ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
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May 26, 2021
Revised: September 21, 2021

Sally Bartels
3647 Tuscanna Gove
Colorado Springs, CO 80920

Re: OWTS – Wastewater Study
Koinonia Ranch
Parcel No. 52190-00-059
6170 Old Ranch Road
El Paso County, Colorado

Dear Ms. Bartels:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in a portion of the SW¼ of Section 19 Township 12 South, Range 65 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located immediately north of Colorado Springs city limits, north of Old Ranch Road and approximately ¾ mile west of Black Forest Road, 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 south-southeast. A minor drainage swale is located in the northern portion of the property. Water was not observed in the drainages at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included undeveloped and rural residential. The site contains field grasses, weeds, and ponderosa pines. The existing house with a water well and septic system located on proposed Lot 5 will remain. Site photographs taken May 21, 2021, are included in appendix A. Site mapping and test pit excavations were completed on May 21, 2021. Test Borings were drilled on December 22, 2020.

Total acreage involved in the proposed subdivision is 39.09-acres. Six rural residential lots and an open space, Tract A, are proposed as part of the subdivision. The proposed lot sizes range from 5.16-acres to 6.65-acres. The existing house located on Lot 5 will remain. The new lots will be serviced by individual wells and on-site wastewater treatment systems. The Site Plan is presented in Figure 3.

SCOPE OF THE REPORT

The scope of the report will include the following:

- 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 with regards to on-site wastewater treatment systems (OWTS).

FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of 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 May 21, 2021.

Three test pits were excavated on the site to determine general suitability for the use of on-site wastewater treatment systems and general soil characteristics for residential construction. Additionally, two test borings were drilled on the site to determine general soil characteristics. The locations of the test pits and test borings are indicated on the Site Plan/Test Pit Location Map, Figure 3. The Test Pit and Test Boring Logs are presented in Appendix A. 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. Results of the laboratory testing are included in Appendix B.

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 three soil types on the site. Complete descriptions of the soil types are presented in Appendix C. In general, the soils consist of sandy loam to gravelly loamy sand. The soils are described as follows:

Type	Description
40	Kettle gravelly, loamy sand, 3 – 8% Slopes
41	Kettle gravelly, loamy sand, 8 – 40% Slopes
71	Pring coarse sandy loam, 3 – 8% Slopes

The soils have been described to have 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 pits consisted of sandy clay loam overlying very gravelly sandy loam to sandy loam. Bedrock was encountered at a depth of 4 feet in Test Pit No. 3. The samples of sands tested had approximately 6 to 21 percent of the soil size particles passing the No. 200 sieve.

The soils encountered in the test borings consisted of silty sand overlying silty sandstone. Bedrock was encountered at depths of 3 to 7 feet in the test borings. The upper sands were encountered at dense to very dense states and dry to moist conditions. The sandstone was

encountered at very dense states and moderate moisture conditions. The samples of sand tested had 16 percent of the soil size particles passing the No. 200 sieve. The samples of sandstone tested had 12 to 31 percent of the soil size particles passing the No. 200 sieve. The silty sand and sandstone typically have low expansion potential. Highly expansive claystone and siltstone lenses are commonly interbedded in the sandstone in the area.

Groundwater

Groundwater or signs of seasonally occurring water were not encountered in the test pits, which were excavated to depths of 4 to 8 feet. Groundwater was not encountered in the test borings which were drilled to depths of 12 to 20 feet. Groundwater is not anticipated to affect shallow foundations on the majority of the site. An area of potentially seasonal shallow groundwater associated with a drainage area has been mapped in the northern portion of the site. Due to the size of the proposed lots, these areas can either be avoided or redirected around proposed structures or proposed soil treatment areas. 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 10 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 Tertiary to Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers of claystone or siltstone.

The geology of the site was evaluated using the *Geologic Map of the Falcon NW Quadrangle,* by Madole in 2003, (Reference 4, Figure 5). The Geology Map for the site is presented in Figure 6. One mappable unit was identified on this site which is described as follows:

Qc/Tkd **Colluvium of Quaternary Age overlying 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 Falcon NW 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 were used in evaluating the

site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

Drainage Areas

A minor drainage swale exists in the northern portion of the site. No water was observed flowing in the drainage at the time of the investigation, however, these areas have the potential for seasonal shallow groundwater. These areas are indicated on the Geology/Engineering Geology Map (Figure 6). Due to the size of the proposed lots, these areas can either be avoided or redirected around proposed structures or proposed soil treatment areas. The anticipated OWTS locations are not affected by these areas. The site does not lie within any floodplain zones according to the FEMA Map No. 08041CO527G dated December 7, 2018 (Figure 7, Reference 7). Exact locations of floodplain and specific drainage studies are beyond the scope of this report. Individual wastewater treatment systems must be located a minimum of 25 feet from dry gulches and 50 feet from water courses or floodplains.

ON-SITE WASTEWATER TREATMENT

The Natural Resource Conservation Service (Reference 1), previously the Soil Conservation Service (Reference 2) has been mapped with three soil descriptions. The Soil Survey Map (Reference 1) is presented in Figure 4, and the Soil Survey Descriptions (Reference 2) are presented in Appendix C. The soils are described as having rapid percolation rates. The existing septic system is located on Lot 5. Observations of the leach area indicated that the system is operating properly. Records for the existing septic system located on Lot 5 are included in Appendix D.

Soils encountered in the tactile test pits consisted of sandy clay loam overlying very gravelly sandy loam to sandy loam. The limiting layers encountered in the test pits are the very gravelly sandy loam, sandy clay loam, and the sandstone, which corresponds with USDA Soil Types R-1 and 3A, with an LTAR values of 0.50 and 0.30 gallons per day per square foot. Formational sandstone was encountered at approximately 4 feet in Test Pit No. 3 (Lot 3). Bedrock was not encountered in Test Pit Nos. 1 and 2 (Lots 2 and 4). However, the soils encountered in Test Pit No. 2 (Lot 4) consisted of residual soils derived from highly weathered sandstone bedrock. Very dense formational sandstone may be encountered near Test Pit No. 2, due to the residually weathered soils encountered in the test pit.

Signs of seasonally occurring groundwater were not observed in the test pits. Absorption fields must be maintained a minimum of 4 feet above groundwater, bedrock, or confining layers. Should groundwater or bedrock be encountered within 6 feet of the surface, designed systems will be required. Designed systems are anticipated on the northern portion of the site. Areas where conventional systems can be utilized may be determined with additional testing. Testing will be required on each lot to determine the site characteristics prior to construction.

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 designed systems are

anticipated for the majority of the lots, depending on soils encountered. The Septic Suitability Map is presented in Figure 8. Potential house locations, water wells, and two septic sites for the new lots are indicated on Figure 8. 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.

CLOSURE

This report has been prepared for Sally Bartels, 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
Geologist

Reviewed by:

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

COLORADO LICENSED
JOSEPH COLLIN GOODE JR
23725
PROFESSIONAL ENGINEER

KAH/jhr

Encl.

Entech Job No. 202498
AAprojects/2020/202498 wws-rev

BIBLIOGRAPHY

1. Natural Resource Conservation *Service,* September 13, 2019. *Web Soil Survey.* United States Department Agriculture, http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

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

3. Scott, Glen R.; Taylor Richard B.; Epis, Rudy C; and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado.* Sheet 2. U.S. Geologic Survey. Map I-1022, Sheet 2.

4. Madole, Richard F., 2003. *Geologic Map of the Falcon NW Quadrangle, El Paso County, Colorado.* Colorado Geological Survey. Open-File Report 03-08.

5. Trimble, Donald E. and Machette, Michael N. 1979. *Geologic Map of the Colorado Springs-Castle Rock Area, Front Range Urban Corridor, Colorado.* USGS, Map I-857-F.

6. Scott, Glen R.; Taylor Richard B.; Epis, Rudy C; and Wobus, Reinhard A. 1978. *Geologic Structure Map of the Pueblo 1° x 2° Quadrangle, South-Central Colorado.* Sheet 2. U.S. Geologic Survey. Map I-1022.

7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Number 08041CO527G

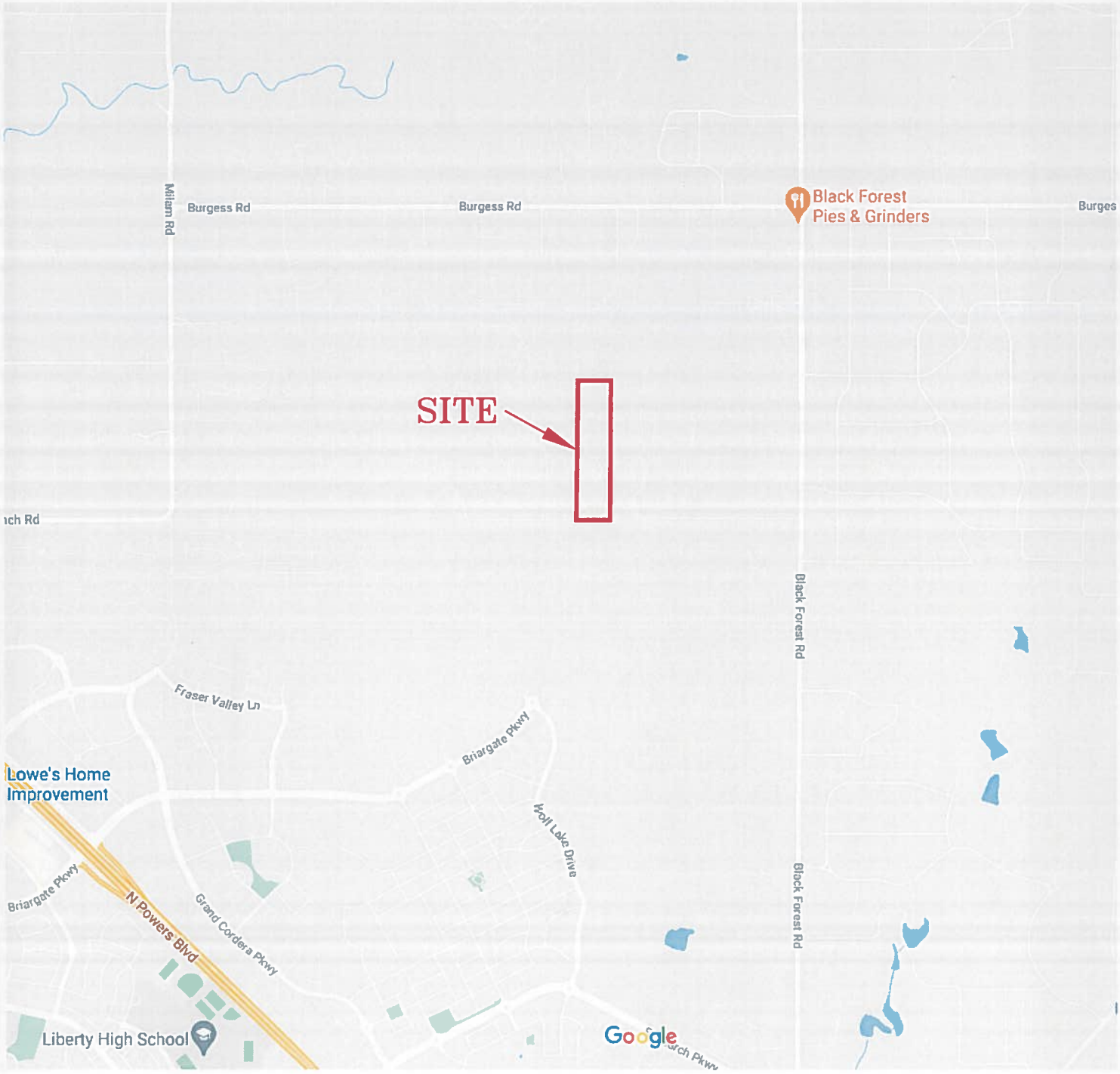
TABLE

Table 1: Summary Test Pit Results

Test Pit No.	Soil Type	USDA Soil Classification	Depth (ft)	Depth to Bedrock (ft.)	Classification of Bedrock
1	Sandy Loam	2	1.5 to 8	N/A	None
2[1]	Sandy Loam	R-1	3-8	N/A	Residual Soils of Dawson Formation
3[1]	Sandy Clay Loam	3A	2 to 4	4'	None

Notes: [1] Design System Required

FIGURES



N

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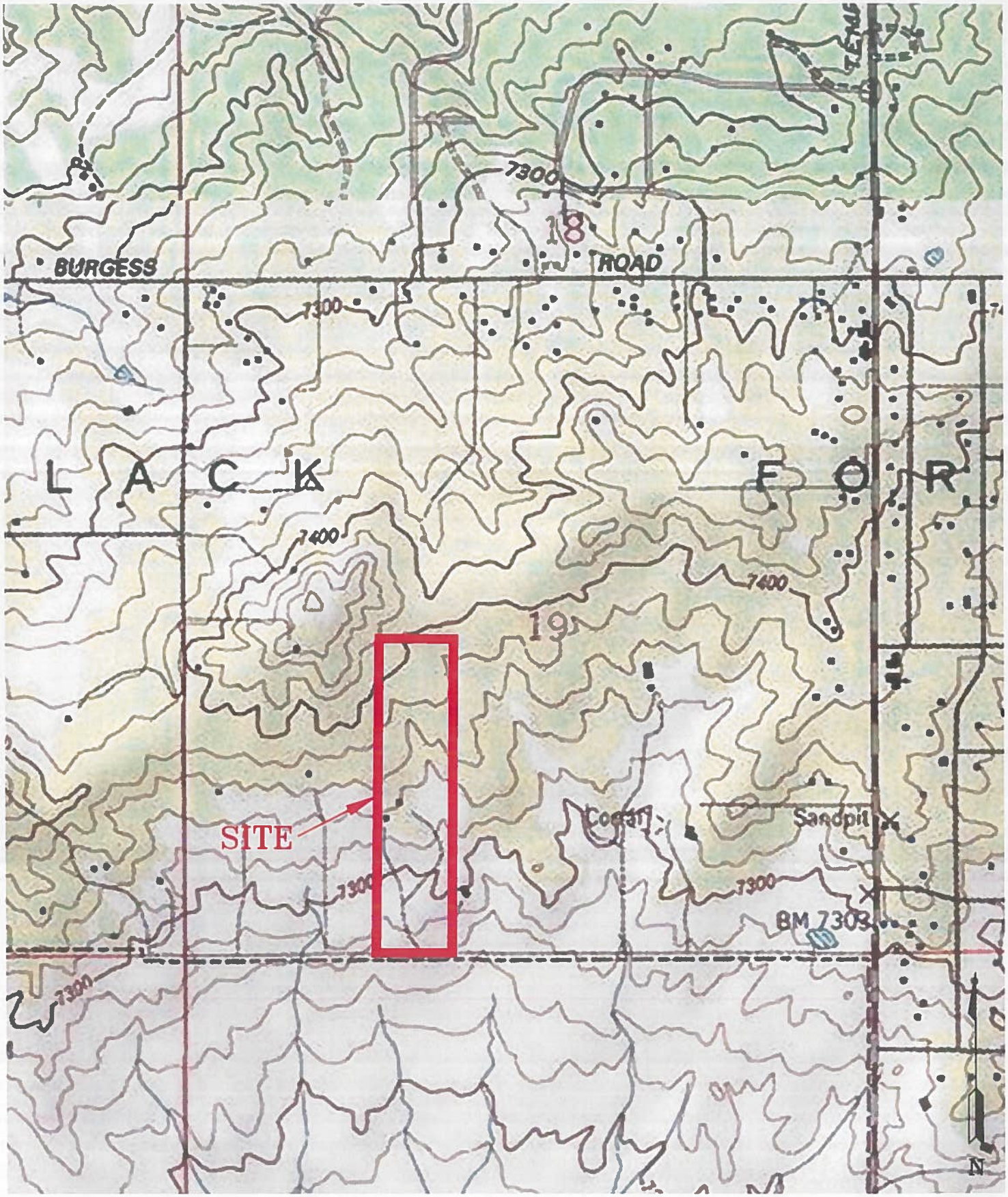
VICINITY MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN:	DATE:	CHECKED:	DATE:
JAC	05/24/21	KAH	05/24/21

JOB NO.: 202498

FIG NO.: 1



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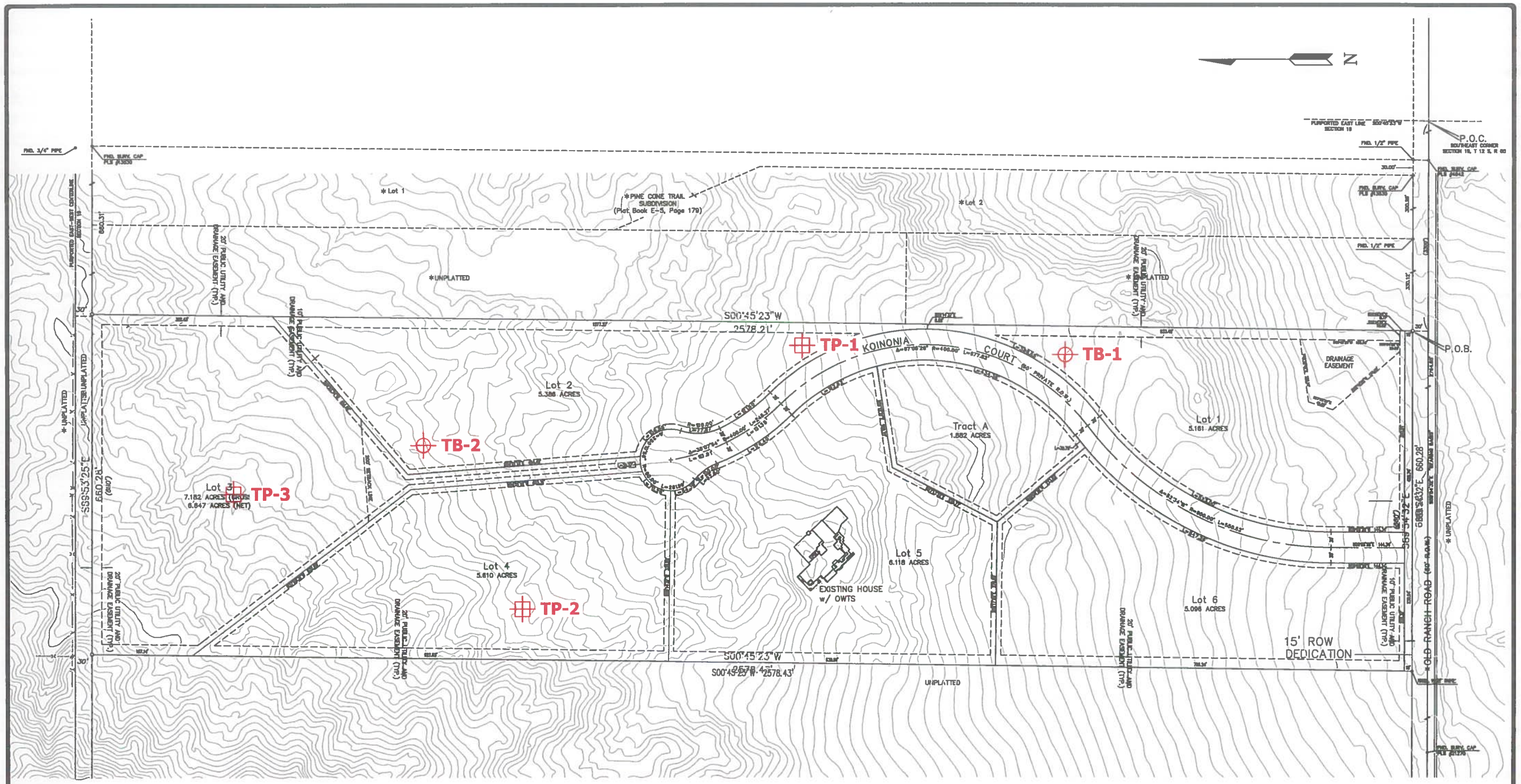
USGS MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN:	DATE:	CHECKED:	DATE:
JAC	05/24/21	KAH	05/24/21

JOB NO.: 202498

FIG NO.: 2



TB- APPROXIMATE TEST BORING LOCATIONS AND NUMBERS

TP- APPROXIMATE TEST PIT LOCATIONS AND NUMBERS

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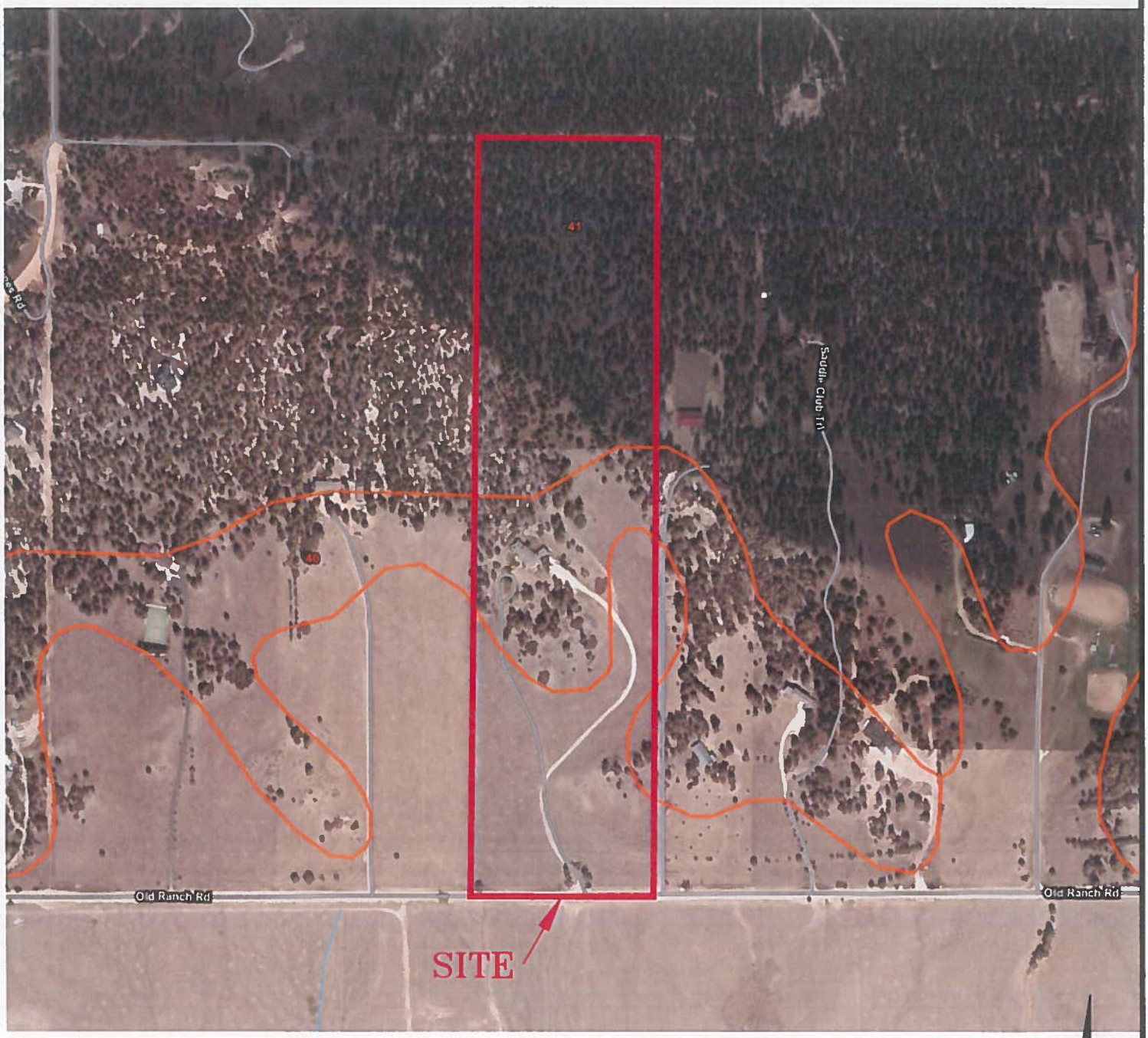
SITE PLAN/TEST PIT MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN	JAC
CHECKED	
DATE	05/24/21
SCALE	AS SHOWN
JOB NO.	202498
FIGURE No.	3



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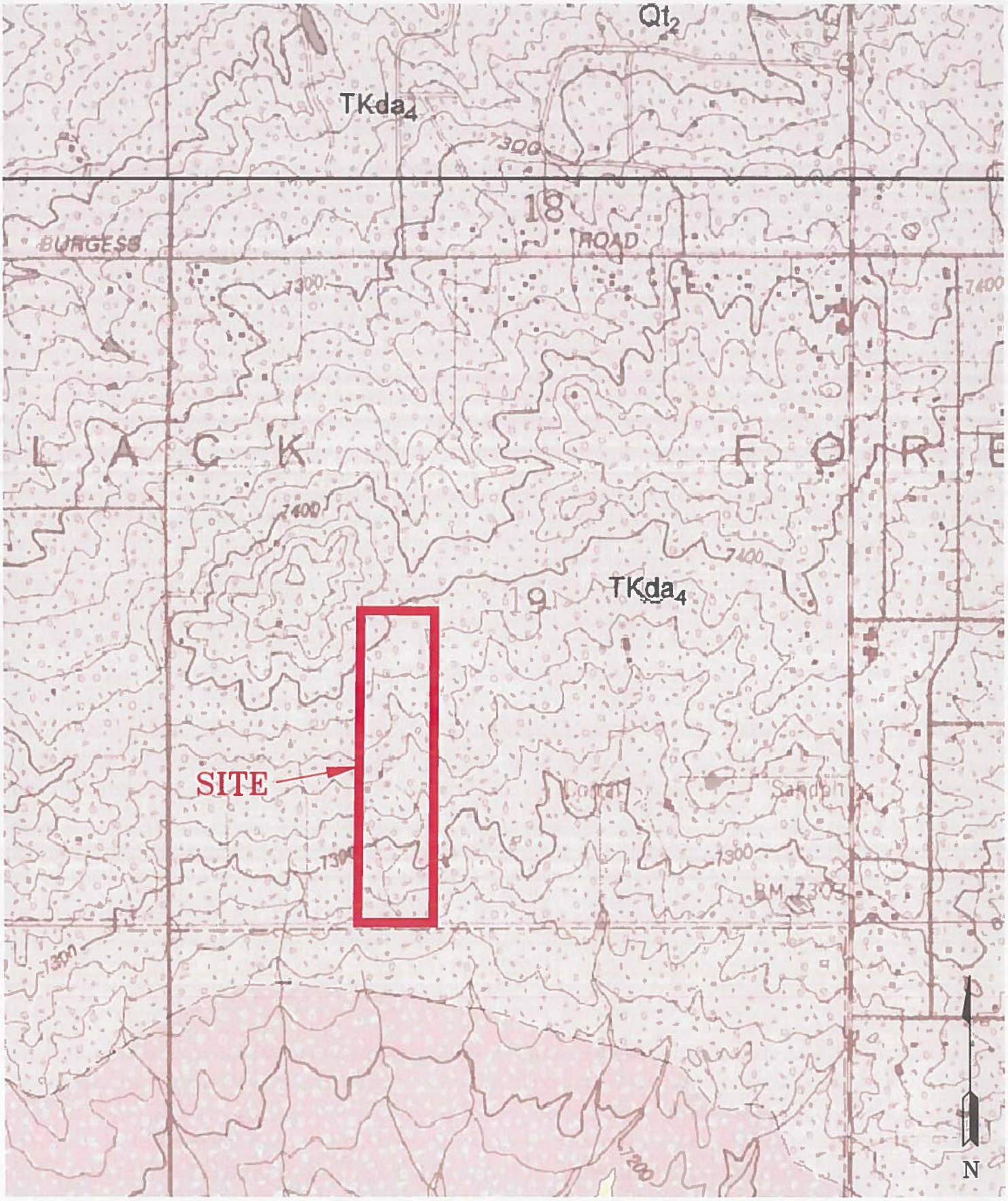
SOIL SURVEY MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN:	DATE:	CHECKED:	DATE:
JAC	05/24/21	KAH	05/24/21

JOB NO.: 202498

FIG NO.: 4



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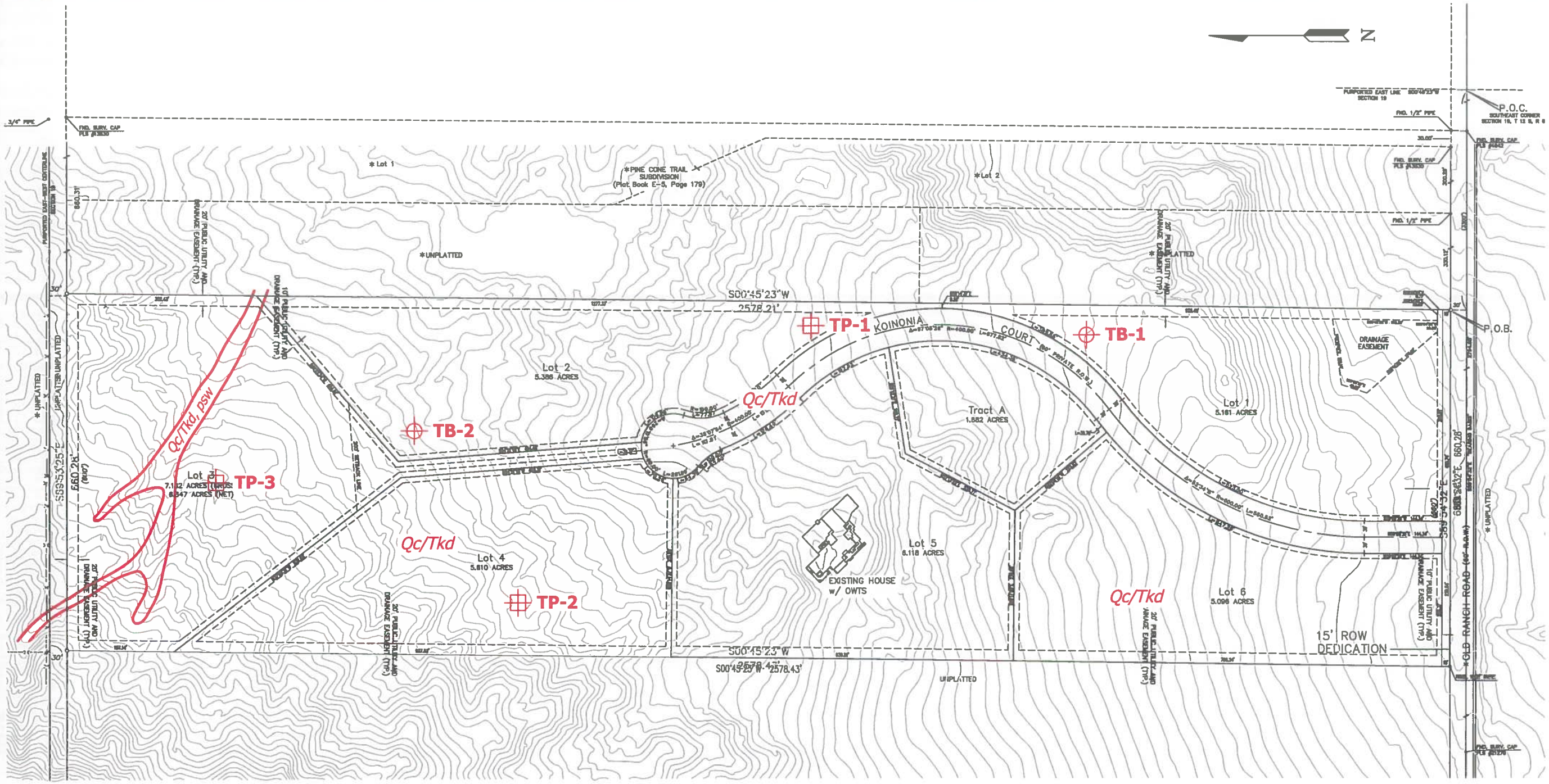
FALCON NW QUADRANGLE GEOLOGIC MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN:	DATE:	CHECKED:	DATE:
JAC	05/24/21	KAH	05/24/21

JOB NO.: 202498

FIG NO.: 5



50 0 100 200 400

1:200

Legend:

Qc/TKd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age: colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone

psw - potentially seasonal shallow groundwater area

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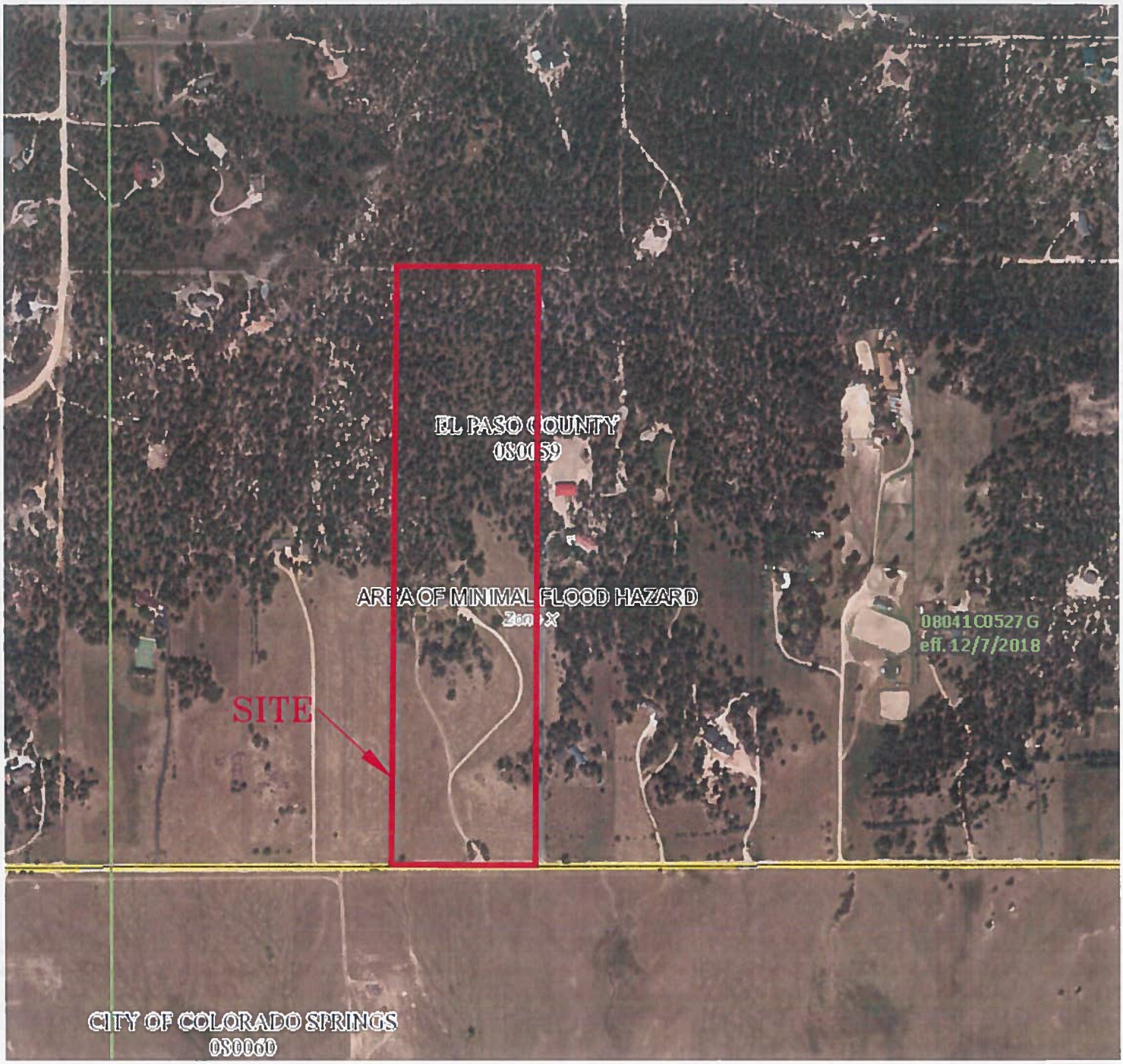
GEOLOGY/ENGINEERING GEOLOGY MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN	JAC
CHECKED	KAH
DATE	05/24/21
SCALE	1:200
JOB NO.	202498
FIGURE No.	6



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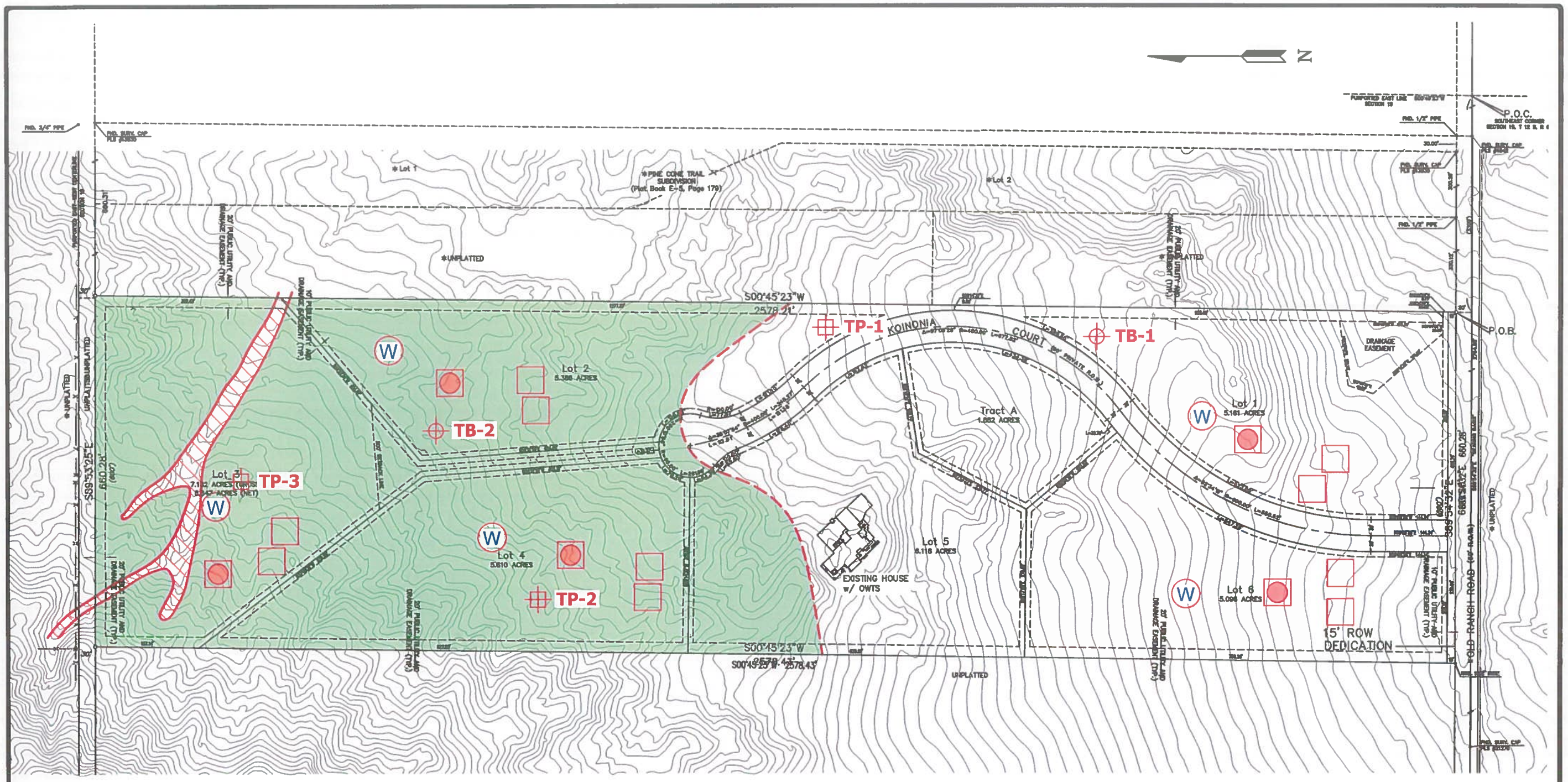
FLOODPLAIN MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN:	DATE:	CHECKED:	DATE:
JAC	05/24/21	KAH	05/24/21

JOB NO.: 202498

FIG NO.: 7



LEGEND:

- POTENTIAL HOUSE LOCATION
- TWO POTENTIAL OWS SITES
- POTENTIAL WELL LOCATION
- AREAS WHERE CONVENTIONAL SYSTEMS ARE ANTICIPATED UNLESS UNSUITABLE SOILS OR SHALLOW BEDROCK ARE ENCOUNTERED, REQUIRING DESIGNED SYSTEMS.
- AREAS WHERE SEPTIC SYSTEMS ARE NOT RECOMMENDED.
- AREAS DESIGNED SYSTEMS ARE ANTICIPATED DUE TO SHALLOW BEDROCK

50 0 100 200 400

1:200

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SEPTIC SUITABILITY MAP
SGWW
6170 OLD RANCH ROAD
EL PASO COUNTY, CO.
FOR: SALLY BARTELS

DRAWN	JAC
CHECKED	KAH
DATE	05/24/21
SCALE	1:200
JOB NO.	202498
FIGURE No.	8

APPENDIX A: Test Pit Logs and Test Boring Logs

TEST PIT NO. 1
DATE EXCAVATED 5/20/2021
Job # 202498

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, sandy clay loam, brown, moist	1					
	2					
	3					
sandy loam, fine to coarse grained, yellowish brown, moist	4			gr	m	2
	5			gr	m	2
	6					
	7					
	8					
	9					
	10					

TEST PIT NO. 2
DATE EXCAVATED 5/20/2021
CLIENT Salley Bartels
LOCATION 6170 Old Ranch Road

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, sandy clay loam, brown, moist	1					
sandy clay loam, fine to coarse grained, dark brown, very moist	2			ma		3A
	3					
gravelly sandy loam, fine to very coarse grained, pale brown, moist, residual soils	4			gr	m	R-1
	5					
	6					
	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

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TEST PIT LOG

DRAWN:	DATE:	CHECKED:	DATE:
jhr	5/26/21		5/27/21

JOB NO.: 202498
FIG NO.: A-1

TEST PIT NO. 3
DATE EXCAVATED 5/20/2021
Job # 202498

DATE EXCAVATED 5/20/2021
CLIENT Sally Bartels
LOCATION 6170 Old Ranch Road

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Refusal due to bedrock @ 48"						
topsoil, sandy clay loam, brown, moist	1					
sandy loam, fine to coarse grained, reddish brown, moist	2			ma		3A
sandy clay loam, fine to coarse grained, reddish brown, moist	3			ma		3A
	4					
Silty Sandstone	5					
	6					
	7					
	8					
	9					
	10					

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
	1					
	2					
	3					
	4					
	5					
	6					
	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

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TEST PIT LOG

DRAWN:	DATE:	CHECKED:	DATE:
jhr	5/26/21		5/22/21

JOB NO.: 202498
FIG NO.: A-2

TEST BORING NO. 1
DATE DRILLED 12/22/2020
Job # 202498

REMARKS

DRY TO 20', 12/22/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			32	3.0	
5			50	6.9	
10			50 / 4"	12.5	
15			50 / 9"	10.1	
20			50 / 4"	12.7	

6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED TO TAN, DENSE TO VERY DENSE, MOIST

SANDSTONE, SILTY, FINE TO MEDIUM GRAINED, TAN, VERY DENSE, MOIST

TEST BORING NO. 2
DATE DRILLED 12/22/2020
CLIENT SALLY BARTELS
LOCATION 6170 OLD RANCH ROAD

REMARKS

DRY TO 12', 12/22/20

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			50 / 11"	2.4	
5			50 / 11"	4.8	
10			50 / 4"	10.3	
			*	8.6	
15					
20					

12" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, VERY DENSE, DRY

SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST

* - BULK SAMPLE TAKEN

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TEST BORING LOG

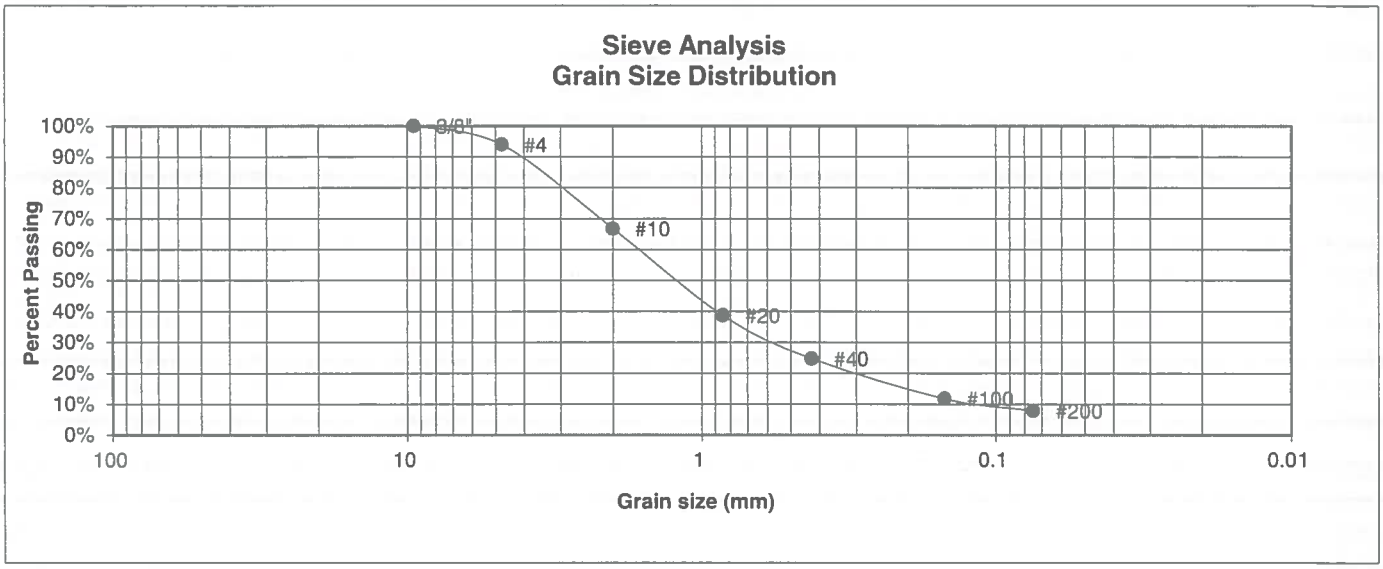
DRAWN:	DATE:	CHECKED:	DATE:
			5/27/21

JOB NO.: 202498

FIG NO.: A-3

APPENDIX B: Laboratory Test Results

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.0%
10	66.7%
20	38.7%
40	24.7%
100	11.8%
200	7.9%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

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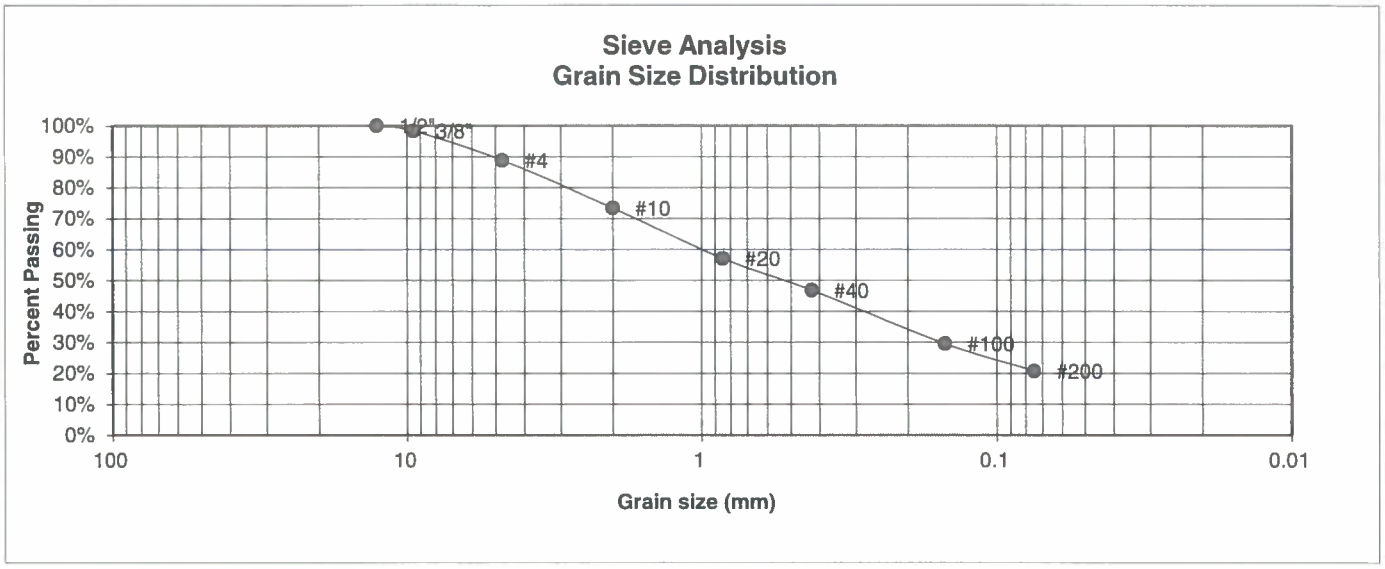
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			5/26/21

JOB NO.: 202498

FIG NO.: B-1

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SC	TEST BY	BL
DEPTH(ft)	2	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.3%
4	88.9%
10	73.4%
20	57.1%
40	46.8%
100	29.6%
200	20.7%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

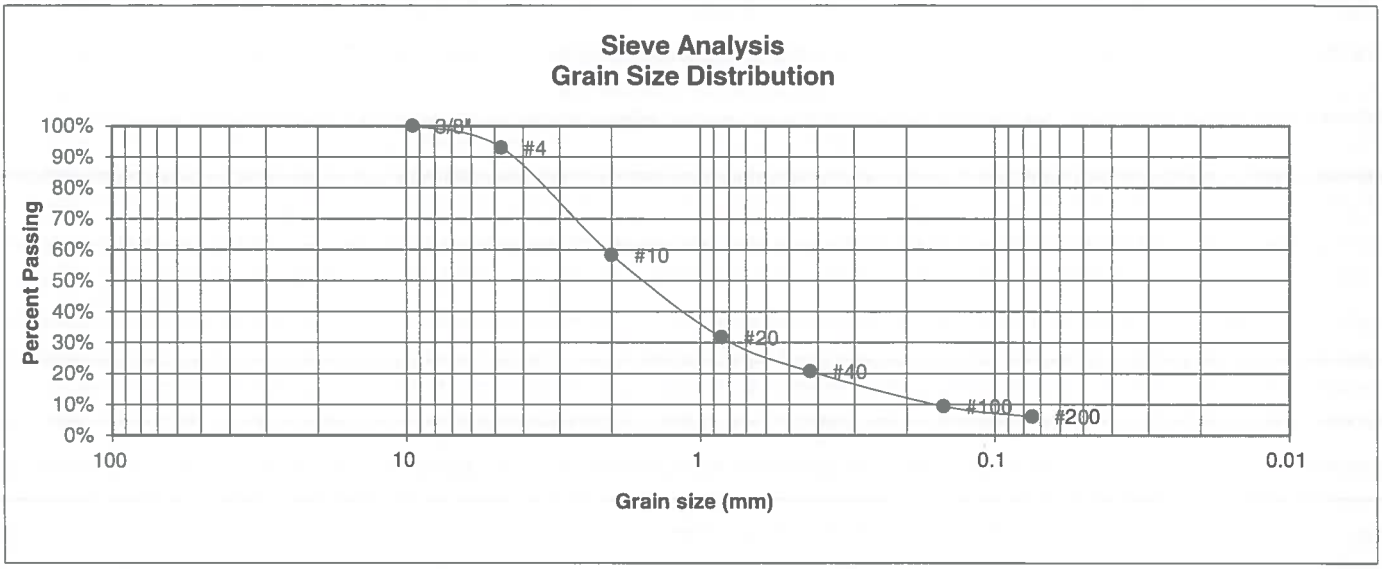
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			5/27/21

JOB NO.: 202498

FIG NO.: B-2

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.0%
10	58.3%
20	31.7%
40	20.7%
100	9.4%
200	6.1%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

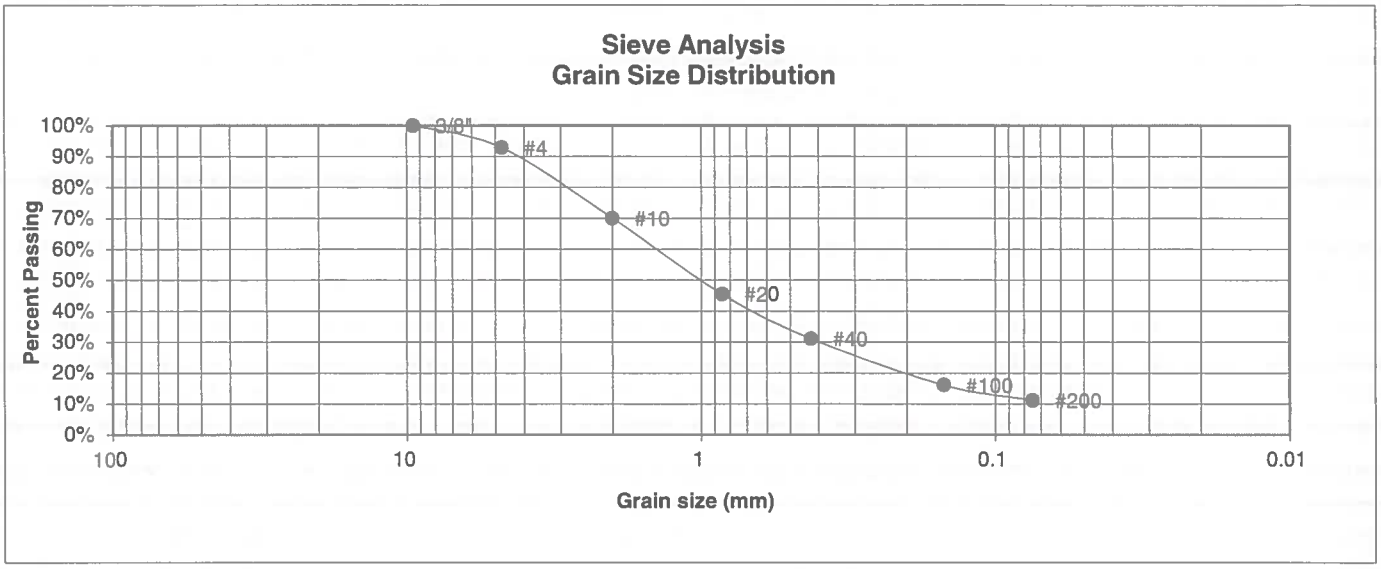
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 5/24/21

JOB NO.: 202498

FIG NO.: B-3

BORING NO.	TP-3	UNIFIED CLASSIFICATION	SC-SW	TEST BY	BL
DEPTH(ft)	2	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.8%
10	70.1%
20	45.5%
40	31.1%
100	16.1%
200	11.2%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

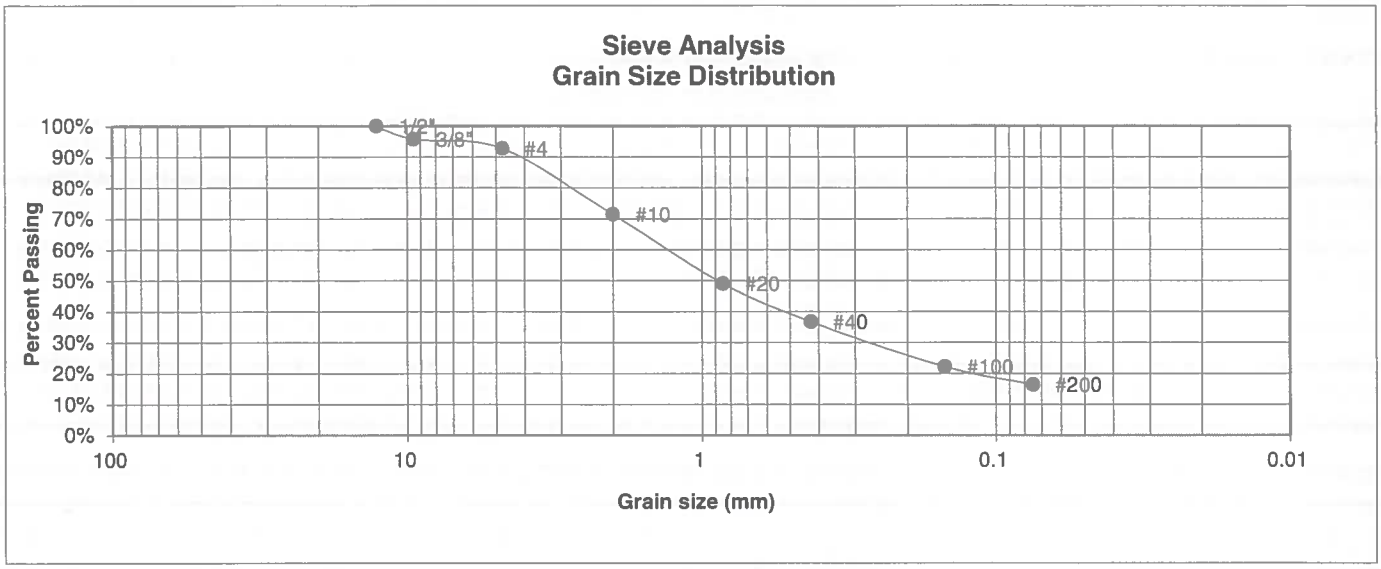
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		h	5/26/21

JOB NO.: 202498

FIG NO.: B-4

BORING NO.	1	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	95.8%
4	92.7%
10	71.4%
20	49.1%
40	36.7%
100	22.2%
200	16.4%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

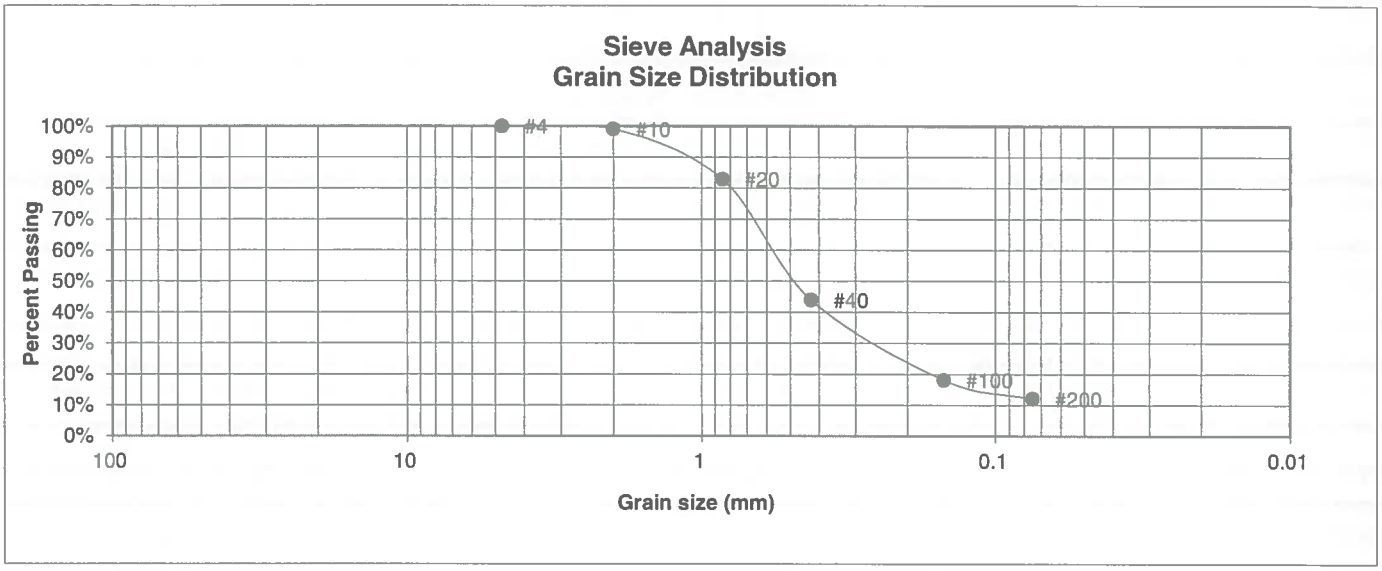
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED: h	DATE: 5/27/21

JOB NO.: 202498

FIG NO.: B-5

BORING NO.	1	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	15	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.0%
20	82.9%
40	44.0%
100	18.1%
200	12.1%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

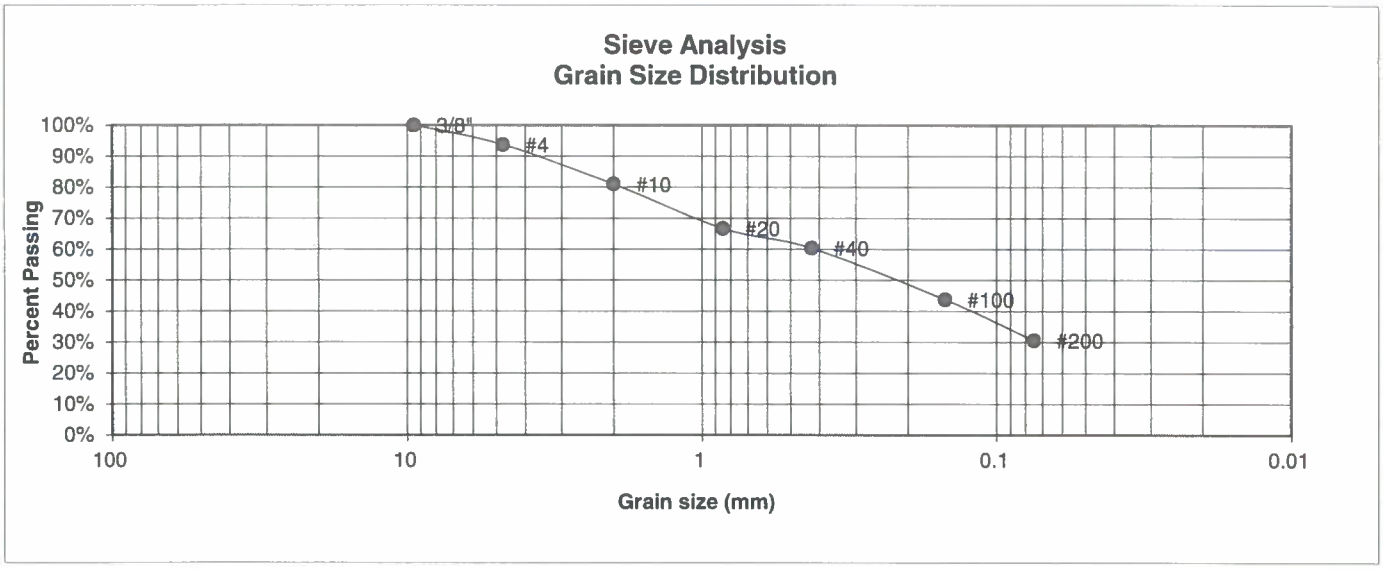
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			5/27/21

JOB NO.: 202498

FIG NO.: B-6

BORING NO.	2	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	5	AASHTO CLASSIFICATION		JOB NO.	202498
CLIENT	SALLY BARTELS				
PROJECT	6170 OLD RANCH ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.7%
10	81.0%
20	66.7%
40	60.4%
100	43.8%
200	30.6%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 5/27/21

JOB NO.: 202498

FIG NO.: B-7

APPENDIX C: Soil Survey Descriptions

El Paso County Area, Colorado

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 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: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively 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 capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
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 18, Jun 5, 2020

El Paso County Area, Colorado

41—Kettle gravelly loamy sand, 8 to 40 percent slopes

Map Unit Setting

National map unit symbol: 368h
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 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 capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
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 18, Jun 5, 2020

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 capacity: 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
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 18, Jun 5, 2020

APPENDIX D: El Paso County Health Department Septic Records

ON #

#5219.000059

EL PASO COUNTY HEALTH DEPARTMENT
COLORADO SPRINGS, COLORADO

#3213 P
OIB

SEWAGE DISPOSAL INSPECTION FORM

APPROVAL:
YES ✓ NO _____

DATE 6/19/85

ENVIRONMENTALIST Krueger

LOCATION (street number) 6170 Old Ranch Rd OCCUPANT _____

LEGAL DESCRIPTION ATTACHED

TYPE OF CONSTRUCTION DWELLING NO. OF BEDROOMS 3

SYSTEM INSTALLED BY R+R DITCHING

COMMERCIAL MFG. YES SIZE 1250

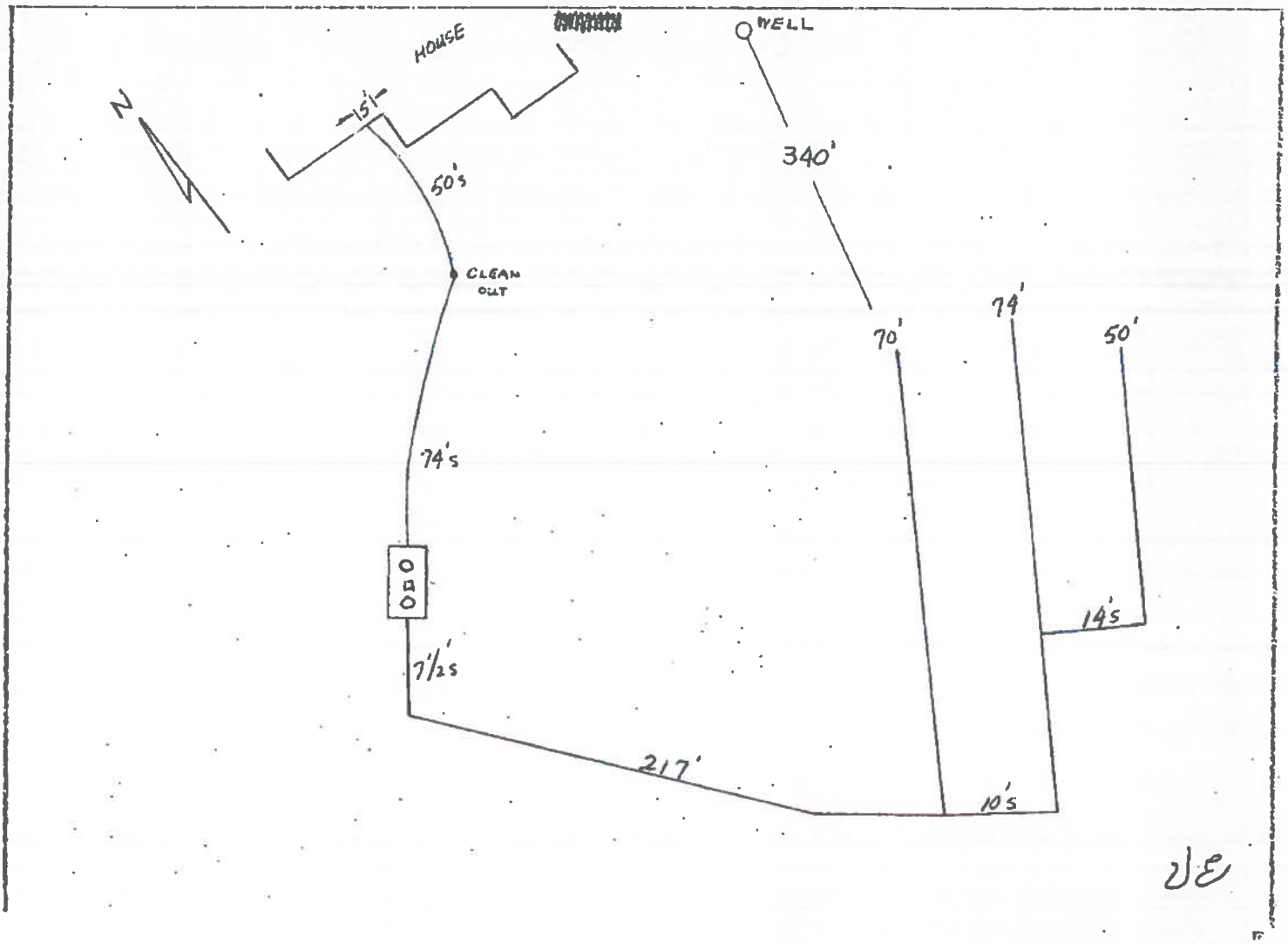
TYPE OF MATERIAL CONCRETE NO. COMPARTMENTS 2

WIDTH _____ LENGTH _____ DEPTH (total) _____ LIQ. CAP. _____

DISPOSAL FIELD: BED OR TRENCH DEPTH 36" WIDTH 36" LENGTH 194' SQ. FT. 582

DISTANCE BETWEEN LINES 10'-14' ROCK river DEPTH 12" UNDER 6" OVER 2"

LEACHING PITS (NO.) _____ LINING MATERIAL _____ CAPACITY SQ. FT. _____



JE

Acres 39.09 **EL PASO COUNTY • COUNTY HEALTH DEPARTMENT** Permit 3013

501 North Foote Avenue • Colorado Springs, Colorado • 578-3125

Water Supply Well

Receipt No. 5610

PERMIT

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

Issued To Eddie Palmer Date 3/21/85

Address of Property 6170 Old Ranch Road, Black Forest, CO. Phone 495-4194

(Permit valid at this address only)

Sewage-Disposal System work to be performed by R & R Ditching Phone 495-3274

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 six (6) 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—

$145.00
PERMIT FEE (NOT REFUNDABLE)

DIRECTOR, COUNTY HEALTH DEPARTMENT

September 21, 1985
DATE OF EXPIRATION

ENVIRONMENTALIST

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 580		total square feet
	193 ft. of trench 36 inches wide		
1250 gallons	ft. of trench inches wide	total square feet	rings or diam.x w/d

NOTES: Keep trenches as shallow as possible no deeper than 30" ground water app. 6½' from top of ground keep trenches as high as possible on slope.

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 times for the purpose of making such inspections as are necessary to determine compliance with requirements of this law.

El Paso County Health Department
501 North Foote Avenue
Colorado Springs, CO 80909-4598
(303) 636-0125

APPLICATION FOR A PERMIT TO CONSTRUCT, REMODEL, OR INSTALL A SEWAGE DISPOSAL SYSTEM

NAME OF OWNER EDDIE PALMER HOME PHONE 495-4194 WORK PHONE SAME

ADDRESS OF PROPERTY OLD RANCH ROAD (PRIVATE) DATE 3/15/85

LEGAL DESCRIPTION OF PROPERTY ATTACHED

TAX SCHEDULE NUMBER 52190-00-059 SYSTEM CONTRACTOR R&R DITCHING PHONE 495-3274

OWNER'S ADDRESS IF DIFFERENT NEW YORK CITY

TYPE OF HOUSE CONSTRUCTION FRAME SOURCE AND TYPE OF WATER SUPPLY PRIVATE

SIZE OF LOT 39.09 ACR MAXIMUM POTENTIAL NUMBER OF BEDROOMS 3 BASEMENT (yes or no) YES

PERCOLATION TEST RESULTS ATTACHED (yes or no) YES

A plot plan and accompanying information are essential; it may be drawn on the back of this application or be attached. Please include by measured distance the location of wells including neighbors' wells, springs, water supply lines, cisterns, buildings, proposed structures, property lines, property dimensions, subsoil drains, lakes, ponds, water courses, streams, and dry gulches. Please show the location of the proposed septic system by directions and distances from actual and/or proposed dwellings, structures, or fixed reference objects. Give complete directions to the property from major highways.

Applicant acknowledges that the completeness of the application is conditional upon such further mandatory and additional tests and reports as may be required by the department to be made and furnished by the applicant for purposes of evaluation of the application; and issuance of the permit is subject to such terms and conditions as deemed necessary to ensure compliance with rules and regulations adopted under Article 10, Title 25, C.R.S. 1973 as amended. The undersigned hereby certifies that all statements made, information and reports submitted by the applicant are or will be represented to be true and correct to the best of my knowlege and belief and are designed to be relied on by the El Paso County Health Dept. in evaluating the same for purposes of issuing the permit applied for herein. I further understand that any falsification or misrepresentation may result in the denial of the application or revocation of any permit granted based upon said application and in legal action for perjury as provided by law.

SIGNATURE Eddie Palmer (for owner)

HEALTH DEPARTMENT USE ONLY

PERMIT NUMBER 3213 RECEIPT NUMBER 5610 DATE TO LAND USE DEPARTMENT 3/20

ABSORPTION AREA 580# TANK CAPACITY 1250 DATE OF SITE INSPECTION 3/18/85

REMARKS: Keep trenches as shallow as possible no deeper than 30" ground water app 6½' from top of ground. keep trenches as high as possible on slope
193' x 36" trench

APPLICATION IS APPROVED (✓) DENIED ( ) DATE 3/18/85 ENVIRONMENTALIST [illegible]