APPENDIX F
SOILS DATA

CAM Colorado, LLC – Red Cliff Mine Soils[1]

Map Symbol	Soil Series Name	Soil Survey Area	Soil Description	Prime Farmland	Erosion Potential (Off-road/Off-trail)/(Road/Trail)	Roadfill/Shrink-Swell Capacity	Salinity	Depth to Bedrock (Inches)
5	Battlement loam; 1 to 8% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	The Battlement series consists of very deep, well or moderately well drained, moderately permeable soils on flood plains, low stream terraces, and narrow valley floors. They formed in alluvium derived from sedimentary rock.	Prime farmland if irrigated	Slight/Moderate	Good	Slightly to moderately alkaline; Strongly alkaline below a depth of 10 inches	60
7	Biedsaw-Sunup gravelly loams; 10 to 40% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on side slopes of mountains and ridges. The Biedsaw is deep, and the Sunup soil is shallow, however both are well drained, formed in colluvium over residuum derived dominantly from the Wasatch shale formation.	Not prime farmland	Moderate/Severe	Poor; Shrink-Swell Capacity = Biedsaw (0.87)	Slightly to moderately alkaline.	20 to 60
15	Cameo fine sandy loam; 1 to 6% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	The Cameo series consists of very deep, well drained, moderately, rapidly permeable soils on flood plains and low stream terraces. These soils formed in calcareous, stratified alluvium derived from mixed sources.	Prime farmland if irrigated	Slight/Moderate	Good	Slightly to strongly alkaline	60
17	Cathedral-Veatch complex; 25 to 85% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on mountain slopes and benches. These soils are well drained and formed in residuum derived dominantly from sandstone. Veatch soil is moderately deep, and Cathedral soil is shallow.	Not prime farmland	Very severe/Severe	Poor	Moderately acid to strongly alkaline	11 to 32
21	Chipeta silty clay loam; 3 to 30% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This shallow, well drained soil is on low, rolling hills, ridges, and toeslopes. It formed in residuum derived dominantly from calcareous, gypsiferous shale.	Not prime farmland	Moderate/Severe	Poor; Shrink-Swell Capacity (0.87)	Slightly to strongly alkaline	17
27	Cryorthents-Rock outcrop complex; 50 to 90% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is mainly on south- and southwest- facing mountainsides and ridges. Cryorthents commonly are well drained and are moderately deep or deep to hard or soft shale formed in residuum and colluvium derived from shale. Rock outcrop consists of barren escarpments, ridge caps, rocky points of shale, and small areas of sandstone.	Not prime farmland	Very severe/Severe	Poor	Not measured	28
42	Grobutte very channery loam; 30 to 60% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This deep, well drained soil is on steep hills and mountainsides. It formed in colluvium derived dominantly from mixed material.	Not prime farmland	Severe/Severe	Poor	Moderately to strongly alkaline	60
47	Hesperus-Empedrado, moist-Pagado complex; 5 to 35% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	The map unit is on mountainsides and benches. The Hesperus soils are on the steeper mountainsides and are deep and well drained formed in residuum derived dominantly from sandstone and shale. The Empedrado is on the benches and in the less sloping areas and is deep and well drained formed in residuum and colluvium derived dominantly from interbedded sandstone and shale. The Pagoda soil is on the benches and mountainside and is deep and well drained formed in colluvium derived dominantly from shale.	Not prime farmland	Moderate/Severe	Fair; Shrink-Swell Capacity = Hesperus (0.87); Pagado (0.75)	Lightly acid to moderately alkaline	40 to 60
51	Mesa-Avalon complex; 3 to 12% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on fans and benches. Soils are deep and well drained formed in alluvium derived dominantly from sedimentary rock.	Not prime farmland	Slight/Moderate	Good	Slightly to strongly alkaline	60
54	Panitchen loam; 1 to 6% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This deep, well drained soils are found on low terraces and flood plains. It formed in alluvium derived dominantly from mixed materials.	Prime farmland if irrigated	Slight/Moderate	Good	Moderately to strongly alkaline.	60
59	Persayo silty clay loam; 3 to 25% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This shallow, well drained soil is found on upland hills. It formed in residuum derived dominantly from shale.	Not prime farmland	Slight/Severe	Poor; Shrink-Swell Capacity = Persayo (0.87)	Slightly to strongly alkaline	14
61	Rock outcrop-Torriorthents complex; 15 to 90% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on south-facing slopes of mountains, hills, ridges, and canyonside in extremely rough and eroded areas. It supports only sparse vegetation. Rock outcrop consists of barren escarpments, ridge caps, and rocky points of sandstone, shale, limestone, or siltstone. Torriorthents commonly are very shallow and shallow over hard bedrock. The soils are well drained and formed in residuum and colluvium derived from sandstone, shale, or siltstone.	Not prime farmland	Very severe/Severe	Not Rated	Slightly to strongly alkaline	13
64	Torrifluvents-Gullied land complex; 0 to 2% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	The map unit is on eroded fans, in swales, and along narrow valley bottoms. Typically, Torrifluvents are deep and well drained to somewhat excessively drained and formed in calcareous alluvium derived dominantly from mixed sources. Gullied land consists of areas where soil horizons have been removed by water, resulting in a network of V-shaped or U-shape channels resembling miniature badlands. Generally, gullies are so large (3 to 25 feet deep and 5 to 100 feet wide) that extensive reshaping is necessary for most uses.	Not prime farmland	Slight/Slight	Good	Slightly to strongly alkaline	60
65	Torriorthents, cool-Rock outcrop complex; 35 to 90% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on steep, mainly south-facing slopes on mountains, hills, ridges, and canyon sides in extremely rough and eroded areas. Torriorthents commonly are very shallow to deep over hard or soft bedrock, well drained or somewhat excessively drained and formed in residuum and colluvium derived from sandstone, shale, limestone, or siltstone. Rock outcrop consists of barren escarpments, ridge caps, and rocky points of sandstone, shale, limestone, or siltstone.	Not prime farmland	Very severe/Severe	Poor	Slightly to strongly alkaline	4 to 60
66	Torriorthents, warm-Rock outcrop complex; 35 to 90% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on steep, mainly south-facing slopes on mountains, hills, ridges, and canyon sides in extremely rough and eroded areas. Torriorthents commonly are very shallow to deep over hard or soft bedrock, well drained or somewhat excessively drained formed in residuum and colluvium derived from sandstone, shale, limestone, or siltstone. Rock outcrop consists of barren escarpments, ridge caps, and rocky points of sandstone, shale, limestone, or siltstone.	Not prime farmland	Very severe/Severe	Poor	Slightly to strongly alkaline	4 to 60

CAM Colorado, LLC – Red Cliff Mine Soils[1]

Map Symbol	Soil Series Name	Soil Survey Area	Soil Description	Prime Farmland	Erosion Potential (Off-road/Off-trail)/(Road/Trail)	Roadfill/Shrink-Swell Capacity	Salinity	Depth to Bedrock (Inches)
67	Tosca channery loam; 25 to 80% slopes	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This deep, well drained soil is on mountain side slopes and footslopes. It formed in colluvium derived dominantly from Green River shale.	Not prime farmland	Very severe/Severe	Poor	Slightly to moderately alkaline	60
75	Wrayha-Rabbitex-Veatch complex; 45 to 65% slopes; very stony	Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties	This map unit is on canyon side slopes. It formed in deeply truncated residuum and localized colluvium derived dominantly from marine shales, siltstones and sandstones. These soils are moderately well drained to well drained.	Not prime farmland	Very severe/Severe	Good	Mildy to strongly alkaline	32 to 60
2	Tolman-Rock outcrop-Chugcreek complex, 3 to 12 percent slopes, very stony	Mesa County Area, Colorado	The Tolman series consists of well drained soils that are shallow to hard bedrock. They formed in slope alluvium, colluvium, and residuum from sedimentary beds. Tolman soils are on hillslopes, ridges, plateaus, and mountain slopes. Rock outcrop consists of barren escarpments, ridge caps, rocky points of shale, and small areas of sandstone. The Chugcreek series consists of well drained soils that are moderately deep to hard igneous bedrock. They formed in slope alluvium and colluvium from granite and gneiss. Chugcreek soils are on gently sloping to steep foothills and mountain slopes.	Not prime farmland	Slight/Not Rated	Poor	Neutral to mildly Alkaline	10 to 38
52	Badlands-Deaver-Chipeta complex; 25 to 99% slopes; extremely stony	Mesa County Area, Colorado	Badlands are found on rolling to very steep, nearly barren mountainsides, low hills, ridgetops, and canyon sides. These soils formed in residuum derived dominantly from highly calcareous and gypsiferous shale and bentonite. The badlands are very shallow, do not exhibit significant soil characteristics and produce a large amount of sediment. The Deaver series consists of moderately deep, well drained soils that formed in residuum derived from shale. Deaver soils are on hills and ridges. The Chipeta series consists of very shallow and shallow, well drained, slowly permeable soils that formed in residuum and colluvium from shale. Chipeta soils are on upland pediments and hills.	Not prime farmland	Severe/Severe	Poor	Slightly to strongly alkaline	17 to 24
68	Killpack-Badlands-Persayo complex; 3 to 25% slopes, saline	Mesa County Area, Colorado	The Killpack series consists of moderately deep, well drained, slowly permeable soils that formed in alluvium and residuum from saline marine shale. Killpack soils are on sideslopes and toeslopes of rolling shale hills. Badlands are found on rolling to very steep, nearly barren mountainsides, low hills, ridgetops, and canyon sides. It formed in residuum derived dominantly from highly calcareous and gypsiferous shale and bentonite. The Badlands are very shallow, do not exhibit significant soil characteristics and produce a large amount of sediment. The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock.	Not prime farmland	Not rated/Not rated	Poor;Killpack Shrink-Swell Capacity (0.87)	Mildy to moderately alkaline	14 to 29
69	Leebench, warm-Avalon complex; 3 to 12% slopes	Mesa County Area, Colorado	The Leebench series consists of very deep, well drained, slowly permeable soils that formed in alluvium from sedimentary and metamorphic rocks. Leebench soils occur on alluvial fans, fan remnants, strath terraces and fan terraces. The Avalon series consists of very deep, well drained, moderately slow and moderately permeable soils formed in alluvium derived mainly from sandstone and shale. These soils are on terraces, alluvial fans, dissected fans, and hills.	Not prime farmland	Slight/Moderate	Good	Slightly to very strongly alkaline	60
71	Mack-Avalon complex, 3 to 12% slopes	Mesa County Area, Colorado	The Mack series consists of very deep, well drained soils that formed in slope alluvium and alluvium derived from sandstone and shale. Mack soils are on fan remnants, terraces, alluvial fans, and mesas. The Avalon series consists of very deep, well drained, moderately slow and moderately permeable soils formed in alluvium derived mainly from sandstone and shale. These soils are on terraces, alluvial fans, dissected fans, and hills.	Not prime farmland	Slight/Moderate	Good	Neutral to strongly alkaline	60 to 80
72	Killpack-Neiberger complex; 3 to 25% slopes	Mesa County Area, Colorado	The Killpack series consists of moderately deep, well drained, slowly permeable soils that formed in alluvium and residuum from saline marine shale. Killpack soils are on sideslopes and toeslopes of rolling shale hills. The Neiberger series consists of moderately deep, well drained soils that formed in eolian deposits over residuum derived from shale. Neiberger soils are on summits, shoulders, sideslopes and footslopes of hills.	Not prime farmland	Slight/Moderate	Poor; Killpack and Neiberger Shrink-Swell Capacity (0.87)	Mildy to strongly alkaline	29 to 30
73	Sagers-Skumpah complex; 0 to 3% slopes	Mesa County Area, Colorado	The Sagers series consists of very deep, well drained, moderate to slowly permeable soils that formed in alluvium and slope alluvium derived from marine shale. These soils are on basin and valley floor remnants, alluvial fans, and stream terraces. The Skumpah series consists of very deep, well drained soils that formed in alluvium derived from shale, limestone, and sandstone. Skumpah soils are on alluvial flats, lake plains, and fan skirts.	Not prime farmland	Slight/Slight	Fair; Sagers and Skumpah Shrink-Swell Capacity (0.87)	Moderately to very strongly alkaline.	60
74	Turley-Sagrlite-Fruitland complex; 0 to 3% slopes	Mesa County Area, Colorado	The Turley series consists of very deep, well drained, moderately slowly permeable soils that formed from alluvium and eolian materials derived from sandstone and shale. Turley soils are found on terraces, fan remnants, and alluvial fans. The Sagrlite series consists of very deep, well drained soils that formed in alluvium from shale and sandstone and are on alluvial fans and terraces. The Fruitland series consists of very deep, well drained and somewhat excessively drained soils that formed in eolian material and moderately coarse textured alluvium and stream alluvium derived from sandstone and shale. Fruitland soils are on stream terraces on valley floors, alluvial fans on valley sides, and summits of mesas.	Not prime farmland	Slight/Slight	Good	Moderately to strongly alkaline	70 to 81

CAM Colorado, LLC – Red Cliff Mine Soils[1]

Map Symbol	Soil Series Name	Soil Survey Area	Soil Description	Prime Farmland	Erosion Potential (Off-road/Off-trail)/(Road/Trail)	Roadfill/Shrink-Swell Capacity	Salinity	Depth to Bedrock (Inches)
84	Moffat-Kompace complex; 6 to 35% slopes	Mesa County Area, Colorado	The Moffat series consists of very deep, well drained, moderately rapidly permeable soils that formed in eolian and alluvial sediments. These soils are on plains, plains on structural benches, and alluvial fans. The Kompace series consists of shallow, well drained soils that formed in eolian deposits over old outwash derived from sandstone. Kompace soils are on summits of small mesas.	Not prime farmland	Moderate/Severe	Fair	Slightly to strongly alkaline.	32 to 60
85	Trail fine sandy loam; 0 to 5% slopes	Mesa County Area, Colorado	The Trail series consists of very deep, well drained and somewhat excessively drained soils that formed in stratified alluvium.	Not prime farmland	Slight/Moderate	Good	Slightly to strongly alkaline	60
87	Persayo-Blackston complex; 6 to 45% slopes	Mesa County Area, Colorado	The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock. The Blackston series consists of very deep, well drained soils that formed in alluvium and slope alluvium derived from mixed sources. Blackston soils are on edges of old high terraces and on fan remnants.	Not prime farmland	Severe/Severe	Poor; Persayo Shrink-Swell Capacity (0.87)	Slightly to moderately alkaline	14 to 60
89	Rock outcrop-Hoovers-Deaver complex, 25 to 65% slopes; very stony	Mesa County Area, Colorado	Rock outcrop consists of barren escarpments, ridge caps, and rocky points of sandstone, shale, limestone, or siltstone. The Hoovers series consists of shallow, well drained soils that formed in loamy slope alluvium derived from sandstone and shale over loamy residuum derived from sandstone. Hoovers soils are on dipslopes on cuestas and summits on mesas. The Deaver series consists of moderately deep, well drained soils that formed in residuum derived from shale. Deaver soils are on hills and ridges.	Not prime farmland	Not rated/Not rated	Not Rated	Moderately to strongly alkaline	18 to 24
91	San Mateo-Escavada, dry complex; 0 to 3% slopes	Mesa County Area, Colorado	The San Mateo series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium, fan alluvium and stream alluvium from mixed sources on alluvial fans on valley sides and flood plains on valley floors. The Escavada series consists of very deep, well drained soils that formed in stratified alluvium derived dominantly from sandstone, and shale. Escavada soils are on flood plains.	Not prime farmland	Slight/Slight	Good	Slightly to strongly alkaline.	70
94	Skumpah very fine sandy loam; 0 to 3% slopes	Mesa County Area, Colorado	The Skumpah series consists of very deep, well drained soils that formed in alluvium derived from shale, limestone, and sandstone. Skumpah soils are on alluvial flats, lake plains, and fan skirts.	Not prime farmland	Slight/Slight	Fair; Skumpah Shrink-Swell Capacity (0.87)	Moderately to strongly alkaline.	60
108	Killpack-Persayo complex; 3 to 25% slopes	Mesa County Area, Colorado	The Killpack series consists of moderately deep, well drained, slowly permeable soils that formed in alluvium and residuum from saline marine shale. Killpack soils are on sideslopes and toeslopes of rolling shale hills. The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock.	Not prime farmland	Slight/Moderate	Poor; Killpack Shrink-Swell Capacity (0.87)	Mildy to strongly alkaline	14 to 29
210	Torrirthents, cool-rock outcrop; 35 to 90% slopes	Mesa County Area, Colorado	This map unit is on steep, mainly south-facing slopes on mountains, hills, ridges, and canyon sides in extremely rough and eroded areas. Torriorthents commonly are very shallow to deep over hard or soft bedrock, well drained or somewhat excessively drained formed in residuum and colluvium derived from sandstone, shale, limestone, or siltstone. Rock outcrop consists of barren escarpments, ridge caps, and rocky points of sandstone, shale, limestone, or siltstone.	Not prime farmland	Very severe/severe	Poor	Slightly to strongly alkaline	4 to 60
275	Torriorthents, warm-rock outcrop; 35 to 90% slopes	Mesa County Area, Colorado	This map unit is on steep, mainly south-facing slopes on mountains, hills, ridges, and canyon sides in extremely rough and eroded areas. Torriorthents commonly are very shallow to deep over hard or soft bedrock, well drained or somewhat excessively drained formed in residuum and colluvium derived from sandstone, shale, limestone, or siltstone. Rock outcrop consists of barren escarpments, ridge caps, and rocky points of sandstone, shale, limestone, or siltstone.	Not prime farmland	Very severe/Severe	Poor	Slightly to strongly alkaline	4 to 60
Av	Avalon sandy loam, gravelly substratum; 2 to 5% slopes	Mesa County Area, Colorado	The Avalon series consists of very deep, well drained, moderately slow and moderately permeable soils formed in alluvium derived mainly from sandstone and shale. These soils are on terraces, alluvial fans, dissected fans, and hills.	Prime farmland if irrigated	Slight/Moderate	Good	Moderately to strongly alkaline.	60
Ba	Massadona silty clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Massadona series consists of very deep, well drained soils that formed in alluvium derived from shale. Massadona soils are on hills, toeslopes, and alluvial fans.	Not prime farmland	Slight/Slight	Fair; Shrink-Swell Capacity (0.63)	Moderately to strongly alkaline.	60
Bc	Sagers silty clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Sagers series consists of very deep, well drained, moderate to slowly permeable soils that formed in alluvium and slope alluvium derived from marine shale. These soils are on basin and valley floor remnants, alluvial fans, and stream terraces.	Prime farmland if irrigated	Slight/Slight	Fair; Shrink-Swell Capacity (0.87)	Moderately to strongly alkaline.	60
BcA	Skumpah silt loam; 0 to 2% slopes	Mesa County Area, Colorado	The Skumpah series consists of very deep, well drained soils that formed in alluvium derived from shale, limestone, and sandstone. Skumpah soils are on alluvial flats, lake plains, and fan skirts.	Not prime farmland	Slight/Slight	Good	Moderately to strongly alkaline.	60
BcS	Sagers silty clay loam, saline; 0 to 2% slopes	Mesa County Area, Colorado	The Sagers series consists of very deep, well drained, moderate to slowly permeable soils that formed in alluvium and slope alluvium derived from marine shale. These soils are on basin and valley floor remnants, alluvial fans, and stream terraces.	Not prime farmland	Slight/Slight	Fair; Shrink-Swell Capacity (0.87)	Moderately to very strongly alkaline.	60
BcW	Cojam loam; 0 to 2% slopes	Mesa County Area, Colorado	The Cojam series consists of very deep, poorly drained soils that formed in alluvium derived from shale. Cojam soils are on alluvial fans and terraces.	Not prime farmland	Slight/Slight	Poor; Shrink-Swell Capacity (0.89)	Slightly to moderately alkaline	60
Bd	Sagers silty clay loam; 2 to 5% slopes	Mesa County Area, Colorado	The Sagers series consists of very deep, well drained, moderate to slowly permeable soils that formed in alluvium and slope alluvium derived from marine shale. These soils are on basin and valley floor remnants, alluvial fans, and stream terraces.	Prime farmland if irrigated	Slight/Moderate	Fair; Shrink-Swell Capacity (0.87)	Moderately to very strongly alkaline.	60

CAM Colorado, LLC – Red Cliff Mine Soils[1]

Map Symbol	Soil Series Name	Soil Survey Area	Soil Description	Prime Farmland	Erosion Potential (Off-road/Off-trail)/(Road/Trail)	Roadfill/Shrink-Swell Capacity	Salinity	Depth to Bedrock (Inches)
Be	Green River silty clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Green River series consists of very deep, moderately well drained, moderately permeable soils that formed in alluvium derived from sedimentary, metamorphic rocks, and igneous rocks. These soils are on flood plains and terraces.	Prime farmland if irrigated	Slight/Slight	Good	Moderately to strongly alkaline.	60
Bk	Blackston gravelly loam; 0 to 2% slopes	Mesa County Area, Colorado	The Blackston series consists of very deep, well drained soils that formed in alluvium and slope alluvium derived from mixed sources. Blackston soils are on edges of old high terraces and on fan remnants.	Not prime farmland	Slight/Slight	Good	Moderately to strongly alkaline.	60
Bl	Blackston gravelly loam; 2 to 5% slopes	Mesa County Area, Colorado	The Blackston series consists of very deep, well drained soils that formed in alluvium and slope alluvium derived from mixed sources. Blackston soils are on edges of old high terraces and on fan remnants.	Not prime farmland	Slight/Slight	Good	Moderately to strongly alkaline.	60
Cc	Persayo silt clay loam; 5 to 12% slopes	Mesa County Area, Colorado	The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock.	Not prime farmland	Slight/Severe	Poor; Shrink-Swell Capacity (0.87)	Slightly to strongly alkaline	14
Cd	Persayo silty clay; 0 to 2% slopes	Mesa County Area, Colorado	The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock.	Not prime farmland	Slight/Slight	Poor; Shrink-Swell Capacity (0.87)	Slightly to strongly alkaline	14
Ce	Persayo silt clay loam; 2 to 5% slopes	Mesa County Area, Colorado	The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock.	Not prime farmland	Slight/Moderate	Poor; Shrink-Swell Capacity (0.87)	Slightly to strongly alkaline	14
Fe	Fruita clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Fruita series consists of very deep, well drained soils formed in slope alluvium derived from gypsiferous shale over alluvium derived from sandstone and shale. Fruita soils are on treads on terraces.	Prime farmland if irrigated	Slight/Slight	Good	Slightly to moderately alkaline	65
Ff	Fruita clay loam; 2 to 5% slopes	Mesa County Area, Colorado	The Fruita series consists of very deep, well drained soils formed in slope alluvium derived from gypsiferous shale over alluvium derived from sandstone and shale. Fruita soils are on treads on terraces.	Prime farmland if irrigated	Slight/Moderate	Good	Slightly to moderately alkaline	65
Fg	Fruitvale clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Fruitvale series consists of very deep, well drained, moderately slow over slowly permeable soils on terraces. They formed in slope alluvium derived from sandstone and shale over residuum weathered from clayey shale.	Prime farmland if irrigated	Slight/Slight	Fair; Shrink-Swell Capacity (0.89)	Slightly to moderately alkaline	60
Fh	Fruitvale clay loam; 2 to 5% slopes	Mesa County Area, Colorado	The Fruitvale series consists of very deep, well drained, moderately slow over slowly permeable soils on terraces. They formed in slope alluvium derived from sandstone and shale over residuum weathered from clayey shale.	Prime farmland if irrigated	Slight/Moderate	Fair; Shrink-Swell Capacity (0.89)	Slightly to moderately alkaline	60
Fp	Fruitland fine sandy loam; 0 to 2% slopes	Mesa County Area, Colorado	The Fruitland series consists of very deep, well drained and somewhat excessively drained soils that formed in eolian material and moderately coarse textured alluvium and stream alluvium derived from sandstone and shale. Fruitland soils are on stream terraces on valley floors, alluvial fans on valley sides, and summits of mesas.	Prime farmland if irrigated	Slight/Slight	Good	Slightly to moderately alkaline	70
Fr	Fruitland fine sandy loam; 2 to 5% slopes	Mesa County Area, Colorado	The Fruitland series consists of very deep, well drained and somewhat excessively drained soils that formed in eolian material and moderately coarse textured alluvium and stream alluvium derived from sandstone and shale. Fruitland soils are on stream terraces on valley floors, alluvial fans on valley sides, and summits of mesas.	Prime farmland if irrigated	Slight/Moderate	Good	Slightly to moderately alkaline	70
Fs	Fruitvale fine sandy loam; 0 to 2% slopes	Mesa County Area, Colorado	The Fruitvale series consists of very deep, well drained, moderately slow over slowly permeable soils on terraces. They formed in slope alluvium derived from sandstone and shale over residuum weathered from clayey shale.	Prime farmland if irrigated	Slight/Slight	Poor; Shrink-Swell Capacity (1.00)	Slightly to moderately alkaline	60
Ft	Fruitvale fine sandy loam; 2 to 5% slopes	Mesa County Area, Colorado	The Fruitvale series consists of very deep, well drained, moderately slow over slowly permeable soils on terraces. They formed in slope alluvium derived from sandstone and shale over residuum weathered from clayey shale.	Prime farmland if irrigated	Slight/Moderate	Poor; Shrink-Swell Capacity (1.00)	Slightly to moderately alkaline	60
Gk	Bebeevar loam; 0 to 2% slopes	Mesa County Area, Colorado	The Bebeevar series consists of very deep, moderately well drained soils that formed in alluvium derived from sandstone, granite, and quartzite. Bebeevar soils are on inter-channel bars of low, braided flood plains along perennial streams.	Prime farmland if irrigated and drained	Slight/Slight	Good	Slightly to moderately alkaline	70
GP	Pits, gravel	Mesa County Area, Colorado	The Pit series consists of very deep, poorly drained soils that formed in fine-textured alluvium weathered from extrusive and basic igneous rocks. Pit soils are on flood plains and in basins.	Not prime farmland	Not rated/Not rated	Not Rated	Mildly to moderately alkaline	60
Gt	Glenton very fine sandy loam; 0 to 2% slopes	Mesa County Area, Colorado	The Glenton series is a member of the coarse-loamy, mixed (calcareous), mesic family of Typic Torrifluvents. Typically, Glenton soils have calcareous very friable granular A horizons, and calcareous very stratified but predominantly moderately coarse textured C horizons.	Prime farmland if irrigated	Slight/Slight	Good	Moderately alkaline	60
Hj	Killpack silty clay loam; 2 to 5% slopes	Mesa County Area, Colorado	The Killpack series consists of moderately deep, well drained, slowly permeable soils that formed in alluvium and residuum from saline marine shale. Killpack soils are on sideslopes and toeslopes of rolling shale hills.	Not prime farmland	Slight/Moderate	Poor; Shrink-Swell Capacity (0.87)	Mildly alkaline	29
Hk	Killpack silty clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Killpack series consists of moderately deep, well drained, slowly permeable soils that formed in alluvium and residuum from saline marine shale. Killpack soils are on sideslopes and toeslopes of rolling shale hills.	Not prime farmland	Slight/Slight	Poor; Shrink-Swell Capacity (0.87)	Mildly alkaline	29
Ma	Mack loam; 0 to 2% slopes	Mesa County Area, Colorado	The Mack series consists of very deep, well drained soils that formed in slope alluvium and alluvium derived from sandstone and shale. Mack soils are on fan remnants, terraces, alluvial fans, and mesas.	Prime farmland if irrigated	Slight/Slight	Good	Neutral to strongly alkaline	80

CAM Colorado, LLC – Red Cliff Mine Soils[1]

Map Symbol	Soil Series Name	Soil Survey Area	Soil Description	Prime Farmland	Erosion Potential (Off-road/Off-trail)/(Road/Trail)	Roadfill/Shrink-Swell Capacity	Salinity	Depth to Bedrock (Inches)
Rc	Fruitland sandy clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Fruitland series consists of very deep, well drained and somewhat excessively drained soils that formed in eolian material and moderately coarse textured alluvium and stream alluvium derived from sandstone and shale. Fruitland soils are on stream terraces on valley floors, alluvial fans on valley sides, and summits of mesas.	Prime farmland if irrigated	Slight/Slight	Good	Slightly to moderately alkaline	70
Re	Sagrlite loam; 0 to 2% slopes	Mesa County Area, Colorado	The Sagrlite series consists of very deep, well drained soils that formed in alluvium from shale and sandstone and are on alluvial fans and terraces.	Prime farmland if irrigated	Slight/Slight	Good	Slightly to moderately alkaline	63
Rp	Persayo silty clay loam; 12 to 40% slopes	Mesa County Area, Colorado	The Persayo series consists of shallow, well drained soils on hills, terraces, and ridges. These soils formed in thin sediments weathered from underlying soft sedimentary bedrock.	Not prime farmland	Severe/Severe	Poor; Shrink-Swell Capacity (0.87)	Slightly to strongly alkaline	14
Rs	Ustifluvents; 0 to 2% slopes	Mesa County Area, Colorado	Ustifluvents are moderately well drained soils found on flood plains. Parent material consists of alluvium derived from sandstone and shale.	Not prime farmland	Slight/Slight	Fair	Moderately to strongly alkaline.	60
Sk	Skumpah very fine sandy loam; 0 to 2% slopes	Mesa County Area, Colorado	The Skumpah series consists of very deep, well drained soils that formed in alluvium derived from shale, limestone, and sandstone. Skumpah soils are on alluvial flats, lake plains, and fan skirts.	Not prime farmland	Slight/Slight	Good	Moderately to strongly alkaline.	60
Tr	Turley clay loam; 0 to 2% slopes	Mesa County Area, Colorado	The Turley series consists of very deep, well drained, moderately slowly permeable soils that formed from alluvium and eolian materials derived from sandstone and shale. Turley soils are on terraces, fan remnants, and alluvial fans.	Prime farmland if irrigated	Slight/Slight	Good	Moderately to strongly alkaline.	81
	Water	Mesa County Area, Colorado	Not applicable	Not prime farmland	NA	NA	NA	NA

[1] Data Sources: Soil Survey of Douglas-Plateau Area, Colorado; Soil Survey of Mesa County Area, Colorado; WSS (Web Soil Survey) 2007.

McClane Canyon Mine

Mine Entrance

Waste Rock Disposal Area

Conveyor

County Road X

Access Road

T-Road

10 Road

M.8 Road

Mack

Spink Canyon

East Salt Creek

Dry Canyon Wash

Camp Gulch

Munger Canyon

Lapham Canyon

Deer Creek

Post Canyon

Howard Canyon

Bunger Canyon

Big Sal Wash

East Gulch

North Dry Fork

Hatchet Canyon

Garvey Canyon

Sevie Canyon

Demaree Canyon

Coyote Wash

Coal Gulch

Mack Wash

Layton Wash

Government Highline Canal

Dry Gulch

Evacuation Wash

Peckland Reece Wash

East Branch Reece Wash

East Branch Big Salt Wash

Grand Valley Canal

Little Salt Wash

Adobe Creek

Salt Creek

Colorado River

Rail Canyon

Legend

- Proposed Rail Spur
- 69kV Transmission Line Route
- Proposed Road
- swdc.CRWCD.allrivers
- swdc.CRWCD.alllakes
- Coal Lease Application
- Proposed Waste Rock Disposal Area
- Proposed Land Use Application Area
- Project Area

0 0.5 1 2 3 4 Miles

N

Red Cliff Mine EIS

Appendix F
Project Area Soils