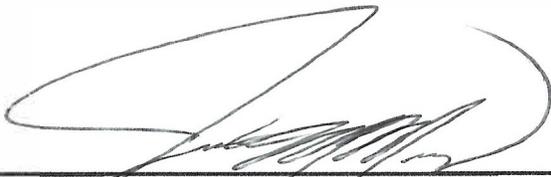


WASTE WATER TREATMENT REPORT

Colvin Heritage Farms

El Paso County, Colorado

May 19, 2021



Julia M. Murphy, MS PG
Professional Geologist /Hydrogeologist



Ground Water Investigations LLC • 11590 Black Forest Rd. 614 N Suite 15
Colorado Springs, CO 80908 • (719) 338-1805

PROJECT DESCRIPTION

The following presents Soils and Geology Report for the proposed Colvin Heritage Farms Minor Subdivision ("Project Site"). The 19.8 acre parcel is proposed to be subdivided to 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 (Figure 1). The parcel is currently partially developed with one residence include a well and individual non-evaporative septic system located on Lot 1. Future construction of a single-family residential home with a well and individual non evaporative septic system is proposed on Lot 2 (Figure 2). The following information is a summary of the study that was completed on proposed Lot 2 by Geoquest LLC. The wastewater system soil investigation reports are signed by their professional Engineer and are attached to this summary.

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). 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).

Geoquest LLC states there was evidence of shallow groundwater that 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. Based on the local geology, the saturated soils identified as groundwater by Geoquest LLC is perched water and not water table conditions. In perched conditions, infiltrating water from rain or snow accumulates in the unsaturated zone above an impermeable soil layer such as clay, or in this case, bedrock. Based on their findings, Geoquest produced an Engineered Septic Design based on an LTAR of 0.3, GPD/SF and including an above grade uniformly pressure dosed soil treatment (Attachment 1).

CONCLUSION

Based on the results of the shallow soils samples collected to identify the viability of a conventional OWTS on Lot 2, it was determined an Engineered design was necessary. Figure 3 reflects the design of the OWTS by Geoquest LLC.

**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)	Cementation 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								

Colvin Heritage Farms

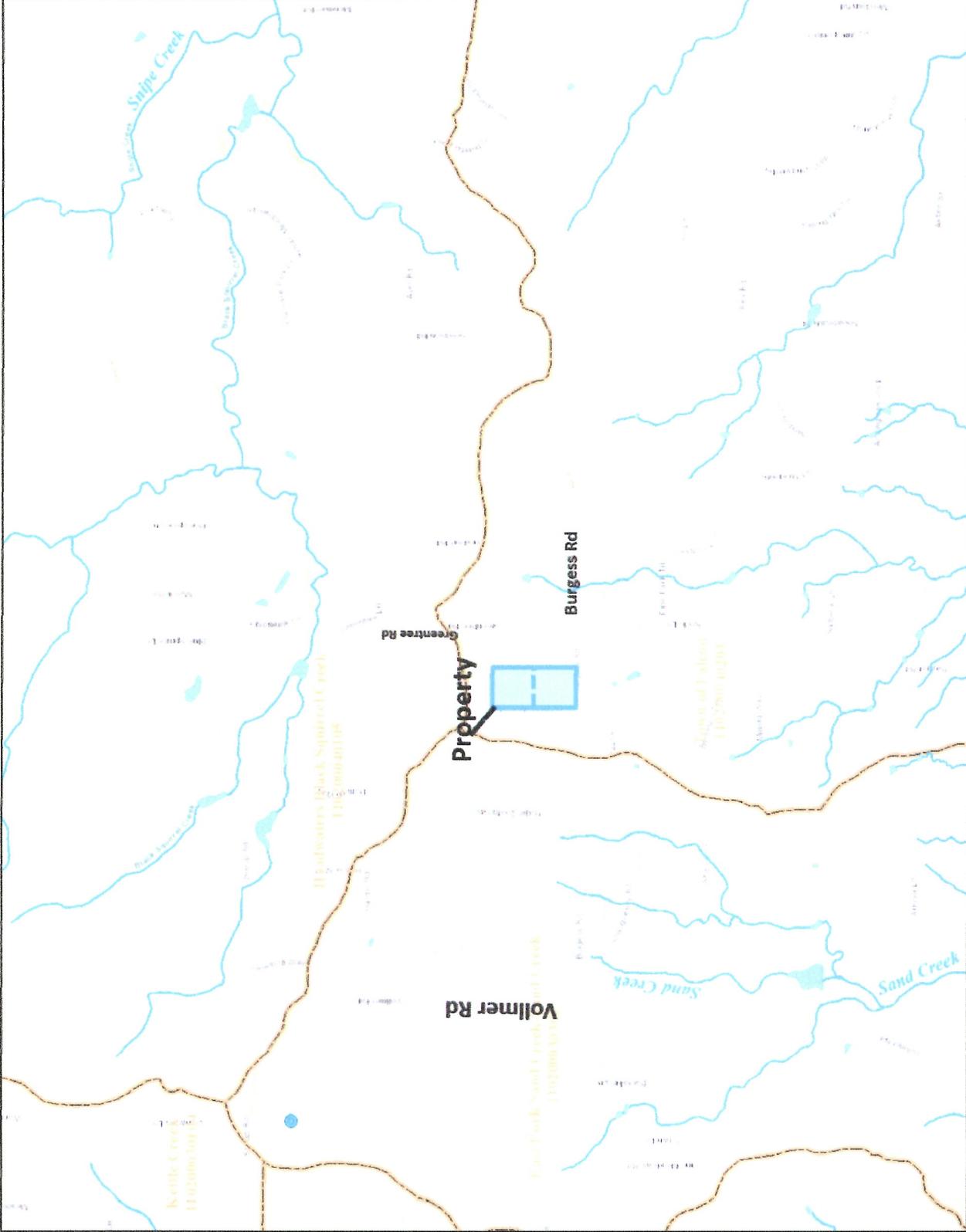
**TABLE 1-cont-
Soil Profile Pit Summary Table
Colvin Heritage Farms Subdivision**

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)	Cementation Class	Color
		Lot 2 6" to 16"	Pit 2	Sandy Clay Loam	Blocky	1	Yes at 16"	Type 3 (LTAR = 0.35) Treatment Level 1
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								



CDSS

Colorado's Decision Support Systems



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



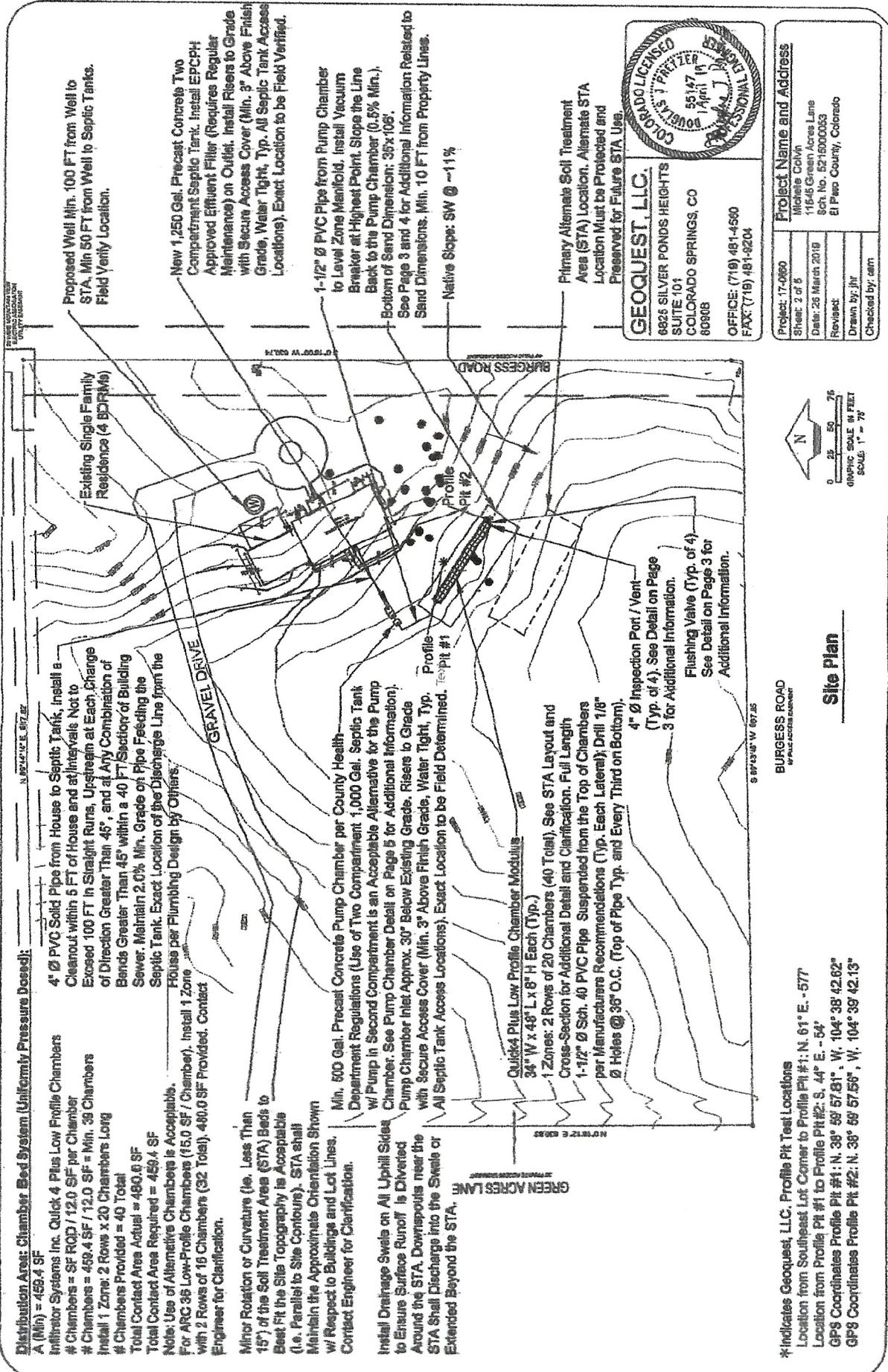
0 2,339 4,677 Feet



1: 28,064

This product is for informational purposes and may not 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



Distribution Area: Chamber Bed System (Uniformity Pressure Dosed):
 A (Min) = 459.4 SF
 Inhibitor Systems Inc. Quik4 Plus Low Profile Chambers
 # Chambers = SF RQD / 12.0 SF per Chamber
 # Chambers = 459.4 SF / 12.0 SF = Min. 38 Chambers
 Install 1 Zone, 2 Rows x 20 Chambers Long
 # Chambers Provided = 40 Total
 Total Contact Area Required = 459.4 SF
 Total Contact Area Actual = 480.6 SF
 Note: Use of Alternative Chambers is Acceptable.
 For ARC 35 Low-Profile Chambers (15.0 SF / Chamber), install 1 Zone with 2 Rows of 16 Chambers (32 Total), 480.0 SF Provided. Contact Engineer for Clarification.

Mirror Rotation or Curvature (i.e. Less Than 15°) of the Soil Treatment Area (STA) Beds to Best Fit the Site Topography is Acceptable (i.e. Parallel to Site Contours). STA shall Maintain the Approximate Orientation Shown w/ Respect to Buildings and Lot Lines. Contact Engineer for Clarification.

Min. 500 Gal. Precast Concrete Pump Chamber per County Health Department Regulations (Use of Two Compartment 1,000 Gal. Septic Tank w/ Pump in Second Compartment is an Acceptable Alternative for the Pump Chamber. See Pump Chamber Detail on Page 5 for Additional Information). Pump Chamber Inlet Approx. 30" Below Existing Grade. Risers to Grade with Secure Access Cover (Min. 3" Above Finish Grade, Water Tight, Typ. All Septic Tank Access Locations). Exact Location to be Field Determined.

Quik4 Plus Low Profile Chamber Modulus
 34" W x 48" L x 6" H Each (Typ.)
 1 Zone, 2 Rows of 20 Chambers (40 Total). See STA Layout and Cross-Section for Additional Detail and Clarification. Full Length 1-1/2" Ø Sch. 40 PVC Pipe Suspended from the Top of Chambers per Manufacturers Recommendations (Typ. Each Lateral); Drill 1/8" Ø Holes @ 36" O.C. (Top of Pipe Typ. and Every Third on Bottom).
 4" Ø Inspection Port / Vent (Typ. of 4). See Detail on Page 3 for Additional Information.
 Flushing Valve (Typ. of 4) See Detail on Page 3 for Additional Information.

*Indicates Geoquest, LLC, Profile Pit Test Locations
 Location from Southeast Lot Corner to Profile Pit #1: N. 61° E. - 577'
 Location from Profile Pit #1 to Profile Pit #2: S. 44° E. - 54'
 GPS Coordinates Profile Pit #1: N. 38° 59' 57.81" W. 104° 38' 42.62"
 GPS Coordinates Profile Pit #2: N. 38° 59' 57.56" W. 104° 39' 42.13"

Proposed Well Min. 100 FT from Well to STA. Min 50 FT from Well to Septic Tanks. Field Verify Location.

New 1,250 Gal. Precast Concrete Two Compartment Septic Tank. Install EPCPH Approved Effluent Filter (Requires Regular Maintenance) on Outlet. Install Risers to Grade with Secure Access Cover (Min. 3" Above Finish Grade, Water Tight, Typ. All Septic Tank Access Locations). Exact Location to be Field Verified.

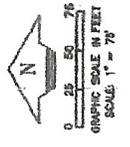
1-1/2" Ø PVC Pipe from Pump Chamber to Level Zone Manifold. Install Vacuum Breaker at Highest Point. Slope the Line Back to the Pump Chamber (0.5% Min.). Bottom of Sand Dimension: 35' x 106'. See Page 3 and 4 for Additional Information Related to Sand Dimensions. Min. 10 FT from Property Lines.
 Native Slope: SW @ -11%

Primary Alternate Soil Treatment Area (STA) Location. Alternate STA Location Must be Protected and Preserved for Future STA Use.

GEOQUEST, LLC.
 6825 SILVER PONDS HEIGHTS
 SUITE 101
 COLORADO SPRINGS, CO
 80908
 OFFICE: (719) 481-4580
 FAX: (719) 481-8204

PROFESSIONAL ENGINEER
 LICENSE NO. 55147
 APRIL 19
 2014

Project: 17-0660	Project Name and Address
Sheet: 2 of 5	Michelle Colvin
Date: 25 March 2019	116-45 Green Acres Lane
Revised:	Sch. No. 5216000053
Drawn by: jlr	El Paso County, Colorado
Checked by: cam	



Site Plan

FIGURE 3
OWTS LOCATION



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

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'C.E. Milligan', is written over the typed name below.

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 Composition

6"- 28" **Sand**

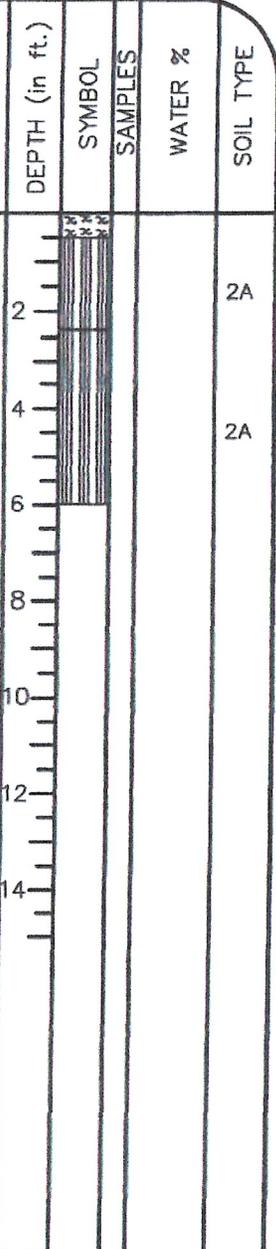
Fine-coarse Grained
 Low-moderate Density
 Moderate Moisture Content
 Low-moderate Clay Content
 Low-moderate Cohesion
 Low-moderate Plasticity
 Light Brown Color
 7.5YR 6/4

USDA Soil Texture: Sandy Loam
 USDA Soil Type: 2A
 USDA Structure Shape: Granular
 USDA Structure Grade: 1
 Cementation Class: Non-Cemented
 Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.50

28"- 6' **Dawson Sandstone**

Fine-coarse Grained
 Moderate-high Density
 Low-moderate Moisture Content
 Low-moderate Clay Content
 Low Cohesion
 Low Plasticity
 Pinkish White Color
 7.5YR 8/2

USDA Soil Texture: Sandy Loam
 USDA Soil Type: 2A
 USDA Structure Shape: None
 USDA Structure Grade: Massive
 Cementation Class: Moderately
 Long Term Acceptance Rate (LTAR, Treatment Level 1): 0.50
 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 Treatments 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 Treatment 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
 Sheet: 1 of 2
 Date: 04 Aug 2017
 Scale: 1/4" = 1'
 Drawn by: mtj
 Checked by: cem

Project Name and Address
Seeger Homes
 11545 Green Acres Ln
 Sch. No. 5215000053
 El Paso County, Colorado

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

0"-6" TOPSOIL

Loam
 Organic Composition

6"- 16" Clayey Sand

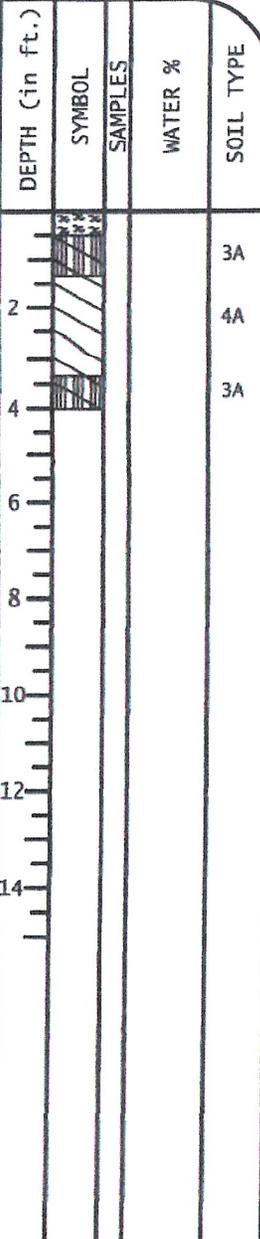
Fine-coarse Grained USDA Soil Texture: Sandy Clay Loam
 Moderate Density USDA Soil Type: 3A
 Moderate Moisture Content USDA Structure Shape: Blocky
 Moderate Clay Content USDA Structure Grade: 1
 Moderate Cohesion Cementation Class: Non-Cemented
 Moderate Plasticity Long Term Acceptance Rate (LTAR, Treatment 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

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 Treatments 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 Treatment Area (STA), Method of Transfer to the STA (Gravity, Dosed, or Pressure Dosed), and Type of Storage / Distribution Media Used in the STA)

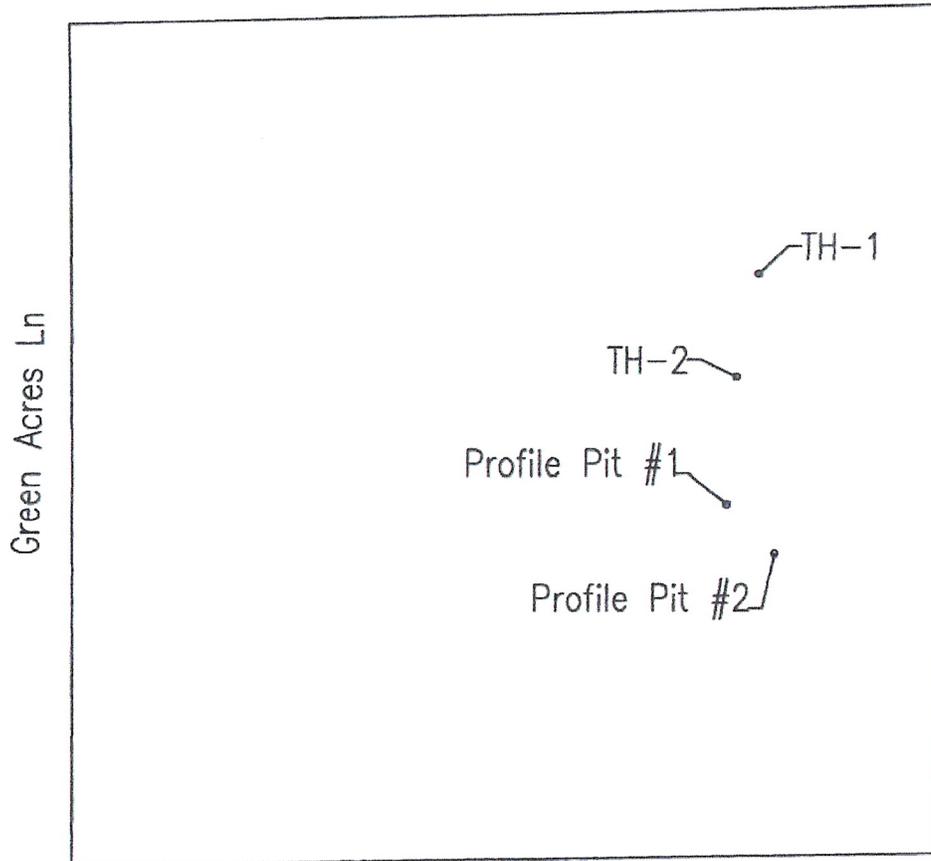
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GEOQUEST LLC
SITE MAP

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 Pit #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"



0 50 100 150
GRAPHIC SCALE IN FEET
SCALE: 1" = 150'