Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from trachyte and/or basalt

Typical profile

A - 0 to 4 inches: very gravelly clay loam
R - 4 to 14 inches: bedrock

Properties and qualities

Slope: 10 to 30 percent
Surface area covered with cobbles, stones or boulders: 15.0 percent
Depth to restrictive feature: 4 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 0.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R042AE277TX - Igneous Hill and Mountain, Mixed Prairie
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountaintop, mountainflank, interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Basalt and/or trachyte

Typical profile

R - 0 to 10 inches: bedrock

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: 0 to 4 inches to lithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)

Interpretive groups

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

Minor Components

Sanmoss
Percent of map unit: 6 percent
Ecological site: R042AE275TX - Gravelly, Mixed Prairie
Hydric soil rating: No

Volco
Percent of map unit: 6 percent
Ecological site: R042AE695TX - Basalt Hill, Mixed Prairie
Hydric soil rating: No

Unnamed
Percent of map unit: 5 percent
Hydric soil rating: No

Chilimol
Percent of map unit: 3 percent
Ecological site: R042AE275TX - Gravelly, Mixed Prairie
Hydric soil rating: No

CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes

Map Unit Setting
National map unit symbol: 1lf3n
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition
Chilimol and similar soils: 45 percent
Boracho and similar soils: 32 percent
Berrend and similar soils: 13 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chilimol

Setting
Landform: Fan piedmonts
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical profile
A - 0 to 10 inches: very gravelly loam

Bk - 10 to 80 inches: very gravelly loam

Properties and qualities

Slope: 1 to 8 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 (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R042AE275TX - Gravelly, Mixed Prairie
Hydric soil rating: No

Description of Boracho

Setting

Landform: Fan piedmonts
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical profile

A - 0 to 6 inches: extremely gravelly sandy loam
Bk - 6 to 12 inches: extremely gravelly sandy loam
Bkkm - 12 to 25 inches: cemented material
BCk - 25 to 80 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 1 to 8 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D
Ecological site: R042AE281TX - Shallow, Mixed Prairie
Hydric soil rating: No

Description of Berrend

Setting

Landform: Fan piedmonts
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear, convex
Parent material: Loamy alluvium derived from igneous rock

Typical profile

A - 0 to 2 inches: loam
Bt - 2 to 19 inches: clay loam
Btk - 19 to 51 inches: clay loam
C - 51 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 8 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 (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 10 percent
Hydric soil rating: No

CND—Chinati-Boracho-Berrend association, 1 to 15 percent slopes

Map Unit Setting

National map unit symbol: 21zpg
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Chinati and similar soils: 54 percent
Boracho and similar soils: 19 percent
Berrend and similar soils: 12 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chinati

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly alluvium and/or residuum weathered from fanglomerate

Typical profile

A - 0 to 3 inches: very gravelly loam
Bt - 3 to 12 inches: very gravelly loam
Bkkm - 12 to 21 inches: cemented material
R - 21 to 47 inches: bedrock

Properties and qualities

Slope: 1 to 15 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 8 to 20 inches to petrocalcic; 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: 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: R042AE281TX - Shallow, Mixed Prairie
Hydric soil rating: No

Description of Boracho

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous rock

Typical profile

A - 0 to 4 inches: very gravelly clay loam
Bk - 4 to 12 inches: extremely cobbly clay loam
Bkkm - 12 to 25 inches: cemented material
BCk - 25 to 80 inches: extremely gravelly sandy clay loam

Properties and qualities

Slope: 1 to 15 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R042AE281TX - Shallow, Mixed Prairie
Hydric soil rating: No

Description of Berrend

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Loamy alluvium derived from igneous rock

Typical profile

A - 0 to 4 inches: sandy loam
Bt - 4 to 20 inches: sandy clay loam
Btk - 20 to 39 inches: sandy clay loam
C - 39 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 8 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 (0.20 to 0.57 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 supply, 0 to 60 inches: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Minor Components

Chilimol

Percent of map unit: 7 percent
Ecological site: R042AE275TX - Gravelly, Mixed Prairie
Hydric soil rating: No

Eppenauer

Percent of map unit: 7 percent
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Marfa

Percent of map unit: 1 percent
Ecological site: R042AE279TX - Loamy Swale, Mixed Prairie
Hydric soil rating: No

CVC—Costavar and Volco soils, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: 17frr

Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Costavar and similar soils: 53 percent
Volco and similar soils: 19 percent
Minor components: 28 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Costavar

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly residuum weathered from basalt and/or ignimbrite

Typical profile

A - 0 to 4 inches: gravelly sandy clay loam
Bt - 4 to 13 inches: very gravelly sandy clay loam
R - 13 to 23 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent
Surface area covered with cobbles, stones or boulders: 2.0 percent
Depth to restrictive feature: 4 to 18 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 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 supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R042AE695TX - Basalt Hill, Mixed Prairie
Hydric soil rating: No

Description of Volco

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Gravelly residuum weathered from basalt and/or ignimbrite

Typical profile

A - 0 to 2 inches: very gravelly loam
Bk - 2 to 9 inches: extremely cobbly loam
R - 9 to 22 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent
Surface area covered with cobbles, stones or boulders: 2.0 percent
Depth to restrictive feature: 6 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 0.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R042AE695TX - Basalt Hill, Mixed Prairie
Hydric soil rating: No

Minor Components

Pardo

Percent of map unit: 14 percent
Ecological site: R042AE281TX - Shallow, Mixed Prairie
Hydric soil rating: No

Berrend

Percent of map unit: 11 percent
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Chilimol

Percent of map unit: 3 percent
Ecological site: R042AE275TX - Gravelly, Mixed Prairie
Hydric soil rating: No

EEB—Espy-Eppenauer complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2004
Elevation: 4,500 to 6,700 feet

Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Espy and similar soils: 56 percent
Eppenauer and similar soils: 39 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Espy

Setting

Landform: Fan piedmonts
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from tuffaceous sandstone

Typical profile

A - 0 to 4 inches: fine sandy loam
Bk - 4 to 16 inches: fine sandy loam
Bkkm - 16 to 22 inches: cemented material
BCk - 22 to 39 inches: fine sandy loam
2C - 39 to 80 inches: loamy sand

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 10 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R042AE281TX - Shallow, Mixed Prairie
Hydric soil rating: No

Description of Eppenauer

Setting

Landform: Fan piedmonts
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave, linear

Parent material: Loamy alluvium over tuffaceous sandstone

Typical profile

A - 0 to 5 inches: fine sandy loam
Bt - 5 to 10 inches: sandy clay loam
Btk - 10 to 18 inches: sandy clay loam
Bk - 18 to 23 inches: loam
Cr - 23 to 40 inches: bedrock

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Minor Components

Marfa

Percent of map unit: 3 percent
Ecological site: R042AE279TX - Loamy Swale, Mixed Prairie
Hydric soil rating: No

Musquiz

Percent of map unit: 2 percent
Ecological site: R042AE758TX - Clay Loam, Mixed Prairie
Hydric soil rating: No

MCA—Marfa clay loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 2001
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Marfa and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marfa

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Loamy and clayey alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 4 inches: clay loam
Bt - 4 to 41 inches: clay loam
2Btk - 41 to 69 inches: loam
2BCk - 69 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 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 (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R042AE279TX - Loamy Swale, Mixed Prairie
Hydric soil rating: No

Minor Components

Medley

Percent of map unit: 4 percent
Ecological site: R042AE275TX - Gravelly, Mixed Prairie
Hydric soil rating: No

Murray

Percent of map unit: 2 percent
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Berrend

Percent of map unit: 2 percent
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2000
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Murray and similar soils: 58 percent
Marfa and similar soils: 21 percent
Boracho and similar soils: 15 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Murray

Setting

Landform: Fan piedmonts
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium derived from igneous rock

Typical profile

A - 0 to 9 inches: fine sandy loam
Bk1 - 9 to 26 inches: loam
Bk2 - 26 to 47 inches: sandy clay loam
Bk3 - 47 to 80 inches: sandy loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 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 supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Description of Marfa

Setting

Landform: Drainageways on fan piedmonts, inset fans on fan piedmonts
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Convex, concave, linear
Parent material: Loamy and clayey alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 4 inches: clay loam
Bt - 4 to 41 inches: clay
2Btk - 41 to 69 inches: loam
2BCk - 69 to 80 inches: loamy fine sand

Properties and qualities

Slope: 1 to 2 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 (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: C
Ecological site: R042AE279TX - Loamy Swale, Mixed Prairie
Hydric soil rating: No

Description of Boracho

Setting

Landform: Fan piedmonts
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Crest, tread
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 5 inches: very gravelly loam
Bk - 5 to 10 inches: extremely gravelly loam
Bkkm - 10 to 25 inches: cemented material
BCk - 25 to 80 inches: extremely gravelly sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: R042AE281TX - Shallow, Mixed Prairie
Hydric soil rating: No

Minor Components

Musquiz

Percent of map unit: 6 percent
Ecological site: R042AE758TX - Clay Loam, Mixed Prairie
Hydric soil rating: No

MZA—Musquiz clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2q8cd
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 14 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Musquiz and similar soils: 80 percent

Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Musquiz

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous rock

Typical profile

A - 0 to 7 inches: clay loam
Bt - 7 to 35 inches: clay
Btk - 35 to 79 inches: clay

Properties and qualities

Slope: 0 to 3 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 (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C
Ecological site: R042AE758TX - Clay Loam, Mixed Prairie
Hydric soil rating: No

Minor Components

Berrend

Percent of map unit: 10 percent
Landform: Fan remnants
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Murray

Percent of map unit: 5 percent
Landform: Fan remnants
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Phantom

Percent of map unit: 5 percent
Landform: Fan skirts
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R042AE272TX - Clay Flat, Mixed Prairie
Hydric soil rating: No

PTA—Phantom clay loam, 0 to 2 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: 201c
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Phantom and similar soils: 86 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phantom

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Clayey alluvium derived from igneous and sedimentary rock

Typical profile

A - 0 to 3 inches: clay loam
Bw - 3 to 27 inches: clay
Bk - 27 to 80 inches: clay

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: NoneOccasional
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C
Ecological site: R042AE272TX - Clay Flat, Mixed Prairie
Hydric soil rating: No

Minor Components

Marfa

Percent of map unit: 11 percent
Ecological site: R042AE279TX - Loamy Swale, Mixed Prairie
Hydric soil rating: No

Musquiz

Percent of map unit: 3 percent
Ecological site: R042AE758TX - Clay Loam, Mixed Prairie
Hydric soil rating: No

PZB—Phantom-Musquiz complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 21zqg
Elevation: 4,500 to 6,700 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Phantom and similar soils: 45 percent
Musquiz and similar soils: 39 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Phantom

Setting

Landform: Alluvial flats
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from igneous rock

Typical profile

A - 0 to 3 inches: clay
Bw - 3 to 30 inches: clay

Bk - 30 to 80 inches: clay

Properties and qualities

Slope: 1 to 3 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
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C
Ecological site: R042AE272TX - Clay Flat, Mixed Prairie
Hydric soil rating: No

Description of Musquiz

Setting

Landform: Fan skirts on fan piedmonts
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous rock

Typical profile

A - 0 to 8 inches: clay loam
Bt - 8 to 23 inches: clay loam
Bk - 23 to 80 inches: loam

Properties and qualities

Slope: 1 to 5 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
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R042AE279TX - Loamy Swale, Mixed Prairie

Hydric soil rating: No

Minor Components

Berrend

Percent of map unit: 12 percent
Ecological site: R042AE694TX - Loamy Slope, Mixed Prairie
Hydric soil rating: No

Unnamed

Percent of map unit: 4 percent
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Concrete

ENG

Engineering

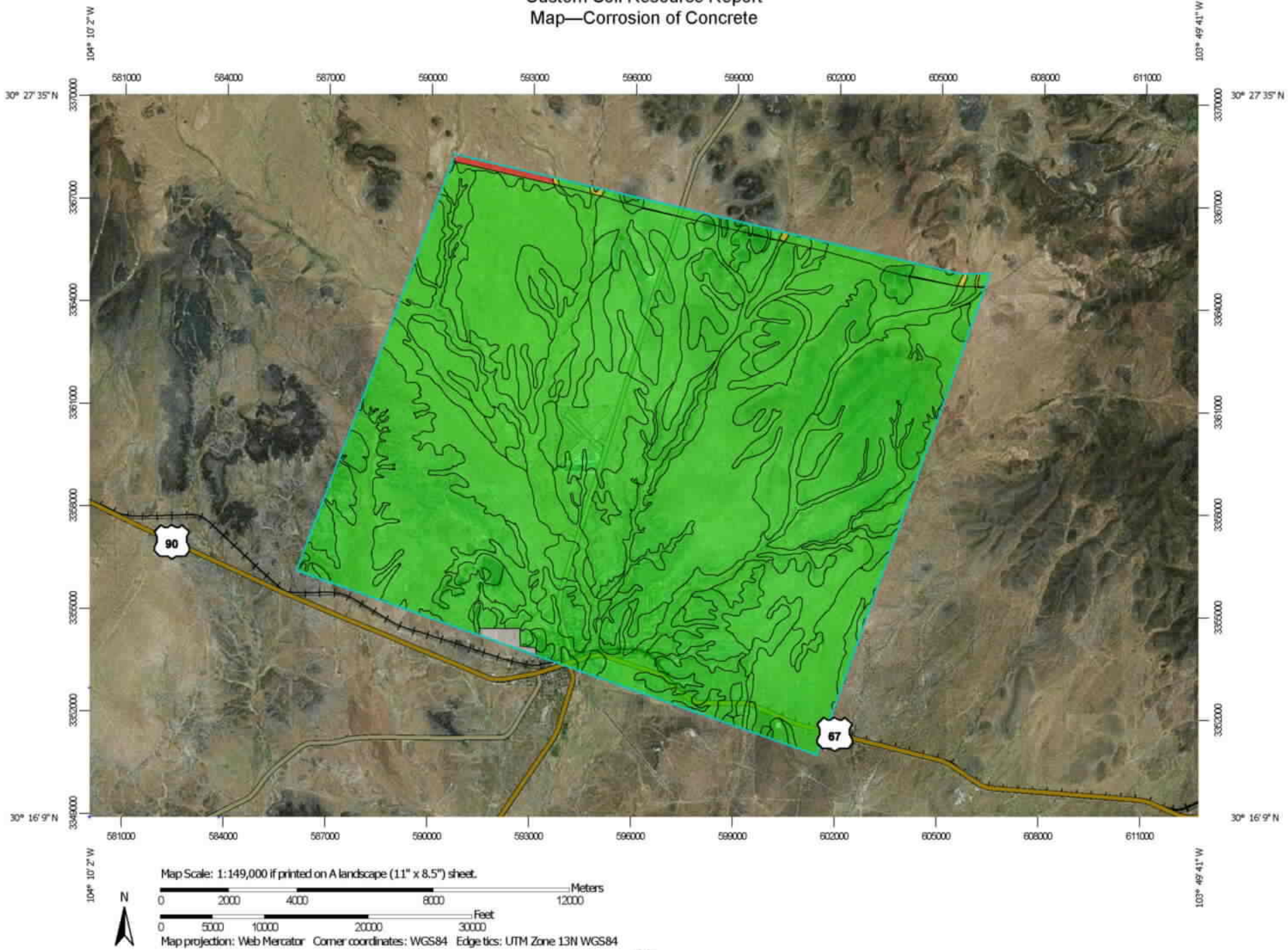
AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Custom Soil Resource Report
Map—Corrosion of Concrete



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines

- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points

- High
- Moderate
- Low
- 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 1:31,700.

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: Jeff Davis County, Texas
Survey Area Data: Version 24, Sep 5, 2023

Soil Survey Area: Presidio County, Texas
Survey Area Data: Version 27, Sep 5, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 5, 2021—Jan 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BeB	Boracho-Espy complex, 1 to 8 percent slopes	Low	69.5	0.1%
BsE	Brewster association, hilly	Low	153.3	0.3%
Ga	Bigetty association	Moderate	60.7	0.1%
LmB	Limpia and Mitre soils, gently sloping	Low	34.2	0.1%
Mu	Musquiz clay loam, 0 to 3 percent slopes	Low	414.2	0.7%
Re	Redona association	Low	223.6	0.4%
Vm	Verhalen-Dalby association	High	153.4	0.3%
Subtotals for Soil Survey Area			**1,109.0**	**2.0%**
Totals for Area of Interest			**55,532.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ANS	Area not surveyed, access denied		140.2	0.3%
BEB	Berrend and Espy soils, 1 to 5 percent slopes	Low	1,637.8	2.9%
BOB	Boracho-Espy complex, 1 to 8 percent slopes	Low	2,766.6	5.0%
BRD	Brewster very gravelly loam, 1 to 12 percent slopes	Low	1.9	0.0%
BRF	Brewster-Rock outcrop complex, 10 to 30 percent slopes	Low	1,135.6	2.0%
CMC	Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes	Low	11,392.4	20.5%
CND	Chinati-Boracho-Berrend association, 1 to 15 percent slopes	Low	5,086.4	9.2%
CVC	Costavar and Volco soils, 1 to 8 percent slopes	Low	301.4	0.5%
EEB	Espy-Eppenauer complex, 1 to 5 percent slopes	Low	264.0	0.5%
MCA	Marfa clay loam, 0 to 2 percent slopes, occasionally flooded	Low	9,573.1	17.2%
MUB	Murray-Marfa-Boracho association, 1 to 5 percent slopes	Low	9,110.9	16.4%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MZA	Musquiz clay loam, 0 to 3 percent slopes	Low	10,152.7	18.3%
PTA	Phantom clay loam, 0 to 2 percent slopes, occasionally flooded	Low	562.3	1.0%
PZB	Phantom-Musquiz complex, 1 to 5 percent slopes	Low	2,291.1	4.1%
Subtotals for Soil Survey Area			**54,416.2**	**98.0%**
Totals for Area of Interest			**55,532.8**	**100.0%**

Rating Options—Corrosion of Concrete

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Corrosion of Steel

ENG

Engineering

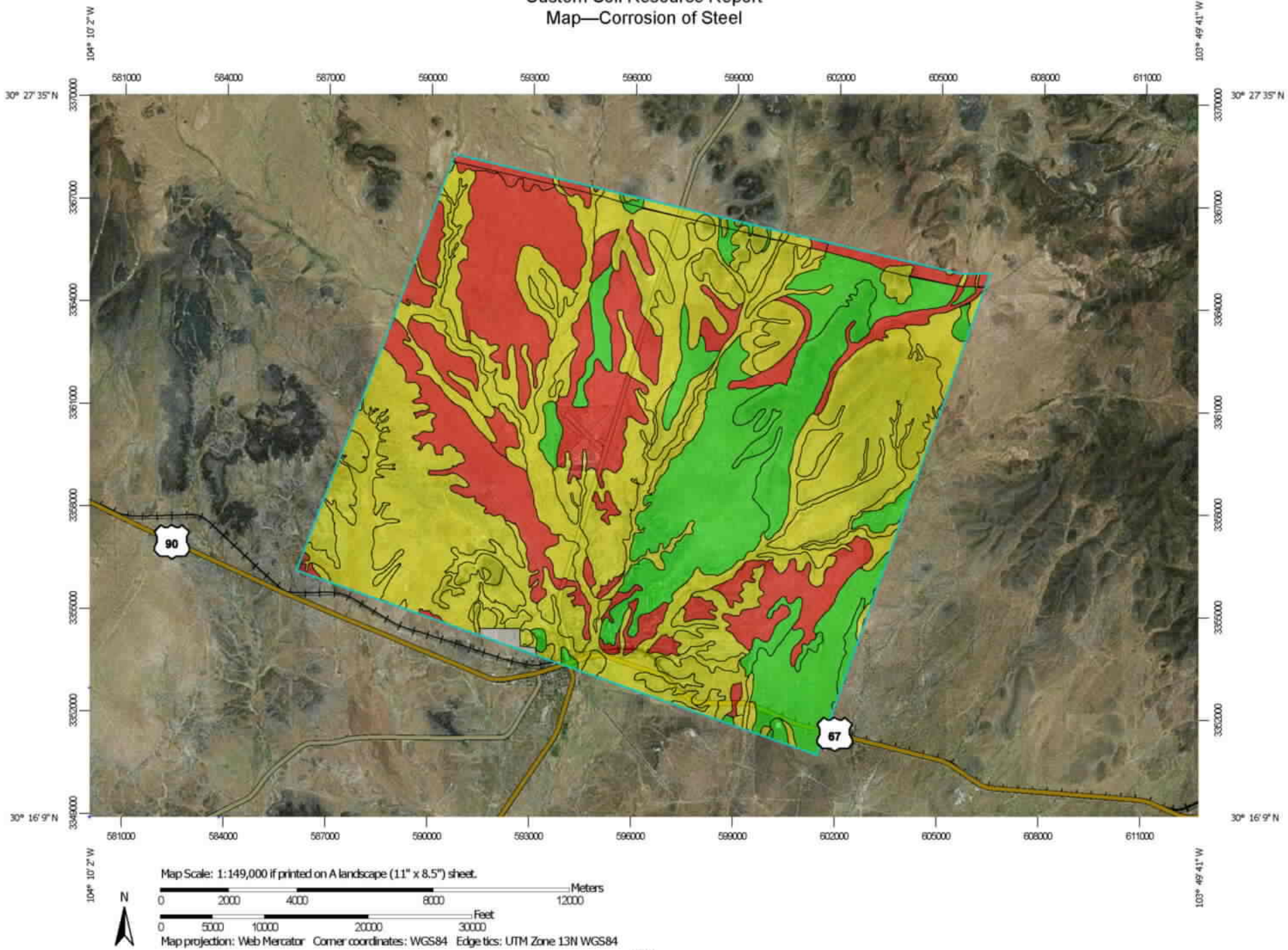
AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Map—Corrosion of Steel



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

Not rated or not available

Soil Rating Lines

High

Moderate

Low

Not rated or not available

Soil Rating Points

High

Moderate

Low

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 1:31,700.

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: Jeff Davis County, Texas
Survey Area Data: Version 24, Sep 5, 2023

Soil Survey Area: Presidio County, Texas
Survey Area Data: Version 27, Sep 5, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 5, 2021—Jan 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BeB	Boracho-Espy complex, 1 to 8 percent slopes	Low	69.5	0.1%
BsE	Brewster association, hilly	Moderate	153.3	0.3%
Ga	Bigetty association	Moderate	60.7	0.1%
LmB	Limpia and Mitre soils, gently sloping	High	34.2	0.1%
Mu	Musquiz clay loam, 0 to 3 percent slopes	High	414.2	0.7%
Re	Redona association	Moderate	223.6	0.4%
Vm	Verhalen-Dalby association	High	153.4	0.3%
Subtotals for Soil Survey Area			**1,109.0**	**2.0%**
Totals for Area of Interest			**55,532.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ANS	Area not surveyed, access denied		140.2	0.3%
BEB	Berrend and Espy soils, 1 to 5 percent slopes	Moderate	1,637.8	2.9%
BOB	Boracho-Espy complex, 1 to 8 percent slopes	Low	2,766.6	5.0%
BRD	Brewster very gravelly loam, 1 to 12 percent slopes	Low	1.9	0.0%
BRF	Brewster-Rock outcrop complex, 10 to 30 percent slopes	Moderate	1,135.6	2.0%
CMC	Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes	Moderate	11,392.4	20.5%
CND	Chinati-Boracho-Berrend association, 1 to 15 percent slopes	Moderate	5,086.4	9.2%
CVC	Costavar and Volco soils, 1 to 8 percent slopes	Moderate	301.4	0.5%
EEB	Espy-Eppenauer complex, 1 to 5 percent slopes	Moderate	264.0	0.5%
MCA	Marfa clay loam, 0 to 2 percent slopes, occasionally flooded	Moderate	9,573.1	17.2%
MUB	Murray-Marfa-Boracho association, 1 to 5 percent slopes	Low	9,110.9	16.4%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MZA	Musquiz clay loam, 0 to 3 percent slopes	High	10,152.7	18.3%
PTA	Phantom clay loam, 0 to 2 percent slopes, occasionally flooded	High	562.3	1.0%
PZB	Phantom-Musquiz complex, 1 to 5 percent slopes	High	2,291.1	4.1%
Subtotals for Soil Survey Area			**54,416.2**	**98.0%**
Totals for Area of Interest			**55,532.8**	**100.0%**

Rating Options—Corrosion of Steel

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

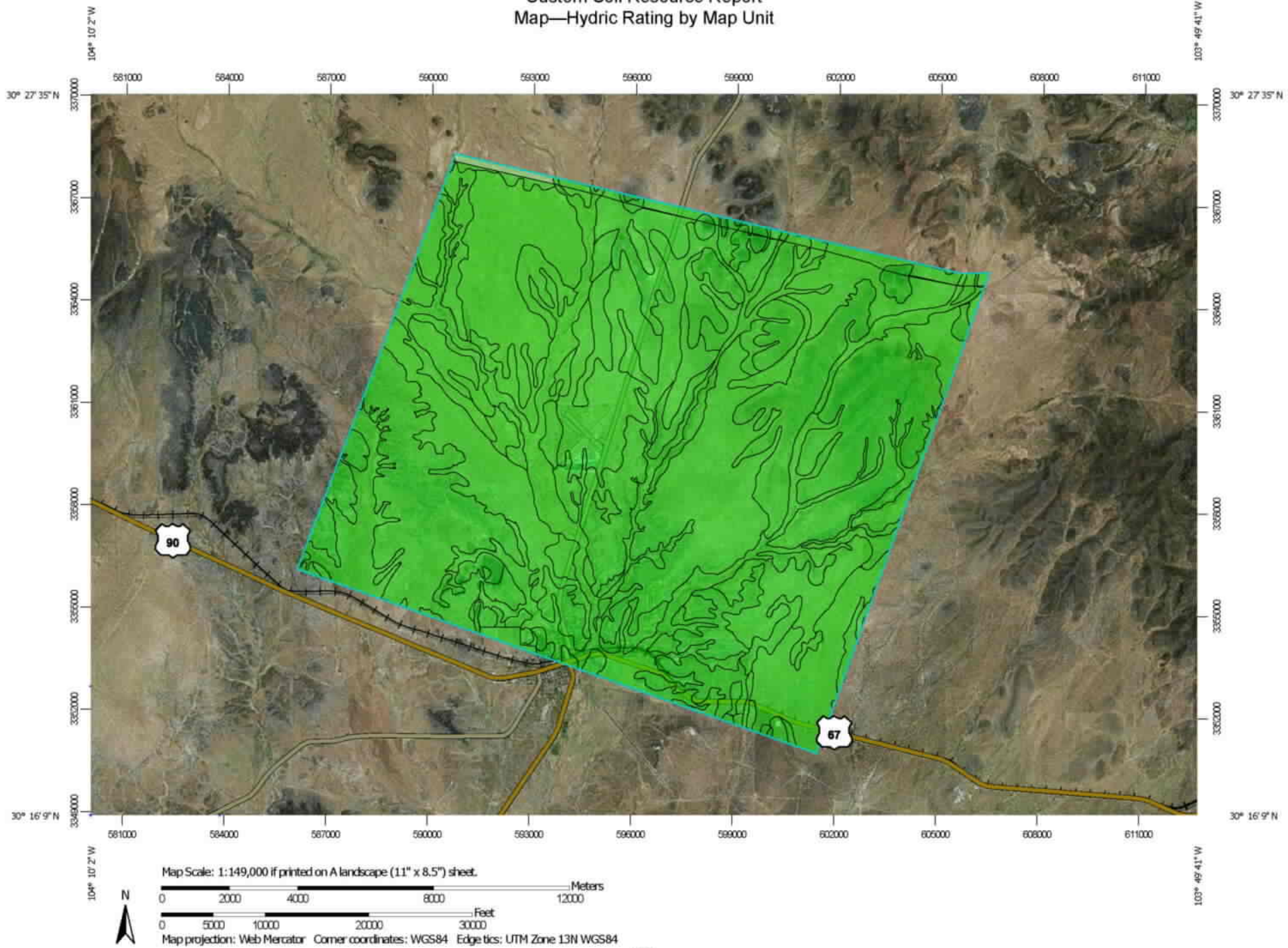
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Hydric Rating by Map Unit



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- 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 1:31,700.

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)

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Survey Area Data: Version 24, Sep 5, 2023

Soil Survey Area: Presidio County, Texas
Survey Area Data: Version 27, Sep 5, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 5, 2021—Jan 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BeB	Boracho-Espy complex, 1 to 8 percent slopes	0	69.5	0.1%
BsE	Brewster association, hilly	0	153.3	0.3%
Ga	Bigetty association	0	60.7	0.1%
LmB	Limpia and Mitre soils, gently sloping	0	34.2	0.1%
Mu	Musquiz clay loam, 0 to 3 percent slopes	0	414.2	0.7%
Re	Redona association	0	223.6	0.4%
Vm	Verhalen-Dalby association	5	153.4	0.3%
Subtotals for Soil Survey Area			**1,109.0**	**2.0%**
Totals for Area of Interest			**55,532.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ANS	Area not surveyed, access denied	0	140.2	0.3%
BEB	Berrend and Espy soils, 1 to 5 percent slopes	0	1,637.8	2.9%
BOB	Boracho-Espy complex, 1 to 8 percent slopes	0	2,766.6	5.0%
BRD	Brewster very gravelly loam, 1 to 12 percent slopes	0	1.9	0.0%
BRF	Brewster-Rock outcrop complex, 10 to 30 percent slopes	0	1,135.6	2.0%
CMC	Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes	0	11,392.4	20.5%
CND	Chinati-Boracho-Berrend association, 1 to 15 percent slopes	0	5,086.4	9.2%
CVC	Costavar and Volco soils, 1 to 8 percent slopes	0	301.4	0.5%
EEB	Espy-Eppenauer complex, 1 to 5 percent slopes	0	264.0	0.5%
MCA	Marfa clay loam, 0 to 2 percent slopes, occasionally flooded	0	9,573.1	17.2%
MUB	Murray-Marfa-Boracho association, 1 to 5 percent slopes	0	9,110.9	16.4%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MZA	Musquiz clay loam, 0 to 3 percent slopes	0	10,152.7	18.3%
PTA	Phantom clay loam, 0 to 2 percent slopes, occasionally flooded	0	562.3	1.0%
PZB	Phantom-Musquiz complex, 1 to 5 percent slopes	0	2,291.1	4.1%
Subtotals for Soil Survey Area			**54,416.2**	**98.0%**
Totals for Area of Interest			**55,532.8**	**100.0%**

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Water Erosion Potential (TX)

"Water Erosion Potential (TX)" is a qualitative interpretation that evaluates a soil's potential to erode through the action of water. The potential assumes that the area being affected is bare, smooth, and exposed to the water erosion processes. The interpretation provides the user with a qualitative rating of the vulnerability of the soil to the action of water; it is not a measure of actual soil loss from erosion.

The water erosion potential of the soil is based on those soil properties or a combination of soil properties and landscape characteristics that contribute to runoff and have low resistance to water erosion processes. Soil features that contribute to water erosivity are surface-layer particle size, saturated hydraulic conductivity, and high runoff landscapes. Conversely, soil features that resist the erosive effect of water are high organic matter content in the surface layer and low runoff landscapes. The water erosion potential is a function of the interaction between those soil features that make the soil susceptible to water erosion and those that resist the water erosion process.

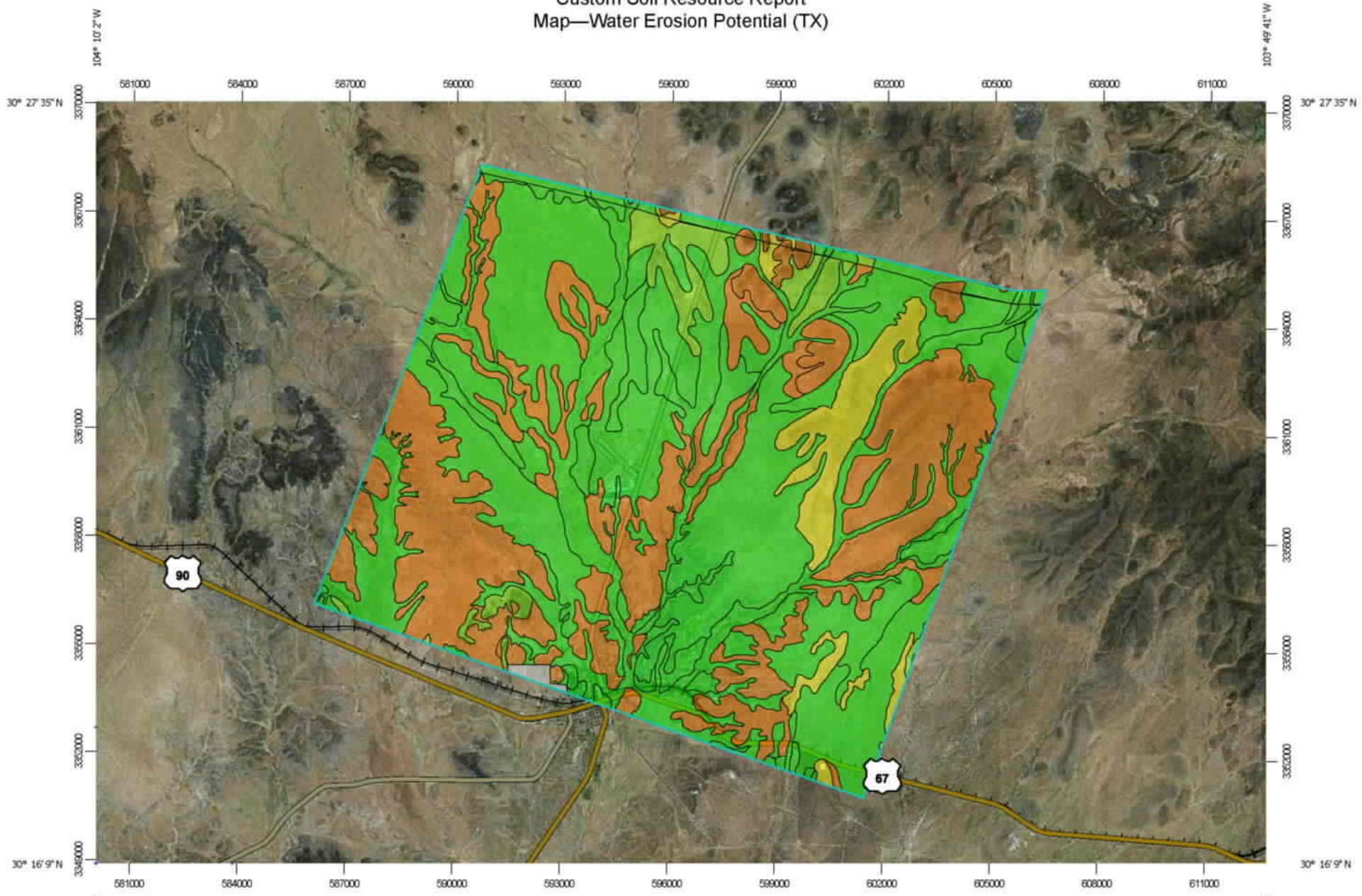
The ratings are both verbal and numerical. Numerical ratings indicate the soil's relative water erosion potential. They are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil has the greatest water erosion potential (1.00) and the point at which a soil has very low water erosion potential (0.00).

Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating process. "Very high" (numerical values less than or equal to 1.0 to greater than 0.9) indicates that the soil has the greatest relative water erosion vulnerability. "High" (numerical value less than or equal to 0.9 to greater than 0.65) indicates that the soil has large relative water erosion vulnerability. "Moderate" (numerical value less than or equal to 0.65 to greater than 0.35) indicates that the soil has medium relative water erosion vulnerability. "Low" (numerical value less than or equal to 0.35 to greater than 0.1) indicates that the soil has small relative water erosion vulnerability. "Very low" (numerical value less than or equal to 0.10) indicates that the soil has little or no relative water erosion vulnerability.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Water Erosion Potential (TX)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Very high water erosion potential
- High water erosion potential
- Moderate water erosion potential
- Low water erosion potential
- Very low water erosion potential
- Not rated or not available

Soil Rating Lines

- Very high water erosion potential
- High water erosion potential
- Moderate water erosion potential
- Low water erosion potential
- Very low water erosion potential
- Not rated or not available

Soil Rating Points

- Very high water erosion potential
- High water erosion potential
- Moderate water erosion potential
- Low water erosion potential
- Very low water erosion potential
- 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 1:31,700.

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: Jeff Davis County, Texas
Survey Area Data: Version 24, Sep 5, 2023

Soil Survey Area: Presidio County, Texas
Survey Area Data: Version 27, Sep 5, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 5, 2021—Jan 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Water Erosion Potential (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
BeB	Boracho-Espy complex, 1 to 8 percent slopes	Moderate water erosion potential	Boracho (60%)	Percs slowly (1.00)	69.5	0.1%
				Organic matter (0.97)		
				LS factor (0.70)		
				Silt content (0.69)		
			Espy (20%)	Organic matter (0.97)		
				Percs slowly (0.92)		
				LS factor (0.70)		
				Silt content (0.69)		
BsE	Brewster association, hilly	High water erosion potential	Brewster (60%)	LS factor (1.00)	153.3	0.3%
				Percs slowly (1.00)		
				Organic matter (0.98)		
				Silt content (0.66)		
Ga	Bigetty association	Very low water erosion potential	Bigetty (100%)	Silt content (1.00)	60.7	0.1%
				Organic matter (0.98)		
				Percs slowly (0.92)		
LmB	Limpia and Mitre soils, gently sloping	Low water erosion potential	Limpia (60%)	Percs slowly (1.00)	34.2	0.1%
				Organic matter (0.97)		
				Silt content (0.73)		
				LS factor (0.35)		
			Mitre (20%)	Organic matter (0.94)		
				Percs slowly (0.94)		
				Silt content (0.63)		
				LS factor (0.35)		
Mu	Musquiz clay loam, 0 to 3 percent slopes	Very low water erosion potential	Musquiz (80%)	Percs slowly (0.99)	414.2	0.7%
				Organic matter (0.97)		
				Silt content (0.44)		
				LS factor (0.10)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Re	Redona association	Very low water erosion potential	Redona (100%)	Organic matter (0.94)	223.6	0.4%
				Percs slowly (0.92)		
				Silt content (0.22)		
				LS factor (0.10)		
Vm	Verhalen-Dalby association	Very low water erosion potential	Verhalen (65%)	Percs slowly (1.00)	153.4	0.3%
				Organic matter (0.95)		
				Silt content (0.33)		
			Dalby (25%)	Percs slowly (1.00)		
				Organic matter (0.95)		
				Silt content (0.34)		
Subtotals for Soil Survey Area					**1,109.0**	**2.0%**
Totals for Area of Interest					**55,532.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
ANS	Area not surveyed, access denied	Not rated	Area not surveyed (100%)		140.2	0.3%
BEB	Berrend and Espy soils, 1 to 5 percent slopes	Low water erosion potential	Berrend (72%)	Percs slowly (0.99)	1,637.8	2.9%
				Organic matter (0.97)		
				LS factor (0.35)		
				Silt content (0.23)		
BOB	Boracho-Espy complex, 1 to 8 percent slopes	Moderate water erosion potential	Boracho (60%)	Percs slowly (1.00)	2,766.6	5.0%
				Organic matter (0.97)		
				LS factor (0.70)		
				Silt content (0.69)		
			Espy (20%)	Organic matter (0.97)		
				Percs slowly (0.92)		
				LS factor (0.70)		
				Silt content (0.69)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
BRD	Brewster very gravelly loam, 1 to 12 percent slopes	Very high water erosion potential	Brewster (75%)	LS factor (1.00)	1.9	0.0%
				Percs slowly (1.00)		
				Organic matter (0.99)		
				Silt content (0.81)		
BRF	Brewster-Rock outcrop complex, 10 to 30 percent slopes	High water erosion potential	Brewster (65%)	LS factor (1.00)	1,135.6	2.0%
				Percs slowly (1.00)		
				Organic matter (0.99)		
				Silt content (0.66)		
CMC	Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes	High water erosion potential	Chilimol (45%)	Organic matter (0.96)	11,392.4	20.5%
				LS factor (0.93)		
				Percs slowly (0.92)		
				Silt content (0.90)		
			Berrend (13%)	Percs slowly (0.99)		
				Organic matter (0.97)		
				LS factor (0.93)		
				Silt content (0.57)		
CND	Chinati-Boracho-Berrend association, 1 to 15 percent slopes	High water erosion potential	Chinati (54%)	LS factor (1.00)	5,086.4	9.2%
				Percs slowly (1.00)		
				Organic matter (0.95)		
				Silt content (0.75)		
			Boracho (19%)	LS factor (1.00)		
				Organic matter (0.95)		
				Percs slowly (0.92)		
				Silt content (0.67)		
CVC	Costavar and Volco soils, 1 to 8 percent slopes	Low water erosion potential	Costavar (53%)	Percs slowly (0.99)	301.4	0.5%
				Organic matter (0.96)		
				LS factor (0.70)		
				Silt content (0.16)		
EEB	Espy-Eppenauer complex, 1 to 5 percent slopes	Very low water erosion potential	Espy (56%)	Organic matter (0.97)	264.0	0.5%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Percs slowly (0.92)		
				Silt content (0.34)		
				LS factor (0.15)		
			Eppenauer (39%)	Organic matter (0.98)		
				Percs slowly (0.92)		
				Silt content (0.29)		
				LS factor (0.15)		
MCA	Marfa clay loam, 0 to 2 percent slopes, occasionally flooded	Very low water erosion potential	Marfa (92%)	Percs slowly (0.99)	9,573.1	17.2%
				Organic matter (0.96)		
				Silt content (0.56)		
				LS factor (0.01)		
MUB	Murray-Marfa-Boracho association, 1 to 5 percent slopes	Very low water erosion potential	Murray (58%)	Organic matter (0.96)	9,110.9	16.4%
				Percs slowly (0.92)		
				Silt content (0.36)		
				LS factor (0.15)		
			Marfa (21%)	Percs slowly (0.99)		
				Organic matter (0.96)		
				Silt content (0.52)		
				LS factor (0.01)		
MZA	Musquiz clay loam, 0 to 3 percent slopes	Very low water erosion potential	Musquiz (80%)	Percs slowly (0.99)	10,152.7	18.3%
				Organic matter (0.97)		
				Silt content (0.44)		
				LS factor (0.10)		
PTA	Phantom clay loam, 0 to 2 percent slopes, occasionally flooded	Very low water erosion potential	Phantom (86%)	Percs slowly (1.00)	562.3	1.0%
				Organic matter (0.95)		
				Silt content (0.37)		
				LS factor (0.01)		
PZB	Phantom-Musquiz complex, 1 to 5 percent slopes	Very low water erosion potential	Phantom (45%)	Percs slowly (1.00)	2,291.1	4.1%
				Organic matter (0.95)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Silt content (0.30)		
				LS factor (0.01)		
Subtotals for Soil Survey Area					**54,416.2**	**98.0%**
Totals for Area of Interest					**55,532.8**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very low water erosion potential	32,806.0	59.1%
High water erosion potential	17,767.7	32.0%
Moderate water erosion potential	2,836.1	5.1%
Low water erosion potential	1,973.4	3.6%
Very high water erosion potential	1.9	0.0%
Null or Not Rated	140.2	0.3%
Totals for Area of Interest	**55,532.8**	**100.0%**

Rating Options—Water Erosion Potential (TX)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Wind Erosion Potential (TX)

The higher the numerical rating the greater the vulnerability rating class. The "very high" potential class (numerical values less than or equal to 1.0 to greater than 0.9) indicates that the soil has the greatest relative wind erosion vulnerability. The "high" class (numerical value less than or equal to 0.9 to greater than 0.65) indicates that the soil has large relative wind erosion vulnerability. The "moderate" class (numerical value less than or equal to 0.65 to greater than 0.4) indicates that the soil has medium relative wind erosion vulnerability. The "low" class (numerical value less than or equal to 0.4 to greater than 0.2) indicates that the soil has small relative wind erosion vulnerability. The "very low" class (numerical value less than or equal to 0.20) indicates that the soil has little or no relative wind erosion vulnerability.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site. The Wind Erosion Potential (TX) is a qualitative interpretation which evaluates a soil's potential to erode through the action of wind. The potential assumes that the area being affected is bare, smooth, and has a long distance exposed to the wind. The soil wind erosion potential provides the user with a qualitative rating of the vulnerability of the soil to the action of the wind and is not a measure of actual soil loss from erosion.

The wind erosion potential of the soil is based on those surface soil properties that by themselves or in combination with others contribute to the soil's potential wind erosivity. Those surface soil features that contribute to wind erosivity are particle size and carbonate content. Conversely, surface features that resist the erosive effect of wind are organic matter content and coarse fragments. The soil wind erosion potential is a function of the interaction between surface soil features that make the soil susceptible to wind erosion and those that resist the wind erosion process.

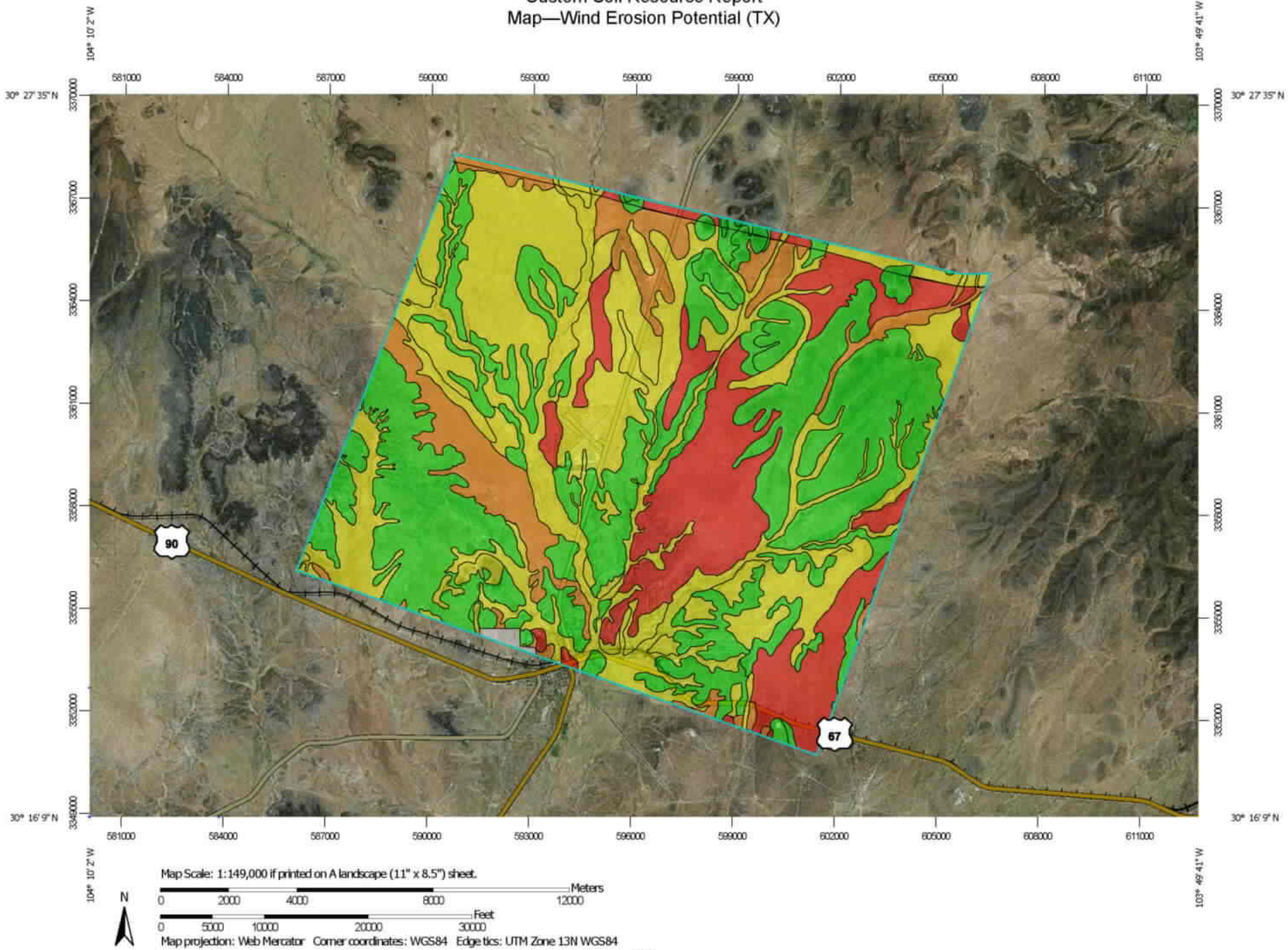
Numerical ratings or values indicate the soil's relative wind erosion potential. Ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil has the greatest wind erosion potential (1.00), and the point at which a soil has very low wind erosion potential (0.00).

The ratings are both verbal and numerical. The potential degree to which a soil is susceptible to wind erosion will range from "very high" to "very low" (from 1.0 to 0.0). Soils that have favorable surface particle size, high organic matter content, or protective coarse fragments will have "very low" wind erosion potential. Soils that have "very high" wind erosion potential are those with a surface layer that has a sandy particle size, high carbonate content, low organic matter content, or no coarse fragment protection.

The higher the numerical rating the greater the vulnerability rating class. The "very high" potential class (numerical values less than or equal to 1.0 to greater than 0.9) indicates that the soil has the greatest relative wind erosion vulnerability. The "high" class (numerical value less than or equal to 0.9 to greater than 0.65) indicates that the soil has large relative wind erosion vulnerability. The "moderate" class (numerical value less than or equal to 0.65 to greater than 0.4) indicates that the soil has medium relative wind erosion vulnerability. The "low" class (numerical value less than or equal to 0.4 to greater than 0.2) indicates that the soil has small relative wind erosion vulnerability. The "very low" class (numerical value less than or equal to 0.20) indicates that the soil has little or no relative wind erosion vulnerability.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation

Map—Wind Erosion Potential (TX)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very high
- High
- Moderate
- Low
- Very low
- Not rated or not available

Soil Rating Lines
- Very high
- High
- Moderate
- Low
- Very low
- Not rated or not available

Soil Rating Points
- Very high
- High
- Moderate
- Low
- Very low
- 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 1:31,700.

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: Jeff Davis County, Texas
Survey Area Data: Version 24, Sep 5, 2023

Soil Survey Area: Presidio County, Texas
Survey Area Data: Version 27, Sep 5, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Mar 5, 2021—Jan 18, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Wind Erosion Potential (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
BeB	Boracho-Espy complex, 1 to 8 percent slopes	Very low wind erosion potential	Boracho (60%)	Rock fragment content of surface (0.60)	69.5	0.1%
				Carbonate content of surface (0.59)		
				Sand content of surface (0.51)		
				Clay content of surface (0.22)		
				Silt content of surface (0.05)		
			Espy (20%)	Sand content of surface (0.51)		
				Rock fragment content of surface (0.44)		
				Clay content of surface (0.22)		
				Silt content of surface (0.05)		
				Organic matter content of surface (0.01)		
BsE	Brewster association, hilly	Very low wind erosion potential	Brewster (60%)	Clay content of surface (0.54)	153.3	0.3%
				Rock fragment content of surface (0.46)		
				Sand content of surface (0.33)		
				Silt content of surface (0.05)		
				Organic matter content of surface (0.01)		
Ga	Bigetty association	Moderate wind erosion potential	Bigetty (100%)	Silt content of surface (0.45)	60.7	0.1%
				Clay content of surface (0.29)		
				Rock fragment content of surface (0.02)		
				Organic matter content of surface (0.01)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
LmB	Limpia and Mitre soils, gently sloping	Very low wind erosion potential	Limpia (60%)	Rock fragment content of surface (0.60)	34.2	0.1%
				Clay content of surface (0.43)		
				Sand content of surface (0.31)		
				Silt content of surface (0.08)		
Mu	Musquiz clay loam, 0 to 3 percent slopes	Moderate wind erosion potential	Musquiz (80%)	Clay content of surface (0.67)	414.2	0.7%
				Sand content of surface (0.33)		
				Silt content of surface (0.03)		
				Organic matter content of surface (0.03)		
				Rock fragment content of surface (0.03)		
Re	Redona association	Very high wind erosion potential	Redona (100%)	Sand content of surface (0.95)	223.6	0.4%
				Clay content of surface (0.00)		
Vm	Verhalen-Dalby association	High wind erosion potential	Verhalen (65%)	Clay content of surface (0.85)	153.4	0.3%
				Silt content of surface (0.02)		
				Rock fragment content of surface (0.00)		
			Dalby (25%)	Clay content of surface (0.85)		
				Silt content of surface (0.02)		
				Rock fragment content of surface (0.00)		
Subtotals for Soil Survey Area					**1,109.0**	**2.0%**
Totals for Area of Interest					**55,532.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
ANS	Area not surveyed, access denied	Not rated	Area not surveyed (100%)		140.2	0.3%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
BEB	Berrend and Espy soils, 1 to 5 percent slopes	High wind erosion potential	Berrend (72%)	Sand content of surface (0.77)	1,637.8	2.9%
				Clay content of surface (0.22)		
				Organic matter content of surface (0.01)		
				Silt content of surface (0.00)		
				Rock fragment content of surface (0.00)		
			Espy (17%)	Sand content of surface (1.00)		
				Rock fragment content of surface (0.10)		
BOB	Boracho-Espy complex, 1 to 8 percent slopes	Very low wind erosion potential	Boracho (60%)	Rock fragment content of surface (0.60)	2,766.6	5.0%
				Carbonate content of surface (0.59)		
				Sand content of surface (0.51)		
				Clay content of surface (0.22)		
				Silt content of surface (0.05)		
			Espy (20%)	Sand content of surface (0.51)		
				Rock fragment content of surface (0.44)		
				Clay content of surface (0.22)		
				Silt content of surface (0.05)		
				Organic matter content of surface (0.01)		
BRD	Brewster very gravelly loam, 1 to 12 percent slopes	Very low wind erosion potential	Brewster (75%)	Rock fragment content of surface (0.60)	1.9	0.0%
				Clay content of surface (0.43)		
				Sand content of surface (0.18)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Silt content of surface (0.13)		
				Organic matter content of surface (0.05)		
BRF	Brewster-Rock outcrop complex, 10 to 30 percent slopes	Very low wind erosion potential	Brewster (65%)	Rock fragment content of surface (0.60)	1,135.6	2.0%
				Clay content of surface (0.54)		
				Sand content of surface (0.33)		
				Silt content of surface (0.05)		
				Organic matter content of surface (0.05)		
CMC	Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes	Very low wind erosion potential	Chilimol (45%)	Rock fragment content of surface (0.60)	11,392.4	20.5%
				Silt content of surface (0.24)		
				Sand content of surface (0.15)		
				Clay content of surface (0.14)		
CND	Chinati-Boracho-Berrend association, 1 to 15 percent slopes	Very low wind erosion potential	Chinati (54%)	Rock fragment content of surface (0.55)	5,086.4	9.2%
				Sand content of surface (0.47)		
				Silt content of surface (0.10)		
				Clay content of surface (0.08)		
			Boracho (19%)	Clay content of surface (0.71)		
				Carbonate content of surface (0.59)		
				Rock fragment content of surface (0.57)		
				Sand content of surface (0.25)		
				Silt content of surface (0.05)		
CVC	Costavar and Volco soils, 1	Moderate wind erosion potential	Costavar (53%)	Sand content of surface (0.86)	301.4	0.5%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
	to 8 percent slopes			Rock fragment content of surface (0.36)		
				Clay content of surface (0.22)		
EEB	Espy-Eppenauer complex, 1 to 5 percent slopes	High wind erosion potential	Espy (56%)	Sand content of surface (1.00)	264.0	0.5%
				Rock fragment content of surface (0.10)		
			Eppenauer (39%)	Sand content of surface (0.98)		
				Organic matter content of surface (0.11)		
				Rock fragment content of surface (0.01)		
MCA	Marfa clay loam, 0 to 2 percent slopes, occasionally flooded	Moderate wind erosion potential	Marfa (92%)	Clay content of surface (0.63)	9,573.1	17.2%
				Sand content of surface (0.22)		
				Silt content of surface (0.08)		
				Organic matter content of surface (0.01)		
				Rock fragment content of surface (0.00)		
MUB	Murray-Marfa-Boracho association, 1 to 5 percent slopes	Very high wind erosion potential	Murray (58%)	Sand content of surface (0.95)	9,110.9	16.4%
				Carbonate content of surface (0.43)		
				Clay content of surface (0.08)		
				Rock fragment content of surface (0.01)		
MZA	Musquiz clay loam, 0 to 3 percent slopes	Moderate wind erosion potential	Musquiz (80%)	Clay content of surface (0.67)	10,152.7	18.3%
				Sand content of surface (0.33)		
				Silt content of surface (0.03)		
				Organic matter content of surface (0.03)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Rock fragment content of surface (0.03)		
PTA	Phantom clay loam, 0 to 2 percent slopes, occasionally flooded	High wind erosion potential	Phantom (86%)	Clay content of surface (0.84) Sand content of surface (0.16) Silt content of surface (0.03) Rock fragment content of surface (0.01)	562.3	1.0%
PZB	Phantom-Musquiz complex, 1 to 5 percent slopes	High wind erosion potential	Phantom (45%)	Clay content of surface (0.85) Silt content of surface (0.02) Rock fragment content of surface (0.01)	2,291.1	4.1%
Subtotals for Soil Survey Area					**54,416.2**	**98.0%**
Totals for Area of Interest					**55,532.8**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very low wind erosion potential	20,639.9	37.2%
Moderate wind erosion potential	20,502.1	36.9%
Very high wind erosion potential	9,334.5	16.8%
High wind erosion potential	4,908.6	8.8%
Null or Not Rated	140.2	0.3%
Totals for Area of Interest	**55,532.8**	**100.0%**

Rating Options—Wind Erosion Potential (TX)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Qualities and Features

This folder contains tabular reports that present various soil qualities and features. The reports (tables) include all selected map units and components for each map unit. Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly,

or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Soil Features–Jeff Davis County, Texas									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
		In	*In*		*In*	*In*			
BeB—Boracho-Espy complex, 1 to 8 percent slopes									
Boracho	Petrocalcic	7-12-20	4-39	Strongly coherent	0	0	None	Low	Low
Espy	Petrocalcic	10-14-20	4-49	Strongly coherent	0	0	None	Low	Low
BsE—Brewster association, hilly									
Brewster	Lithic bedrock	4-7-20	—	Indurated	0	—	None	Moderate	Low
Rock outcrop	Lithic bedrock	0-	—	Indurated	—	—			
Ga—Bigetty association									
Bigetty		—	—		0	—	None	Moderate	Moderate
LmB—Limpia and Mitre soils, gently sloping									
Limpia		—	—		0	—	None	High	Low
Mitre	Petrocalcic	10-14-20	0-3	Indurated	0	—	None	Moderate	Low
Mu—Musquiz clay loam, 0 to 3 percent slopes									
Musquiz		—	—		0	0	None	High	Low
Re—Redona association									
Redona		—	—		0	—	None	Moderate	Low

Soil Features–Jeff Davis County, Texas									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
Vm—Verhalen-Dalby association									
Verhalen		—	—		0	—	None	High	High
Dalby		—	—		0	—	None	High	High

Soil Features–Presidio County, Texas									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
		In	*In*		*In*	*In*			
ANS—Area not surveyed, access denied									
Area not surveyed		—	—		—	—			
BEB—Berrend and Espy soils, 1 to 5 percent slopes									
Berrend		—	—		0	—	None	Moderate	Low
Espy	Petrocalcic	10-12-20	—	Strongly coherent	0	—	None	Moderate	Low

Soil Features–Presidio County, Texas									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
BOB—Boracho-Espy complex, 1 to 8 percent slopes									
Boracho	Petrocalcic	7- 12-20	4-39	Strongly coherent	0	0	None	Low	Low
Espy	Petrocalcic	10-14-20	4-49	Strongly coherent	0	0	None	Low	Low
BRD—Brewster very gravelly loam, 1 to 12 percent slopes									
Brewster	Lithic bedrock	2- 4-20	—	Indurated	0	—	None	Low	Low
BRF—Brewster-Rock outcrop complex, 10 to 30 percent slopes									
Brewster	Lithic bedrock	4- 4-20	—	Indurated	0	—	None	Moderate	Low
Rock outcrop	Lithic bedrock	0- 0-4	—	Indurated	—	—			
CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes									
Chilimol		—	—		0	—	None	Moderate	Low
Boracho	Petrocalcic	7- 12-20	4-30	Strongly coherent	0	—	None	Moderate	Low
Berrend		—	—		0	—	None	Moderate	Low

Soil Features–Presidio County, Texas									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
CND—Chinati-Boracho-Berrend association, 1 to 15 percent slopes									
Chinati	Petrocalcic	8-12-20	—	Strongly coherent	0	—	None	Moderate	Low
	Lithic bedrock	20-21-40	—	Strongly coherent	0	—	None	Moderate	Low
Boracho	Petrocalcic	7-12-20	—	Strongly coherent	0	—	None	Moderate	Low
Berrend		—	—		0	—	None	Moderate	Low
CVC—Costavar and Volco soils, 1 to 8 percent slopes									
Costavar	Lithic bedrock	4-13-18	—	Indurated	0	—	None	Moderate	Low
Volco	Lithic bedrock	6-9-20	—	Indurated	0	—	None	Moderate	Low
EEB—Espy-Eppenauer complex, 1 to 5 percent slopes									
Espy	Petrocalcic	10-16-20	—	Strongly coherent	0	—	None	Moderate	Low
Eppenauer	Paralithic bedrock	20-23-40	—	Weakly coherent	0	—	None	Moderate	Low
MCA—Marfa clay loam, 0 to 2 percent slopes, occasionally flooded									
Marfa		—	—		0	—	None	Moderate	Low

Soil Features–Presidio County, Texas									
Map symbol and soil name	**Restrictive Layer**				**Subsidence**		**Potential for frost action**	**Risk of corrosion**	
	Kind	**Depth to top**	**Thickness**	**Hardness**	**Initial**	**Total**		**Uncoated steel**	**Concrete**
		Low-RV-High	*Range*		*Low-High*	*Low-High*			
MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes									
Murray		—	—		0	—	None	Low	Low
Marfa		—	—		0	—	None	Moderate	Low
Boracho	Petrocalcic	7- 10-20	4-30	Strongly coherent	0	—	None	Moderate	Low
MZA—Musquiz clay loam, 0 to 3 percent slopes									
Musquiz		—	—		0	0	None	High	Low
PTA—Phantom clay loam, 0 to 2 percent slopes, occasionally flooded									
Phantom		—	—		0	—	None	High	Low
PZB—Phantom-Musquiz complex, 1 to 5 percent slopes									
Phantom		—	—		0	—	None	High	Low
Musquiz		—	—		0	—	None	Moderate	Low

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Water Features

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

The *months* in the table indicate the portion of the year in which a water table, ponding, and/or flooding is most likely to be a concern.

Water table refers to a saturated zone in the soil. The water features table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on

observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. The kind of water table, apparent or perched, is given if a seasonal high water table exists in the soil. A water table is perched if free water is restricted from moving downward in the soil by a restrictive feature, in most cases a hardpan; there is a dry layer of soil underneath a wet layer. A water table is apparent if free water is present in all horizons from its upper boundary to below 2 meters or to the depth of observation. The water table kind listed is for the first major component in the map unit.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Map unit symbol and soil name	Hydrologic group	Surface runoff	Most likely months	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*		*Ft*				
BeB—Boracho-Espy complex, 1 to 8 percent slopes											
Boracho	D	High	Jan-Dec	—	—	—	—	—	None	—	None
Espy	D	High	Jan-Dec	—	—	—	—	—	None	—	None
BsE—Brewster association, hilly											
Brewster	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Rock outcrop	D			—	—	—	—	—	—	—	
Ga—Bigetty association											
Bigetty	C	Low	Jan-Jun	—	—	—	—	—	None	—	
			Jul-Oct	—	—	—	—	—	None	Very brief (4 to 48 hours)	Occasional
			Nov-Dec	—	—	—	—	—	None	—	
LmB—Limpia and Mitre soils, gently sloping											
Limpia	C	High	Jan-Dec	—	—	—	—	—	None	—	None
Mitre	D	Medium	Jan-Dec	—	—	—	—	—	None	—	None
Mu—Musquiz clay loam, 0 to 3 percent slopes											
Musquiz	C	Medium	Jan-Dec	—	—	—	—	—	None	—	None
Re—Redona association											
Redona	B	Low	Jan-Dec	—	—	—	—	—	None	—	None
Vm—Verhalen-Dalby association											
Verhalen	D	High	Jan-May	—	—	—	—	—	None	—	
			Jun-Sep	—	—	—	—	—	None	—	Rare
			Oct-Dec	—	—	—	—	—	None	—	
Dalby	D	High	Jan-May	—	—	—	—	—	None	—	
			Jun-Sep	—	—	—	—	—	None	—	Rare
			Oct-Dec	—	—	—	—	—	None	—	

Map unit symbol and soil name	Hydrologic group	Surface runoff	Most likely months	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*		*Ft*				
ANS—Area not surveyed, access denied											
Area not surveyed				—	—	—	—	—	—	—	
BEB—Berrend and Espy soils, 1 to 5 percent slopes											
Berrend	C	Medium	Jan-Dec	—	—	—	—	—	None	—	None
Espy	D	High	Jan-Dec	—	—	—	—	—	None	—	None
BOB—Boracho-Espy complex, 1 to 8 percent slopes											
Boracho	D	High	Jan-Dec	—	—	—	—	—	None	—	None
Espy	D	High	Jan-Dec	—	—	—	—	—	None	—	None
BRD—Brewster very gravelly loam, 1 to 12 percent slopes											
Brewster	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
BRF—Brewster-Rock outcrop complex, 10 to 30 percent slopes											
Brewster	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Rock outcrop	D	Very high		—	—	—	—	—	—	—	
CMC—Chilimol-Boracho-Berrend complex, 1 to 8 percent slopes											
Chilimol	B	Medium	Jan-Dec	—	—	—	—	—	None	—	None
Boracho	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Berrend	C	High	Jan-Dec	—	—	—	—	—	None	—	None
CND—Chinati-Boracho-Berrend association, 1 to 15 percent slopes											
Chinati	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Boracho	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Berrend	C	High	Jan-Dec	—	—	—	—	—	None	—	None
CVC—Costavar and Volco soils, 1 to 8 percent slopes											
Costavar	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None
Volco	D	Very high	Jan-Dec	—	—	—	—	—	None	—	None

Map unit symbol and soil name	Hydrologic group	Surface runoff	Most likely months	Water table			Ponding			Flooding	
				Upper limit	Lower limit	Kind	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	*Ft*		*Ft*				
EEB—Espy-Eppenauer complex, 1 to 5 percent slopes											
Espy	D	High	Jan-Dec	—	—	—	—	—	None	—	None
Eppenauer	C	Low	Jan-Dec	—	—	—	—	—	None	—	None
MCA—Marfa clay loam, 0 to 2 percent slopes, occasionally flooded											
Marfa	C	Medium	Jan-Jun	—	—	—	—	—	None	—	
			Jul-Oct	—	—	—	—	—	None	Brief (2 to 7 days)	Occasional
			Nov-Dec	—	—	—	—	—	None	—	
MUB—Murray-Marfa-Boracho association, 1 to 5 percent slopes											
Murray	B	Low	Jan-Dec	—	—	—	—	—	None	—	None
Marfa	C	Medium	Jan-Dec	—	—	—	—	—	None	—	None
Boracho	D	High	Jan-Dec	—	—	—	—	—	None	—	None
MZA—Musquiz clay loam, 0 to 3 percent slopes											
Musquiz	C	Medium	Jan-Dec	—	—	—	—	—	None	—	None
PTA—Phantom clay loam, 0 to 2 percent slopes, occasionally flooded											
Phantom	C	High	Jan-Mar	—	—	—	—	—	None	—	
			Apr-Oct	—	—	—	—	—	None	Very brief (4 to 48 hours)	Occasional
			Nov-Dec	—	—	—	—	—	None	—	
PZB—Phantom-Musquiz complex, 1 to 5 percent slopes											
Phantom	C	High	Jan-Dec	—	—	—	—	—	None	—	None
Musquiz	C	High	Jan-Dec	—	—	—	—	—	None	—	None

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Ademski, Thomas J (Tommy)

From: Love, Rodney H-CTR (FAA) <Rodney.H-CTR.Love@faa.gov>
Sent: Monday, October 30, 2023 2:42 PM
To: Ademski, Thomas J (Tommy)
Cc: Cardenas, Debbie (FAA)
Subject: U.S. MAIL POSTMARKED 11 OCT , RECEIVED 16 OCT - REQUEST FOR INFORMATION LETTER - T.J. ADEMSKI
Attachments: T.J. ADEMSKI U.S. MAIL POSTMARKED 11 OCT , RECEIVED 16 OCT - REQUEST FOR INFORMATION LETTER - Scan_2023-10-30-143150.pdf

Hello Mr. Ademski,

FAA Obstruction Evaluation Group is in receipt of your letter requesting information for your planned project. With reference to permits, easements, and other approvals, this office has no information of nor direct handling of such manners. Once the coordinates are submitted for your project. From there OEG will check the accuracy of the project based on the information provided and ensure that there is no conflict with aviation safety. If you have any questions regarding this please contact Ms. Debbie Cardenas (CC'd) who is the OE Technician for the state of Texas.

V/r
Rodney H. Love
NAVTAC Contract Support
Federal Aviation Administration
Obstruction Evaluation Group
AJV-A520
10101 Hillwood Parkway
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Need Help Resources?

Please visit our website:
https://oeaaa.faa.gov * All filing guidance can be found at:
https://oeaaa.faa.gov/oeaaa/external/content/instructions.jsp
1) To see if your structure is required to file with FAA, please go to:
https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm
2) OEAAA.faa.gov Filing Instructions: https://oeaaa.faa.gov/oeaaa/external/content/instructions.jsp
3) General FAQs: https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=generalFAQs
4) DOT/FAA Obstruction Marking & Lighting Advisory Circular (AC 70/7460-1M):
https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1030047
5) Light Outage Reporting: https://oeaaa.faa.gov/oeaaa/external/content/lightOutageReporting.jsp
6) Helpdesk (System Issues/Support): **202-580-7500/Email:** oeaaa_helpdesk@cghtech.com

U.S. Department of Homeland Security
FEMA Region 6
800 N. Loop 288
Denton, TX 76209

FEMA

Thomas J. Ademski
Project Manager
Burns McDonnell
8911 North Capital of Texas Highway
Building 3, Suite 300
Austin, TX 78759

RE: Request for Information AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project Jeff Davis and Presidio Counties, Texas

Dear Mr. Ademski,

We acknowledge receipt of your request for review/environmental consultation in reference to the AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project Jeff Davis and Presidio Counties, Texas.

☐ We have no comments to offer.

☒ We offer the following comments:

We would request that the community Floodplain Administrator be contacted for the review and possible permit requirements for this project. If federally funded, we would request the project maintain compliance with EO11988 & EO 11990.

The Community Floodplain Administrator for your project contact information is listed below:

Jeff Davis County, TX
Curtis Evans
County Judge
PO BOX 836
Fort Davis, TX 79734
countyjudge@co.jeff-davis.tx.us
(432) 426– 3968

Presidio, TX
Ruben Carrasco
Road and Bridge Supervisor
PO BOX 1521
Presidio, TX 79845
pcroadsrucv@co.presidio.tx.us
(432) 229-3528

REVIEWER:
Loukisha Williams
Floodplain Management and Insurance Branch
Mitigation Division
(940) 383-7228

DATE: 10/30/2023

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
3400 DEFENSE PENTAGON
WASHINGTON, DC 20301-3400

ENERGY, INSTALLATIONS
AND ENVIRONMENT

December 1, 2023

Thomas Ademski
Burns & McDonnell
6200 Bridge Point Parkway Building 4, Suite 400
Austin, TX 78759

Dear Mr. Ademski,

As requested, the Military Aviation and Installation Assurance Siting Clearinghouse coordinated within the Department of Defense (DoD) an informal review of the Alamito Creek to Fort Davis 138-kV Transmission Line Project. The results of our review indicated that the transmission line project, located in Jeff Davis and Presidio Counties, Texas, as proposed, will have minimal impact on military operations conducted in the area.

Please note that this informal review by the DoD Military Aviation and Installation Assurance Siting Clearinghouse does not constitute an action under 49 United States Code Section 44718 and that the DoD is not bound by the conclusion arrived at under this informal review. To expedite our review in the Obstruction Evaluation Airport Airspace Analysis (OE/AAA) process, please add the project number 2023-10-T-DEV-24 in the comments section of the filing. If you have any questions, please contact me at steven.j.sample4.civ@mail.mil.

Sincerely,

Steven J. Sample
Executive Director
Military Aviation and Installation
Assurance Siting Clearinghouse

TEXAS GENERAL LAND OFFICE
COMMISSIONER DAWN BUCKINGHAM, M.D.

October 17, 2023

Thomas J. Ademski
Burns McDonnell
6200 Bridge Point Parkway, Building 4, Suite 400
Austin, TX 78759

Re: Request for Information
AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project
Jeff Davis and Presidio Counties, Texas

Dear Mr. Ademski:

On behalf of Commissioner Buckingham, I would like to thank you for your letter concerning the above- referenced project.

Using your map depicting the project's study area, it does not appear that the General Land Office will have any environmental issues or land use constraints at this time.

When a final route for this proposed project has been determined, please contact me and we can assess the route to determine if the project will cross any streambeds or Permanent School Fund (PSF) land that would require an easement from our agency.

In the interim, if you would like to speak to me further about this project, I can be reached by email at jeff.burroughs@glo.texas.gov or by phone at (512) 463-7845.

Again, thank you for your inquiry.

Sincerely,

Jeff Burroughs
Manager, Right-of-Way Department
Leasing Operations

Ademski, Thomas J (Tommy)

From: TxDOT Records Request Center <txdot@govqa.us>
Sent: Wednesday, October 25, 2023 11:10 AM
To: Ademski, Thomas J (Tommy)
Subject: TxDOT Public Records Request :: R032032-101823

--- Please respond above this line ---

RE: PUBLIC RECORDS REQUEST of October 18, 2023, Reference # R032032-101823

Good morning Mr. Ademski,

TxDOT received a public information request from you on October 18, 2023. Your request mentioned:

"AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project
Jeff Davis and Presidio Counties, Texas

AEP Texas Inc. (AEP Texas) will be filing an application with the Public Utility Commission of Texas (PUC) to amend its Certificate of Convenience and Necessity (CCN) to construct new a new single-circuit 138-kilovolt (kV) transmission line between the existing Alamito Creek Substation located northeast of the city of Marfa, and the existing Fort Davis Substation located in the southern portion of the community of Fort Davis (Project). The proposed transmission line will be approximately 20 miles in length, and will require a I 00-foot wide right-of-way (ROW). Please refer to the attached map for the location of the study area and the termination points.

Bums & McDonnell has been preparing an Environmental Assessment (EA) and Alternative Routing Study for the proposed Project that will support AEP Texas's CCN application with the PUC. Bums & McDonnell has been collecting and evaluating information to identify environmental, cultural, and land use constraints that exist in the study area. Bums & McDonnell will consider and evaluate these constraints during the development and evaluation of potential alternative routes between the Project's endpoints.

A letter dated August 3, 2019, was previously sent regarding the AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project; however, the Project was delayed. The Alamito Creek to Ft. Davis 138-kV Transmission Line Project is once again moving forward and Bums & McDonnell is requesting that your agency or office provide any current or updated environmental or land use concerns that you may have regarding the siting and potential environmental effects from the construction of these facilities within the designated study area as shown on the enclosed map.

We would appreciate receiving information related to any permits, easements, or other approvals that your agency or office requires. We would also like to request information related to any major proposed development or construction projects that your agency or office may be planning, or is aware of, within the study area.

Your input on any of the following resources as they relate to your agency or office will assist the project team in evaluating the proposed Project:
• Land use (current or proposed land development projects, park/recreation areas, etc.)

- **Aesthetics**
- **Water quality and wetlands**
- **Soils and geology**
- **Wildlife, vegetation, and fisheries (including threatened and endangered species)**
- **Socioeconomics (population, employment, growth, current/future development)**
- **Cultural resources (historic and archeological sites)**
- **Transportation and roads (proposed airport and roadway expansions, construction, operations, and maintenance)**

(see scanned letter attached)"

TxDOT has reviewed its files and has determined there are no responsive documents to your request. As a response, **Roger Williams**, Environmental Coordinator, states the following:

"Based on what American Electrical Power (AEP) intends to do in this area, the power stations were plotted in GIS with a line connecting through each station (rough sketch), from Marfa to Fort Davis. A 100 ft. buffer was created on the transmission line to see the proximity of the transmission line and buffer to TxDOT's SH17. See attached figures (*AEP Records Request, Marfa Area AEP Records Request, Fort Davis Area AEP Records Request*).

The only area we see where this project may come close to TxDOT ROW is at the substation in Fort Davis. As far as projects, there are none within the area of the proposed transmission line. Recommend providing contacts for the Alpine area engineer, ROW/utilities and maintenance so that the requester can speak directly with those contacts concerning permits, easements, etc. Any work that TxDOT would be doing in this area is within existing right of way for safety and maintenance."

Regarding information related to any permits, easements, or other approvals, see contacts below:

Omar Madrid,

Director of Maintenance

omar.madrid@txdot.gov

and

Carlos Mendez

Utility Coordinator

carlos.mendez@txdot.gov

In order to retrieve the maps provided, please log into the TxDOT Records Request Center.

If you have any questions, you may contact my office at (915) 790-4207.

Your request is now closed.

Thank you,

Susan Ryde
Open Records Coordinator
El Paso District

To monitor the progress or update this request please log into the TxDOT Records Request Center

Ademski, Thomas J (Tommy)

From: noreply@thc.state.tx.us
Sent: Wednesday, November 1, 2023 11:32 AM
To: Ademski, Thomas J (Tommy); reviews@thc.state.tx.us
Subject: AEP Texas CCN Amendment

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202401394
Date: 11/01/2023
AEP Texas CCN Amendment

Description: AEP will be filing an application with the PUC to amen its CCN to construct a new single-circuit 138-kilovolt (kV) transmission line between the existing Alamito Creek Substation.

Dear Thomas J. Ademski:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Caitlin Brashear and Drew Sitters, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- An archeological survey is required. You may obtain lists of archeologists in Texas through the Council of Texas Archeologists and the Register of Professional Archaeologists. Please note that other qualified archeologists not included on these lists may be used. If this work will occur on land owned or controlled by a state agency or political subdivision of the state, a Texas Antiquities Permit must be obtained from this office prior to initiation of fieldwork. All fieldwork should meet the Archeological Survey Standards for Texas. A report of investigations is required and should be produced in conformance with the Secretary of the Interior's Guidelines for Archaeology and Historic Preservation and submitted to this office for review. Reports for a Texas Antiquities Permit should also meet the Council of Texas Archeologists Guidelines for Cultural Resources Management Reports and the Texas Administrative Code. In addition, any buildings 45 years old or older that are located on or adjacent to the tract should be documented with photographs and included in the report. To facilitate review and make project information available through the Texas Archeological Sites Atlas, we appreciate the submittal of survey area shapefiles via the Shapefile tab on eTRAC concurrently with submission of the draft report. Please note that while appreciated for Federal projects this is required for projects conducted under a Texas Antiquities Permit. For questions on how to submit these, please visit our video training series at:
  https://www.youtube.com/playlist?list=PLONbbv2pt4cog5t6mCqZVaEAx3d0MkgQC

We have the following comments: Despite limited archeological investigations within the study area, multiple archeological sites (n=8), such as precontact occupation sites and a historic cemetery, have been documented within the proposed Alamito Creek to Ft. Davis 138 kV transmission line study area. Furthermore, the study area overlaps with

numerous perennial water sources including, but not limited to, Chihuahua Creek, Musquiz Creek, Cienega Creek, and Cuevro Draw, which would have attracted both precontact and historic occupation. Thus, the potential for the proposed project to adversely affect cultural resources is considered high and an archeological survey of the proposed transmission line route is warranted prior to breaking ground. Archeological survey methods should include an inspection of the ground surface along transects spaced no greater than 10 meters apart with shovel tests excavated in areas where the potential for buried deposits exists, such as playa rims, stream terraces, floodplains, and dunes, in areas with poor ground surface visibility, and within the vicinity of cultural material (e.g., archeological sites and isolated occurrences/finds). When historic sites are encountered, the Texas Historical Commission's Guidance for Studying Late 19th-Century and Early 20th-Century Sites must be followed, which includes conducting deed research to identify the individual(s) associated with the historic resource(s). When selecting a route, we encourage you to consult with a professional archeologist to avoid previously recorded archeological sites and to identify areas of high probability. Once a route is selected, please ask the archeological consultant to submit their Scope of Work to this office for review. Regarding above-ground resources there are numerous known historic resources in the Study Area as identified in the above-referenced correspondence. Should this project ultimately include Federal involvement, additional consultation with our office will be required.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: caitlin.brashear@thc.texas.gov, drew.sitters@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

Life's better outside.®

Commissioners

Arch "Beaver" Aplin, III
Chairman
Lake Jackson

Dick Scott
Vice-Chairman
Wimberley

James E. Abell
Kilgore

Oliver J. Bell
Cleveland

Paul L. Foster
El Paso

Anna B. Galo
Laredo

Jeffery D. Hildebrand
Houston

Robert L. "Bobby" Patton, Jr.
Fort Worth

Travis B. "Blake" Rowling
Dallas

Lee M. Bass
Chairman-Emeritus
Fort Worth

T. Dan Friedkin
Chairman-Emeritus
Houston

David Yoskowitz, Ph.D.
Executive Director

November 10, 2023

Mr. Thomas J. Ademski
Project Manager, Environmental Services
Burns & McDonnell
6200 Bridge Point Parkway, Bldg. 4 Ste. 400
Austin, TX 78759

RE: AEP Texas, Inc. Proposed Alamito Creek to Fort Davis 138-kilovolt Transmission Line Project; Jeff Davis and Presidio Counties, Texas (2023 Re-coordination)

Dear Mr. Ademski:

Texas Parks and Wildlife Department (TPWD) received the coordination request regarding the above-referenced proposed transmission line project. TPWD staff has reviewed the information provided and offer the following comments and recommendations concerning this project.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code section 12.0011. We are providing input on this proposed project to facilitate incorporation of voluntary measures during construction, operation, and maintenance that may assist the project proponent in minimizing impacts to the state's natural resources. For tracking purposes, please refer to TPWD Project Number 51512 in any return correspondence regarding this project.

Project Description

The project description provided in the October 10, 2023, coordination letter from Burns & McDonnell states "AEP Texas Inc. (AEP Texas) will be filing an application with the Public Utility Commission of Texas (PUC) to amend its Certificate of Convenience and Necessity (CCN) to construct new a new single-circuit 138-kilovolt (kV) transmission line between the existing Alamito Creek Substation located northeast of the city of Marfa, and the existing Fort Davis Substation located in the southern portion of the community of Fort Davis (Project). The proposed transmission line will be approximately 20 miles in length, and will require a 100-foot wide right-of-way (ROW).

Burns & McDonnell has been preparing an Environmental Assessment (EA) and Alternative Routing Study for the proposed Project that will support AEP Texas's CCN application with the PUC. Burns & McDonnell has been collecting and evaluating information to identify environmental, cultural, and land use constraints that exist in the study area. Burns & McDonnell will consider and evaluate these constraints during the development and evaluation of potential alternative routes between the Project's endpoints.

A letter dated August 3, 2019, was previously sent regarding the AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project; however, the Project was delayed. The Alamito Creek to Ft. Davis 138-kV Transmission Line Project is once again moving forward and Burns & McDonnell is requesting that your agency or office provide any current or updated environmental or land use concerns that you may have regarding the siting and potential environmental effects from the construction of these facilities within the designated study area."

Previous Coordination

TPWD provided information and recommendations regarding the preliminary study area for this project to Burns & McDonnell on August 14, 2019. Email correspondence from Burns & McDonnell in February 2022 stated "AEP's project was initiated in 2019 but was placed on hold for a lengthy period. It was restarted last fall, and we have recently completed public outreach meetings. I did want to ask if TPWD may want to provide any updates to the 2019 response letter." Therefore, TPWD provided updated comments and recommendations on this project in 2022. That letter was sent to Burns & McDonnell on March 25, 2022. TPWD was contacted again by Burns & McDonnell (via telephone) in October 2023 explaining that the project was still on hold and was being restarted and that they would like to coordinate with us again to see if there had been any updates that had taken place since the previous correspondence. TPWD notes that study area has not changed since the initial coordination that took place in August 2019.

Recommendation: Please review the TPWD correspondence dated August 14, 2019, and March 25, 2022, and consider the recommendations provided, as they remain applicable to the project as currently proposed. TPWD does not have any additional comments to provide at the time of this coordination request. The 2019 and 2022 comment letters are attached for your reference.

I appreciate the opportunity to provide preliminary input on potential impacts related to this project, and I look forward to reviewing the EA and Alternative Route Analysis. Please contact me at (512) 389-8054 or Jessica.Schmerler@tpwd.texas.gov if you have any questions.

Sincerely,

Jessica Schmerler

Jessica E. Schmerler, CWB
Wildlife Habitat Assessment Program
Wildlife Division

JES:51512

Attachments (2)
TPWD Comment Letter (August 14, 2019)
TPWD Comment Letter (March 25, 2022)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Austin Ecological Services Field Office
1505 Ferguson Lane
Austin, TX 78754-4501
Phone: (512) 937-7371

In Reply Refer To: September 19, 2023
Project Code: 2022-0034859
Project Name: AEP Proposed Alamito Creek to Fort Davis 138-kV Transmission Line Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Austin Ecological Services Field Office
1505 Ferguson Lane
Austin, TX 78754-4501
(512) 937-7371

PROJECT SUMMARY

Project Code: 2022-0034859
Project Name: AEP Proposed Alamito Creek to Fort Davis 138-kV Transmission Line Project
Project Type: Transmission Line - New Constr - Above Ground
Project Description: American Electric Power is proposing to build a 138-kV transmission line in Jeff Davis and Presidio counties, Texas.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@30.43492962733422,-103.96592569656895,14z

Counties: Jeff Davis and Presidio counties, Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Northern Aplomado Falcon *Falco femoralis septentrionalis* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1923	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. This species only needs to be considered under the following conditions: ▪ Wind Energy Projects Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

FISHES

NAME	STATUS
Pecos Gambusia *Gambusia nobilis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/460	Endangered
Rio Grande Silvery Minnow *Hybognathus amarus* Population: Rio Grande, from Little Box Canyon to Amistad Dam No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1391	Experimental Population, Non-Essential

INSECTS

NAME STATUS

Monarch Butterfly *Danaus plexippus* Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

FLOWERING PLANTS

NAME STATUS

Guadalupe Fescue *Festuca ligulata* Endangered

There is **final** critical habitat for this species.
Species profile: https://ecos.fws.gov/ecp/species/8068

Hinckley Oak *Quercus hinckleyi* Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7060

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	Burns & McDonnell
Name:	Gary Newgord
Address:	8911 Capital of Texas Highway
Address Line 2:	Building 4, Suite 4260
City:	Austin
State:	TX
Zip:	78759
Email	genewgord@burnsmcd.com
Phone:	5129231969

APPENDIX B - PUBLIC INVOLVEMENT

An AEP Company

AEP Texas
400 W 15th Street, Suite 1520
Austin, TX 78701
aeptexas.com

October 19, 2021

<NAME, ADDRESS>

<Property ID: >

Subject: AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project

Dear <NAME>,

AEP Texas would like to have your input about a proposed new transmission line in Presidio and Jeff Davis County, Texas (Project). You are receiving this letter because your property has been identified as being crossed by or is in close proximity to preliminary routing links that are being considered for the Project. The Project involves building approximately 20 miles of new 138-kilovolt transmission line to be currently operated at 69 kilovolts, with the final distance dependent on which route might be approved by the Public Utility Commission of Texas (PUC). An application will be filed with the PUC by AEP Texas with multiple configurations of the routing links to develop a set of adequate routes for consideration by the PUC. The PUC will ultimately approve which combination of the routing links makes up the route for construction of the Project. At this time, AEP Texas is in the early stage of evaluating routing link options that would be used in routes submitted to the PUC and is seeking input from potentially affected landowners.

Typically, AEP Texas would hold in-person open-house meetings in the communities where the potentially affected properties by the Project are located. At these open-house meetings AEP Texas would provide information to landowners about the project, process, and routing links to receive input about the preliminary routing link options. As a result of the COVID-19 pandemic and the social distancing recommendations made by the Centers for Disease Control and Prevention, the State of Texas, and the PUC, in-person open-house meetings are not practicable or appropriate at this time.

As an alternative, AEP Texas invites you to visit the Project website at AEPTexas.com/AC-FD to learn more about the Project and share your input about the proposed routing links. By utilizing the Property ID(s) as referenced above directly below the address of this letter, you can find your property(s) and the proposed routing links that could cross your property(s) on an interactive map located on the website. You can also view information about the PUC regulatory approval process, the need for the Project, the routing link development process and route analysis process, and the type of transmission line structures that are being considered for the Project.

In addition, AEP Texas also invites you to attend from a computer a live WebEx town hall meeting where AEP Texas representatives will explain the PUC regulatory approval process, the need for the Project, the routing link development process and route analysis process, and answer questions that meeting participants might have. The live WebEx town-hall meeting will take place on:

- Tuesday November 2, from 6:00-7:30 p.m., and is accessible by visiting **AEPTexas.com/AlamitoTownHall** and entering the access code **Marfa**, if prompted.
  Or, you can call into the audio by dialing (415) 655-0001, using access code 2432-683-0653 and event password 62732.

For questions regarding computer access to the live WebEx town hall, please email Michael Harris, AEP Project Outreach Specialist, at mhharris@aep.com.

AEP Texas encourages landowners to participate in the live WebEx town-hall meeting if possible. If you are not able to participate in the live meeting, there are several other ways that you can ask questions and provide your input about the Project.

- Call the Project team and leave a message toll-free at **(833)703-0537**;
- Email the Project team at AC-FDTrans@aep.com;
- Submit comments through the "Contact Us" page or the interactive map on the Project website.

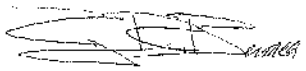
For your information, a map that shows the routing options for the Project and a Frequently Asked Questions (FAQ) document are enclosed. If you would like a more detail map of the Project and your property, please contact the Project team at any of the above options.

Input from landowners is important to help AEP Texas understand the concerns of potentially affected landowners and this input will aid the Project team as it develops its final routing links, analyzes routing options, and develops routes to be considered by the PUC. AEP Texas has enclosed a questionnaire and a stamped return envelope to obtain your opinion on specific issues about the Project. AEP Texas encourages you to submit the questionnaire even if you provide comments or input by other available methods.

For AEP Texas to timely consider your input and comments, please return the questionnaire by **December 7, 2021**.

AEP Texas appreciates you taking the time to provide your comments and input.

Sincerely,



Regulatory Consultant
rrbermea@aep.com

Enclosures: Routing Map, FAQ, Questionnaire, and stamped return envelope

An AEP Company

AEP Texas
400 W 15th Street, Suite 1520
Austin, TX 78701
aeptexas.com

October 25, 2021

<NAME, ADDRESS>

<Property ID: >

Subject: AEP Texas Alamito Creek to Ft. Davis 138-kV Transmission Line Project

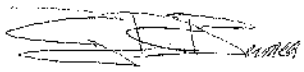
Dear <NAME>,

Please Note: On October 19, 2021, AEP Texas sent you an invitation to a Virtual Town Hall meeting for the Alamito Creek to Ft. Davis 138-kV Transmission Line Project. In this letter, the date for the Virtual Town Hall meeting was shown as November 2, 2021. The date for the Virtual Open House has been changed to November 9, 2021. All of the WebEx information is still valid with the exception of this date. Please make note of this date change as shown below.

- **Tuesday November 9, from 6:00-7:30 p.m.**, and is accessible by visiting **AEPTexas.com/AlamitoTownHall** and entering the access code **Marfa**, if prompted.
  Or, you can call into the audio by dialing (415) 655-0001, using access code 2432-683-0653 and event password 62732.

If you have any further questions, please call me at 512-481-4575.

Sincerely,



Roy R. Bermea
Regulatory Consultant
rrbermea@aep.com

Q. WHAT IS THE TRANSMISSION PROJECT?

A. The transmission project is planned as a 138-kV transmission line to be currently operated at 69-kV. The proposed Project will include a new single-circuit 138-kilovolt (kV) transmission line between the existing Alamito Creek Substation located in the northeastern portion of the City of Marfa, and the existing Fort Davis Substation located in the southern portion of the community of Fort Davis (Project). The proposed transmission line will be approximately 20 miles in length, and will require a 100-foot wide right-of-way (ROW).

The final route (or combination of routing links) will be determined by the Public Utility Commission (PUC) after AEP Texas files a Certificate of Convenience and Necessity (CCN) application at the PUC.

Q. WHY IS THE PROJECT NEEDED?

A. This transmission line was originally placed in service as a distribution line in 1929 and its performance has declined to the point that it is necessary to replace the transmission line. However, the existing transmission line is a radial tap line that provides electrical service to numerous distribution service substations. Therefore, the line cannot be taken out of service without the loss of electrical service to customers that take their electric service from one of these substations. Therefore, AEP Texas proposes to construct a new transmission line and will remove the old transmission line once the new line is in service and the substations are connected to it. To construct a new transmission line AEP Texas is required to file a CCN with the PUC. When a CCN is filed AEP Texas must provide the PUC an adequate number or geographically diverse routes to consider. This plan will also allow AEP Texas to continue to provide electric service to the substations while the new transmission facilities are being constructed. The proposed Project will be approximately 20 miles in length, depending on the alternative route selected by the PUC, and will require a 100-foot wide right-of-way (ROW).

Q. WHAT IS THE PUC?

A. The PUC is the state agency that was created by the Texas Legislature to provide statewide regulation of the rates and services of, telecommunications, water, and electric utilities, including the approval and siting of new electric transmission lines as is the case for this Project.

Q. DOES THE PUC HAVE JURISDICTION OVER AEP TEXAS?

A. Yes, AEP Texas activities are regulated by the PUC. AEP Texas must submit a CCN Application to the PUC to obtain approval to construct the transmission line Project. In that CCN Application, AEP Texas will present to the PUC numerous alternative routes for the PUC to consider. If the PUC agrees with AEP Texas that the transmission line is needed, the PUC will then make the final determination of the transmission route to be used for this Project. Of the multiple routing options submitted by AEP Texas, the PUC will only approve one route for the transmission line Project.

Q. HOW CAN THE PUBLIC FIND MORE INFORMATION ABOUT THE PROJECT?

A. AEP Texas has established a website where the public can find additional information about the Project. The website also allows the public to submit comments about the Project and to ask questions to the Project Team. The public is also invited to participate in a live WebEx town-hall meeting to learn about the Project and to ask questions to the Project Team. Please refer to the letter that is included in this notice package for details about the Project website, the live WebEx town-hall meeting, and the ways the public can communicate with the Project Team.

AEP Texas and its routing consultant value the opportunity to share information about the Project and to obtain public input on the preliminary routing links for the Project. This input will be considered in the development and evaluation of alternative routes to be submitted to the PUC.

Q. WILL AN ENVIRONMENTAL STUDY OF THE ROUTES BE PERFORMED?

A. Yes. AEP Texas is currently working with an experienced routing consultant to perform an environmental assessment and routing analysis for the proposed transmission line Project. The routing consultant employs professional personnel with backgrounds in various environmental sciences, socioeconomics, and cultural resources. The environmental assessment and routing analysis will be part of the CCN Application filed with the PUC.

Q. WHEN WILL AEP TEXAS FILE THE CCN APPLICATION AND START CONSTRUCTION OF THE TRANSMISSION LINE?

A. AEP Texas plans to file the CCN Application in the late 1st Quarter of 2022 and anticipates approval within one-year of filing its CCN Application. After final design is completed and easements are obtained, AEP Texas anticipates that construction will begin in the first quarter 2024.

Q. WHAT IS AN EASEMENT?

A. An easement is a legal document that gives a utility certain rights to use privately owned land for a specific purpose. The landowner retains ownership of the property. The proposed Project will require easements to be obtained from landowners to construct the transmission line approved by the PUC. Easement rights would be purchased as needed to allow for installation, operation, and maintenance of the transmission line.

Q. HOW WIDE IS AN EASEMENT?

A. The typical easement along the transmission line path will be 100 feet wide. Additional easement area might be necessary in some locations for specialized structures and other easements (mostly temporary) might be required for construction of the Project.

Q. HOW ARE LANDOWNERS AFFECTED BY TRANSMISSION LINE EASEMENTS?

A. Easements provide the utility the ability to clear right-of-way, construct electric facilities, and continue to operate and maintain the new transmission line. Clearing includes the removal of trees and shrubs in the easement that would interfere with the safe operation and maintenance of the transmission line. Erosion control measures are implemented during the clearing and construction process. After AEP Texas has obtained a necessary easement(s) from a landowner, the landowner will be contacted prior to clearing and construction activities. AEP Texas will undertake reasonable efforts to minimize disturbances to the landowner's use of the property and the impact to landowner's property in general during clearing and construction activities.

After completing construction of the transmission line, the surface of the easement area will be restored as nearly as possible to its original contours and grades and will be re-vegetated as necessary using native species, while giving consideration to landowner preferences. The landowner may continue to use the easement property, as long as the activity does not interfere with the construction, operation and maintenance of the line and does not jeopardize the safe use of the easement area. PUC rules require that a new easement restrict the new construction of any above-ground structures within the right-of-way of the transmission line.

Q. WILL THE TRANSMISSION LINE BE SECURE AND SAFE?

A. Yes. AEP Texas designs and constructs transmission lines with safety in mind. The materials that are used comply with the strength requirements of all applicable codes, including the NESC (as required by Texas statute) and the American Standard Testing Materials Specifications. The AEP Texas design and construction practices meet or exceed all of these codes and specifications.