

WASTEWATER STUDY OVERLOOK AT HOMESTEAD – FILING NO. 1 ELBERT ROAD EL PASO COUNTY, COLORADO

Prepared for:

PT Overlook, LLC 1864 Woodmoor Drive, Suite 100 Monument, Colorado 80132

Attn: Joe DesJardin

June 7, 2024 Revised November 13, 2024

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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Reviewed by:



Joseph C. Goode Jr., P.E. President

PCD No. SF2425



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1 SUMMARY

Project Location

The project lies in portions of the S¹/₂ of Section 22 and N¹/₂ of Section 27, Township 11 South, Range 64 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 3¹/₂ miles northwest of Peyton, Colorado.

Project Description

Overlook at Homestead Filing No. 1 Subdivision is approximately 202 acres, with thirty-six (36) 5-acre rural residential lots proposed (Lots 1 - 36). The development will be serviced by individual water wells and on-site wastewater systems (OWTS).

Scope of Report

This report presents the results of our geologic evaluation and treatment of engineering geologic hazard study.

Land Use and Engineering Geology

This site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose some constraints/hazards on development and land use. These include areas of artificial fill, expansive soils, shallow bedrock, seasonally shallow and potential seasonally shallow groundwater areas, springs, potentially unstable slopes, shallow bedrock. Rockfall, and debris flow susceptible areas affect lots in the southeast portion of the site. Based on the proposed development plan, it appears that these areas will have some impact on the development. These conditions will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either avoided or properly mitigated. All recommendations are subject to the limitations discussed in the report. This report was revised to address review comments made by the Colorado Geological Survey dated October 21, 2024.

2 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in portions of the S¹/₂ of Section 22 and N¹/₂ of Section 27, Township 11 South, Range 64 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 3¹/₂ miles northwest of Peyton, Colorado, northeast of Elbert Road and Sweet Road. The location of the site is as shown on the Vicinity Map, Figure 1.



The topography of the site is generally gradually to moderately sloping to the south with steep slopes along the mesa. Several drainages and minor drainage swales, ponds, and springs were on the site. The ponds and portions of the drainages had water at the time of our initial site visit. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included grazing and pasture land with an older farmhouse and out buildings in the northern portion of the site. The site contains primarily field grasses, ponderosa pines, cacti, yucca, and weeds. Site photographs, taken May 2 and 24, 2023, are included in Appendix A.

Overlook at Homestead Filing No. 1 Subdivision is approximately 202 acres, with thirty-six (36) 5-acre rural residential lots proposed (Lots 1 - 36). Preliminary grading plans indicate three extended detention basins (EDBs) across the southern side of Filing No. 1 to be located on portions of Lots 6-7, 8-10, and 14-16. Grading will primarily be associated with the construction of roads and extended detention basins. The Overall Site Plan is presented in Figure 3, and the Development Plan/Test Boring Location Map is presented in Figure 4.

3 SCOPE OF THE REPORT

The scope of the report will include a general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.

4 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements and air photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on May 2 and 24, 2023 (References 1 and 2). The site was revisited on May 28, 2024 to verify previous mapping and evaluate current site conditions.



Fourteen Test Pits were excavated as part of the previous site investigation to determine general soil and bedrock characteristics and general suitability of the site for the use of on-site wastewater treatment systems (OWTS). Test Pit Nos. 1 - 8 were located on the lots within Filing No. 1. The locations of the test pits are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Test Pit Logs are presented in Appendix B, and Summarized on Table B-1. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on some of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis ASTM D-422. Visual and tactile evaluation of the soils was performed. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table C-1.

5 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 20 miles to the west is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southeastern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be very gently dipping in a northwesterly direction (Reference 1). The rocks in the area of the site are sedimentary in nature and typically Upper Cretaceous in age. The bedrock underlying the site consists of the Dawson Formation. Overlying this formation are unconsolidated deposits of man-made fill and alluvial soils of Quaternary Age. The alluvial soils were deposited by water on site and as stream terraces along drainages, and alluvial fan deposits originating from the mesa located in the southeastern portion of the site. Man-made deposits exist as fill/trash piles, and earthen embankments across the site. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.1 Soil Conservation Survey

The Natural Resource Conservation Service (Reference 2), previously the Soil Conservation Service (Reference 3) has mapped four soil types on the site (Figure 5). In general, the soils classify as coarse sandy loam, sandy loam, and rock outcrops. The soils are described as follows:



Туре	Description
42	Kettle – rock outcrop complex, 8 to 60% slopes
66	Peyton – sandy loam, 1 to 5% slopes
68	Peyton-Pring Complex, 3 to 8% slopes
71	Pring – coarse sandy loam, 3 to 8% slopes

Complete descriptions of each soil type are presented in Appendix D. The soils have generally been described to have moderate to moderately rapid permeabilities. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The majority of the soils have been described to have moderate erosion hazards

5.2 Site Stratigraphy

The Eastonville Quadrangle Geology Map showing the site is presented in (Figure 6, Reference 6). The Geology Map prepared for the site is presented in Figure 7. Five mappable units were identified on this site which are described as follows:

- **Qaf** Artificial Fill of Holocene Age: These recent man-made deposits associated with earthen embankments in the southern portion of the site.
- Qa₂ Alluvium two of Early Holocene Age: This material is a water-deposited alluvium, typically classified as a silty to well-graded sand, brown to dark brown in color and of moderate density. This deposit can sometimes be very highly stratified containing thin layers of very silty and clayey soil. Alluvium two correlates with the Piney Creek Alluvium in the Denver Area.
- **Qc Colluvial deposits of Holocene to late Pleistocene Age:** These materials consist of silty sands and gravel deposited by the action of sheetwash and gravity as well as the insitu weathering of the bedrock materials on-site. The colluvium is mapped along the slopes of the mesa and contain localized areas of rockfall and fan deposits.
- **Qpg Gravel of Palmer Divide of early Pleistocene? or late Pliocene Age:** These materials consist of alluvial deposited fine to coarse sand interbedded with pinkish brown to brownish gray pebble and cobble gravel. Clast types within the gravel consist of quartz, granite, red sandstone, tan arkosic sandstone, ironstone, petrified wood, and porphyritic

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and tuffaceous volcanic clasts. The gravel occurs in weakly stratified to massive beds or as lenses within fluvial sand, and caps the mesa on the site.

Tkd Dawson Formation of Tertiary to Cretaceous Age: The Dawson formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone. Overlying this formation is a variable layer of residual and/or colluvial soils. The residual soils were derived from the in-situ weathering of the bedrock materials onsite. The colluvial soils have been transported by the action of sheetwash and gravity. These soils consisted of silty to clayey sands and sandy clays.

The bedrock underlying the site consists of the Dawson Formation of Tertiary to Cretaceous Age. The Dawson Formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone. Overlying this formation are variable layers of alluvial deposits, and residual soil. The residual soils were derived from the in-situ weathering of the bedrock materials on-site. These soils consisted of silty to clayey sands and sandy clays.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Eastonville Quadrangle* distributed by the Colorado Geological Survey in 2012 (Reference 6), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1978 (Reference 7), and the *Geologic Map of the Denver* $1^{0} \times 2^{0}$ *Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 8). The Test Borings used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 7.

5.3 Groundwater

Signs of seasonal groundwater were encountered in seven of the fourteen test pits at depths ranging from 3 to 8 feet. A minimum separation of 4 feet between the OWTS field and groundwater levels is recommended. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time. It should be noted that in the sandy materials on-site, some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock. Builders and planners should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site and deal with each individual problem as necessary at the time of construction.



Groundwater and Floodplain Areas - Constraint

A drainage is located in the southwestern portion of the site and several minor drainages are located across the site that generally flow in southerly directions. None of the drainages on the site have been mapped within floodplain zones according to the FEMA Map No. 08041CO350G, (Figure 8, Reference 9). Areas where potentially seasonal shallow, seasonal shallow, ponded water, and springs have been indicated on the site geology/engineering geology map, Figure 7. Lots adjacent to the drainages may experience higher groundwater levels during peak flows. Subsurface perimeter drains are recommended for structures adjacent to the floodplains and drainages to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 9. Finished floor levels must be a minimum of one floor above the floodplain level. **Exact floodplain locations and drainage studies are beyond the scope of this report.**

Seasonal Shallow and Potential Seasonally Shallow Groundwater - Constraint

In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and possible frost heave potential, depending on the soil conditions. These areas are located within some of the drainages in the eastern and southeastern portion of the site. Due to the proposed lot sizes it is anticipated these areas would be avoided by the development. Areas immediately adjacent to drainage may also experience higher subsurface moisture conditions during periods of higher flows. OWTS soil treatment areas should not be placed in these areas.

Areas of Ponded Water - Constraint

Areas of ponded water exists behind the earthen dams in the southwestern portion of the site (Lots 8 and 10). Due to the lot sizes it is anticipated these areas can be avoided by the proposed development. Any drainage into these areas should be rerouted in a non-erosive manner where it does not create areas of ponded water around any proposed structures or OWTS soil treatment areas.

Spring - Constraint

Two springs were observed in the west-central portion of the site, the spring within Filing No. 1 is located on Lot 27. The springs should be avoided by development and will likely be located within drainage easements. Springs other than those indicated on Figure 6 may be present on the site.



6 ON-SITE WASTEWATER TREATMENT

The site was evaluated for individual on-site wastewater treatment systems in accordance with El Paso Land Development Code. Fourteen (14) tactile test pits were excavated across the site. The test pits were located in potential locations of future wastewater systems. Test Pit Nos. 1 - 8 were located on the lots within Filing No. 1. The approximate locations of the Test Pits are indicated on Figure 4, and on the Septic Suitability Map, Figure 10. A table showing the results of the Tactile Test Pits is presented in Table B-1. Test Pit Logs are included in Appendix B, and Laboratory Test Results in Appendix C. A Summary of Laboratory Test Results, and Test Pit Logs from the previous investigation are included in Table C-1.

The Natural Resource Conservation Service (Reference 4), previously the Soil Conservation Service (Reference 5) has been mapped with four soil descriptions. The Soil Survey Map (Reference 4) is presented in Figure 5, and the Soil Survey Descriptions are presented in Appendix D. The soils are described as having slow to rapid percolation rates. The majority of the soils have been described with moderate permeabilities.

Soils encountered in the tactile test pits consisted of sandy loam, sandy clay loam, and sandy clay. Bedrock was encountered in all but one test pit (TP-13). Shallow bedrock (less than 5 feet) was encountered in thirteen of the test pits. Signs of seasonal occurring groundwater were observed in six of the test pits at depths of 3 to 8 feet. The limiting layers encountered in the test pits are sandy loam (2A), sandstone (sandy loam when classified as a soil) (Soil Type 2A), sandstone (sandy clay loam when classified as a soil) (Soil Type 3A), and claystone (sandy clay when classified as a soil). The soil types correspond to LTAR values ranging from 0.50 to 0.15 gallons per day per square foot. Additional investigation may identify areas where suitable conventional systems could be used on the lots.

On-site Wastewater Systems are to be designed on a per lot basis prior to obtaining a building permit. The systems are to meet County Chapter 8 OWTS criteria and State CDPHE criteria including any required mitigation to accommodate respective leach fields and infrastructure including, but not limited to earthwork grading, berming and diversion swale implementation, installation of secondary sand filters or any other higher treatment levels and dosing as required on a per lot basis and determined by test pit results and site topography. There are no identified geologic hazards on the site that are prohibitive to future OWTS design at this time.

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In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems (OWTS) and that contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to El Paso County and State Guidelines and properly maintained. Based on the testing performed as part of this investigation designed systems will likely be required for the majority of the lots. A Septic Suitability Map is presented in Figure 10. OWTS sites should not be located within drainages. Individual soil testing is required on the lots prior to construction. Absorption fields must be located a minimum of 100 feet from any well, including those on adjacent properties. Absorption fields must also be located a minimum of 50 feet from any drainages, floodplains or ponded areas and 25 feet from dry gulches.

7 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some constraints on development and construction of the site. The majority of these conditions can be mitigated through proper engineering design and construction practices. The proposed development and use are consistent with anticipated geologic and engineering geologic conditions.

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Individual investigations for building sites will be required prior to construction. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

This report has been prepared for PT Overlook, LLC for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

8



8 **REFERENCES**

- 1. Entech Engineering, Inc., Revised date December 1, 2023. *Soils and Geology Study, Overlook at Homestead, Elbert Road, El Paso County, Colorado*. Entech Job No. 230677.
- 2. Entech Engineering, Inc., Revised date December 1, 2023. *Wastewater Study, Overlook at Homestead, Elbert Road, El Paso County, Colorado*. Entech Job No. 230677.
- *3.* Bryant, Bruce; McGraw, Laura W.; and Wobus, Reinhard A. 1981. *Geologic Structure Map of the Denver 1° x 2° Quadrangle, North-Central Colorado.* Sheet 2. U.S. Geologic Survey. Map I-1163, Sheet 2.
- 4. Natural Resource Conservation *Service,* September 22, 2015. *Web Soil Survey.* United States Department Agriculture, http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.
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- 10. McCoy, Kevin M., Morgan, Matthew L., and Berry, Karen A., 2018. *Debris Flow Susceptibility Map of El Paso County, Colorado.* Colorado Geological Survey. Open-File Report 18-11.
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- 15. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.



FIGURES



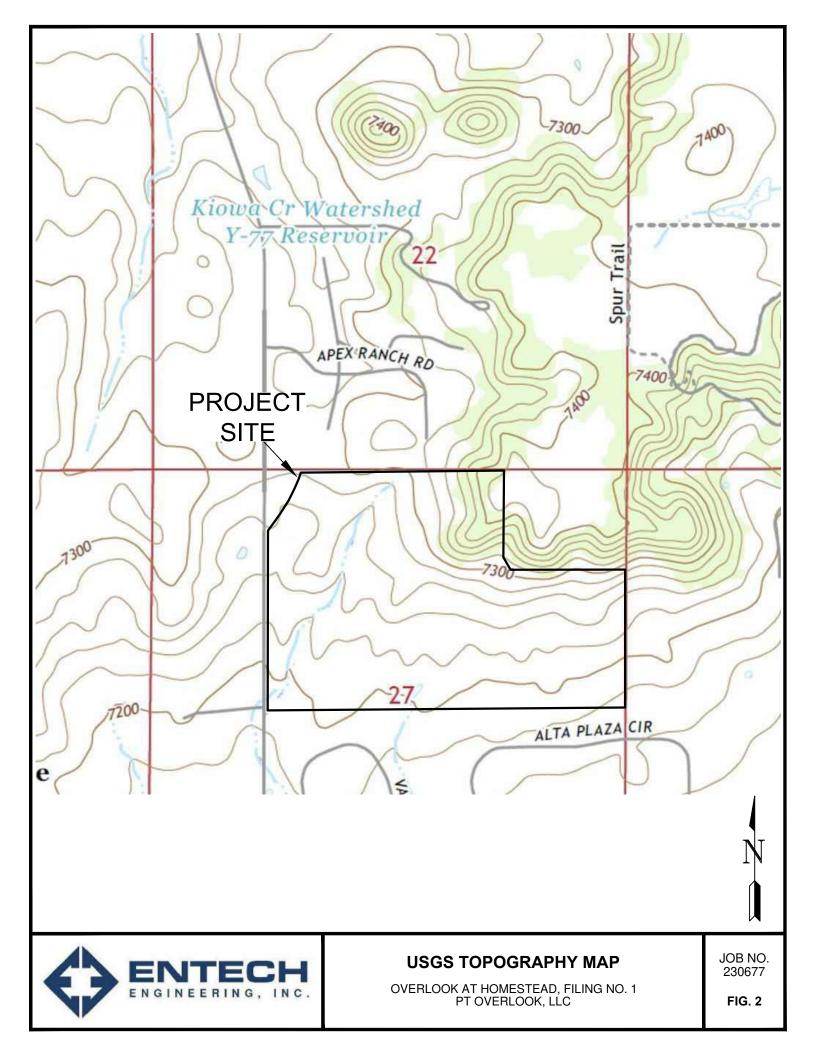


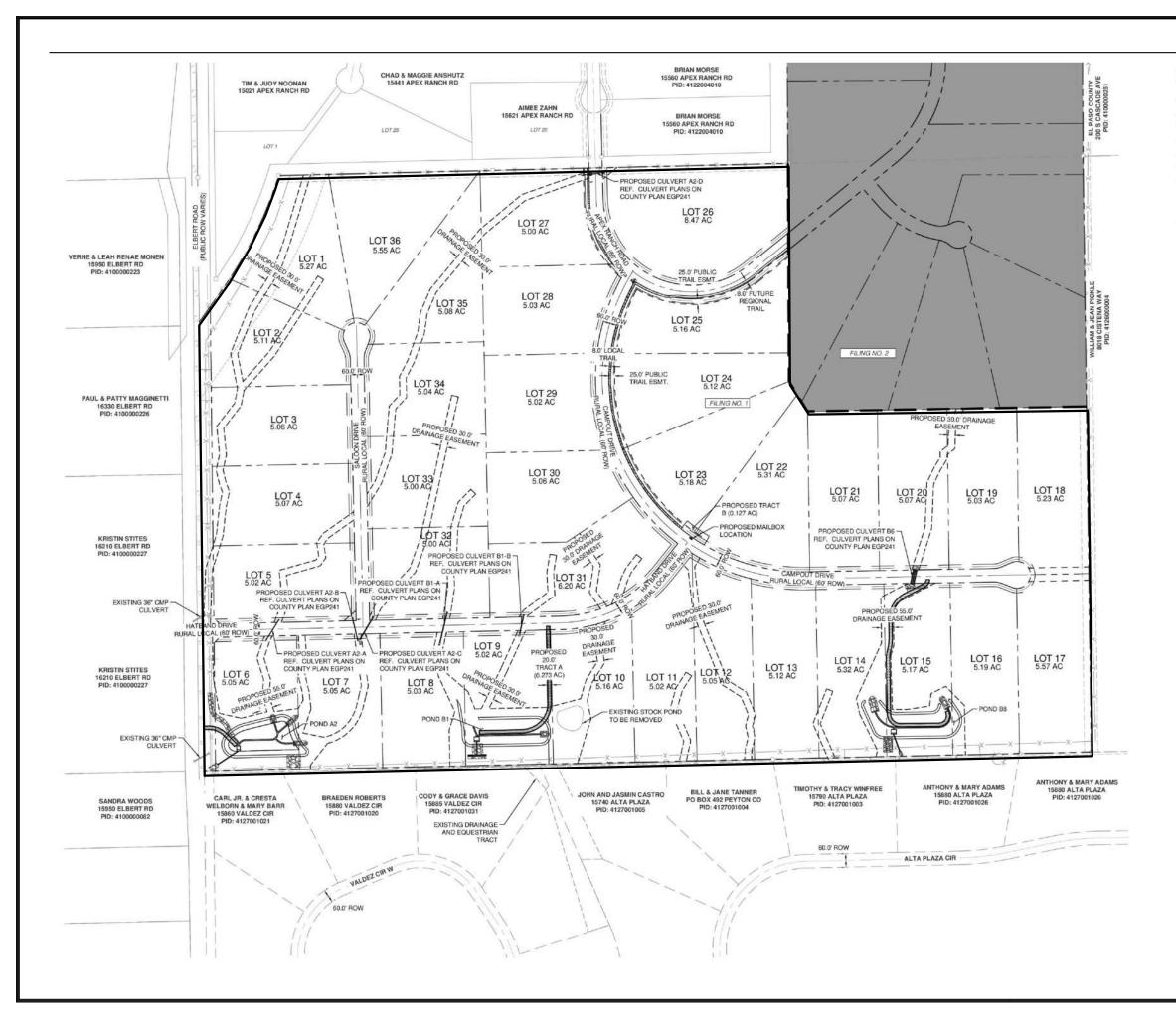


VICINITY MAP

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FIG. 1

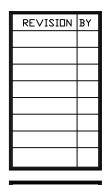




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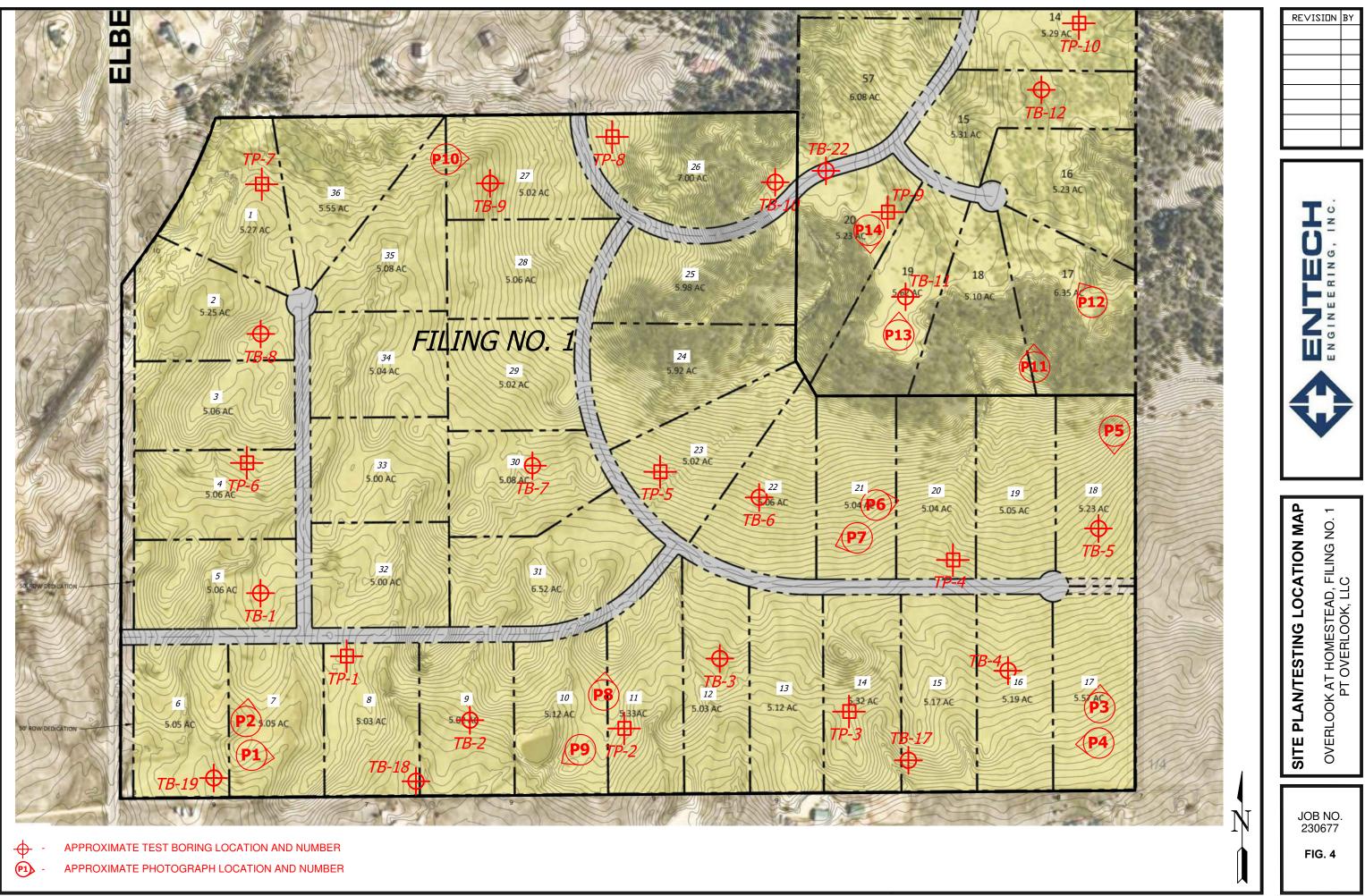
PROPERTY LINE ROW LINE LOT LINE CENTER LINE EASEMENT LINE GRADE BREAK LINE DITCH LINE EXISTING FENCE PUBLIC IMPROVEMENTS EASEMENT PUBLIC UTILITY EASEMENT

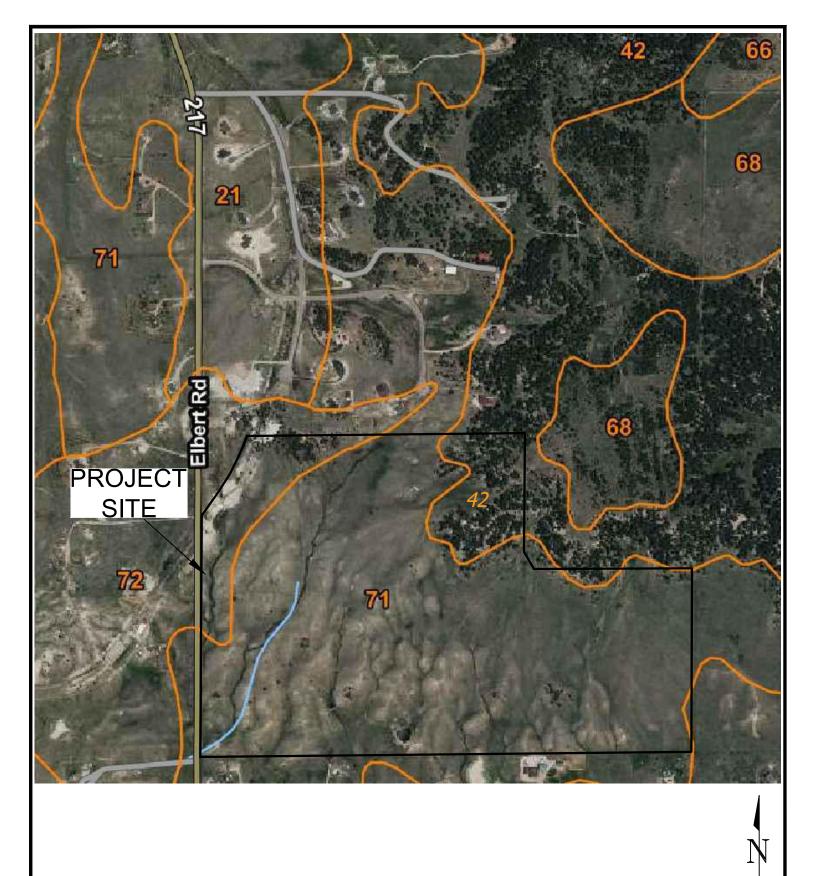










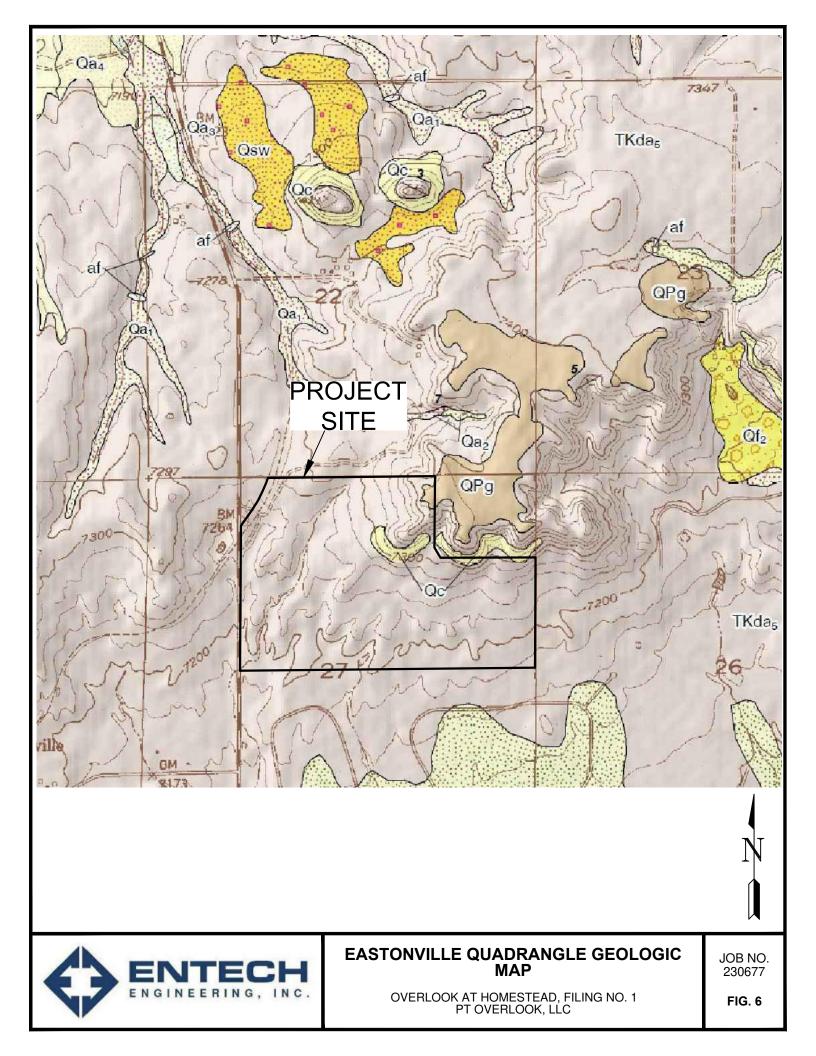




SOIL SURVEY MAP

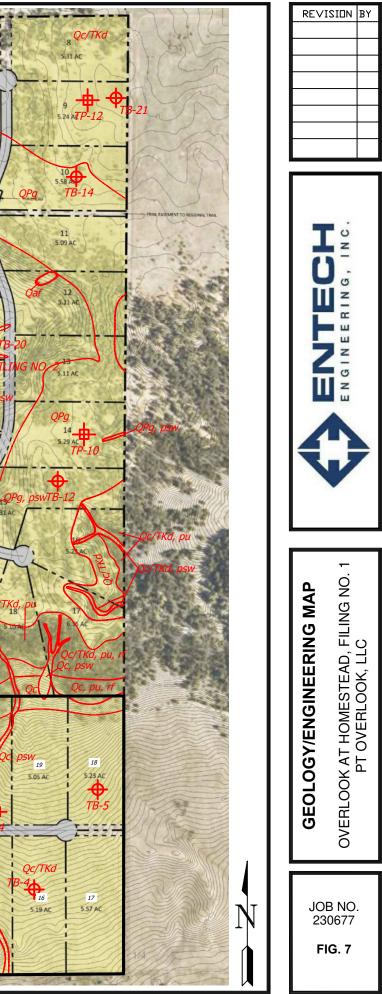
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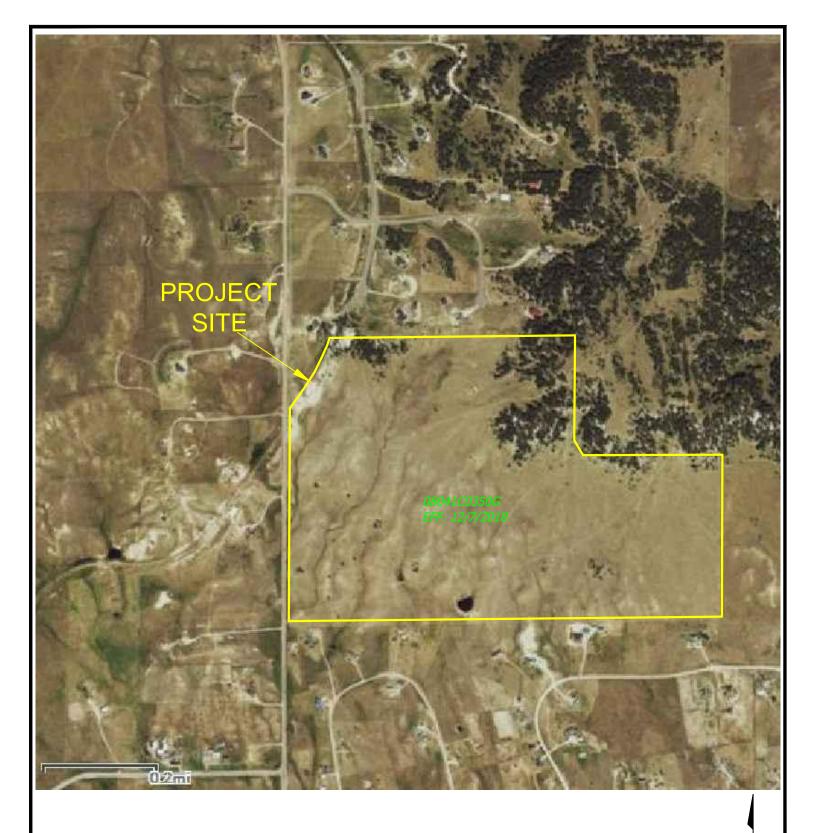
FIG. 5



	QC/TKd, psw QC/TKd, psw QC/TKd, psw QC/TKd, psw TD-15 - QC/TKd 12 AA QC/TKd, ptm TD-15 - QC/TKd Sister QC/TKd, ptm TD-15 - QC/TKd Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Sister Si
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	OGTKd, pu OC/TKd 57 508 AL 58 508 AL 59 502 AL 500
	QC/TKd, SW QC/TKd, SW QC/TKd, SW QC/TKd, SW QC/TKd, SW QC/TKd, DU, rf QC/TKd, DU, rf
Legend: Qaf - Artificial Fill of Holocene Age: man-made fill deposits associated with existing earthen berms and trash pile on lot 12 Qa ₂ - Alluvium Two of Early Holocene Age: water deposited alluvium within drainage on Lot 59 Qc - Colluvial deposits of Holocene to Late Pleistocene Age: rockfall, sheetwash, and minor fan deposits QPg - Gravel of the Palmer Divide of early Pleistocene? or late Pliocene Age:	CC/TKd, DSW CC/TKd, DSW CC/TC
Age: alluvial deposited sands with pebble and cobble gravel pu- psw- potentially unstable slopes psw- potentially seasonal shallow groundwater sw- seasonal shallow groundwater w- ponded or flowing water rf - rockfall Debris Flow Susceptibility - (Figure 9) Lots affecting by this potential hazard include Lots 23 - 35	Qc/TKd TB-1

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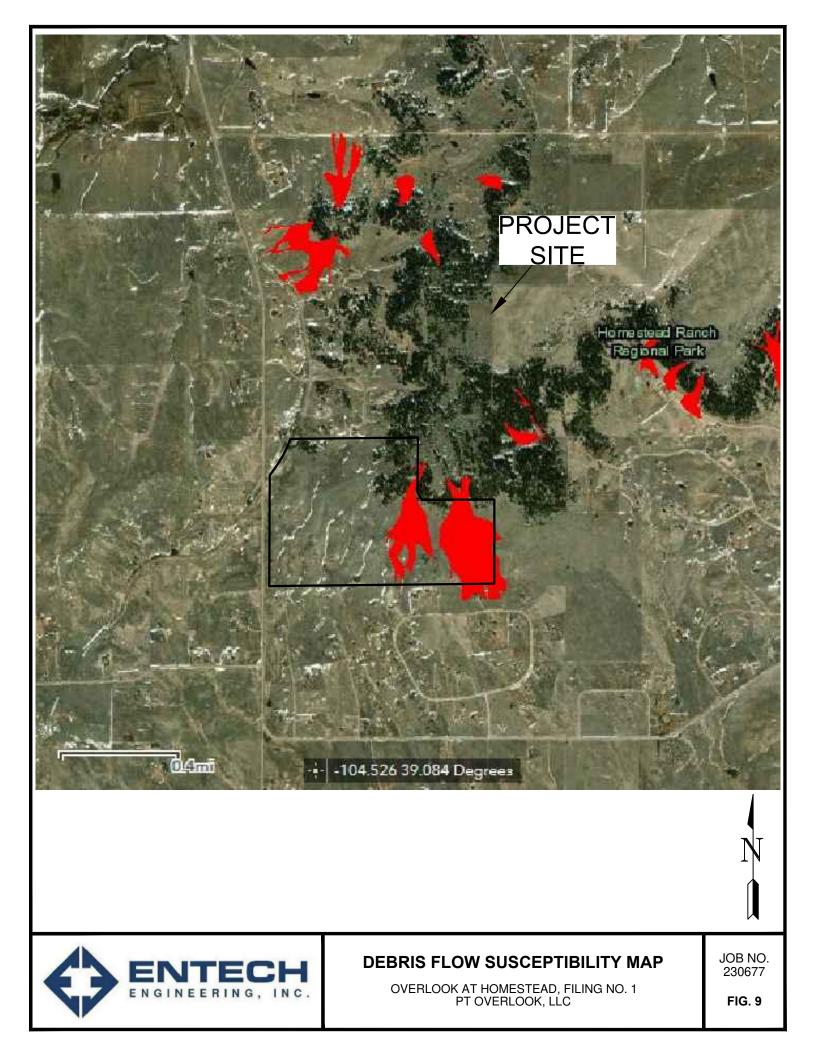


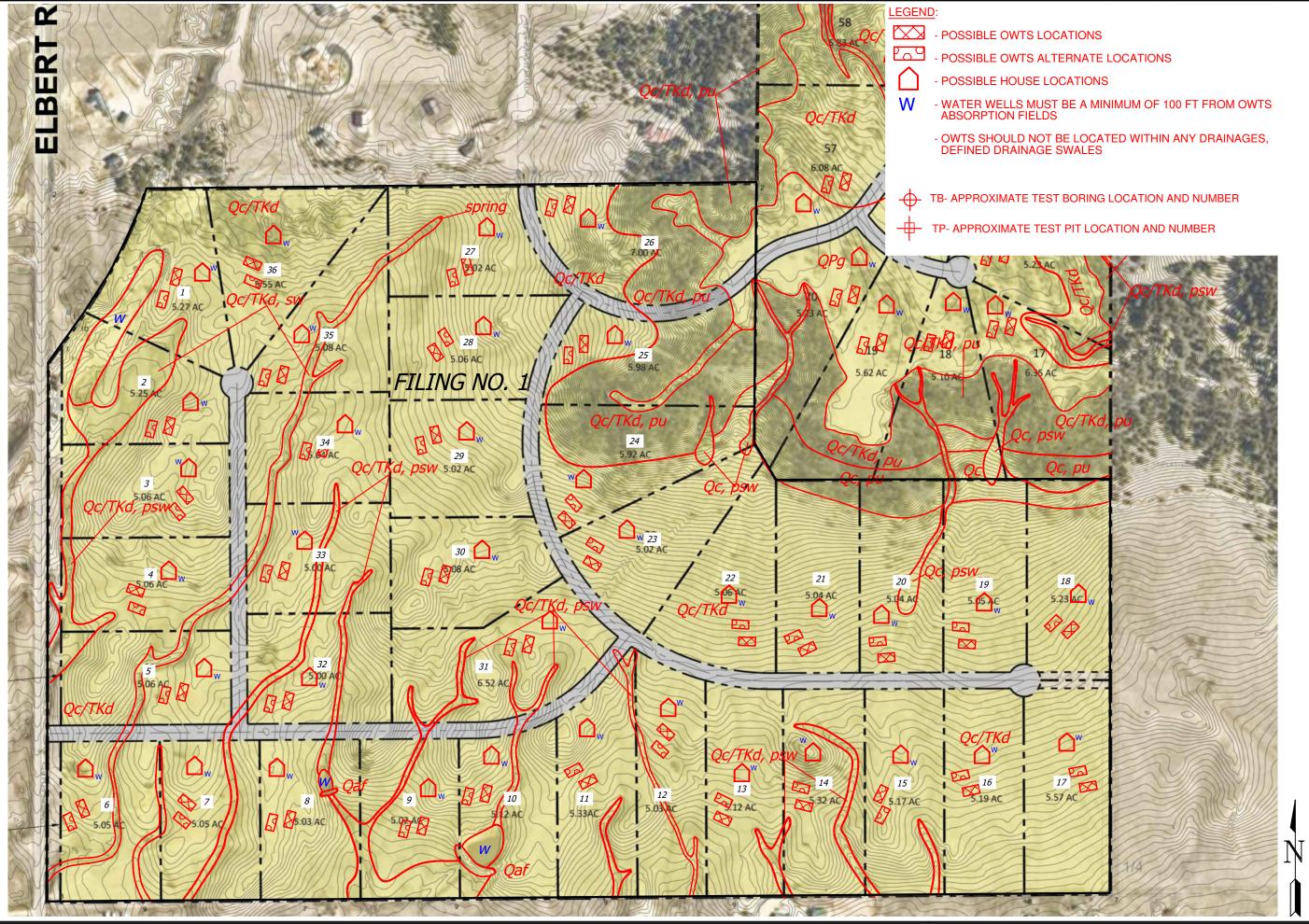


FEMA FLOODPLAIN MAP

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FIG. 8





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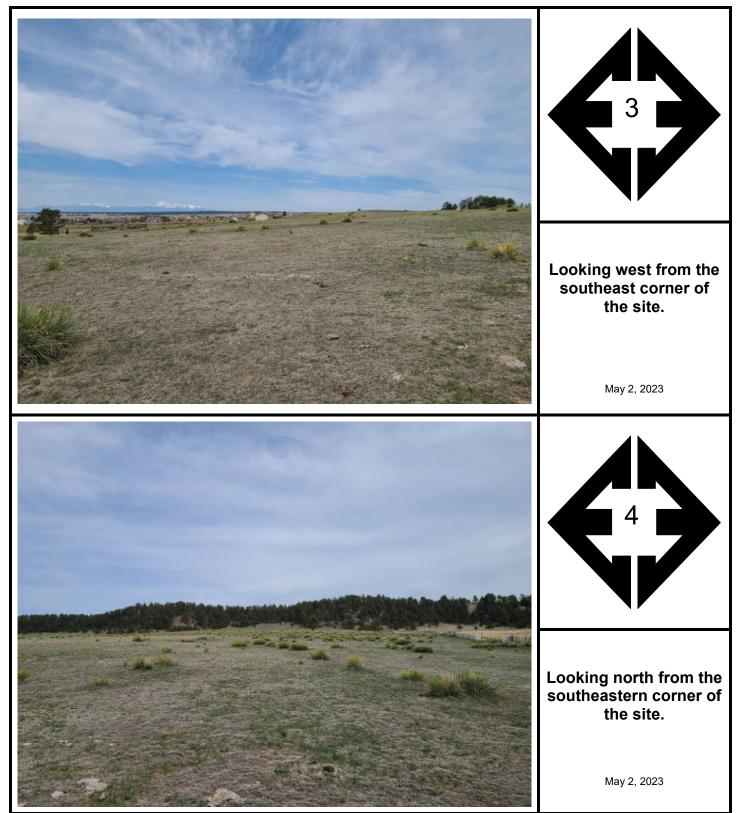
FIG. 10

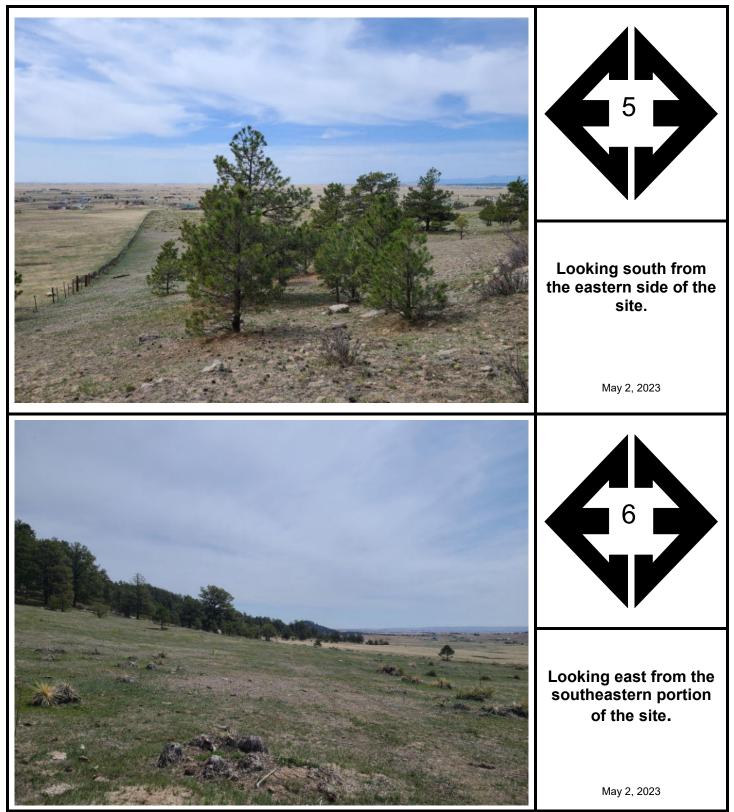
OWTS SUITABILITY MAP



APPENDIX A: Site Photographs



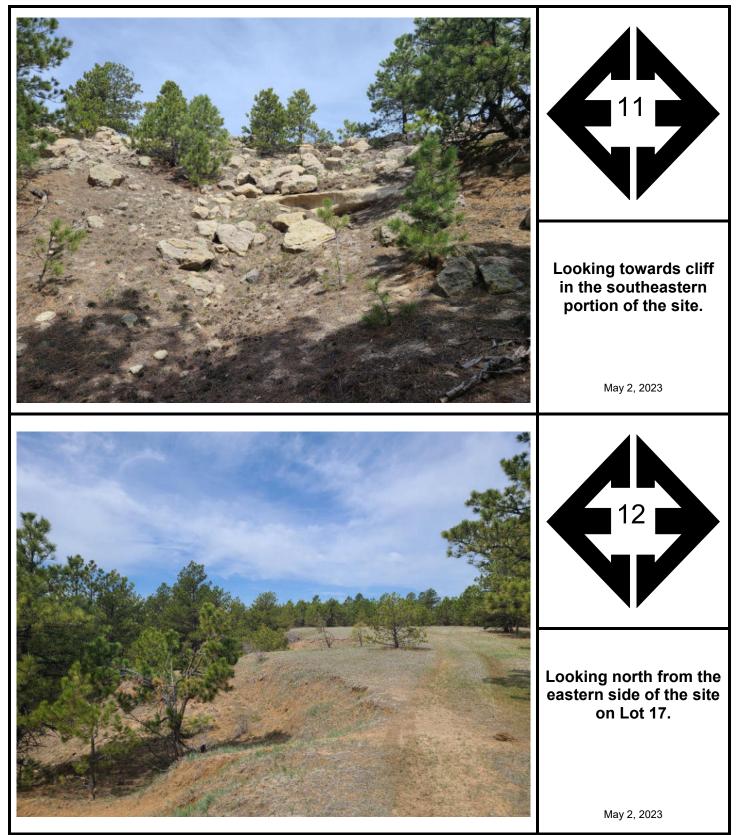


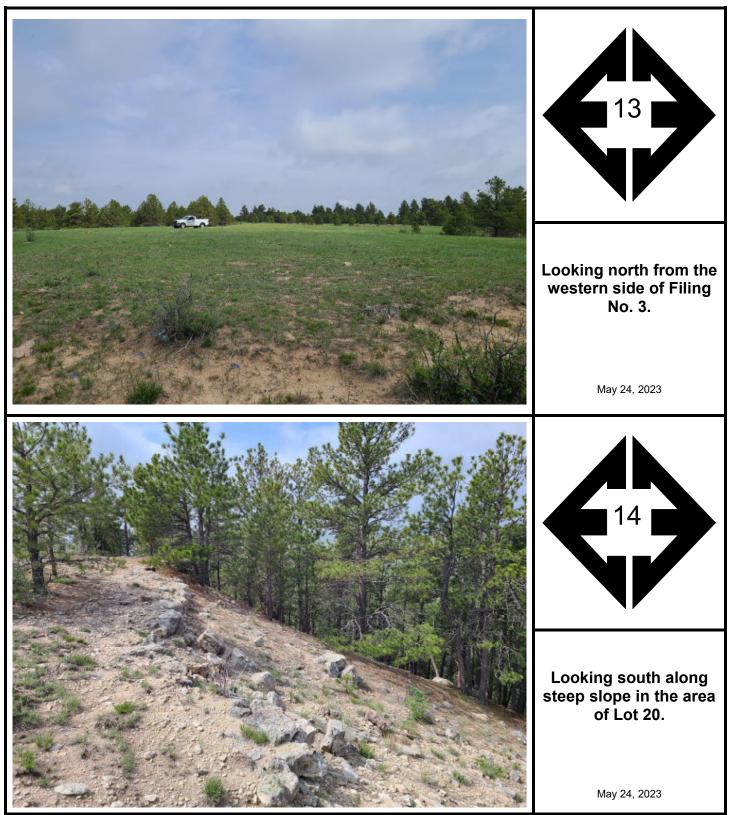




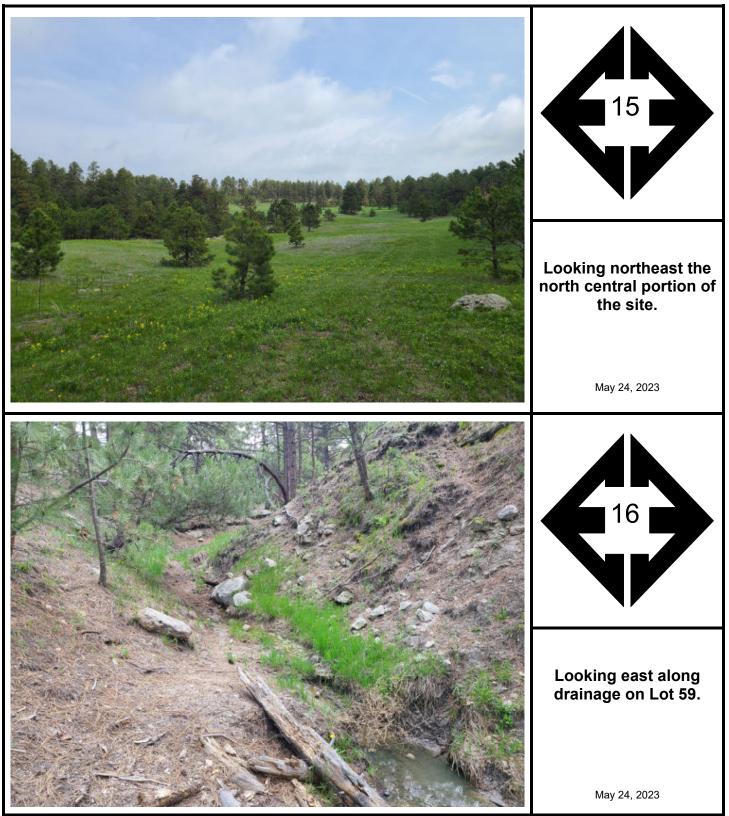


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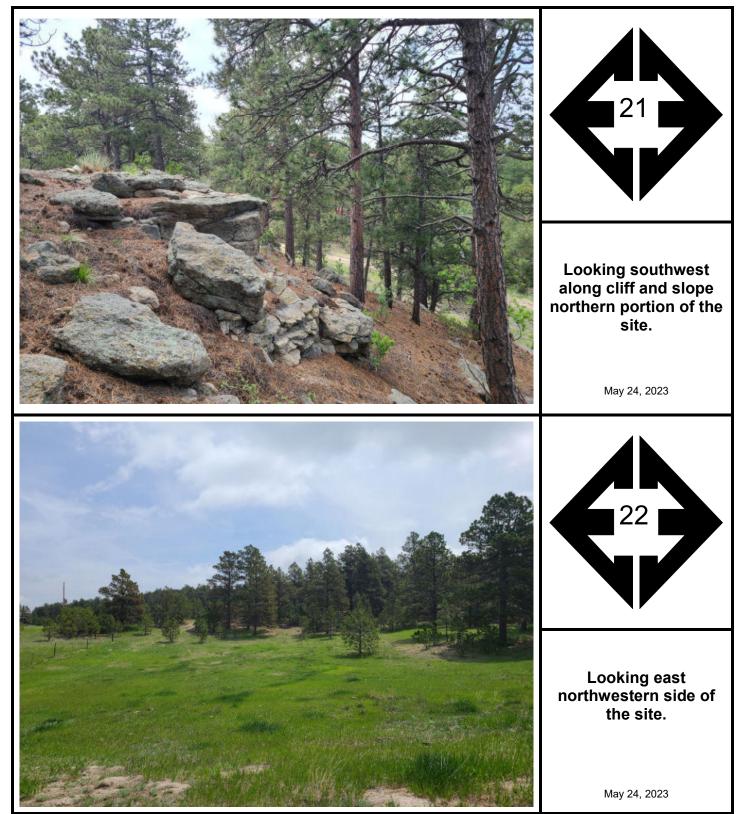


Job No. 230677











APPENDIX B: Test Pit Logs



TABLE B-1

OWTS TEST PIT RESULTS

TEST PIT	DEPTH TO BEDROCK (ft.)	DEPTH TO SIGNS OF GROUNDWATER (ft.)	USDA SOIL TYPE & LTAR
1	4*	8	3A, 0.30
2	4*	5*	3A, 0.30
3	1.5*	5*	3A, 0.30
4	1.5*	>8	4A, 0.15
5	1*	3*	3A, 0.30
6	1*	4*	2A, 0.50
7	3*	3*	3A, 0.30
8	2*	>6	3A, 0.30
9	0.5*	>4	4A, 0.15
10	1.5*	>2	2A, 0.50
11	1*	>3.5	4A, 0.15
12	2.5*	>3.5	2A, 0.50
13	>8	>8	2A, 0.50
14	1.5*	>8	4A, 0.15

* - CONDITIONS THAT WOULD REQUIRE AN ENGINEERED OWTS

Project: Elbert Road Client: PT Overlook Job No: 230677

TEST PIT 1 DATE EXCAVATED 5/5/2023							TEST PIT 2 DATE EXCAVATED 5/5/2023
REMARKS				Soil Structure Shape	Soil Structure Grade		REMARKS
39.065618°, -104.545200° TOPSOIL (0-12IN), SANDY CLAY	Depth (ft)	K Symbol	Samples	Soil Struc	Soil Struc	Soil Type	39.065438°, -104.540963° Soil 3 th Coil 3
LOAM, FINE TO COARSE GRAINED, DARK BROWN	1						FINE TO COARSE GRAINED, DARK 1
SANDY CLAY LOAM, FINE TO COARSE GRAINED, LIGHT BROWN	3			GR	W	ЗA	SANDY LOAM, FINE TO COARSE GRAINED, LIGHT BROWN 3 GR W 2A
WEATHERED SANDSTONE (DAWSON FORMTAION), SANDY CLAY LOAM FINE TO COARSE GRAINED, LIGHT BROWN	4 5 6			MA	W	3A	WEATHERED SANDSTONE 4 1 MA W 3A (DAWSON FORMATION), SANDY 5 1 1 1 1 CLAY LOAM, FINE TO COARSE 6 1 1 1 1
SIGNS OF SEASONAL GW AT 8FT	7 8						SIGNS OF SEASONAL GW AT 5FT 7 8
	9 10						9 - 10 -
	•	I	ļ			•	
<u>Soil Struc</u> granular - platy - pl blocky - b	- gr ol	<u>Shap</u>	<u>)e</u>				<u>Soil Structure Grade</u> weak - w moderate - m strong - s
prismatic single gra massive -	- pr ain - s	g					loose - I
			—	—			



TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677

EST PIT 3 ATE EXCAVATED 5/5/2023 EMARKS					TEST PIT 4 DATE EXCAVATED 5/5/2023 REMARKS				
39.065483°, -104.537584°	Depth (ft) Symbol	samples Soil Structure Shape	Soil Structure Grade	Soil Type	39.067254°, -104.536395°	Depth (ft) Symbol	Samples Soil Structure Shape	Soil Structure Grade	Soil Type
TOPSOIL (0-18IN), SANDY CLAY LOAM, FINE TO COARSE GRAINED, DARK BROWN WEATHERED SANDSTONE (DAWSON FORMATION), SANDY CLAY LOAM, FINE TO COARSE GRAINED, LIGHT BROWN FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY CLAY LOAM, FINE TO COARSE GRAINED, LIGHT BROWN TO SIGNS OF SEASONAL GW AT 5FT EXCAVATION REFUSAL AT 6FT	1 2 3 4 5 6 7 8 9 10	MA	w	3А	TOPSOIL (0-18IN), SANDY LOAM, FINE TO COARSE GRAINED, DARK BROWN WEATHERED SANDSTONE (DAWSON FORMATION), SANDY LOAM, FINE TO COARSE GRAINED, BROWN FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY CLAY, FINE TO COARSE GRAINED, DARK BROWN TO LIGHT BROWN	1 2 3 4 5 6 7 8 9	MA	w	3A 4A
<u>Soil Stru</u> granular platy - pl blocky - prismatic single gr massive	bl c - pr ain - sg	2			<u>Soil Structure Grade</u> weak - w moderate - m strong - s loose - l				



TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677

TEST BORING 5							TEST BORING 6						
DATE DRILLED 5/5/2023		1				-	DATE DRILLED 5/5/2023						
REMARKS							REMARKS						
39.067408°, -104.541559°	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type	39.068467°, -104.546536°	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
TOPSOIL (0-12IN), SANDLY LOAM,		¥.					TOPSOIL (0-12IN) SANDY LOAM,		ĸ				
FINE TO COARSE GRAINED, DARK BROWN	1 2	• <u>•</u>					FINE TO MEDIUM GRAINED, DARK BROWN	1 2	4. 				
WEATHERED SANDSTONE	-			MA	W	2A	WEATHERED SANDSTONE				MA	W	2A
(DAWSON FORMATION), SANDY	3	:::					(DAWSON FORMATION), SANDY	3					
LOAM, FINE TO COARSE	-						LOAM WITH GRAVEL, FINE TO	-					
GRAINED, LIGHT BROWN	4						VERY COARSE, LIGHT BROWN TO	4					
FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY	5			MA	S	3A	SIGNS OF OF SEASONAL GW AT 4F	5					
CLAY LOAM, FINE TO COARSE GRAINED	6							6					
SIGNS OF SEASONAL GW AT 3FT	7							7					
EXCAVATION REFUSAL AT 6FT	8							8					
	9							9					
	10							10					

Soil Structure Shape granular - gr platy - pl blocky - bl prismatic - pr single grain - sg massive - ma

Soil Structure Grade weak - w moderate - m strong - s loose - l



TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677

TEST BORING 7	TEST BOR	RING 8
DATE DRILLED 5/5/2023 REMARKS	DATE DRIL	
REMARKS	t) s icture Shape e icture Grade	t) b inture Shape e inture Grade
39.070573°, -104.544408°	002602001 Soil Struct Soil Type	Soil Struc Soil Struc Soil Type
TOPSOIL (0-6IN), SANDY LOAM, FINE TO MEDIUM GRAINED, DARK BROWN SANDY LOAM, FINE TO COARSE GRAINED, LIGHT BROWN FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY CLAY LOAM, FINE TO COARSE GRAINED, BROWN TO GRAY SIGNS OF SEASOANL GW AT 3FT EXCAVATION REFUSAL AT 5FT	1 I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	24IN), SANDY LOAM, ARSE GRAINED, DARK 1 2 O SANDSTONE ORMATION), SANDY 3 E TO COARSE
<u>Soil Stru</u> granular platy - pl blocky - prismatic single gr massive	cture Shape Soil Structu - gr weak - w moderate - strong - s ol strong - s is - pr loose - l ain - sg strong - s	ure Grade

TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677

TEST PIT 9 DATE EXCAVATED 5/8/2023							TEST PIT 10 DATE EXCAVATED 5/8/2023						
REMARKS							REMARKS						
39.070145°, -104.537347°	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type	39.072651°, -104.535072°	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
TOPSOIL (0-6IN), SANDY CLAY	_	¥.					TOPSOIL (0-18IN), SANDY CLAY	_	¥.				
LOAM, FINE TO COARSE GRAINED, DARK BROWN	1						LOAM, FINE TO MEDIUM GRAINED, DARK BROWN	1	- <u>1</u> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			-	
WEATHERED SANDSTONE	2	\sim		MA	W	3A		2			MA	S	2A
(DAWSON FORMATION), SANDY CLAY LOAM, FINE TO COARSE	3	\bigotimes		MA	S	4A	FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY LOAM, FINE TO COARSE	3					
GRAINED, LIGHT BROWN	4			MA	S	3A	EXCAVATION REFUSAL AT 2FT	4	1				
FORMATIONAL CLAYSTONE (DAWSON FORMATION), SANDY	5							5					
CLAY, BROWN	6							6					
FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY	7							7					
CLAY LOAM, FINE TO COARSE GRAINED, LIGHT BROWN TO	8							8					
SIGNS OF SEASONAL GW AT 3FT	9							9	1				
EXCAVATION REFUSAL AT 4FT	10							10					

Soil Structure Shape granular - gr platy - pl blocky - bl prismatic - pr single grain - sg massive - ma Soil Structure Grade weak - w moderate - m strong - s loose - l



TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677

	TOPSOIL (0-2 FINE TO MEI DARK BROW FORMATION (DAWSON FO CLAY, FINE T GRAINED, BF FORAMTION (DAWSON FO CLAY LOAM, GRAINED), L	TEST PIT DATE EXC REMARKS
<u>Soil Stru</u> granular platy - pl blocky - prismatic single gr massive	IAL CLAYSTONE ORMATION), SANDY TO MEDIUM	11 AVATED 5/8/2023
bl : - pr ain - sg	(t) 1 2 3 4 5 6 7 8 9 10	
<u>pe</u>	Samples	
	P A Soil Structure Shape	lpe
	C C Soil Structure G	Grade
<u>Soil Structure Grade</u> weak - w moderate - m strong - s loose - l	39.077543°, -104.5354516° TOPSOIL (0-12IN), SANDY LOAM WITH GRAVEL, FINE TO COARSE GRAINED, DARK BROWN SANDY LOAM WITH GRAVEL, FINE TO COARSE GRAINED, LIGHT BROWN FORMATIONAL SANDSTONE (DAWSON FORMATION), SANDY LOAM, FINE TO MEDIUM GRAINED, LIGHT BROWN EXCAVATION REFUSAL AT 3.5FT	TEST PIT 12 DATE EXCAVATED 5/8/2023 REMARKS
	(t)	
	Samples	
	B B Soil Structure Sr	Shape
	ω ≷ Soil Structure Gr	Grade
	2A 2A 2A	



TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677

TEST BORING 13 DATE DRILLED 5/8/2023	TEST BORING 14 DATE DRILLED 5/8/2023	
REMARKS	REMARKS	
39.0760721°, -104.540046° (TOPSOIL (0-6IN), SANDY LOAM,	Symbol Samples Samples Samples Samples Soil Type Soil Type Soil Type	Depth (ft) Symbol Samples Soil Structure Shape Soil Structure Grade Soil Type
FINE TO MEDIUM GRAINED, DARK BROWN 2 SANDY LOAM, FINE TO COARSE GRAINED, BROWN 4 5 6	2 GR W 2A FORMATIONAL CLAYSTONE 3 GR W 2A FORMATIONAL CLAYSTONE 4 GR W 2A FORMATIONAL CLAYSTONE 4 GR GR GR GR 5 GR FORMATIONAL CLAYSTONE GRAINED, BROWN 5 GR GR FORMATIONAL SANDSTONE 6 GR GR GR FORMATIONAL SANDSTONE 6 GR GR GR GR 6 GR GR GR GR 7 GR GR GR GR 8 GR GR GR GR 9 GR GR GR GR	1 3 MA S 4A 3 MA S 4A 5 MA S 3A 6
7 8 9 10		7 8 9 10
<u>Soil Structur</u> granular - gr platy - pl blocky - bl prismatic - p single grain massive - m	r weak - w moderate - m strong - s or loose - l - sg	



TEST PIT LOGS

OVERLOOK AT HOMESTEAD PT OVERLOOK, LLC JOB NO. 230677



APPENDIX C: Laboratory Test Results

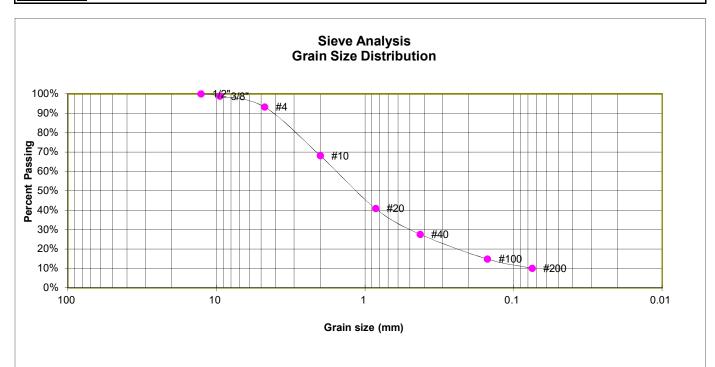


TABLE C-1 SUMMARY OF LABORATORY TEST RESULTS

SOIL TYPE	TEST PIT NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
3A	TP-1	1-4			9.5						SM-SW	SAND, WITH SILT
4A	TP-4	3.5-5.5			34.9						SC	SAND, CLAYEY
2A	TP-5	1-2.5			8.4						SM-SW	SAND, WITH SILT
2A	TP-6	4-8			9.9						SM-SW	SAND, WITH SILT
3A	TP-8	4-6			25.2						SC	SAND, CLAYEY
4A	TP-11	1-2.5			47.0						SC	SAND, CLAYEY
2A	TP-13	2-4			10.1						SM-SW	SAND, WITH SILT

TEST BORINGTP-13DEPTH (FT)2-4SOIL TYPE2A

SOIL DESCRIPTION SAND, WITH SILT



U.S.	Percent
<u>Sieve #</u>	<u>Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.9%
4	93.2%
10	68.1%
20	40.9%
40	27.6%
100	14.8%
200	10.1%

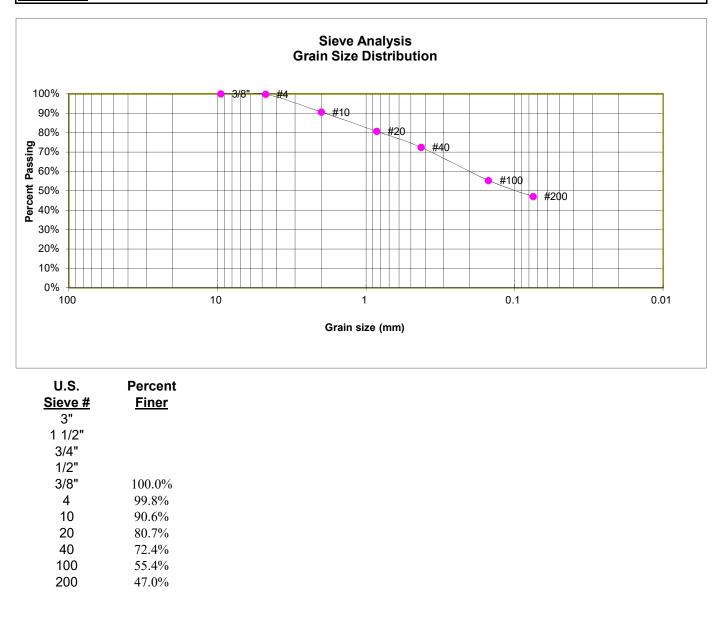


LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677

TEST BORINGTP-11DEPTH (FT)1-2.5SOIL TYPE4A

SOIL DESCRIPTION SAND, CLAYEY USCS CLASSIFICATION SC



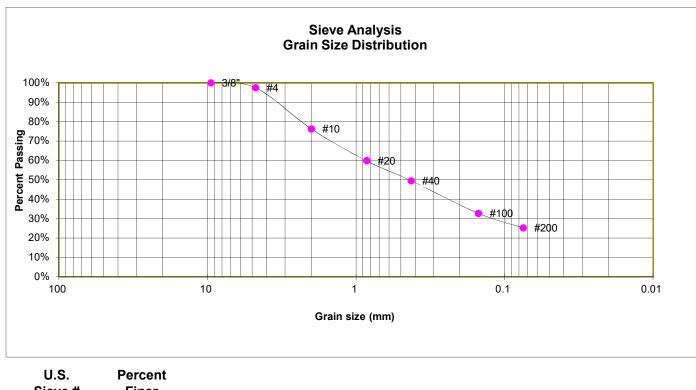


LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677

TEST BORINGTP-8DEPTH (FT)4-6SOIL TYPE3A

SOIL DESCRIPTION SAND, CLAYEY USCS CLASSIFICATION SC



0.5.	Percent
<u>Sieve #</u>	<u>Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.5%
10	76.3%
20	59.8%
40	49.5%
100	32.7%
200	25.2%

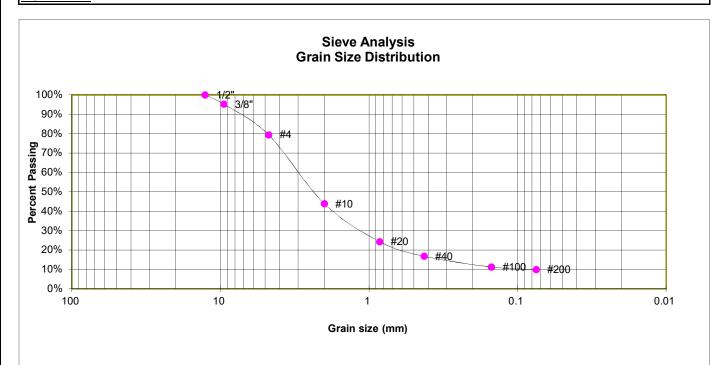


LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677

TEST BORINGTP-6DEPTH (FT)4-8SOIL TYPE2A

SOIL DESCRIPTION SAND, WITH SILT



Percent
<u>Finer</u>
100.0%
95.2%
79.5%
43.9%
24.4%
16.8%
11.3%
9.9%

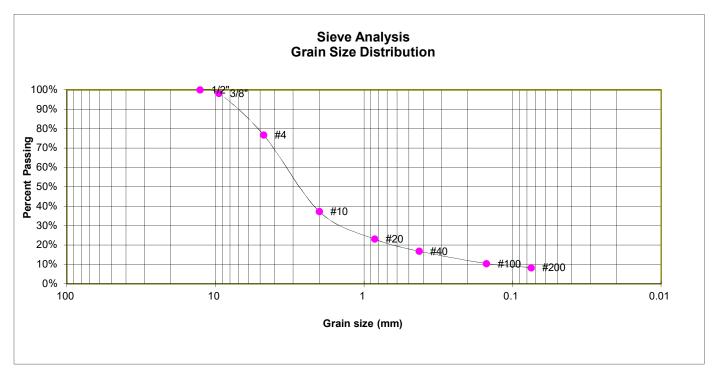


LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677

TEST BORING TP-5 DEPTH (FT) 1-2.5 SOIL TYPE 2A

SOIL DESCRIPTION SAND, WITH SILT



Percent
<u>Finer</u>
100.0%
98.2%
76.8%
37.3%
23.1%
16.8%
10.4%
8.4%

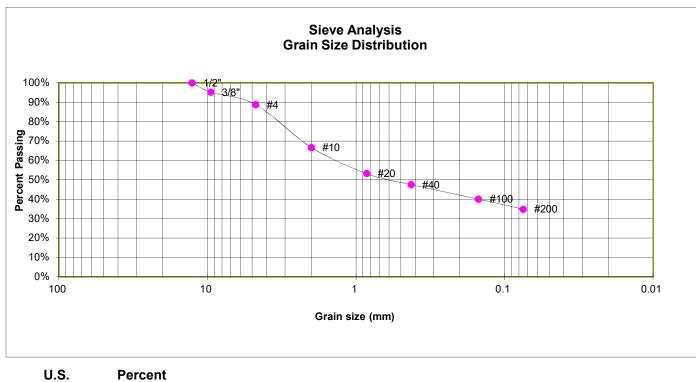


LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677

TEST BORINGTP-4DEPTH (FT)3.5-5.5SOIL TYPE4A

SOIL DESCRIPTION SAND, CLAYEY USCS CLASSIFICATION SC



U.S.	Percent
Sieve #	<u>Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	95.2%
4	88.8%
10	66.7%
20	53.3%
40	47.5%
100	40.1%
200	34.9%

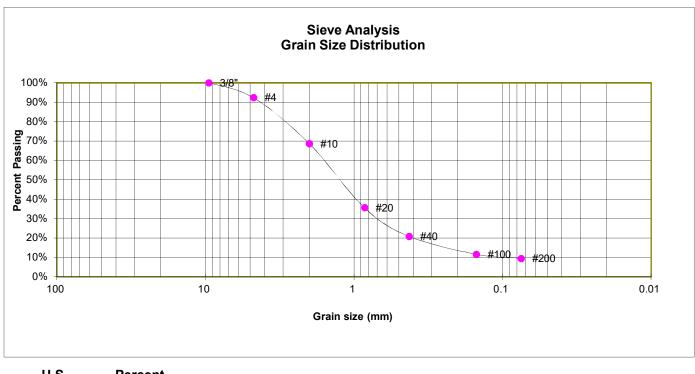


LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677

TEST BORINGTP-1DEPTH (FT)1-4SOIL TYPE3A

SOIL DESCRIPTION SAND, WITH SILT



U.S.	Percent
<u>Sieve #</u>	<u>Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.3%
10	68.7%
20	35.6%
40	20.8%
100	11.6%
200	9.5%



LABORATORY TEST RESULTS

ELBERT ROAD PT OVERLOOK JOB NO. 230677



APPENDIX D: Soil Survey Descriptions

El Paso County Area, Colorado

42—Kettle-Rock outcrop complex

Map Unit Setting

National map unit symbol: 368j Elevation: 6,800 to 7,700 feet Frost-free period: 110 to 130 days Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 60 percent Rock outcrop: 20 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills Landform position (three-dimensional): Side slope Down-slope shape: Linear Across-slope shape: Linear Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand *Bt* - 16 to 40 inches: gravelly sandy loam *C* - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 8 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 7e Hydrologic Soil Group: B Ecological site: F048AY908CO - Mixed Conifer Hydric soil rating: No

Description of Rock Outcrop

Typical profile

R - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 60 percent Depth to restrictive feature: 0 inches to lithic bedrock Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

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

Minor Components

Other soils

Percent of map unit: Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado Survey Area Data: Version 20, Sep 2, 2022



El Paso County Area, Colorado

66—Peyton sandy loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 369c
Elevation: 6,800 to 7,600 feet
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Peyton and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Flats, hills Landform position (three-dimensional): Side slope, talf Down-slope shape: Linear Across-slope shape: Linear Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam Bt - 12 to 25 inches: sandy clay loam BC - 25 to 35 inches: sandy loam C - 35 to 60 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 (0.20 to 0.60 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4c Hydrologic Soil Group: B Ecological site: R049XY216CO - Sandy Divide Hydric soil rating: No

JSDA

Minor Components

Other soils

Percent of map unit: Hydric soil rating: No

Pleasant

Percent of map unit: Landform: Depressions Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado Survey Area Data: Version 20, Sep 2, 2022



El Paso County Area, Colorado

68—Peyton-Pring complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369f Elevation: 6,800 to 7,600 feet Farmland classification: Not prime farmland

Map Unit Composition

Peyton and similar soils: 40 percent Pring and similar soils: 30 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peyton

Setting

Landform: Hills Landform position (three-dimensional): Side slope Down-slope shape: Linear Across-slope shape: Linear Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 12 inches: sandy loam Bt - 12 to 25 inches: sandy clay loam BC - 25 to 35 inches: sandy loam C - 35 to 60 inches: sandy loam

Properties and qualities

Slope: 3 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 (0.20 to 0.60 in/hr) Depth to water table: More than 80 inches Frequency of flooding: None Frequency of ponding: None Available water supply, 0 to 60 inches: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 4c Hydrologic Soil Group: B Ecological site: R049XY216CO - Sandy Divide Hydric soil rating: No

JSDA

Description of Pring

Setting

Landform: Hills Landform position (three-dimensional): Side slope Down-slope shape: Linear Across-slope shape: Linear Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 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): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: B Ecological site: R048AY222CO - Loamy Park Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: Hydric soil rating: No

Pleasant

Percent of map unit: Landform: Depressions Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado Survey Area Data: Version 20, Sep 2, 2022



El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k Elevation: 6,800 to 7,600 feet Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills Landform position (three-dimensional): Side slope Down-slope shape: Linear Across-slope shape: Linear Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 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): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification (nonirrigated): 3e Hydrologic Soil Group: B Ecological site: R048AY222CO - Loamy Park Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit: Landform: Depressions Hydric soil rating: Yes Other soils

Percent of map unit: Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado Survey Area Data: Version 20, Sep 2, 2022

