

8.4.9. Geology and Soils Standards and Reports



(A) Geology and Soils Report Required.

(1) Required with Sketch Plans and Preliminary Plans. All sketch plans and preliminary plans submitted for review shall be accompanied by geology and soils report.

(2) Previously Submitted. Where a geology and soils report has been completed and reviewed at an earlier stage of the subdivision review process, a new report may not be required if in the determination of the PCD Director the existing report provides the level of site-specific detail necessary to review the subdivision application, and the recommendations of the report and the Colorado Geological Survey (CGS) have been followed in the preparation of the preliminary plan.

(B) General.

(1) Prepared by Professional Geologist. The geology and soils report shall be prepared by, or under the direction of, a professional geologist as defined by CRS 34-1-201(3), or a Professional Engineer as defined by Board Policy Statement 50.2 - "Engineering in Natural Hazard Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Surveyors.



Soils and Geology Report

Southern Rail Park Spur

Fountain, Colorado

June 2023

Please provide author of report and identify certify

There are specific basic report requirements to be identified in this report. A Map including the sketch plan with both constraints and hazards identified for example.

This report should address the requirements in 8.4.9 (even if minimalistic). Please review Section 8.4.9 and update so report meets intent of section.

As defined in Chapter 1 of LDC

Geologic and Soils Report — A report prepared by a professional geologist that identifies the geologic and soil conditions related to a specific development application site and the relationship of those conditions to the intended land use.

Geologic Constraint — A geologic condition, including but not limited to potentially unstable slopes, expansive soils/bedrock, high groundwater levels, soils creep, hydrocompaction, shallow bedrock, erosion, corrosive soils, radon, or drainage way, which may be mitigated or avoided to allow for development.

Geologic Hazard — A geologic condition, including but not limited to avalanches, debris flows-fans/mudslides, earthquakes, floodway, floodplain, ground subsidence, landslides, rockfall, ponded water, undermining, faulting, or similar naturally occurring dangerous features or soil conditions or natural features unfavorable to development, which may pose a significant threat to persons or property.



Contents

1	Purpose and Scope.....	2
2	Project Description	2
3	Information Search and Findings.....	2
	3.1 Physiographic Location	2
	3.2 Soils	3
	3.3 Geology.....	3
	3.4 Site Hazards.....	4
	3.5 Economic Considerations.....	5
4	Field Reconnaissance	5
5	Recommended Subsurface Exploration	7
6	Conclusions.....	8
7	Limitations.....	8
8	References.....	9

Appendices

Appendix A: Figures

Appendix B: Well Construction and Test Reports

This is actually for a sketch plan. A soils and geology report is not required for a special district.

1 Purpose and Scope

This Soils and Geology Report (Report) presents the results of HDR Engineering, Inc.'s (HDR's) geological research for the proposed rail spur outside the city of Fountain, Colorado. The work completed has been performed under HDR's Scope of Work agreement with Edw. C. Levy Co. (Client), of Detroit, Michigan, executed on May 10, 2023. The purpose of this report is to support the Client's pursuit of obtaining a Title 32 Special District in El Paso County, Colorado. As such, HDR has prepared this Report in accordance with El Paso County Code 8.4.9, Geology and Soils Standards Reports.

The following Scope of Work (SOW) was executed by HDR as part of this report development:

- Perform a desktop review of existing information for the project area,
- Perform a site visit to evaluate the on site conditions,
- Prepare this report.

2 Project Description

The project is located south of the City of Fountain and west of Interstate I-25 in El Paso County, Colorado. To the west of the site lies Fort Carson, and to the east is the Colorado Springs Utilities (CSU) Nixon Power Plant (Nixon). The objective of the project is to provide rail access for the Fort Carson Military Reservation and adjacent areas via an existing rail spur that services Nixon. The existing spur is served by both the Burlington Northern Santa Fe (BNSF) and Union Pacific Railroad (UPRR) main tracks.

The current design includes approximately 4.35 miles of new track, and includes cuts and fills throughout the alignment. In general, the current alignment includes approximately 3.0 miles of cut with maximum slope angles of approximately 2(Horizontal):1(Vertical). Additionally, the alignment includes approximately 0.3 miles of fill section with maximum side slopes of 2H:1V.

3 Information Search and Findings

3.1 Physiographic Location

The project site is located east of the Southern Rocky Mountains Province, and on the western edge of the Colorado Piedmont Subprovince of the Great Plains Physiographic Province. The area is along the base of the foothills of the Front Range and consists of a broad hilly valley generally under El. 5500. The area stretches north and northeast from Denver along the South Platte River, and southward along the Arkansas River from Colorado Springs. Major landforms include valleys, lowlands, outwash plains, alluvial fans, and terraces.

3.2 Soils

A review of the local soils per the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) web soil survey, the project area contains approximately 14 soil types, broken down generally into the following five (5) main soils types:

- Heldt Clay Loam, 0-3% slopes – Found on alluvial fans and stream terraces, well drained, with low runoff,
- Razor-Midway Complex – Found on hills, well drained, with medium runoff,
- Shamber-Razor Complex, 8-50% slopes – Found on breaks, well drained, with medium runoff,
- Fort Loam, 1-5% slopes – Found on interfluves and fans, well drained with low runoff,
- Mananzola Silt Clay Loam, 0-2% slopes – Found on fan remnants, interfluves, terraces, and drainageways, well drained.

3.3 Geology

According to the Colorado Geologic Map Data from the United States Geological Survey, the project site is underlain by the Pierre Shale Middle Unit of Cretaceous Age, and the Modern Alluvium of Quaternary Age.

The Pierre Shale (Kpm) consists of dark-gray to olive-gray fossiliferous marine shale and was deposited during the transgression of the Middle to Late Cretaceous Western Interior Seaway. Thickness of the formation is approximately 5,000 feet, though neither upper nor basal contact of the formation occurs locally. The shale is characterized by an abundance of marine invertebrate fossils and expansive clays. Swelling soils and bedrock exposures are common hazards for development. The formation includes moderately inclined slopes, such as mesa bluffs and river banks, and is prone to slope instability.

The Alluvium Three formation consists of Modern Alluvium, Older Gravels, and Alluvium and includes dark-brownish gray to tan-gray, occasionally mottled, stratified, poorly to occasionally well sorted sand and clayey to silty sands. The unit can contain clean, medium-grained, well sorted sand layers and sporadic gravel lenses with clasts up to small cobbles. Gravels are generally from crystalline protoliths from conglomerates of the Dawson Formation.

3.4 Water Wells

Utilizing the Colorado Department of Water Resources (DWR's) DWR Well Permit Research tool, a total of four (4) constructed water wells were identified in the immediate vicinity of the proposed project area. The Well Construction and Test Reports are included in Appendix A. In general, the well logs consist of sandy clay overburden, with bedrock encountered between 19 and 38 feet below grade. A summary of the well logs is provided in the table below.

Well Identification	Northing	Easting	Overburden Material	Depth to Bedrock (ft.)	Total Depth (ft.)
4974-F	4277323.05950	522681.16839	Unknown	Not Recorded	28
208846	4276836.81190	523033.63223	Clay, Rock and Gravel	38	60
267182	4276705.08	525136.18	Sandy Clay, Clayey Sand	22	30
267183	4276755.49	525394.88	Clay and Sand	19	21

Table 1 – Summary of Well Information

3.5 Site Hazards

address constraints and hazards within the site ; how they will impact development

According to the Colorado Earthquake and Fault Map Server mapping system, the Ute Pass Fault zone is located to the west of the project location. Additionally, two mapped earthquake epicenters are located west in the foothills, with a maximum magnitude of 3.5, and a depth of 5 km.

Per Colorado Geological Survey Collapsible Soil Susceptibility Map of Colorado, the project site is located within the Sedimentary Formations (Cretaceous and Tertiary) zone. The soils in this area are poorly indurated, bedrock formations with high percentages of clay and silt and are easily eroded. Collapsibility is a result of both the composition and softness of the soils. Often located in arid to semiarid climates, these collapsible soils are often associated with alluvial fans, alluvium, colluvium and eolian depositions.

In accordance with the Colorado Geological Survey Map ON-006-12, the project site is located immediately east of mapped potentially dangerous debris flow regions. Debris flows are characterized by moving mass of loose mud, sand, soil, rock, vegetation, or water that travels down a slope under the influence of gravity. Debris flows can reach speeds approaching 100 miles per hour, though most commonly are slow and move only a few feet per year. Often initiated by heavy rainfalls and flash floods on steep slopes, flows can result in significant slope instability if not protected.

Radon levels of the underlying geologic units have been reported by the Colorado Geologic survey in the Open File Report No. 91-4. Based on this report, the project site lies within the Tertiary Valley Fill region. A total of 378 samples were collected from this area. Below is a summary of the radon results in the area, and the percentages of various concentration ranges.

- Average Radon Level – 3.97 pCi/l
 - 0 < 4 pCi/l – 68.52%
 - 4 < 10 pCi/l – 25.66%
 - 10 < 20 pCi/l – 4.50%
 - >20 pCi/l – 1.32%

provide the general map of all constraints _streams, drainages, slopes instability /excessive of 30%, rock fall debris, floodplain, debris flows etc...overlaid on the proposed Sketch Plan

3.6 Economic Considerations

The sand deposits along the Fountain Creek corridor contain known quantities of coarse-grained quartz sands used for the petroleum industry throughout the country according to the Sand, Gravel, and Quarry Aggregate Resources, published in 1974 by the Colorado Geological Survey. Extent of the resource areas were not delineated in the publication; however, based on the field reconnaissance and known surface quarrying activities, the site is known to have value for construction materials.

4 Field Reconnaissance

A field reconnaissance was performed by HDR personnel on June 12, 2023. The project location was reviewed for existing and potential constructability concerns, as well as potential issues and requirements for an upcoming drilling program. Below is a brief description of the onsite geology, hydrology, and existing features.

The eastern portion of the project site is located immediately north of the existing rail loop utilized by the power plant. Topography generally consisted of small mesas with steep, approximately 2H:1V sideslopes, and was generally vegetated with small scrub grass. Soils appeared to be a sandy loam with significant amounts of gravels and cobbles. No bedrock exposures were noted in this area. Below is an image of the general site conditions encountered during the field reconnaissance.



Photo 1: View of Eastern Portion of Site

After reviewing the eastern portion of the site, the extension of the corridor to the northwest was viewed. The area moved off of the existing mesa, and into a lower valley. The valley soils appeared to consist of a significant percentage of clays, with some standing water. No bedrock outcrops were noted in the valley, though portions of the area had been previously worked and therefore limited the availability of native soil and rock exposures. Atop a nearby mesa, in route to evaluate the valley, ponding water was present on the surface, suggesting the soils were less free draining than to the east. However, the day of the field reconnaissance experienced unusually heavy rainfall; therefore site conditions are likely different than those observed.



Photo 2: View of Western Portion of Site

5 Recommended Subsurface Exploration

In order to support the forthcoming design and construction of the corridor, HDR recommends performing geotechnical borings to further evaluate the subsurface condition. Based on the existing alignment and cross sections, HDR recommends performing borings at approximately 1,000-foot intervals along the alignment, adjusting from the centerline to intercept proposed side slopes, as needed. Therefore, a total of approximately 23 borings are recommended. For cut locations, borings shall be performed to a minimum depth of 15 feet below final grade, and for fill borings, borings shall be performed to a minimum of 10 feet below existing grade. Borings shall include Standard Penetration Test (SPT) sampling at 2.5-foot intervals, and if auger refusal is encountered, NQ (minimum) size rock coring shall be performed to confirm bedrock presence. If needed, depending on soil conditions, modified California sampling shall be performed to collect adequate sample material. Groundwater elevations shall be collected at completion of the borings, and at 24-hours after completion, to better understand the local groundwater conditions. Shelby tube samples should be collected if soft, cohesive soils are encountered.

Please look at the Soils & Geology report requirements in Chapter 8.4.9- Testing is required; staff did agree that we would reduce the area of testing but 100 % removal of requirement was not discussed

A laboratory testing program is recommended upon completion of the borings. It is anticipated that the testing program will consist of full soil classifications to verify field descriptions (ASTM D2487), direct shear tests (ASTM D3080) to determine in situ soil strengths, and unconfined compressive strength of rock, if encountered (ASTM D7012C). Swell testing (ASTM D4546) shall be performed to assist in developing shrink/swell characteristics. Final laboratory testing will be determined based on the conditions encountered during the subsurface exploration.

6 Conclusions this section should make recommendations on the future development in response to constraints and hazards

The project area of concern was evaluated for potential concerns associated with further development of the property. Based on our evaluation, the proposed property is suitable for the anticipated development. However, a subsurface evaluation should be performed prior to further design to evaluate the potential geologic and engineering constraints. Through the use of typical engineering design and construction practices, these concerns can be mitigated. Upon completion of the subsurface evaluation, a follow up report summarizing the geologic conditions and engineering concerns should be prepared to support future design.

7 Limitations

The recommendations submitted in this report were based on the information revealed by our data review, published information research, and a review of historical data and reports prepared by previous entities pertaining to the project location. This report has been prepared to aid in determining the recommended geotechnical evaluation for the site development. We based our recommendations on information on the site and proposed linework as provided. Substantial changes in configuration, locations, or grades should be brought to our attention so we can modify our recommendations as needed.

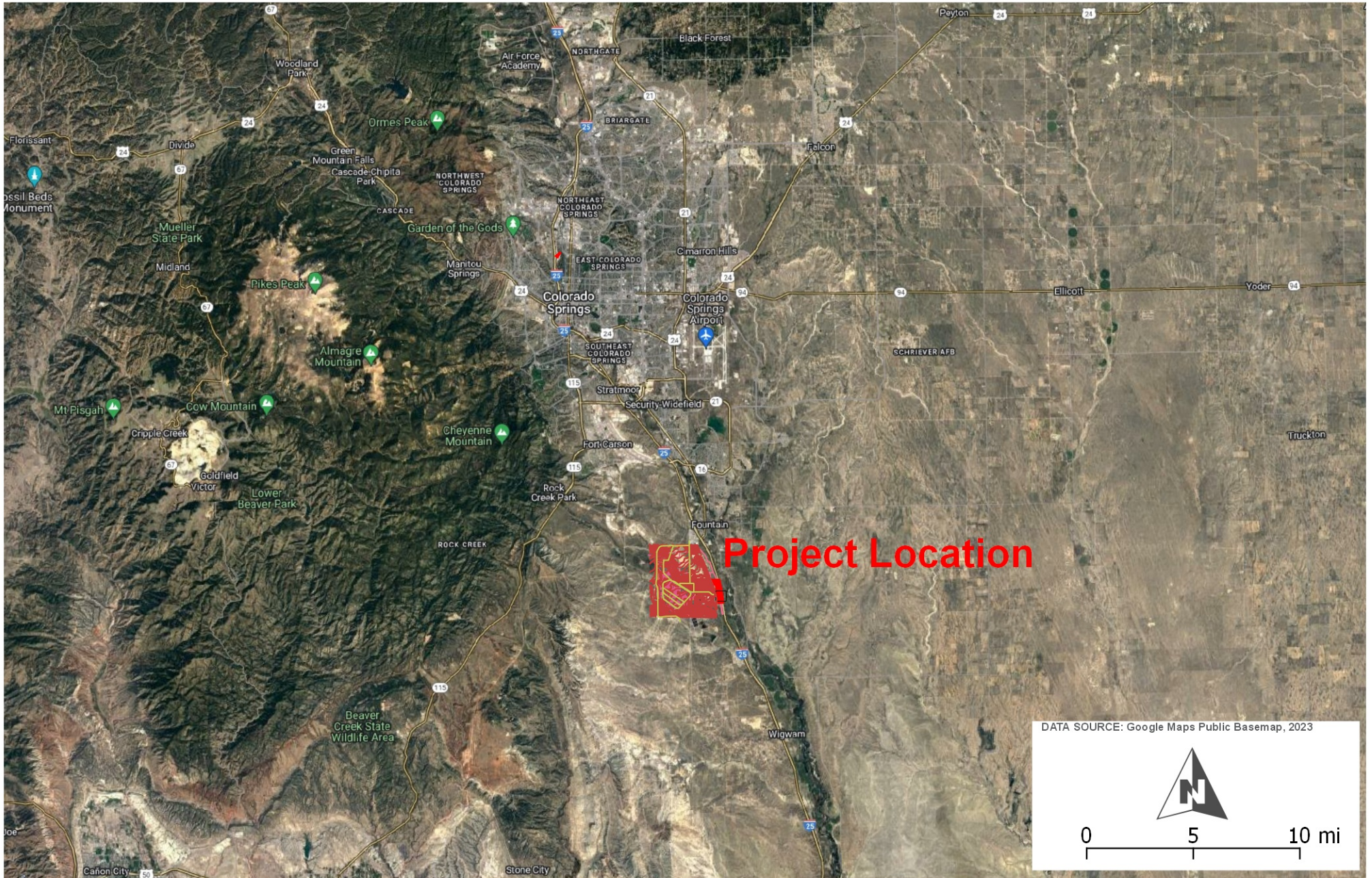
We have endeavored to complete the services identified herein in a manner consistent with that care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions as this project. No other representation, express or implied, is included or intended, and no warranty or guarantee is included or intended in this report, or other instrument of service.

8 References

- Natural Resource Conservation Service, June 4, 2023. “Web Soil Survey”. United States Department of Agriculture, <http://websoilsurvey.sc.egov.usds.gov>
- United States Department of Agriculture Soil Conservation Service. June 4, 2023. “Soil Survey of El Paso County Area, Colorado”.
- Colorado Department of Water Resources. July 20, 2023. “DWR Well Permit Research”.
- Colorado Geological Survey (1991). “Results of the 1987-88 EPA Supported Radon Study in Colorado”. Open File Report 91-4.
- Schwochow, S.D., Shroba, R.R., and Wicklein, P.C. (1974). “Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties”. Colorado Geological Survey, Special Publication 5-B.
- Keller, J., TerBest, H, and Garrison, R. (2003). “Evaluation of Minerla and Mineral Fuel Potential of El Pason County State Mineral Lands Administered by the Colorado State Land Board”. Colorado Geological Survey, Open File Report 03-07.

Appendix A

Figures

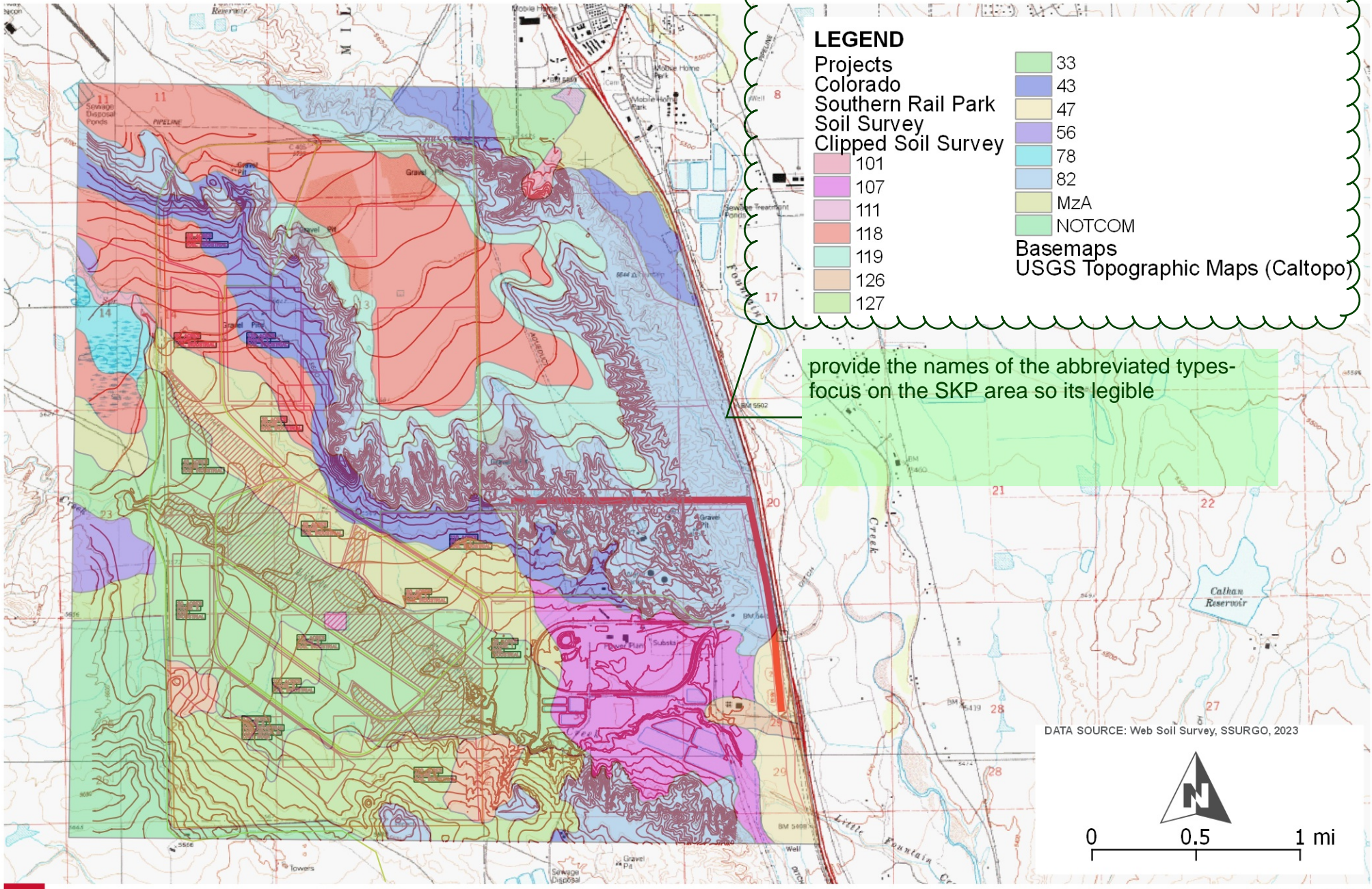


DATA SOURCE: Google Maps Public Basemap, 2023

0 5 10 mi

PROJECT LOCATION MAP
SOUTHERN RAIL SPUR
EL PASO COUNTY, COLORADO
FIGURE 1



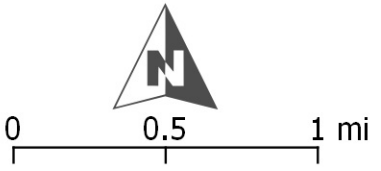


LEGEND

- Projects
- Colorado
- Southern Rail Park
- Soil Survey
- Clipped Soil Survey
- 101
- 107
- 111
- 118
- 119
- 126
- 127
- 33
- 43
- 47
- 56
- 78
- 82
- MZA
- NOTCOM
- Basemaps
- USGS Topographic Maps (Caltopo)

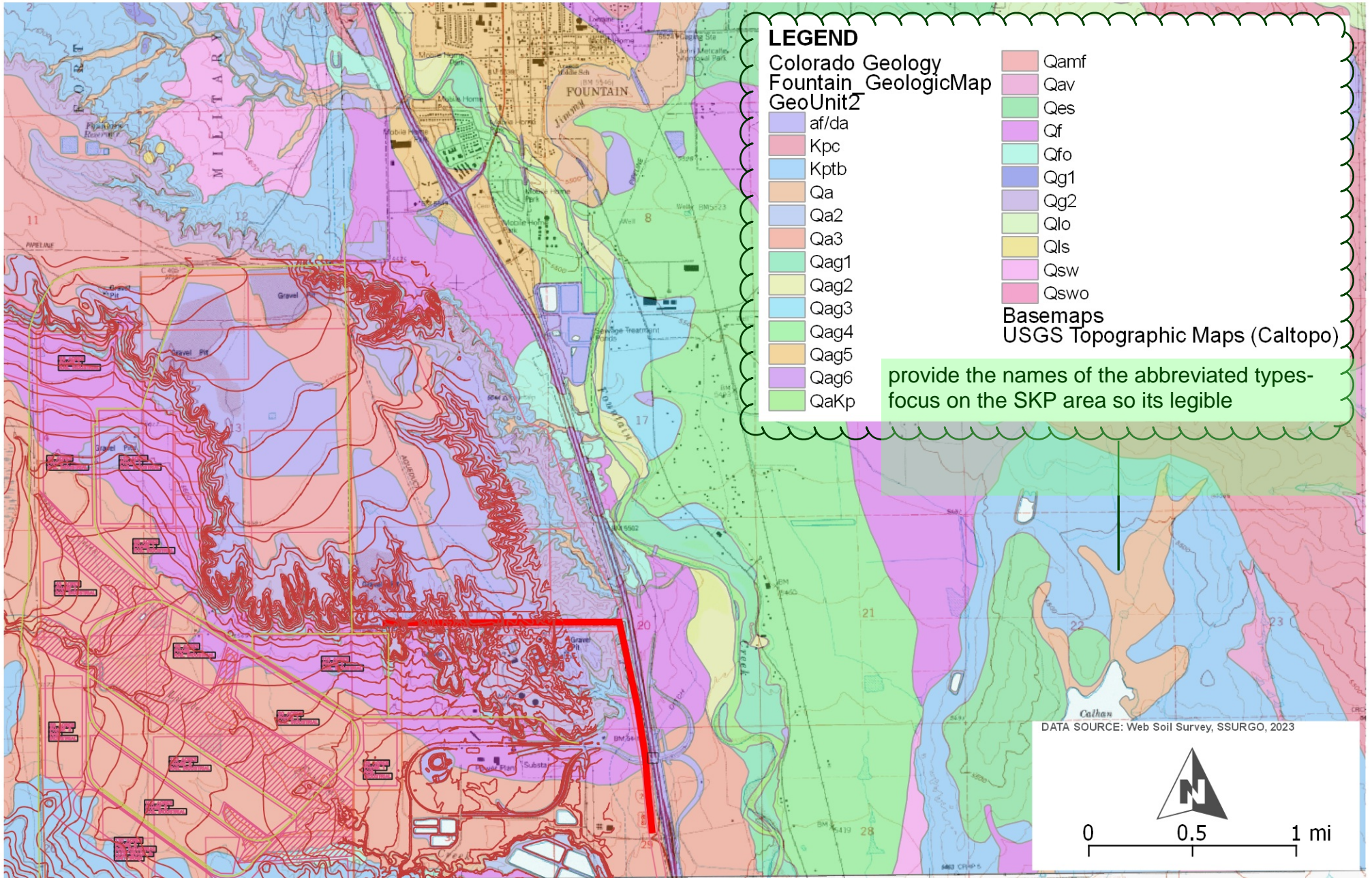
provide the names of the abbreviated types-
focus on the SKP area so its legible

DATA SOURCE: Web Soil Survey, SSURGO, 2023

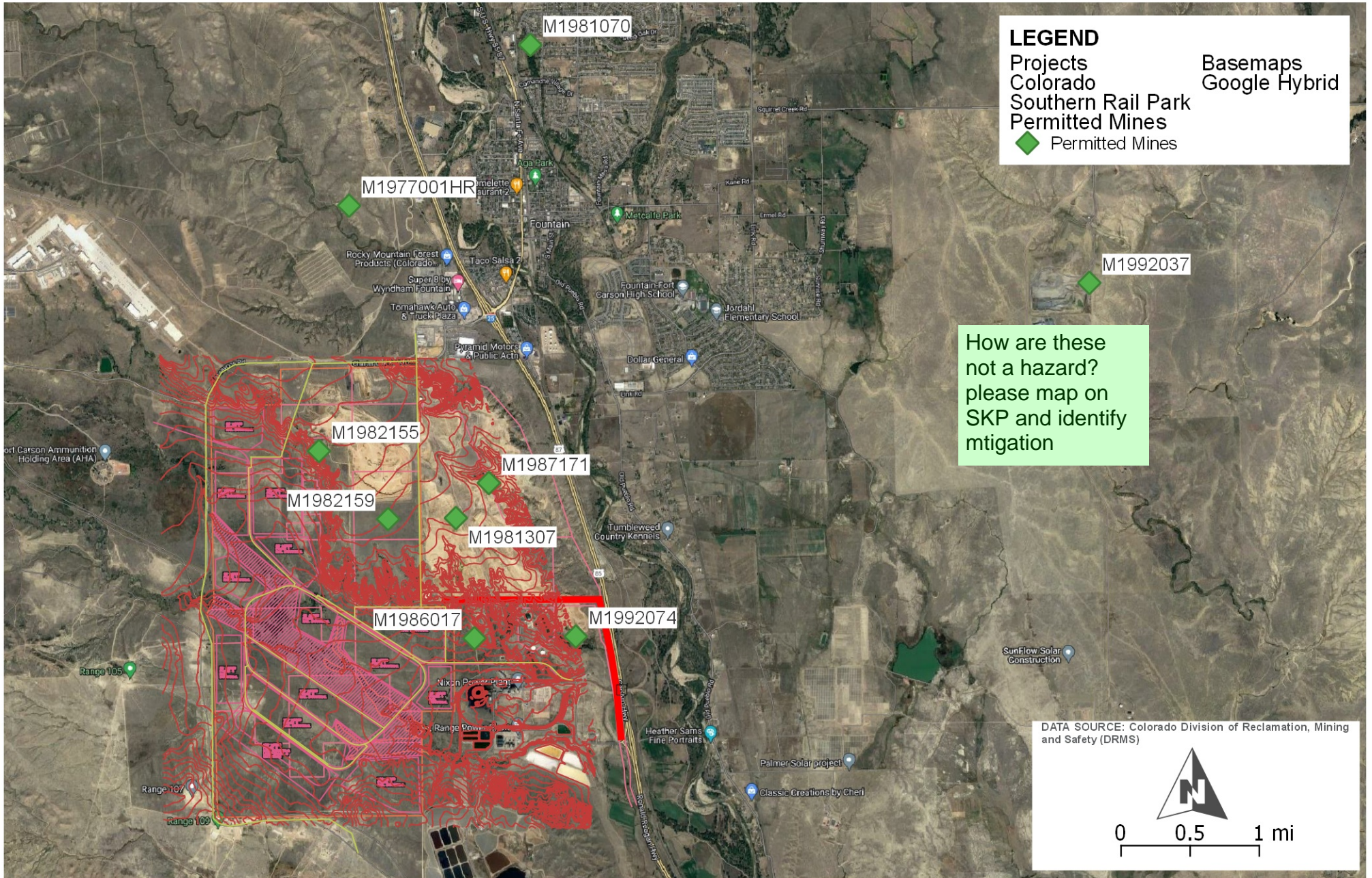


SOILS MAP
SOUTHERN RAIL SPUR
EL PASO COUNTY, COLORADO
FIGURE 2





GEOLOGIC MAP
SOUTHERN RAIL SPUR
EL PASO COUNTY, COLORADO
FIGURE 3

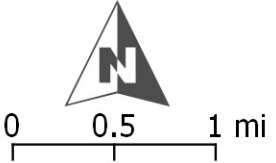


LEGEND
 Projects
 Colorado
 Southern Rail Park
 Permitted Mines
 ◆ Permitted Mines

Basemaps
 Google Hybrid

How are these not a hazard?
 please map on SKP and identify mitigation

DATA SOURCE: Colorado Division of Reclamation, Mining and Safety (DRMS)



ECONOMIC CONSIDERATIONS
SOUTHERN RAIL SPUR
EL PASO COUNTY, COLORADO
FIGURE 4



Appendix B

we dont need this as a part
of the GEO reprot

Well Construction and Test Reports



Form C Rev.
9-62/10M

STATE OF COLORADO

APPLICATION FOR: A PERMIT TO USE GROUND WATER
 A PERMIT TO CONSTRUCT A WELL

RECEIVED
DEC 30 1963
GROUND WATER SECTION
COLORADO
STATE ENGINEER

Applicant William J. Christian

P.O. Address Box 294 Fountain, Colo

Quantity applied for gpm or
1400 to 2000 AF Storage

Used for Irrigation Purposes

on/at SW 1/4 NW 1/2 Sec 24-16-66
(legal description of land site)

560 Acres Martin Christian Ditch
Total acreage irrigated and other rts.

ESTIMATED DATA OF WELL

Hole size in. to ft. size

aquifer in. to ft. 50 ft. by 100 ft.
28 ft Deep.

Casing Plain in. from to ft.
 in. from to ft.

Open or Perf. in. from to ft.
 in. from to ft.

PUMP
DATA: Type Centrif . HP 5 Size 12" Outlet

Use initiation date Jan 15 1964.
(Use Supplemental pages for additional data)

Driller to furnish Log and History (Form E)
within 30 days after completion of well.

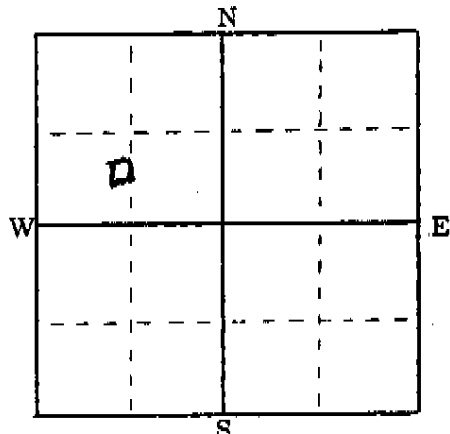
County El Paso

LOCATION OF WELL
SE 1/4 of NW 1/4 of Sect. 24, Twp. 76

Rge. 66 P.M. OR

Street Address or Lot & Block No.

Town or Subdivision



Locate well in 40 acre (small) square as near as possible.

Large square is one section.

\$25.00 fee required for uses other than Domestic or Livestock.

Applicant William J. Christian
Agent or Driller Self No. Private Driller

Address Box 294 Fountain, Colorado

THIS APPLICATION APPROVED
PERMIT NO. 4974-F
ISSUED:
DATE DEC 30 1963 1963

NOTE - SATISFACTORY COMPLETION REQUIRED FOR APPROVAL OF APPLICATION

B.M.

STATE OF COLORADO
DIVISION OF WATER RESOURCES
OFFICE OF THE STATE ENGINEER
GROUND WATER SECTION

RECEIVED
JUN 8 1964
GROUND WATER SECT.
COLORADO
STATE ENGINEER

Index No. 1550
IDWD 2-10
Use
Registered 6/8/64

LOG AND HISTORY OF WELL

WELL LOCATION

(For State Engineer's Use)
Driller self Lic. No.
Owner William J. Christian
Street Box 294 City Fountain Colo
Tenant
Use of Water Irrigation
On or By NE 1/4 SW 1/4 Sec 24-16S-66W No. 10 Acres 10
(description of site or land)
Date Started Feb 22 1964
Date Completed May 6 1964
Yield 250 GPM or CFS

E1 Paso County
SE 1/4 of NE 1/4 of Sect. 23
Twp. 16S Rge. 66W 6 PM

WELL DESCRIPTION:

Depth to Water 22 ft. Total Depth 28 ft.
(measured from ground surface)
Diameter { from 50 ft. to 100 ft., in.
from ft. to ft., in.
from ft. to ft., in.

TEST DATA:

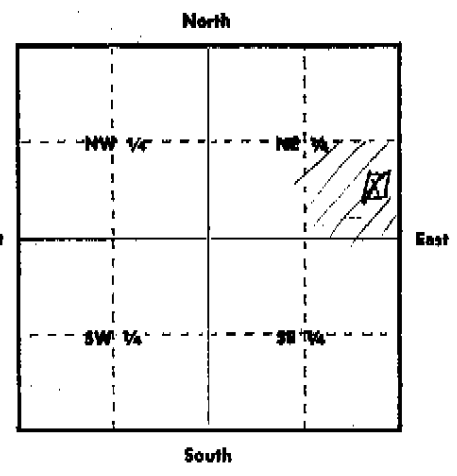
How Tested by Pump or Bailed
Date Tested 5/6 1964 Length 3 hrs.
Rate GPM Drawn Down ft.

PUMP DATA:

Pump Type Centrif Outlet Size 6 in.
Driven by Diesel HP 30

CASING RECORD:

No Casing Plain Casing
Size Kind from ft. to ft.
Size Kind from ft. to ft.
Size Kind from ft. to ft.
Perforated Casing
Size Kind from ft. to ft.
Size Kind from ft. to ft.
Size Kind from ft. to ft.



ABOVE DIAGRAM REPRESENTS ONE FULL SECTION. LOCATE WELL ACCURATELY IN SMALL SQUARE REPRESENTING 40 ACRES.

or
If the above is not applicable fill in:
No. Street
City or Town
or
Lot Block
Subdivision
(include filing or number)

TO BE MADE OUT IN QUADRUPPLICATE:
Original Blue and Duplicate Green Copy must be filed with the State Engineer within 30 days after well is completed. White copy is for the Owner and Yellow copy for the Driller. SIGN BLUE COPY

WELL CONSTRUCTION AND TEST REPORT STATE OF COLORADO, OFFICE OF THE STATE ENGINEER

For Office Use only RECEIVED

APR 27 1998

WATER RESOURCES STATE ENGINEER COLO

208846

1. WELL PERMIT NUMBER MH-32505 208846

2. OWNER NAME(S) Christian Ranches Mailing Address 136 Steven Dr. City, St. Zip Security, CO 80911 Phone ()

3. WELL LOCATION AS DRILLED: NW 1/4 SW 1/4, Sec. 24 Twp. 16 S, Range 66 W 6th. DISTANCES FROM SEC. LINES: 1584 ft. from South Sec. line. and 550 ft. from West Sec. line. OR SUBDIVISION: LOT BLOCK FILING(UNIT) STREET ADDRESS AT WELL LOCATION:

4. GROUND SURFACE ELEVATION ft. DRILLING METHOD Mud Rotary DATE DRILLED 2/10/98 DATE COMPLETED 4/14/98 TOTAL DEPTH 60 ft. DEPTH COMPLETED 60 ft.

5. GEOLOGIC LOG: Table with columns Depth and Description of Material (Type, Size, Color, Water Location). Rows include Clay, Rock & gravel, and Blue shale.

6. HOLE DIAM. (in.) From (ft) To (ft). Table with rows for 8 3/4 and 6 1/4 diameters.

7. PLAIN CASING Table with columns OD (in), Kind, Wall Size, From(ft), To(ft). Includes PERF. CASING: Screen Slot Size: 4.5 PVC .227 6 60.

8. FILTER PACK: Material Gravel Size 1/4" Rock Interval 10-0&10-60

9. PACKER PLACEMENT: Type Depth

10. GROUTING RECORD: Table with columns Material, Amount, Density, Interval, Placement. Includes Cement #94 x 6 gal. 11-5 Poured. Cement 3x3x6" Around Steel Casings.

REMARKS:

11. DISINFECTION: Type HTH Amt. Used 8 oz.

12. WELL TEST DATA: [] Check box if Test Data is submitted on Form No. GWS 39 Supplemental Well Test. TESTING METHOD Bailed Static Level 13.5 ft. Date/Time measured 04/09/98, Production Rate 7 gpm. Pumping level 55 ft. Date/Time measured 04/09/98, Test length (hrs.) 4

13. I have read the statements made herein and know the contents thereof, and that they are true to my knowledge. [Pursuant to Section 24-4-104 (13)(a) C.R.S., the making of false statements herein constitutes perjury in the second degree and is punishable as a class 1 misdemeanor.]

CONTRACTOR Can-America Drilling, Inc. Phone (719) 541-2967 Lic. No. 1149 Mailing Address Box 416 Simla, CO 80835

Name/Title (Please type or print) Wayne Arde V.P.

Signature Wayne Arde

Date 4/14/98

FORM NO. GWS-31 04/2005	WELL CONSTRUCTION AND TEST REPORT STATE OF COLORADO, OFFICE OF THE STATE ENGINEER 1313 Sherman St., Room 818, Denver, CO 80203 Phone - Info (303) 866-3587 Main (303) 866-3581 Fax (303) 866-3589 http://www.water.state.co.us	For Office Use Only <div style="text-align: center;"> RECEIVED DEC 20 2005 WATER RESOURCES STATE ENGINEER COLO. </div>																																								
1. WELL PERMIT NUMBER: <u>267182</u>																																										
2. WELL OWNER INFORMATION NAME OF WELL OWNER: Colorado Springs Utilities MAILING ADDRESS: P.O. Box 1103, Mail Code 940 CITY: Colorado Springs STATE: CO ZIP CODE: 80947 TELEPHONE NUMBER: (719) 668-8672																																										
3. WELL LOCATION AS DRILLED: _____ 1/4, _____ 1/4, Sec. _____, Twp. _____ <input type="checkbox"/> N or <input type="checkbox"/> S, Range _____ <input type="checkbox"/> E or <input type="checkbox"/> W DISTANCES FROM SEC. LINES: _____ ft. from <input type="checkbox"/> N or <input type="checkbox"/> S section line and _____ ft. from <input type="checkbox"/> E or <input type="checkbox"/> W section line. SUBDIVISION: _____, LOT _____, BLOCK _____, FILING (UNIT) _____ Optional GPS Location: GPS Unit must use the following settings: Format must be UTM , Units must be meters , Datum must be NAD83 , Unit must be set to true N , <input type="checkbox"/> Zone 12 or <input checked="" type="checkbox"/> Zone 13 STREET ADDRESS AT WELL LOCATION: Clear Spring Ranch, Fountain, Colorado Northing: 4276705.08																																										
4. GROUND SURFACE ELEVATION <u>5,480</u> feet DATE COMPLETED <u>11/14/05</u> TOTAL DEPTH <u>30.50</u> feet		DRILLING METHOD <u>Hollow stem auger</u> DEPTH COMPLETED <u>30.20</u> feet																																								
5. GEOLOGIC LOG: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Depth</th> <th>Type</th> <th>Grain Size</th> <th>Color</th> <th>Water Loc.</th> </tr> </thead> <tbody> <tr><td>0</td><td>CL- alluvium</td><td>f-m</td><td>lt. brown</td><td>n/a</td></tr> <tr><td>4</td><td>SC</td><td>f</td><td>lt. brown</td><td>n/a</td></tr> <tr><td>5</td><td>Sandy CL</td><td>f-m</td><td>brown</td><td>n/a</td></tr> <tr><td>11</td><td>Sandy CL</td><td>f-c</td><td>brown</td><td>n/a</td></tr> <tr><td>16</td><td>CL-shale</td><td>n/a</td><td>olive-brwn</td><td>n/a</td></tr> <tr><td>22</td><td>Shale</td><td>n/a</td><td>olive-brwn</td><td>26.20</td></tr> <tr><td>30</td><td>EOB</td><td></td><td></td><td></td></tr> </tbody> </table>		Depth	Type	Grain Size	Color	Water Loc.	0	CL- alluvium	f-m	lt. brown	n/a	4	SC	f	lt. brown	n/a	5	Sandy CL	f-m	brown	n/a	11	Sandy CL	f-c	brown	n/a	16	CL-shale	n/a	olive-brwn	n/a	22	Shale	n/a	olive-brwn	26.20	30	EOB				6. HOLE DIAM (in.) From (ft) To (ft) <u>8-1/2</u> <u>0</u> <u>30.50</u>
Depth	Type	Grain Size	Color	Water Loc.																																						
0	CL- alluvium	f-m	lt. brown	n/a																																						
4	SC	f	lt. brown	n/a																																						
5	Sandy CL	f-m	brown	n/a																																						
11	Sandy CL	f-c	brown	n/a																																						
16	CL-shale	n/a	olive-brwn	n/a																																						
22	Shale	n/a	olive-brwn	26.20																																						
30	EOB																																									
Remarks: _____		7. PLAIN CASING: <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>OD (in)</th> <th>Kind</th> <th>Wall Size (in)</th> <th>From (ft)</th> <th>To (ft)</th> </tr> </thead> <tbody> <tr> <td><u>2</u></td> <td><u>PVC</u></td> <td><u>Sched 40</u></td> <td><u>0</u></td> <td><u>15.20</u></td> </tr> </tbody> </table>	OD (in)	Kind	Wall Size (in)	From (ft)	To (ft)	<u>2</u>	<u>PVC</u>	<u>Sched 40</u>	<u>0</u>	<u>15.20</u>																														
OD (in)	Kind	Wall Size (in)	From (ft)	To (ft)																																						
<u>2</u>	<u>PVC</u>	<u>Sched 40</u>	<u>0</u>	<u>15.20</u>																																						
		PERFORATED CASING: Screen Slot Size (in): _____ <u>2</u> <u>PVC</u> <u>.020</u> <u>15.20</u> <u>30.20</u>																																								
		8. FILTER PACK: Material <u>Silica</u> Size <u>8-12</u> Interval <u>13-30.20</u>																																								
		9. PACKER PLACEMENT: Type <u>Bentonite chips</u> Depth <u>2-13</u>																																								
		10. GROUTING RECORD <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Material</th> <th>Amount</th> <th>Density</th> <th>Interval</th> <th>Placement</th> </tr> </thead> <tbody> <tr> <td><u>Conc</u></td> <td></td> <td><u>n/a</u></td> <td><u>0-2</u></td> <td><u>Hand</u></td> </tr> </tbody> </table>	Material	Amount	Density	Interval	Placement	<u>Conc</u>		<u>n/a</u>	<u>0-2</u>	<u>Hand</u>																														
Material	Amount	Density	Interval	Placement																																						
<u>Conc</u>		<u>n/a</u>	<u>0-2</u>	<u>Hand</u>																																						
11. DISINFECTION: Type <u>n/a</u> Amt. Used <u>n/a</u>																																										
12. WELL TEST DATA: <input type="checkbox"/> Check box if Test Data is submitted on Form Number GWS 39 Supplemental Well Test. TESTING METHOD _____ Static Level <u>26.20</u> ft. Date/Time measured: <u>11/21/05</u> Production Rate _____ gpm. Pumping Level _____ ft. Date/Time measured _____ Test Length (hrs) _____ Remarks: _____																																										
13. I have read the statements made herein and know the contents thereof, and they are true to my knowledge. This document is signed and certified in accordance with Rule 17.4 of the Water Well Construction Rules, 2 CCR 402-2. [The filing of a document that contains false statements is a violation of section 37-91-108(1)(e), C.R.S., and is punishable by fines up to \$5000 and/or revocation of the contracting license.]																																										
Company Name: Colorado Springs Utilities, Enviro Services Dept.		Phone: (719)668-8672																																								
		License Number: P.E.																																								
Mailing Address: P.O. Box 1103, Mail Code 940, Colorado Springs, CO 80947																																										
Signature: <u>Rebecca Davies</u>		Print Name and Title: <u>Rebecca Davies, Staff Engineer</u>																																								
		Date: <u>9 Dec 2005</u>																																								

V1_Soils and Geo comments.pdf Markup Summary

dsdparsons (14)



Subject: Text Box
Page Label: 1
Author: dsdparsons
Date: 10/26/2023 7:43:54 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

8.4.9. Geology and Soils Standards and Reports

(A)Geology and Soils Report Required.

(1)Required with Sketch Plans and Preliminary Plans. All sketch plans and preliminary plans submitted for review shall be accompanied by geology and soils report.

(2)Previously Submitted. Where a geology and soils report has been completed and reviewed at an earlier stage of the subdivision review process, a new report may not be required if in the determination of the PCD Director the existing report provides the level of site-specific detail necessary to review the subdivision application, and the recommendations of the report and the Colorado Geological Survey (CGS) have been followed in the preparation of the preliminary plan.

(B)General.

(1)Prepared by Professional Geologist. The geology and soils report shall be prepared by, or under the direction of, a professional geologist as defined by CRS 34-1-201(3), or a Professional Engineer as defined by Board Policy Statement 50.2 - "Engineering in Natural Hazard Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Surveyors.



Subject: Planner
Page Label: 1
Author: dsdparsons
Date: 10/26/2023 7:46:34 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

Please provide author of report and identify certify



Subject: Planner
Page Label: 1
Author: dsdparsons
Date: 10/26/2023 10:57:30 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

There are specific basic report requirements to be identified in this report . A Map including the sketch plan with both constraints and hazards identified for example.

This report should address the requirements in 8.4.9 (even if minimalistic). Please review Section 8.4.9 and update so report meets intent of section.



Subject: Text Box
Page Label: 1
Author: dsdparsons
Date: 10/26/2023 3:24:27 PM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

Geologic and Soils Report — A report prepared by a professional geologist that identifies the geologic and soil conditions related to a specific development application site and the relationship of those conditions to the intended land use.

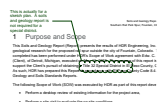
Geologic Constraint — A geologic condition, including but not limited to potentially unstable slopes, expansive soils/bedrock, high groundwater levels, soils creep, hydrocompaction, shallow bedrock, erosion, corrosive soils, radon, or drainage way, which may be mitigated or avoided to allow for development.

Geologic Hazard — A geologic condition, including but not limited to avalanches, debris flows-fans/mudslides, earthquakes, floodway, floodplain, ground subsidence, landslides, rockfall, ponded water, undermining, faulting, or similar naturally occurring dangerous features or soil conditions or natural features unfavorable to development, which may pose a significant threat to persons or property.



Subject: Planner
Page Label: 1
Author: dsdparsons
Date: 10/26/2023 3:25:09 PM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

As defined in Chapter 1 of LDC



Subject: Planner
Page Label: 3
Author: dsdparsons
Date: 10/26/2023 7:41:20 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

This is actually for a sketch plan. A soils and geology report is not required for a special district.

Category	Value	Unit
Area	10,000	Sq. Ft.
Volume	10,000	Cu. Yds.
Weight	10,000	Tons

Address constraints and hazards within the site. This includes...
 Hazardous materials and...
 Floodplain...
 Seismicity...
 Landslides...
 Erosion...
 Radon...
 Corrosive soils...
 High groundwater levels...
 Expansive soils...
 Unstable slopes...
 Shallow bedrock...
 Soil creep...
 Hydrocompaction...
 Drainage way...
 Mitigation or avoidance...
 Allow for development...

Subject: Planner
Page Label: 5
Author: dsdparsons
Date: 10/26/2023 10:59:55 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

address constraints and hazards within the site ; how they will impact development

at - 337 PC11
 85.52%
 -25.66%
 -4.50%
 32%

Subject: Planner
Page Label: 5
Author: dsdparsons
Date: 10/26/2023 11:43:27 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

provide the general map of all constraints _streams, drainages, slopes instability /excessive of 30%, rock fall debris, floodplain, debris flows etc...overlaid on the proposed Sketch Plan



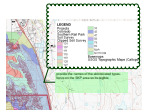
Subject: Planner
Page Label: 8
Author: dsdparsons
Date: 10/26/2023 10:41:57 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

Please look at the Soils & Geology report requirements in Chapter 8.4.9- Testing is required; staff did agree that we would reduce the area of testing but 100 % removal of requirement was not discussed



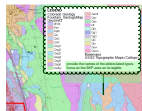
Subject: Planner
Page Label: 9
Author: dsdparsons
Date: 10/26/2023 11:02:15 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

this section should make recommendations on the future development in response to constaruiinats and hazards



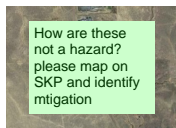
Subject: Planner
Page Label: Southern Rail Park Figure 2 Soils Map
Author: dsdparsons
Date: 10/26/2023 11:44:26 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

provide the names of the abbreviated types- focus on the SKP area so its legible



Subject: Planner
Page Label: Southern Rail Park Figure 3 Geologic Map
Author: dsdparsons
Date: 10/26/2023 11:03:34 AM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

provide the names of the abbreviated types- focus on the SKP area so its legible



Subject: Planner
Page Label: Southern Rail Park Figure 4 Economic Considerations
Author: dsdparsons
Date: 10/26/2023 3:28:57 PM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

How are these not a hazard? please map on SKP and identify mtigation



Subject: Planner
Page Label: Appendix_Primary 2
Author: dsdparsons
Date: 10/26/2023 3:28:14 PM
Status:
Color: ■
Layer:
Space:
Closed: Unchecked

we dont need this as a part of the GEO reprot