# SOILS AND GEOLOGY REPORT

## Colvin Heritage Farms

El Paso County, Colorado

May 19 2021

**Revised June 24, 2021**

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## PROJECT DESCRIPTION

The following presents Soils and Geology Report for the proposed Colvin Heritage Farms Minor Subdivision ("Project Site") (Figure 1). The 19.8 acre parcel is proposed to be subdivided two create two lots consisting of 10.1 acres (Lot 1 with an existing home and well) and 9.7 acres (Lot 2) having the respective address' of 11660 and 11545 Green Acres Lane, Colorado Springs CO 80908 in El Paso County, Colorado.

## GEOLOGY

The Project Site is located within the Black Forest Quadrangle near the western edge of a geologic structural depression known as the Denver Basin. This asymmetrical structural basin is shallow-dipping toward the northeast within Black Forest. The uppermost materials are that of the Dawson Formation deposited during the early to possibly middle Eocene (Figure 2). Historically, braided streams eastwardly carried and deposited gravel, sand, silt and clays derived from weathered Precambrian Pike Peak Granite from the uplifted areas to the west (Thorson, 2003).

Facies Unit 5 (TKda5) is the uppermost facies of the Dawson Formation and is mapped over the entire Project Site (Figure 2). This Facies is generally described as light-tan fine to medium grained feldspathic friable sandstone. The sandstone is poorly sorted and interbedded with lenses of sandy clays. Facies Unit 5 is described as generally permeable, well drained, with good foundation characteristics.

## SOILS

The National Resource Conservation Service (NRCS) has identified three soil types on the Property.

| Type | Description |
|---|---|
| 40 | Kettle gravely loamy sand, 3 to 8 % slopes |
| 41 | Kettle gravely loamy sand, 8 to 40% slopes |
| 71 | Pring Coarse sandy loam 3 to 8 percent slope |

Attachment 1 provides a complete detailed description of the soils. The natural drainage class is "somewhat extensively drained" (Type 40 and 41) to "well drained " (Type 71). Runoff potential is low for Type 40 and 71 and moderate for Type 41 and (NRCS, 2018). All are Hydrologic Soil Group B described in part as having a moderately low runoff potential when thoroughly wet.

**Soil Test Pits**

Field investigations at the Project Site consisted of excavating two profile pits within Soil Type 40 on Lot 2 (Attachment 1) to evaluate the subsurface for an onsite wastewater treatment system (OWTS) (Geoquest-1 2017). The profile pits were excavated to a maximum depth of 6 feet below ground *surface. Samples were collected from select intervals and evaluated for soil properties. Test Pit 1* encountered USDA soil Type 2A and bedrock. Test Pit 2 encountered USDA soil Type 3A and 4A and bedrock (Table 1).

Evidence of shallow groundwater occurred at a depth of 28 inches in Profile Pit 1 and 16 inches in Profile Pit 2 both at the weathered bedrock/Bedrock interface. Geoquest specified that the site will require an Engineered Septic Design with a design based on an LTAR of 0.3, GPD/SF and including an above grade uniformly pressure dosed soil treatment (Geoquest-1 2017). The location of the test pits and the proposed is presented on Figure 3. The test pit reports is included as Attachment 2.

**PROFILE BORINGS**

Two exploratory borings were drilled using a 4-in diameter auger to depths of 15 feet (Geoquest-2, 2017). Samples were collected using a 2-inch split spoon barrel sampler. A 140 pound drop-hammer, dropped 30 inches, was used to drive the sampler into the soil in accordance with ASTM D-1586. Samples were classified in the field and by laboratory analysis to evaluate physical and overlying sandstone (2-15 feet) with low to moderate clay content and moisture content ranging from 6.6 to 8 % (Attachment 4).

**TABLE 1**
**Soil Profile Pit Summary Table**
**Colvin Heritage Farms Subdivision**

| Depth (in) | Sample Interval | USDA Soil Texture | USDA Soil Structure - Shape | Soil Structure Grade | Redoximorphic Features Present? (Y/N) | Soil Type (from Table 9 in O-14) | Cemen-tation Class | Color |
|---|---|---|---|---|---|---|---|---|
| | | Topsoil | | | | | | |
| Lot 2 | Pit 1 | Sandy Loam | Granular | 1 | Yes at 28" | **Type 2 (LTAR = 0.60) Treatment Level 1** | Non-Cemented | Lt Brn 7.5YR 6/4 |
| 6" to 28" | | | | | | | | |
| 28" to 72" | | Sandy Loam | none | Massive | Yes at 28 " | **Type 2 (LTAR = 0.60) Treatment Level 1** | Moderate | Pnk/Wt 7.5YR 8/2 |

Depth to groundwater (Permanent or Seasonal) at 28-inches

**TABLE 1-cont-**
**Soil Profile Pit Summary Table**
**Colvin Heritage Farms Subdivision**

| Depth (in) | Sample Interval | USDA Soil Texture | USDA Soil Structure - Shape | Soil Structure Grade | Redoximorphic Features Present? (Y/N) | Soil Type (from Table 9 in O-14) | Cemen-tation Class | Color |
|---|---|---|---|---|---|---|---|---|
| Lot 2 | Pit 2 | Sandy Clay Loam | Blocky | 1 | Yes at 16" | **Type 3 (LTAR = 0.35) Treatment Level 1** | Non-Cementted | Dk Yel Brn 10YR 3/4 |
| 6" to 16" | | | | | | | | |
| 16" to 40" | | Sandy Clay | none | Massive | Yes at 16 " | **Type 4 (LTAR = 0.20) Treatment Level 1** | Moderate | Lt Yel Brn 2.5YR 6/3 |
| 40" to 48" | | Sandy Clay Loam | none | Massive | no | **Type 3 (LTAR = 0.35) Treatment Level 1** | Moderate | Pale Brn 2.5YR 7/4 |
| Depth to groundwater (Permanent or Seasonal) at 16-inches | | | | | | | | |

## HYDROGEOLOGY

The Property is located within the northern most portion of the Falcon Basin Drainage (Matrix 2015) within the Upper Black Squirrel Creek Designated Ground Water Basin. The ground surface elevation across the Project Site ranges from 7430 to 7484 feet above mean sea level (Figure 3). Surface drainage flows via existing natural drainage swales, draining to the southeast and south across the Project Site. Figure 4 shows the natural surface drainage pattern (JPS 2020). Surface water was visible on the southernmost area within the drainage depression near Burgess Road

during a site visit by GWI in the area labeled "Design Point 1" on Figure 4. As this visit was not following a recent precipitation event, persistent shallow water may occur in this area and should be considered in selecting a building location. There are areas greater than 1-acre within vacant lot 2 where there is relatively flat to gently sloping terrain suitable for building. The slope on the vacant lot is mild, ranging from 1 to 10 percent.

## 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 polluted water, landfills, fill areas, contamination; airports and major utility facilities, and landslides were evaluated and not identified on the Project Site.

### Flooding

The National Flood Hazard map delineated the Property and surrounding area an "area of Minimal Flood Hazard" (FEMA 2018) (Figure 5). The drainage report completed by the applicant's engineer emphasized the importance of maintaining drainage patterns and erosion control to avoid drainage problems (JPS 2020).

### Erosion

The Project Site has mature ponderosa pines with a canopy covering a significant area of the northern portion of the Project Site. Lot 2 is mostly covered by native vegetation and to a lesser extent, ponderosa pine trees. The area does not appear to have been affected by the 2013 Black Forest Fire. Based on the Soil test pits and borings, The Project Site is underlain by Dawson Bedrock comprised of an arkosic sandstone. Building setbacks and other methods to reduce potential hazards associated with possible slope instabilities from erosion may be needed as arkoses are easily eroded on exposed weathered outcrops and disturbed areas due to excavation.

### Expansive Soils

The soils were determined to have a "small amount of expansive potential" from the foundation borings as described in the Soils report directed at foundation design for the proposed home on Lot 2. As variability in the local soils within the Dawson Formation indicate there is a potential for expansive soils, thus borings will be to be re-evaluated upon completion of the foundation excavation and prior to the placement of any framework.

### Shallow Groundwater

Geoquest reported groundwater encountered in Soil Profile Pit #1 at 28 inches and Profile test pit #2 at 16 inches (Geoquest-1, 2017). The property is defined by highland areas and swales. The pit locations are situated within the highland area; the groundwater Geoquest identified was perched groundwater, not the groundwater table. Water drains from the uplands towards the low-lying area southeast of the proposed home site and was visible at the southern portion of the property by Burgess road and is identified on Figure 3 as being within the drainage easement. Conditions at the Project Site indicate a potential for periodically high moisture conditions and/or frost heave. Additional investigations will be needed by a certified geotechnical engineer in the areas where foundations are planned to design appropriate subdrain systems.

## MINERAL RESOURCES

Colorado Geological Mineral Resources Derivative Map indicates a low potential to contain economically viable mineral resources.

## CONCLUSION

The site is not exposed to any geologic hazards or geotechnical constraints that would preclude the proposed two-lot residential subdivision. The OWTS for the vacant lot was determined to require an engineered system.

## REFERENCES

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US Forest Service Abandoned Mind Lands Inventory
Debris Flows-Fans/Mudslides

Federal Emergency Management Agency (FEMA). December 12, 2018.

https://www.fema.gov/national-flood-hazard-layer-nfhl; nfhl Viewer.

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Geoquest-2 2017. Soils Report for Seger Homes Job #17-0660.

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Matrix Deign Group. Falcon Drainage Planning Study Selected Plan Report Final-September 2015.

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JR Engineering LLC, May 5, 2015 Drainage Basin Planning Study for Kettle Creek Basin prepared for High Valley Land Company Inc. http//Coloradosprings.gov/dbps

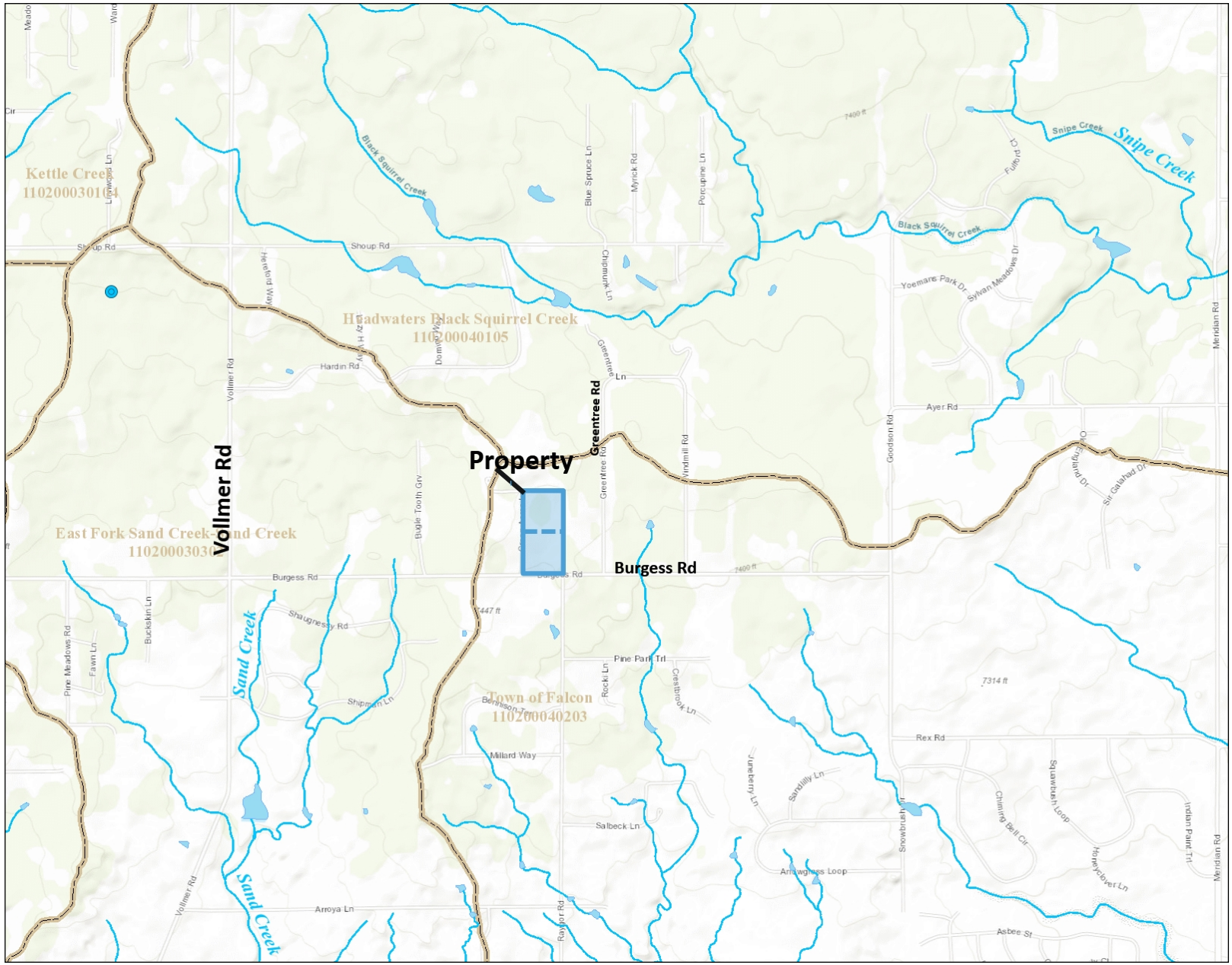
Natural Resource Conservation Service (NRCS), August 21, 2017. Web Soil Survey. United States Department of Agriculture: https://websoilsurvey.nrcs.usda.gov

NCRS: https://websoilsurvey.nrcs.usda.gov
Watts, Oliver Consulting Engineer inc.,January 16, 2019. Preliminary and Final Drainage Plan and Report Poenitsch Subdivision, El Paso County.

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

CDSS
Colorado's Decision Support Systems

# Map Viewer




## Legend

- NHDPoint
- NHDArea
  - CanalDitch
  - StreamRiver
- NHDWaterbody
  - LakePond
  - Reservoir
  - SwampMarsh
- NHDFlowline
  - ArtificialPath
  - CanalDitch
  - Connector
  - Pipeline
  - StreamRiver
  - Underground Conduit
- WBD_HU12
- County

## Location


## Notes

PROPERTY LOCATION
Colvin 19.8 Acres

SE S15 T12S R65W

FIGURE 1

4,677 0 2,339 4,677 Feet

1: 28,064

*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: 7/23/2018 7:56:13 PM

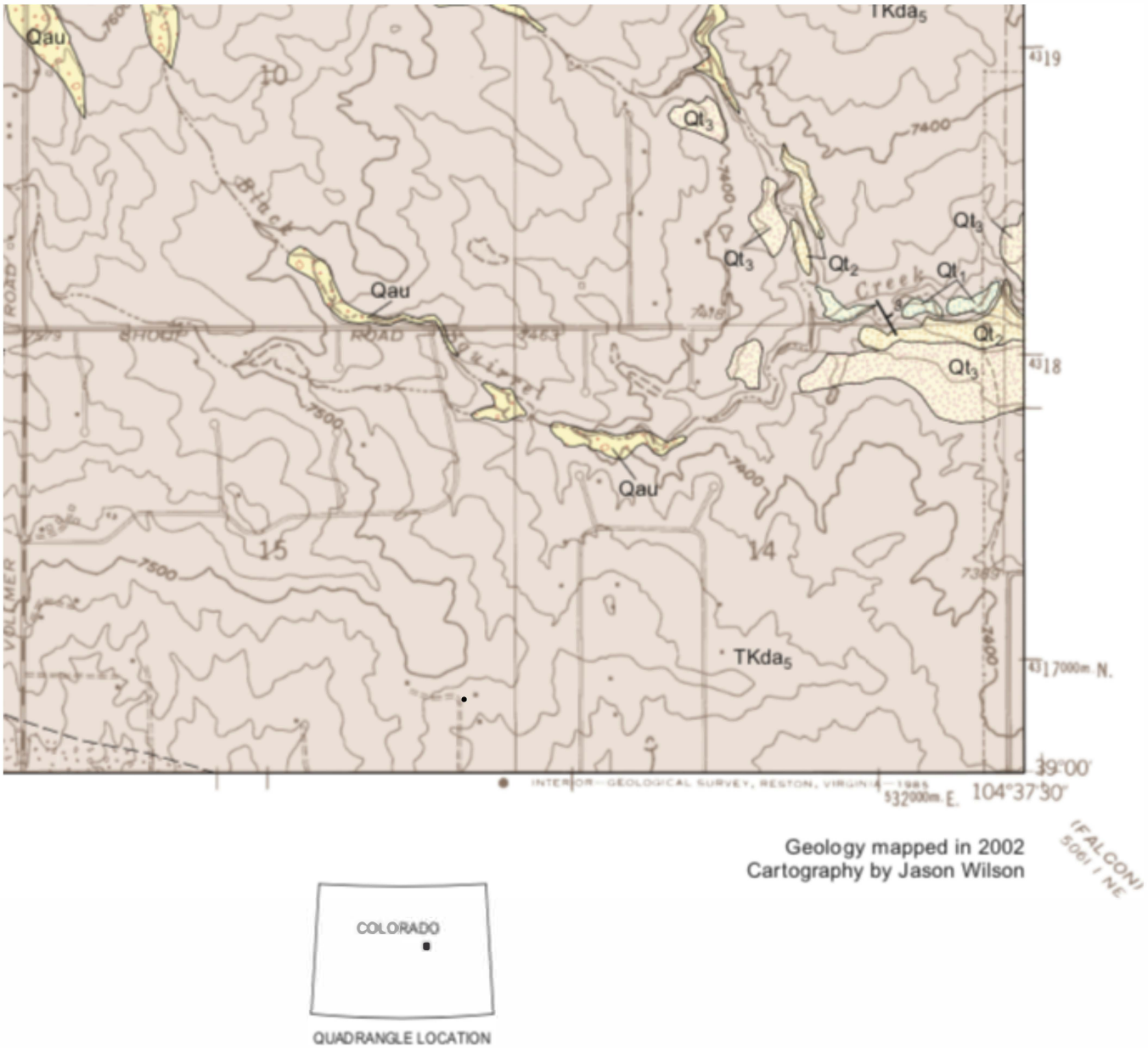



FIGURE 2
GEOLOGY

# COLVIN HERITAGE FARMS SUBDIVISION FILING 1

A SUBDIVISION OF A PORTION OF THE SOUTHEAST QUARTER OF SECTION 15,
TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
EL PASO COUNTY, COLORADO

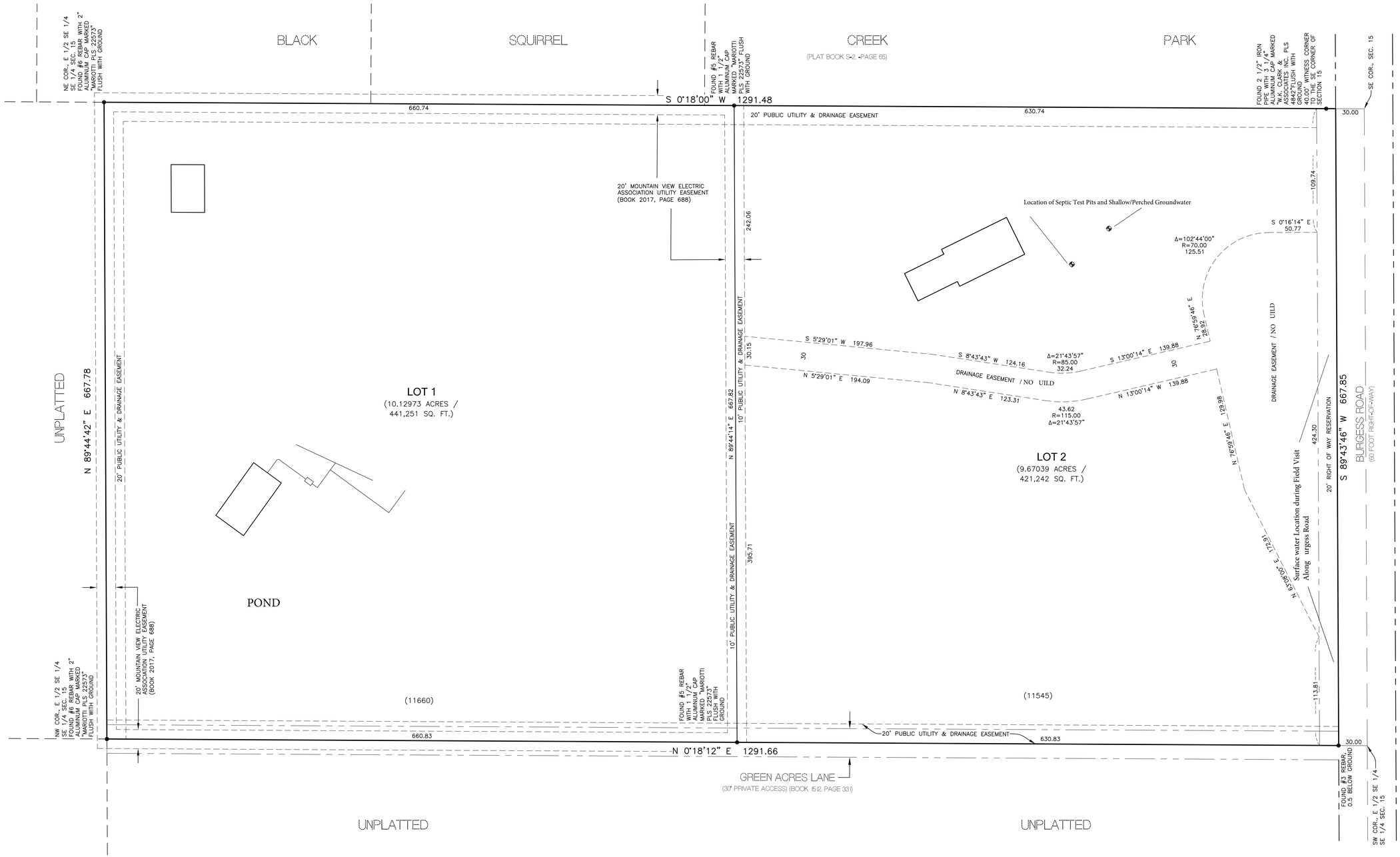



FIGURE 3

DSD FILE NO: MS2010

GRAPHIC SCALE

50 0 25 50

( IN FEET )
1 inch = 50 ft.


COMPASS SURVEYING & MAPPING, LLC
3249 WEST CAREFREE CIRCLE
COLORADO SPRINGS, CO 80917
719-354-4120
WWW.CSAMLLC.COM


| REVISIONS: | | |
|---|---|---|
| 1 | 4/03/21 | County comments. |

PROJECT NO. 19227
MAY 11, 2020
SHEET 2 OF 2

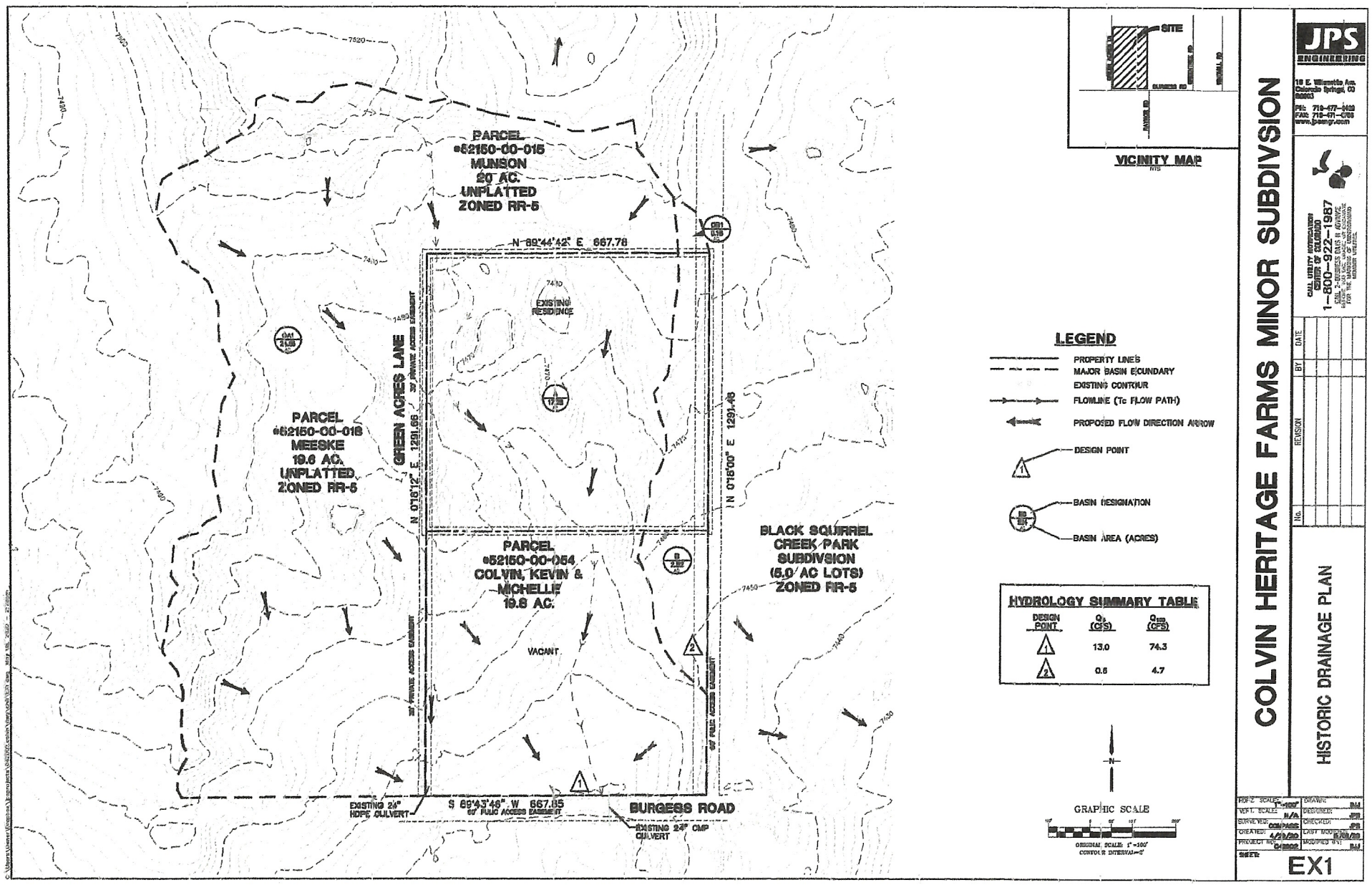

PARCEL
#52150-00-015
MUNSON
20 AC.
UNPLATTED
ZONED RR-5
N 89°44'42" E 667.78
EXISTING RESIDENCE
PARCEL
#52150-00-018
MEESKE
19.6 AC.
UNPLATTED
ZONED RR-5
GREEN ACRES LANE
30' PRIVATE ACCESS EASEMENT
N 01°12" E 1291.66
N 01°00" E 1291.46
PARCEL
#52150-00-054
COLVIN, KEVIN &
MICHELLE
19.6 AC.
VACANT
BLACK SQUIRREL
CREEK PARK
SUBDIVISION
(5.0 AC LOTS)
ZONED RR-5
EXISTING 24"
HDPE CULVERT
S 89°43'46" W 667.85
60' PUBLIC ACCESS EASEMENT
BURGESS ROAD
EXISTING 24" CMP
CULVERT
SITE
VICINITY MAP
LEGEND
PROPERTY LINES
MAJOR BASIN BOUNDARY
EXISTING CONTOUR
FLOWLINE (Tc FLOW PATH)
PROPOSED FLOW DIRECTION ARROW
DESIGN POINT
BASIN DESIGNATION
BASIN AREA (ACRES)
HYDROLOGY SUMMARY TABLE
DESIGN POINT
Q5 (CFS)
Q100 (CFS)
1 13.0 74.3
2 0.6 4.7
GRAPHIC SCALE
ORIGINAL SCALE: 1" =100'
CONTOUR INTERVAL=2'
COLVIN HERITAGE FARMS MINOR SUBDIVSION
HISTORIC DRAINAGE PLAN
JPS ENGINEERING
CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
EX1

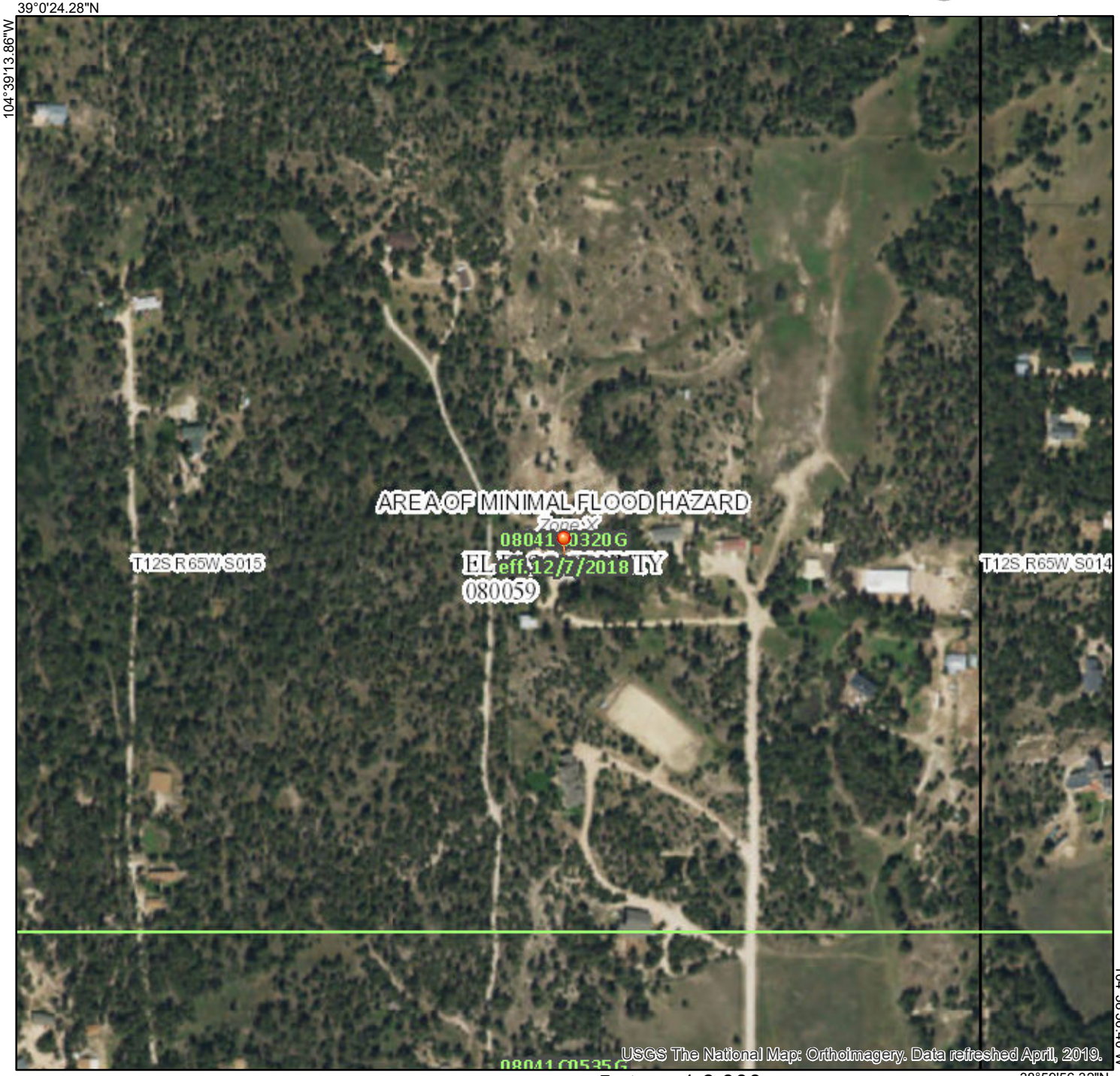
FIGURE 4

# National Flood Hazard Layer FIRMette

FEMA

39°0'24.28"N

104°39'13.86"W




104°38'36.40"W

38°59'56.32"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

## Legend

FIGURE 5

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**

- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 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 4/7/2020 at 2:16:02 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

United States Department of Agriculture

NRCS

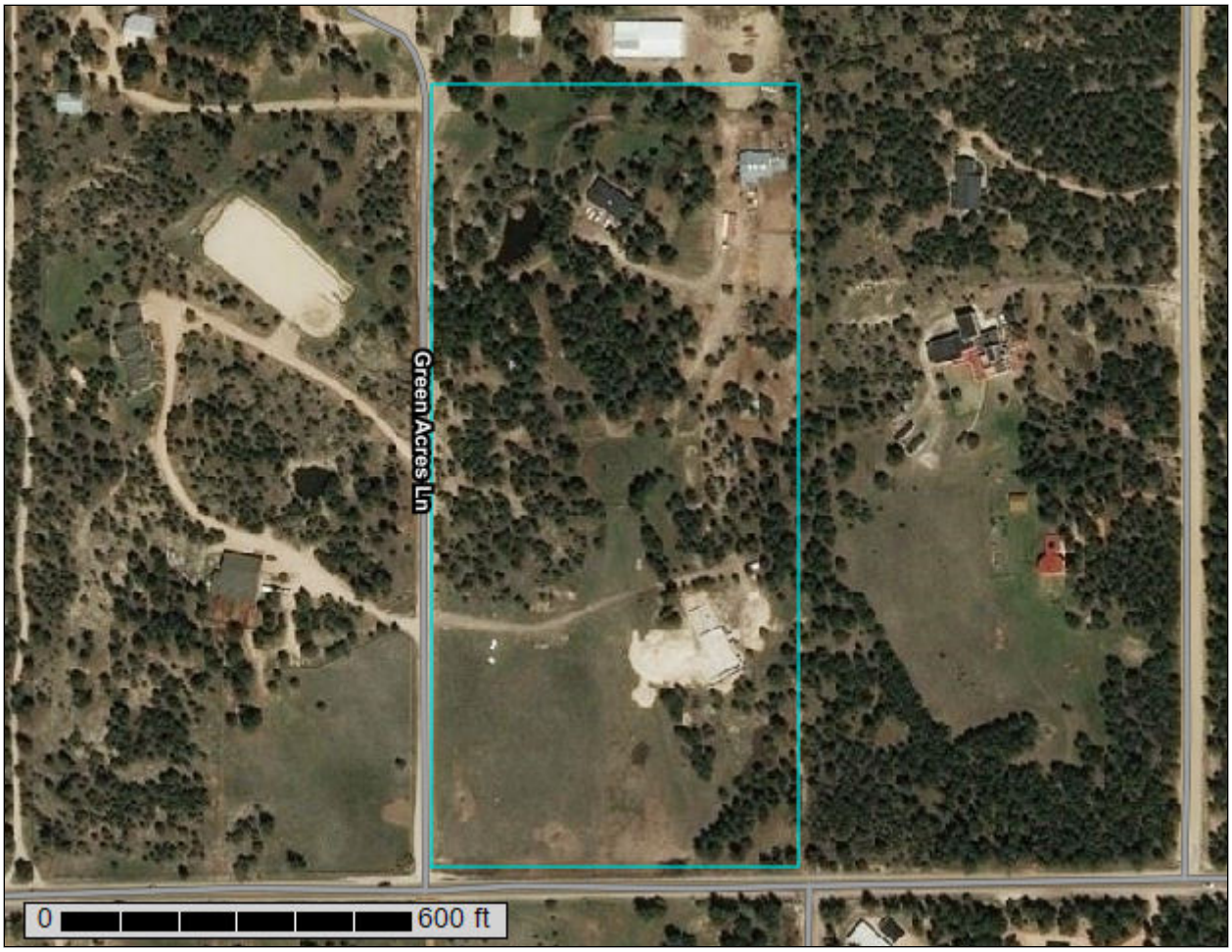
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for

# El Paso County Area, Colorado

## Colvin Heritage Farms




March 6, 2020

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

# Contents

# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map


Map Scale: 1:2,380 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

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 17, Sep 13, 2019

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

Date(s) aerial images were photographed: Sep 8, 2018—May 26, 2019

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 |
|---|---|---|---|
| 40 | Kettle gravelly loamy sand, 3 to 8 percent slopes | 10.8 | 55.8% |
| 41 | Kettle gravelly loamy sand, 8 to 40 percent slopes | 4.8 | 24.8% |
| 71 | Pring coarse sandy loam, 3 to 8 percent slopes | 3.7 | 19.4% |
| **Totals for Area of Interest** | | **19.3** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# 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
*Natural 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 storage in profile:* 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

#### Pleasant

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

#### Other soils

*Percent of map unit:*
*Hydric soil rating:* No

## 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
*Natural 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 storage in profile:* 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

#### Other soils

*Percent of map unit:*
*Hydric soil rating:* No

#### Pleasant

*Percent of map unit:*

*Landform:* Depressions
*Hydric soil rating:* Yes

## 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
*Natural 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 storage in profile:* Low (about 6.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* B
*Ecological site:* Loamy Park (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

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ATTACHMENT 2

GEOQUEST, LLC

6825 Silver Ponds Heights #101
Colorado Springs, CO 80908
(719) 481-4560

# PROFILE PIT EVALUATION

## FOR

## SEEGER HOMES

**JOB #17-0660**

11545 Green Acres Lane,
El Paso County,
Colorado

COLORADO REGISTERED
CHARLES E. MILLIGAN
34608
PROFESSIONAL ENGINEER

Respectfully submitted,

Charles E. Milligan, P.E.
Civil Engineer

**PROFILE PIT FINDINGS**

Enclosed are the results of the profile pit for the septic system to be installed at **11545 Green Acres Lane, El Paso County, Colorado.** The location of the test pit was determined by Seeger Homes. The residence will not be on a public water system. The number of bedrooms in the design for the residence is unknown. Due to the natural slope of the property, the entire system will feed to the south-southwest at approximately 6% at least 20 feet. All applicable portions of the El Paso County Health Department Onsite Wastewater Treatment System Regulations (OWTS) must be complied with for the installation of the treatment system.

The inspection was performed on July 21, 2017, in accordance with Table 10-1 of the **E.P.C.P.H. OWTS Regulations.**

Soil Profile #1:

**0 to 6"** - Topsoil- loam, organic composition.

**6" to 28"** - USDA soil texture sandy loam, soil type 2A, structure shape granular, structure grade 1, non-cemented, LTAR 0.50, light brown in color, 7.5YR 6/4.

**28" to 6′** - USDA soil texture sandy loam, soil type 2A, structure shape none, structure grade massive, moderately cemented, LTAR 0.50, pinkish white in color, 7.5YR 8/2, Dawson sandstone, redoximorphic features at 28 inches.

Soil Profile #2:

**0 to 6"** - Topsoil- loam, organic composition.

**6" to 16"** - USDA soil texture sandy clay loam, soil type 3A, structure shape blocky, structure grade 1, non-cemented, LTAR 0.30, dark yellowish in color, 10YR 3/4.

**16" to 40"** - USDA soil texture sandy clay, soil type 4A, structure shape none, structure grade massive, moderately cemented, LTAR 0.15, light yellowish brown in color, 2.5YR 6/3, Dawson sandstone, redoximorphic features at 16 inches.

**40" to 4′** - USDA soil texture sandy clay loam, soil type 3A, structure shape none, structure grade massive, moderately cemented, LTAR 0.30, pale brown in color, 2.5Y 7/4, Dawson sandstone.

Groundwater evidence was encountered at the depth of 28 inches in Profile Pit #1 and at 16 inches in Profile Pit #2 during the inspection. Bedrock was encountered at the depth of 28 inches in Profile Pit #1 and at 16 inches and 40 inches in Profile Pit #2 during the inspection. No known wells were observed within 100 feet of the proposed system. **All setbacks shall conform to county regulations.**

**Due to encountering USDA soil type 3A, bedrock, and groundwater evidence, the septic system to be installed on this site shall be designed by a Colorado Licensed Engineer. Based on the observed conditions, we feel a design based on an LTAR of 0.30, GPD/SF (USDA 3A, treatment soil, treatment level 1) is reasonable. An above grade uniformly pressure dosed soil treatment area is required.**

If during construction of the field itself, subsurface conditions change considerably or if the location of the proposed field changes, this office shall be notified to determine whether the conditions are adequate for the system as designed or whether a new system needs to be designed.

Weather conditions at the time of the test consisted of partly cloudy skies with hot temperatures.

# PROFILE PIT LOG - Profile Pit #1

JOB#: 17-0660
DATE EVALUATED: 21 Jul 2017
EQUIPMENT USED: MINI-EXCAVATOR

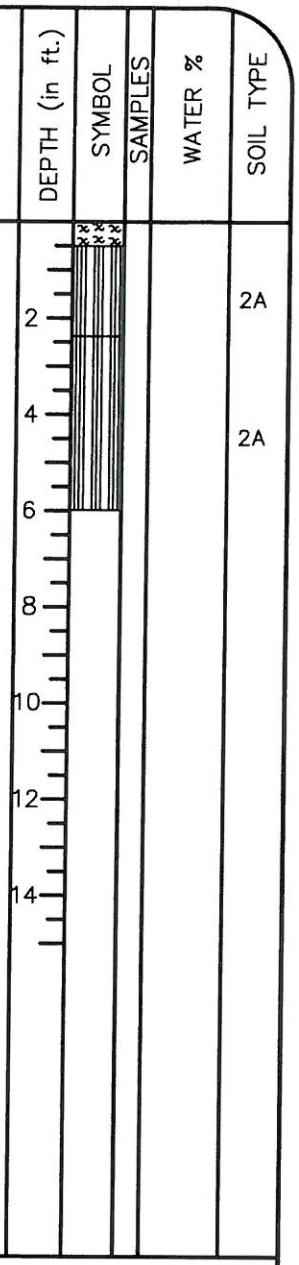
0"-6" **TOPSOIL**
Loam
Organic Compoisition

6"- 28" **Sand**

| | |
|---|---|
| Fine-coarse Grained | USDA Soil Texture: Sandy Loam |
| Low-moderate Density | USDA Soil Type: 2A |
| Moderate Moisture Content | USDA Structure Shape: Granular |
| Low-moderate Clay Content | USDA Structure Grade: 1 |
| Low-moderate Cohesion | Cementation Class: Non-Cemented |
| Low-moderate Plasticity | Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.50 |
| Light Brown Color 7.5YR 6/4 | |

28"- 6' **Dawson Sandstone**

| | |
|---|---|
| Fine-coarse Grained | USDA Soil Texture: Sandy Loam |
| Moderate-high Density | USDA Soil Type: 2A |
| Low-moderate Moisture Content | USDA Structure Shape: None |
| Low-moderate Clay Content | USDA Structure Grade: Massive |
| Low Cohesion | Cementation Class: Moderately |
| Low Plasticity | Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.50 |
| Pinkish White Color 7.5YR 8/2 | Redox @ 28" |




**LTAR** to be Used for OWTS Sizing: **0.30GPD/SF (USDA Type 3A, Treatment soil, Treatment Level 1)**
**Depth to Groundwater (Permanent or Seasonal):** Seasonal @ 28"
**Depth to Bedrock and Type:** Dawson Sandstone @ 28"
**Depth to Proposed Infiltrative Surface from Ground Surface:** Above Grade (Uniformly pressure dosed STA)
**Soil Treatment Area Slope and Direction:** SSW @ 6%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

| | |
|---|---|
| Project: 17-0660 | Project Name and Address |
| Sheet: 1 of 2 | Seeger Homes |
| Date: 04 Aug 2017 | 11545 Green Acres Ln |
| | Sch. No. 5215000053 |
| | El Paso County, Colorado |
| Scale: 1/4" = 1' | |
| Drawn by: mtj | |
| Checked by: cem | |


GEOQUEST, LLC.
6825 SILVER PONDS HEIGHTS
SUITE 101
COLORADO SPRINGS, CO
80908

OFFICE: (719) 481-4560
FAX: (719) 481-9204

# PROFILE PIT LOG - Profile Pit #2

JOB#: 17-0660
DATE EVALUATED: 21 Jul 2017
EQUIPMENT USED: MINI-EXCAVATOR

| DEPTH (in ft.) | SYMBOL | SAMPLES | WATER % | SOIL TYPE |
|---|---|---|---|---|

0"-6" **TOPSOIL**
Loam
Organic Compoisition

6"- 16" **Clayey Sand**

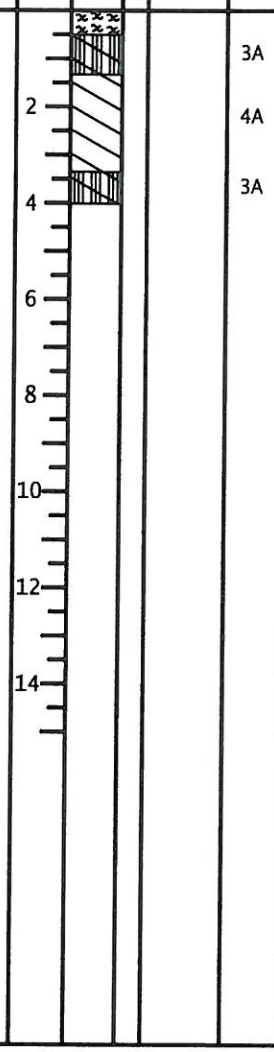
| | |
|---|---|
| Fine-coarse Grained | USDA Soil Texture: Sandy Clay Loam |
| Moderate Density | USDA Soil Type: 3A |
| Moderate Moisture Content | USDA Structure Shape: Blocky |
| Moderate Clay Content | USDA Structure Grade: 1 |
| Moderate Cohesion | Cementation Class: Non-Cemented |
| Moderate Plasticity | Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.30 |
| Dark Yellowish Brown Color 10YR 3/4 | |

16"- 40" **Dawson Sandstone**

| | |
|---|---|
| Fine-medium Grained | USDA Soil Texture: Sandy Clay |
| High Density | USDA Soil Type: 4A |
| Moderate Moisture Content | USDA Structure Shape: None |
| Moderate-high Clay Content | USDA Structure Grade: Massive |
| Moderate-high Cohesion | Cementation Class: Moderately |
| Moderate-high Plasticity | Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.15 |
| Light Yellowish Brown Color 2.5YR 6/3 | Redox @ 16" |

40"- 4' **Dawson Sandstone**

| | |
|---|---|
| Fine-coarse Grained | USDA Soil Texture: Sandy Clay Loam |
| Moderate-high Density | USDA Soil Type: 3A |
| Low-moderate Moisture Content | USDA Structure Shape: None |
| Moderate Clay Content | USDA Structure Grade: Massive |
| Moderate Cohesion | Cementation Class: Moderately |
| Moderate Plasticity | Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.30 |
| Pale Brown Color 2.5Y 7/4 | |




**LTAR** to be Used for OWTS Sizing: **0.30GPD/SF (USDA Type 3A, Treatment soil, Treatment Level 1)**
**Depth to Groundwater (Permanent or Seasonal):** Seasonal @ 16"
**Depth to Bedrock and Type:** Dawson Sandstone @ 16"
**Depth to Proposed Infiltrative Surface from Ground Surface:** Above Grade (Uniformly pressure dosed STA)
**Soil Treatment Area Slope and Direction:** SSW @ 6%

Note: See El Paso County Board of Health Regulation Chapter 8: On-Site Wastewater Treaments Systems (OWTS) Regulations for Additional Information. Refer to Table 10-1 for Corresponding LTAR if Treatment Level 2, 2N, 3, or 3N will be Implemented in the Design of the OWTS. System Sizing Depends on a Number of Factors (i.e. LTAR, # of Bedrooms, Type of Soil Treament Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

| | |
|---|---|
| Project: 17-0660 | Project Name and Address |
| Sheet: 2 of 2 | Seeger Homes |
| Date: 04 Aug 2017 | |
| | 11545 Green Acres Ln |
| | Sch. No. 5215000053 |
| Scale: 1/4" = 1' | El Paso County, Colorado |
| Drawn by: mtj | |
| Checked by: cem | |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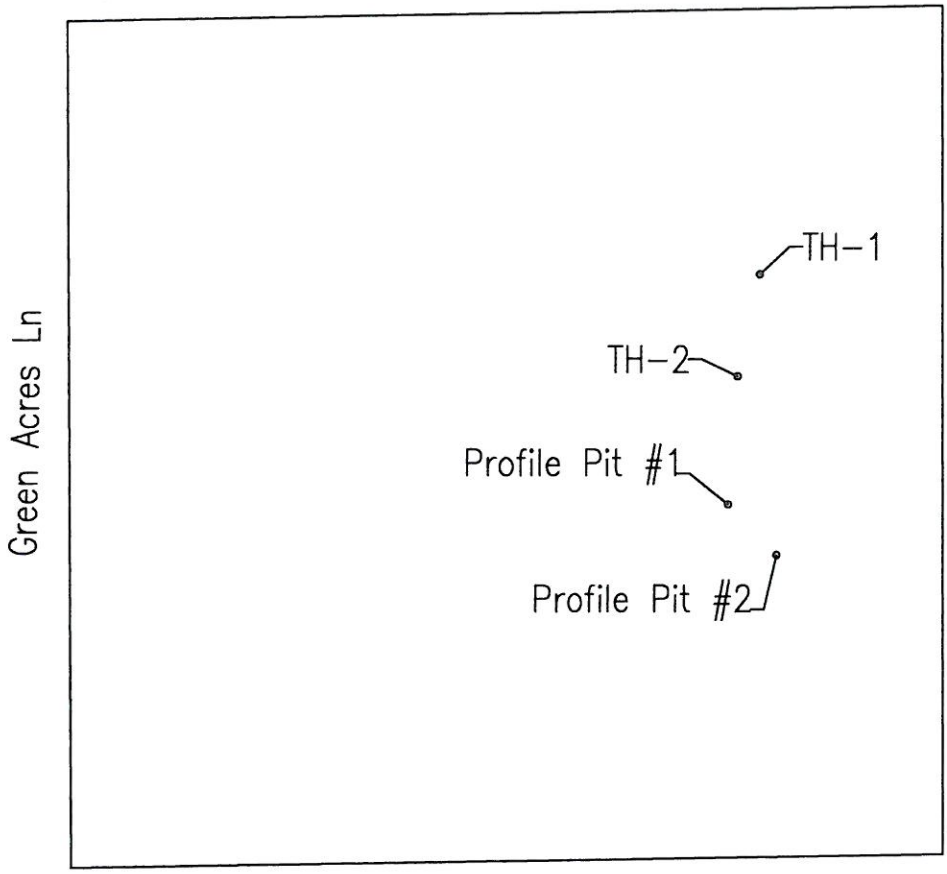
GEOQUEST LLC

**SITE MAP**

11545 Green Acres Ln
El Paso County,
Colorado,
Job #17-0660




Location from Southwest Lot Corner to Profile Pit #1:
N. 61° E. – 577'
Location from Profile Pit #1 to Profile Plt #2:
S. 44° E. – 54'
GPS Coordinates:
Pit 1; N. 38° 59' 57.81" W. 104° 38' 42.62"
Pit 2; N. 38° 59' 57.56" W. 104° 39' 42.13"