ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599

August 21, 2024

Mark McDonald
12425 Meridian Road
Elbert, Colorado 80106

Re: Soils and Geology Study
Misfit Crew Estates
5775 Mountain Shadow View
Parcel No. 61240-00-013
El Paso County, Colorado
Entech Job No. 240944

Dear Mr. McDonald:

The project consists of subdividing approximately 36 acres. Three rural residential lots are proposed. Existing houses and structures on Lot 1 will remain, with two new lots proposed. The site is located southeast of the intersection of northwest of Hodgen Road and Thompson Road, in northern El Paso County, Colorado.

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the SE¼ of Section 24, Township 11 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is gradually to moderately sloping to the southwest and northeast along a ridge through the central portion of the site. A drainage is located in the southern portion of the site within proposed Lots 2 and 3, and several minor drainage swales and a pond are located on Lot 1. The pond seasonally contains water. Water was not observed flowing in any of the drainages the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included agricultural and rural residential. The site contains primarily field grasses, and weeds with landscaped areas, pine trees and aspens around the existing residence on Lot 1. Site photographs, taken July 11, 2024, are included in Appendix A.

Total acreage involved in the proposed subdivision is approximately 36 acres. Three rural residential lots are proposed as part of the replat. The proposed lot sizes range from approximately 5 to 25 acres. The existing residence and outbuildings will remain on Lot 1. The two new lots will be serviced by individual wells and on-site wastewater treatment systems. Existing septic records for the residence on Lot 1 are included with this report. The Site and Exploration Plan with the proposed replat is presented in Figure 3.

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 on development and land use. These include artificial fill, potentially expansive soils, ponded water, and potential seasonally shallow groundwater areas. Based on the proposed development plan, it appears that these areas will have some minor impacts on the development. The drainage in the southern portion of the site within Lots 2 and 3 is within a drainage easement where development will be avoided. 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.

SCOPE OF THE REPORT

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

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 aerial photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on July 11, 2024.

Two test borings were drilled to determine general soil conditions and two test pits were excavated to determine the general suitability for the use of on-site wastewater treatment systems. The location of the test borings and test pits are indicated on the Site Plan/Test Pit Location Map, Figure 3. The Test Boring and Test Pit Logs are presented in Appendix B. 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, and Atterberg Limits, ASTM D-4318. Results of the laboratory testing are included in Appendix C.

SOIL AND GEOLOGIC CONDITIONS

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 1, Figure 4), previously the Soil Conservation Service (Reference 2) has mapped two soil types on the site. Complete descriptions of the soil types are presented in Appendix D. In general, the soils consist of sandy loam to gravelly loamy sand. The soils are described as follows:

Soil Type	Description
40	Kettle gravelly loamy sand, 3 – 8% Slopes
41	Kettle gravelly loamy sand, 8 – 40% Slopes

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as homesites. Possible hazards with soils erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 2).

Soils

The soils encountered in the test borings and test pits consisted of a layer of silty to clayey sand overlying weathered sandy claystone and silty sandstone. Bedrock was encountered at depths ranging from 7 to 12 feet in the test borings, and at approximately 5 feet in the test pits. The upper sands were encountered at loose to medium dense states and moist conditions. Swell/Collapse Testing on a sample of the claystone resulted in a consolidation of 1.3%. Expansive claystone and siltstone are commonly interbedded within the sandstone of the Dawson Formation. Test Boring and Test Pit Logs are included in Appendix B and Laboratory testing results are included in Appendix C.

Groundwater

Groundwater was not encountered in the test borings which were drilled to depths of 20 feet. Redoximophic features were observed in Test Pit No. 1 at 7.5 feet. It is anticipated groundwater will not affect shallow foundations on the site. Fluctuations in groundwater conditions may occur due to variations in rainfall or other factors not readily apparent at this time. Isolated sand layers within the soil profile can carry water in the subsurface. Contractors should be cognizant of the potential for the occurrence of subsurface water features during construction.

Geology

Approximately 12 miles west of the site 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 a large structural feature known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction (Reference 3). The bedrock underlying the site consists of the Dawson Formation of Cretaceous Age. The Dawson Formation typically consists of fine to coarse-grained arkosic sandstone with interbedded claystone or siltstone. Overlying the Dawson Formation are alluvial deposits of Holocene to late Pleistocene Age.

The geology of the site was evaluated using the *Geologic Map of the Black Forest Quadrangle,* by Thorson in 2003, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. Two mappable units were identified on this site which is described as follows:

Qaf **Artificial Fill of Holocene Age:** These man-placed fill associated with the existing erosion berms across the property and the earthen embankment located south of the existing residence on Lot 1.

Tkd **Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson Formation typically consists of

coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Black Forest Quadrangle* distributed by the Colorado Geologic Survey in 2003 (Reference 4, Figure 5), The *Geologic Map of the Colorado Springs-Castle Rock Area,* distributed by the US Geological Survey in 1979 (Reference 5), and the *Geologic Map of the Pueblo 1° x 2° Quadrangle,* distributed by the US Geological Survey in 1978 (Reference 6). The test borings and test pits were also used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

ENGINEERING GEOLOGIC HAZARDS

Mapping has been performed on this site to identify areas where various geologic conditions exist of which developers should be cognizant during the planning, design and construction stages where new construction is proposed. The engineering geologic constraints/hazards identified on this site include artificial fill, potentially expansive soils, ponded water, and potential seasonally shallow groundwater areas. These constraints/hazards and recommended mitigation techniques are discussed as follows:

Artificial Fill – Constraint
These are areas of man-made fill associated with erosion berms across the site and an existing embankment located on Lot 1. Areas of fill other than those mapped may exist on the site.
Mitigation: If uncontrolled fill is encountered beneath foundations, mitigation will be necessary. Mitigation typically involves removal and recompaction at 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

Expansive Soils – Constraint
Expansive soils were encountered in the test borings, and highly expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. These clays or claystone, if encountered beneath foundations, can cause differential movement in the structure foundation. Individual site investigations will be required for construction on each lot prior to permitting/construction.
Mitigation: Should expansive soils be encountered at or near the foundation subgrade; mitigation will be necessary. Mitigation of expansive soils typically consists of overexcavation of 4 feet of the expansive soils or bedrock and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements.

Landslide Hazard and Slope Stability
The topography of the site is gradually to moderately sloping to the southwest and northeast along a ridge through the central portion of the site. No signs of slope failures or unstable slopes were not observed on the site at the time of our site reconnaissance.

Drainage Areas

A drainage is located in the southern portion of the site within proposed Lots 2 and 3, and several minor drainage swales and a pond are located on Lot 1. The pond seasonally contains water. Water was not observed flowing in any of the drainages the time of this investigation. This area is indicated in the Geology/Engineering Geology Map (Figure 6) and are discussed below. The drainage on Lots 2 and 3 is within a drainage easement no-build area. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO305G dated December 7, 2018 (Figure 7, Reference 7). Exact locations of floodplain and specific drainage studies are beyond the scope of this report.

The pond located on Lot 1 has been identified in the National Wetland Inventory as Freshwater Emergent Wetland habitats classified as PUSCh (Palustrine – P, Unconsolidated Shore – US, Persistent – 1, Seasonally Flooded – C, Diked/Impounded – H), (Figure 8, Reference 8). No construction or development is proposed in this area.

- Potentially Seasonal Shallow Groundwater Area - Constraint

Portions of the drainage and minor drainage swales on the site have been identified as a potentially seasonal shallow groundwater area. In these areas we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils. The upslope sides of the erosion berms also have the potential to become saturated after periods of increased precipitation. These area lies within defined minor drainages which can be avoided by the development of Lots 2 and 3. Construction in any portions of these areas, if required, or immediately adjacent to these areas should follow these precautions.

Mitigation: Foundations must have a minimum 30-inch depth for frost protection. In areas where high subsurface moisture conditions are anticipated periodically, subsurface perimeter drains are recommended to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 9. Any grading in these areas should be done to direct surface flow around structures to avoid areas of ponded water. All organic material would be completely removed prior to any fill placement. **Specific drainage studies are beyond the scope of this report.**

Shallow Bedrock – Constraint

Bedrock was encountered in the test borings at depths ranging from the 7 to 12 feet, and at approximately 5 feet in the test pits. Where shallow bedrock is encountered, excavation/grading may be difficult requiring track-mounted excavators with ripper attachments.

Faults – Hazard

The closest fault is the Rampart Range Fault, located approximately 11 miles west of the site (Reference 3). No faults are mapped in the site itself. Previously, Colorado was mapped entirely within Seismic Zone 1, a very low seismic risk. Additionally, the International Residential Code (IRC), 2003, currently places this area in Seismic Design Category B, also a low seismic risk. According to a report by the Colorado Geological Survey by Kirkman and Rogers, Bulletin 43 (1981) (Reference 9), this area should be designed for Zone 2 due to more recent data on the potential for movement in this area and any resultant earthquakes.

Radon – Hazard

Radon is a colorless, tasteless radioactive gas with a United States Environmental Protection Agency (EPA) specified action level of 4.0 picocuries per liter (pCi/L) of air. Radon gas has a very short half-life of 3.8 days. Radon levels for the area have been reported by the Colorado Geologic Survey in the open file, Report No. 91-4 (Reference 10). Average Radon levels for the 80908-zip code is 3.40 pCi/l. The following is a table of radon levels in this area:

Average Radon Levels for the 80908 Zip Code	
0 < 4 pCi/L	50.00%
4 < 10 pCi/L	50.00%
10 < 20 pCi/L	0.00%
> 20 pCi/L	0.00%

Mitigation:

The potential for high radon levels is present for the site. Build-up of radon gas can usually be mitigated by providing increased ventilation of basement and crawlspace and sealing joints. **Specific requirements for mitigation should be based on site specific testing.**

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING

The proposed development will be rural-residential utilizing individual on-site wastewater treatment systems and water wells. Total acreage involved in the proposed subdivision is approximately 36 acres. Three rural residential lots proposed as part of the replat. The proposed lot sizes range from approximately 5 to 26 acres. The existing residence and outbuildings will remain on Lot 1. The two new lots will be serviced by individual wells and on-site wastewater treatment systems. The existing geologic and engineering geologic conditions will impose minor constraints on development and construction. These geologic conditions on the site include artificial fill, potentially expansive soils, ponded water, and potential seasonally shallow groundwater areas, which can be satisfactorily mitigated through avoidance or proper engineering design and construction practices.

The upper granular soils encountered in the test borings and test pits on the site were encountered at loose medium dense states, the claystone was encountered at hard consistencies and sandstone at dense states. Expansive soils were encountered in the test borings. Expansive claystone and siltstone are commonly interbedded in the sandstone of the Dawson Formation. Mitigation of expansive soils typically consists of overexcavation of 4 feet of the expansive soils or bedrock and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area.

Man-place fill associated with existing erosion berms across the site can be mitigated with regrading if necessary. The earthen dam on Lot 1 is to be avoided by any future construction.

A drainage is located in the southern portion of the site within proposed Lots 2 and 3, and several minor drainage swales and a pond are located on Lot 1. The pond seasonally contains water. Water was not observed flowing in any of the drainages the time of this investigation. This area is indicated in the Geology/Engineering Geology Map (Figure 6) and are discussed below. The drainage on Lots 2 and 3 is within a drainage easement no-build area. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO305G dated December 7, 2018 (Figure 7, Reference 8). Exact locations of floodplain and specific drainage studies are beyond the scope of this report. **Specific drainage studies are beyond the scope of this report.**

The pond located on Lot 1 has been identified in the National Wetland Inventory as Freshwater Emergent Wetland habitats classified as PUSCh (Palustrine – P, Unconsolidated Shore – US, Persistent – 1, Seasonally Flooded – C, Diked/Impounded – H), (Figure 8, Reference 8). No construction or development is proposed in this area.

In summary, the granular soils will likely provide suitable support for shallow foundations. The geologic conditions encountered on site can be mitigated with avoidance or proper engineering and construction practices.

ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 11), of the area of the site is not mapped with any resources. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 12), the site is not mapped with any potential aggregate resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 13), the area of the site has been mapped as “little or no potential” for industrial minerals.

According to *the Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 13), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as “Poor” for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site (Reference 13).

The site has been mapped as “Fair” for oil and gas resources (Reference 13). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

EROSION CONTROL

The soil types observed on the site are mildly to highly susceptible to wind erosion, and moderately to highly susceptible to water erosion. A minor wind erosion and dust problem may be created for a short time during and immediately after construction. Should the problem be considered severe enough during this time, watering of the cut areas or the use of chemical palliative may be required to control dust. However, once construction has been completed and vegetation re-established, the potential for wind erosion should be considerably reduced.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some minor constraints on development and construction of the site. The majority of these conditions can be avoided by construction. Others 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 new building sites and septic systems 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 Mark McDonald, 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.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Sr. Geologist

Reviewed by:

Digitally signed by Joseph C. Goode Jr.
Date: 08/21/24

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

LLL/JG
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2. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado.*

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7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the El Paso County, Colorado.* Map Number 08041CO305G.

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12. 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.

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FIGURES

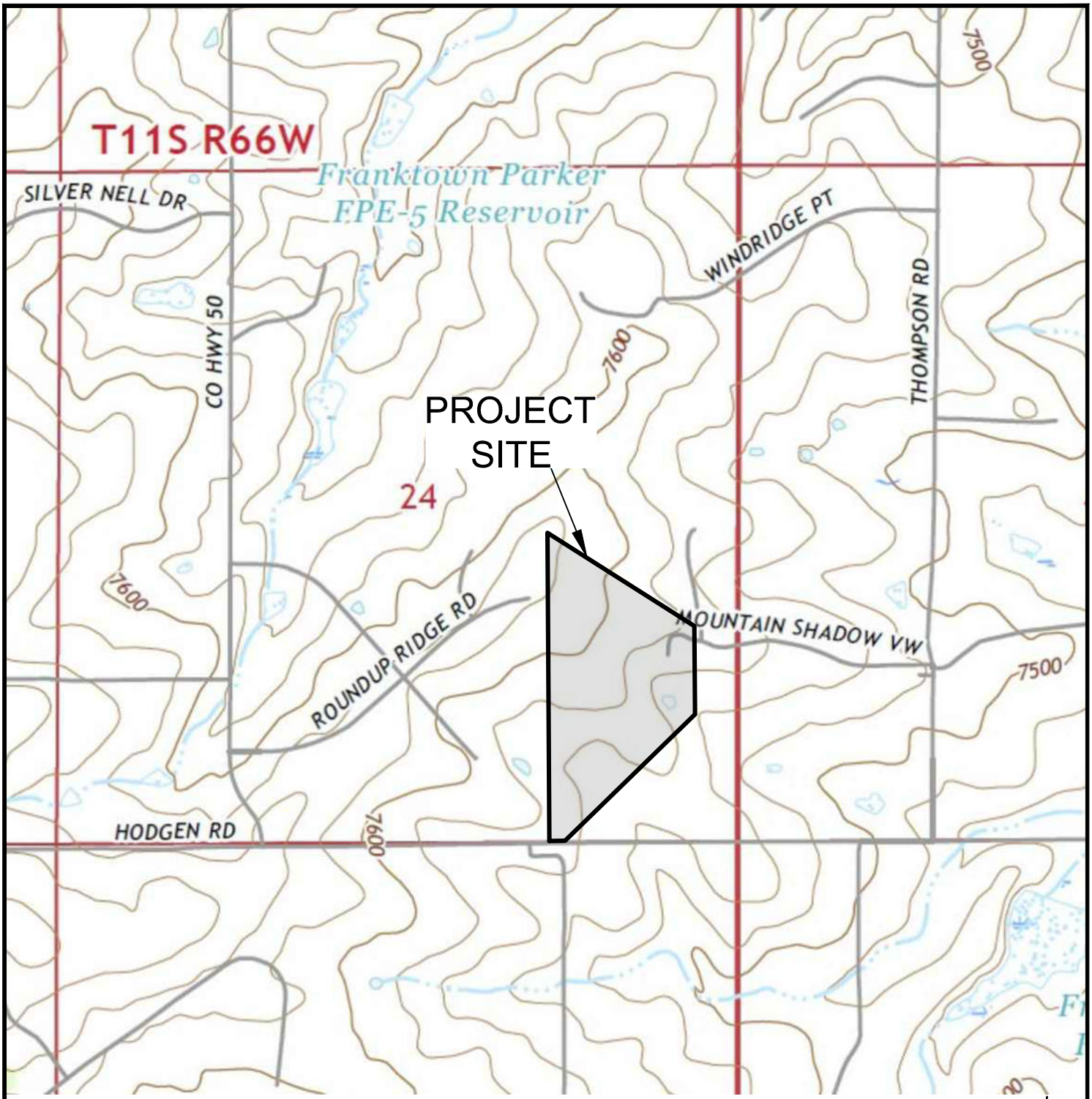
ENTECH ENGINEERING, INC.

VICINITY MAP

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO.
240944

FIG. 1



ENTECH ENGINEERING, INC.

USGS TOPOGRAPHY MAP

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

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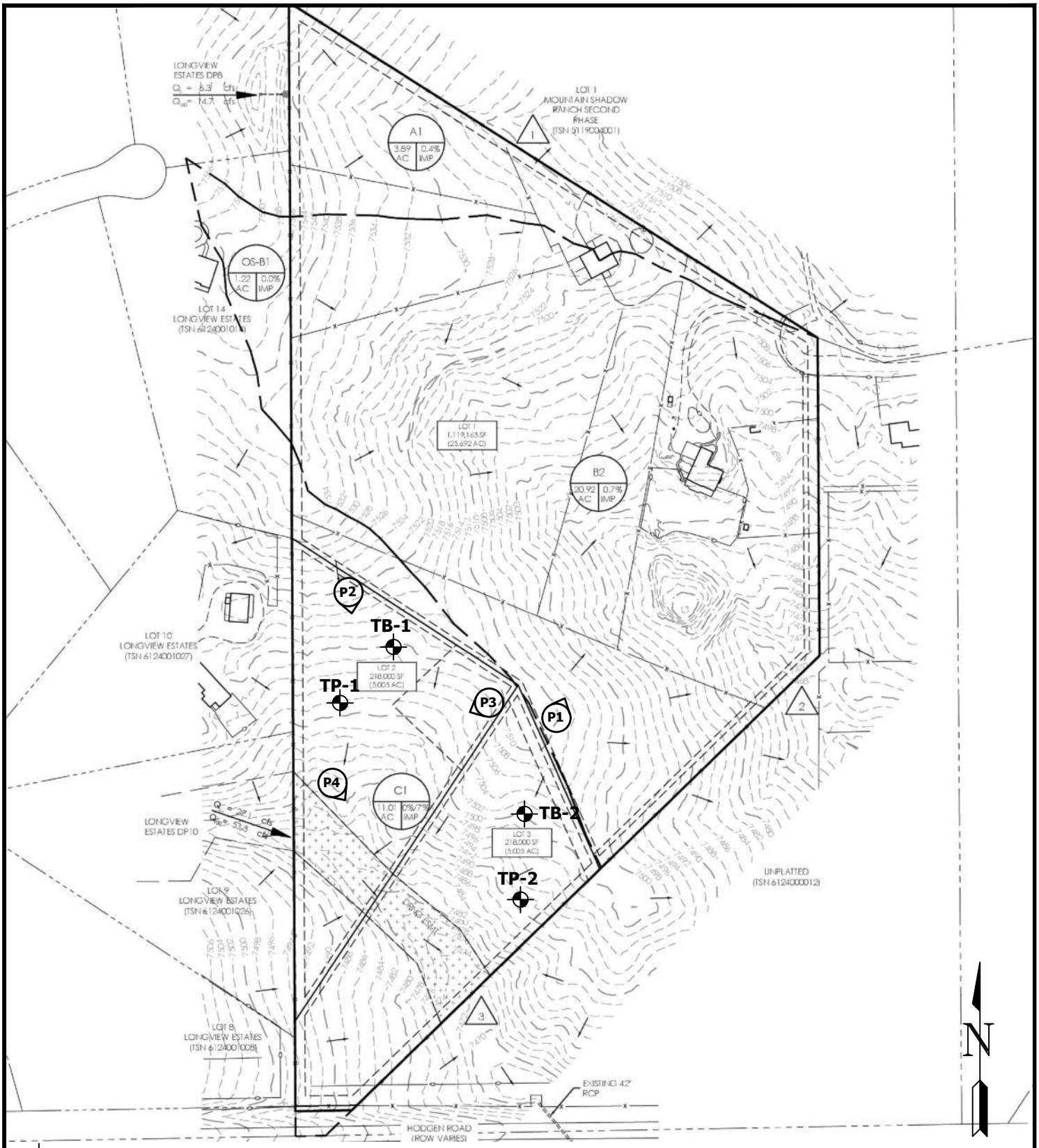
FIG. 2



TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

- APPROXIMATE PHOTOGRAPH LOCATION AND NUMBER

ENTECH ENGINEERING, INC.

SITE AND EXPLORATION PLAN

5775 MOUNTAIN SHADOW VIEW
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FIG. 3

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SOIL SURVEY MAP

5775 MOUNTAIN SHADOW VIEW
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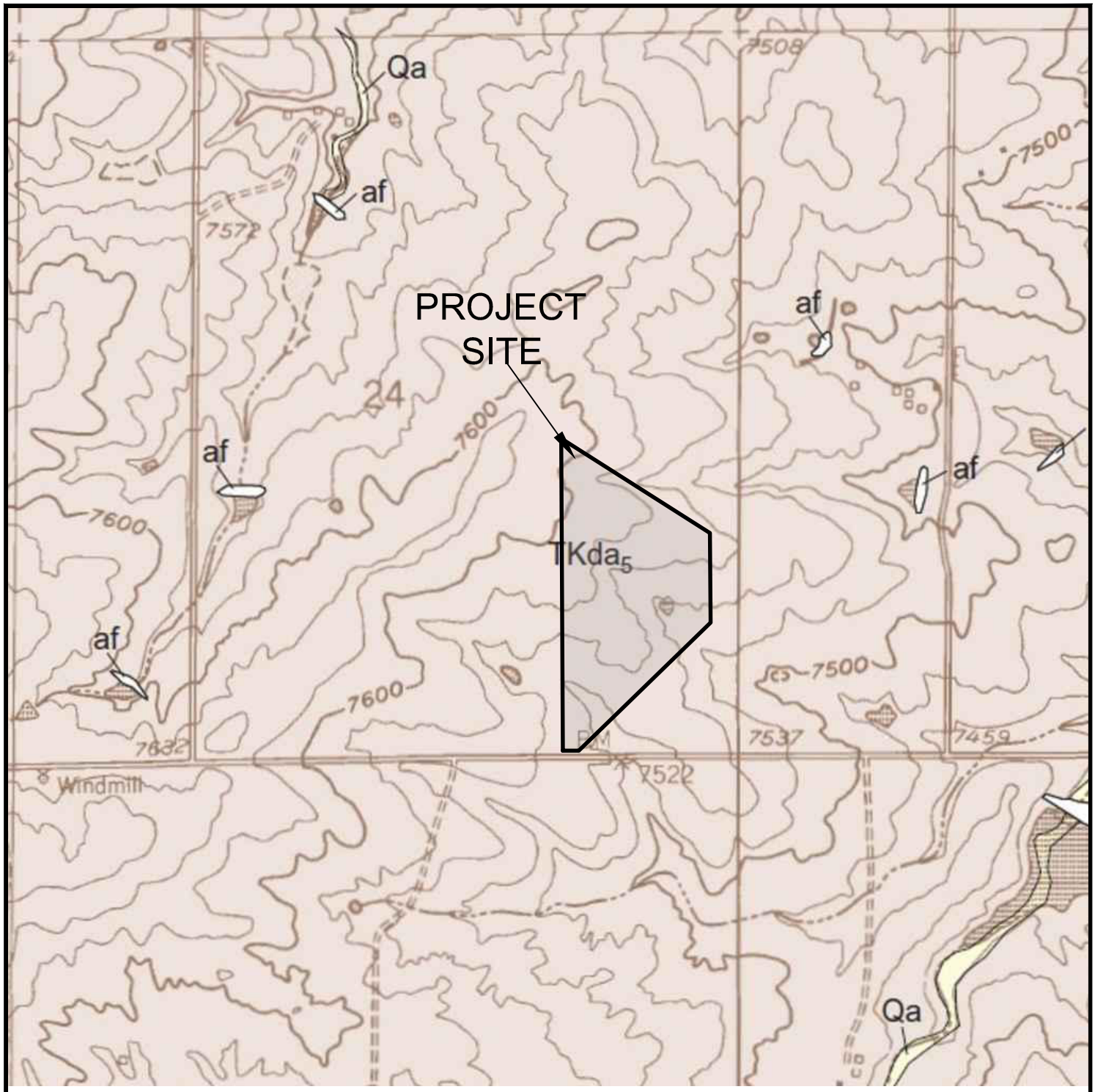
FIG. 4



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GEOLOGIC MAP OF THE BLACK FOREST QUADRANGLE

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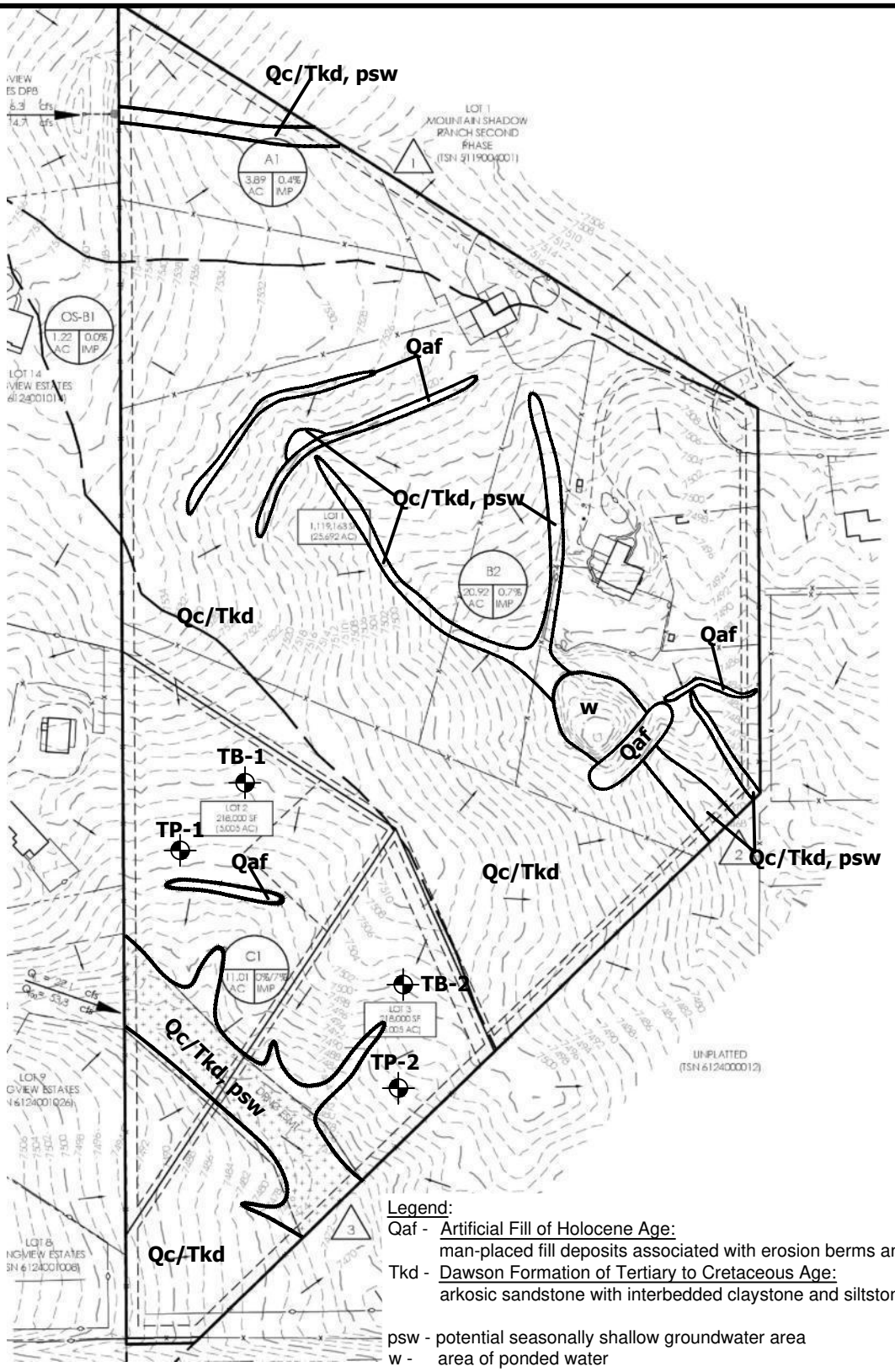
FIG. 5



Legend:

Qaf - Artificial Fill of Holocene Age:
man-placed fill deposits associated with erosion berms and earthen dam

Tkd - Dawson Formation of Tertiary to Cretaceous Age:
arkosic sandstone with interbedded claystone and siltstone

psw - potential seasonally shallow groundwater area

w - area of ponded water

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GEOLOGY/ENGINEERING GEOLOGY MAP

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

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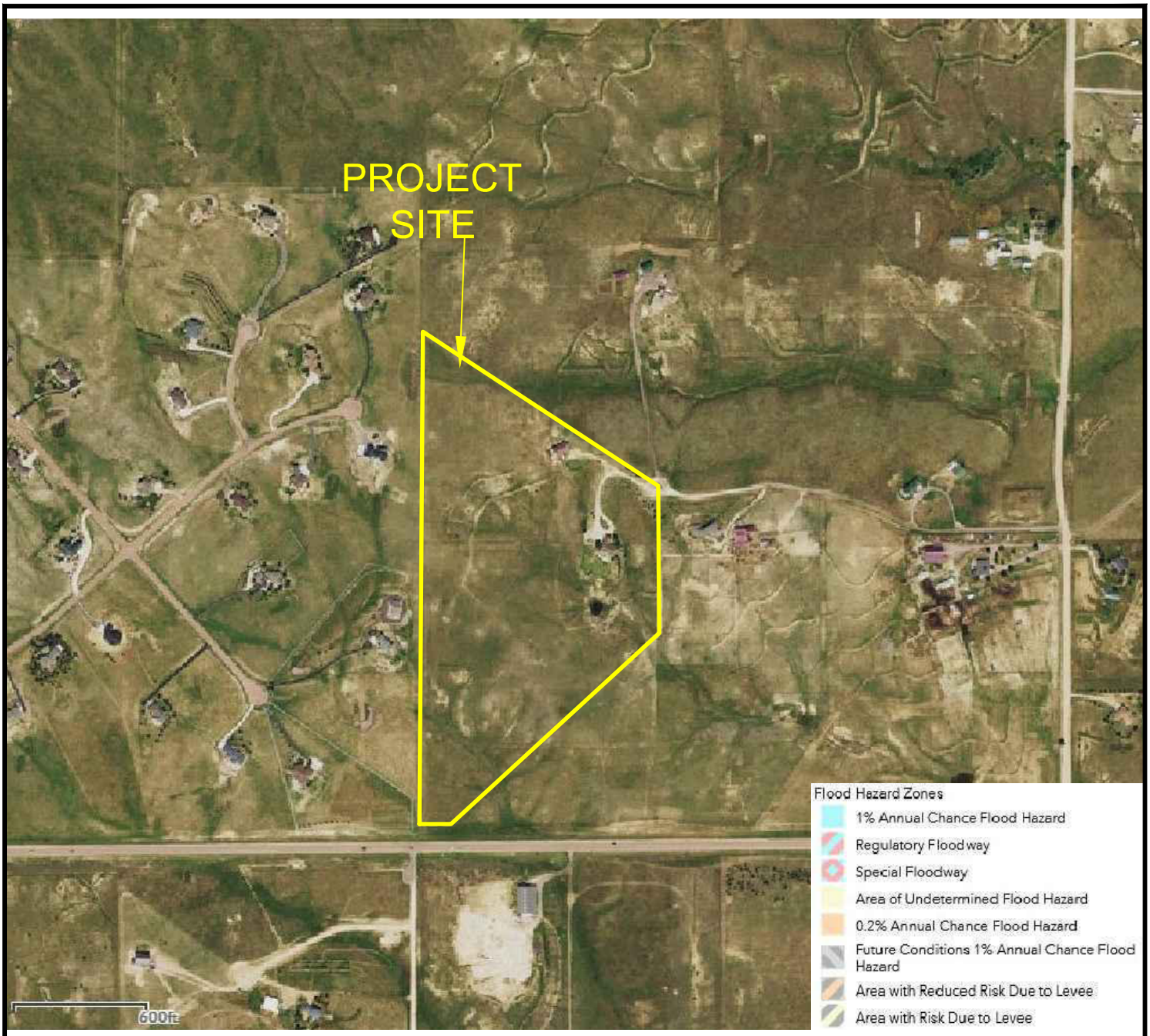
FIG. 6



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FEMA FLOODPLAIN MAP

5775 MOUNTAIN SHADOW VIEW
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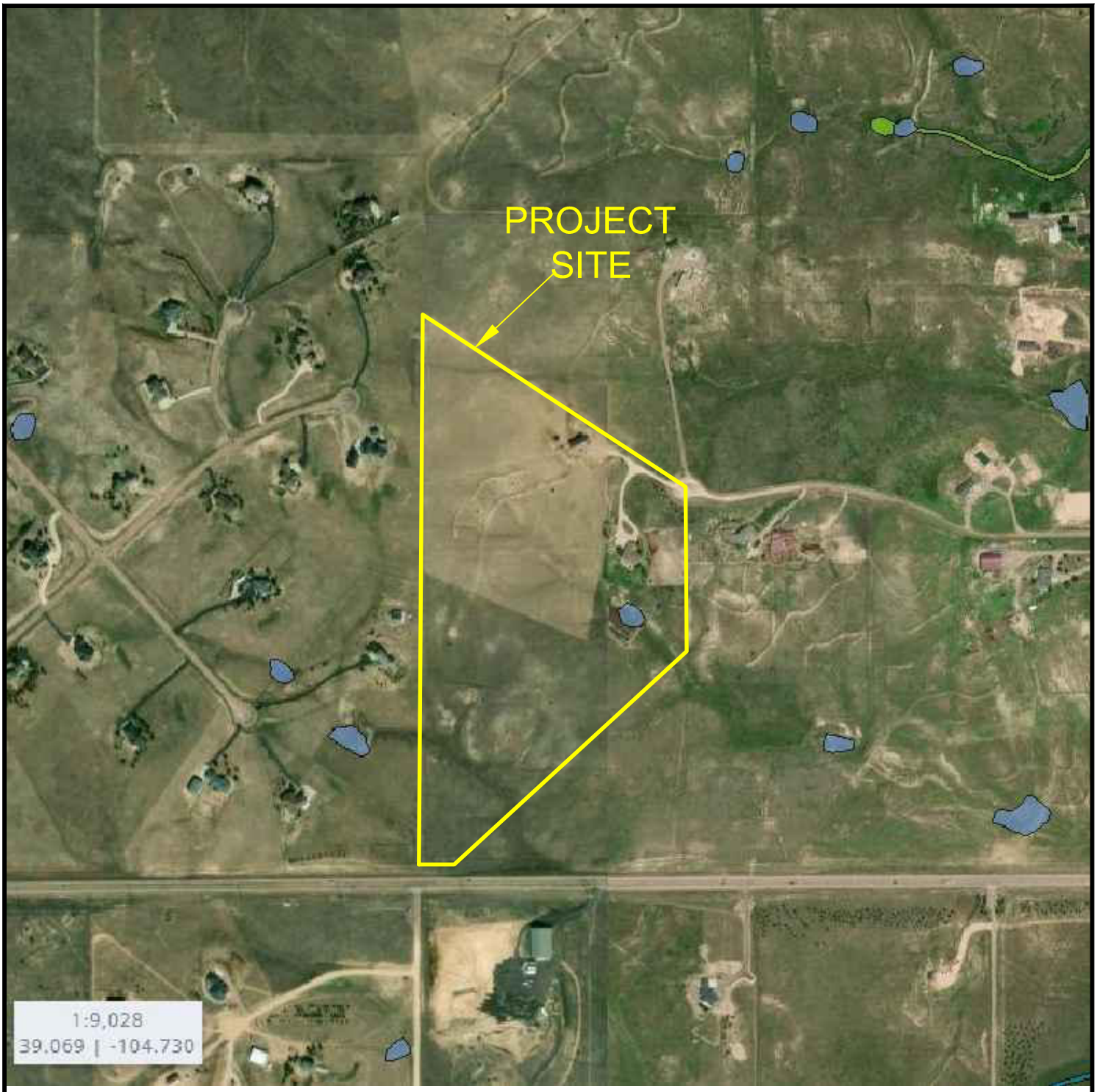
FIG. 7



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USFWS WETLANDS MAP

5775 MOUNTAIN SHADOW VIEW
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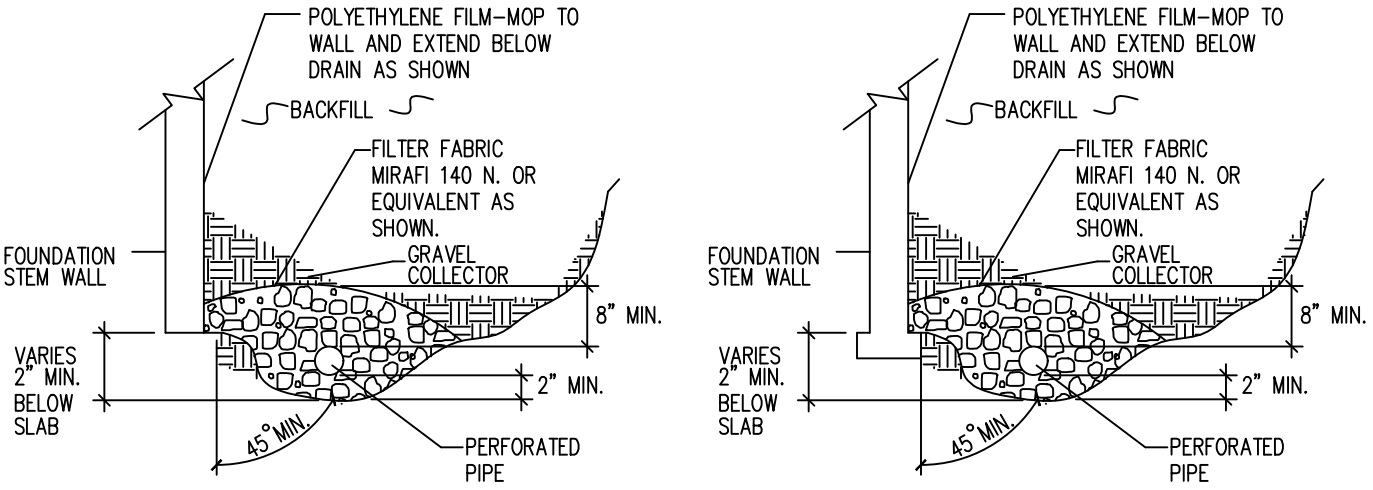
FIG. 8



NOTES:

–GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS–85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

–PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4–INCH DIAMETER IS MOST OFTEN USED.

–ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON–PERFORATED PIPE.

–FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

–MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

–DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUT FALL IS NOT AVAILABLE.

ENTECH ENGINEERING, INC.

PERIMETER DRAIN DETAIL

5775 MOUNTAIN SHADOW VIEW
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FIG. 9

APPENDIX A: Site Photographs

1

Looking north from the eastern central portion of the site.

July 11, 2024

2

Looking south from the western central portion of the site.

July 11, 2024

Job No. 240944

3

Looking west from the central portion of the lot.

July 11, 2024

4

Looking southeast along drainage easement.

July 11, 2024

Job No. 240944

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING 1
DATE DRILLED 7/11/2024

REMARKS

DRY TO 20', 7/12/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %
SAND, CLAYEY, OLIVE to BROWN, LOOSE to MEDIUM DENSE, MOIST			14	6.5
5			4	8.3
10			24	14.9
CLAYSTONE, WEAK, OLIVE, HIGHLY WEATHERED (CLAY, SANDY, HARD, MOIST)			50/10"	9.7
15				
SANDSTONE, EXTREMELY WEAK, TAN, COMPLETELY WEATHERED (SAND, SILTY, VERY DENSE, MOIST)			48	4.8
20				

TEST BORING 2
DATE DRILLED 7/11/2024

REMARKS

DRY TO 20', 7/12/24

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %
SAND, SILTY, GRAVELLY, BROWN, LOOSE, MOIST			6	3.3
SAND, CLAYEY, OLIVE, MEDIUM DENSE, MOIST			17	16.2
5				
CLAYSTONE, WEAK, OLIVE, HIGHLY WEATHERED (CLAY, SANDY, HARD, MOIST)			50/10"	8.7
10				
SANDSTONE, EXTREMELY WEAK, TAN, COMPLETELY WEATHERED (SAND, SILTY, VERY DENSE to DENSE, MOIST)			50/11"	7.9
15				
			35	8.2
20				

ENTECH ENGINEERING, INC.

TEST BORING LOGS

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO. 240944

FIG. B-1

TEST PIT 1
DATE EXCAVATED 7/12/2024

REMARKS

redoximorphic features @ 7.5'

Depth (ft)	Description	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
1	0-6" topsoil,sandy loam, dark brown, moist		gr	m	2
2	sandy loam, fine to coarse grained, light brown, moist				
3			gr	w	3A
4	sandy clay loam, fine to coarse grained, light brown, moist				
5					
6	sandstone (Dawson Formation), gravelly sandy clay, fine to coarse grained, light brown, moist		ma		4A
7					
8					
9					
10					

TEST PIT 2
DATE EXCAVATED 7/12/2024

REMARKS

Depth (ft)	Description	Samples	Soil Structure Shape	Soil Structure Grade	Soil Type
1	0-6" topsoil,sandy loam, dark brown, moist				
2	sandy loam, fine to coarse grained, light brown, moist		gr	w	2A
3					
4	sandy clay loam, fine to coarse grained, light brown, moist		gr	w	3A
5					
6	sandstone (Dawson Formation), gravelly sandy clay, fine to coarse grained, light brown, moist		ma		4A
7					
8					
9					
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
structureless - sl

ENTECH ENGINEERING, INC.

TEST PIT LOGS

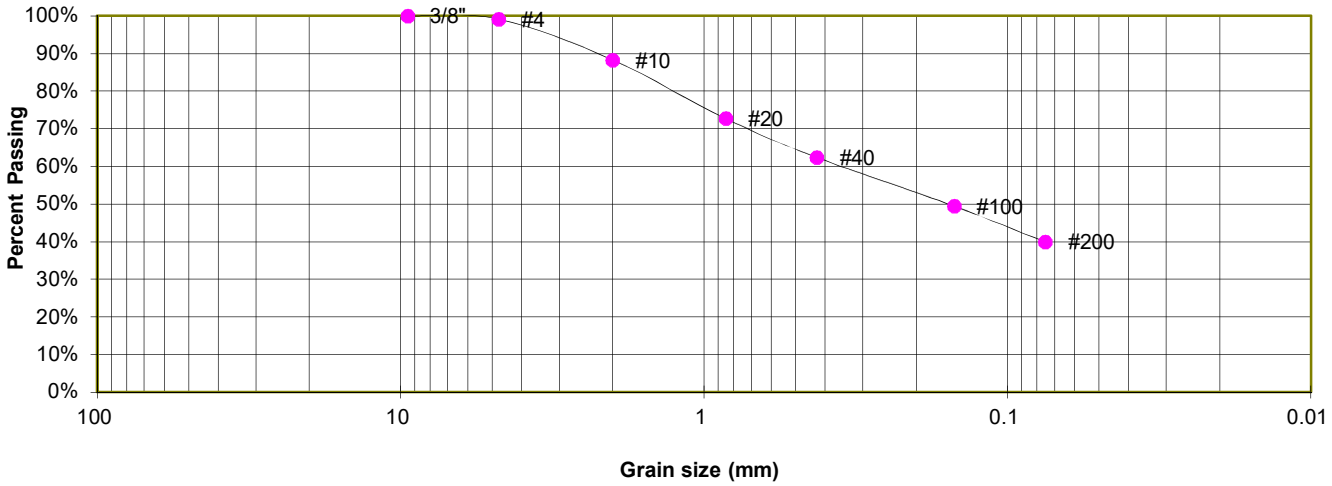
5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO.
240944

FIG. B-2

APPENDIX C: Laboratory Testing Results

TEST BORING	1	SOIL DESCRIPTION	SAND, CLAYEY
DEPTH (FT)	5		



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.2%
10	88.3%
20	72.7%
40	62.4%
100	49.5%
200	39.9%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

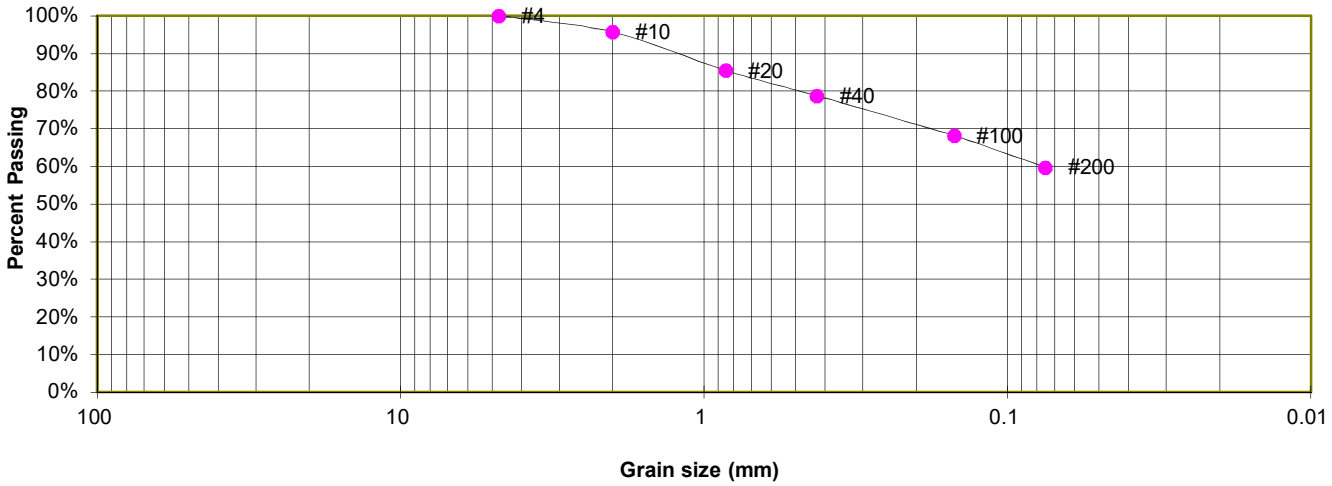
LABORATORY TEST RESULTS

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO.
240944

FIG. C-1

TEST BORING	1	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	15		



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	95.8%
20	85.5%
40	78.8%
100	68.2%
200	59.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: CL

ENTECH ENGINEERING, INC.

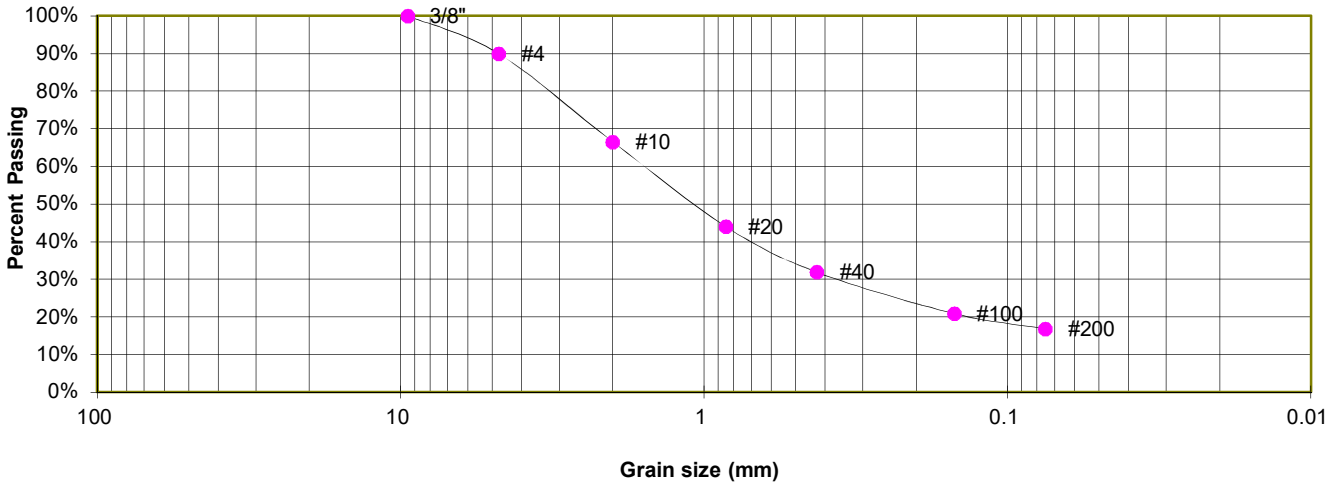
LABORATORY TEST RESULTS

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO. 240944

FIG. C=2

TEST BORING	2	SOIL DESCRIPTION	SAND, SILTY, GRAVELLY
DEPTH (FT)	2-3		



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	89.9%
10	66.5%
20	44.1%
40	31.9%
100	21.0%
200	16.8%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

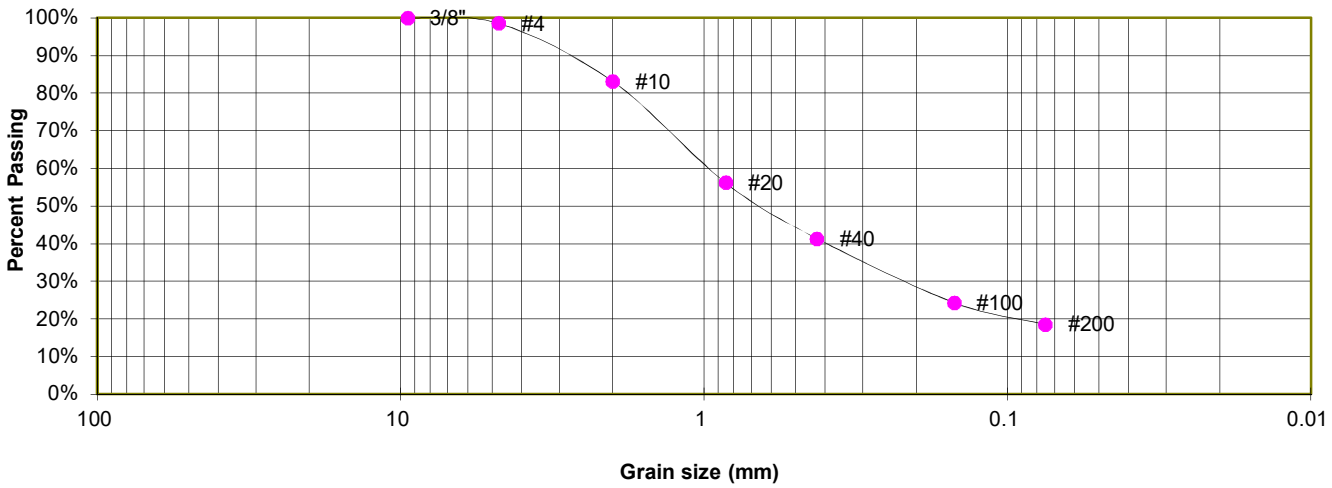
LABORATORY TEST RESULTS

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO.
240944

FIG. C-3

TEST BORING	2	SOIL DESCRIPTION	SANDSTONE (SAND, SILTY)
DEPTH (FT)	20		



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.6%
10	83.1%
20	56.2%
40	41.4%
100	24.3%
200	18.6%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO.
240944

FIG. C-4

TEST BORING	1	SOIL DESCRIPTION	CLAYSTONE (CLAY, SANDY)
DEPTH (FT)	15		

SWELL/COLLAPSE TEST RESULTS

NATURAL UNIT DRY WEIGHT (PCF): 119
NATURAL MOISTURE CONTENT: 10.5%
SWELL/COLLAPSE (%): -1.3%

ENTECH ENGINEERING, INC.

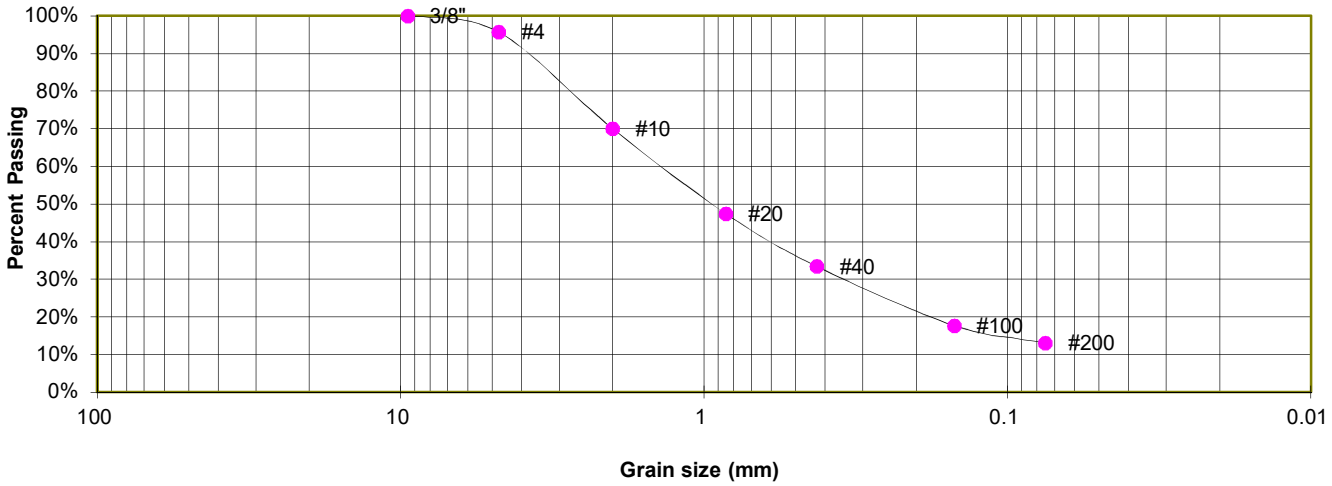
SWELL TEST RESULTS

5775 MOUNTAIN SHADOW VIEW
MARK MCDONALD

JOB NO. 240944

FIG. C-5

TEST PIT	TP-1	SOIL DESCRIPTION	SCL
DEPTH (FT)	3		



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.7%
10	70.0%
20	47.5%
40	33.4%
100	17.7%
200	13.1%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

ENTECH ENGINEERING, INC.

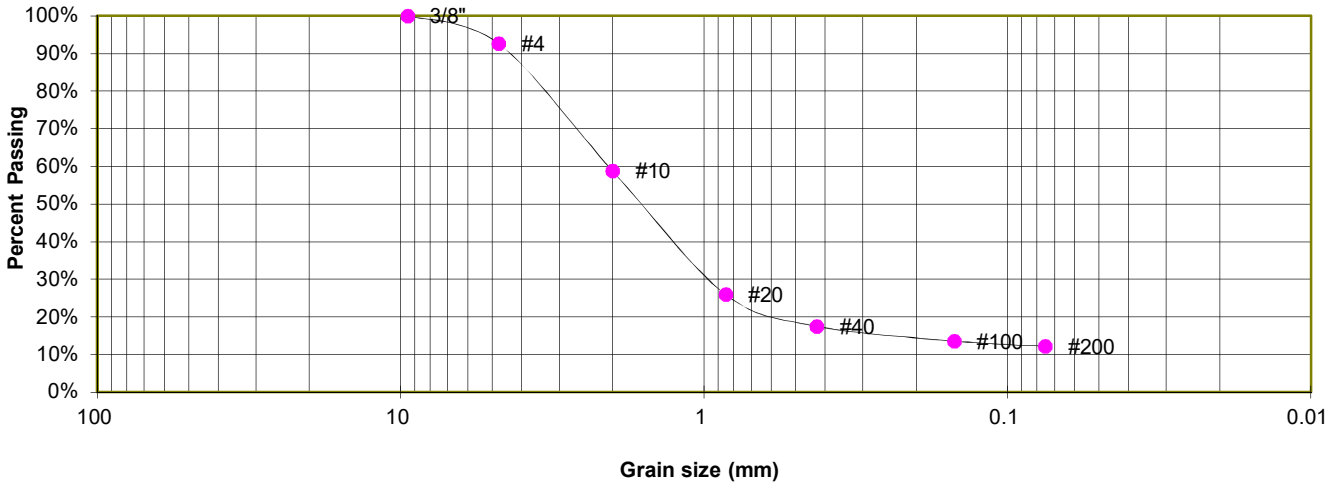
LABORATORY TEST RESULTS

TEACUP COW RANCH
MARK MCDONALD

JOB NO. 240944

FIG. C-6

TEST PIT	TP-2	SOIL DESCRIPTION	SC
DEPTH (FT)	6		



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.6%
10	58.8%
20	26.0%
40	17.5%
100	13.6%
200	12.1%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SC

ENTECH ENGINEERING, INC.

LABORATORY TEST RESULTS

TEACUP COW RANCH
MARK MCDONALD

JOB NO. 240944

FIG. C-7

APPENDIX D: USDA Soil Descriptions

El Paso County Area, Colorado

21—Cruckton sandy loam, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 367s
Elevation: 7,200 to 7,600 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 42 to 46 degrees F
Frost-free period: 110 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Cruckton

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 11 inches: sandy loam
Bt - 11 to 28 inches: sandy loam
C - 28 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
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 21, Aug 24, 2023

El Paso County Area, Colorado

67—Peyton sandy loam, 5 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369d
Elevation: 6,800 to 7,600 feet
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 115 to 125 days
Farmland classification: Not prime farmland

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: 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: 5 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (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): 4e
Hydrologic Soil Group: B
Ecological site: R049XY216CO - Sandy Divide
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 21, Aug 24, 2023

APPENDIX E: El Paso County Health Department, Existing Septic Records

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
INDIVIDUAL SEWAGE DISPOSAL SYSTEM INSPECTION FORM

Permit # 12476
Date 10/15/98

#6124000013

APPROVED: YES ✓ NO ____ ENVIRONMENTALIST KRUEGER

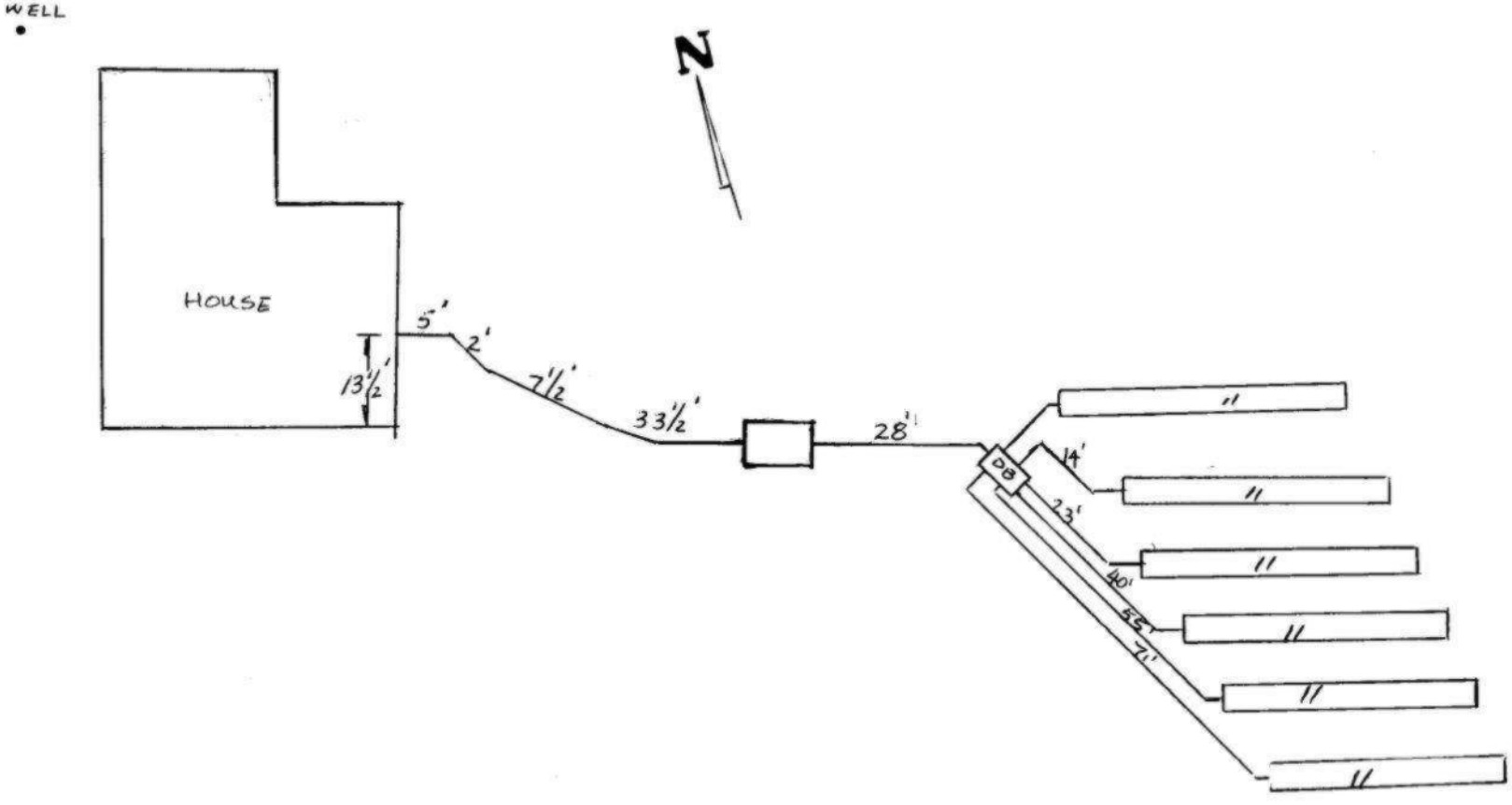
Address 5775 MOUNTAIN SHADOW VIEW Owner FALCON CREST HOMES, INC

Legal Description ATTACHED
Residence ✓, # of bedrooms 5; Commercial ____; System Installer FLETCHER

SEPTIC TANK:
Commercial ✓; Noncommercial ____, L ____, W ____, WD ____
Construction Material CONCRETE, capacity 2250 gallons.

DISPOSAL FIELD:
Rock Systems:
Trench: depth ____, width ____, total length ____, sq. feet ____
Bed: depth ____, length ____, width ____, sq. feet ____
Rock type ____, depth ____, under PVC ____, over PVC ____
Seepage Pits: # of pits ____, total # of rings ____, working depth(s) ____
size of pit(s) L X W ____, lining material ____, total sq. feet ____
Rockless Systems:
Chamber: Type INFILTRATOR, number of chambers 66, bed ____, trench ✓
sq. ft./section 15.5, reduction allowed 40 %, sq. ft required 1688
total sq. ft. installed 1705, depth of installation 30"
Engineer Design Y or (N), Designing Engineer ____,
Approval letter provided? Y or N
Well 50 feet from tank (Y) or N 100 feet from leach field (Y) or N
Well installed at time of septic system inspection (Y) or N Public Water ____
*Approval will be revoked if in the future the well is found to be within 50 feet of the septic tank and/or 100 feet of the disposal field.

NOTES:



Acres 36.10 **EL PASO COUNTY • DEPARTMENT OF HEALTH AND ENVIRONMENT**

301 South Union Blvd. • Colorado Springs, Colorado • 578-3125

Water Supply WELL

Permit 12776

PERMIT

TO CONSTRUCT, ALTER, REPAIR OR MODIFY ANY INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Receipt No. [illegible]

Issued to FALCON CREST HOMES, INC. Date 7-9-98

Address of Property 5775 MOUNTAIN SHADOW VIEW, E2,SE4, SEC: 24-T11S-R66W Phone 481-0614

(Permit valid at this address only) MOUNTAIN SHADOW SUBD.

Sewage-Disposal System work to be performed by ~~KUNKEL DRILLING~~ FLETCHER Phone ~~683-3720~~

This Permit is issued in accordance with 25-10-106 Colorado Revised Statutes 1973, as amended. PERMIT EXPIRES upon completion-installation of sewage-disposal system or at the end of twelve (12) months from date of issue–whichever occurs first-(unless work is in progress). This permit is revokable if all stated requirements are not met.

–THIS PERMIT DOES NOT DENOTE APPROVAL OF ZONING AND ACREAGE REQUIREMENTS–

$245.00
PERMIT FEE (NOT REFUNDABLE)

Steven J. Engelder, MD
DIRECTOR, DEPARTMENT OF HEALTH AND ENVIRONMENT

7-9-99
DATE OF EXPIRATION

[signature] for D. Krueger
ENVIRONMENTALIST

578-3152

NOTE: LEAVE ENTIRE SEWAGE-DISPOSAL SYSTEM UNCOVERED FOR FINAL INSPECTION. 48 HOUR ADVANCE NOTICE REQUIRED.

SEPTIC TANK:	TRENCH SYSTEM:	BED SYSTEM:	SEEPAGE PIT SYSTEM:
	total square feet 1688		total square feet
1750 gallons	ft. of trench inches wide		
	ft. of trench inches wide	total square feet	rings or diam.x w/d

NOTES: STAY IN AREA OF PERC. TEST. LEACH FIELD TO BE AT LEAST, OR GREATER THAN, 110 FEET FROM ALL WELLS. KEEP BOTTOM OF LEACH FIELD AT APPROXIMATELY 34 INCHES.

The Health Office shall assume no responsibility in case of failure or inadequacy of a sewage-disposal system, beyond consulting in good faith with the property owner or representative. Free access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with requirements of this law.