Soils and Geology Evaluation

For

Wyoming Estates

3050 N. Curtis Road

May 20, 2019

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PROJECT DESCRIPTION

The following presents Soils and Geology for the proposed Wyoming Estates Minor Subdivision (Project Site) located in the SE ¼ of the NE ¼ of Section 33, Township 13 South, Range 64 West of the 6th P.M. in the County of El Paso (Figure 1).

The Project Site is comprised 40.01 acres of vacant land to be subdivided into 4 single- family residential RR-5 (Figure 2). The water supply for each lot will be from individual wells and wastewater will be treated by individual non-evaporative septic systems.

GEOLOGY

The Project Site is located within the Falcon Quadrangle near the southeastern edge of the Denver Basin, a geologic structural depression. This asymmetrical structural basin is shallow-dipping toward the northeast. The uppermost/surfical deposits are unconsolidated Quaternary eolian deposits which include Lots 1, 3 and 4 and the western portion of Lot 2; the northeast corner of the Project Site (eastern portion of Lot 2) are older gravels and alluvium (Figure 3). These are underlain in vertical succession, by the Denver, Arapahoe and Laramie Fox Hills Aquifers. Residential Wells in the area can be found completed in the Denver and Arapahoe Aquifers. The base of the Denver Aquifer is about 490 feet below ground surface (bgs) and the Arapahoe Aquifer is from about 515 (top) to 1000 ft bgS (CDSS, SB5).

The Project Site generally slopes to the northeast ranging from 1% to 9%. In the southwest corner, drainage is to the southeast. Figure 4 provides the Project Site Surface Contours.

SOILS

The National Resource Conservation Service (NRCS) has identified three soil types with a northeast trend on the Property (Figure 5).

Type	Description	Percent Coverage
8	Blakeland Loamy Sand, 1 to 9 percent Slope	46.8
19	Columbine gravelly sandy loam sand, 0 to 3 % slopes	1.8
95	Truckton Sandy Loams,1 to 9 percent Slope	51.4

Attachment 1 provides a complete description of the soils. The soil is classified as "well" to "excessively well" drained. Runoff potential is low with no ponding or flooding which is consistent with historical aerial photos.

FIELD INVESTIGATIONS

OTWS

Field investigations at the Project Site consisted of excavating two profile pits at each proposed lot (8 total) to identify onsite wastewater treatment system (OWTS) locations (PARR 2018, Figure 6. The OWTS profile pits were excavated to a maximum depth of 8.5 feet below ground surface. Samples were collected from select intervals and evaluated for soil properties. At locations tested on Lots 1, 2 and 4, a conventional, non-engineered onsite wastewater treatment system was determined to be acceptable. At the location tested at Lot 2, results indicate that an engineered onsite wastewater treatment system is needed. Table 1 summarizes the field investigations results. Attachment 3 provides the detailed engineering reports.

Lots 1, 2, and 4, do not require, then in next sentence it says lot 2 does require

Pavement Design

Two test holes were evaluated for a proposed gravel roadway for pavement design (Raiper, 2019, Figure 7). Soil samples were collected with testing included sieve analysis and Atterberg limits in addition to determining resistance values (R-Values). The results are summarized in Table 2.

TABLE 1

Soil Sample Resulrs for OWTS

Depth (ft.)	Sample Interval	3050 Curtis Road, Lot 1, 80831						
		USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
Lot 1	Pit1							
2		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	10YR 3/2 (Moist)
4								
6		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	10YR 5/3 (Moist)
8								
Lot 1	PIT2	Topsoil						
Lot 1	PIT2							
2		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	10YR 3/2 (Moist)
4								
6								
8								

Depth (ft.)	Sample Interval	3050 Curtis Road, Lot 2, 80831						
		USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
Lot 2	Pit1							
2		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatment Level 1**	<35%	10YR 3/3 (Moist)
4								
6		Clay	Blocky	Strong	No	Type 4 (LTAR = 0.20) Treatment Level 1	<35%	2.5Y 5/4 (Moist)
8								
Lot 2	PIT2	Topsoil						
2		Sandy Loam	Granular	Moderate	No	**Type 2 (LTAR = 0.60) Treatmen**	<35%	10YR 3/3 (Moist)
4								
6		Clay	Blocky	Strong	No	Type 4 (LTAR = 0.20) Treatment Level 1	<35%	2.5Y 5/4 (Moist)
8								

Depth (ft.)	Sample Interval	3050 Curtis Road, Lot 3, 80831						
		USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
Lot 3	Pit1							
2		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	10YR 4/3 (Moist)
4								
6								
8								
Lot 3	Pit2	Topsoil						
2		Sandy Clay Loam	Granular	Strong	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	10YR 4/3 (Moist)
4								
6								
8								

Depth (ft.)	Sample Interval	3050 Curtis Road, Lot 4, 80831						
		USDA Soil Texture	USDA Soil Structure - Shape	Soil Structure Grade	Redoximorphic Features Present? (Y/N)	Soil Type (from Table 9 in O-14)	% Rock Frag.	Color
		Topsoil						
Lot 4	Pit1							
2		Sandy Clay Loam	Granular	Moderate	No	**Type 3 (LTAR = 0.35)**	<35%	10YR 2/2 (Moist)
		Sandy Clay Loam	Blocky	Strong	No	**Type 3 (LTAR = 0.35)**	<35%	2.5Y 3/3 (Moist)
4								
6		Sandy Clay Loam	Blocky	Moderate	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	2.5Y 4/3 (Moist)
8								
Lot 4	Pit2	Topsoil						
2		Sandy Clay Loam	Granular	Moderate	No	**Type 3 (LTAR = 0.35) Treatment Level 1**	<35%	2.5Y 4/3 (Moist)
4								
6								
8								

TABLE 2

Location	Depth (ft)	Plasticity Index	%Passing #200	Moisture Content (%)	USCS Soil Classification	Tested R-Value
TP1	1-3	NP	26	4.2	SM	76
TP1	8-10	6	30	5.1	SC-SM	-
TP2	1-3	NP	17	3.6	SM	-
TP2	3-5	NP	20	3.5	SM	-

It was reported for the locations tested, "there was a very (low) potential for swell due to the sandy composition of site soils which consist of non-plastic to low plasticity silty sand and silty clayey sand soils with low percentage of particles passing the #200 sieve screen. Therefore, there is no need to provide any additional stabilization or treatments to subgrade soils" (Raiper, 2019)

GROUNDWATER

Groundwater was not encountered in any of the OWTS test pit and was not evident in the profile test pits a week following excavation. There are no existing wells on the Project Site. Shallow alluvial wells in the area occur in the older gravels and alluviums to the northeast (Soil Type 19 on Figure 5, Qgo Figure 3) which are also on the eastern portion of Lot 3. USGS reported groundwater levels in a Well labeled as SCO1306433AAA1 and located just north of Lot 3. Groundwater levels were measured consistently over the last 40 years and consistently occurs at an elevation of about 6480 ft amsl (Attachment 2) approximately 20 feet below the northeast corner of Lot 3. Based on review of the geology, well reports, and surface drainage, this Is likely the location /elevation of the highest water table underlying at the Project Site.

GEOLOGIC HAZARDS

The Project Site was evaluated for geologic hazards that may impact development. Hazards identified in the El Paso County Land Development Code including: Mining, wildfire, highwater table or polluted water, landfills, fill areas, contamination; airports and major utility facilities, and landslides were not identified on the Project Site. The National Flood Hazard map delineated the Property and surrounding area an "area of Minimal Flood Hazard" (FEMA 2018). The Project Site is not located in a flood plain (Figure 8).

Erosion

The soils at the Project Site are susceptible to erosion. Currently, the property is covered with prairie grasses. Construction activities will enhance erosion potential however slopes are mild and once the disturbed surface is revegetated, erosion should be low.

Expansive Soils

Within the 8 profile pits to evaluate suitability for OWTS design, expansive soils were not encountered. The soils were described as having a sandy composition, non-plastic to low plastic sands, silty clayey sand soil. Due to potential variability, additional borings will be necessary prior to foundation excavation and subsequentially re-evaluated upon completion of the foundation excavation and prior to the placement of any framework.

MINERAL RESOURCES

The Project Site is not included in the maps of aggregate deposits or known mineral resources. Colorado Geological Mineral Resources Derivative Map indicates a low potential to contain economically viable mineral resources.

CONCLUSION

Please verify with above statement

The Project Site is compatible with the proposed development of single family residential lots. Lot 2 was identified as requiring an engineered individual wastewater treatment system however another location more to the west may yield a more positive result. Hazards are minimal and can be mitigated by standard practices.

REFERENCES

Bartusek, Mike, February 19, 2018, RESPEC, Wyoming Estates Subdivision Final Drainage Report.

El Paso County Planning Development. December 1995. El Paso County Aggregate Resource Evaluation Maps.

Federal Emergency Management Agency (FEMA). December 12, 2018. https://www.fema.gov/national-flood-hazard-layer-nfhl; nfhl Viewer.

Morgan, Mathew L. and White, Johnathan L. 2012. Geologic Map of the Falcon Quadrangle, El Paso County Colorado. Colorado Geological Survey. Open File Report 12-05.

Mineral Resources. https://cologeosurvey.maps

National Resource Conservation Service, https://websoilsurvey.nrcs.usda.gov

Parr Engineering and Consulting Inc. September 27, 2018. Profile Pits Subdivision JN 18.394, 18.395, 18.396, 18.397

Rapier, Delbert , Protex, Geotechnical Pavement Design, Curtis Road and David Road Job No. 8619, January 9, 2019.

Schwochow, S.D; et al. 1974. Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties. Colorado Geological Survey, Special Publication 5-B.

Thorson, Jon P., 2003. *Geologic Map of the Black Forest Quadrangle, El Paso County, Colorado*. Colorado Geological Survey Open -File Report 03-06.

FIGURE 1
LOCATION

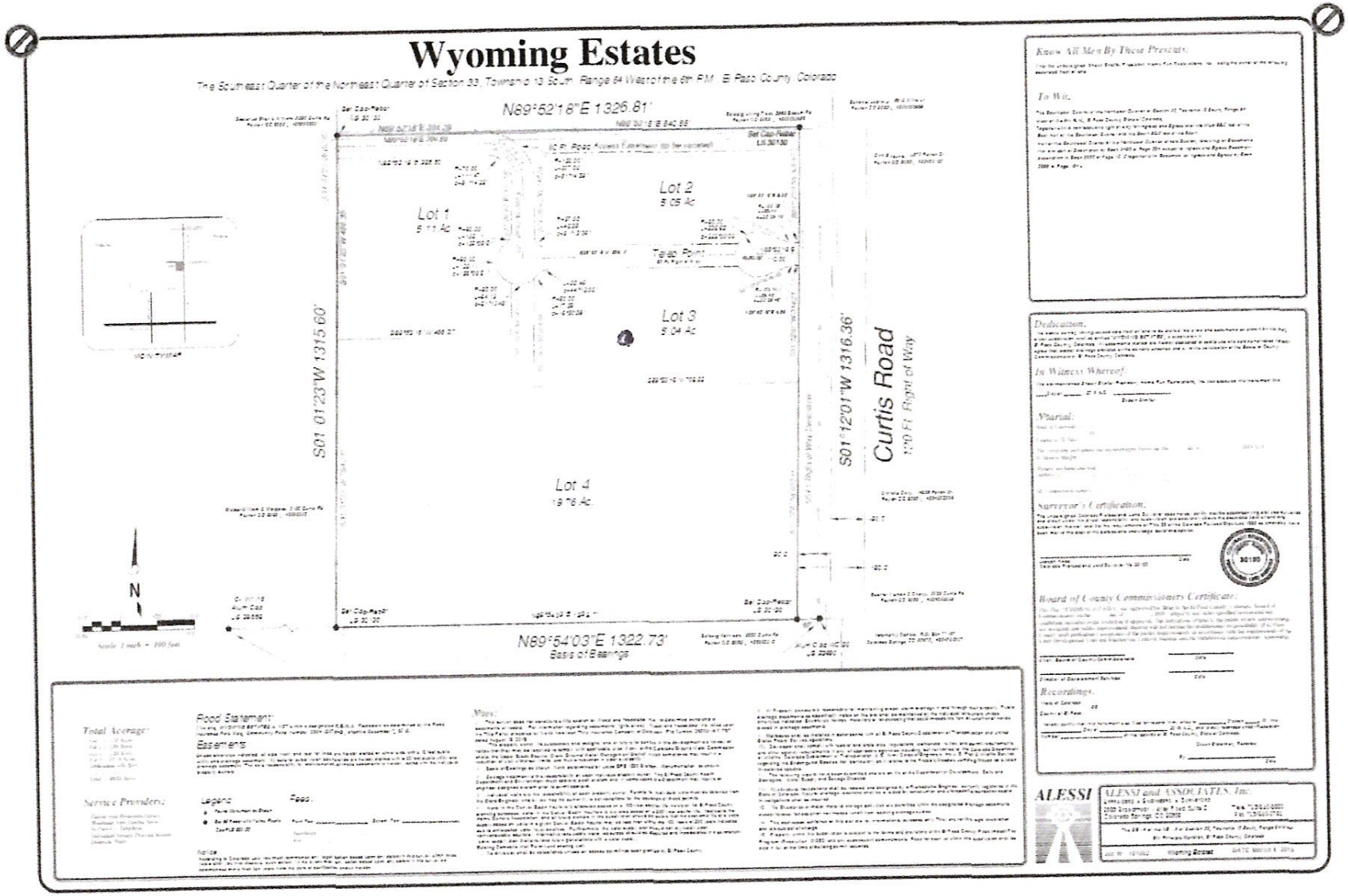
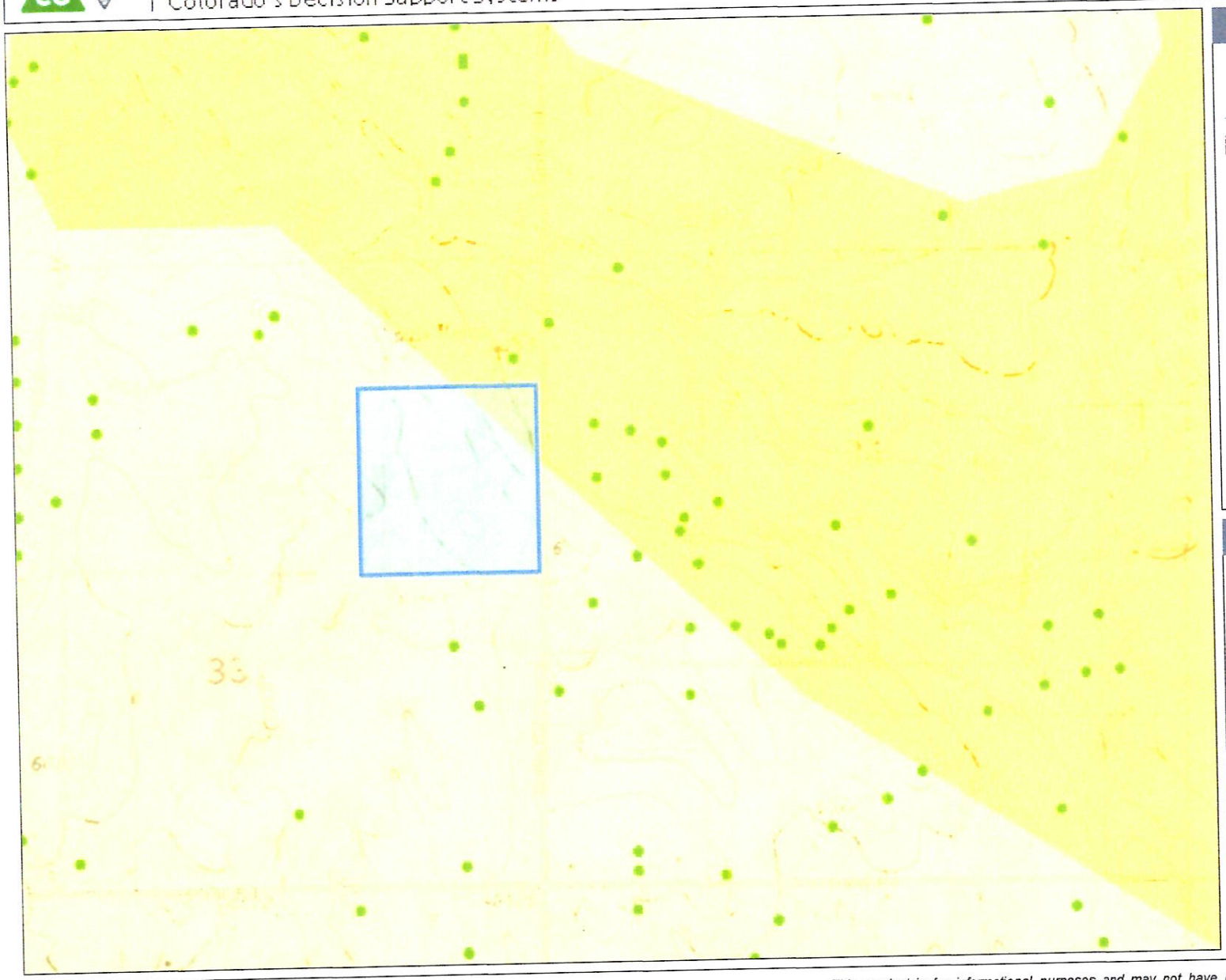


FIGURE 2
Wyoming Estates

CDSS
Colorado's Decision Support Systems

Wyoming Estates



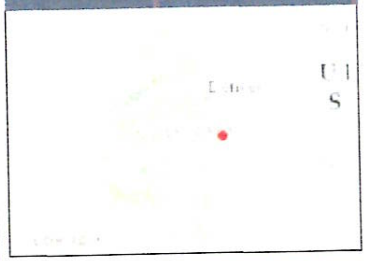
Legend

- Well Constructed
- Confluence Point
- Source Water Route Framewo
- County

Colorado Geology (Tweto)

- Qa
- Qg
- Qgo
- Qe
- Qeo
- Qd
- Qdo
- Ql
- Qb
- QTsa
- QTa
- To

Location



Notes

Depositional Boundary
Eolian Deposits and Older Gravels and Alluvium (NE)

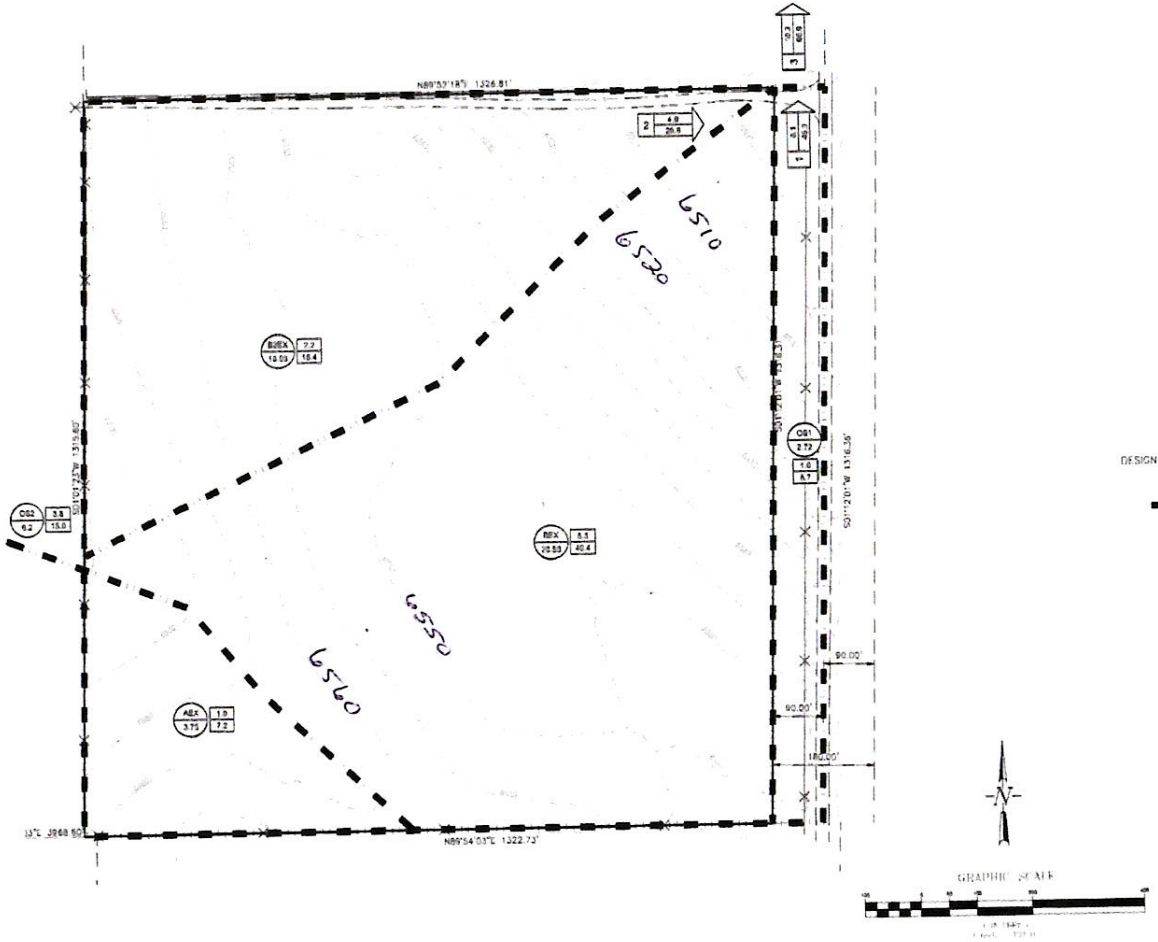
FIGURE 3

2,339 0 1,169 2,339 Feet

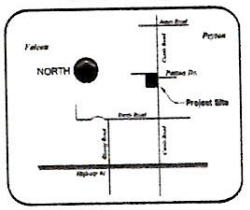
1: 14,032

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Date Prepared: 5/20/2019 4:44:19 PM



VICINITY MAP:



LEGEND

- BASIN DESIGNATION
- BASIN AREA, ACRES
- 5 YEAR STORM, CFS
- 100 YEAR STORM, CFS
- DESIGN POINT
- 5 YEAR ACCUMULATED FLOW, CFS
- 100 YEAR ACCUMULATED FLOW, CFS
- SUB-BASIN BOUNDARY
- DIRECTION OF DRAINAGE FLOW

FIGURE 4
LAND SURFACE CONTOURS

RESPEC (FORMERLY ADP)
3639 AUSTIN BLUFFS PKWY
SUITE 102
COLORADO SPRINGS, CO 80918
PHONE (719) 266-0212

DESIGNED MAB
DRAWN MJD
CHECKED MAB
DATE 07/04/2019

REVISION

STAMP

811 Know what's below. Call before you dig.

PROJ NO. 69433
DWG NM. 69433-DrngRnus

HOME RUN RESTORATIONS, INC
5090 WILEY RD
PEYTON, CO 80831

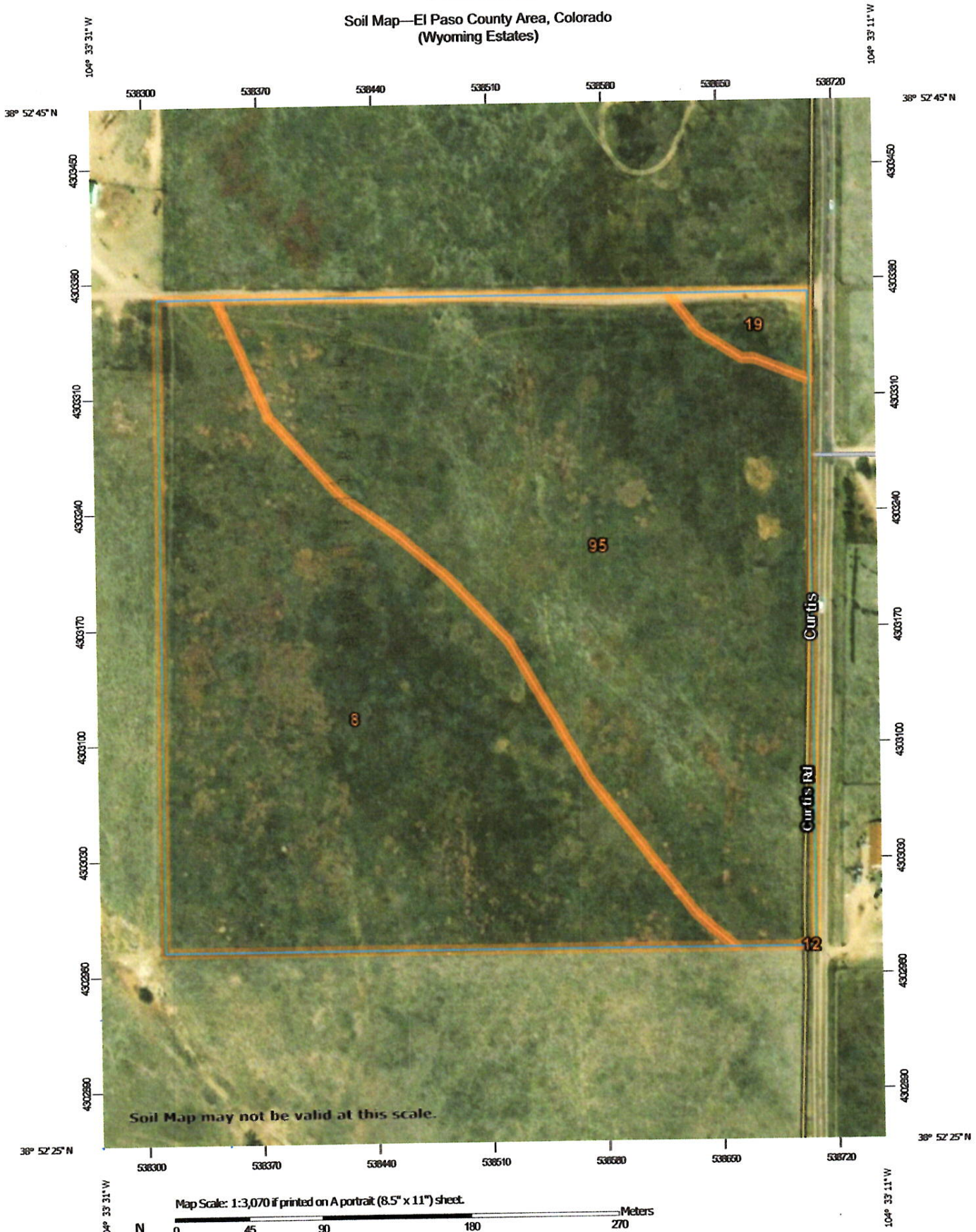
WYOMING ESTATES
SUBDIVISION
EL PASO COUNTY, CO

DRAINAGE PLAN
EXISTING CONDITIONS

DRAWING NUMBER:
C
SHEET 1

FIGURE 5

Soil Map—El Paso County Area, Colorado
(Wyoming Estates)



Map Scale: 1:3,070 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

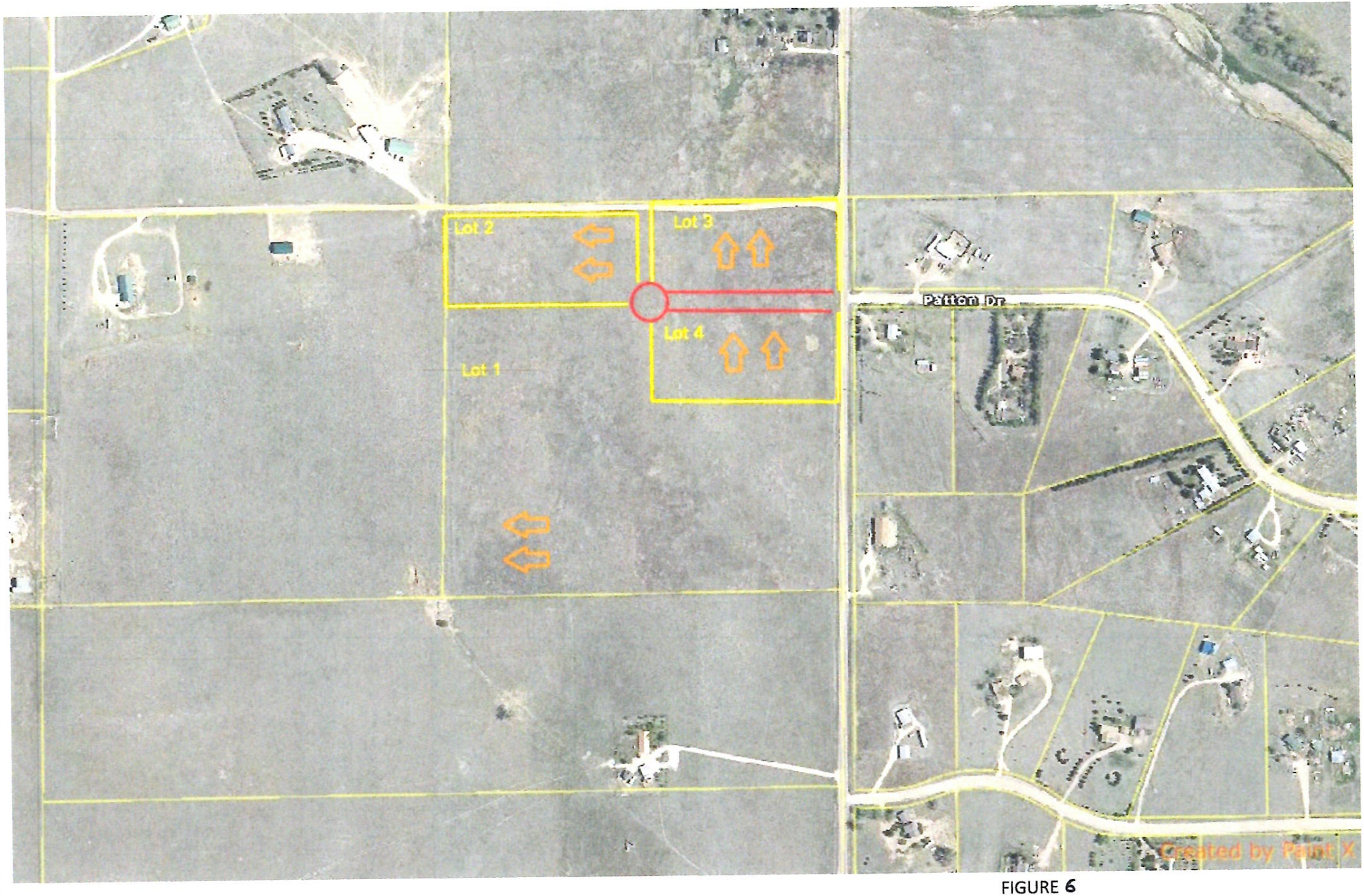
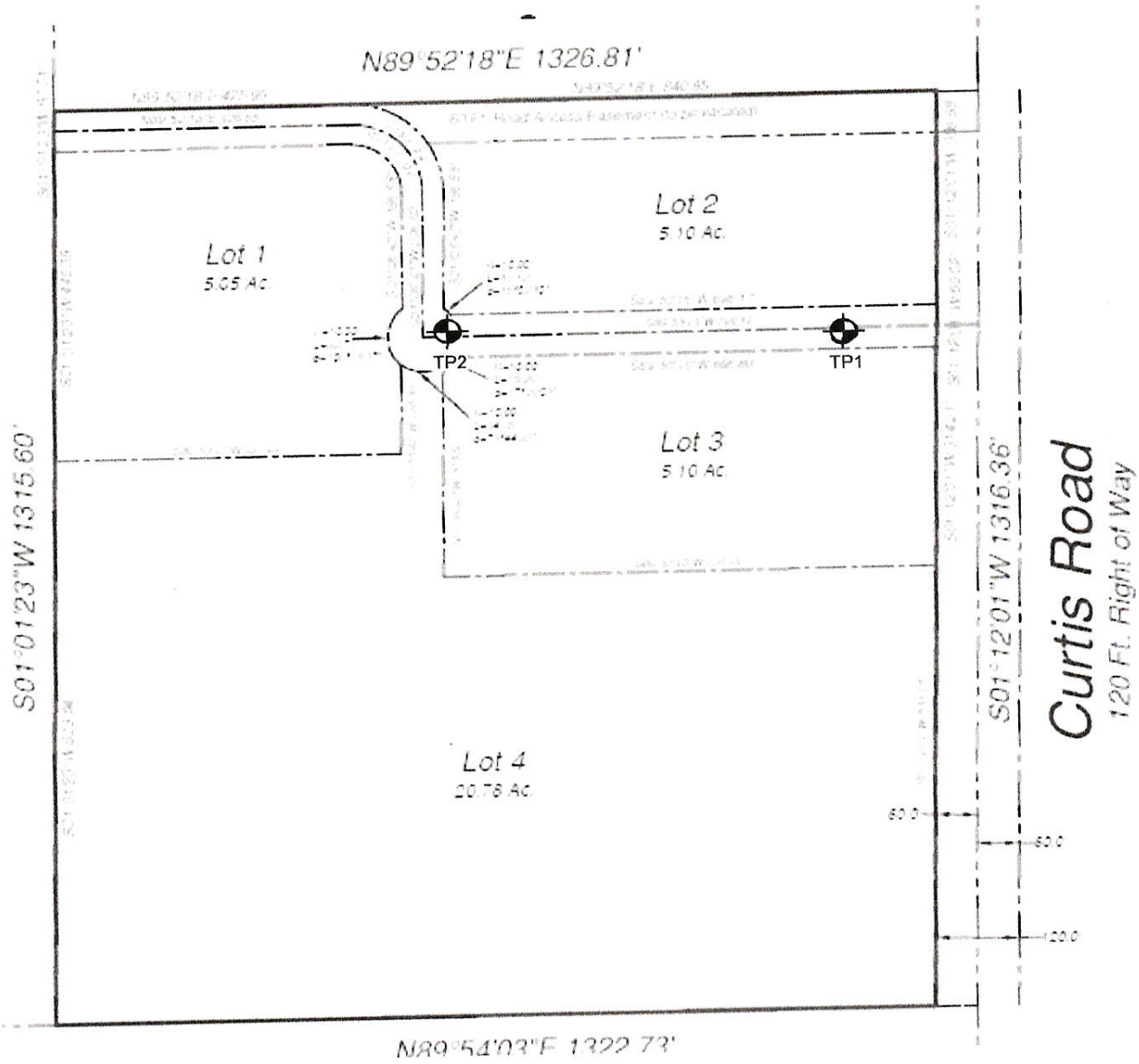


FIGURE 6
SOIL PROFILE LOCATION OTWS

FIGURE 7

Pavement Design Test Pit Locations



Legend:

Approximate Backhoe Test Pit Excavation

Site Plan

Scale: N.T.S.	Drawn by: KR	Date: 1/9/18

Curtis Road and David Road

3050 Curtis Road

El Paso, Colorado

ProTeX Job No.: 8619

FIGURE 8

National Flood Hazard Layer FIRMette

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

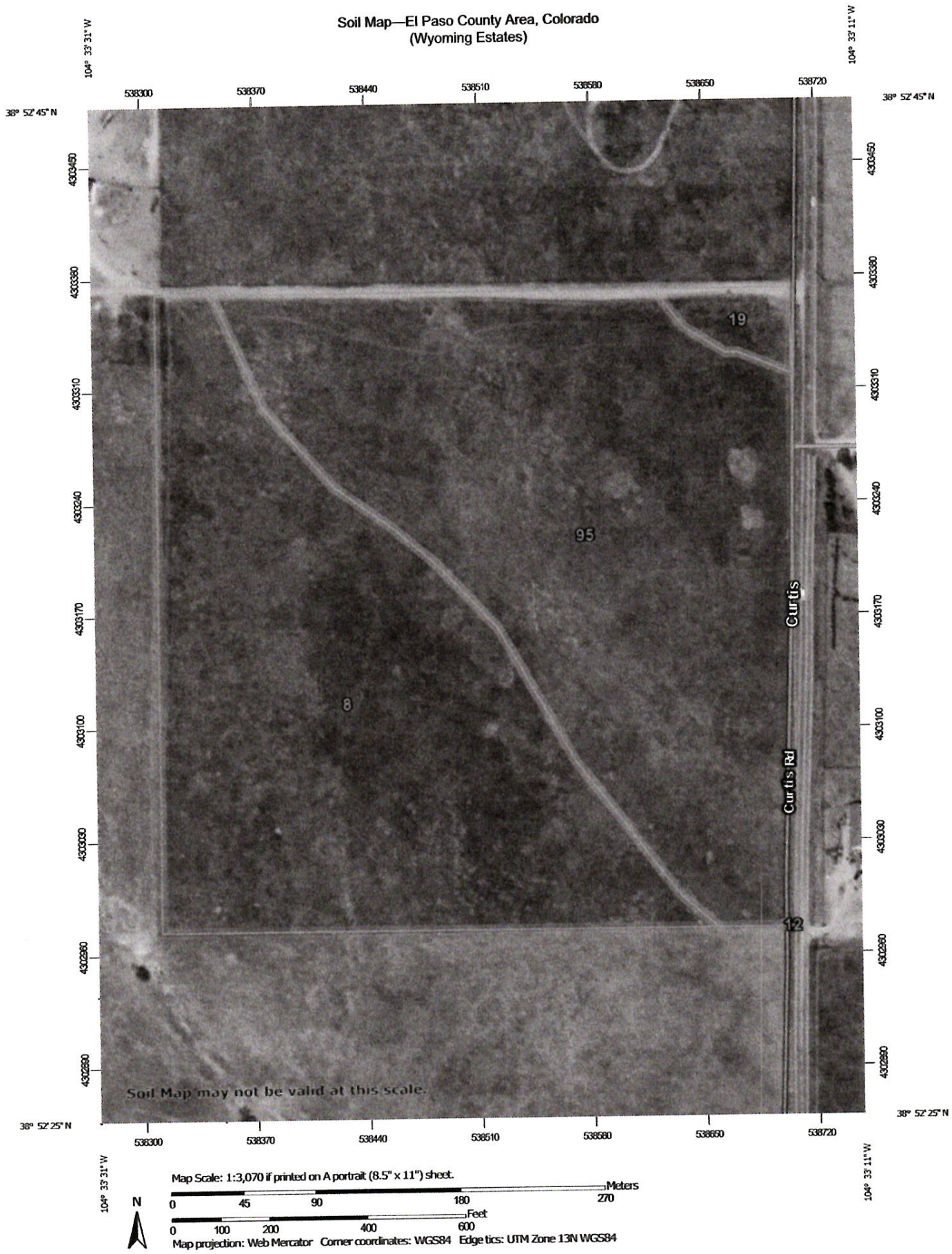
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/25/2019 at 12:54:03 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

ATTACHMENT 1

SOILS

Soil Map—El Paso County Area, Colorado
(Wyoming Estates)



Map Scale: 1:3,070 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 7, 2016—Aug 17, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	18.2	46.8%
12	Bresser sandy loam, cool, 3 to 5 percent slopes	0.0	0.0%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	0.7	1.8%
95	Truckton loamy sand, 1 to 9 percent slopes	20.0	51.4%
Totals for Area of Interest		**38.9**	**100.0%**

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
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 16, Sep 10, 2018

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Gravelly Foothill (R049BY214CO)
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit:
Landform: Swales

Hydric soil rating: Yes

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 16, Sep 10, 2018

El Paso County Area, Colorado

95—Truckton loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 36bd
Elevation: 6,000 to 7,000 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Truckton

Setting

Landform: Hills, flats
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 8 inches: loamy sand
Bt - 8 to 24 inches: sandy loam
C - 24 to 60 inches: coarse sandy loam

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
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 16, Sep 10, 2018

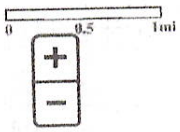
ATTACHMENT 2

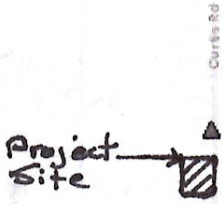
GROUNDWATER LEVEL

USGS
science for a changing world

Groundwater Watch

Site Number: 385250104331301 - SC01306433AAA1





DESCRIPTION:
Latitude 38°52'49.7", Longitude 104°33'14.5" NAD83
El Paso County, Colorado, Hydrologic Unit 11020004
Well depth: 75.1 feet
Hole depth: 75.1 feet
Land surface altitude: 6,485.00feet above NGVD29.

AVAILABLE DATA:

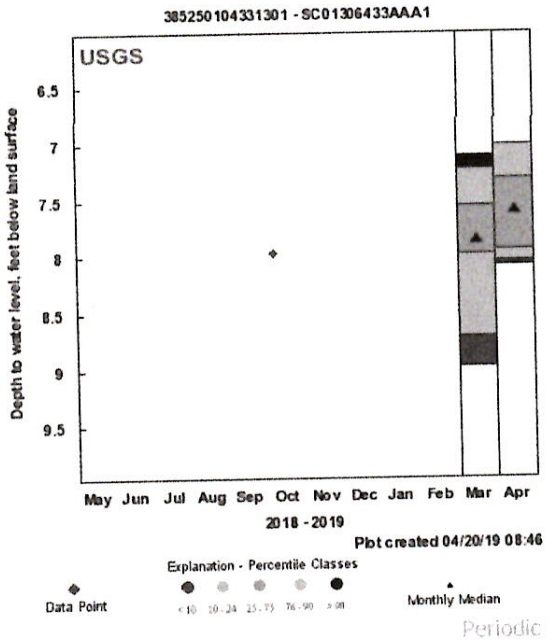
Data Type	Begin Date	End Date	Count
Field groundwater-level measurements	1979-03-14	2018-10-02	37

Additional Data Sources		Begin Date	End Date	Count
Groundwater Watch	**offsite**	1979	2018	37

OPERATION:
Record for this site is maintained by the USGS Colorado Water Science Center
Email questions about this site toColorado Water Science Center Water-Data Inquiries

Groundwater Watch Help Page

Site Statistics



Most recent data value: 7.97 on 10/2/2018
Period of Record Monthly Statistics for 385250104331301
Depth to water level, feet below land surface
All Approved Continuous & Periodic Data Used In Analysis
Note: Highlighted values in the table indicate closest statistic to the most recent data value.

Month	Lowest	10th %ile	25th %ile	50th %ile	75th %ile	90th %ile	Highest Median	Number of Years
Mar	8.97	8.71	7.98	7.87	7.56	7.23	7.11	13
Apr	8.08	8.04	7.95	7.61	7.32	7.02	7.02	15

As of 4/19/2019 16:51-2

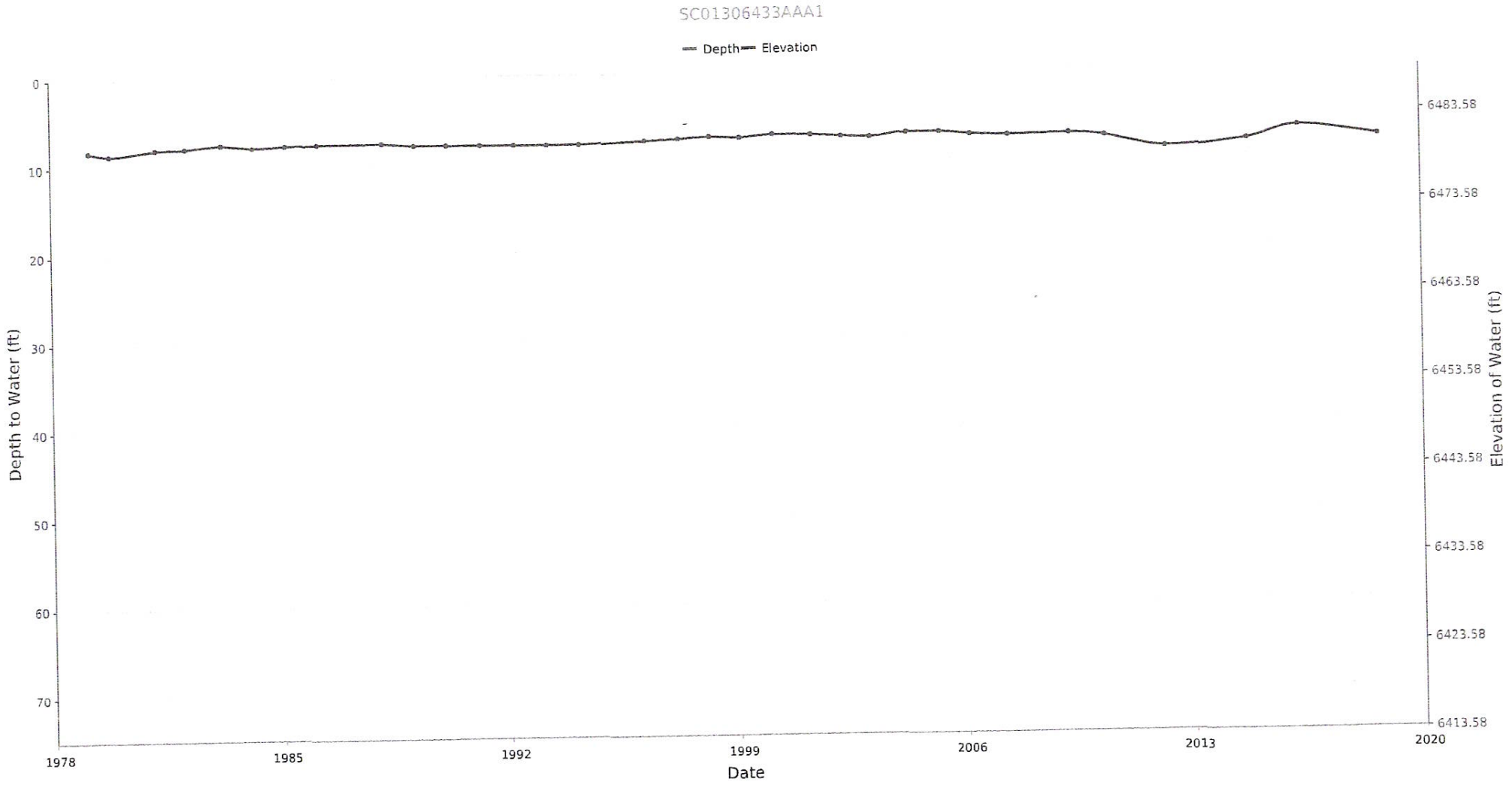
Statistics Options

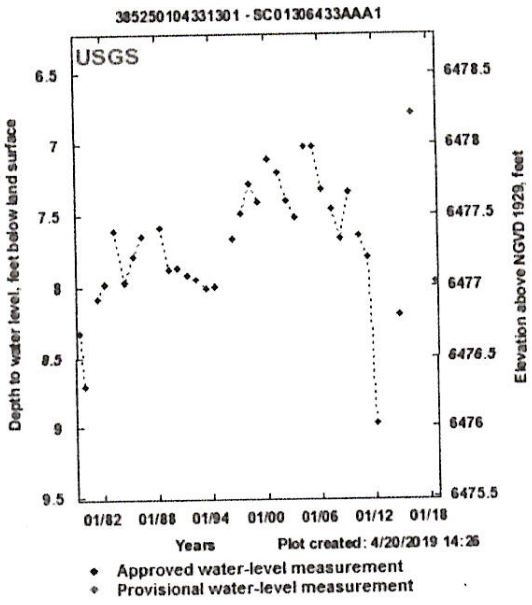
View month/year statistics

Periodic Groundwater Data

Summary for Period of Record Periodic Water Levels
Depth to water level, feet below land surface
Approved Periodic Water Level Values

Begin Date	End Date	Number of Values
03/14/79	10/02/18	37


SC01306433AAA1
Depth
Elevation
0
10
20
30
40
50
60
70
Depth to Water (ft)
6483.58
6473.58
6463.58
6453.58
6443.58
6433.58
6423.58
6413.58
Elevation of Water (ft)
1978
1985
1992
1999
2006
2013
2020
Date



Highest WL	Date of Highest WL	Lowest WL	Date of Lowest WL
6.78	04/21/16	8.97	03/27/12

Groundwater Levels Options

View latest data on NWISWeb

Download groundwater levels in text format

Return to Groundwater Watch | Return to County Page | Return to State Page

*References to non-Department of the Interior (DOI) products do not constitute an endorsement by the DOI.

ATTACHMENT 3

SOIL SAMPLES OWTS

PARR ENGINEERING & CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

STA SOIL EVALUATION

Date: September 27, 2018 **Job:** JN: 18.394

Site Location: 3050 Curtis Road, Lot 1, Peyton, CO 80831

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: The materials in the various strata of the soil profile pit were visually classified in accordance with the U.S. Department of Agriculture (USDA) standards.

COLORADO LICENSED JARED ROBERT DUMKE PROFESSIONAL ENGINEER 09-27-18 54410

Profile Pit	YES
Perc Test	-

Date: (Profile Eval) September 18, 2018
Excavator Homeowner
Evaluator R.J & S.D.

Depth to Groundwater (permanent or seasonal) Pit #1: Not Reached
Depth to Groundwater (permanent or seasonal) Pit #2: Not Reached

Depth to Bedrock - Pit #1: Not Reached
Depth to Bedrock - Pit #2: Not Reached

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Jared R. Dumke, P.E.

Profile Pit 1	
Latitude:	**38°52'31.31"N**
Longitude:	**104°33'28.35"W**
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 5'-0"	**Type 3 (LTAR=0.35)**
5'-0" - 8'-0"	**Type 2 (LTAR=0.60)**
-	-

Profile Pit 2	
Latitude:	**38°52'30.60"N**
Longitude:	**104°33'27.64"W**
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 8'-6"	**Type 3 (LTAR=0.35)**
-	-
-	-

			Location	
			Latitude:	**Longitude:**
Perc #1	N/A	Min./In.	-	-
Perc #2	N/A	Min./In.	-	-
Perc #3	N/A	Min./In.	-	-
	Average: N/A	Min./In.		

Recommendations: **(1) A conventional, non-engineered On-Site Wastewater Treatment system (OWTS) is acceptable for this site.**

PARR ENGINEERING & CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

STA SOIL EVALUATION

Date: September 27, 2018 **Job:** JN: 18.395

Site Location: 3050 Curtis Road, Lot 2, Peyton, CO 80831

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: *The materials in the various strata of the soil profile pit were visually* classified in accordance with the U.S. Department of Agriculture (USDA) standards.

COLORADO LICENSED JARED ROBERT DUMKE 54410 PROFESSIONAL ENGINEER 09-27-18

Profile Pit	YES
Perc Test	-

Date: (Profile Eval) September 18, 2018
Excavator Homeowner
Evaluator R.J & S.D.

Depth to Groundwater (permanent or seasonal) Pit #1: Not Reached
Depth to Groundwater (permanent or seasonal) Pit #2: Not Reached

Depth to Bedrock - Pit #1: Not Reached
Depth to Bedrock - Pit #2: Not Reached

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Jared R. Dumke, P.E.

Profile Pit 1	
Latitude:	38°52'41.42"N
Longitude:	104°33'25.06"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 6'-0"	Type 2 (LTAR=0.60)
6'-0" - 8'-6"	Type 4 (LTAR=0.20)
-	-

Profile Pit 2	
Latitude:	38°52'41.10"N
Longitude:	104°33'24.94"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 3'-0"	Type 2 (LTAR=0.60)
3'-0" - 8'-6"	Type 4 (LTAR=0.20)
-	-

			Location	
			Latitude:	Longitude:
Perc #1	N/A	Min./In.	-	-
Perc #2	N/A	Min./In.	-	-
Perc #3	N/A	Min./In.	-	-
Average:	N/A	Min./In.		

Recommendations: (1) An Engineered On-Site Wastewater Treatment system (OWTS) is required for this location due to: Soil Type 4 identified in the treatment zone of Profile Pit #1 & Profile Pit #2.

PARR ENGINEERING & CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

STA SOIL EVALUATION

Date: September 27, 2018 **Job:** JN: 18.396

Site Location: 3050 Curtis Road, Lot 3, Peyton, CO 80831

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: *The materials in the various strata of the soil profile pit were visually* classified in accordance with the U.S. Department of Agriculture (USDA) standards.

COLORADO LICENSED JARED ROBERT DUMKE 54410 PROFESSIONAL ENGINEER 09-27-18

Profile Pit	YES
Perc Test	-

Date: (Profile Eval) September 18, 2018
Excavator Homeowner
Evaluator R.J & S.D.

Depth to Groundwater (permanent or seasonal) Pit #1: Not Reached
Depth to Groundwater (permanent or seasonal) Pit #2: Not Reached

Depth to Bedrock - Pit #1: Not Reached
Depth to Bedrock - Pit #2: Not Reached

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Jared R. Dumke, P.E.

Profile Pit 1	
Latitude:	38°52'40.93"N
Longitude:	104°33'18.76"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 8'-6"	Type 3 (LTAR=0.35)
-	-
-	-

Profile Pit 2	
Latitude:	38°52'41.21"N
Longitude:	104°33'18.03""W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 8'-6"	Type 3 (LTAR=0.35)
-	-
-	-

			Location	
			Latitude:	Longitude:
Perc #1	N/A	Min./In.	-	-
Perc #2	N/A	Min./In.	-	-
Perc #3	N/A	Min./In.	-	-
Average:	N/A	Min./In.		

Recommendations: (1) A conventional, non-engineered On-Site Wastewater Treatment system (OWTS) is acceptable for this site.

PARR ENGINEERING & CONSULTING, INC.

Christopher L. Parr, P.E. Principal
11590 Black Forest Road, Suite 10, Colorado Springs, CO 80908
Office: 719-494-0404 Cell: 719-659-1313

STA SOIL EVALUATION

Date: September 27, 2018 **Job:** JN: 18.397

Site Location: 3050 Curtis Road, Lot 4, Peyton, CO 80831

Purpose of Investigation: To determine general subsurface soil conditions at the site location & to formulate design criteria for the proposed On-Site Wastewater Treatment system (OWTS)

Field Procedure: The materials in the various strata of the soil profile pit were visually classified in accordance with the U.S. Department of Agriculture (USDA) standards.

COLORADO LICENSED JARED ROBERT DUMKE 54410 PROFESSIONAL ENGINEER 09-27-18

Profile Pit	YES
Perc Test	-

Date: (Profile Eval) September 18, 2018
Excavator Homeowner
Evaluator R.J & S.D.

Depth to Groundwater (permanent or seasonal) Pit #1: Not Reached
Depth to Groundwater (permanent or seasonal) Pit #2: Not Reached

Depth to Bedrock - Pit #1: Not Reached
Depth to Bedrock - Pit #2: Not Reached

Other Terrain Features or Soil Conditions: See Attached Site Map

Endorsement: Jared R. Dumke, P.E.

Profile Pit 1	
Latitude:	38°52'37.92"N
Longitude:	104°33'17.81"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 2'-6"	Type 3 (LTAR=0.35)
2'-6" - 4'-0"	Type 3 (LTAR=0.35)
4'-0" - 8'-6"	Type 3 (LTAR=0.35)

Profile Pit 2	
Latitude:	38°52'37.81"N
Longitude:	104°33'16.94"W
Layer	Soil Type & LTAR
0 - 1'-0"	Topsoil
1'-0" - 8'-6"	Type 3 (LTAR=0.35)
-	-
-	-

				Location	
				Latitude:	Longitude:
Perc #1	N/A		Min./In.	-	-
Perc #2	N/A		Min./In.	-	-
Perc #3	N/A		Min./In.	-	-
	Average:	N/A	Min./In.		

Recommendations: (1) A conventional, non-engineered On-Site Wastewater Treatment system (OWTS) is acceptable for this site.

Markup Summary

dsdsevigny (2)

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Lock: Locked
Author: dsdsevigny
Date: 7/9/2019 12:29:02 PM
Color:

Lots 1, 2, and 4, do not require, then in next sentence it says lot 2 does require

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Subject: Cloud+
Page Label: 6
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Author: dsdsevigny
Date: 7/9/2019 12:29:02 PM
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