

April 16, 2020

Cita Cisse CEMEX, Inc. P.O. Box 529 Lyons, CO 80540

Re: Dowe Flats Mine, Permit No. M-1993-041, Technical Revision No. 4 (TR-04), Adequacy Review No. 2

Mr. Cisse:

On April 10, 2020, the Division of Reclamation, Mining and Safety (Division) received your response to the Division's preliminary adequacy review sent on March 2, 2020 regarding Technical Revision No. 4 (TR-04).

After reviewing the materials submitted, the Division has identified the following adequacy items that must be addressed before an approval of TR-04 can be issued (and the reclamation bond can be calculated):

- 1) Your response in Item No. 1 clarifies a discrepancy between the affected area (464.9 acres) stated in the previously approved Technical Revision No. 2 (TR-02) and the affected area actually shown on the approved maps (499.9 acres). The Division appreciates this clarification, and as long as it is merely a correction of the accounting discrepancy in TR-02 and not a proposed increase in affected lands for the site, the Division will be sure to make this correction to the affected area upon approval of this revision. Your response did not specify the maximum allowed disturbed area proposed for the site (currently set at 105 acres). The Table 1: Current Status of Affected Area Lands included with your response separates the affected lands by disturbance type. Of the total 499.9 acres of affected lands, 185 acres are classified as "Final Reclamation" or "Undisturbed", leaving 314.9 acres of various types of disturbances. However, under the revegetation section of the bond estimate provided, a total of 324.4 acres will require revegetation for reclamation. Therefore, it is not clear what maximum disturbance is proposed at this time (499.9 acres, 315 acres, or 325 acres?). Please specify the maximum allowed disturbance at any time that is proposed in this revision. Please be sure this amount covers, at a minimum, all existing disturbances that have not been fully reclaimed in accordance with the approved reclamation plan.
- 2) Under the revegetation section of the bond estimate provided, the operator specifies areas that will be seeded with an upland seed mixture or a wetland seed mixture for reclamation. In order for the Division to calculate the reclamation bond for TR-04, a list of the grasses, legumes, forbs, shrubs, or trees to be planted must be provided for each of the proposed seed mixtures



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(upland and wetland), including the rates of seeding/planting per species in PLS pounds per acre. Your response in Item No. 10 (c) states the seed mixtures and seeding rates are included as defined in the currently approved reclamation plan. However, the Division was unable to find an upland seed mixture and a wetland seed mixture in the approved permit. The original 112c permit application submitted on June 1, 1993 included a total of eight different seed mixtures in Tables E-2 through E-9 (see enclosed pages 4-18 of Exhibit E from the application received on June 1, 1993), and the Division was unable to find any subsequent revisions in the permit file that included changes to these seed mixtures. Please specify which of the seed mixtures provided in Tables E-2 through E-9 represent the upland and wetland seed mixtures proposed in this revision. If none of the seed mixtures provided represent those proposed, please provide details of the two seed mixtures proposed, including their respective species and seeding/planting rates per species in PLS pounds per acre.

This completes the Division's 2^{nd} adequacy review of the materials submitted for TR-04. The decision date for TR-04 is currently set for **May 10, 2020**. If additional time is needed to address the adequacy item(s), an extension request must be received by our office prior to the decision date.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger

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Environmental Protection Specialist

Encl: Pages 4-18 of Exhibit E from the 112c permit application received on June 1, 1993

CC: Michael Cunningham, DRMS

Topsoil Placement

Topsoil will be replaced on graded slopes at depths indicated on Table E-1. Prior to placement, the graded slopes will be left rough to facilitate adhesion of the topsoil layer. Topsoil depth will be monitored during placement by reclamation personnel to verify that it is within the specified range.

Seedbed Preparation

Areas to be seeded will be ripped following topsoil placement to a depth of 18 inches to relieve subsoil compaction caused by heavy machinery traffic. Areas to be drill seeded will be cultipacked? If necessary, they will be diced to reduce clod size. If ready during the period of April 1 to October 1, the appropriate cover crop will be sown (see Mulching below). If outside that time range, 2 tons/ acre of clean long-fiber straw will be spread and crimped into the surface. Areas to be broadcast seeded will be harrowed immediately prior to and after seeding to assure maximal contact of seed with uncrusted soil and at least moderate seed burial depth.

Seed Mixes

Listed in Tables E-2 through E-9 are planting specifications for each of 8 different post-reclamation vegetation types. In these tables are included both seed mixes and nursery stock planting rates. For the seed mixes, rates of Pure Live Seed (PLS)/acre for drill seeding and broadcast seeding are shown. Plant communities to be created during reclamation include the following:

- Shallow Soil (Dry) Grassland (Table E-2) This type is planned for ridgetop sites and slope with southeast to southwest exposures. Topsoil depth will be 4 to 8 inches.
- Deep Soil (Moist) Grassland (Table E-3) This type is planned for valley bottom and other low slope areas of varying exposure. The deep soil (topsoil depth 15 to 21 inches) will allow optimal development of grass root systems. Although it is anticipated that moist conditions will prevail, it is not intended for this type to be a wetland community.
 - Toe Slope Grassland (Table E-4) This type is to be placed at the base of reclaimed slopes below Shallow Soil (Dry) Grassland, Dry Shrubland, or Moist

Shrubland to intercept and contain any sediment from runoff waters passing downslope from these communities from which, in particular, there can be expected to be a more limited ground cover for the short to medium term of vegetation development. Topsoil will be 9 to 15 inches deep.

- Dry Shrubland (Table E-5) This type is to be placed on southeast to southwest exposures on shallow soil (topsoil depth 2 to 6 inches).
- Moist Shrubland (Table E-6) To be placed on steep to moderately steep northeast to northwest facing slopes on shallow soil (topsoil depth 2 to 6 inches), this type will include a variety of tall shrubs that will provide food, shelter, and breeding habitat to a large variety of mammalian and avian species.
- Herbaceous Wetland (Table E-7) This community will be established in low areas that will be wetted by ground water seepage and capillary rise from the water table. Topsoil depth will 9 to 15 inches.
- Wooded Wetland (Table E-8) In this community, tall shrubs and trees that tolerate wetland soil conditions will be planted. Substrates in which these will be placed will be 15 to 20 inches of topsoil, with surface elevations set slightly (6 to 12 inches) above water table to allow roots "breathing space. In addition to the species listed, it is anticipated that cottonwoods (Populus spp.) will volunteer in various locations both in this and the preceding type. Crack willows will not be planted.
 - Cottonwood Groves (Table E-9) Areas of cottonwood grove are planned to provide avian (especially raptor) perches as the trees eventually mature. Topsoil depth will be 21 to 27 inches. These areas will be located in concave areas, both in valley bottoms and in upper elevation depressions. To provide the necessary physical features needed for raptor perching before the trees grow tall enough, artificial perches will be provided, consisting of a Wolmanzied pole extending 40 feet above the surface, with a cross-bar at the top, and another located about 5 ft. below.

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Seeding Methods

Drill seeding will proceed on slopes of 2(h):1(v) or less steep, oriented on the contour. The seed drill will be a "Grassland" type drill with at least two seed boxes, one of which will have picker wheels, or other means of handling fluffy seed. It will be equipped with double disk furrow openers, depth bands set at 1/4 to 1/2 inch, and packer wheels or drag chains. During planting, the legume, smooth, or small seed box will be filled with the aggressive cool season species indicated in the Plant Material Mixes (Tables E-2 through E-9) and every second and third drop tube out of this box will be blocked so that these aggressive species are placed only in every third furrow; thus, in two furrows of each three, the less aggressive cool season grasses, as well as the warm season grasses and the forbs (and shrubs, where applicable) will be planted alone. This will allow these less aggressive species to develop without the often fatal direct competition of more aggressive cool season grasses. (Note that these listed mixes do not include any of the extremely aggressive introduced cool season grasses that so often overwhelm all other components, even in seed mixes that seem to contain a large proportion of native species).

Broadcast seeding will be undertaken on slopes steeper than 2(h):1(v). Seeding rates for broadcast are higher than for drill seeding because some substantial portion of seed sown by broadcast fall in microsites from which successful germination and establishment are impossible. Immediately prior to broadcast, the surface will be harrowed to expose freshly disturbed soil, which will result in optimal soil-seed contact; immediately following seeding, the surface will be lightly harrowed or raked to cover the seeds lightly.

Mulching

The preferred means of providing the protective cover necessary to shelter germinating seeds is use of a cover crop. Cover crop species and periods during which they may be profitably planted are listed in Table E-10. Use of cover crop is preferred because 1) it results in a stronger vertical surface structure than other mulching methods, providing much superior protection from erosive and desiccating effects of wind, 2) it provides more organic matter and often better surface cover than other forms of mulch, and 3) it reduces the possibility of introduction of additional weed seed. These cover crops will be sown using a drill equipped with coulter wheels and furrow openers spaced between 10 and 16 inches. If the seedbed is not ready to plant between April 1 and October 1, then use of a straw mulch will be undertaken. Two (2) tons of clean long-fiber straw will be spread and crimped into the soil surface prior to

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seeding. In areas to be broadcast seeded, seeding will precede application of mulch which will be either hydromulched with 1600 lbs. of thermally produced wood fiber mulch, or covered with 2 tons of clean long-fiber straw. In either case, the applied mulch will be anchored with 100 lbs/acre of Psyllium-based tackifier.

Temporary Surface Stabilization - Show these on a map + guel volume

Certain areas, such as topsoil stockpiles, roadcuts, or fills, will require establishment of a vegetational cover to protect the surface from erosion until disposition of the underlying material in final reclamation. Following completion of earthmoving, such temporary areas will be drill seeded with the seed mix indicated in Table E-11. After seeding, the area will be mulched as indicated in Mulching above, either with straw or hydraulically-applied wood fiber, and anchored with tackifier.

Fertilizer

Phosphate is the form of treble superphosphate will be spread at the rate of 30 lb P₂O₅ per acre during seedbed preparation and incorporated into the upper 6 inches of soil. Nitrogen as a slow-release form will be applied at the rate of 20 lbs. N per acre in the same fashion. After the preparation of the seedbed, no fertilizer amendments to permanently seeded areas are planned; such well-intentioned actions have proven to encourage the competition of weeds to the substantial detriment of desirable but often slow-growing native species.

Weed Control

Weed growth in the planted areas will be monitored and any development of weeds that may cause significant damage to the desirable planted species will be discouraged by mowing; or in the case of perennial plants listed as noxious in Colorado and Boulder County, plowed and replanted or treated with alglyphosate-based herbicide.

Control of Wild Browsers

One of the major potential problems that must be controlled in efforts to create wildlife habitat is protection of the young shrubs and trees from the depredation of some of the wildlife in whose benefit the eventual establishment of those plants rests. Units of reclaimed land will be enclosed with 8 foot-high fence that will remain in place for a period of 5 years after the planting of that area. This will allow the shrubs and trees to attain sufficient growth, above and below ground to withstand browsing pressure.

Shrub and Tree Planting

Woody plants are to be planted in the reclaimed areas using containerized nursery stock. These shrubs and trees will be planted at rates listed in the Tables E-2, E-4, E-5, E-6, and E-8. Wetland stock listed in Table E-7 will be planted as rhizomes or corms. Trees listed in Table E-9, will be planted as nursery stock in the calipers footnoted there.

Table E-1. Topsoil Placement Depths

Community Type	Avg. Depth (in.) Acres	Volume (cy)
Shallow Soil (Dry) Grassland	6	160	129,000
Shallow Soil Grassland with Pines	6	49	39,500
Deep Soil (Moist) Grassland	18	10	24,200
Toe Slope Grassland	12	72	116,000
Dry Shrubland	4	227	120,700
Moist Shrubland	4	95	50,500
Herbaceous Wetland	18	33	79,800
Wooded Wetland	12	3	4,800
Cottonwood Groves	24	12	38,700
Water	0	44	0
	To	otal 705	603,200

Note: Exhibit E shows the location and acreage of each vegetation community type.

Table E-2. Plant Material Mixes - Shallow Soil (Dry) Grassland

Scientific Name	Common Name - Variety	Seeding Rate (PL <u>Drill</u>	S lb/ac) ^b B'cast°
GRASSES			
Agropyron dasystachyum ^d	Thickspike Wheatgrass - Critana	0.4	1.0
Agropyron inermed	Beardless Bluebunch Whtgs - Whitmar	2.2	5.5
Agropuron riparium ^d	Streambank Wheatgrass - Sodar	0.6	1.5
Agropyron smithiid	Western Wheatgrass - Arriba	1.5	3.8
Agropyron spicatum ^d	Bluebunch Wheatgrass - Secar	1.9	4.8
Bouteloua curtipendula	Sideoats Grama - Vaughn	0.9	2.3
Bouteloua gracilis	Blue Grama - Native, Alma	0.2	0.5
Buchloe dactyloides	Buffalo Grass	2.9	7.3
Festuca arizonica ^d	Arizona Fescue - Redondo	0.6	1.5
Koeleria macrantha	Junegrass	0.03	0.08
Oryzopsis hymenoides	Indian Ricegrass - Nezpar, Paloma	1.9	4.8
Poa canbyi	Canby Bluegrass - Canbar	0.2	0.5
Schizachyrium scoparium	Little Bluestem - Blaze, Pastura	1.0	2.5
Stipa comata	Needleandthread	1.4	3.5
Stipa viridula	Green Needlegrass - Lodorm	0.9	2.3
<u>FORBS</u>			
Achillea lanulosa	Western Yarrow	0.01	0.03
Aster glaucodes	Glaucous Aster	0.06	0.15
Coreopsis tinctoria	Plains Coreopsis	0.03	0.08
Heliomeris multiflora	Showy Goldeneye	0.03	0.08
Linum lewisii	Blue Flax	0.11	0.28
Medicago sativa	Alfalfa - Ladak	0.16	0.40
Penstemon palmeri	Palmer Penstemon - Cedar	0.05	0.13
Petalostemon purpureum	Purple Prairie Clover - Kanab	0.11	0.28
Ratibida columnifera	Prairie Coneflower	0.03	0.08
Sphaeralcea coccinea	Orange Globemallow	0.06	0.15
SHRUBS			
Atriplex canescens	Fourwing Saltbush	1.3	3.3
Cercocarpus montanus	Birch-leaf Mountain Mahogany	1.2	3.0
Chrysothamnus nauseosus	Rubber Rabbitbrush	0.2	0.5
Cercocarpus montanus Chrysothamnus nauseosus	Birch-leaf Mountain Mahogany Rubber Rabbitbrush	Planting Stems / a400	icre

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed Broadcast seeded More aggressive species that will be sown only in every third drill furrow.

Table E-3. Plant Material Mixes - Deep Soil (Moist) Grassland

Scientific Name	Common Name - Variety	Seeding Rate (PI <u>Drill</u>	S lb/ac) ^b B'cast ^c
GRASSES			
Agropyron dasystachyum ^d	Thickspike Wheatgrass - Critana	0.7	1.8
Agropyron riparium ^d	Streambank Wheatgrass - Sodar	0.7	1.8
Agropyron smithiid	Western wheatgrass - Arriba	2.0	5.0
Agropyron trachycaulum ^d	Slender Wheatgrass - San Luis	0.7	1.8
Andropogon gerardii	Big Bluestem - Champ, Native	2.0	5.0
Elymus cinereus ^d	Basin Wildrye - Magnar	0.5	1.3
Festuca rubra	Creeping Red Fescue - Dawson	0.1	0.3
Panicum virgatum	Switchgrass - Nebraska 28	0.6	1.5
Poa ampla	Big Bluegrass - Sherman	0.1	0.3
Poa compressa	Canada Bluegrass - Reubens	0.02	0.05
Sorghastrum nutans	Indiangrass - Holt	1.2	3.0
Stipa viridula	Green Needlegrass - Lodorm	1.2	3.0
<u>FORBS</u>			
Achillea lanulosa	Western Yarrow	0.04	0.10
Aster adscendens	Pacific Aster	0.04	0.10
Gaillardia aristata	Blanketflower	0.33	0.83
Hedysarum boreale	Sweetvetch	0.30	0.75
Linum lewisii	Blue Flax	0.15	0.38
Medicago sativa	Alfalfa - Ladak	0.13	0.33
Monarda fistulosa	Horsemint	0.03	0.08
Penstemon strictus	Rocky Mountain Penstemon - Bandera	0.07	0.18
Solidago rigida	Stiff Goldenrod	0.06	0.15
Thermopsis divaricarpa	Goldenbanner	0.40	1.00

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed Broadcast seeded More aggressive species that will be sown only in every third drill furrow.

Table E-4. Plant Material Mixes - Toe Slope Grassland

		Seeding Rate (P	LS (b/ac)b
Scientific Name	Common Name - Variety	<u>Drill</u>	B'cast ^c
GRASSES			
Agropyron dasystachyum	Thickspike Wheatgrass - Critana	2.1	5.3
Agropyron riparium	Streambank Wheatgrass - Sodar	2.1	5.3
Agropyron smithii	Western Wheatgrass - Arriba	4.6	11.5
Andropogon gerardii	Big Bluestem - Champ or Pawnee	2.5	6.3
Elymus cinereus	Basin Wildrye - Magnar	2.5	6.3
Elymus triticoides	Creeping Wildrye - Shoshoni	6.4	16.0
FORBS			
Medicago sativa	Alfalfa - Ladak	0.2	0.5
SHRUBS Rhus glabra v. cismontana	Smooth Sumac	Planting Stems / 400	acre

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed Broadcast seeded

Table E-5. Plant Material Mixes - Dry Shrubland

Scientific Name	Common Name - Variety	Seeding Rate (F <u>Drill</u>	S PLS lb/ac) ^b B'cast ^c
GRASSES			
Agropyron inerme ^d	Beardless Bluebunch Whtgs Whitmar	2.3	5.8
Bouteloua curtipendula	Sideoats Grama -Vaughn	1.7	4.3
Bouteloua gracilis	Blue Grama - Alma	0.4	1.0
Festuca arizonica ^d	Arizona Fescue - Redondo	0.6	1.5
Oryzopsis hymenoides	Indian Ricegrass - Paloma	1.5	3.8
<u>FORBS</u>			
Aster glaucodes	Glaucous Aster	0.20	0.50
Heliomeris multiflora	Showy Goldeneye	0.12	0.30
Linum lewisii	Blue Flax - Appar	0.50	1.25
Penstemon palmeri	Palmer Penstemon	0.21	0.53
Solidago rigida	Rigid Goldenrod	0.17	0.43
		Planting	z Rate
<u>SHRUBS</u>		Stems /	-
Atriplex canescens	Fourwing Saltbush	200	
Cercocarpus montanus	Birch-leaf Mountain Mahogany	400	
Chrysothamnus nauseosus	Rubber Rabbitbrush	100	
Krascheninnikovia lanata	Winterfat	100	
Rhus trilobata	Three-leaf Sumac	100	
MIND HILLDRIN	imee-ieai buillac	100	

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed Broadcast seeded More aggressive species that will be sown only in every third drill furrow.

Table E-6. Plant Material Mixes - Moist Shrubland

		Seeding Rate (PL	S lb/ac) ^b
Scientific Name	Common Name - Variety*	<u>Drill</u>	B'castc
GRASSES Agropyron trachycaulum Festuca rubra	Slender Wheatgrass - Premier, San Luis Creeping Red Fescue - Dawson	0.3 0.1	0.8 0.3
Poa compressa	Canada Bluegrass - Reubens	0.02	0.05
SHRUBS	Market Mark	Planting Stems / a	
Acer glabrum	Mountain Maple	40 60	
Amelanchier alnifolia	Serviceberry Red Hawthorn	40	
Crataegus erythropoda Physocarpus monogynus	Ninebark	40	
Prunus americanus	American Plum	60	
Prunus virginiana	Black Chokecherry	60	
Quercus gambelii	Gambel's Oak	60	
Ribes aureum	Golden Currant	40	
Ribes inerme	Gooseberry	40	
Symphoricarpos albus	Common Snowberry	40	
Symphoricarpos occidentalis	Western Snowberry	40	

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed Broadcast seeded

Table E-7. Plant Material Mixes - Herbaceous Wetland

Scientific Name	Common Name - Variety	Seeding Rate (P <u>Drill</u>	LS lb/ac) ^b B'cast ^c
GRASSES Asclepias incarnata Scirpus paludosus Typha latifolia	Swamp Milkweed Alkali Bulrush Broadleaf Cattail	NA NA NA	0.25 2.0 2.0
Juncus arcticus Sagittaria latifolia Scirpus acutus Scirpus pungens	Baltic Rush Common Arrowhead Hardstem Bulrush Threesquare	Planting Stems /100400500	<u>acre</u>

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed Broadcast seeded

Table E-8. Plant Material Mixes - Wooded Wetland

Scientific Name	Common Name - Variety	Seeding Rate (PL <u>Drill</u>	S lb/ac) ^b B'cast ^c
GRASSES Agropyron trachycaulum Agrostis alba Elymus canadensis	Slender Wheatgrass - Premier, San Luis Redtop Canada Wildrye	0.3 0.0003 0.3	1.0 0.001 1.0
SHRUBS Alnus tenuifolia Betula fontinalis Lonicera involucrata Pentaphylloides floribunda Salix amygdaloides Salix exigua Salix interior Salix bebbiana Swida sericea	Thinleaf Alder Western Riverbirch Twinberry Shrubby Cinquefoil Peachleaf Willow Coyote Willow Sandbar Willow Bebb Willow Red-osier Dogwood	Planting Stems / a404020402020	

^{*}Variety unnamed native unless specified b PLS = Pure Live Seed c Broadcast seeded

Table E-9. Plant Material Mixes -Cottonwood Grove

Scientific Name	Common Name - Variety	Seeding Rate (PL <u>Drill</u>	S lb/ac) ^b B'cast ^c
GRASSES			
Agropyron trachycaulum	Slender Wheatgrass - Premier, San Luis	0.3	0.8
Elymus triticoides	Creeping Wildrye - Shoshoni	0.9	2.3
Festuca rubra	Creeping Red Fescue - Dawson	0.1	0.3
		Planting	Rate
TREES		Stems / ac	cre
Populus x acuminata	Lanceleaf Cottonwoodd	200	
Populus deltoides	Plains Cottonwood ^d	200	

^a Variety unnamed native unless specified ^b PLS = Pure Live Seed ^c Broadcast seeded ^d 20% 3/4 inch caliper, 40% 1 to 1.5 inch caliper, and 40% 2 to 2.5 inch caliper.

Table E-10. Cover Crops for Use in Revegetation

Crop	Date of Planting	Date of Seeding	Rate (PLS lb/ac)
Wheat/Wheatgrass Hybr	id		
("Regreen)	4/1 to 5/15	Next fall	35
	8/15 to 10/1	Next spring	35
Oats	4/1 to 5/15	Next fall	30
Winter Wheat	8/1 to 10/1	Next fall	25
Spring Barley	4/1 to 5/15	Next fall	30
Long-season (southern) sorghum	5/15 to 7/15	Next fall	10