STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
FAX: (303) 832-8106

M1976-007UG
✓ Complied!
5 Minor Infractions

CN01
0 Violations
ECS/mac/awa

COLORADO DIVISION OF RECLAMATION MINING & SAFETY

RECEIVED
AUG 02 2021
DIVISION OF RECLAMATION MINING & SAFETY

CONSTRUCTION MATERIALS
REGULAR (112) OPERATION
RECLAMATION PERMIT APPLICATION FORM

CHECK ONE: ☐ **There is a File Number Already Assigned to this Operation**

Permit # M -____-____-___ (Please reference the file number currently assigned to this operation)

☐ **New** Application (Rule 1.4.5) ☐ **Amendment** Application (Rule 1.10)
☑ **Conversion** Application (Rule 1.11)

Permit # M 1976 007 UG (provide for **Amendments** and **Conversions** of existing permits)

The application for a Construction Materials Regular 112 Operation Reclamation Permit contains three major parts: (1) the application form; (2) Exhibits A-S, Addendum 1, any sections of Exhibit 6.5 (Geotechnical Stability Exhibit; and (3) the application fee. When you submit your application, be sure to include one (1) complete signed and notarized **ORIGINAL** and one (1) copy of the completed application form, two (2) copies of Exhibits A-S, Addendum 1, appropriate sections of 6.5 (Geotechnical Stability Exhibit, and a check for the application fee described under Section (4) below. Exhibits should **NOT** be bound or in a 3-ring binder; maps should be folded to 8 1/2" X 11" or 8 1/2" X 14" size. To expedite processing, please provide the information in the format and order described in this form.

GENERAL OPERATION INFORMATION

Type or print clearly, in the space provided, ALL information requested below.

1. **Applicant/operator or company name (name to be used on permit)**: Acme Brick Company
   1.1 Type of organization (corporation, partnership, etc.): Corporation

2. **Operation name (pit, mine or site name)**: Golden Mine

3. **Permitted acreage (new or existing site)**: 9.0 permitted acres
   3.1 Change in acreage (+) 76.51 acres
   3.2 Total acreage in Permit area 85.51 acres

4. **Fees**:
   4.1 New Application $2,696.00 application fee
   4.2 New Quarry Application $3,342.00 quarry application
   4.4 Amendment Fee $2,229.00 amendment fee
   4.5 Conversion to 112 operation (set by statute) $2,696.00 conversion fee

5. **Primary commoditie(s) to be mined**: clay
   5.1 Incidental commoditie(s) to be mined: 1. NA - lbs/Tons/yr 2. / lbs/Tons/yr
   3. / lbs/Tons/yr 4. / lbs/Tons/yr 5. / lbs/Tons/yr
   5.2 Anticipated end use of primary commoditie(s) to be mined: brick
   5.3 Anticipated end use of incidental commoditie(s) to be mined: NA

6. **Name of owner of subsurface rights of affected land**: CO State Land Board
   If 2 or more owners, "refer to Exhibit O".

7. **Name of owner of surface of affected land**: CO State Land Board

8. **Type of mining operation**: ☑ Surface ☐ Underground

9. **Location Information**: The center of the area where the majority of mining will occur:

   COUNTY: Jefferson

   PRINCIPAL MERIDIAN (check one): ☑ 6th (Colorado) ☐ 10th (New Mexico) ☐ Ute

   SECTION (write number): S 16

   TOWNSHIP (write number and check direction): T 3 ☐ North ☑ South

   RANGE (write number and check direction): R 70 ☐ East ☑ West

   QUARTER SECTION (check one): ☐ NE ☐ NW ☐ SE ☑ SW

   QUARTER/QUARTER SECTION (check one): ☐ NE ☑ NW ☐ SE ☐ SW

   GENERAL DESCRIPTION: (the number of miles and direction from the nearest town and the approximate elevation):
   6160 ft elevation; 0.60 miles north on Hwy 93 from Pine Ridge Rd intersection north of Golden, CO.

10. **Primary Mine Entrance Location** (report in either Latitude/Longitude **OR** UTM):

    Latitude/Longitude:

    Example: (N) 39° 44′ 12.98″
    (W) 104° 59′ 3.87″

    Latitude (N): deg _____ min _____ sec ____._____ (2 decimal places)

    Longitude (W): deg _____ min _____ sec ____._____ (2 decimal places)

    OR

    Example: (N) 39.73691°
    (W) -104.98449°

    Latitude (N) 39 . 78774 (5 decimal places)

    Longitude(W) 105 . 23093 (5 decimal places)

    OR

    Universal Tranverse Mercator (UTM)

    Example: 201336.3 E NAD27 Zone 13
    4398351.2 N

    UTM Datum (specify NAD27, NAD83 or WGS 84) Nad 83 Zone 13

    Easting _____

    Northing _____

11. **Correspondence Information**:

APPLICANT/OPERATOR (name, address, and phone of name to be used on permit)

Contact's Name: **Ed Watson** Title: Executive Vice President Operations

Company Name: Denver Brick Company

Street/P.O. Box: 3024 Acme Brick Plaza P.O. Box:

City: Fort Worth

State: TX Zip Code: 76109

Telephone Number: (817) - 390-2472

Fax Number: (NA) -

PERMITTING CONTACT (if different from applicant/operator above)

Contact's Name: Angela Bellantoni Title: Consultant

Company Name: Environmental Alternatives Inc

Street/P.O. Box: P.O. Box: 326

City: Cañon City

State: CO Zip Code: 81215

Telephone Number: (719) - 275-8951

Fax Number: (NA) -

INSPECTION CONTACT

Contact's Name: Richard Murphy Title: Exploration Manager

Company Name: Acme Brick Company

Street/P.O. Box: 210 Acme Street P.O. Box:

City: Denton

State: TX Zip Code: 76205

Telephone Number: (940) - 435-5587

Fax Number: (NA) -

CC: STATE OR FEDERAL LANDOWNER (if any)

Agency: CO State Land Board; Benjamin Teschner, Solids Minerals Manager

Street: 1127 Sherman Street, Suite 300

City: Denver

State: CO Zip Code:

Telephone Number: (720) - 233-2014

CC: STATE OR FEDERAL LANDOWNER (if any)

Agency:

Street:

City:

State: Zip Code:

Telephone Number: ( ) -

12. **Primary future (Post-mining) land use (check one)**:

- [ ] Cropland(CR)
- [ ] Pastureland(PL)
- [ ] General Agriculture(GA)
- [x] Rangeland(RL)
- [ ] Forestry(FR)
- [ ] Wildlife Habitat(WL)
- [ ] Residential(RS)
- [ ] Recreation(RC)
- [ ] Industrial/Commercial(IC)
- [ ] Developed Water Resources(WR)
- [ ] Solid Waste Disposal(WD)

13. **Primary present land use (check one)**:

- [ ] Cropland(CR)
- [ ] Pastureland(PL)
- [ ] General Agriculture(GA)
- [ ] Rangeland(RL)
- [x] Forestry(FR)
- [ ] Wildlife Habitat(WL)
- [ ] Residential(RS)
- [ ] Recreation(RC)
- [ ] Industrial/Commercial(IC)
- [ ] Developed Water Resources(WR)

14. **Method of Mining**: Briefly explain mining method (e.g. truck/shovel): Front end loaders

15. **On Site Processing**: [x] Crushing/Screening

13.1 Briefly explain mining method (e.g. truck/shovel): _____

List any designated chemicals or acid-producing materials to be used or stored within permit area: NA

16. **Description of Amendment or Conversion**:

If you are amending or converting an existing operation, provide a brief narrative describing the proposed change(s).

Acme Brick is requesting an amendment to modify the permit boundary to increase permitted acres. This will allow clay stockpiles on a designated storage pad not in the mining area. ~~Because the stockpiles will no longer be in the actively mined area, reclamation can occur~~ contemporaneous to mining.

Maps and Exhibits:

Two (2) complete, unbound application packages must be submitted. One complete application package consists of a signed application form and the set of maps and exhibits referenced below as Exhibits A-S, Addendum 1, and the Geotechnical Stability Exhibit. Each exhibit within the application must be presented as a separate section. Begin each exhibit on a new page. Pages should be numbered consecutively for ease of reference. If separate documents are used as appendices, please reference these by name in the exhibit.

With each of the two (2) signed application forms, you must submit a corresponding set of the maps and exhibits as described in the following references to Rule 6.4, 6.5, and 1.6.2(1)(b):

EXHIBIT A	Legal Description
EXHIBIT B	Index Map
EXHIBIT C	Pre-Mining and Mining Plan Map(s) of Affected Lands
EXHIBIT D	Mining Plan
EXHIBIT E	Reclamation Plan
EXHIBIT F	Reclamation Plan Map
EXHIBIT G	Water Information
EXHIBIT H	Wildlife Information
EXHIBIT I	Soils Information
EXHIBIT J	Vegetation Information
EXHIBIT K	Climate Information
EXHIBIT L	Reclamation Costs
EXHIBIT M	Other Permits and Licenses
EXHIBIT N	Source of Legal Right-To-Enter
EXHIBIT O	Owners of Record of Affected Land (Surface Area) and Owners of Substance to be Mined
EXHIBIT P	Municipalities Within Two Miles
EXHIBIT Q	Proof of Mailing of Notices to County Commissioners and Conservation District
EXHIBIT R	Proof of Filing with County Clerk or Recorder
EXHIBIT S	Permanent Man-Made Structures
Rule 1.6.2(1)(b)	ADDENDUM 1 - Notice Requirements (sample enclosed)
Rule 6.5	Geotechnical Stability Exhibit (any required sections)

The instructions for preparing Exhibits A-S, Addendum 1, and Geotechnical Stability Exhibit are specified under Rule 6.4 and 6.5 and Rule 1.6.2(1)(b) of the Rules and Regulations. If you have any questions on preparing the Exhibits or content of the information required, or would like to schedule a pre-application meeting you may contact the Office at 303-866-3567.

Responsibilities as a Permittee:

Upon application approval and permit issuance, this application becomes a legally binding document. Therefore, there are a number of important requirements which you, as a permittee, should fully understand. These requirements are listed below. Please read and initial each requirement, in the space provided, to acknowledge that you understand your obligations. If you do not understand these obligations then please contact this Office for a full explanation.

1. Your obligation to reclaim the site is not limited to the amount of the financial warranty. You assume legal liability for all reasonable expenses which the Board or the Office may incur to reclaim the affected lands associated with your mining operation in the event your permit is revoked and financial warranty is forfeited;

2. The Board may suspend or revoke this permit, or assess a civil penalty, upon a finding that the permittee violated the terms or conditions of this permit, the Act, the Mineral Rules and Regulations, or that information contained in the application or your permit misrepresent important material facts;

3. If your mining and reclamation operations affect areas beyond the boundaries of an approved permit boundary, substantial civil penalties, to you as permittee can result;

4. Any modification to the approved mining and reclamation plan from those described in your approved application requires you to submit a permit modification and obtain approval from the Board or Office;

5. It is your responsibility to notify the Office of any changes in your address or phone number;

6. Upon permit issuance and prior to beginning on-site mining activity, you must post a sign at the entrance of the mine site, which shall be clearly visible from the access road, with the following information (Rule 3.1.12):

   a. the name of the operator;

   b. a statement that a reclamation permit for the operation has been issued by the Colorado Mined Land Reclamation Board; and,

   c. the permit number.

7. The boundaries of the permit boundary area must be marked by monuments or other markers that are clearly visible and adequate to delineate such boundaries prior to site disturbance.

8. It is a provision of this permit that the operations will be conducted in accordance with the terms and conditions listed in your application, as well as with the provisions of the Act and the Construction Material Rules and Regulations in effect at the time the permit is issued.

9. Annually, on the anniversary date of permit issuance, you must submit an annual fee as specified by Statute, and an annual report which includes a map describing the acreage affected and the acreage reclaimed to date (if there are changes from the previous year), any monitoring required by the Reclamation Plan to be submitted annually on the anniversary date of the permit approval. Annual fees are for the previous year a permit is held. For example, a permit with the anniversary date of July 1, 1995, the annual fee is for the period of July 1, 1994 through June 30, 1995. Failure to submit your annual fee and report by the permit anniversary date may result in a civil penalty, revocation of your permit, and forfeiture of your financial warranty. It is your responsibility, as the permittee, to continue to pay your annual fee to the Office until the Board releases you from your total reclamation responsibility.

N/A 10. <u>For joint venture/partnership operators</u>: the signing representative is authorized to sign this document and a power of attorney (provided by the partner(s)) authorizing the signature of the representative is attached to this application.

NOTE TO COMMENTORS/OBJECTORS:

It is likely there will be additions, changes, and deletions to this document prior to final decision by the Office. Therefore, if you have any comments or concerns you must contact the applicant or the Office prior to the decision date so that you will know what changes may have been made to the application document.

The Office is not allowed to consider comments, unless they are written, and received prior to the end of the public comment period. You should contact the applicant for the final date of the public comment period.

If you have questions about the Mined Land Reclamation Board and Office's review and decision or appeals process, you may contact the Office at (303) 866-3567.

P.O. Box 326, Cañon City, CO 81215
angela@envalternatives.com
719-275-8951

Acme Brick Company

Regular (112) Operation
Reclamation Permit Application
For
Golden Mine
Jefferson County, CO

Application and Exhibits

Submitted

July 26, 2021

Certification:

As an authorized representative of the applicant, I hereby certify that the operation described has met the minimum requirements of the following terms and conditions:

1. To the best of my knowledge, all significant, valuable and permanent man-made structure(s) in existence at the time this application is filed, and located within 200 feet of the proposed affected area have been identified in this application (Section 34-32.5-115(4)(e), C.R.S.).

2. No mining operation will be located on lands where such operations are prohibited by law (Section 34-32.5-115(4)(f), C.R.S.;

3. As the applicant/operator, I do not have any extraction/exploration operations in the State of Colorado currently in violation of the provisions of the Colorado Land Reclamation Act for the Extraction of Construction Materials (Section 34-32.5-120, C.R.S.) as determined through a Board finding.

4. I understand that statements in the application are being made under penalty of perjury and that false statements made herein are punishable as a Class 1 misdemeanor pursuant to Section 18-8-503, C.R.S.

This form has been approved by the Mined Land Reclamation Board pursuant to section 34-32.5-112,C.R.S., of the Colorado Land Reclamation Act for the Extraction of Construction Materials. Any alteration or modification of this form shall result in voiding any permit issued on the altered or modified form and subject the operator to cease and desist orders and civil penalties for operating without a permit pursuant to section 34-32.5-123, C.R.S.

Signed and dated this 9th day of April, 2021.

Denver Brick Company
Applicant/Operator or Company Name

If Corporation Attest (Seal)

Signed: Ed Watson

Signed: [illegible]

Corporate Secretary or Equivalent

Title: Executive Vice President- Operations

Town/City/County Clerk

State of Texas)
) ss.
County of Tarrant)

The foregoing instrument was acknowledged before me this 9th day of April, 2021, —, by Ed Watson as Executive Vice President of Denver Brick Company

HERLY WOMACK
NOTARY PUBLIC
STATE OF TEXAS
MY COMM. EXP. 12/02/24
NOTARY ID 13280729-3

Herly Womack
Notary Public

My Commission expires: 12/02/2024

SIGNATURES MUST BE IN BLUE INK

You must post sufficient Notices at the location of the proposed mine site to clearly identify the site as the location of a

Introduction

Brick is an essential construction material with discoveries in southern Turkey dating back to 7000 BC. The first fired brick is dated 3500 BC which carried brick construction into cooler climates since brick no longer required to be baked in the sun. The Roman Empire further extended brick construction with the development of mobile kilns (Brick Architecture, 2017).

Unlike ubiquitous sand and gravel sources that can be processed into any number of construction products, clay sources consist of specific clays that produce a specific brick depending on the brick recipe and firing technique. The Golden Mine contains both clay and sandstone; plastic and non-plastic brick ingredients. As many as five different clays are found in the mine area. The clay can be mixed with the sandstone on site, resulting in even more brick variations. The value of the clay in this hogback formation is historic and economically essential.

The Golden Mine was initially an underground mine. Historic records document activity in the 1860's. The underground mine experienced groundwater challenges. The adits have since been closed and mining is limited to surface clay deposits. In fact, mining along the hogback extends north more than five miles. The resource rich geology provides construction material for infrastructure development, utilities, roads and housing developments.

Acme Brick Company (Acme) is submitting application to convert M-1976-007UG a 110 Permit to a 112 Permit. The permit boundary will increase from 9.0 acres to 85.51 acres with an affected area of 70.15 acres.

The CO State Land Board granted mineral leases to Denver Brick Company, aka Acme Brick Company, on January 14, 1941 and General Shale Brick Inc. (GS) on July 14, 1985. Denver Brick Company's lease includes minerals in 160 acres from the hogback ridge east to Highway 93 and ingress/egress to the highway. The mine, known as the Golden Mine, has provided up to five types of clay and sandstone used in brick manufacturing for over 80 years. GS's Flintlock Clay Mine was reclaimed in 2013 with the site and bond released in 2018.

The Golden Mine is a 9.0-acre clay mine that produces less than 20K tons of clay each year. Even though the mine has low production volume, this site provides minerals and sandstone that are critical for brick manufacturing. In a typical year, clay is mined, processed and stockpiled during two to three weeks each year. The stockpiled material is hauled to brick plants in 25 ton trucks as needed to meet market demand. Over the course of one year, 400 trucks per year or an average of one truck per day will haul material from the site.

This permit conversion will allow a 5 acre staging area consistent for the life of the mine. Processing and stockpiles will be located in the staging area. This configuration will limit activity immediately adjacent to the vertical face of the hogback, improving safety for miners and haulers. Reclamation will occur contemporaneously with mining. A 3H:1V slope will be contemporaneously constructed of interburden and other non-clay material at the toe of the mine face as mining progresses southward.

Table of Exhibits

6.4.1 Exhibit A: Legal Description

6.4.2 Exhibit B: Index Map

6.4.3 Exhibit C: Pre-mining and Mining Plan Map(s) Of Affected Lands

6.4.4 Exhibit D: Mining Plan

6.4.5 Exhibit E: Reclamation Plan

6.4.6 Exhibit F: Reclamation Plan Map

6.4.7 Exhibit G: Water Information

6.4.8 Exhibit H: Wildlife Information

6.4.9 Exhibit I: Soils Information

6.4.10 Exhibit J: Vegetation Information

6.4.11 Exhibit K: Climate

6.4.12 Exhibit L: Reclamation Costs

6.4.13 Exhibit M: Other Permits and Licenses

6.4.14 Exhibit N: Source of Legal Right to Enter

6.4.15 Exhibit O: Owners of Record of Affected Land (Surface Area) And Owners of Substance to be Mined

6.4.16 Exhibit P: Municipalities Within Two Miles

6.4.17 Exhibit Q: Proof of Mailing of Notices to County Commissioners and Soil Conservation District

6.4.18 Exhibit R: Proof of Filing with County Clerk and Recorder

6.4.19 Exhibit S: Permanent Man-Made Structures_Within 200 Feet of Affected Area

Addendum 1: Proof of Property Posting

6.4.1 Exhibit A
Legal Description

The proposed permit boundary will include land within CO State Land Board leases to General Shale (Lease No. 102418) and Denver Brick aka Acme Brick (Lease No. 102414).

The legal description of the proposed permit boundary:
The South ½ of the Southwest ¼ of the Northwest ¼ and the West ½ of the Southwest ¼ of Section 16, Township 3 South, Range 70 West of the 6th P.M. in Jefferson County, CO.

The legal description of the proposed affected area inside the above proposed permit boundary is provided herein.

The mine entrance, Longitude 105.23093°W and Latitude 39.78774° N, onto Hwy 93 north of Golden, CO.

LEGAL DESCRIPTION
AFFECTED AREA BOUNDARY

PART OF THE NORTHWEST QUARTER AND SOUTHWEST QUARTER, SECTION 16, TOWNSHIP 3 SOUTH, RANGE 70 WEST OF THE SIXTH P.M. JEFFERSON COUNTY, COLORADO

A PARCEL OF LAND LOCATED IN THE NORTHWEST AND SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 3 SOUTH, RANGE 70 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHWEST CORNER OF SAID SOUTHWEST QUARTER;
THENCE N0° 10' 40"E, ALONG THE WEST LINE OF SAID NORTHWEST QUARTER, A DISTANCE OF 297.85 FEET;
THENCE N70° 14' 12"E A DISTANCE OF 482.84 FEET; THENCE N90° 00' 00"E A DISTANCE OF 154.37 FEET;
THENCE N0° 00' 00"E A DISTANCE OF 512.35 FEET; THENCE N4° 36' 40"W A DISTANCE OF 107.10 FEET;
THENCE N25° 03' 17"W A DISTANCE OF 321.08 FEET; THENCE N6° 10' 46"W A DISTANCE OF 182.57 FEET;
THENCE N16° 19' 01"W A DISTANCE OF 128.73 FEET; THENCE N12° 09' 04"E A DISTANCE OF 103.05 FEET;
THENCE N24° 01' 46"E A DISTANCE OF 982.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF WEST 56TH AVENUE;
THENCE S89° 47' 40"E, ALONG SAID RIGHT-OF-WAY LINE, A DISTANCE OF 54.66 FEET;
THENCE S24° 01' 46"W A DISTANCE OF 998.87 FEET; THENCE S12° 09' 04"W A DISTANCE OF 85.16 FEET;
THENCE S16° 19' 01"E A DISTANCE OF 120.49 FEET; THENCE S6° 10' 46"E A DISTANCE OF 178.70 FEET;
THENCE S25° 03' 17"E A DISTANCE OF 321.78 FEET; THENCE S4° 36' 40"E A DISTANCE OF 118.13 FEET;
THENCE S0° 00' 00"E A DISTANCE OF 514.36 FEET; THENCE N90° 00' 00"E A DISTANCE OF 620.84 FEET;
THENCE S0° 23' 43"W A DISTANCE OF 1238.01 FEET; THENCE N89° 00' 04"W A DISTANCE OF 99.74 FEET;
THENCE S0° 59' 20"W A DISTANCE OF 212.43 FEET TO A POINT OF NON-TANGENT CURVE;
THENCE 77.25 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 25° 17'37", A RADIUS OF 175.00 FEET AND A CHORD THAT BEARS S63° 15' 08"E, 76.63 FEET;
THENCE S75° 53' 57"E A DISTANCE OF 53.41 FEET TO A POINT OF CURVE;
THENCE 85.23 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 21° 42'13", A RADIUS OF 225.00 FEET AND A CHORD THAT BEARS S65° 02' 50"E, 84.72 FEET;
THENCE S54° 11' 44"E A DISTANCE OF 210.19 FEET TO A POINT OF CURVE;
THENCE 85.16 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 65° 03'24", A RADIUS OF 75.00 FEET AND A CHORD THAT BEARS S86° 43' 26"E , 80.66 FEET;
THENCE N60° 44' 52"E A DISTANCE OF 551.13 FEET TO A POINT OF CURVE;
THENCE 341.90 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 52° 14'18", A RADIUS OF 375.00 FEET AND A CHORD THAT BEARS N86° 52' 01"E, 330.18 FEET;
THENCE S67° 00' 50"E A DISTANCE OF 195.67 FEET TO THE WESTERLY RIGHT-OF-WAY LINE OF COLORADO HIGHWAY 93;
THENCE S4° 26' 06"W, ALONG SAID RIGHT-OF-WAY LINE, A DISTANCE OF 52.74 FEET;
THENCE N67° 00' 50"W A DISTANCE OF 212.44 FEET TO A POINT OF CURVE;
THENCE 296.31 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 52° 14'18", A RADIUS OF 325.00 FEET AND A CHORD THAT BEARS S86° 52' 01"W, 286.16 FEET;
THENCE S60° 44' 52"W A DISTANCE OF 551.13 FEET;
THENCE 141.93 FEET ALONG THE ARC OF SAID CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 65° 03'24", A RADIUS OF 125.00 FEET AND A CHORD THAT BEARS N86° 43' 26"W, 134.43 FEET;
THENCE N54° 11' 44"W A DISTANCE OF 210.19 FEET TO A POINT OF CURVE;
THENCE 66.29 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 21° 42'13", A RADIUS OF 175.00 FEET AND A CHORD THAT BEARS N65° 02' 50"W, 65.89 FEET;
THENCE N75° 53' 57"W A DISTANCE OF 53.41 FEET TO A POINT OF CURVE;
THENCE 61.97 FEET ALONG THE ARC OF SAID CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 15° 46'51", A RADIUS OF 225.00 FEET AND A CHORD THAT BEARS N68° 00' 31"W, 61.78 FEET;
THENCE S0° 59' 20"W A DISTANCE OF 777.72 FEET; THENCE S89° 00' 04"E A DISTANCE OF 110.53 FEET;
THENCE S0° 23' 44"W A DISTANCE OF 818.99 FEET; THENCE N89° 27' 38"W A DISTANCE OF 481.76 FEET;
THENCE N16° 23' 16"W A DISTANCE OF 582.08 FEET; THENCE N21° 17' 22"W A DISTANCE OF 512.60 FEET;
THENCE N17° 39' 59"W A DISTANCE OF 323.97 FEET;
THENCE N16° 39' 13"W A DISTANCE OF 1147.50 FEET TO SAID WEST LINE OF THE SOUTHWEST QUARTER;
THENCE N0° 04' 06"E , ALONG SAID WEST LINE, A DISTANCE OF 197.24 FEET TO THE POINT OF BEGINNING;
CONTAIING 3,055,824 SQUARE FEET OR 70.15 ACRES OF LAND, MORE OR LESS.

COLORADO REGISTERED
JOHN E. KRATZ
20142
PROFESSIONAL LAND SURVEYOR

PREPARED BY:
RED ROCK LAND SURVEYS, LLC
JOHN E. KRATZ, PLS
CO. REG. NO. 20142

254 Pelage Ct., Cañon City, CO 81212
(303) 994-6300 jkratz@redrocklandsurveys.com

PREPARED BY:	JEK
CHECKED BY:	LAK
DATE:	07/13/2021
JOB NO.	21.19

NOTE: THIS LEGAL DESCRIPTION COMPILED FROM AVAILABLE INFORMATION AND RECORDS ONLY, AND DOES NOT CONSTITUTE A LAND SURVEY AS DEFINED BY COLORADO STATE LAW.

EXHIBIT A

AFFECTED AREA BOUNDARY

PART OF THE SOUTHWEST 1/4, SECTION 16, TOWNSHIP 3 SOUTH, RANGE 70 WEST OF THE SIXTH P.M.
JEFFERSON COUNTY, COLORADO

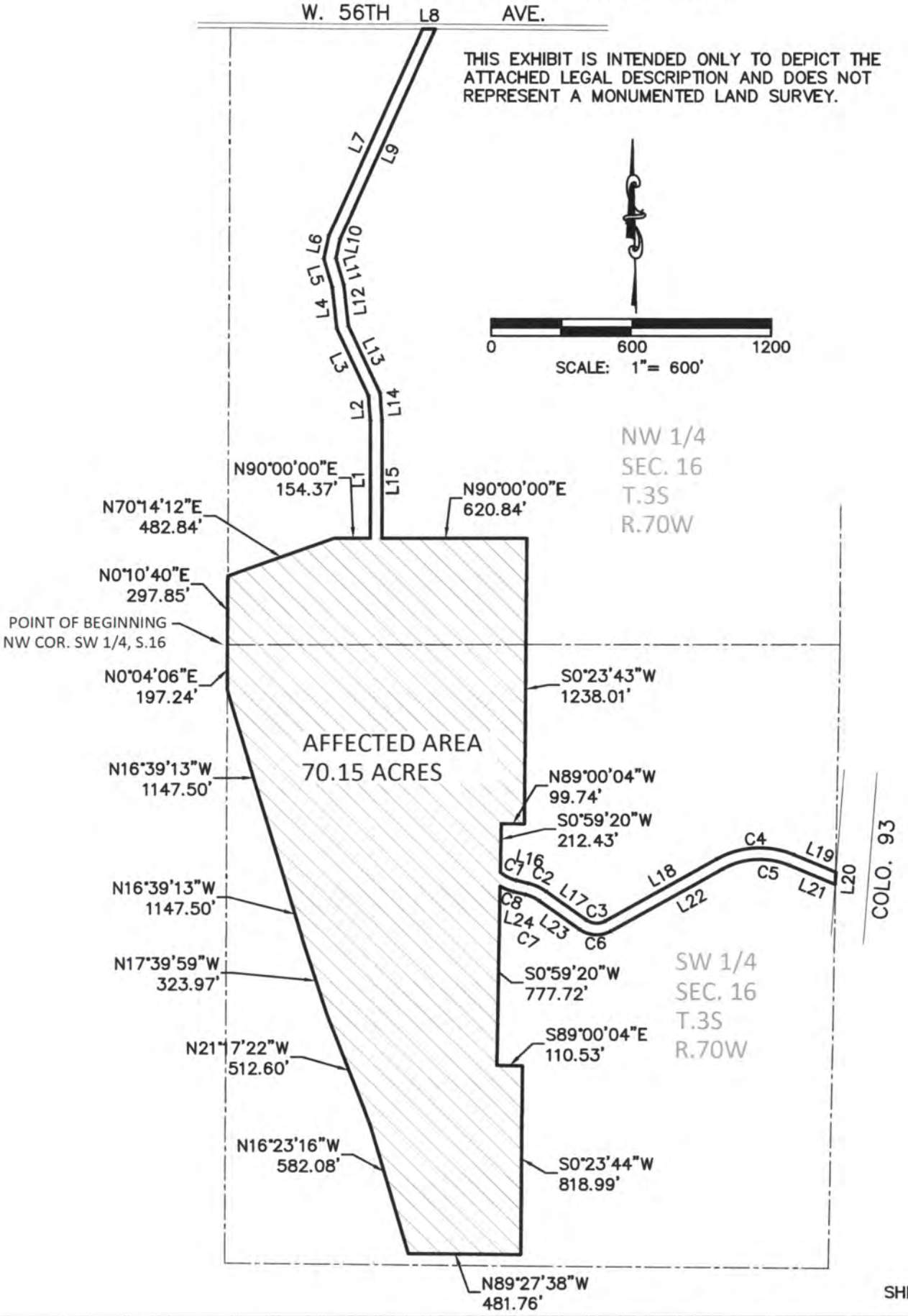


EXHIBIT A
AFFECTED AREA BOUNDARY

PART OF THE SOUTHWEST 1/4, SECTION 16, TOWNSHIP 3 SOUTH,
RANGE 70 WEST OF THE SIXTH P.M.
JEFFERSON COUNTY, COLORADO

Parcel Line Table		
Line #	Length	Direction
L1	512.35'	N0°00'00"E
L2	107.10'	N4°36'40"W
L3	321.08'	N25°03'17"W
L4	182.57'	N6°10'46"W
L5	128.73'	N16°19'01"W
L6	103.05'	N12°09'04"E
L7	982.00'	N24°01'46"E
L8	54.66'	S89°47'40"E
L9	998.87'	S24°01'46"W
L10	85.16'	S12°09'04"W
L11	120.49'	S16°19'01"E
L12	178.70'	S6°10'46"E
L13	321.78'	S25°03'17"E
L14	118.13'	S4°36'40"E
L15	514.36'	N0°00'00"E
L16	53.41'	S75°53'57"E
L17	210.19'	S54°11'44"E
L18	551.13'	N60°44'52"E
L19	195.67'	S67°00'50"E
L20	52.74'	S4°26'06"W
L21	212.44'	N67°00'50"W
L22	551.13'	S60°44'52"W
L23	210.19'	N54°11'44"W
L24	53.41'	N75°53'57"W

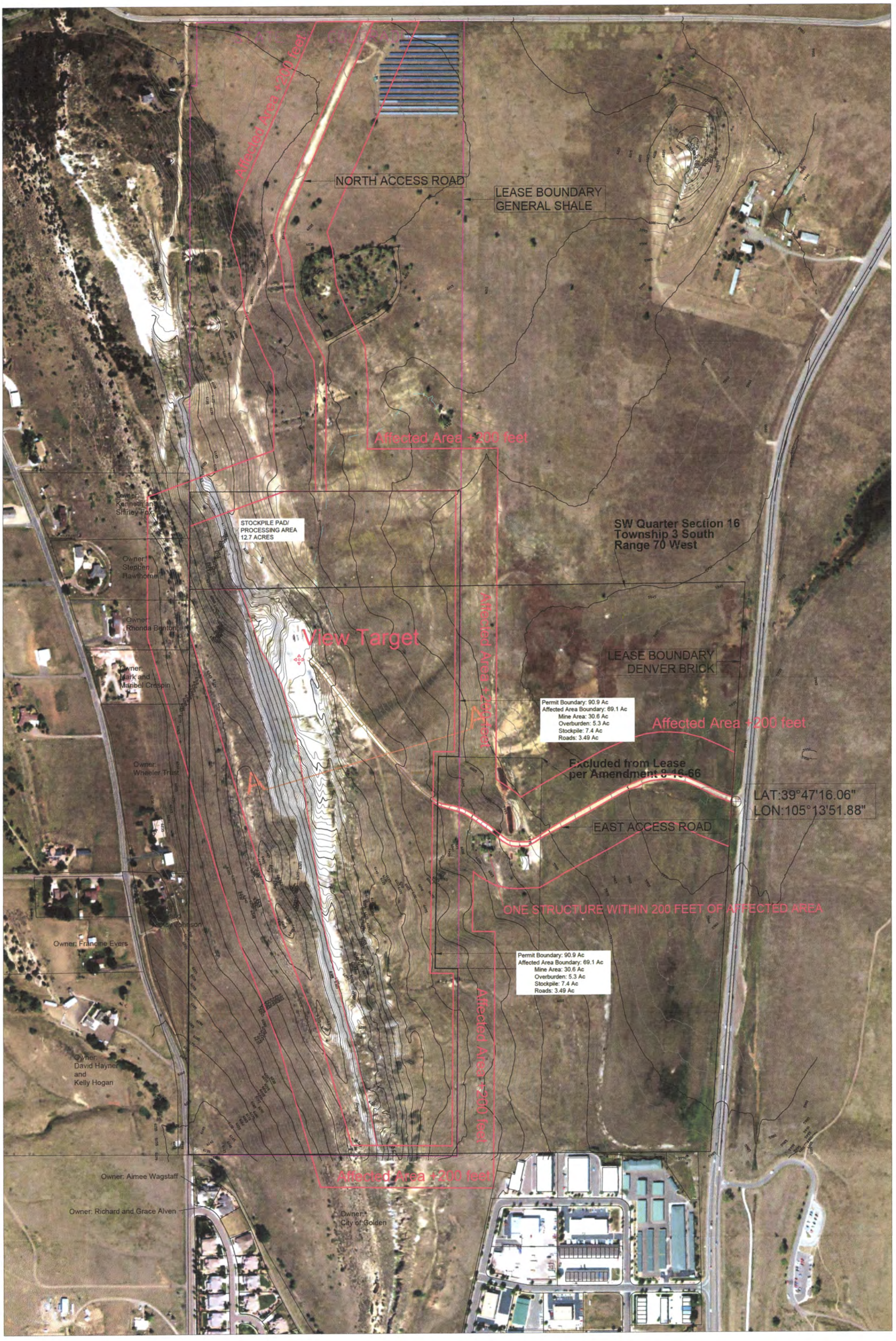
Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	77.25'	175.00'	25°17'37"	S63°15'08"E	76.63'
C2	85.23'	225.00'	21°42'13"	S65°02'50"E	84.72'
C3	85.16'	75.00'	65°03'24"	S86°43'26"E	80.66'
C4	341.90'	375.00'	52°14'18"	N86°52'01"E	330.18'
C5	296.31'	325.00'	52°14'18"	S86°52'01"W	286.16'
C6	141.93'	125.00'	65°03'24"	N86°43'26"W	134.43'
C7	66.29'	175.00'	21°42'13"	N65°02'50"W	65.89'
C8	61.97'	225.00'	15°46'51"	N68°00'31"W	61.78'

THIS EXHIBIT IS INTENDED ONLY TO DEPICT THE ATTACHED LEGAL DESCRIPTION AND DOES NOT REPRESENT A MONUMENTED LAND SURVEY.

6.4.2 Exhibit B
Index Map

6.4.3 Exhibit C
Pre-mining and Mining Plan Map(s)
Of Affected Lands

Golden Mine Rule 6.4.3 Exhibit C: Mining Plan



6.4.4 Exhibit D
Mining Plan

The Golden Mine is a historic clay mine that has supplied the brick industry for more than 160 years. Initial mining was underground. Modern day mining, including the Flintlock Mine to the north, is surface mining only. The current 110 Permit area encompasses 9.0 acres along the east face of the ridge. This amendment will increase the permit boundary to include 85.51 acres. Approximately 70.15 acres will be affected by the mine, overburden and topsoil storage and clay stockpiles. The remaining 15.36 acres will serve as buffer areas and hogback ridgeline preservation area. It is included in the affected area boundary in case stabilization or reconstruction is required.

Geologic Description

The target deposit is siliceous clay lying between layers of steeply sloping hard sandstone faces on the east side of the Golden Hogback. This clay deposit contains five different clays. Hogbacks are geologic formations that uplifted and laid on the side exposing the oldest geologic layers to the west and youngest geologic layers to the east. The following description commences with the oldest layer and progresses eastward to the youngest layers.

Cupilo and black silica beds are located in the highwall, the western side of the hogback. The cupilo is tan sandstone that alternates with layers of black claystone called black silica. Some of the black silica is plastic meaning when tempered with water it makes mud and some of the clay is non plastic. The black silica is the reason the highwall fails or slides. The cupilo becomes pink when fired and the black silica becomes white when fired during brick manufacturing.

Ripple clay shale is an 18 feet thick layer of dark gray claystone that is non plastic. Even though it is clay it will not become plastic. This bed fires to a light gray or white color. This is the bed that was historically and extensively mined underground.

Rider beds are alternating beds of non-plastic dark gray claystone and light orange sandstone. These layers cannot be separated into sandstone and claystone so are mined as one clay material. The overall fired color is pink. Two Brothers clay is located between the rider beds and a thick bed of sandstone. This clay is plastic and becomes white during firing. The historic underground operation often made ventilation shafts in this bed.

A hard bed of white sandstone ranging between five feet and 10 feet thick in the middle of the mine requires blasting.

Alternating beds ranging in thickness from one to five feet thick are encountered next in the eastward progression. The beds vary in color including yellow, white, or orange sandstone with dark gray semi plastic claystone between the sandstone layers. This sandstone can be separated from the claystone. This clay tends to turn pink when fired.

Benton clays are the east side of the target deposit. They are dark gray in color and become more plastic as the one progresses east in the deposit. These clays start as a tan color during firing then become red and finally a gray color. Passed a

certain point during firing, they become low temperature clay meaning the clay will melt at the fired temperatures used to manufacture brick. At this point the clay is of no value. This low temperature clay will mark the edge of the mine and will be within the proposed east affected area boundary.

Mining Operation

The variety of clays in the permit boundary is not only a unique resource but also an interesting mining challenge. During mining, each clay and/or sandstone layer described above is segregated and stockpiled separately. Since each brick mix is a proprietary blend of clays, sandstone and other ingredients, the specific clay needed for a brick batch is hauled to the brick factory as market demands.

Mining will begin on the east side of the deposit and will proceed towards the west in one to two benches depending on the depth desired. The depth of mining is determined by the thickness of the clay between the sandstone layer and the desired quantity of clay product stockpile for brick manufacturing. The mine develops as a north to south ramp where the south ramp area is at a higher elevation than the north ramp area. The ramp surface provides space to blend the various clays and sandstone as identified in the previous geologic description in order to produce consistent clay blends to the brick plant. Mining is proposed to a ground elevation of 6050 ft., safely above the ceiling of the historic underground clay mines.

Between 600 and 800 linear feet of the mine face is blasted (if necessary), mined, segregated and stockpiled. Using an excavator and off road trucks, the sandstone beds and claystone beds are sorted bed by bed as either waste (called interburden and is often sandstone) or clay. Blasting may be required for the thick sandstone layer in the middle of the deposit due to the hardness of the sandstone layer and other layers if encountered. The interburden will be placed in a mined out face of the mine as contemporaneous reclamation. Excess interburden will be stockpiled for use in final reclamation. The final clay blends are stockpiled by blend. As market demands, a clay blend is loaded onto a highway truck utilizing a front-end loader and hauled to the brick plant. The loader may use a grizzly, separating the large sandstone rubble from clay/sandstone and stockpile the boulders on the waste stockpile.

The proposed affected area will be bonded and mined as one operational unit. The north 5.3 acres, in the southwest corner of the northwest ¼ of Section 16, will serve as the stockpile area. The processing area will be established adjacent to the stockpile area to the south, away from the active mine area at the toe of the mine face. The stockpile and processing area locations will be consistent during the life of the mine.

Based on market demand, the clay is hauled from the site to brick factories with annual hauling quantities ranging from 250 tons to 20,000 tons per year. The existing interior haul road and access will be used. No new roads will be constructed. The life of the mine is anticipated between ten and 15 years. Two to ten employees will work the mine during mining operations.

Mining is campaign style mining. This means that product is mined and stockpiled once every 3-5 years for a duration of three to five weeks per campaign. Outside of the mining campaign there will be limited activity at the mine. Most of the activity will consist of hauling the product stockpiles to the brick plant intermittently every 2-6 weeks.

Contemporaneous reclamation will commence when 200 to 400 linear feet is mined to the final mine depth of 6050 ft. elevation. A 3H:1V slope will be maintained at the toe of the hogback face that blends with the reclaimed slope of the Flintlock Mine to the north. As sandstone and overburden are removed from the working face, it will be placed at the toe of the exposed mined out face to further build out the 3H:1V slope.

Surface mining will occur as an open pit. Topsoil in the stockpile and processing area does not need to be removed but may be pushed aside in order to level the area, making more surface available for operating and stockpiling. This topsoil will form a perimeter berm that will serve as a visual barrier. Should topsoil or other suitable plant growth material be encountered elsewhere, it will be placed on the reconstructed 3H:1V slope. In the event excess topsoil or other suitable plant growth material is encountered, it will be stockpiled and the stockpiled stabilized by seeding with the reclamation seed mix.

Mining equipment includes an excavator, a grizzly, off-road trucks, a loader and a bulldozer. A motor grader and a water truck will be used to maintain roads and mitigate dust. The material is initially screened with a grizzly. Further processing, if necessary, is performed through a third party contractor.

The mine floor slopes toward the toe of the hogback face. Surface water as precipitation and snow melt will pool at the base of the mine face and infiltrate within 72 hours. Perimeter berms are constructed along the edge of the mine floor and around the stockpile area.

The CO State Land Board (SLB) commissioned a paleontological survey in the vicinity and including the permit area. In the even paleontological artifacts are discovered, mining will immediately cease in the area of the discovery and the SLB will be notified.

Access Roads

The historic access onto Hwy 93 has served the mine many decades. With infrequent mine campaigns and low production volumes, the historic access will continue to be used by the applicant. In addition, the applicant is proposing an additional and optional access north to West 56th Avenue to be developed in the event CDOT's plans for Hwy 93 improvements result in access restrictions.

6.4.5 Exhibit E
Reclamation Plan

Post-mining land use will be rangeland that will blend with the successful reclamation of the Flintlock Mine to the north. The post-mining land use will increase the open space area owned by Jefferson County to the east. The rangeland vegetation will enable a cattle lease opportunity for the CO State Land Board, the property owner.

Topsoil will be salvaged and stockpiled along the east edge of the mine area. Topsoil thickness increases as one progressed east across the mine area. Whereas it is very thin near the toe of the vertical face, topsoil may be present to a depth of of eight inches along the east side of the proposed mine area. All topsoil, regardless of depth will be salvaged prior to mining. This will insure that sufficient topsoil will be available for reclamation; replacing to a depth of four to six inches. Stockpiled topsoil will be appropriately posted and segregated for use in reclamation if it is not immediately placed on backfilled and graded slopes. In the event the topsoil cannot be used within one year, the stockpiles will be broadcast seeded with a temporary seed mix or chemically stabilized.

Reclamation will occur contemporaneously with mining once a linear length of approximately 300 feet is mined to the final 6050 feet elevation. At the end of mining, all reclamation will be completed within two years. Reclamation will include backfilling and plugging the inactive underground mine adits with interburden. As interburden and fines are produced during mining, the material will be placed at the toe of the hogback at a 3H:1V slope. Non-clay fines will be placed on the slope, and contoured with a bulldozer. Four to six inches of topsoil will be placed on the reconstructed slopes in this same contemporaneous fashion, reducing the need for stockpiles. This will also reduce degradation of the topsoil.

The reclamation slope and vegetation will blend with the Flintlock Mine to the north to develop a consistent vista for the Jefferson County residents and passersby on the highway. Based on interburden production projections, approximately 25% of mined material will be interburden or reject material. Interburden is currently stockpiled on the north end of the mine disturbance. The existing stockpiled interburden will be used to build the stockpile and processing pad. As mining progresses the proposed 300 linear feet to a depth of 6050 ft. elevation, the interburden will be placed at the toe of the vertical face at a 3H:1V slope. The resulting slope will be approximately 15 vertical feet on the mine face and 45 horizontal feet eastward onto the mine floor. In the event interburden is in a greater quantity than anticipated, it will all be placed to construct the slope at the toe of the vertical face. Upon completion of mining, the material in the stockpile and processing pad will be transported to the south end, the final mine area, and used to continue the slope, ultimately blending with the topography to the east and south.

The access road is owned by CO State Land Board. At the time of this application, it will be included in final reclamation. The road will be ripped using a loader fitted with a claw to loosen the compacted surface. The area will be graded to blend with surrounding contours. Topsoil will be placed to a depth of four to six inches and seeded.

To address the potential for erosion during reclamation, contour furrows will be shaped into the slope at 50 vertical foot intervals down the face of the slope, perpendicular to the slope. The contour furrows will be approximately 20 ft. long and spaced approximately 50 ft. apart.

Seeding will occur between October 1 and April 30 with the seed mix presented in Table 1. Seed will be drilled at the rate of 10.4 pounds per acre, mulched with certified weed free straw, two tons per acre, and tracked into place with a dozer. Fertilizer was not recommended by Soil Conservation District or Colorado Department of Wildlife. In the event an agency recommends a fertilizer prior to or during reclamation, the Division will be notified and the applicant will comply with the recommendation.

Table 1: Jefferson Soil Conservation District recommended seed mix.

Common Name & Variety	**PLS/acre**
Western wheatgrass	4.0
Big bluestem	2.2
Little bluestem	1.05
Sideoats grama	1.35
Yellow indiangrass	1.5
Blue grama	0.3
Total	**10.4**

Shrubs will also be planted during reclamation. 120 mountain mahogany shrubs of 5-gallon minimum size, will be planted in clusters along the reclaimed slopes and stockpile areas. Clusters will contain approximately 10 shrubs and will be spaced aesthetically pleasingly along the seeded area.

The reclaimed slopes will be monitored regularly for vegetation success or erosion impacts. Additional erosion control measures will be implemented if necessary. Weed control will be performed if the weed density inhibits the establishment of grasses or if noxious weeds appear in the reclaimed area.

6.4.6 Exhibit F
Reclamation Plan Map

6.4.7 Exhibit G
Water Information

Groundwater will not be intercepted during mining or reclamation. Surface water streambeds are not in the vicinity of the mine. The mine floor slopes toward the toe of the hogback. Surface water as precipitation and snow melt will pool at the base of the mine face and infiltrate within 72 hours. Perimeter berms constructed along the edge of the mine floor and around the stockpile area will direct pooled precipitation toward the toe of the hogback.

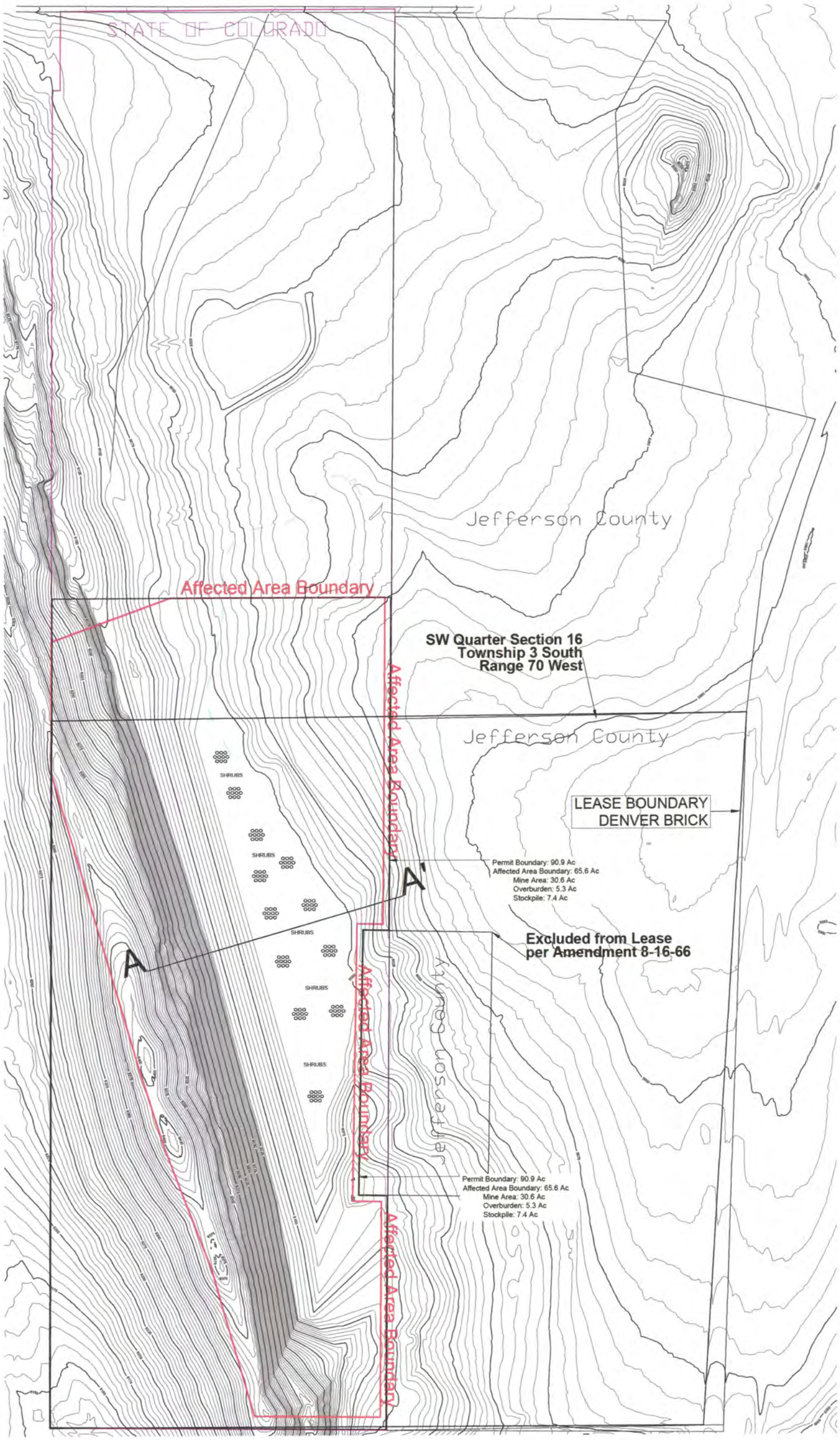
Consumptive use of water will occur as needed for dust suppression using approximately 4000 gallons/day during processing: three weeks every 18 months. During the remainder of the 18 months, water will be applied to the stockpiles and mine area as needed based on precipitation and natural revegetation.

6.4.8 Exhibit H
Wildlife Information

This location is historically a clay mine dating back to the 1800's, co-existing with wildlife for more than one century. The CO DOW letter dated June 13, 1977 is provided herein recognizing the minor impact on wildlife and potential to improve the area for wildlife with reclamation. This small clay mine with intermittent active mining will have far less impact on wildlife than the substantial mine and industrial operation to the north and the ever creeping residential development to the east and municipal development to the south.

6.4.9 Exhibit I
Soils Information

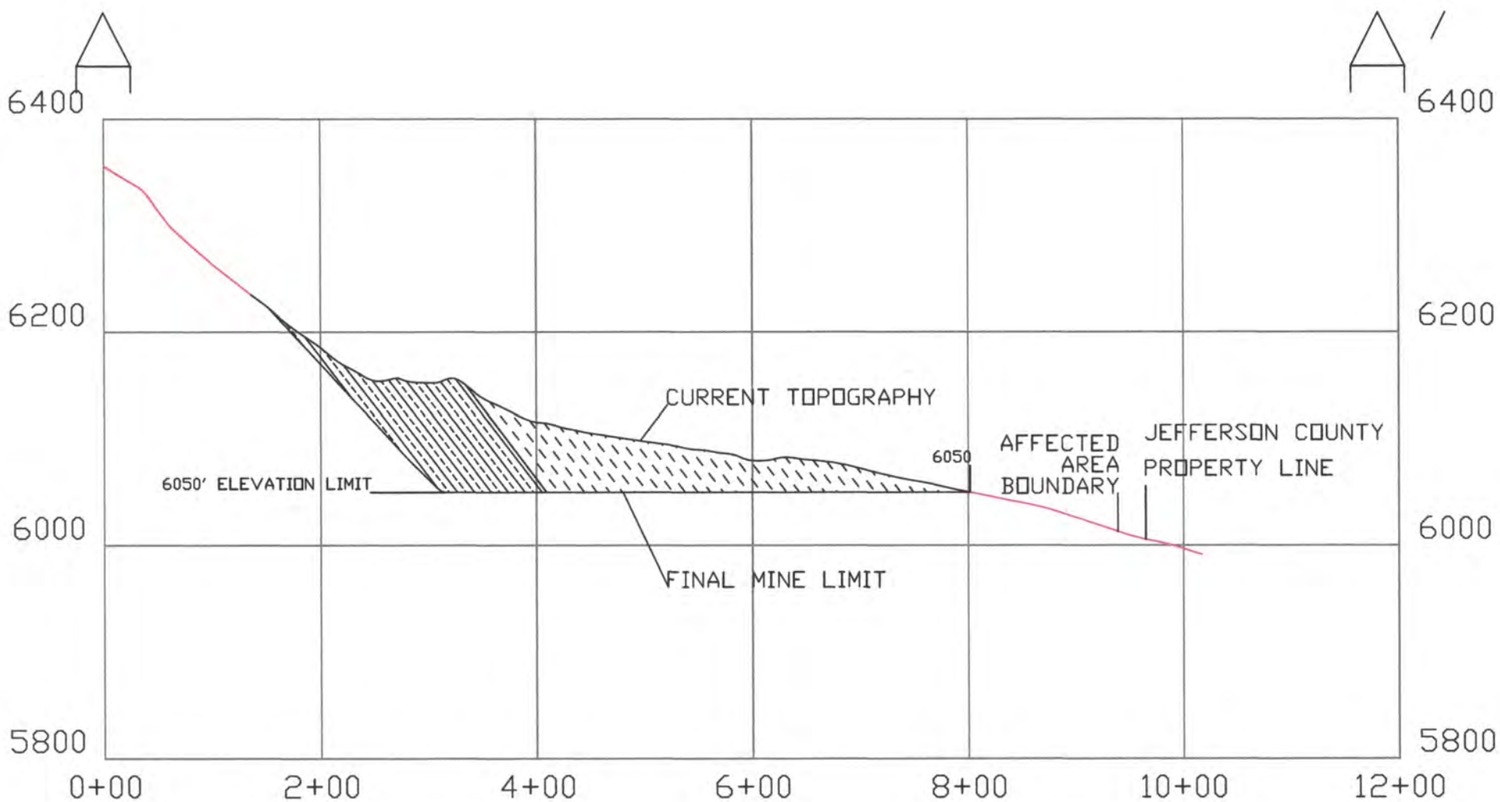
The NRCS Web Soil Survey application was applied to the permit area. The Area-of-Interest soil map and descriptions are provided herein along with range vegetation productivity. The affected area includes Argiustolls-Rock outcrop complex and Baller-Rock outcrop complex.



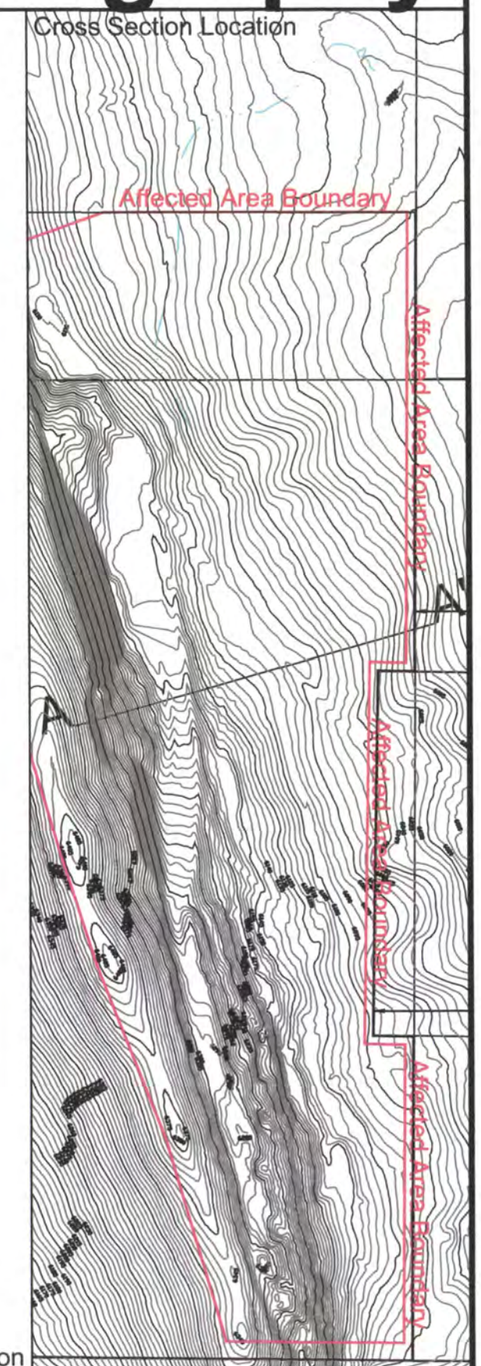
Drawn By: Richard Murphy Signature:	Rule 6.4.3 Exhibit F: Reclamation Plan Map	M-1976-007UG Golden Mine Amendment-01	Acme Brick Company Exploration Department Denton, Texas	Date: 2-25-21 Scale: 1" = 200'	Rev.	Date	By:

Golden Cross Section A-A' Current Topography

Cross Section



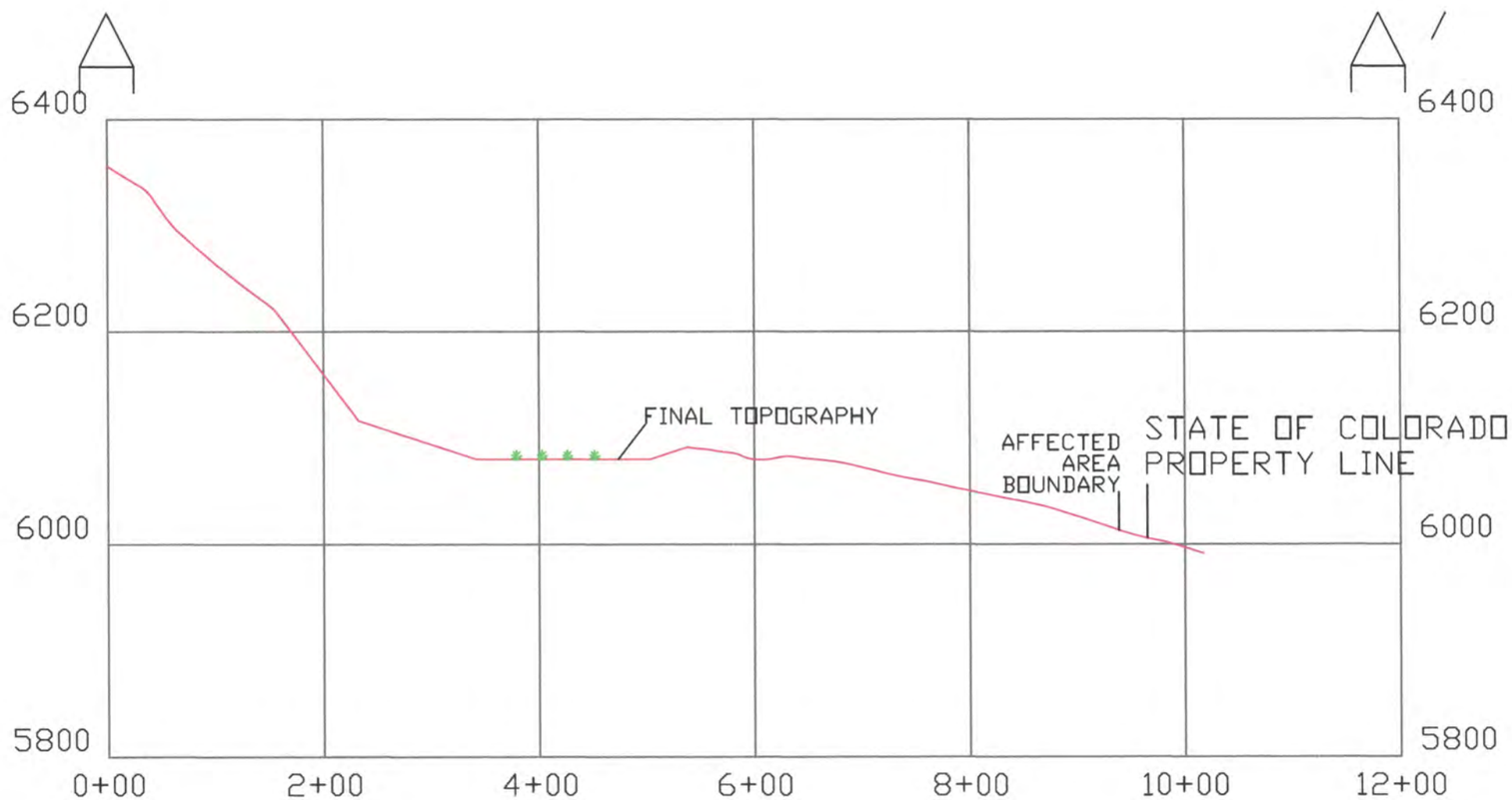
Cross Section Location



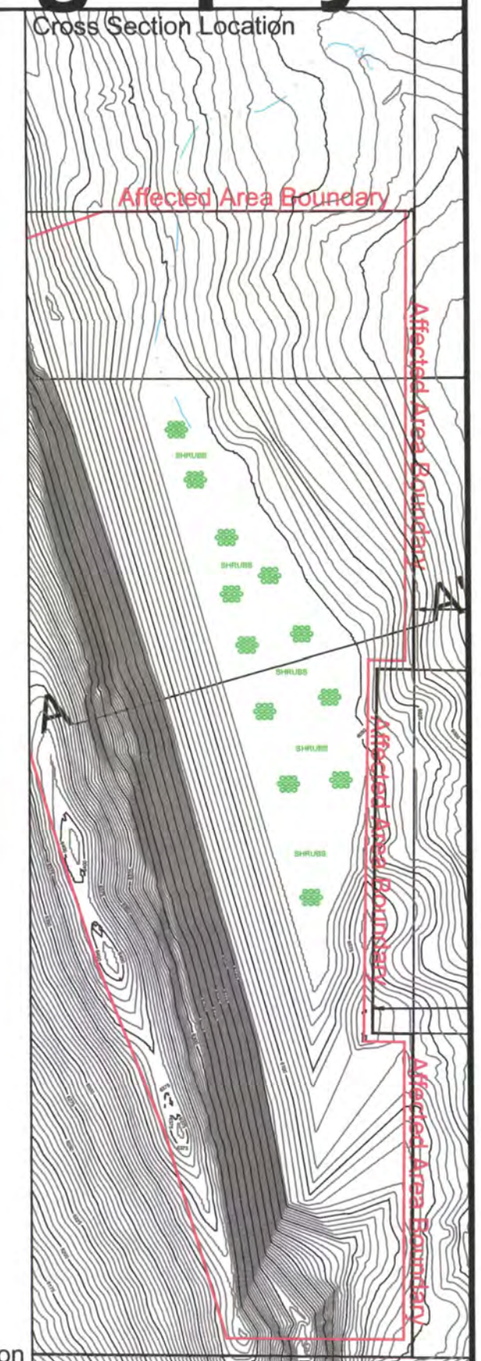
No Vertical Exaggeration

Golden Cross Section A-A' Final Topography

Cross Section



Cross Section Location



No Vertical Exaggeration

Soil Map—Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
(Golden Mine)

Map Scale: 1:5,330 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 25, 2018—Apr 9, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Argiustolls-Rock outcrop complex, 15 to 60 percent slopes	56.5	49.2%
6	Arvada clay loam, 0 to 2 percent slopes	0.7	0.6%
7	Ascalon sandy loam, 5 to 9 percent slopes	4.3	3.8%
8	Ascalon sandy loam, 9 to 15 percent slopes	3.8	3.3%
9	Baller-Rock outcrop complex, 15 to 50 percent slopes	40.6	35.3%
139	Rock outcrop, sedimentary	0.0	0.0%
151	Torrifluvents, very gravelly, 0 to 3 percent slope	1.6	1.4%
174	Willowman-Leyden cobbly loams, 9 to 30 percent slopes	7.4	6.4%
Totals for Area of Interest		**114.8**	**100.0%**

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

5—Argiustolls-Rock outcrop complex, 15 to 60 percent slopes

Map Unit Setting

National map unit symbol: jpp6
Elevation: 5,600 to 6,500 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Argiustolls and similar soils: 65 percent
Rock outcrop: 20 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Argiustolls

Setting

Landform: Hillslopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly, stony, loamy colluvium and/or residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 10 inches: stony sandy loam
H2 - 10 to 35 inches: very gravelly sandy loam, very gravelly sandy clay loam
H2 - 10 to 35 inches: unweathered bedrock
H3 - 35 to 39 inches:

Properties and qualities

Slope: 15 to 60 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R048AY206CO - Rocky Foothill
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, free face
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sedimentary rock

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Ascalon

Percent of map unit: 8 percent
Landform: Fans, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY202CO - Loamy Foothill
Hydric soil rating: No

Urban land

Percent of map unit: 7 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

6—Arvada clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: jppk
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Arvada, rarely flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arvada, Rarely Flooded

Setting

Landform: Flood plains, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from calcareous shale

Typical profile

H1 - 0 to 6 inches: clay loam
H2 - 6 to 30 inches: clay, silty clay
H2 - 6 to 30 inches: clay loam, silty clay loam
H3 - 30 to 60 inches:
H3 - 30 to 60 inches:

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 4 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water capacity: Very high (about 14.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: R048AY261CO - Salt Flats
Hydric soil rating: No

Minor Components

Urban land

Percent of map unit: 3 percent
Hydric soil rating: No

Nunn variant, rarely flooded

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY265CO - Salt Meadow
Hydric soil rating: No

Nunn

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Renohill

Percent of map unit: 3 percent
Landform: Ridges, hillslopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Manzanola

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49

Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

7—Ascalon sandy loam, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: jppx
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Ascalon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Fans, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 18 inches: sandy clay loam, sandy loam
H2 - 7 to 18 inches: sandy clay loam, loam, sandy loam
H3 - 18 to 23 inches: fine sandy loam, loamy sand, sandy loam
H3 - 18 to 23 inches:
H3 - 18 to 23 inches:
H4 - 23 to 60 inches:
H4 - 23 to 60 inches:
H4 - 23 to 60 inches:

Properties and qualities

Slope: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 17.2 inches)

Interpretive groups
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R048AY202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Nunn, thick surface
Percent of map unit: 5 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Lavate
Percent of map unit: 4 percent
Landform: Hogbacks
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY202CO - Loamy Foothill
Hydric soil rating: No

Critchell
Percent of map unit: 4 percent
Landform: Hogbacks
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY214CO - Gravelly Foothill
Hydric soil rating: No

Urban land
Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

8—Ascalon sandy loam, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: jpq8
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Ascalon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Fans, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits

Typical profile

H1 - 0 to 7 inches: sandy loam
H2 - 7 to 18 inches: sandy clay loam, sandy loam
H2 - 7 to 18 inches: sandy clay loam, loam, sandy loam
H3 - 18 to 23 inches: fine sandy loam, loamy sand, sandy loam
H3 - 18 to 23 inches:
H3 - 18 to 23 inches:
H4 - 23 to 60 inches:
H4 - 23 to 60 inches:
H4 - 23 to 60 inches:

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very high (about 17.2 inches)

Interpretive groups
Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R048AY202CO - Loamy Foothill
Hydric soil rating: No

Minor Components

Nunn, thick surface
Percent of map unit: 5 percent
Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Lavate
Percent of map unit: 4 percent
Landform: Hogbacks
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY202CO - Loamy Foothill
Hydric soil rating: No

Critchell
Percent of map unit: 4 percent
Landform: Hogbacks
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY214CO - Gravelly Foothill
Hydric soil rating: No

Urban land
Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

9—Baller-Rock outcrop complex, 15 to 50 percent slopes

Map Unit Setting

National map unit symbol: jpqm
Elevation: 5,600 to 6,500 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Baller and similar soils: 60 percent
Rock outcrop: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Baller

Setting

Landform: Hogbacks, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Noncalcareous, stony, loamy residuum weathered from sandstone

Typical profile

H1 - 0 to 4 inches: very cobbly sandy loam
H2 - 4 to 14 inches: very cobbly sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R048AY204CO - Shallow Foothill

Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, free face, side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Midway

Percent of map unit: 4 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex, linear
Ecological site: R049XY212CO - Shaly Foothill
Hydric soil rating: No

Denver

Percent of map unit: 3 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Leyden

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear, convex
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Urban land

Percent of map unit: 2 percent
Landform: Hillslopes
Hydric soil rating: No

Standley

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Ulm

Percent of map unit: 2 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

139—Rock outcrop, sedimentary

Map Unit Composition

Rock outcrop, sedimentary: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop, Sedimentary

Setting

Landform: Terraces, hogbacks, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountaintop, free face, mountainflank, free face, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Parent material: Exposed bedrock, talus, and large boulders of sandstone and/or mudstone and/or shale and/or conglomerate

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Baller

Percent of map unit: 5 percent
Landform: Hogbacks, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Ecological site: R048AY204CO - Shallow Foothill
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

151—Torrifluvents, very gravelly, 0 to 3 percent slope

Map Unit Setting

National map unit symbol: jpm5
Elevation: 5,200 to 6,500 feet
Mean annual precipitation: 13 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Torrifluvents, occasionally flooded, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Torrifluvents, Occasionally Flooded

Setting

Landform: Terraces, flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified sandy and gravelly alluvium

Typical profile

H1 - 0 to 6 inches: variable
H2 - 6 to 60 inches: stratified very gravelly sand to sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (0.20 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A
Ecological site: R049XY036CO - Overflow
Hydric soil rating: No

Minor Components

Riverwash, frequently flooded

Percent of map unit: 4 percent
Landform: Channels
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R049XY031CO - Sandy Bottomland
Hydric soil rating: Yes

Paymaster, rarely flooded

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Fluvaquents, frequently flooded

Percent of map unit: 4 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XA178WY - Wetland (Foothills And Mountains Southeast)
Hydric soil rating: No

Haverson, rarely flooded

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY036CO - Overflow
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties

174—Willowman-Leyden cobbly loams, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: jpmz
Elevation: 5,600 to 6,500 feet
Mean annual precipitation: 15 to 17 inches
Frost-free period: 126 to 142 days
Farmland classification: Not prime farmland

Map Unit Composition

Willowman and similar soils: 60 percent
Leyden and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Willowman

Setting

Landform: Hillslopes, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous, cobbly, gravelly, loamy alluvium

Typical profile

H1 - 0 to 6 inches: cobbly loam
H2 - 6 to 10 inches: very gravelly sandy clay loam, very gravelly loam, very gravelly clay loam
H2 - 6 to 10 inches: very gravelly sandy loam, very gravelly loam
H2 - 6 to 10 inches:
H3 - 10 to 60 inches:
H3 - 10 to 60 inches:

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R048AY346CO - Cobbly Foothills
Hydric soil rating: No

Description of Leyden

Setting

Landform: Ridges, hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Calcareous, gravelly, cobbly, stony, and clayey slope alluvium over residuum weathered from mudstone

Typical profile

H1 - 0 to 3 inches: cobbly loam
H2 - 3 to 35 inches: gravelly clay loam, gravelly clay
H2 - 3 to 35 inches: weathered bedrock
H3 - 35 to 39 inches:

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R048AY346CO - Cobbly Foothills
Hydric soil rating: No

Minor Components

Primen

Percent of map unit: 3 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest

Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Nunn

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Standley

Percent of map unit: 3 percent
Landform: Fans
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Veldkamp

Percent of map unit: 3 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R048AY346CO - Cobbly Foothills
Hydric soil rating: No

Denver

Percent of map unit: 2 percent
Landform: Alluvial fans, hillslopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XY208CO - Clayey Foothill DRAFT (1-2018) MLRA 49
Hydric soil rating: No

Urban land

Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Range Production (Normal Year)—Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park ...
(Golden Mine)

Map Scale: 1:5,330 if printed on A portrait (8.5" x 11") sheet.

Meters: 0 50 100 200 300

Feet: 0 250 500 1000 1500

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- <= 240
- > 240 and <= 325
- > 325 and <= 840
- > 840 and <= 1020
- > 1020 and <= 1190
- Not rated or not available

Soil Rating Lines

- <= 240
- > 240 and <= 325
- > 325 and <= 840
- > 840 and <= 1020
- > 1020 and <= 1190
- Not rated or not available

Soil Rating Points

- <= 240
- > 240 and <= 325
- > 325 and <= 840
- > 840 and <= 1020
- > 1020 and <= 1190
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Golden Area, Colorado, Parts of Denver, Douglas, Jefferson, and Park Counties
Survey Area Data: Version 15, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 25, 2018—Apr 9, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Range Production (Normal Year)

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
5	Argiustolls-Rock outcrop complex, 15 to 60 percent slopes	325	56.5	49.2%
6	Arvada clay loam, 0 to 2 percent slopes	765	0.7	0.6%
7	Ascalon sandy loam, 5 to 9 percent slopes	1190	4.3	3.8%
8	Ascalon sandy loam, 9 to 15 percent slopes	1190	3.8	3.3%
9	Baller-Rock outcrop complex, 15 to 50 percent slopes	240	40.6	35.3%
139	Rock outcrop, sedimentary		0.0	0.0%
151	Torrifluvents, very gravelly, 0 to 3 percent slope	1020	1.6	1.4%
174	Willowman-Leyden cobbly loams, 9 to 30 percent slopes	840	7.4	6.4%
Totals for Area of Interest			**114.8**	**100.0%**

Description

Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation. In a normal year, growing conditions are about average. Yields are adjusted to a common percent of air-dry moisture content.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Rating Options

Units of Measure: pounds per acre per year

Aggregation Method: Weighted Average

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: Yes

6.4.10 Exhibit J
Vegetation Information

A substantial area is affected and was historically affected by mining. In those areas where native vegetation has not been disturbed, principal native plants are blue grama, cactus, yucca, green needlegrass, sand dropseed, and scattered juniper.

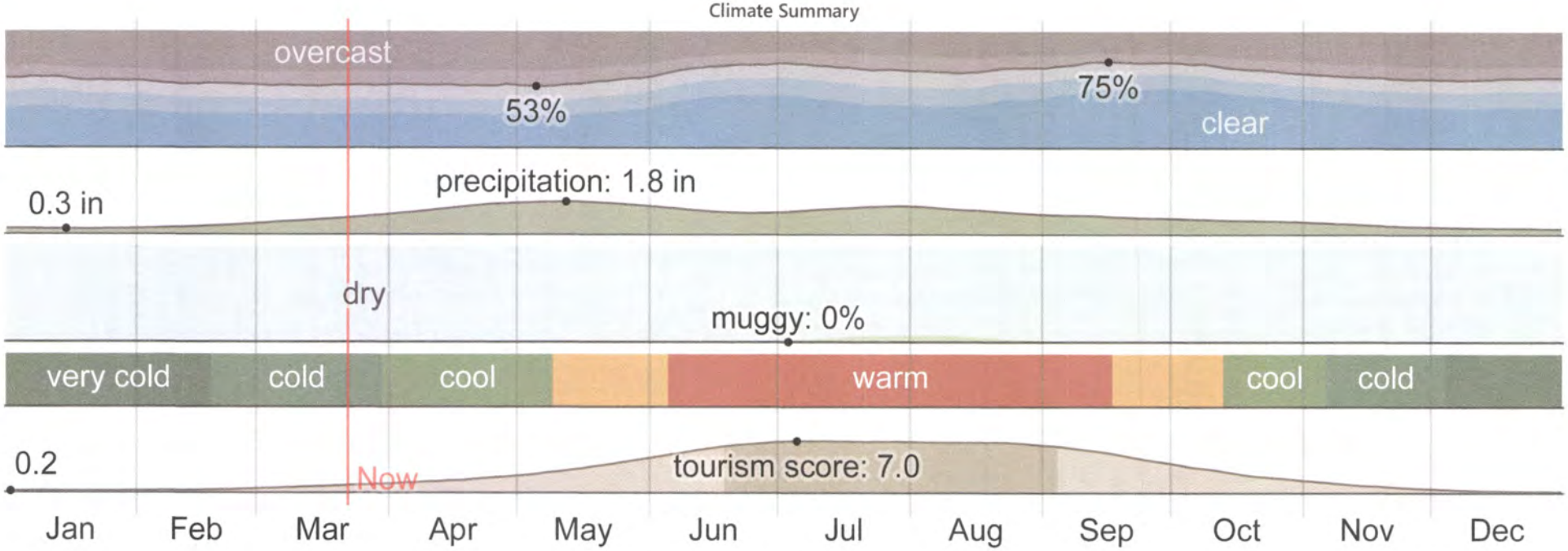
6.4.11 Exhibit K
Climate

Average Weather in Golden Colorado, United States

In Golden, the summers are warm, the winters are very cold and dry, and it is partly cloudy year round. Over the course of the year, the temperature typically varies from 22°F to 85°F and is rarely below 6°F or above 93°F.

Based on the tourism score (https://weatherspark.com/y/3539/Average-Weather-in-Golden-Colorado-United-States-Year-Round#Sections-BestTime), the best time of year to visit Golden for warm-weather activities is from mid June to early September.

Climate Summary



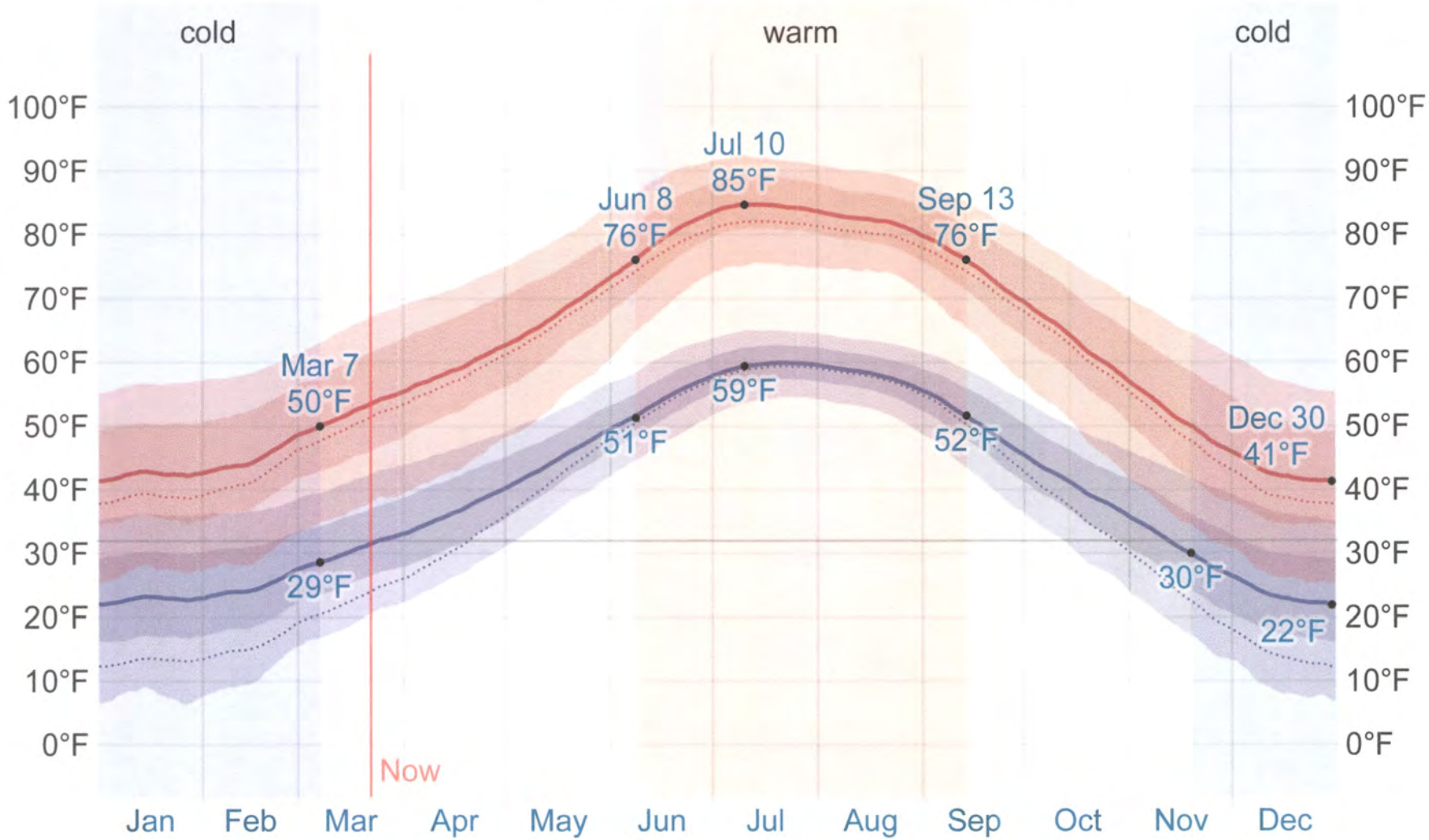
Click on each chart for more information.

Temperature

The warm season lasts for 3.2 months, from June 8 to September 13, with an average daily high temperature above 76°F. The hottest day of the year is July 10, with an average high of 85°F and low of 59°F.

The cold season lasts for 3.6 months, from November 19 to March 7, with an average daily high temperature below 50°F. The coldest day of the year is December 30, with an average low of 22°F and high of 41°F.

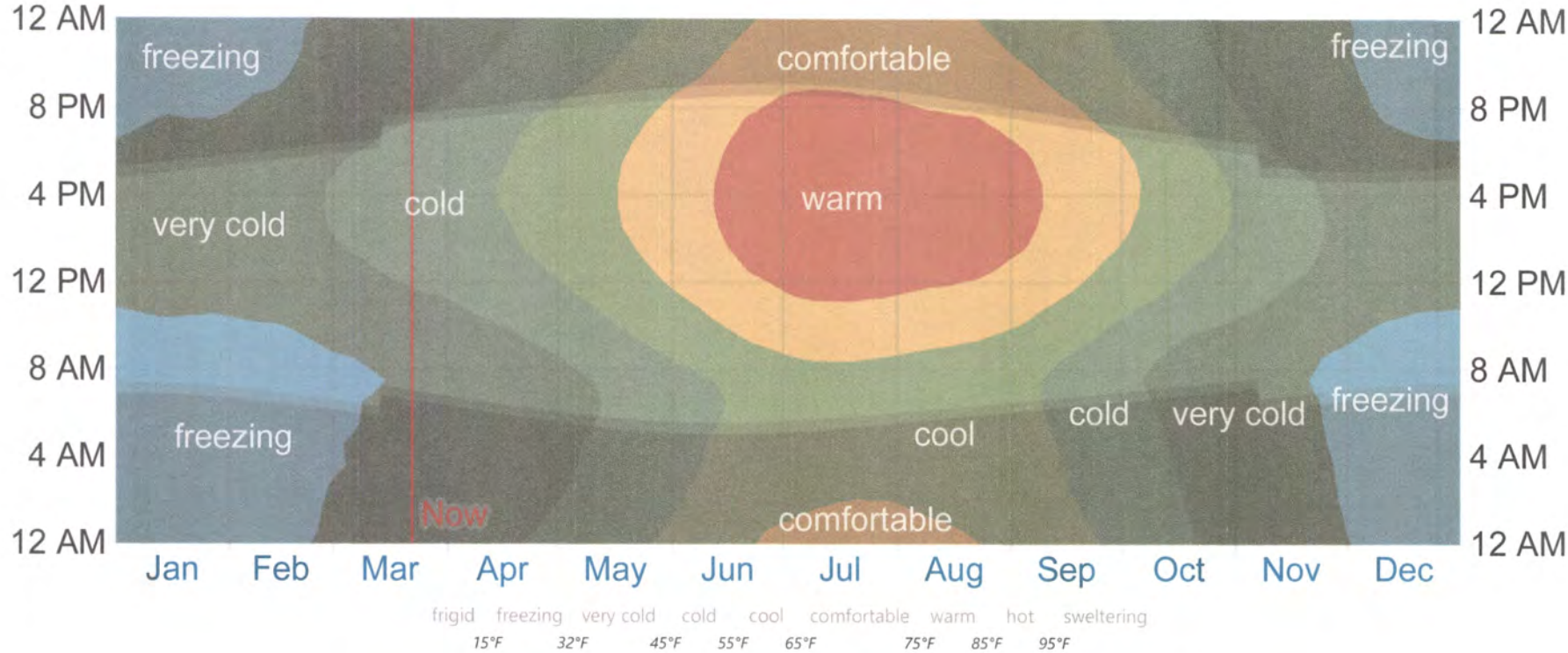
Average High and Low Temperature



The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

The figure below shows you a compact characterization of the entire year of hourly average temperatures. The horizontal axis is the day of the year, the vertical axis is the hour of the day, and the color is the average temperature for that hour and day.

Average Hourly Temperature



The average hourly temperature, color coded into bands. The shaded overlays indicate night and civil twilight.

Çankaya, Turkey (/y/97347/Average-Weather-in-%C3%87ankaya-Turkey-Year-Round) (6,338 miles away) is the far-away foreign place with temperatures most similar to Golden (view comparison (/compare/y/3539~97347/Comparison-of-the-Average-Weather-in-Golden-and-%C3%87ankaya)).

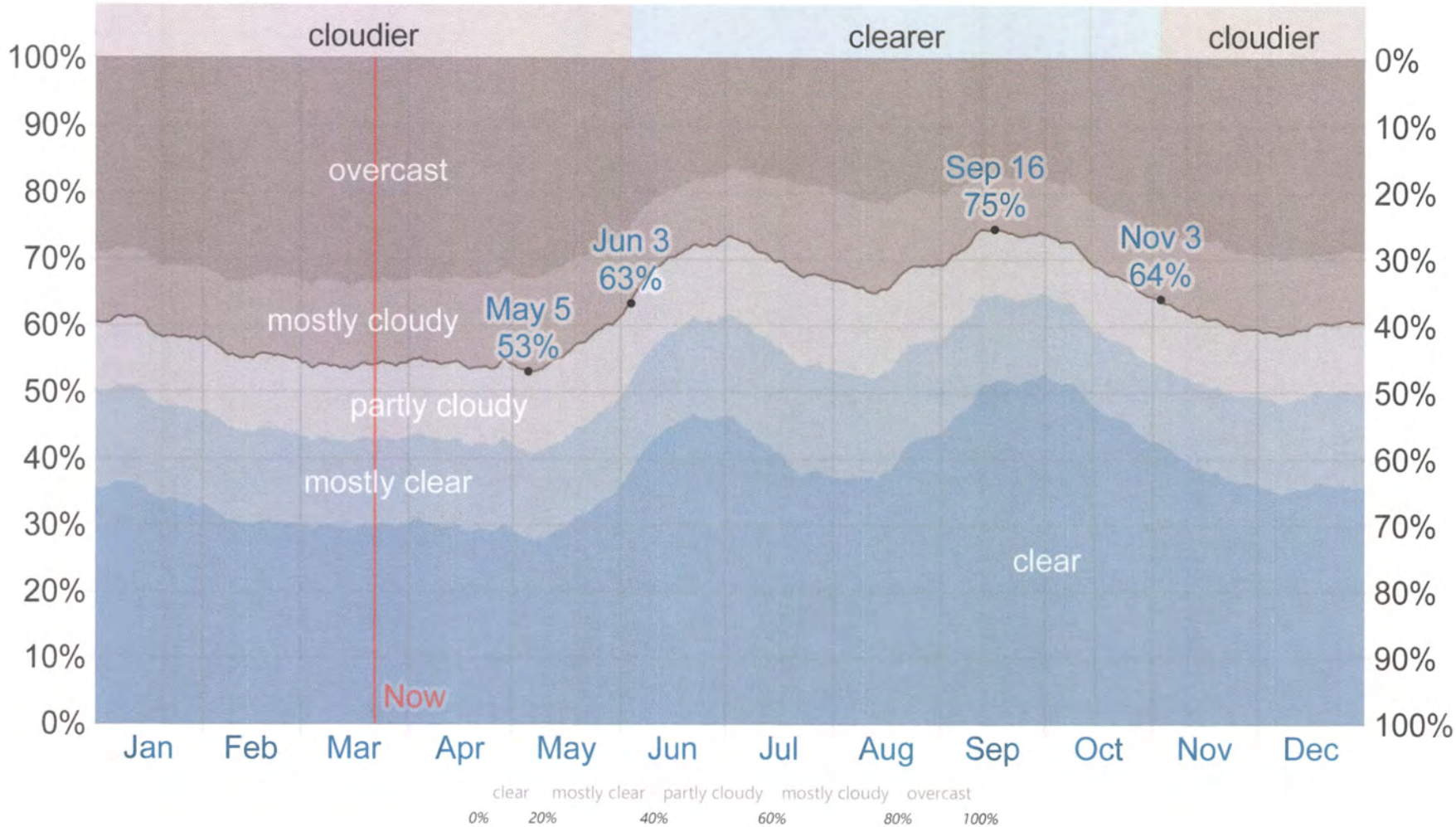
Clouds

In Golden, the average percentage of the sky covered by clouds experiences significant seasonal variation over the course of the year.

The clearer part of the year in Golden begins around June 3 and lasts for 5.0 months, ending around November 3. On September 16, the clearest day of the year, the sky is clear, mostly clear, or partly cloudy 75% of the time, and overcast or mostly cloudy 25% of the time.

The cloudier part of the year begins around November 3 and lasts for 7.0 months, ending around June 3. On May 5, the cloudiest day of the year, the sky is overcast or mostly cloudy 47% of the time, and clear, mostly clear, or partly cloudy 53% of the time.

Cloud Cover Categories



The percentage of time spent in each cloud cover band, categorized by the percentage of the sky covered by clouds.

Precipitation

A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Golden varies throughout the year.

The wetter season lasts 5.1 months, from April 2 to September 4, with a greater than 19% chance of a given day being a wet day. The chance of a wet day peaks at 31% on July 22.

The drier season lasts 6.9 months, from September 4 to April 2. The smallest chance of a wet day is 7% on January 24.

Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. Based on this categorization, the most common form of precipitation in Golden changes throughout the year.

Rain alone is the most common for 8.8 months, from February 26 to November 22. The highest chance of a day with rain alone is 31% on July 22.

Snow alone is the most common for 3.2 months, from November 22 to February 26. The highest chance of a day with snow alone is 5% on February 15.

Daily Chance of Precipitation

The percentage of days in which various types of precipitation are observed, excluding trace quantities: rain alone, snow alone, and mixed (both rain and snow fell in the same day).

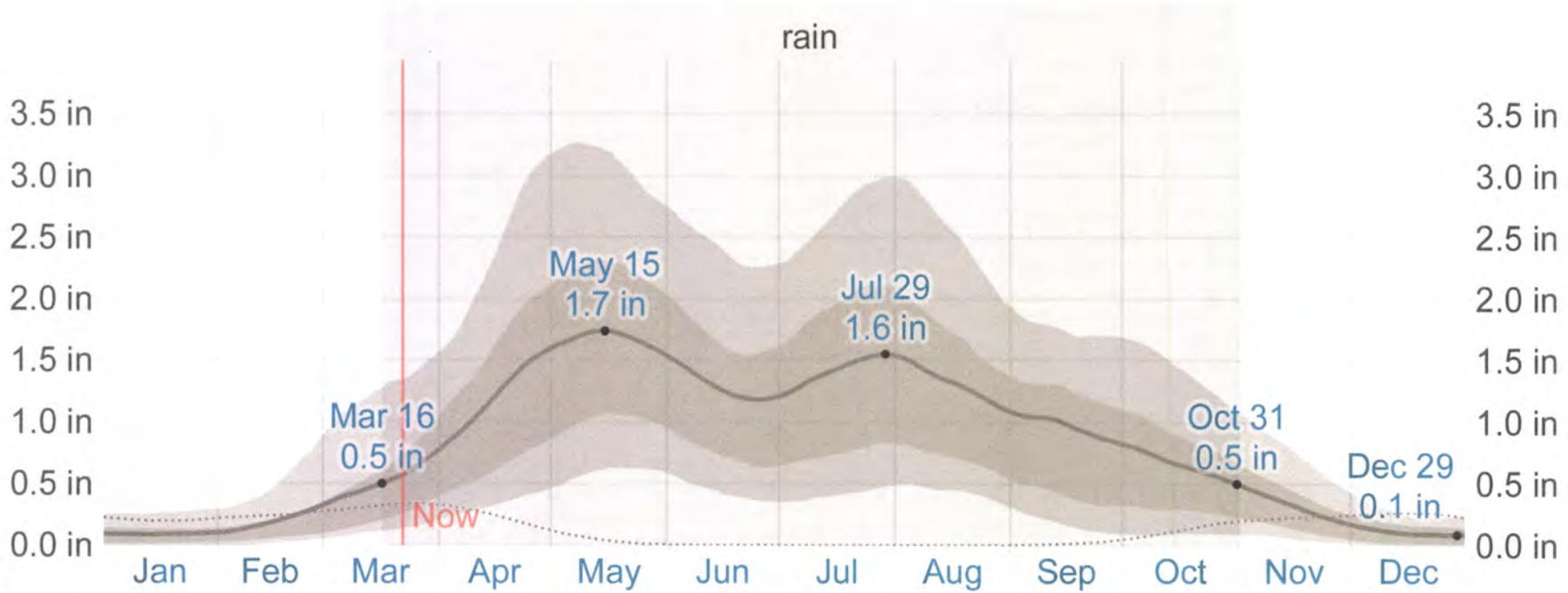
Rainfall

To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year. Golden experiences some seasonal variation in monthly rainfall.

The rainy period of the year lasts for 7.5 months, from March 16 to October 31, with a sliding 31-day rainfall of at least 0.5 inches. The most rain falls during the 31 days centered around May 15, with an average total accumulation of 1.7 inches.

The rainless period of the year lasts for 4.5 months, from October 31 to March 16. The least rain falls around December 29, with an average total accumulation of 0.1 inches.

Average Monthly Rainfall



The average rainfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands. The thin dotted line is the corresponding average liquid-equivalent snowfall.

Snowfall

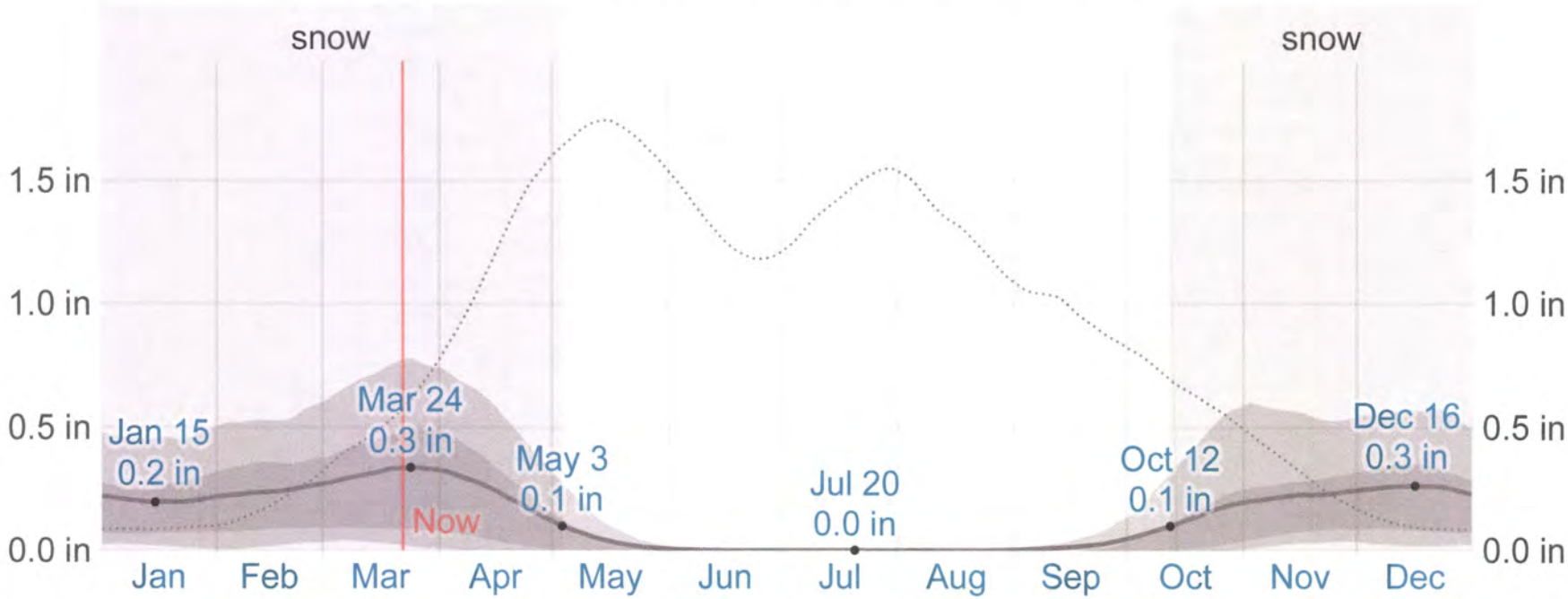
We report snowfall in liquid-equivalent terms. The actual depth of new snowfall is typically between 5 and 10 times the liquid-equivalent amount, assuming the ground is frozen. Colder, drier snow tends to be on the higher end of that range and warmer, wetter snow on the lower end.

As with rainfall, we consider the snowfall accumulated over a sliding 31-day period centered around each day of the year. Golden experiences some seasonal variation in monthly liquid-equivalent snowfall.

The snowy period of the year lasts for 6.7 months, from October 12 to May 3, with a sliding 31-day liquid-equivalent snowfall of at least 0.1 inches. The most snow falls during the 31 days centered around March 24, with an average total liquid-equivalent accumulation of 0.3 inches.

The snowless period of the year lasts for 5.3 months, from May 3 to October 12. The least snow falls around July 20, with an average total liquid-equivalent accumulation of 0.0 inches.

Average Liquid-Equivalent Monthly Snowfall

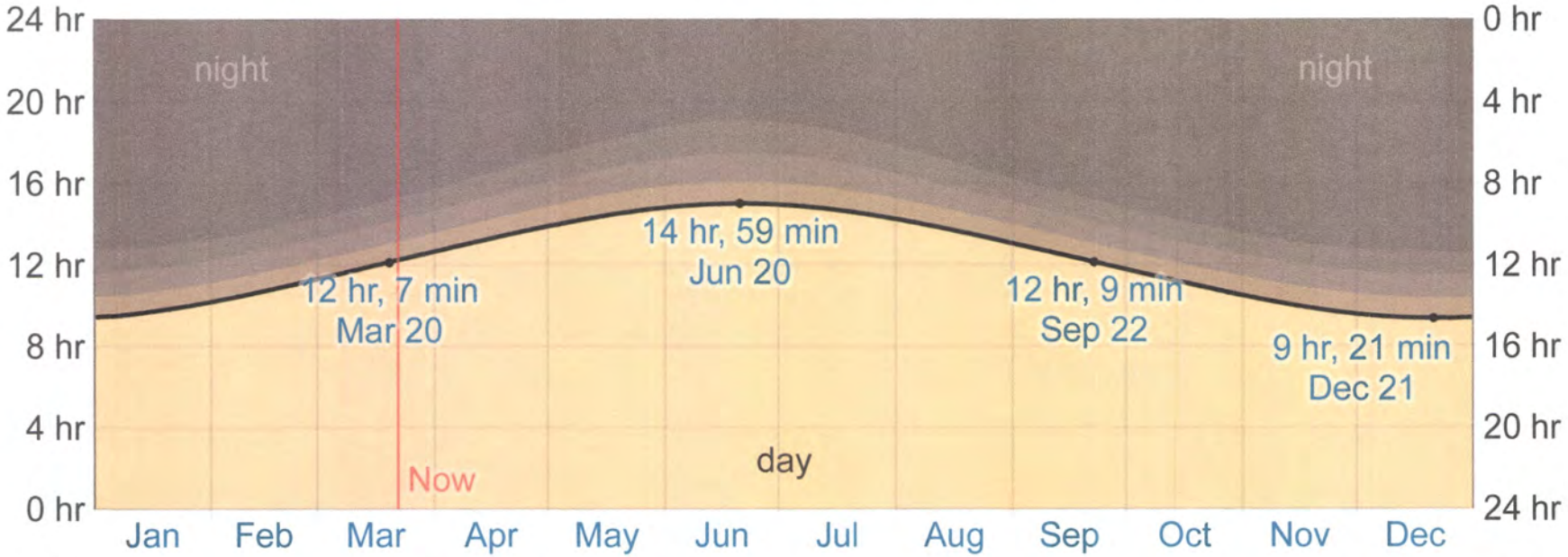


The average liquid-equivalent snowfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands. The thin dotted line is the corresponding average rainfall.

Sun

The length of the day in Golden varies significantly over the course of the year. In 2021, the shortest day is December 21, with 9 hours, 21 minutes of daylight; the longest day is June 20, with 14 hours, 59 minutes of daylight.

Hours of Daylight and Twilight

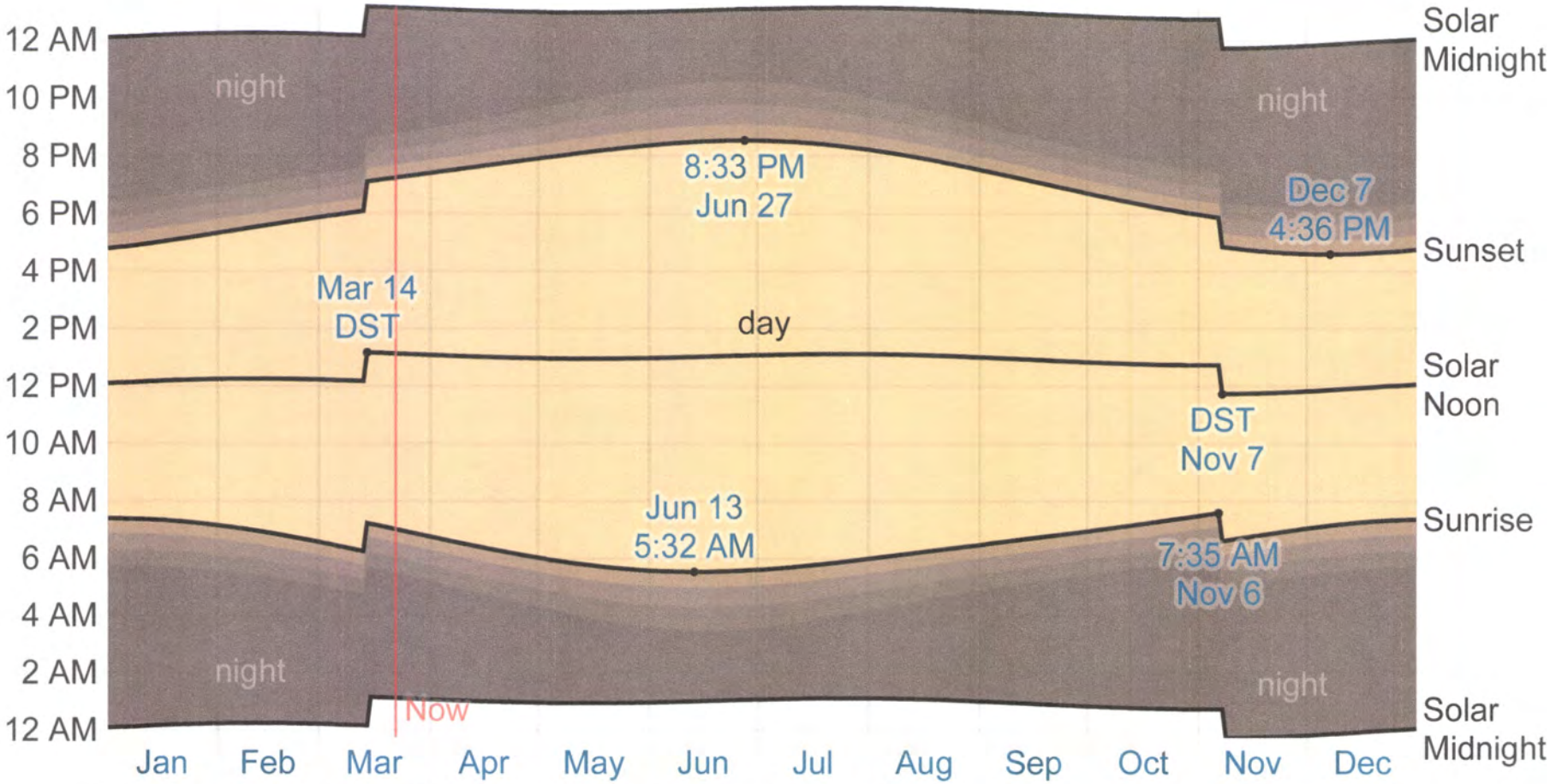


The number of hours during which the Sun is visible (black line). From bottom (most yellow) to top (most gray), the color bands indicate: full daylight, twilight (civil, nautical, and astronomical), and full night.

The earliest sunrise is at 5:32 AM on June 13, and the latest sunrise is 2 hours, 3 minutes later at 7:35 AM on November 6. The earliest sunset is at 4:36 PM on December 7, and the latest sunset is 3 hours, 57 minutes later at 8:33 PM on June 27.

Daylight saving time (DST) is observed in Golden during 2021, starting in the spring on March 14, lasting 7.8 months, and ending in the fall on November 7.

Sunrise & Sunset with Twilight and Daylight Saving Time

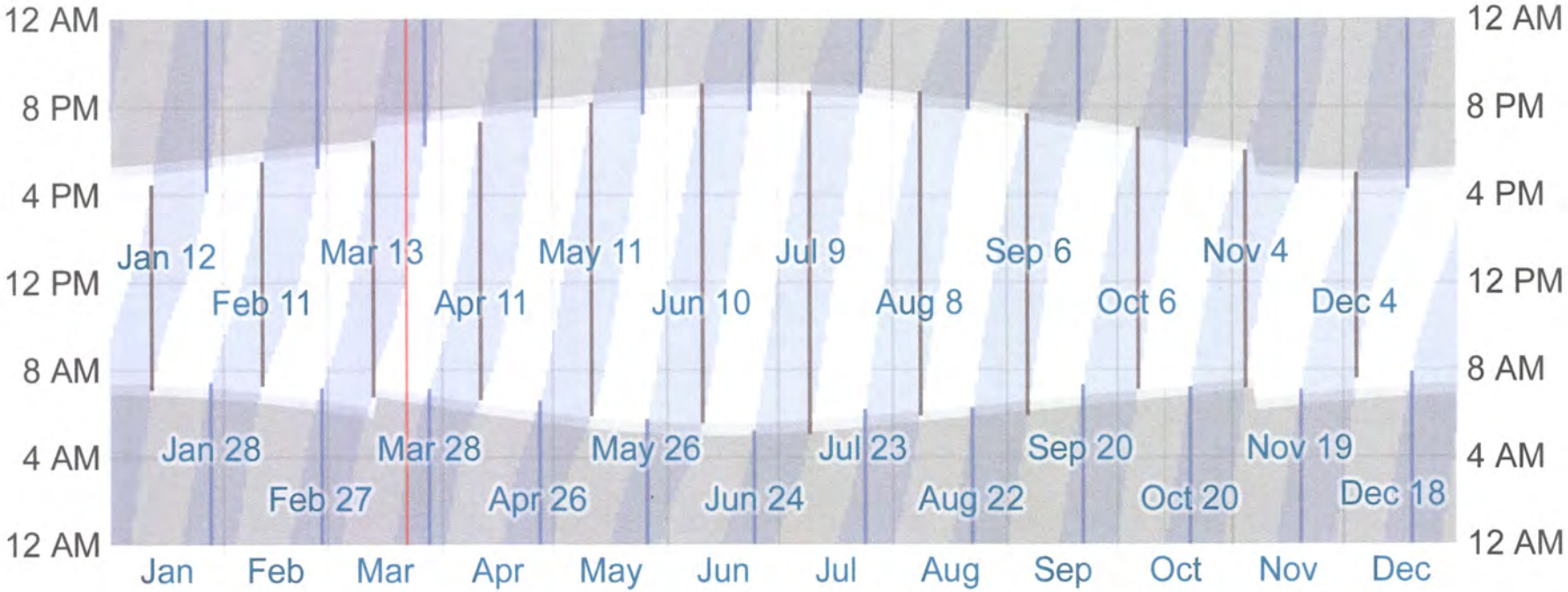


The solar day over the course of the year 2021. From bottom to top, the black lines are the previous solar midnight, sunrise, solar noon, sunset, and the next solar midnight. The day, twilights (civil, nautical, and astronomical), and night are indicated by the color bands from yellow to gray. The transitions to and from daylight saving time are indicated by the 'DST' labels.

Moon

The figure below presents a compact representation of key lunar data for 2021. The horizontal axis is the day, the vertical axis is the hour of the day, and the colored areas indicate when the moon is above the horizon. The vertical gray bars (new Moons) and blue bars (full Moons) indicate key Moon phases.

Moon Rise, Set & Phases



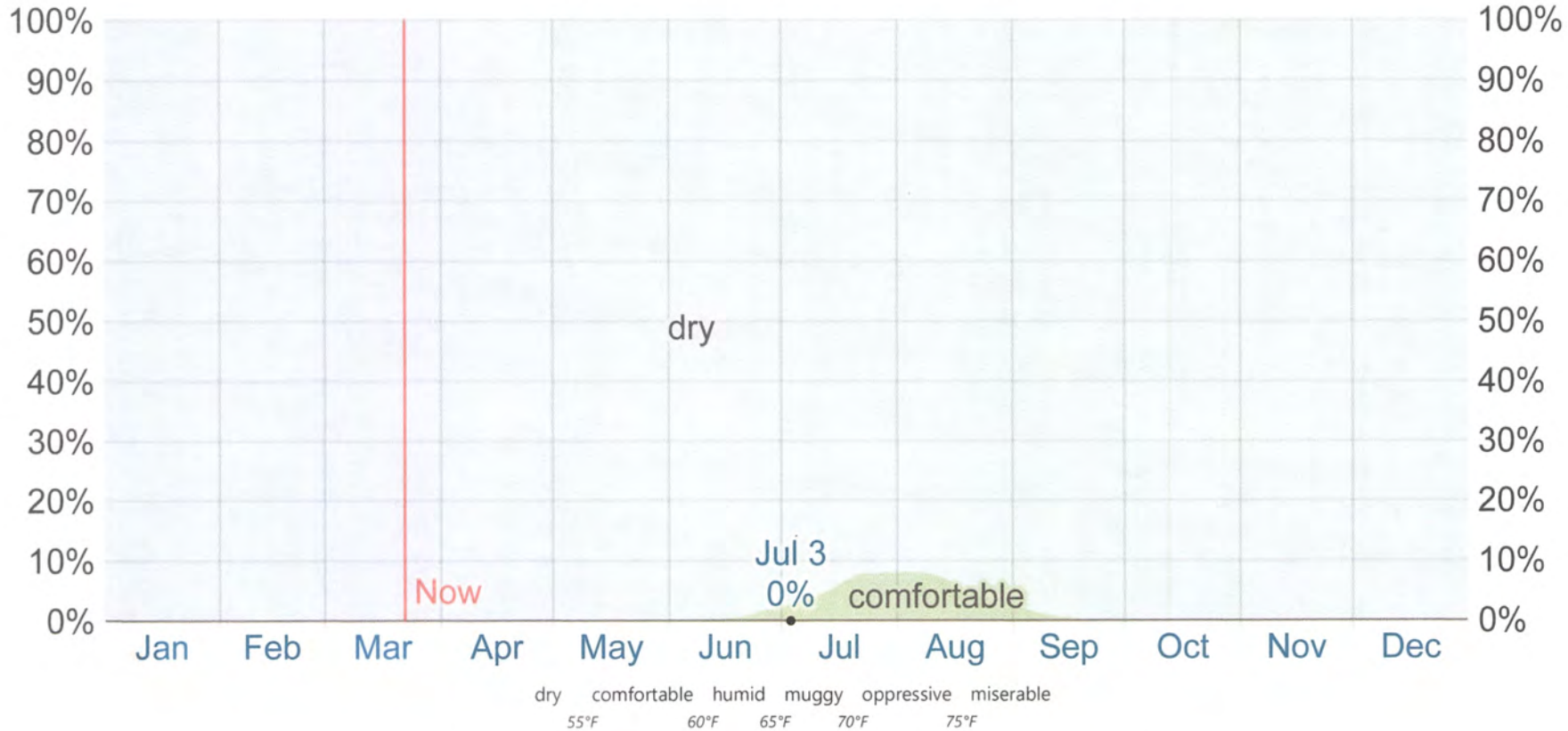
The time in which the moon is above the horizon (light blue area), with new moons (dark gray lines) and full moons (blue lines) indicated. The shaded overlays indicate night and civil twilight.

Humidity

We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

The perceived humidity level in Golden, as measured by the percentage of time in which the humidity comfort level is muggy, oppressive, or miserable, does not vary significantly over the course of the year, remaining a virtually constant 0% throughout.

Humidity Comfort Levels



The percentage of time spent at various humidity comfort levels, categorized by dew point.

Wind

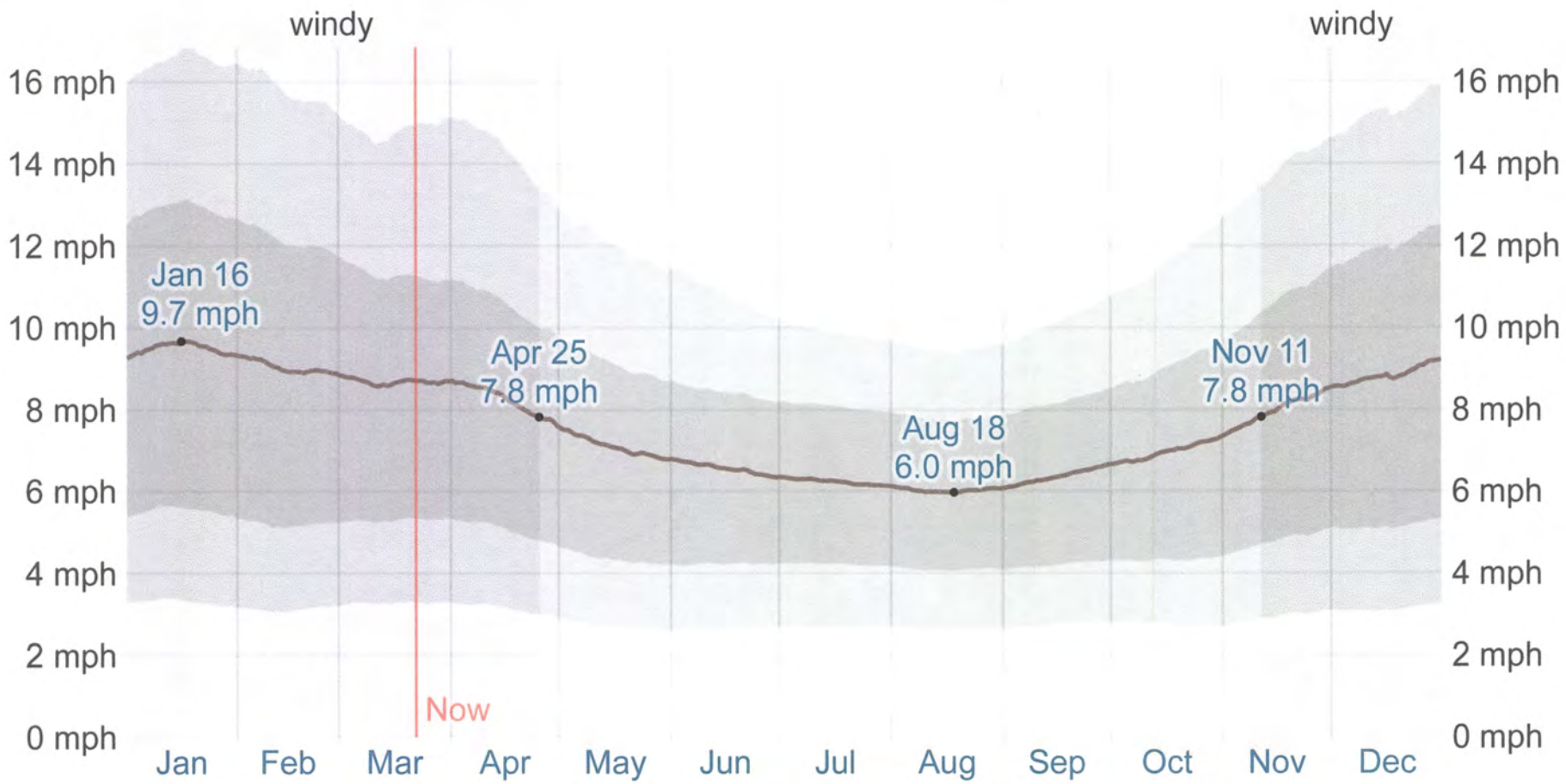
This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages.

The average hourly wind speed in Golden experiences significant seasonal variation over the course of the year.

The windier part of the year lasts for 5.4 months, from November 11 to April 25, with average wind speeds of more than 7.8 miles per hour. The windiest day of the year is January 16, with an average hourly wind speed of 9.7 miles per hour.

The calmer time of year lasts for 6.6 months, from April 25 to November 11. The calmest day of the year is August 18, with an average hourly wind speed of 6.0 miles per hour.

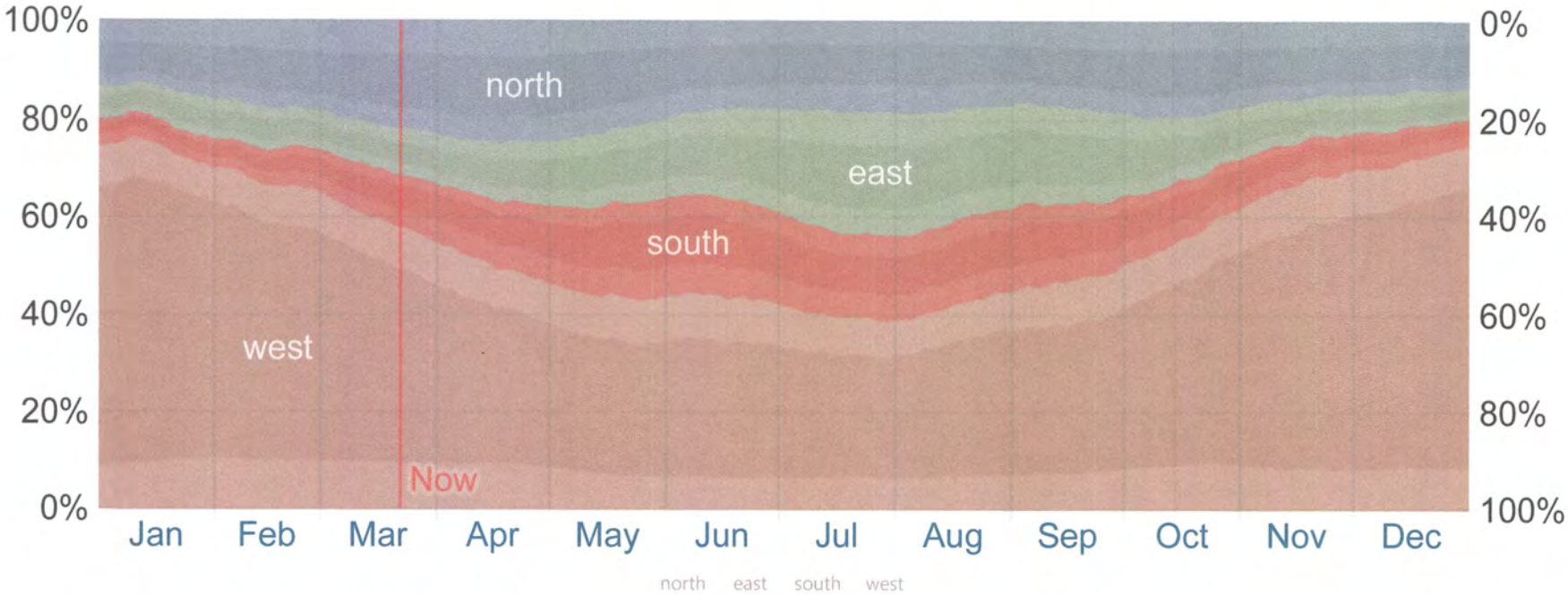
Average Wind Speed



The average of mean hourly wind speeds (dark gray line), with 25th to 75th and 10th to 90th percentile bands.

The predominant average hourly wind direction in Golden is from the west throughout the year.

Wind Direction



The percentage of hours in which the mean wind direction is from each of the four cardinal wind directions, excluding hours in which the mean wind speed is less than 1.0 mph. The lightly tinted areas at the boundaries are the percentage of hours spent in the implied intermediate directions (northeast, southeast, southwest, and northwest).

Best Time of Year to Visit

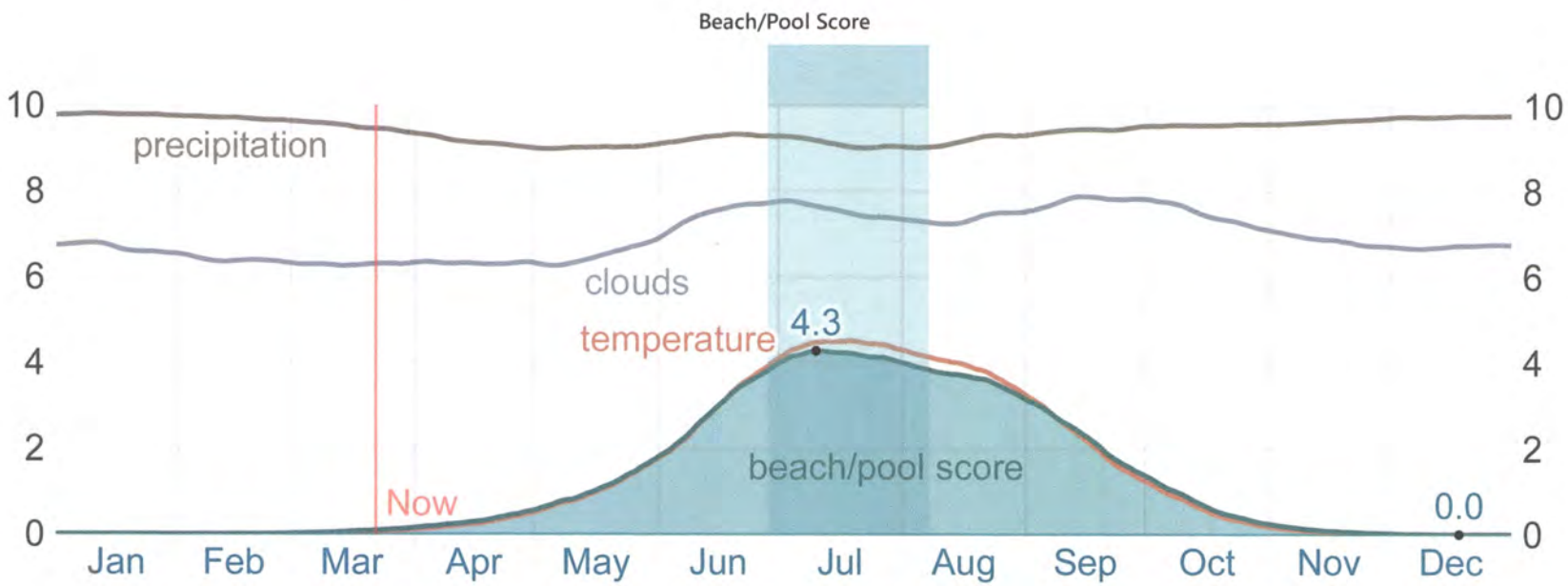
To characterize how pleasant the weather is in Golden throughout the year, we compute two travel scores.

The tourism score favors clear, rainless days with perceived temperatures between 65°F and 80°F. Based on this score, the best time of year to visit Golden for general outdoor tourist activities is from mid June to early September, with a peak score in the first week of July.

Tourism Score

The tourism score (filled area), and its constituents: the temperature score (red line), the cloud cover score (blue line), and the precipitation score (green line).

The beach/pool score favors clear, rainless days with perceived temperatures between 75°F and 90°F. Based on this score, the best time of year to visit Golden for hot-weather activities is from late June to early August, with a peak score in the second week of July.



The beach/pool score (filled area), and its constituents: the temperature score (red line), the cloud cover score (blue line), and the precipitation score (green line).

Methodology

For each hour between 8:00 AM and 9:00 PM of each day in the analysis period (1980 to 2016), independent scores are computed for perceived temperature, cloud cover, and total precipitation. Those scores are combined into a single hourly composite score, which is then aggregated into days, averaged over all the years in the analysis period, and smoothed.

Our cloud cover score is 10 for fully clear skies, falling linearly to 9 for mostly clear skies, and to 1 for fully overcast skies.

Our precipitation score, which is based on the three-hour precipitation centered on the hour in question, is 10 for no precipitation, falling linearly to 9 for trace precipitation, and to 0 for 0.04 inches of precipitation or more.

Our tourism temperature score is 0 for perceived temperatures below 50°F, rising linearly to 9 for 65°F, to 10 for 75°F, falling linearly to 9 for 80°F, and to 1 for 90°F or hotter.

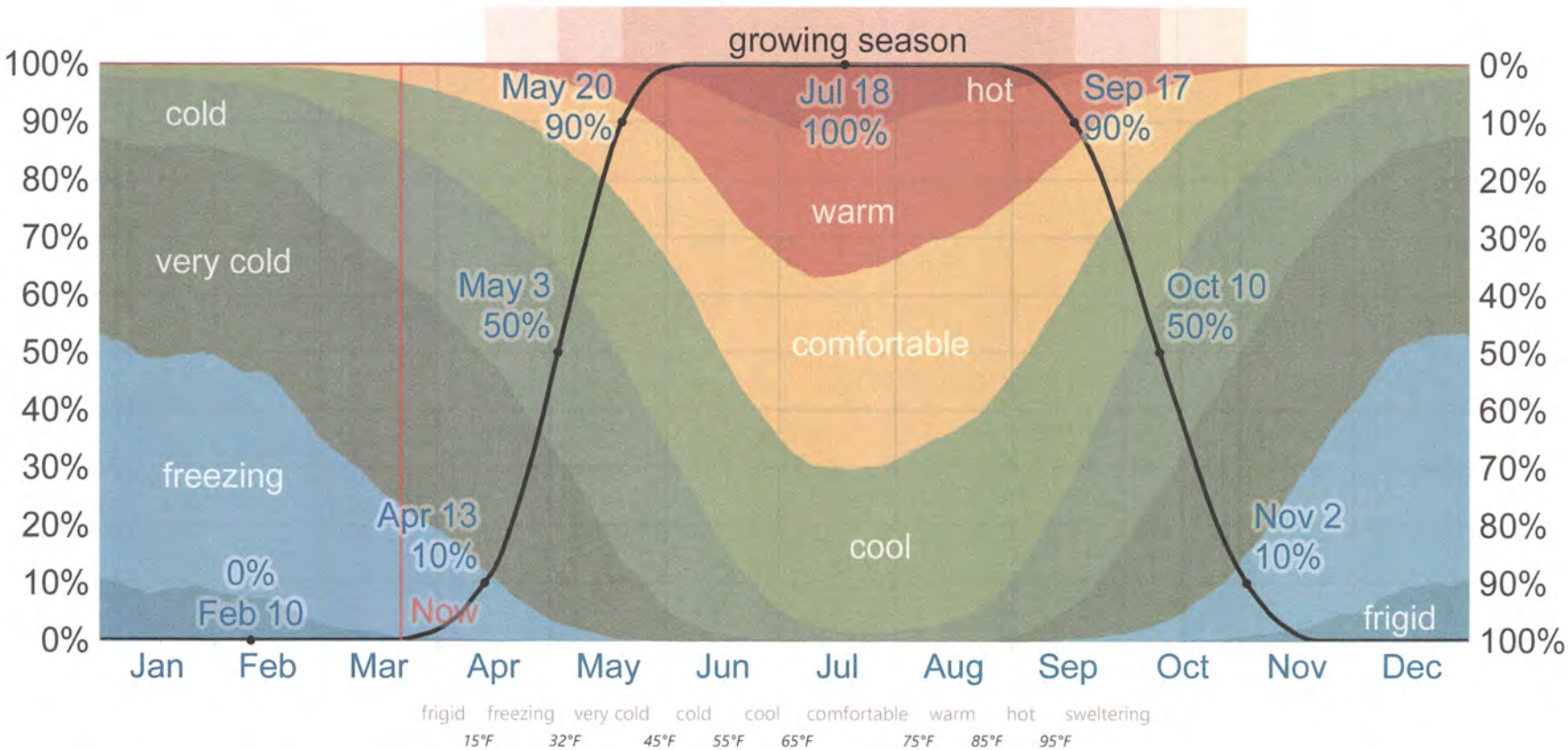
Our beach/pool temperature score is 0 for perceived temperatures below 65°F, rising linearly to 9 for 75°F, to 10 for 82°F, falling linearly to 9 for 90°F, and to 1 for 100°F or hotter.

Growing Season

Definitions of the growing season vary throughout the world, but for the purposes of this report, we define it as the longest continuous period of non-freezing temperatures (≥ 32°F) in the year (the calendar year in the Northern Hemisphere, or from July 1 until June 30 in the Southern Hemisphere).

The growing season in Golden typically lasts for 5.2 months (160 days), from around May 3 to around October 10, rarely starting before April 13 or after May 20, and rarely ending before September 17 or after November 2.

Time Spent in Various Temperature Bands and the Growing Season

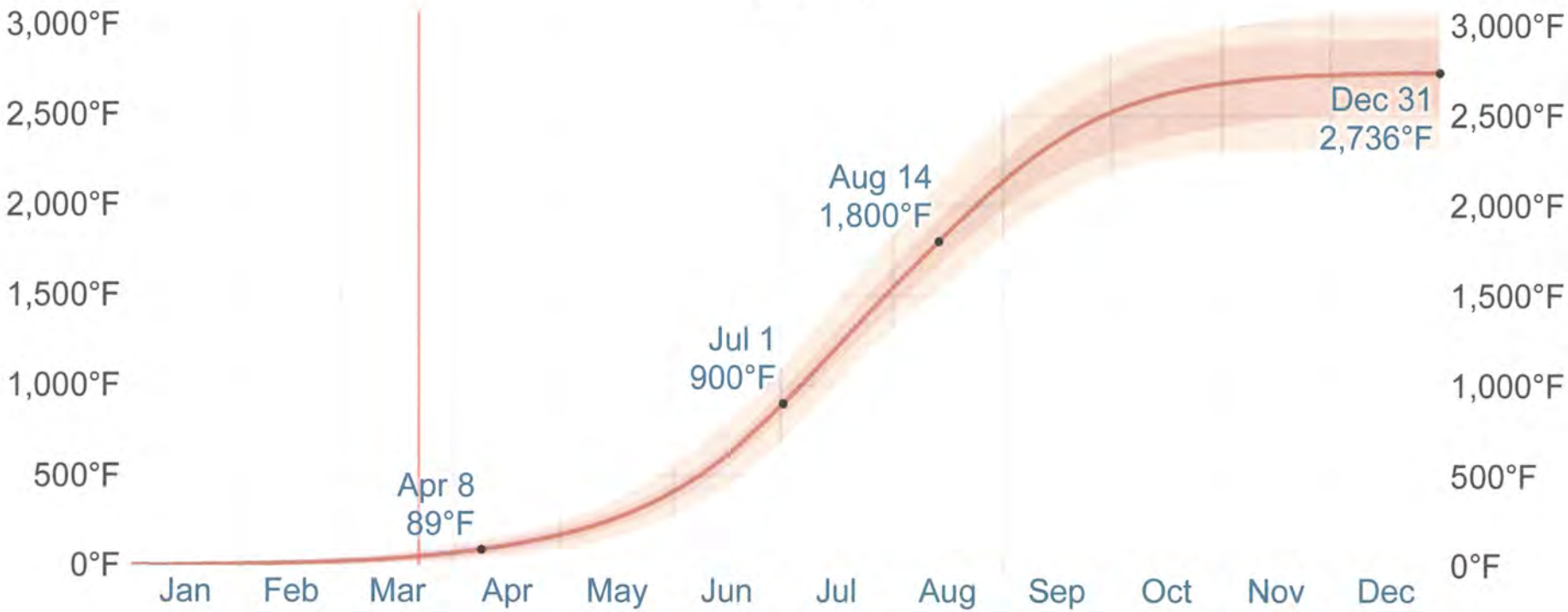


The percentage of time spent in various temperature bands. The black line is the percentage chance that a given day is within the growing season.

Growing degree days are a measure of yearly heat accumulation used to predict plant and animal development, and defined as the integral of warmth above a base temperature, discarding any excess above a maximum temperature. In this report, we use a base of 50°F and a cap of 86°F.

Based on growing degree days alone, the first spring blooms in Golden should appear around April 8, only rarely appearing before March 22 or after April 29.

Growing Degree Days



The average growing degree days accumulated over the course of the year, with 25th to 75th and 10th to 90th percentile bands.

Solar Energy

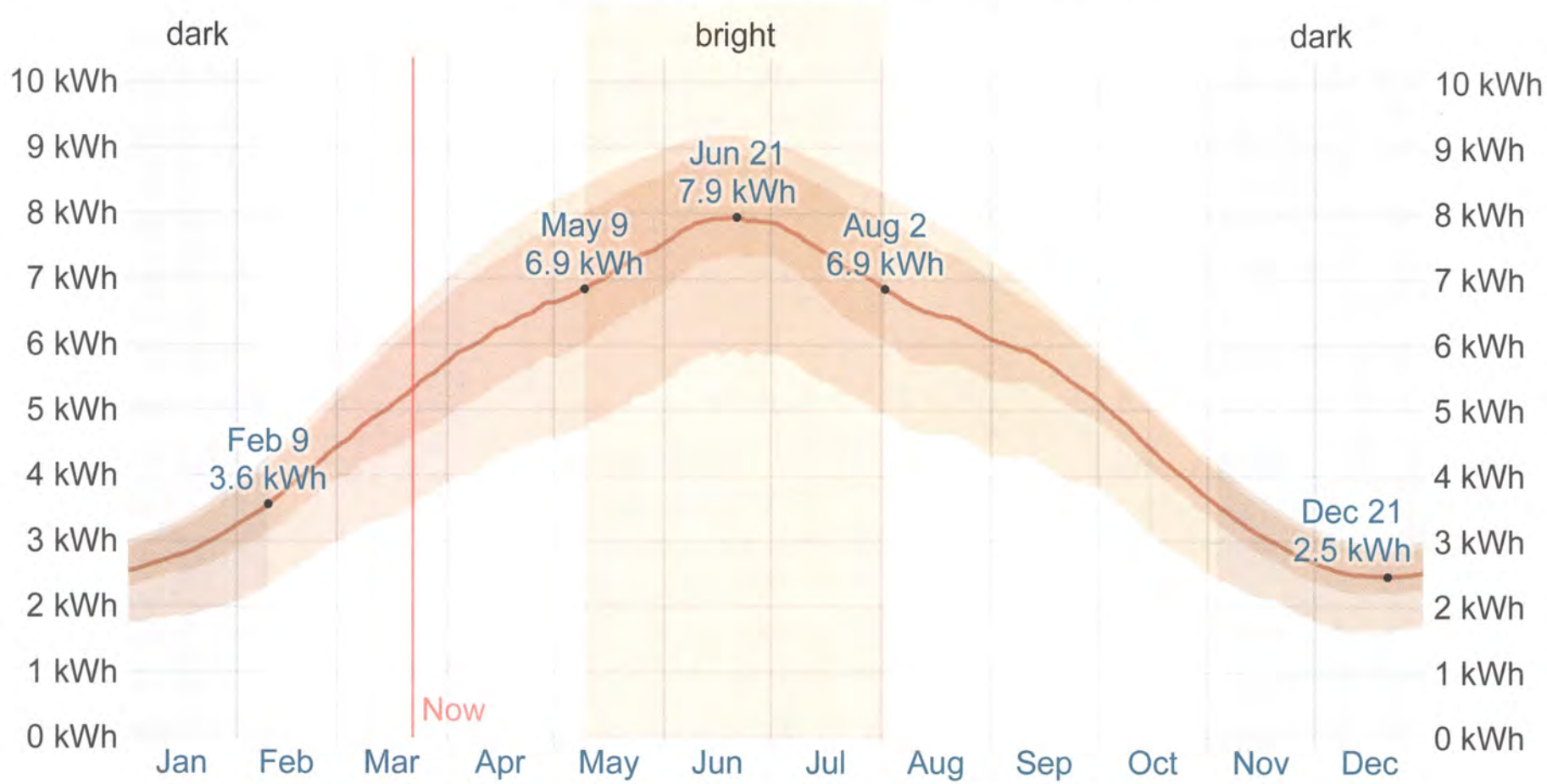
This section discusses the total daily incident shortwave solar energy reaching the surface of the ground over a wide area, taking full account of seasonal variations in the length of the day, the elevation of the Sun above the horizon, and absorption by clouds and other atmospheric constituents. Shortwave radiation includes visible light and ultraviolet radiation.

The average daily incident shortwave solar energy experiences extreme seasonal variation over the course of the year.

The brighter period of the year lasts for 2.8 months, from May 9 to August 2, with an average daily incident shortwave energy per square meter above 6.9 kWh. The brightest day of the year is June 21, with an average of 7.9 kWh.

The darker period of the year lasts for 3.2 months, from November 3 to February 9, with an average daily incident shortwave energy per square meter below 3.6 kWh. The darkest day of the year is December 21, with an average of 2.5 kWh.

Average Daily Incident Shortwave Solar Energy



The average daily shortwave solar energy reaching the ground per square meter (orange line), with 25th to 75th and 10th to 90th percentile bands.

Topography

For the purposes of this report, the geographical coordinates of Golden are 39.756 deg latitude, -105.221 deg longitude, and 5,666 ft elevation.

The topography within 2 miles of Golden contains very significant variations in elevation, with a maximum elevation change of 1,798 feet and an average elevation above sea level of 6,088 feet. Within 10 miles contains very significant variations in elevation (4,741 feet). Within 50 miles also contains extreme variations in elevation (9,600 feet).

The area within 2 miles of Golden is covered by shrubs (51%), grassland (22%), and artificial surfaces (21%), within 10 miles by shrubs (38%) and trees (24%), and within 50 miles by trees (37%) and grassland (25%).

Data Sources

This report illustrates the typical weather in Golden, based on a statistical analysis of historical hourly weather reports and model reconstructions from January 1, 1980 to December 31, 2016.

Temperature and Dew Point

There are 4 weather stations near enough to contribute to our estimation of the temperature and dew point in Golden.

For each station, the records are corrected for the elevation difference between that station and Golden according to the International Standard Atmosphere (https://en.wikipedia.org/wiki/International_Standard_Atmosphere), and by the relative change present in the MERRA-2 satellite-era reanalysis (https://gmao.gsfc.nasa.gov/reanalysis/MERRA-2/) between the two locations.

The estimated value at Golden is computed as the weighted average of the individual contributions from each station, with weights proportional to the inverse of the distance between Golden and a given station.

The stations contributing to this reconstruction are: Rocky Mountain Metropolitan Airport (/y/145653/Average-Weather-at-Rocky-Mountain-Metropolitan-Airport-Colorado-United-States-Year-Round) (67%, 18 kilometers, northeast); Denver / Stapleton International, Co. (/y/145691/Average-Weather-at-Denver-Stapleton-International-Co.;-Colorado;-United-States-Year-Round) (29%, 30 kilometers, east); Wilkerson Pass (2.0%, 83 kilometers, south); and Copper Mountain, Red Cliff Pass (/y/145631/Average-Weather-at-Copper-Mountain-Red-Cliff-Pass;-Colorado;-United-States-Year-Round) (1.7%, 86 kilometers, west).

Other Data

All data relating to the Sun's position (e.g., sunrise and sunset) are computed using astronomical formulas from the book, Astronomical Algorithms 2nd Edition (https://www.amazon.com/Astronomical-Algorithms-Jean-Meeus/dp/0943396611), by Jean Meeus.

All other weather data, including cloud cover, precipitation, wind speed and direction, and solar flux, come from NASA's MERRA-2 Modern-Era Retrospective Analysis (https://gmao.gsfc.nasa.gov/reanalysis/MERRA-2/). This reanalysis combines a variety of wide-area measurements in a state-of-the-art global meteorological model to reconstruct the hourly history of weather throughout the world on a 50-kilometer grid.

Land Use data comes from the Global Land Cover SHARE database (http://www.fao.org/land-water/land/land-governance/land-resources-planning-toolbox/category/details/en/c/1036355/), published by the Food and Agriculture Organization of the United Nations.

Elevation data comes from the Shuttle Radar Topography Mission (SRTM) (http://www2.jpl.nasa.gov/srtm/), published by NASA's Jet Propulsion Laboratory.

Names, locations, and time zones of places and some airports come from the GeoNames Geographical Database (http://www.geonames.org/).

Time zones for airports and weather stations are provided by AskGeo.com (https://askgeo.com/).

Maps are © Esri, with data from National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, and iPC.

Disclaimer

The information on this site is provided as is, without any assurances as to its accuracy or suitability for any purpose. Weather data is prone to errors, outages, and other defects. We assume no responsibility for any decisions made on the basis of the content presented on this site.

We draw particular cautious attention to our reliance on the MERRA-2 model-based reconstructions for a number of important data series. While having the tremendous advantages of temporal and spatial completeness, these reconstructions: (1) are based on computer models that may have model-based errors, (2) are coarsely sampled on a 50 km grid and are therefore unable to reconstruct the local variations of many microclimates, and (3) have particular difficulty with the weather in some coastal areas, especially small islands.

We further caution that our travel scores are only as good as the data that underpin them, that weather conditions at any given location and time are unpredictable and variable, and that the definition of the scores reflects a particular set of preferences that may not agree with those of any particular reader.

6.4.12 Exhibit L
Reclamation Costs

COST SUMMARY WORK

Task Description: Reclamation cost estimate

Site: Golden Mine

TASK LIST (Direct costs)

TASK	Description	Task Hours	Cost
001C	Backfill highwalls 3H:1V	16.43	$ 7,797.98
002	Rip processing area	0.55	$ 114.20
003	Contour and pushdown overburden piles	3.79	$ 790.84
005	Finish grade disturbed area	46.86	$ 4,492.66
006	Distribute topsoil over affected areas	96.02	$ 40,030.79
010	Reseed facilities area and haul road	131.2	$ 189,711.26
012	Mobilize and demobilize	4	$ 5,550.57
	Hours Total:	298.84	

Direct Costs Total:	$ 248,488.30

INDIRECT COSTS

OVERHEAD AND PROFIT

Liability insurance:	2.02%	$ 5,019.46
Performance bond:	1.05%	$ 2,683.67
Job superintendent	100	$ 7,500.00
Profit:	5%	$ 12,424.42
CONTRACT AMOUNT (DIRECT AND O&P)		$ 276,115.86

LEGAL-ENGINEERING-PROJECT MANAGEMENT

Engineering work and/or contract/bid preparation	0.00%	$ -
Reclamation management and/or administration	4.50%	$ 12,425.21

TOTAL BOND AMOUNT	$ 288,541.07

Mill

Task Description: Mobilize /Demobilize Task # 012

Site: Golden Mine

EQUIPMENT TRANSPORT RIG COST

Rig Capacities:	0-25 Tons	26-50 tons	51+ tons
Unit Cost:	$ 88.67	$ 117.55	$ 125.45

NON ROADABLE EQUIPMENT

Machine	Weight/Tons	Haul trip cost/hr/fleet	Return Trip cost/hr/fleet	DOT Permit cost/fleet
CAT D8	53.08	$ 205.64	$ 125.45	$ 250.00
CAT 12M	16.01	$ 112.15	$ 88.67	$ 250.00
CAT 950	20.13	$ 184.07	$ 88.67	$ 250.00
Drill/Broadcast seeder with tractor	25	$ 128.26	$ 88.67	$ -
	Subtotal	$ 630.12	$ 391.46	$ 750.00

ROADABLE EQUIPMENT

2500 gallon water truck		$ 68.18	$ 68.18
Fuel tanker		$ 81.14	$ 81.14
Lube truck		$ 94.90	$ 94.90
Flatbed truck		$ 115.89	$ 115.89
	Subtotal	$ 360.11	$ 360.11

EQUIMENT HAUL DISTANCE AND TIME

Golden 10 miles one-way

Average speed 40 mph

Transportion Cycle Time Hours

	Non-Roadable	Roadable
Haul time:	0.5	0.5
Return time:	0.5	0.5
Loading time:	0.5	NA
Unloading time:	0.5	NA
Subtotals:	2	1

Total Non-Roadable Cost: $ 1,665.18

Total Roadable Cost: $ 360.11

JOB TIME AND COST

Total time: 4

Total cost: $ 5,550.57

Task Description:	Reseed disturbed area	Task #	010
Site:	Golden Mine		

Reseeding Activity	Description	Cost/Acre
Drill seeding		$ 88.58
Mulching		$ 86.88
Crimping mulch	Tractor	$ 66.02

Seed Mix

Species	Rate-PLS lbs/Acre	Cost/lb	Cost/acre
Western Wheatgrass	4.00	$ 4.50	$ 18.00
Big Bluestem	2.20	$ 14.00	$ 30.80
Blue Grama	0.30	$ 13.50	$ 4.05
Sideoats Grama	1.35	$ 7.50	$ 10.13
Little bluestem	1.05	$ 12.00	$ 12.60
Yellow indiangrass	1.50	$ 15.00	$ 22.50
			$ 98.08

Shrubs	No./acre	Cost/shrub	Cost/acre
Mountain Mahogany	9.00	$ 9.99	$ 89.91

Mulch

Hay	2 ton/acre	$ 522.00

Job time and estimate

No. of Acres	65.6
Initial cost/acre	$ 2,030.39

Grass Reseeding cost/acre (Estimate 30% failure rate)	$ 861.56
Initial Job Cost	$ 133,193.26
Reseeding Job Cost	$ 56,518.01
Total Job Cost	$ 189,711.26
Job Hours	131.2

Task Description: Distribute topsoil over affected areas Task # 006

Site: Golden Mine

HOURLY EQUIPMENT COST

Basic Machine:	C730 Truck		CAT 950 Loader		CatD8 Dozer
Unit Cost/Hour:	$ 129.72		$ 95.37		$ 191.83
Unit Production:	18.06	LCY			
	201.79	LCY/Hr	528.59	LCY/Hr	

MATERIAL QUANTITIES

Initial volume:	34,444	
Swell factor:	1.125	
Loose volume:	38,750	LCY

TRAVEL TIME

Haul distance	1200	ft
Total cycle time	5.37	minutes

JOB TIME AND COST

Fleet size:	1 truck, 1 loader, 1 dozer
Total job time:	96.02
Fleet cost /hour	416.92
Total job cost:	$ 40,030.79

Task Description: Finish grade disturbed areas Task # 005

Site: Golden Mine

HOURLY EQUIPMENT COST

Basic Machine:	CAT 12M
Horsepower:	158
Unit Cost/Hour:	$ 95.88

MATERIAL QUANTITIES

Area:	65.6	acres
Unit production:	1.4	acre/hr

JOB TIME AND COST

Fleet size:	1 grader
Unit cost:	$ 68.49
Total job time:	46.86
Total job cost:	$ 4,492.66

Task Description: Contour and pushdown overburden piles Task # 003

Site: Golden Mine

HOURLY EQUIPMENT COST

Basic Machine:	Cat D8
Horsepower:	310
Unit Cost/Hour:	$ 208.90

MATERIAL QUANTITIES

Initial volume:	5945100
Swell factor:	1.165
Loose volume:	6926042
Unit production:	180

MATERIAL QUANTITIES

Area:	5.3
Unit production:	1.4

JOB TIME AND COST

Fleet size:	1 dozer
Unit cost:	$ 149.21
Total job time:	3.79
Total job cost:	$ 790.84

Task Description: Backfill highwalls 3H:1V Task # 001C

Site: Golden Mine

HOURLY EQUIPMENT COST

Basic Machine:	C730 Truck	CAT 950 Loader	CatD8 Dozer	2500 gallon water truck
Unit Cost/Hour:	$ 129.72	$ 95.37	$ 191.83	$ 57.56
Unit Production:	18.06 LCY			
	108.36 LCY/Hr	528.59 LCY/Hr		

MATERIAL QUANTITIES

Initial volume:	1,583
Swell factor:	1.125
Loose volume:	1,781

TRAVEL TIME

Haul distance	2000 ft
Total cycle time	10 minutes

JOB TIME AND COST

Fleet size:	1 truck, 1 loader, 1 dozer, 1 water truck
Total job time:	16.43
Fleet cost /hour	474.48
Total job cost:	$ 7,797.98

6.4.13 Exhibit M
Other Permits and Licenses

Permit/License	Contact Name	Address	Status
Jefferson County Planning and Zoning Location and Extent	Justin Montgomery	100 Jefferson County Parkway, Suite 3550, Golden, CO, 80419	
Colorado Department of Public Health and Environment Fugitive Dust Permit and Plan		CDPHE APCD-B1 4300 Cherry Creek Drive South Denver, Colorado 80222-1530	92JE940F
Colorado Department of Public Health and Environment Stormwater Discharge Permit and Plan		CDPHE WQCD-PE-B2 4300 Cherry Creek Drive South Denver, Colorado 80222-1530	COG501852
Colorado State Land Board Minerals Lease	Ben Teschner	1127 Sherman Street, Suite 300 Denver, CO 80203	Denver Brick Lease #102414 General Shale Lease #102418

6.4.14 Exhibit N
Source of Legal Right to Enter

15.00

RECORDED IN
COUNTY OF JEFFERSON
STATE OF COLORADO
RECEPTION NO. 85094449
10/02/85 10:07 15.00

Form 226-3
Rev. 10/89

STATE OF COLORADO

State Board of Land Commissioners
Department of Natural Resources
Denver, Colorado 80203

STATE DOCUMENTARY FEE
Not Recorded
OCT 2 1985

CLAY MINING LEASE NO. 3041/16-S

1-5

THIS MINING LEASE, Made in duplicate and entered into this 15th day of July, 19 85, by and between the State of Colorado, acting through its STATE BOARD OF LAND COMMISSIONERS, hereinafter referred to as Lessor, and Robinson Brick Company, P.O. Box 5243 TA 500 South Santa Fe Drive, Denver, CO 80217, hereinafter referred to as Lessee:

WITNESSETH: Lessor, for and in consideration of the sum of Ninety-two and 75/100 - - - - - - Dollars ($ 92.75), receipt of which is hereby acknowledged as payment of filing fee in the amount of $ 12.75, and first year's rental in the amount of $ 80.00, and in further consideration of Lessee's agreement to pay the following amounts annually as rental in advance on the anniversary date of this lease so long as said lease shall remain in effect:

LEASE YEAR	RATE PER ACRE
2nd	$1.00
3rd	1.00
4th	1.00
5th and all subsequent years	1.00

and in further consideration of the terms and conditions hereinafter stated, and of the payment of royalties reserved herein, to be kept and performed by Lessee, its successors and assigns, does hereby demise and lease to Lessee the right and privilege of exploring and prospecting for, and mining for and taking clay and associated minerals of value that can be removed in the process of mining and milling clay from the lands hereinafter described, situate, lying and being in the County of Jefferson, State of Colorado, to wit:

ACRES	SUBDIVISION	SECTION	TOWNSHIP	RANGE	PATENTS
80.00	W/2NW/4	16	3 South	70 West	None

containing 80.00 acres, more or less, together with the right to use as much of the surface thereof as may reasonably be required in the exercise of the rights and privileges herein granted, and the reasonable right to ingress and egress; the right to the use of all otherwise unappropriated water from said lands but not from surface lessee's or surface owner's water wells or reservoirs; the right to construct buildings, make excavations, stockpiles, dumps, drains, roads, railroads, power lines, pipelines, and other improvements as may be necessary; subject, however, to all existing easements and rights-of-way of third parties, and the rights of surface lessees and surface patentees, and further subject to the terms, conditions, and royalties set out in this lease.

RESERVING, However, to the State of Colorado:

A. All rights and privileges of every kind and nature, except as are herein specifically granted.

B. The right to use or lease said premises or any part thereof at any time for any purpose other than and not inconsistent or interfering with the rights and privileges herein specifically granted.

C. The right at all times during the life of this lease to go upon said premises and every part thereof, for the purpose of inspecting same, and the books of accounts and records of mineral workings therein, and of ascertaining whether or not said Lessee and those holding thereunder, by and from it, are carrying out the terms, covenants, and agreements in this lease contained.

TO HAVE AND TO HOLD The above-described premises, with the appurtenances, unto the Lessee, its heirs, successors, assigns, or legal representatives, from Twelve o'clock noon on the 15th day of July, 19 85, for the full term of ten (10) years, and until Twelve o'clock noon on the 15th day of July, 1995, and, except as hereinafter stated, as long thereafter as the minerals hereinabove designated are being produced in paying quantities from said premises, and the royalties and rents provided for herein, or by any extension hereof, are being paid, subject to the following terms, conditions, and agreements, to wit:

1. Minimum Royalty – As minimum and advance royalty, without relation to the amount of minerals mined from the leased premises, the Lessees will pay to the Lessor the following amounts:

LEASE YEAR	MINIMUM ROYALTY	LEASE YEAR	MINIMUM ROYALTY
1st thru 5th	None		

Acreage changes resulting from surrender or partial assignment do not reduce the minimum royalty proportionately. The Board will determine the minimum royalty.

Further, at the end of each five-year period, the Board may fix the rate of advance royalty to be paid for each succeeding five-year period of the lease.

In the event that said Lessee does not extract from said premises said minimum amounts above specified during each lease year of the term of this lease, it is nevertheless understood that the above sums of money are royalties for the years stated, and are due and payable to the Lessor whether minerals are mined or not during such year, but that such minimum advance royalty will be credited upon the first royalties due as hereinafter provided for minerals actually produced from said premises and sold or milled during the year for which such minimum royalty was paid.

2. Production Royalty – Lessor hereby reserves and Lessee agrees to pay to Lessor as royalty the following:

(a-1) [illegible]
50¢ per ton or 67.5¢ per cubic yard

(a-2) For non-fissionable materials – [illegible]

(b) [illegible] Within sixty days prior to the termination of each and every five-year period for so long as this lease remains in effect, the State Board of Land Commissioners may reappraise the property herein leased and fix and determine the rate of production royalty to be paid during each year of the succeeding five-year period. Failure to comply with any new royalty rate set by the Board may subject this lease to cancellation by thirty-day written notice by the Board.

2

If requested by Lessor, Lessee is to furnish proof of price received for all minerals sold. Such royalty is due and payable on or before the twenty-fifth (25th) day of each calendar month during the term of this lease for minerals mined, removed, and sold by Lessee during the preceding calendar month.

Royalty payments shall apply to payment received by the Lessee on any mineral so sold. The minerals mined from the leased premises may be milled in a custom or commercial plant or mill owned and operated by Lessee. They may not be mixed or commingled with ores from other properties until they have been crushed and sampled by the mill for the purpose of determining the hereinabove designated minerals and other minerals contained in the crude ore that may be salvaged by milling of same. The resulting samples are to be assayed at the laboratory used by the mill where ore is milled and Lessor may demand an assay certificate showing the contents of each delivery to mill. If requested by the Lessor, the mill is to reserve a pulp of each composite sample for testing, provided, however, said mill will not be obliged to keep pulp for a period of more than ninety (90) days. In the event of a dispute as to analysis, the pulp prepared from each composite sample is to be referred to an umpire acceptable to Lessor and Lessee and the determination of the umpire will be binding upon both parties. The net weight of the crude ore on a dry-weight basis will be determined at the scales at the mill. Lessor will have the right to check the weights as often as it deems advisable. Lessee will furnish Lessor with duplicate scale weight certificates. Lessee agrees to, and will be held accountable to see that the foregoing provisions are carried out by such mill or mills as receive minerals produced from the premises herein demised.

The Lessee has the right to mine, raise, carry, and transport ores from the lands hereby leased through other lands now or hereafter owned or leased by the Lessee, and the right to raise, carry, and transport ores mined by the Lessee from other lands owned or leased by the Lessee over or through the lands covered by this lease; provided, that the ores mined from other lands are in no event mixed with ore mined from these leased premises, except as provided above.

3. Overriding Royalty Limitations – It is agreed that this lease or any subsequent assignment hereof may not be burdened with overriding royalties the aggregate of which exceeds 2%. Lessor must be notified of all overriding royalties accruing to this lease. Violation of the above may subject this lease to cancellation by Lessor.

4. Weights -- It is agreed that all minerals mined and taken from said premises are to be weighed and the weight thereof is to be entered in due form in weight records kept for such purposes by Lessee.

5. Reports – After operations are begun, it is agreed that on or before the 25th day of each and every month during the term of this lease the Lessee will make a sworn report on forms furnished by Lessor, in which the exact amount in weight of all minerals mined and removed from said premises and sold during the preceding calendar month are to be entered and accompanied by full payment for all royalty due for the month. Further, Lessee must furnish annually a map or blueprint of survey of all workings, with location of same tied to a corner established by United States surveys of some land subdivision, certified to by a licensed engineer or surveyor.

6. Inspection – It is agreed that during all proper hours and at all times during the continuance of this lease the Lessor or its duly authorized agent or agents, is authorized to check scales as to their accuracy, to go through any of the slopes, entries, shafts, openings, or workings on said premises, and to examine, inspect, survey and take measurements of the same and to examine and make extracts of copies of all books and weight sheets and records which show in any way the mineral output of the leased premises, and that all conveniences necessary for said inspection, survey, or examination are to be furnished to the Lessor.

7. Mining Methods – Failure to comply with any of the provisions of this paragraph may subject this lease to cancellation.

In the underground and open pit workings, all shafts, inclines, and tunnels must be well timbered (when good mining requires timbering) and all parts of workings, where minerals are not exhausted, will be kept free from water and waste materials. The underground and open pit workings are to be protected against fire, floods, creeps, and squeezes. If such events do occur, they must be checked in a manner which is in keeping with good methods of mining. Such methods of mining must be used as will insure the extraction of the greatest possible amounts of minerals consistent with prevailing good mining practice.

Lessee agrees to slope the sides of all surface pits or excavations to a ratio of not more than one foot (1') vertical for each two feet (2') of horizontal distance. Such sloping is to become a normal part of the operation. Whenever practicable, all pits or excavations are to be shaped to drain, and in no case may the pits or excavations be allowed to become a hazard to persons or livestock. All material mined and not removed from the premises will be used to fill the pits so that at the expiration, surrender, or termination of this lease the land will, as nearly as practicable, approximate its original configuration, with a minimum of permanent damage to the surface.

Upon request from the Board, Lessee further agrees to submit plans and maps of proposed mining programs in advance, so that the Board may be fully aware of the proposed operations.

8. Rights-of-way – It is agreed that the Lessor reserves the right to grant rights-of-way over said premises for public roads, railroads, power, telegraph, telephone, ditch, and canal lines, but such grants are to be subject to the rights of the Lessee.

9. Notices – It is agreed that any notice required or permitted to be given to the Lessee under the provisions of this lease is to be sent by certified mail to the address set forth at the beginning of this lease or to such other address as Lessee may indicate in writing to Lessor and such service by mail will be deemed sufficient and in full compliance with the terms of this lease. Notice to Lessor is to be given in like manner, addressed to State Board of Land Commissioners, Denver, Colorado.

10. Assignment – The Lessee, with the written consent of the Lessor, will have the right to assign this lease as to the entire leasehold interest of such Lessee in all or part of the lands covered hereby, not less, however, than tracts of approximately forty (40) acres or Governmental lot corresponding to a quarter-quarter section for any partial assignment, and for approval of such assignment the Lessor will make a charge of $25.00 for any one assignment. No assignment of undivided interests or retention or reservation of overriding royalties will be recognized or approved by Lessor; and the effect, if any, of any such assignments or reservations will be strictly and only as between the parties thereto, and outside the terms of this lease, and no dispute between parties to any such assignment or reservation shall operate to relieve the Lessee from performance of any terms or conditions hereof or to postpone the time therefor. Lessor will at all times be entitled to look solely to the Lessee or his assignee shown on its books as being the sole owner hereof, and for the sending of all notices required by this lease, and for the performance of all terms and conditions hereof. If an assignment of this lease, in whole or in part, is approved, a new lease will be issued to the assignee for the balance of the life of the lease, covering the lands assigned. Said lease will be on the mining lease form in use at the time of assignment, and limited as to term as said lease is limited, and the assignor shall be released from all further obligations, and shall be held to have released all rights and benefits thereafter accruing with respect to the assigned land, as if the same had never been a part of the subject matter of this lease.

3

11. Prospecting – Lessee agrees that while using and operating any diamond, churn, or other drill on said premises, it will keep an accurate log on all work so done and performed, showing geological formations penetrated, the depth or thickness of each, the mineral character of each, especially mineral veins and water bearing strata, the location of same, the elevation, and tie to a corner established by U. S. surveys of some legal subdivision, and each and every thing necessary to make a complete log of the hole throughout its entire depth, a true copy of which said log will be furnished to the Lessor.

It is understood and agreed that the methods used in carrying out any program of exploration, and the rate of progress of such program may be determined by the Lessee. If the Lessee carries on any program of exploration, other than drilling, Lessee will submit to Lessor written reports showing the character and extent of prospecting being carried out on the leased premises and giving any details of mineral outcroppings, seams, and veins which may have been encountered; and Lessor agrees that during the term of this lease all such information supplied to Lessor by Lessee will remain confidential and unpublished so far as consistent with law.

12. Surrender and Relinquishment – The Lessee may at any time, by paying the State of Colorado, acting through its State Board of Land Commissioners, all amounts then due as provided herein, surrender and cancel this lease insofar as the same covers all or any portion of the lands herein leased and be relieved from further obligations or liability hereunder with respect to the lands so surrendered; provided, that no partial surrender or cancellation of this lease may be for less than tracts of approximately forty (40) acres or Governmental lot corresponding to a quarter-quarter section, the rental being reduced proportionately; provided further, that this surrender clause and option herein reserved to the Lessee will cease and become absolutely inoperative immediately and concurrently with the institution of any suit in any court of law by the Lessee, Lessor, or any assignee of either, to enforce this lease or any of its terms, express or implied, but in no case will surrender be effective until Lessee has made full provision for conservation of the minerals and protection of the surface rights of the leased premises.

All information in Paragraphs 5 and 11, above, must have been filed with the Board before this lease may be terminated.

13. If lessee initiates or establishes any water right for the leased premises, the point of surface diversion or ground water withdrawal of which is on the leased premises, such right will, if the surface rights of said premises are owned by lessor, become property of lessor, without cost, at the termination of the lease.

14. Protection against Surface Damage – Bond Requirements – Lessee has the right to utilize as much of the surface of the lands as is necessary for mining operations, and is liable and agrees to pay for all damages to livestock, growing crops, water wells, reservoirs, or improvements, caused by Lessee's operations on said lands. Further, it is understood that this lease is granted subject to surface patents, deeds, and certificates of purchase, and Lessee assumes responsibility for all claims arising from damages to the surface caused by Lessee's operations on such lands. It is agreed and understood that no operations may be commenced on the lands hereinabove described unless and until the Lessee or his assignee has filed a good and sufficient bond with the Lessor in an amount to be fixed by Lessor, to secure the payment for such damage to livestock, growing crops, water, or improvements as may be caused by Lessee or his assignee's operations on said lands. The Lessor may grant relief from the foregoing bond requirement upon application for such relief from the Lessee.

15. Indemnification of Lessor – The Lessee further agrees to hold the Lessor harmless for any and all manner of claims arising or to arise from the said leased premises by Lessee whether from soil or surface subsidence or from any other cause or any other nature whatsoever; this paragraph is binding upon Lessee and upon the heirs, assigns, successors, and legal representatives of Lessee, and is a continuing obligation during and after the expiration of this lease, so long as any possibility of soil or surface subsidence remains.

16. Right of Removal – In the event this lease is terminated by forfeiture, surrender, or the expiration of term, and all obligations of Lessee under this lease are satisfied, Lessee may remove all his improvements and equipment from the said premises within six months from the date of such termination, and such removal must be accomplished without unnecessary waste or injury to the premises. All improvements and equipment remaining on the leased premises six months after the termination hereof will be forfeited automatically to the State of Colorado, without compensation.

17. Compliance with Law – Lessee further covenants and agrees that during the continuance of this lease it will fully comply with all the provisions, terms, and conditions of all laws, whether State or Federal, and orders issued thereunder which may be in effect during the continuance hereof relating to mining or other operations of Lessee hereunder.

18. Forfeiture – It is agreed that if for any reason the Lessee fails to keep each and every one of the covenants herein, and if such default continues for a period of thirty (30) days after service of written notice thereof by certified mail upon the Lessee by the Lessor, the Lessor has the right to declare this lease forfeited, and to enter onto the leased premises, or any part thereof, either with or without process of law, and to expel, remove, and put out the Lessee or any person occupying the premises, using such force as may be necessary to do so. In the event of the termination of this lease by reason of breach of the covenants herein contained, the Lessee will surrender and peaceably deliver up to the Lessor the above-described premises which premises are to be in good mining condition. If, upon termination of this lease for any reason, whether by surrender, forfeiture, or expiration of term, or otherwise, Lessee has not complied fully with the terms of the lease, Lessor will hold and retain possession of the property, improvements, and equipment of Lessee, as security unto Lessor for the payment of rents and royalties due it, or to protect it against liens, or to indemnify it against any loss or damage sustained by it by reason of the default of the Lessee, for which purpose Lessor is hereby given lien upon all such property, improvements, and equipment, which lien will attach as the same are placed upon the premises. In the event Lessor forecloses the lien in this article given to it by Lessee, Lessor may itself be a purchaser at any sale thereof under such foreclosure. Upon the termination of this lease for any cause, if the Lessee remains in possession of said premises, he will be guilty of an unlawful detainer under the statutes in such case made and provided, and he will be subject to all the conditions and provisions thereof and to eviction and removal, forcibly or otherwise, with or without process of law, as above provided.

RECEPTION NO. 85094449

19. Extension – If the leased premises are not producing at the end of the primary term, the Lessee may make written application to Lessor to extend this lease for an additional fixed term and the making of such extension will be at the option of the Lessor.

Lessee must pay all taxes lawfully assessed on property of Lessee located on the leased premises.

The benefits and obligations of this lease extend to and are binding upon the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

IN WITNESS WHEREOF, The Lessor has caused these presents to be executed in duplicate by the State Board of Land Commissioners and sealed with the official seal of said Board, and the Lessee has hereunto set his hand and seal, all on the day and year first above written.

4

LESSOR:

STATE OF COLORADO
by its
STATE BOARD OF LAND COMMISSIONERS

President

Register

Engineer

Recommended:

By: _____ Minerals Director

Attest: _____ ASST. Secretary

LESSEE:

Robinson Brick Company

By: _____
Vice President

ARCHAEOLOGY
PREHISTORIC AND HISTORIC RESOURCES SHALL NOT BE MARRED, DISTURBED, REMOVED OR ALTERED ON STATE LAND AS PROVIDED BY LAW.

SPECIAL STIPULATIONS

RIDER to be attached to and remain a part of Colorado Mining Lease No. 3041/16-S

It is agreed that rules and regulations as set forth by the Mined Land Reclamation Board of Colorado for recovery and restoration of mined land will apply to this lease and lands leased herewith.

Minerals Director

STATE BOARD OF LAND COMMISSIONERS

Rowena Rogers

~~Register~~ President

LESSEE

ROBINSON BRICK COMPANY

By James A. Robinson

RECEPTION NO. 85094449

RB

MGL

ROBINSON BRICK COMPANY

SINCE 1880

500 S. SANTA FE DRIVE P. O. BOX 5243 DENVER, COLO. 80217

20081001139 C
$ 300.00
SECRETARY OF STATE
01-02-2008 10:53:13

Document processing fee
If document is filed on paper — $150.00
If document is filed electronically — Currently Not Available
Fees & forms/cover sheets are subject to change.
To file electronically, access instructions for this form/cover sheet and other information or print copies of filed documents, visit www.sos.state.co.us and select Business Center.
Paper documents must be typewritten or machine printed.

ABOVE SPACE FOR OFFICE USE ONLY

Statement of Merger
(Surviving Entity is a Foreign Entity)

filed pursuant to § 7-90-203.7 and § 7-90-204.5 of the Colorado Revised Statutes (C.R.S.)

1. For each merging entity, its ID number (if applicable), entity name or true name, form of entity, jurisdiction under the law of which it is formed, and principal address are

(Caution: At least one merging entity must be an entity formed under the laws of Colorado.)

ID Number: 19871109310
(Colorado Secretary of State ID number)

Entity name or true name: Robinson Brick Company

Form of entity: Corporation

Jurisdiction: Colorado

Street address: 1845 West Dartmouth Avenue
(Street number and name)

Denver *(City)* CO *(State)* 80110 *(ZIP/Postal Code)*

(Province – if applicable) USA *(Country)*

Mailing address
(leave blank if same as street address)
(Street number and name or Post Office Box information)

(City) *(State)* *(ZIP/Postal Code)*

(Province – if applicable) *(Country)*

ID Number
(Colorado Secretary of State ID number)

Entity name or true name

Form of entity

Jurisdiction _____

Street address _____
(Street number and name)
_____
_____ _____ _____
(City) *(State)* *(ZIP/Postal Code)*
_____ _____
(Province – if applicable) *(Country)*

Mailing address
(**leave blank** if same as street address) _____
(Street number and name or Post Office Box information)
_____
_____ _____ _____
(City) *(State)* *(ZIP/Postal Code)*
_____ _____.
(Province – if applicable) *(Country)*

ID Number _____
(Colorado Secretary of State ID number)

Entity name or true name _____

Form of entity _____

Jurisdiction _____

Street address _____
(Street number and name)
_____
_____ _____ _____
(City) *(State)* *(ZIP/Postal Code)*
_____ _____
(Province – if applicable) *(Country)*

Mailing address
(**leave blank** if same as street address) _____
(Street number and name or Post Office Box information)
_____
_____ _____ _____
(City) *(State)* *(ZIP/Postal Code)*
_____ _____.
(Province – if applicable) *(Country)*

(If the following statement applies, adopt the statement by marking the box and include an attachment.)

☐ There are more than three merging entities and the ID number (if applicable), entity name or true name, form of entity, jurisdiction under the law of which it is formed, and the principal address of each additional merging entity is stated in an attachment.

2. For the surviving entity which is a foreign entity, its entity ID number (if applicable), entity name or true name, form of entity, jurisdiction under the law of which it is formed, and principal address are

*(**Caution:** The surviving entity cannot be an entity formed under the laws of Colorado.)*

ID Number 20071593249
(Colorado Secretary of State ID number)

Entity name or true name	General Shale Brick, Inc.
Form of entity	Corporation
Jurisdiction	Delaware
Street address	3211 N. Roan Street *(Street number and name)* Johnson City — TN — 37602 *(City)* — *(State)* — *(ZIP/Postal Code)* *(Province – if applicable)* — USA *(Country)*
Mailing address (leave blank if same as street address)	*(Street number and name or Post Office Box information)* *(City)* — *(State)* — *(ZIP/Postal Code)* *(Province – if applicable)* — *(Country)*

3. Each merging entity has been merged into the surviving foreign entity.

4. *(If the following statement applies, adopt the statement by marking the box and state the appropriate document number(s).)*

☐ One or more of the merging entities is a registrant of a trademark described in a filed document in the records of the secretary of state and the document number of each filed document is

Document number _____

Document number _____

Document number _____

(If the following statement applies, adopt the statement by marking the box and include an attachment.)

☐ There are more than three trademarks and the document number of each additional trademark is stated in an attachment.

5. *(Mark the applicable box and complete the statement. **Caution**: Mark only one box.)*

☑ The surviving foreign entity maintains a registered agent in this state.

OR

☐ The surviving foreign entity does not maintain a registered agent in this state and service of process may be addressed to the entity and mailed to the principal address pursuant to section 7-90-704 (2), C.R.S.

OR

☐ The surviving foreign entity has not maintained a registered agent in this state and appoints a registered agent to accept service pursuant to section 7-90-204.5, C.R.S. The person appointed as registered agent has consented to being so appointed. Such registered agent's name and address are

Name
(if an individual) _____ *(Last)* _____ *(First)* _____ *(Middle)* _____ *(Suffix)*

OR

(if an entity) _____
(Caution: Do not provide both an individual and an entity name.)

Street address _____
(Street number and name)

_____

_____ CO _____
(City) *(State)* *(ZIP Code)*

Mailing address _____
(leave blank, if same as street address) *(Street number and name or Post Office Box information)*

_____

_____ CO _____
(City) *(State)* *(ZIP Code)*

6. *(If applicable, adopt the following statement by marking the box and include an attachment.)*

☐ This document contains additional information as provided by law.

7. *(Caution: Leave blank if the document does not have a delayed effective date. Stating a delayed effective date has significant legal consequences. Read instructions before entering a date.)*

(If the following statement applies, adopt the statement by entering a date and, if applicable, time using the required format.)

The delayed effective date and, if applicable, time of this document are _____.
(mm/dd/yyyy hour:minute am/pm)

Notice:

Causing this document to be delivered to the Secretary of State for filing shall constitute the affirmation or acknowledgment of each individual causing such delivery, under penalties of perjury, that such document is such individual's act and deed, or that such individual in good faith believes such document is the act and deed of the person on whose behalf such individual is causing such document to be delivered for filing, taken in conformity with the requirements of part 3 of article 90 of title 7, C.R.S. and, if applicable, the constituent documents and the organic statutes, and that such individual in good faith believes the facts stated in such document are true and such document complies with the requirements of that Part, the constituent documents, and the organic statutes.

This perjury notice applies to each individual who causes this document to be delivered to the Secretary of State, whether or not such individual is identified in this document as one who has caused it to be delivered.

8. The true name and mailing address of the individual causing this document to be delivered for filing are

Green Richard L. _____
(Last) *(First)* *(Middle)* *(Suffix)*

c/o General Shale Brick, Inc.
(Street number and name or Post Office Box information)

3211 N. Roan Street

Johnson City TN 37601
(City) *(State)* *(ZIP/Postal Code)*

_____ USA
(Province – if applicable) *(Country)*

(If applicable, adopt the following statement by marking the box and include an attachment.)

☐ This document contains the true name and mailing address of one or more additional individuals causing the document to be delivered for filing.

Disclaimer:

This form/cover sheet, and any related instructions, are not intended to provide legal, business or tax advice, and are furnished without representation or warranty. While this form/cover sheet is believed to satisfy minimum legal requirements as of its revision date, compliance with applicable law, as the same may be amended from time to time, remains the responsibility of the user of this form/cover sheet. Questions should be addressed to the user's legal, business or tax advisor(s).

Delaware

The First State

I, HARRIET SMITH WINDSOR, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"ROBINSON BRICK COMPANY", A COLORADO CORPORATION,

WITH AND INTO "GENERAL SHALE BRICK, INC." UNDER THE NAME OF "GENERAL SHALE BRICK, INC.", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF DELAWARE, AS RECEIVED AND FILED IN THIS OFFICE THE SECOND DAY OF JANUARY, A.D. 2008, AT 10:44 O'CLOCK A.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.

Harriet Smith Windsor

Harriet Smith Windsor, Secretary of State

3735567 8100M

AUTHENTICATION: 6277063

080000861

DATE: 01-02-08

You may verify this certificate online at corp.delaware.gov/authver.shtml

State of Delaware
Secretary of State
Division of Corporations
Delivered 10:55 AM 01/02/2008
FILED 10:44 AM 01/02/2008
SRV 080000861 - 3735567 FILE

CERTIFICATE OF OWNERSHIP AND MERGER
MERGING
ROBINSON BRICK COMPANY
WITH AND INTO
GENERAL SHALE BRICK, INC.

(Pursuant to Section 253 of the
General Corporation Law of Delaware)

GENERAL SHALE BRICK, INC. ("*Parent*"), a corporation organized and existing under the laws of the State of Delaware, does hereby certify:

FIRST: That the Parent was organized pursuant to the provisions of the General Corporation Law of the State of Delaware, on December 4, 2003.

SECOND: That the Parent owns 100% of the outstanding shares of the capital stock of ROBINSON BRICK COMPANY (the "*Subsidiary*"), a corporation organized pursuant to the provisions of the Business Corporation Act of the State of Colorado on April 13, 1900.

THIRD: That the Parent, by the following resolutions of its Board of Directors, duly adopted by unanimous written consent on January 2, 2008, determined to merge the Subsidiary with and into the Parent, by the adoption thereof:

> **RESOLVED**, that the Board deems it advisable and in the best interest of the Parent for Subsidiary, to merge with and into the Parent, with the Parent being the surviving entity (the "*Transaction*"); and be it further
>
> **RESOLVED**, that the form, terms and provisions of the Merger Agreement and Plan of Merger, by and between the Parent and the Subsidiary, substantially in the form presented to the undersigned on the date hereof (the "*Merger Agreement*"), and the transactions contemplated thereby, are advisable and in the best interest of the Parent and its sole stockholder; and be it further
>
> **RESOLVED**, that the Merger Agreement and the transactions contemplated thereby be, and they hereby are, authorized, adopted, approved and ratified in all respects; and be it further
>
> **RESOLVED**, that the president and any vice president of the Parent be, and they hereby are, and each of them individually hereby is, authorized and empowered, in the name and on behalf of the Parent, to execute and deliver the Merger Agreement with such changes therein as the officer or officers so acting may, by his or their execution thereof approve, and the execution and delivery thereof to be conclusive evidence that the same has been approved; and be it further

RESOLVED, that the form, terms and provisions of the Delaware Certificate of Ownership and Merger and Colorado Statement of Merger, each substantially in the form presented to the undersigned on the date hereof (respectively, the "*Delaware Certificate of Merger*" and the "*Colorado Statement of Merger*"), be, and they hereby are, approved in all respects; and that the proper officers of the Parent be, and they hereby are, and each of them individually hereby is, authorized and empowered, in the name and on behalf of the Parent, to execute and file the Delaware Certificate of Merger with the Delaware Secretary of State and the Colorado Statement of Merger with the Colorado Secretary of State, with such changes therein as the officer or officers so acting may, by his or their execution thereof approve, and the execution and delivery thereof to be conclusive evidence that the same has been approved; and be it further

FOURTH: That the Certificate of Incorporation of the Surviving Corporation shall continue to be the Certificate of Incorporation of the surviving corporation until thereafter amended in accordance with applicable law.

FIFTH: That this Certificate of Ownership and Merger shall be effective upon filing with the Delaware Secretary of State.

[*The signature page follows*]

IN WITNESS WHEREOF, GENERAL SHALE BRICK, INC. has caused this Certificate of Ownership and Merger to be executed in its corporate name this 2nd day of January, 2008.

GENERAL SHALE BRICK, INC.

By: _____

Mark Kinser
Vice President

Source of Legal Right to Enter

Certification of Legal Right to Enter

Denver Brick Company has legal authority to operate on General Shale Brick Inc. Flintlock Mine Colorado State Land Board Lease CY 3401.

Signed,

Kevin Ham

Kevin Ham

Signed and dated 12 day of April, 2021

The foregoing instrument was acknowledged before me this 12 day of April, 2021

By Kevin Ham

Tammy Carter

Notary Public

My Commission Expires 8-27-2024

TAMMY CARTER
STATE OF TENNESSEE NOTARY PUBLIC
WASHINGTON COUNTY

FORM 226
REV. 12/55

STATE OF COLORADO

Renewal of Lease No. 203-16

Clay MINING LEASE No. 1530, Book 16

1. THIS MINING LEASE, Made in duplicate and entered into this 15th day of January, 1961, by and between THE STATE OF COLORADO, acting through its State Board of Land Commissioners, hereinafter referred to as "Lessor" and The Denver Fire Clay Company ASSIGNED of 3033 Blake Street, Denver 17, Colorado, hereinafter referred to as "Lessee".

WITNESSETH

2. Lessor, for and in consideration of the sum of Seventy Seven and 50/100---------- Dollars ($ 77.50) $74.50# ~~$80.00*~~/ as rental for the first year hereof, receipt of which is hereby acknowledged, and the further payment of ~~an~~ equal sum on or before each anniversary of the date hereof, as annual rental for the ensuing year, which Lessee hereby covenants and agrees to pay so long as this lease shall remain in effect, and in further consideration of the covenants and agreements hereinafter mentioned, to be kept and performed by the Lessee, its successors and assigns, has demised and leased to the Lessee the right and privilege of mining for and taking Clay and other minerals of value that can be removed in the process of mining and milling Clay from the lands hereinafter described, situate, lying and being in the County of Jefferson, and State of Colorado, to-wit:

TOWNSHIP 3-South, RANGE 70-West 6th P. M.

SECTION 16: * SW/4 Less 11.36 acres described on Page 4 hereof. ~~/Less a strip of land containing 5.75 acres described as follows: (North 190 Feet of the NW/4 of the SW/4 containing 5.75 acres now under lease to Denver Brick and Pipe Company)~~

148.64 amended 8/16/66 containing ~~154.25~~ ~~160.00*~~ /acres, more or less, together with the right to use as much of the surface thereof as may reasonably be required in the exercise of the rights and privileges herein granted, subject to existing rights of way, the rights of lessees, and the rights of patentees of said premises where the lands herein leased or any part thereof have been patented and mineral rights reserved to the State of Colorado.

3. Reserving, however, to the State of Colorado:

a. The right to use or lease said premises or any part thereof at any time for any purpose other than and not inconsistent or interfering with the rights and privileges herein specifically granted.

b. The right at all times during the life of this lease to go upon said premises and every part thereof, for the purpose of inspecting same, and the books of account and records of mineral workings therein, and of ascertaining whether or not said Lessee and those holding thereunder by and from it, are carrying out the terms, covenants and agreements in this lease contained.

c. Reserving all rights and privileges of every and whatsoever kind or nature not herein expressly granted.

4. TO HAVE AND TO HOLD the above described premises, with the appurtenances, unto the Lessee and the heirs, assigns, successors or legal representatives of Lessee, from 12:00 noon on the 15th day of January, 1961, for the full term of five (5) years and until 12:00 noon on the 15th day of January, 1966, and as long thereafter as the minerals hereinabove designated are being produced in paying quantities from said premises, and the royalty and rents provided for herein are being paid, subject to the terms, conditions and agreements, herein set forth.

5. As minimum and advance royalty, without relation to the amount of the minerals mined from the leased premises, the Lessee shall pay to the Lessor the following amounts:

Lease Year	Minimum Royalty
1st year	$ none
2nd year	none
3rd year	none
4th year	none
5th year	none

It is further provided that if this lease is extended by reason of production, the State Board of Land Commissioners shall by Board Order, at the termination of each and every five-year period during the extension of this lease, fix and determine the rate of advance royalty to be paid annually in advance by the Lessee for and during each year of the succeeding five-year period of the lease.

6. In the event that said Lessee shall not extract from said premises said minimum amounts above specified during each lease year of the term of this lease, it is nevertheless understood that the above sums of money are royalties for the years stated, and are due and payable to the Lessor whether minerals are mined or not during such year, but that such minimum advance royalty shall be credited upon the first royalties due as hereinafter provided for minerals actually produced from said premises and sold or milled during the year for which such minimum royalty was paid.

7. Lessee covenants and agrees that during the continuance of this lease he will fully comply with all of the provisions, terms and conditions of all laws, whether State or Federal, and orders issued thereunder, which may be in effect during the continuance hereof relating to the operations of Lessee under this lease, and the marketing of any product thereof, or labor relations in connection with such operations or marketing.

8. The Lessee shall mine and extract from the demised premises the mineral hereinabove designated and other minerals that can be extracted in the process of mining and milling so as to produce the greatest net return per ton of ore mined, regardless of the principal type of ore which shall yield such return.

* Lease amended to cover entire SW/4 (160.00 acres). September 10, 1965.
# Lease amended to reflect partial release, per rider attached to Page 4 hereof. 8/16/66

FOR TRANSFER

SEE #12-29-16

9. Lessor reserves as royalty, and Lessee agrees to pay to Lessor on or before the 20th day of each month hereafter the following:

(a) ~~_____ per cent of the sales at mill of all ores delivered to the mill at which sold.~~

(b) $0.30 per ton of 2,000 pounds of all Clay mined.

10. Royalty payments shall apply to payment received by the Lessee on any mineral so sold. The minerals mined from the leased premises may be milled in a custom or commercial plant or mill owned and operated by Lessee. They may not be mixed or commingled with ores from other properties until they have been crushed and sampled by the mill for the purpose of determining the hereinabove designated mineral and other minerals contained in the crude ore that may be salvaged by milling of same. The resulting samples shall be assayed at the laboratory used by the mill where ore is milled and Lessor shall receive an assay certificate showing the contents of each day's delivery to mill. In addition, the mill shall reserve a pulp of each day's composite sample for testing, provided, however, said mill shall not be obliged to keep pulp for a period of more than ninety (90) days. In the event of a dispute as to analysis, the pulp prepared from each composite sample shall be referred to an umpire acceptable to Lessor and Lessee and the determination of the umpire shall be binding upon both parties. The net weight of the crude ore on a dry weight basis shall be determined at the scales at the mill. Lessor shall have the right to check the weights as often as it deems advisable. Lessee shall furnish Lessor with duplicate scale weight certificates. Lessee agrees to, and shall be held accountable to see that the foregoing provisions are carried out by such mill or mills as shall receive minerals produced from the premises herein demised.

11. On or before the 20th day of each and every month during the term of this lease, Lessee shall make a sworn report to the Lessor in which shall be entered and set down the exact amount in weight of all minerals of value mined on said premises during the preceding calendar month. Such statements shall clearly set forth the tonnage as shown by the miners production reports, and shall also show the use or disposal by the Lessee of such minerals of value. The report shall be made whether or not any minerals are mined during the month for which the report is made. In the event that no mining is done during the month for which the report is made, such report shall contain a complete statement of the work done by the Lessee during the month.

12. The Lessee shall have the right to mine, raise, carry and transport ores from the lands hereby leased through other lands now or hereafter owned or leased by the Lessee, and the right to raise, carry and transport ores mined by the Lessee from other lands owned or leased by the Lessee over or through the lands covered by this lease; provided, that the ores mined from other lands are in no event mixed with ore mined from these leased premises, except as provided in Paragraph 10 herein.

13. The Lessee further agrees to hold the Lessor harmless for any and all manner of claims arising or to arise from the said leased premises by Lessee whether from soil or surface subsidence, or from any other cause or any other nature soever; this paragraph shall be binding upon Lessee and upon the heirs, assigns, successors and legal representatives of Lessee, and shall be a continuing obligation during and after the expiration of this lease, so long as any possibility of soil or surface subsidence remains.

14. The Lessee may at any time, by paying to the State of Colorado, acting by its State Board of Land Commissioners, all amounts then due as provided herein, and the further sum of Two Dollars ($2.00), surrender and cancel this lease insofar as the same covers all or any portion of the lands herein leased and be relieved from further obligations or liability hereunder with respect to the lands so surrendered; provided that no partial surrender or cancellation of this lease shall be for less than contiguous tracts of approximately forty (40) acres or Governmental lot corresponding to a quarter-quarter section; provided further that this surrender clause and the option herein reserved to the Lessee shall cease and become absolutely inoperative immediately and concurrently with the institution of any suit in any court of law by the Lessee, Lessor or any assignee of either to enforce this lease, or any of its terms express or implied, but in no case shall surrender be effective until Lessee shall have made full provision for conservation of the minerals and protection of the surface rights of the leased premises.

15. The Lessee, with the written consent of the Lessor, shall have the right to assign this lease as to the entire leasehold interest of such Lessee in all or part of the lands covered hereby, not less, however, than contiguous tracts of approximately forty (40) acres or Governmental lot corresponding to a quarter-quarter section for any partial assignment and for approval of such assignment the Lessor may make a charge of ten cents ($0.10) per acre, with a minimum charge for any one assignment of Ten and No/100 Dollars ($10.00). No assignment of undivided interests or retention or reservation of overriding royalties will be recognized or approved by Lessor; and the effect, if any, of any such assignments or reservations will be strictly and only as between the parties thereto, and outside the terms of this lease, and no dispute between parties to any such assignment or reservation shall operate to relieve the Lessee from performance of any terms or conditions hereof or to postpone the time therefor. Lessor will and shall at all times be entitled to look solely to the Lessee or his assignee shown on its books as being the sole owner hereof, and for the sending of all notices required by this lease and for the performance of all terms and conditions hereof. If an assignment in whole or part of this lease is approved, a new lease shall be issued to the assignee covering the lands assigned, for the balance of the life of the lease, on the lease form in use at the time of the assignment for the mining of Clay, and limited as to term as said lease is limited, and the assignor shall be released and discharged from all obligations, and shall be held to have released all rights and benefits thereafter accruing with respect to the assigned land, as if the same had never been a part of the subject matter of this lease.

16. In the underground and open pit workings, all shafts, inclines and tunnels shall be well timbered (when good mining requires timbering) and all parts of workings, where minerals are not exhausted, will be kept free from water and waste materials, as in ordinary operations. The underground and open pit workings shall be protected against fire and floods and the creeps and squeezes. If such events do occur they shall be checked in a manner which is in keeping with good methods of mining. Such methods of mining shall be used as shall insure the extraction of the greatest possible amounts of minerals consistent with good mining methods.

17. Lessee shall be liable and agrees to pay for all damages to the surface of the land, livestock, growing crops or improvements caused by Lessee's operations on said lands. It is agreed and understood that no operations shall be commenced on the lands hereinabove described unless and until the Lessee or his assignee shall have filed a good and sufficient bond with the Lessor in an amount to be fixed by Lessor, to secure the payment for such damage to the surface of the land, livestock, growing crops or improvements as may be caused by Lessee or his assignee's operations of said lands and to secure compliance with all the provisions, conditions, covenants and obligations of this lease and the statutes of the State of Colorado, and rules and regulations thereto appertaining.

18. It is agreed that during all proper hours and at all times during the continuance of this lease the Lessor, by its Superintendent of the Mineral Department or by its duly authorized agent or agents, shall be, and hereby is authorized to check scales as to their accuracy, to go through any of the slopes, entries, shafts, openings or workings on said premises, and to examine, inspect and survey the same and to examine and make extracts or copies of all books and weight sheets which show in any way the mineral output of the leased premises, and that all conveniences necessary for said inspection, survey or examination shall be furnished to the Lessor, its Superintendent of the Mineral Department or its agent or agents by the Lessee.

19. It is agreed that the Lessee, while using any diamond, churn or other drill on said premises during the term of this lease, shall keep an accurate log of all work so done and performed, showing the geological formations penetrated, the depth or thickness of each, the mineral character of each, especially mineral veins and strata, their elevations, the location of same by tying to a corner of some legal subdivision or, in unsurveyed territory, to some bench mark or other officially established point, established by the United States surveys, and each and every thing necessary to make and supply a perfect and complete log of the hole throughout its entire depth, a true copy of which said log shall be furnished the Lessor when and at the time such holes are drilled or at any time thereafter upon demand of the Lessor.

20. A map of the mine shall be made yearly by an engineer or surveyor duly licensed by the State of Colorado, on a scale of not less than 100 feet to the inch, showing the dimensions of ore vein, a permanent hub with center point at the top of the shaft or the face of the slope, at each elevation and at each angle, at side entries, stopes, rooms or drifts, showing elevation of same and latitude and departure and date established, each point taken from a true meridian established on the surface; and shall bear the name or number of the mine; its location as to county, section, township, and range, the name of the company or owner; the north point; the scale to which the map is drawn and explanatory legend; and the certificate of the engineer or surveyor as to its accuracy.

21. Mine maps and plans hereinbefore mentioned shall be extended and corrected at least once each year. True copies of all maps and plans shall be provided as follows: The original maps and tracings to be kept in the office of the engineer or surveyor, blue or white prints certified to by engineer to be on file, one at the office at the mine, one at the office of the Mineral Superintendent of the State Board of Land Commissioners, Capitol Building, Denver, Colorado.

22. Lessor reserves the right to grant rights of way over said premises for public roads, railroads, power, telegraph, telephone, ditches, and canal lines, or lease the above described lands for any other purpose than the one specified herein, which such grants or leases shall be so made as not to interfere with the operation of this lease, and so as to require the grantees of such rights to assume all risk resulting therefrom.

23. Any notice required or permitted to be given to the Lessee under the provisions of this lease shall be sent by registered mail, addressed to The Denver Fire Clay Company
3033 Blake Street, Denver 17, Colorado
Such service of notice by mail shall be sufficient and in full compliance with the terms of this lease.

24. In the event this lease is terminated by forfeiture, surrender or the expiration of term, the Lessee may remove all improvements and equipment from the said premises within nine (9) months from the date of such termination, and such removal shall be accomplished without unnecessary waste or injury to the premises. All improvements and equipment remaining on the leased premises nine months after the termination hereof shall be forfeited to the State of Colorado, without compensation.

25. The Lessee, before commencing work under the provisions of this lease, or sub-leasing, contracting or subcontracting any of the work, shall procure Workmen's Compensation Insurance, as required by the Workmen's Compensation Act of Colorado, and shall at times keep such compensation insurance in full force and effect, and shall furnish the Lessor with premium receipts or other satisfactory evidence of Lessee's compliance with this requirement; and a failure of the Lessee strictly to comply with this requirement shall subject this lease to cancellation at the option of Lessor as hereinafter provided.

26. It is agreed that if for any reason the Lessee shall fail to keep each and every one of the covenants herein, and such default shall continue for a period of thirty (30) days after service of written notice thereof upon the Lessee by the Lessor, the Lessor shall have the right to declare this lease forfeited, and to enter onto the leased premises, or any part thereof, either with or without process of law, and to expel, remove and put out the Lessee or any person occupying the premises, using such force as may be necessary to do so. In the event of the termination of this lease by reason of breach of the covenants herein contained, the Lessee shall surrender and peaceably deliver up to the Lessor the above described premises, and such premises shall be in good mining condition. If, upon termination of this lease for any reason, whether by surrender, forfeiture or expiration of term or otherwise, Lessee shall not have fully complied with the terms of this lease, Lessor shall hold and retain possession of the property, improvements, and equipment of Lessee, as security unto Lessor for the payment of rents and royalties due it, or to protect it against liens, or to indemnify it against any loss or damage sustained by it by reason of the default of the Lessee, for which purpose Lessor is hereby given a lien upon all of such property, improvements, and equipment, which lien shall attach as the same are placed upon the premises. In the event Lessor shall foreclose the lien in this Article given to it by Lessee, Lessor may itself be a purchaser at any sale thereof under such foreclosure. Upon the termination of this lease for any cause, if the Lessee shall remain in the possession of said premises, he shall be guilty of an unlawful detainer under the statutes in such case made and provided and he shall be subject to all the conditions and provisions thereof and to eviction and removal, forcibly or otherwise, with or without process of law, as above provided.

27. Lessee shall pay all taxes lawfully assessed on property of Lessor located on the leased premises.

28. No assignment or transfer of this lease will be held valid by Lessor, unless made with its consent in writing and duly entered in the books of record of said Board.

29. The benefits and obligations of this lease shall extend to and be binding upon the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

30. IN WITNESS WHEREOF, the Lessor has caused these presents to be executed in duplicate by the State Board of Land Commissioners and sealed with the official seal of said Board, and the Lessee has hereunto set his hand and seal, all on the day and year first above written.

Recommended to the Board:

W. H. Pattison

W. H. Pattison, Director
State Mineral Department

STATE BOARD OF LAND COMMISSIONERS

By A. M. Ramsey
President

Register

Engineer

LESSEE

THE DENVER FIRE CLAY CO.

W. O. Brandt

Vice President

RECORD OF ASSIGNMENTS

#July 27, 1966 -- The Denver Fire Clay Company furnished a release covering 11.36 acres described on the rider attached hereto. Lease No. 1530-16 reflects such release of 8/16/66.

State Mineral Department

A tract of land in the Southwest One-quarter (SW¼) of Section 16, Township 3-South, Range 70-West of the 6th Principal Meridian, Jefferson County, Colorado, more particularly described as follows:

Beginning at a point on the West line of the E½ SW¼ of said Section 817.30 feet southerly from the Northwest Corner of said E½ SW¼; thence South 89°00'04" East a distance of 395.0 feet to a point; thence South 0°59'20" West a distance of 1000.0 feet to a point; thence North 89°00'04" West, a distance of 495.0 feet to a point; thence North 0°59'20" East a distance of 1000.0 feet to a point; thence South 89°00'04" East a distance of 100.0 feet to a point of beginning.

Containing in all an area of 11.36 acres, more or less.

LEASE NO. 1530 BOOK 16

STATE OF COLORADO

Clay MINING LEASE

Lessee ~~The Denver Fire Clay Company~~

Address 3033 Blake Street

Denver 17, Colorado

Effective date: Noon of January 15, 1961

Expiration date: Noon of January 15, 1966

Extended to: January 15, 1976

Filing fees paid $ ----

Land fund School

County Jefferson

Acres ~~154.25~~ ~~160.00~~ 148.64#

*Amended September 10, 1965.

*Amended August 16, 1966

SPECIAL STIPULATIONS

Sand/Gravel Permit (Lease) No. 1530/16

It is agreed that rules and regulations as set forth by the Land Reclamation Board of Colorado for recovery and restoration of mined land will apply to this lease and lands leased herewith.

Mineral Director

Register

Lessee
Permittee

Vice President
DFC Ceramics, Inc.

COLORADO STATE BOARD OF LAND COMMISSIONERS

ASSIGNMENT RECORD

FULL X PARTIAL ___ ASSIGNMENT OF LEASE NO. 1530/16-S

1. In consideration of One dollar ($1.00) and other valuable consideration DFC Ceramics, Inc.
   (Assignor, please print or type)
2. the within named lessee(s), does (do) hereby assign, transfer and (or) sell all rights, title, interest and (or) claim in and
3. to this lease in its entirety, or 148.64 *(No. of acres m/l)* namely the SW/4, less 11.36 acres of 16-3S-70W *(Subdivision of Section)* of the Section,
4. Township and Range described in this lease), unto The Denver Brick Company *(Assignee, please print or type)* whose
5. address is P.O. Box 1600, Castle Rock, Colorado 80104-1600
   (Street, Building or P. O. Box No.) *(City)* *(State)* *(Zip)*
6. who will be the new lessee of record for all, or that part of this lease above described, to have, hold and enjoy all rights
7. and covenants of this lease and who will accept and abide by all laws, rules, regulations and responsibilities pertinent
8. to and (or) contained herein and in said lease henceforth from 12:00 noon on this 11th day of May, A.D., 1992.
9. *(Signature of Assignor)* *(Signature of Assignee)*
10. *(Seal or Authority)* President, DFC Ceramics *(Seal or Authority)* President, Denver Brick Co.
11. Signed and acknowledged before me this 11th day of May, A.D., 1992.
12. My commission expires March 25, A.D., 1995.

NOTARY PUBLIC

APPROVAL OF ASSIGNMENT

This assignment approved by order of the State Board of Land Commissioners this 10th day of June, A.D. 1992.

Recommended

MINERALS DIRECTOR

REGISTER

6.4.15 Exhibit O
Owners of Record of Affected Land (Surface Area) And Owners of Substance to be Mined

The CO State Land Board is the owner of record of both the affected surface area and substance to be mined. The Denver Brick lease is provided in the preceding exhibit.

6.4.16 Exhibit P
Municipalities Within Two Miles

Golden, CO, with address of 911 10th Street, Golden, CO 8040, is located within two miles of the permit boundary.

6.4.17 Exhibit Q
Proof of Mailing of Notices to County Commissioners and Soil Conservation District

NOTICE OF FILING APPLICATION

FOR COLORADO MINED LAND RECLAMATION PERMIT

FOR **REGULAR (112) CONSTRUCTION MATERIALS EXTRACTION OPERATION**

NOTICE TO THE BOARD OF SUPERVISORS

OF THE LOCAL CONSERVATION DISTRICT

Jefferson County DISTRICT

Acme Brick Company (the "Applicant/Operator") has applied for a Regular (112) reclamation permit from the Colorado Mined Land Reclamation Board (the "Board") to conduct the extraction of construction materials operations in Jefferson County. The attached information is being provided to notify you of the location and nature of the proposed operation. The entire application is on file with the Division of Reclamation, Mining, and Safety (the "Division") and the local county clerk and recorder.

The applicant/operator proposes to reclaim the affected land to rangeland use. Pursuant to Section 34-32.5-116(4)(m), C.R.S., the Board may confer with the local Conservation Districts before approving of the post-mining land use. Accordingly, the Board would appreciate your comments on the proposed operation. Please note that, in order to preserve your right to a hearing before the Board on this application, you must submit written comments on the application within twenty (20) days of the date of last publication of notice pursuant to Section 34-32.5-112(10), C.R.S.

If you would like to discuss the proposed post-mining land use, or any other issue regarding this application, please contact the Division of Reclamation, Mining, and Safety, 1313 Sherman Street, Room 215, Denver, Colorado 80203, (303) 866-3567.

NOTE TO APPLICANT/OPERATOR: You must attach a copy of the application form to this notice. If this is a notice of a change to a previously filed application you must either attach a copy of the changes, or attach a complete and accurate description of the change.

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website at www.usps.com
OFFICIAL USE
Certified Mail Fee
$
Extra Services & Fees (check box, add fee as appropriate)
Return Receipt (hardcopy) $
Return Receipt (electronic) $
Certified Mail Restricted Delivery $
Adult Signature Required $
Adult Signature Restricted Delivery $
Postage
$
Total Postage
$
Sent To Jefferson Conservation District
Street and Apt 10799 W. Alameda Avenue #261205
City, State, ZI Lakewood, CO 80226
PS Form 380
JUL 20 2021
Postmark Here
7018 1130 0000 4537 2365

NOTICE OF FILING APPLICATION

FOR COLORADO MINED LAND RECLAMATION PERMIT

FOR **REGULAR (112) CONSTRUCTION MATERIALS EXTRACTION OPERATION**

NOTICE TO THE BOARD OF COUNTY COMMISSIONERS

Jefferson COUNTY

Acme Brick Company (the "Applicant/Operator") has applied for a Regular (112) reclamation permit from the Colorado Mined Land Reclamation Board (the "Board") to conduct the extraction of construction materials operations in Jefferson County. The attached information is being provided to notify you of the location and nature of the proposed operation. The entire application is on file with the Division of Reclamation, Mining, and Safety (the "Division") and the local county clerk and recorder.

The applicant/operator proposes to reclaim the affected land to rangeland use. Pursuant to Section 34-32.5-116(4)(m), C.R.S., the Board may confer with the local Board of County Commissioners before approving of the post-mining land use. Accordingly, the Board would appreciate your comments on the proposed operation. Please note that, in order to preserve your right to a hearing before the Board on this application, you must submit written comments on the application within twenty (20) days of the date of last publication of notice pursuant to Section 34-32.5-112(10), C.R.S.

If you would like to discuss the proposed post-mining land use, or any other issue regarding this application, please contact the Division of Reclamation, Mining, and Safety, 1313 Sherman Street, Room 215, Denver, Colorado 80203, (303) 866-3567.

NOTE TO APPLICANT/OPERATOR: You must attach a copy of the application form to this notice. If this is a notice of a change to a previously filed application you must either attach a copy of the changes, or attach a complete and accurate description of the change.

7018 1130 0000 4537 2358

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®

OFFICIAL USE

Certified Mail Fee
$

Extra Services & Fees (check box, add fee as appropriate)
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postag
$

JUL 30 2021
Postmark Here

Sent To Jefferson County
Board of County Commissioners

Street and A 100 Jefferson County Parkway

City, State, Z Golden, CO 80419

PS Form 38

6.4.18 Exhibit R
Proof of Filing with County Clerk and Recorder

I Emily Jack, of Jefferson County Clerk and Recorder's Office located at 100 Jefferson County Parkway, Suite 2560, Golden, CO 80401, received from Angela Bellantoni of Environmental Alternatives, Inc the CO Division of Reclamation Mining and Safety amendment application for the Golden Mine on behalf of Acme Brick Company.

Emily Jack
Jefferson County representative's signature

7-27-2021
Date

6.4.19 Exhibit S
Permanent Man-Made Structures
Within 200 Feet of Affected Area

Structure Description	Structure Owner	Date Structure Agreement Executed
Solar Farm		
Buildings and West 56th Avenue	Jefferson County	
Highway 93	CO Department of Transportation	Access permit dated December 21, 2020.

Addendum 1
Proof of Posting Property

This site is the location of an existing mining operation. ACME Brick Company whose address and phone number is 210 Acme Street, Denton, TX 76205; (940) 435-5587 has applied for a conversion from a 110 to a 112 reclamation permit with the Colorado Mined Land Reclamation Board. Anyone wishing to comment on the application may view the application at the Jefferson County Clerk or Recorder's Office at 100 Jefferson County Parkway, Suite 2560, Golden, CO, 80419 and should send comments prior to the end of the public comment period to the Division of Reclamation, Mining and Safety, 1313 Sherman Street, Room 215, Denver, Colorado 80203.

Certification:

I, Angela Bellantoni, hereby certify that I posted a sign containing the above notice for the proposed permit area known as the (Name of Operation) Golden Mine, on (Date Posted) July 23, 2021.

Angela M Bellantoni
SIGNATURE

July 23, 2021
DATE

ACME BRICK COMPANY
PO Box 425 • Fort Worth, TX 76101-0425
(817) 332-4101 • brick.com

CHECK NO. [redacted]
DATE 4/29/2021
PAYEE # 4305480

Permit # M1976007UG
Receipt # 35649

PAY EXACTLY
$*****2,696.00

PAY EXACTLY TWO THOUSAND SIX HUNDRED NINETY SIX AND 00/100**********

Dennis D Muntz
(Authorized Signature)

PAY TO THE ORDER OF
Environmental Alternatives Inc
PO Box 326
Canon City CO 81215

VOID AFTER 120 DAYS
JPMorgan Chase Bank, N.A., Dallas, TX
88-88/1113

Division of Reclamation, Mining, and Safety

Fee Receipt for M1976007UG

The Denver Brick Company
Richard Murphy
210 Acme St

Denton TX 762050000

Receipt #: 35649
Date: 08/02/2021
Permit: M1976007UG

Payment Method	Revenue Code	Fee Description/Notes	Amount
Check #01972162	4300-MCNV	Minerals Conversions User: SDT Payer: Acme Brick Company CN01	$2,696.00
		Receipt Total:	**$2,696.00**

PRIORITY MAIL
FLAT RATE
POSTAGE REQUIRED

PRESS FIRMLY TO SEAL

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com
$7.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0459 6882 47 0079 5000 0018 0203

U.S. POSTAGE PAID
Click-N-Ship®

07/30/2021

Mailed from 81215

PRIORITY MAIL 1-DAY™

Expected Delivery Date: 07/31/21

ANGELA M BELLANTONI
ENVIRONMENTAL ALTERNATIVES, INC.
PO BOX 326
CANON CITY CO 81215-0326

0006

RECEIVED
AUG 02 2021
DIVISION OF RECLAMATION
MINING & SAFETY

SHIP TO: ERIC SCOTT
CO DRMS
1313 N SHERMAN ST
STE 215
DENVER CO 80203-2243

USPS TRACKING #

9405 5036 9930 0459 6882 47

Electronic Rate Approved #038555749

USPS.COM/PICKUP

EP14F Oct 2018
OD: 12 1/2 x 9 1/2

This packaging is the property of the U.S. Postal Service® and is provided solely for use in sending Priority Mail® shipments. It may not be used for any other purpose, nor may this packaging be sold or otherwise disposed of for resale. EP14F © U.S. Postal Service; October 2018; All rights reserved.