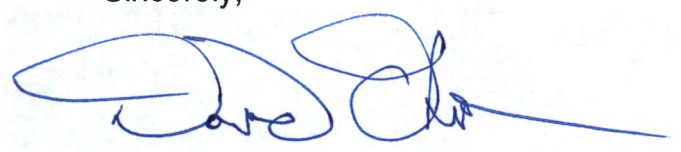
19. Timetable for Reclamation Activities, provides a timeline for a final site inspection, release of the surety bond financial assurance instrument, and the termination of Permit No. RA003ME. The 2023 date is 10 years after the projected initiation of the reclamation of the mine (2013). Pursuant to 19.10.12.1204.A NMAC, MMD shall retain the amount of financial assurance necessary for a third party to re-establish vegetation for a period of 12 years after the last year of augmented seeding. For example, if the reclamation of the overburden piles is performed in 2014, including seeding, then the 12 year period would begin in 2014 and the reclaimed areas could be eligible for financial assurance release in 2026. Please revise the Timetable for Reclamation Activities pursuant to the MMD requirements.

20. Timetable for Reclamation Activities, states that during the period after seeding that the reclaimed areas would undergo "monitoring and maintenance" including vegetation studies by a third party for plant density and diversity in 2017. The 1999 Cullum Mine Revegetation Plan specifies three periods of revegetation success monitoring. The first vegetation monitoring will be performed in the fall following the seeding. The second vegetation monitoring will be performed during the sixth year after seeding and the third vegetation monitoring will be performed during the last two years of the bonding period (i.e., years 11 and 12 after seeding). The Mining Act Reclamation Program ("MARP") Closeout Plan Guidelines calls for revegetation success monitoring to be performed, at a minimum, during the last two years of the bonding period. Please revise the Timetable for Reclamation Activities and the Reclamation Cost Estimates to include revegetation success monitoring during the last two years of the bonding period (i.e., years 11 and 12 after seeding) in addition to any proposed vegetation monitoring during the period between seeding and year 12 after seeding.

Please respond to the MMD comments and the attached comments from the NMDG&F and the NMSFD within 60 days of receipt of this letter.

If you have any questions, please contact me at (505) 476-3432 or at David.Ohori@state.nm.us.

Sincerely,



David R. Ohori
Permit Lead

Enclosures

cc: Ken Klco, Azurite, Inc.
Holland Shepherd, Manager, Mining Act Reclamation Program
Mine File (RA003ME)

GOVERNOR
Susana Martinez

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STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

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www.wildlife.state.nm.us

November 19, 2013

David Ohori, Permit Lead
EMNRD Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe NM 87505

RE: Cullum Mine, Modification 13-1 to Permit RA003ME; NMDGF Project No. 16062

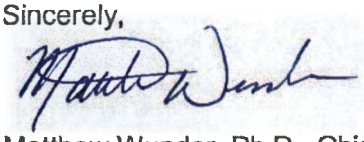
Dear Mr. Ohori:

In response to your letter dated November 5, 2013, the New Mexico Department of Game and Fish (Department) has reviewed the above referenced document. In 1999 a reclamation-only permit was issued for the Cullum Mine, an open-pit pumice mine owned by Santa Clara Pueblo and last operated in the 1970s. The proposed modification would allow the Pueblo to leave in place the pit highwalls and all overburden piles with the exception of two piles which currently show the greatest erosion and least vegetation. The site is located in Section 17, Township 20N, Range 7E, in Rio Arriba County. A site inspection was conducted on November 18, 2013 by representatives of MMD, the Department, and the Pueblo.

Diverse native vegetation has become established in the pit bottoms, including mature ponderosa pine trees. The pit walls appear to be stable, so the Department concurs with leaving them in place as is, rather than creating new surface disturbance by knocking them down. Vegetation coverage on the various overburden stockpile surfaces is patchy. The permit modification proposes to interseed approximately 35 acres of existing vegetation in order to meet the established vegetation success standard. The Department concurs with interseeding overburden piles as needed. We recommend the non-native species alfalfa, orchardgrass, and yellow sweet-clover be removed from the seed mix. Species as listed on the Natural Resources Conservation Service "Woodland Grazing Guide" (appended to the 1999 Cullum Mine Revegetation Plan) can be substituted as appropriate. We also recommend adding the shrub winterfat as a highly nutritional browse for mule deer and elk. The proposal is to seed 10-20 lbs./acre on 35 acres, but the cost estimate is for 150 lbs. total, which would only provide approximately 4.3 lbs./acre.

Thank you for the opportunity to comment on this permit action. No adverse impact to wildlife or habitat is expected. If there are any questions, please contact Rachel Jankowitz, Mining Habitat Specialist at 505-476-8159 or rjankowitz@state.nm.us.

Sincerely,



Matthew Wunder, Ph.D., Chief
Ecological and Environmental Planning Division

cc: USFWS NMES Field Office
Kurt Vollbrecht, NMED Groundwater Quality Bureau

Ohori, David, EMNRD

From: Roth, Daniela, EMNRD
Sent: Friday, November 15, 2013 8:39 AM
To: Ohori, David, EMNRD
Subject: RE: Request for Comments on Cullum Mine, Modification 13-1 (Permit No. RA003ME)

Dear David Ohori:

Thank you for providing me with the opportunity to comment on the Cullum Mine, modification 13-1 (minimal impact Existing Mine, Permit No. RA003ME), in Rio Arriba County, NM.

There are no state listed endangered plants known from Rio Arriba County which could be impacted by this proposed action. However, I recommend against the use of non-native and potentially invasive plant species, currently proposed as part of the reclamation seed mix, in particular alfalfa (*Medicago sativa*), orchard grass (*Dactylis glomerata*), and yellow clover (*Melilotus officinale*). A variety of native grasses and forbs are available on the commercial market for reclamation purposes. These are adapted to the local climate and soil conditions and would contribute to the reclamation goal of increasing plant diversity and in reducing the erosion potential of the site.

Please let me know if I can be of further assistance.

Daniela Roth

BOTANY PROGRAM COORDINATOR
EMNRD-Forestry Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505
(505)476-3347 (Phone)
(505)476-3330 (Fax)
http://www.emnrd.state.nm.us/SFD/

BOND AMOUNT CALCULATION — No Agua Mine

New Mexico Mining and Minerals Division

General Information — 12/11/13

Applicant	Harborlite Corporation PO Box 338 Antonito, CO 81120	Contact: John Groves 719/376-5484
Permit Number	TA005RE	
Number of Acres	516 acres (max disturbance by 2019)	
Type of Operation	Existing/Surface/Perlite	
Location	Tres Piedras (No Agua Hills)	
Prepared by	Tony Sumner, Imerys	
Recommended Bond	**$1,133,745**	

BOND AMOUNT CALCULATION — No Agua Mine
New Mexico Mining and Minerals Division — Worksheet #1
Reclamation Description — 12/11/13
CEE

Describe worst-case reclamation scenario:

Remove buildings, sheds, equipment, tanks, fuel, and foundations

- Milling equipment, machinery, and metal buildings removed by salvage contractor (based on El Grande Mine)
- Remove abandoned equipment and debris
- Remove foundations (or cover) and dispose on-site

Earthmoving

- Cover Perlite Fines Dump with 1' depth of soil-overburden blend
- Cover low-slope areas of North Hill with 1' depth of perlite-overb. blend
- Cover low-slope areas of West Hill and South Hill Pits with 1' depth of soil-overburden blend
- Rip rap from West Hill and South Hill Pits to Overburden Waste Dumps (3" avg. cover over 10% of total area)
- Rip rap from North Hill Pit to Perlite Fines Dump (3" avg. cover)

Ripping

- Rip roads
- Rip bottom of North Hill Pit
- Rip North Hill area
- Rip top of Overburden Waste Dump
- Rip bottom of West Hill and South Hill Pits
- Rip plant area

Grading

- Grade all disturbed areas
- Remove/reclaim sediment basins

Revegetation

- Reveg low-slope areas of North Hill
- Reveg low-slope areas of West Hill and South Hill Pits
- Reveg Overburden Waste Dumps
- Reveg Perlite Fines Dump
- Reveg plant area
- Reveg roads

Other

- Construct rip rap channels and check dams

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Building Demolition

No Agua Mine
Worksheet #2
12/11/13
CEE

Location Adjust.	Santa Fe	89.8%
Subtotals	Buildings	$193,214
	Other	$29,894
	Disposal	$6,322
Total Cost		**$229,430**

Area Description	Material	Dimensions (ft)			Quantity	Unit	2008 Unit Cost ($/unit)	2008 Item Cost ($)	2012 Item Cost ($)
Buildings to be demolished:									
Mill	metal	*Removed by salvage contractor*							
Auxiliary Buildings	metal	*Removed by salvage contractor*						215,160	233,755
Office	metal	*Removed by salvage contractor*							
Other items to be demolished:									
Grizzley	conc/metal	25	30	15	417	cy	40.72	16,980	18,447
Foundations	conc				500	cy	32.62	16,310	17,720
Debris handling and disposal costs:									
Concrete, onsite	conc				1,000	cy	7.04	7,040	7,648
					Total Cost (unadjusted)			**$255,490**	**$277,570**

Data Source
RS Means 2008 Heavy Construction — Santa Fe location adjust. 89.8%

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

No Agua Mine
Worksheet #3
12/11/13
CEE

Item	Description	Volume (cy)	Origin	Destination	Haul Distance (ft)	Grade	Equipment
1	Reduce slopes, overburden waste dumps	0 *	toe	crest	150	30%	D9
2	Reduce slopes, perlite fines dump	32,548	crest	toe	300	-20%	D9
3	Cover West Hill Pit bottom	9,680	waste	West Hill	3,500	-1%	631E
4	Cover South Hill Pit bottom	10,325	waste	South Hill	3,000	-5%	631E
5	Rip rap to fines dump	20,167	North Hill	fines	5,000	-2%	966/773D
6	Rip rap to overburden waste dumps	2,017	West Hill	waste	2,500	8%	966/773D
7	Perlite fines to North Hill (top)	24,200	fines	N Hill (top)	6,000	2%	631E/D9
8	Perlite fines to North Hill Pit (bottom of pit)	8,067	fines	N Hill (pit))	5,400	-6%	631E/D9
9	Overburden to North Hill (top)	24,200	waste	N Hill (top)	13,000	1%	631E
10	Overburden to North Hill Pit (bottom of pit)	8,067	waste	N Hill (pit))	10,500	-4%	631E

* See note on Worksheet #4

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

No Agua Mine
Worksheet #4
12/11/13
CEE

Unit	Description	Area (ac)	Cover Depth (ft)	Swell Factor	Volume
North Hill (top)	Cover: perlite-overb. blend	30.0	1.00	1.00	48,400
North Hill (pit)	Cover: perlite-overb. blend	10.0	1.00	1.00	16,133
West Hill Pit	Cover: soil-overb. blend	6.0	1.00	1.00	9,680
South Hill Pit	Cover: soil-overb. blend	6.4	1.00	1.00	10,325
East Hill Pit	No disturbance to-date	0.0	0.0	0.0	0.0
Plant Area	Cover: perlite-overb. blend	20.0	1.00	1.00	32,267
Perlite Fines Dump	Cover: soil-overb. blend	50.0	1.00	1.00	80,667
Perlite Fines Dump	Reduce slope to 3:1				64,815
Overburden Waste Dump	Reduce slope to 3:1 *				93,333
Perlite Fines Dump	Rip rap from North Hill	50	0.25	1.00	20,167
Overburden Waste Dump	Rip rap from West Hill	5	0.25	1.00	2,017

* West Hill backfill quantity exceeds slope reduction quantity of Overburden Waste Dump, so 3:1 slope will be achieved with D9 grading after scrapers remove needed material

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

No Agua Mine
Worksheet #5
12/11/13
CEE

Description: Reduce slopes, perlite fines dump

Equipment:

D9---perlite fines dump slopes
300' push
fines & overburden (26-4: sand, damp)

Volume	**32,548**	**cy**	**Time**	**96**	**hours**
			Productivity	**339**	**cy/hr-dozer**
PERFORMANCE FACTORS					
material	1.00		operator	0.75	
grade	1.40		work hour	50	min/hr
soil weight correction	2850	lb/cy	visibility	1.00	
prod. method/blade	1.00		elevation	1.00	
normal production	480	cy/hr	direct drive trans.	1.00	

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

No Agua Mine
Worksheet #6
12/11/13
CEE

Description: Recontour all disturbed areas
Pits, plant area, dumps

Equipment: D9

Area	**230**	**ac**	**Time**	**119**	**hours**
			Productivity	**1.94**	**ac/hr-dozer**
PERFORMANCE FACTORS					
material	1.00		operator	0.75	
grade	1.00		work hour	50	min/hr
soil weight correction	2550	lb/cy	visibility	1.00	
prod. method/blade	1.00		elevation	1.00	
effective blade width	14.2	feet	direct drive trans.	1.00	
speed	2	miles/hr			

Worksheet #7
12/11/13
CEE

Productivity and Hours Required for Ripper-Equipped Dozer Use

Description: Rip plant area
Equipment: D9, plant area

Area	**20.0**	**ac**	**Time**	**18**	**hours**
Volume	**84,969**	**cy**	**Productivity**	**4.49**	**ac/hr-dozer**
PERFORMANCE FACTORS					
ripping length	500	ft	turn time	0.25	min/pass
ripper penetration	31.6	in	work hour	50	min/hr
pocket spacing	46.4	in			
no. of pockets	3				

Description: Rip North Hill
Equipment: D9, North Hill

Area	**55.4**	**ac**	**Time**	**50**	**hours**
Volume	**235,400**	**cy**	**Productivity**	**4.44**	**ac/hr-dozer**
PERFORMANCE FACTORS					
ripping length	400	ft	turn time	0.25	min/pass
ripper penetration	31.6	in	work hour	50	min/hr
pocket spacing	46.4	in			
no. of pockets	3				

Description: Rip Overburden Waste Dump top
Equipment: D9, Overburden Waste Dump top

Area	**36.2**	**ac**	**Time**	**31**	**hours**
Volume	**153,904**	**cy**	**Productivity**	**4.64**	**ac/hr-dozer**
PERFORMANCE FACTORS					
ripping length	2,000	ft	turn time	0.25	min/pass
ripper penetration	31.6	in	work hour	50	min/hr
pocket spacing	46.4	in			
no. of pockets	3				

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

No Agua Mine
Worksheet #8
12/11/13
CEE

Description: Load trucks at West Hill Pit

Equipment: 966, West Hill, rip rap 100' haul

Volume	**2,017**	**cy**	**Time**	**7.5**	**hours**
Net Bucket Capacity	**4.3**	**cy**	**Productivity**	**269**	**cy/hr-loader**
Loader Cycle Time	**0.79**	**min**			
PERFORMANCE FACTORS					
heaped bucket capacity	5.00	cy	haul time	0.13	min
bucket fill factor	0.85		return time	0.11	min
			cycle time	0.55	min
Operating Cost	50.88	$/hr	work hour	50	min/hr

Description: Load trucks at North Hill Pit

Equipment: 966, North Hill, rip rap 100' haul

Volume	**20,167**	**cy**	**Time**	**75**	**hours**
Net Bucket Capacity	**4.3**	**cy**	**Productivity**	**269**	**cy/hr-loader**
Loader Cycle Time	**0.79**	**min**			
PERFORMANCE FACTORS					
heaped bucket capacity	5.00	cy	haul time	0.13	min
bucket fill factor	0.85		return time	0.11	min
			cycle time	0.55	min
Operating Cost	50.88	$/hr	work hour	50	min/hr

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

No Agua Mine
Worksheet #9
12/11/13
CEE

Description: Rip rap to overburden waste dumps
Equipment: 773D, rip rap to overburden waste dump

Volume	**2,017**	**cy**	**Time**	**9**	**hours**
Truck Cycle Time	**28.0**	**min**	**Productivity**	**228**	**cy/hr**
PERFORMANCE FACTORS					
struck capacity	34.0	cy	haul time	8.6	min
heaped capacity	44.6	cy	return time	1.8	min
loader cycles per truck	10	/truck	loading time	7.9	min
no. of trucks (select)	3	trucks	truck exchange time	0.7	min
one-way haul	2,000	feet	dump/manuev. time	1.1	min
haul grade	7.5	%	work hour	50	min/hr
rolling resistance	4.0	%	Operating Cost	117.05	$/hr

	No. of Trucks	Hours	Trucks Cost	Loader Cost	Total Cost
	2	13	$3,563	$921	$4,485
Optimum====>	**3**	**9**	**$3,700**	**$638**	**$4,338**
	4	7	$3,837	$496	$4,334
	5	7	$4,797	$496	$5,293
	6	7	$5,756	$496	$6,252
	7	7	$6,715	$496	$7,212
	8	7	$7,675	$496	$8,171
	9	7	$8,634	$496	$9,130

Worksheet #9
12/11/13
CEE

Productivity and Hours Required for Truck Use

Description: Rip rap to fines dump
Equipment: 773D, rip rap to fines dump

Volume	**20,167**	**cy**	**Time**	**92**	**hours**
Truck Cycle Time	**29.1**	**min**	**Productivity**	**219**	**cy/hr**
PERFORMANCE FACTORS					
struck capacity	34.0	cy	haul time	6.0	min
heaped capacity	44.6	cy	return time	5.5	min
loader cycles per truck	10	/truck	loading time	7.9	min
no. of trucks (select)	3	trucks	truck exchange time	0.7	min
one-way haul	5,000	feet	dump/manuev. time	1.1	min
haul grade	-2.0	%	work hour	50	min/hr
rolling resistance	4.0	%	Operating Cost	117.05	$/hr

	No. of Trucks	Hours	Trucks Cost	Loader Cost	Total Cost
	2	138	$37,826	$9,781	$47,607
Optimum====>	**3**	**92**	**$37,826**	**$6,521**	**$44,347**
	4	75	$41,115	$5,316	$46,431
	5	75	$51,394	$5,316	$56,710
	6	75	$61,673	$5,316	$66,989
	7	75	$71,951	$5,316	$77,267
	8	75	$82,230	$5,316	$87,546
	9	75	$92,509	$5,316	$97,825

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

No Agua Mine
Worksheet #11
12/11/13
CEE

Description: Cover South Hill Pit bottom

Equipment: 631D, cover pit bottom (South Hill)

Volume	**10,325**	**cy**	**Time**	**48**	**hours**
			Productivity	**217**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.6	min
heaped capacity	31	cy	loaded trip time	2.1	min
grade (loaded)	-5	%	manuever and	0.7	min
rolling resistance	5	%	spread time		
haul distance	3000	ft	return trip time	2.6	min
work hour	50	min			

Description: Cover West Hill Pit bottom

Equipment: 631D, cover pit bottom (West Hill)

Volume	**9,680**	**cy**	**Time**	**47**	**hours**
			Productivity	**206**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.6	min
heaped capacity	31	cy	loaded trip time	2.6	min
grade (loaded)	-1	%	manuever and	0.7	min
rolling resistance	5	%	spread time		
haul distance	3500	ft	return trip time	2.4	min
work hour	50	min			

Productivity and Hours Required for Scraper Use

Worksheet #11
12/11/13
CEE

Description: Perlite fines to North Hill (top)

Equipment: 631D, perlite fines to North Hill (top) (w/ scraper assist)

Volume	**24,200**	**cy**	**Time**	**188**	**hours**
			Productivity	**129**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.6	min
heaped capacity	31	cy	loaded trip time	6.7	min
grade (loaded)	2	%	manuever and	0.7	min
rolling resistance	5	%	spread time		
haul distance	6000	ft	return trip time	2.1	min
work hour	50	min			

Description: Perlite fines to North Hill Pit (bottom of pit)

Equipment: 631D, perlite fines to North Hill Pit (bottom) (w/ scraper assist)

Volume	**8,067**	**cy**	**Time**	**52**	**hours**
			Productivity	**157**	**cy/hr-scraper**
PERFORMANCE FACTORS					
struck capacity	21	cy	load time	0.6	min
heaped capacity	31	cy	loaded trip time	2.0	min
grade (loaded)	-6	%	manuever and	0.7	min
rolling resistance	5	%	spread time		
haul distance	5400	ft	return trip time	5.0	min
work hour	50	min			

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Summary Calculation of Earthmoving Costs

No Agua Mine
Worksheet #13
12/11/13
CEE

Total Cost	$202,098

	2008							2012						
Equipment Type	Owning and Operating Cost ($/hr)	Labor Cost ($/hr)	Time Req'd (hrs)	Total Cost ($)	Total Production	Prod. Unit	Unit Cost ($/unit)	Owning and Operating Co ($/hr)	Labor Cost ($/hr)	Time Req'd (hrs)	Total Cost ($)	Total Production	Prod. Unit	Unit Cost ($/unit)
Dozers-Earthmoving														
D9---perlite fines dump slopes		39.85	96.0	3,827	32,548	cy	0.12		39.85	96.0	3,827	32,548	cy	0.12
D9---scraper assist	133.50	39.85	239.5	41,520	NA	cy	NA	145.04	39.85	239.5	44,284	NA	cy	NA
Dozers-Grading														
D9	133.50	39.85	118.5	20,546	230	ac	89.33	145.04	39.85	118.5	21,913	230	ac	95.27
Loaders														
966, West Hill, rip rap	58.50	39.85	7.5	737	2,017	cy	0.37	63.56	39.85	7.5	775	2,017	cy	0.38
966, North Hill, rip rap	58.50	39.85	75.0	7,374	20,167	cy	0.37	63.56	39.85	75.0	7,753	20,167	cy	0.38
Trucks														
773D, rip rap to overburden waste dump	135.00	30.60	26.6	4,400	2,017	cy	2.18	146.67	30.60	26.6	4,710	2,017	cy	2.34
773D, rip rap to fines dump	135.00	30.60	276.2	45,733	20,167	cy	2.27	146.67	30.60	276.2	48,955	20,167	cy	2.43
Scrapers														
631D, cover pit bottom (South Hill)	133.05	39.85	47.7	8,240	10,325	cy	0.80	144.55	39.85	47.7	8,788	10,325	cy	0.85
631D, cover pit bottom (West Hill)	133.05	39.85	46.9	8,111	9,680	cy	0.84	144.55	39.85	46.9	8,650	9,680	cy	0.89
631D, perlite fines to North Hill (top)	133.05	39.85	188.0	32,508	24,200	cy	1.34	144.55	39.85	188.0	34,670	24,200	cy	1.43
631D, perlite fines to North Hill Pit (botto	133.05	39.85	51.5	8,905	8,067	cy	1.10	144.55	39.85	51.5	9,497	8,067	cy	1.18
Rippers														
D9, roads	133.50	39.85	8.6	1,496	10	ac	149.57	145.04	39.85	8.6	1,595	10	ac	159.53
D9, North Hill Pit floor	133.50	39.85	4.0	687	5	ac	149.57	145.04	39.85	4.0	732	5	ac	159.53
D9, West Hill Pit (north) floor	133.50	39.85	5.0	860	6	ac	156.08	145.04	39.85	5.0	917	6	ac	166.47
D9, plant area	133.50	39.85	17.8	3,089	20	ac	154.45	145.04	39.85	17.8	3,295	20	ac	164.73
D9, North Hill	133.50	39.85	49.9	8,648	55	ac	156.08	145.04	39.85	49.9	9,224	55	ac	166.47
D9, Overburden Waste Dump top	133.50	39.85	31.3	5,418	36	ac	149.57	145.04	39.85	31.3	5,779	36	ac	159.53
				$202,098							**$215,364**			

BOND AMOUNT CALCULATION
New Mexico Mining and Minerals Division
Revegetation Costs

No Agua Mine
Worksheet #14
12/11/13
CEE

2008

Description:

Apply mulch, fertilizer, and seed mix to areas and chain, plow, and crimp

Location Adjust.	Santa Fe	104.1%
Total Cost		**$191,544**

Area	Area (acres)	Unit Cost ($/acre)	Subtotal Cost ($)
North Hill Pit	40	800	32,000
West Hill and South Hill Pits	60	800	48,000
East Hill Pit	0	800	0
Plant Area	20	800	16,000
Overburden Waste Dump	50	800	40,000
Roads	10	800	8,000
Fines Waste Dump	50	800	40,000
	230		$184,000

Data Sources:

Means Construction Cost Data (2008)

2012

Description:

Apply mulch, fertilizer, and seed mix to areas and chain, plow, and crimp

Location Adjust.	Santa Fe	104.1%
Total Cost		**$208,098**

Area	Area (acres)	Unit Cost ($/acre)	Subtotal Cost ($)
North Hill Pit	40	869	34,766
West Hill and South Hill Pits	60	869	52,148
East Hill Pit	0	869	0
Plant Area	20	869	17,383
Overburden Waste Dump	50	869	43,457
Roads	10	869	8,691
Fines Waste Dump	50	869	43,457
	230		$199,902

Data Sources:

Means Construction Cost Data (2012)

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

No Agua Mine
Worksheet #15
12/11/13
CEE

2008

Activity	Quantity	Unit	Unit Cost ($/unit)	Item Cost ($)
Rip rap channel crew (8 people, 3 weeks)	960	hr	20.00	19,200
Total				**$19,200**

2012

Activity	Quantity	Unit	Unit Cost ($/unit)	Item Cost ($)
Rip rap cha	960	hr	21.73	20,859
Total				**$20,859**

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

			No Agua Mine Worksheet #16 2008 Chris Eustice		No Agua Mine Worksheet #16 06/28/12 Tony Sumner
			2008		**2012**
DIRECT COSTS	Facility and Structure Removal		$229,430		$277,570
	Earthmoving		$202,098		$215,364
	Revegetation @ percent bonded	160%	$306,470		$319,843
	Other		$19,200		$20,859
	Subtotal		**$757,199**		**$833,636**
	Cost Escalation Period (years)	0			
	Cost Escalation Rate	0.0%			
	Adjusted Subtotal		**$757,199**		**$833,636**
INDIRECT COSTS	Mobilization and Demobilization (1%-5%)	2%	$15,144		$16,673
	Contingencies (2%-10%)	7%	$53,004		$58,355
	Engineering Redesign Fee (2%-10%)	6%	$45,432		$50,018
	Contractor Profit and Overhead (3%-14%)	10%	$75,720		$83,364
	Reclamation Management Fee (2%-7%)	5%	$37,860		$41,682
	MMD Procurement Cost (2%-10%)	6%	$45,432		$50,018
TOTAL BOND AMOUNT			**$1,029,790**		**$1,133,745**