WATER RESOURCES
& WASTEWATER REPORT

For

Grandview Reserve
Preliminary Plan

January 2019

JDS-HYDRO

5540 TECH CENTER DR, SUITE 100, COLORADO SPRINGS, CO 80919 (719) 227-0072 FAX (719) 471-3401

4 Site Investments, LLC

WATER RESOURCES and WASTEWATER REPORT

JANUARY 2019

Prepared for:

4 Site Investments, LLC
1271 Kelly Johnson Blvd. Ste 100
Colorado Springs, CO 80920

Prepared by:

JDS-Hydro Consultants, Inc
5540 Tech Center Dr, Suite 100
Colorado Springs, CO 80919

Executive Summary:
Water Resources and Wastewater Report—Grandview Reserve

Development at Grandview Reserve by 4 Site Investments, LLC consists of 768.23 acres and 184 rural style lots, located between Eastonville Rd and Highway 24, within Sections 21, 22, 27, and 28, all in Township 12 South, Range 64 West of the 6th Principal Meridian. Residential properties within the development will be provided water services through individual residential wells and wastewater services through individual on-site wastewater treatment systems (OWTS). The proposed development consists of the following areas:

- Area B: 158 rural lots
- Area C: 26 rural lots

It is expected that each rural residential home in Grandview Reserve will require an average of 0.42 annual acre-feet (which includes annual allocations for domestic use, irrigation, and stock water). This anticipated water demand is consistent with historic needs for nearby developments.

Areas B and C will be served by individual on-site residential wells and septic. Table 1 below summarizes the water available for consumptive use from the Dawson Aquifer and annual demand estimations for Grandview Reserve.

Table 1: Water Supply and Demand Summary

Area	***SFE***	***Total Supply (AF/Year)***	***Total Demand (AF/Year)***
B	158	66.67	66.36
C	26	16.67	10.92

While water from the Dawson Aquifer underlying Area B is non-tributary and does not require replacement, the not non-tributary water underlying Area C will require an augmentation plan. Augmentation to the Dawson Aquifer in this area will likely consist of OWTS return flows and LIRF credits.

Wastewater projections are based on similar districts' historical use in this area. There are 184 residential units expected in Grandview Reserve, which will all have on-site septic systems. Table 2 below summarizes the projected wastewater loads for Grandview Reserve.

Table 2: Projected Wastewater Loads Summary

Area	***SFE***	***Unit Base Flow (GPD)***	***Average Daily Flow (GPD)***
B	158	172	27,176
C	26	172	4,472

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this study is to provide a preliminary outline of the water resources and wastewater needs that would be necessary for Grandview Reserve.

1.1 New Development Description:

Development at Grandview Reserve by 4 Site Investments, LLC consists of 768.23 acres and 184 lots, located between Eastonville Rd and Highway 24, primarily within Sections 21, 22, 27, and 28, all in Township 12 South, Range 64 West of the 6th Principal Meridian. The proposed lots are to be provided water and sewer services through on-site individual wells and septic. The development is broken into two areas based on the tributary status of the Dawson aquifer in those areas, defined in the decree in **Appendix D**. The following areas are shown in the context of Grandview Reserve in the "Areas in Grandview Reserve" exhibit included in **Appendix A**:

Area B
- 158 single family homes on individual well and septic systems
- Location: Sections 21,22,27, T12S, R64W, 6th PM
- Water source: Dawson
- Tributary status: Non-Tributary

Area C
- 26 single family homes on individual well and septic systems
- Location: Section 28, T12S, R64W, 6th PM
- Water source: Dawson
- Tributary status: Not-Non-Tributary

Appendix A contains a preliminary plan for Grandview Reserve.

2.0 PROJECTION OF WATER NEEDS

2.1 Analysis of Water Demands:

Expected water demands are calculated in **Appendix B.** Table 2-1 below estimates the projected water demands for development at Grandview Reserve. Each Dawson Aquifer well is proposed to divert 0.42 acre-feet of water annually for in-house use in one single family residence.

Table 2-1-Projected Water Demands for Grandview Reserve

Area	*SFE*	*Unit Use (AF/Year)*	*Annual Demand (AF)*	*ADF(GPD)*	*MDF (GPD)*	*Peak Hour Flow (GPM)*
B	158	0.42	66.36	59,242	145,144	151
C	26	0.42	10.92	9,749	23,884	25

3.0 PROPOSED WATER RIGHTS AND SYSTEM FACILITIES

3.1 Water Rights:

Water rights adjudications have been decreed by the State of Colorado, Water Division 2 District Court. A special warranty deed was issued on November 6th, 2018 (**Appendix D**), granting water to 4 Site Investments, LLC. The findings and relevant information are displayed in **Appendix C**. Table 3-1 below summarizes that information.

Table 3-1
Summary of Available Legal Water Supply for Grandview Reserve

Water	Annual Supply* (Acre-Feet)	Area
Dawson NT	66.67	B
Dawson NNT	16.67	C

*300-year annual supply

While water from the Dawson Aquifer underlying Area B is non-tributary and does not require replacement, the not non-tributary water underlying Area C will require an augmentation plan. Augmentation to the Dawson Aquifer in this area will likely consist of OWTS return flows and LIRF credits.

Beneficial use of the water from the decree (determination number: 513-BD) includes domestic, livestock watering, lawn irrigation, commercial, industrial, and replacement supply.

3.2 Source of Supply:

Domestic water demand will be met using individual wells drilled into the Dawson formation.

3.3 Water Quality and Treatment:

The water quality in the Dawson Aquifer in this area has typically been suitable for residential potable use. It will be up to each individual property owner to decide if and what water quality testing will be conducted on their well.

3.4 Water Storage:

Since each single-family home in the Grandview Reserve development will have its own individual Dawson well, the development will not have central water storage.

3.5 Fire Flow:

Since each lot in the Grandview Reserve development will have its own individual Dawson well, a central water system will not be available to provide fire flow.

4.0 WASTEWATER AND WASTEWATER TREATMENT

4.1 Wastewater Loads

Wastewater projections are based on similar districts' historical use in this area. There are 184 residential units expected in Grandview Reserve, which will all have on-site septic systems. **Appendix B** includes a complete breakdown of projected wastewater loads, summarized in Table 4-1 below. Average daily wastewater loads are expected to be approximately 172 gallons per day per single family residence, and maximum daily wastewater loads are expected to be approximately 210 gallons per day per single family residence.

Table 4-1-Projected Wastewater Loads for Grandview Reserve

Wastewater Loads			
Area	***# of Units***	***Average Daily Flow (ADF) (GPD) @ 172 GPD/SFE***	***Maximum Daily Flow (GPD) @ 210 GPD/SFE***
B	**158**	**27,176**	**33,180**
C	**26**	**4,472**	**5,460**

Total expected average daily flows of Grandview Reserve are 31,648 gallons/day.

4.2 On-Site Wastewater Treatment Systems

The proposed 184 single family homes (minimum lot size of 2.5 acres) will be served by individual on-site wastewater treatment systems. The site was evaluated for on-site wastewater treatment systems by Entech Engineering, Inc. in December 2018. Ten (10) test borings and eight (8) tactile test pits were performed on potential locations of future systems to determine soil and bedrock characteristics and general suitability of the site for the use of on-site wastewater treatment systems. Laboratory testing was also performed to classify and determine the soils engineering characteristics. The on-site soils have been described to typically have rapid permeabilities. The majority of the soils have been described as good for urban development, though roads may need to be designed to minimize frost-heave potential. Possible hazards with soil erosion are present on the site, however, the erosion potential can be controlled with vegetation.

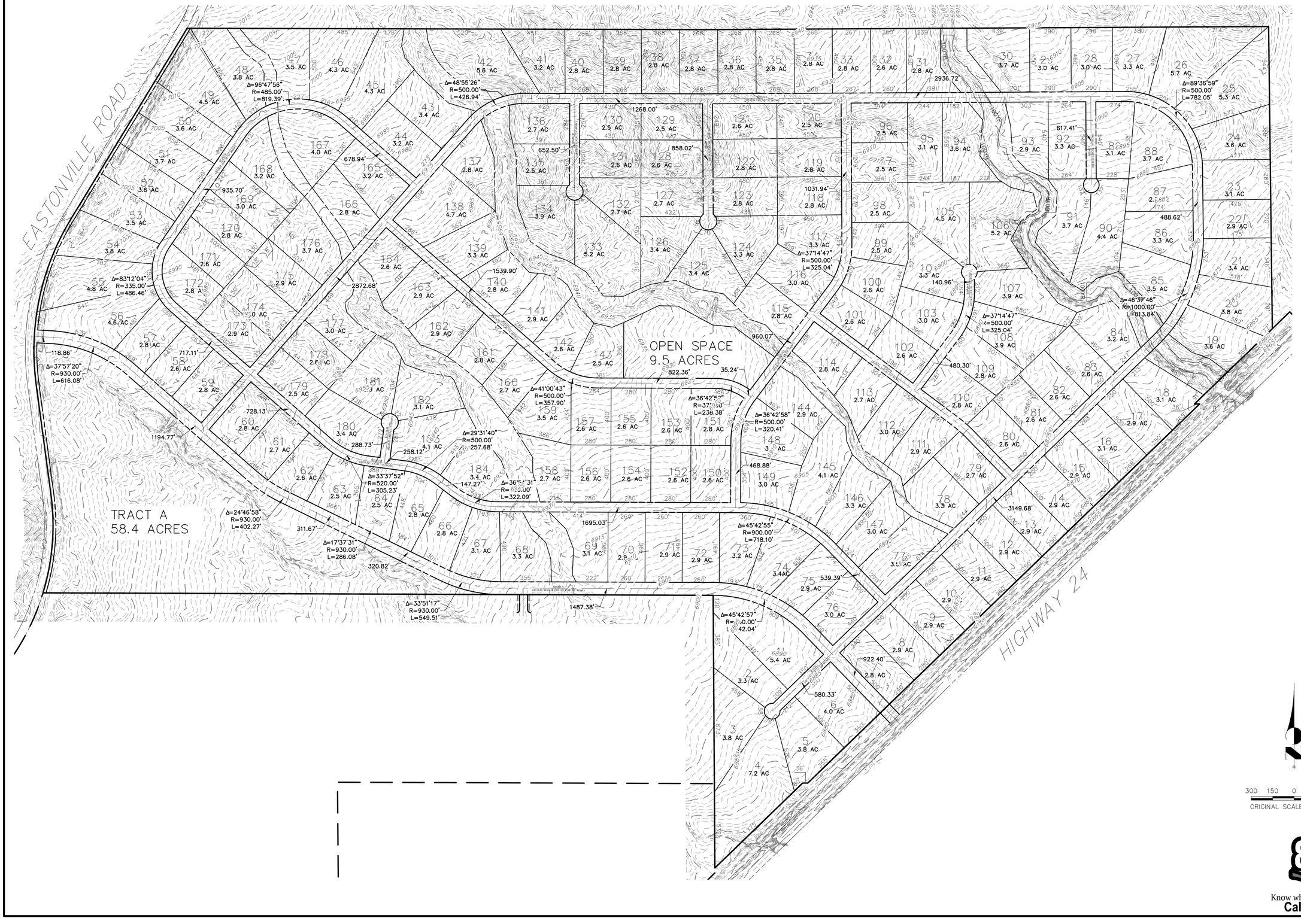
Based on the evaluation mentioned above, the site is suitable for individual on-site wastewater treatment systems (OWTS). Contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to El Paso County and State Guidelines and properly maintained. Based on the testing performed, lots located near test pits number 1, 5, 6, 7, and 8 will require designed systems due to the areas having a USDA soil type of 4A. Areas where shallow bedrock or

groundwater is encountered may require designed systems as well. Additional investigation would be required to identify areas that are suitable for the use of conventional systems.

The Soil, Geology, and Geologic Hazard Report by Entech Engineering, Inc. dated January 15th, 2019 is included in **Appendix E**.

Appendix A

GRANDVIEW RESERVE



300 150 0 300
ORIGINAL SCALE: 1" = 300'

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

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR
PETER MARTZ
4 SITE INVESTMENTS, LLC
12774 KELLY JOHNSON BLVD.
SUITE 100
COLORADO SPRINGS, CO 80923

J·R ENGINEERING
A Westrian Company
Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

No.	REVISION	BY	DATE

H-SCALE	1" = 300'
V-SCALE	NA
DATE	01/02/19
DESIGNED BY	RPD
DRAWN BY	RPD
CHECKED BY	

GRANDVIEW RESERVE

LOT DIMENSIONS

SHEET 1 OF 1

JOB NO. 29931.26

OPEN SPACE
9.5 ACRES

TRACT A
58.4 ACRES

60' ROW RURAL ~~COLLECTOR (MINOR)~~

AREA C
SFE: 26
DEMAND: 10.92 AF/YEAR
SUPPLY: 16.67 AF/YEAR
AQUIFER: DAWSON
TRIBUTARY STATUS: NNT

AREA B
SFE: 158
DEMAND: 66.36 AF/YEAR
SUPPLY: 66.67 AF/YEAR
AQUIFER: DAWSON
TRIBUTARY STATUS: NT

0' 300' 600'

JDS-HYDRO CONSULTANTS, INC.
5540 TECH CENTER DR., SUITE 100
COLORADO SPRINGS, COLORADO 80919
(719) 227-0072

4-WAY RANCH METROPOLITAN DISTRICT

GRANDVIEW RESERVE

AREAS IN GRANDVIEW RESERVE

REVISIONS				
NO.	DESCRIPTION	BY	APP.	DATE
1				
2				
3				
4				
5				
6				
7				

EXHIBIT

Project No.:	136.24
Date:	01/15/18
Design:	RMM
Drawn:	GUS
Check:	RMM

SHEET OF

Appendix B

Appendix B

4-Site Investments, LLC - Grandview Reserve

Overall Water Demands and Wastewater Loads

Area	Use	SFE	Water Demands					Wastewater Loads			
			Unit Use (AF/Year)	Total Use (AF/Year)	Average Daily Flow (GPD)	Max Daily Use (@ 2.45x ADF) (GPD)	Peak Hour Flow (@ 1.5x MDF) (GPM)	Unit Base Flow (GPD)	Unit MDF (GPD)	Average Daily Flow (GPD)	Max Day Daily Flow (GPD)
Area B	Residential	158	0.42	66.36	59,242.39	145,143.86	151.19	172	210	27,176	33,180
Area C	Residential	26	0.42	10.92	9,748.75	23,884.43	24.88	172	210	4,472	5,460
	Total:	184		77.28						31,648	

Appendix C

Appendix C
4-Site Investments, LLC - Grandview Reserve
Overall Water Supply Inventory

Land Formation/ Aquifer	Area	Finding/ Decree	Tributary Status	Volume	Annual Allocation 100 Year	Annual Allocation 300 Year	Acreage	Sand Thickness	Specific Yield
				Acre-Feet	A-F/Year	A-F/Year			
Currently Available On-Site Ground Water Legal Source									
Dawson	Area B	513-BD*	NT	20,000	200.00	66.67	627.23	125	20%
Dawson	Area C	513-BD*	NNT	5,000	50.00	16.67	141	110	20%
Total Legal Supply				**25,000**	**250**	**83**			

Beneficial Uses

Domestic
Livestock watering
Lawn irrigation
Commercial
Industrial
Replacement supply

*Note that the special warranty deed included in Appendix D allocates more water to 4-Site Investments, LLC than the listed decree.

Appendix D

COLORADO GROUND WATER COMMISSION
FINDINGS AND ORDER

IN THE MATTER OF AN APPLICATION FOR DETERMINATION OF WATER RIGHT TO ALLOW THE WITHDRAWAL OF GROUND WATER IN THE UPPER BLACK SQUIRREL CREEK DESIGNATED GROUND WATER BASIN

APPLICANT: FOUR WAY RANCH PARTNERSHIP / SPRING CREEK LLC

AQUIFER: DAWSON

DETERMINATION NO.: **513-BD**

In compliance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, 2 CCR 410-1, Four Way Ranch Partnership / Spring Creek, L.L.C., (hereinafter "applicant") submitted an application for determination of water right to allow the withdrawal of designated ground water from the Dawson Aquifer.

FINDINGS

1. The application was received complete by the Colorado Ground Water Commission on September 10, 2003.

2. The applicant requests a determination of rights to designated ground water in the Dawson Aquifer (hereinafter "aquifer") underlying 8,095 acres, generally described as the W1/2 of Section 1; Sections 2 and 3; the E1/2, the SE1/4 of the NW1/4, the SW1/4 of the SW1/4, and the E1/2 of the SW1/4 of Section 4; the E1/2, a portion of the E1/2 of the W1/2, and the NW1/4 of the NW1/4 of Section 9; Sections 10 and 11; that part of Sections 12, 13, and 14, located northwest of the Highway 24 right-of-way; the NW1/4 and the W1/2 of the SW1/4 of Section 15; most of the E1/2 of Section 16; the E1/2, a portion of the E1/2 of the NW1/4, and a portion of the SW1/4 of Section 21; that part of Sections 22, 23, and 27 located northwest of the Highway 24 right-of-way; the NE1/4 and a portion of the W1/2 of Section 28; a portion of the SE1/4 of Section 29; the N1/2 of the NE1/4 and a portion of the NE1/4 of the NW1/4 of Section 32; and that part of the N1/2 of the NW1/4 of Section 33 located northwest of the Highway 24 right-of-way; all in Township 12 South, Range 64 West of the 6th Principal Meridian, in El Paso County. According to a signed statement dated June 23, 2003, the applicant owns the 8,095 acres of land, as further described in said affidavit which is attached hereto as Exhibit A, and claims control of the ground water in the aquifer underlying this land area.

3. The proposed annual amount of ground water to be allocated and withdrawn from the aquifer for intended beneficial uses is the maximum allowable amount.

4. The above described land area overlying the ground water claimed by the applicant is located within the boundaries of the Upper Black Squirrel Creek Designated Ground Water Basin and within the Upper Black Squirrel Creek Ground Water Management District. The Colorado Ground Water Commission (hereinafter "Commission") has jurisdiction.

5. The applicant intends to apply the allocated ground water to the following beneficial uses: domestic, livestock watering, lawn irrigation, commercial, industrial and replacement supply. The applicant's proposed place of use of the allocated ground water is the above described 8,095 acre land area.

6. The replacement water requirement for withdrawal of the ground water from the aquifer underlying the 8,095 acres of overlying land claimed by the applicant consists of two different requirements, which effectively divides the claimed land into three areas. The amount of ground water in the aquifer and a maximum annual amount available for allocation will be determined specifically for the aquifer underlying each of the three areas. These areas are designated and described as following:

   Area A – 3,967 acres, generally described as the applicant's claimed overlying land area in the W1/2 of Section 1, Section 2, Section 3; the E1/2, the SE1/4 of the NW1/4, the SW1/4 of the SW1/4, and the E1/2 of the SW1/4 of Section 4; the E1/2, a portion of the E1/2 of the W1/2, and the NW1/4 of the NW1/4 of Section 9, and Sections 10 and 11, all in Township 12 South, Range 64 West of the 6th Principal Meridian.

   Area B – 3,400 acres, generally described as the applicant's claimed overlying land area in that part of Sections 12, 13, and 14, located northwest of the Highway 24 right-of-way; the NW1/4 and the W1/2 of the SW1/4 of Section 15; most of the E1/2 of Section 16; the E1/2, a portion of the E1/2 of the NW1/4, and a portion of the SW1/4 of Section 21; that part of Sections 22, 23, and 27 located northwest of the Highway 24 right-of-way; all in Township 12 South, Range 64 West of the 6th Principal Meridian.

   Area C – 728 acres, generally described as the applicant's claimed overlying land area in the NE1/4 and a portion of the W1/2 of Section 28; a portion of the SE1/4 of Section 29; the N1/2 of the NE1/4 and a portion of the NE1/4 of the NW1/4 of Section 32; and that part of the N1/2 of the NW1/4 of Section 33 located northwest of the Highway 24 right-of-way all in Township 12 South, Range 64 West of the 6th Principal Meridian.

   These three areas are further described in a map attached hereto as Exhibit B.

7. The quantity of water in the aquifer underlying the 8,095 acres of land claimed by the applicant is as follows: Area A = 174,548 acre-feet; Area B = 85,000 acre-feet, Area C = 16,016 acre-feet. This determination was based on the following as specified in the Designated Basin Rules:

   a. The average specific yield of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is 20 percent.

   b. The average thickness of the saturated permeable material of the aquifer underlying the land under consideration that could yield a sufficient quantity of water that may be extracted and applied to beneficial use is as follows: Area A = 220 feet; Area B = 125 feet, Area C = 110 feet.

8. At this time, there is no substantial artificial recharge that would affect the aquifer within a one hundred year period.

9. Pursuant to Section 37-90-107(7), C.R.S., and in accordance with the Designated Basin Rules, the Commission shall allocate ground water in the aquifer based on ownership of the overlying land and an aquifer life of one hundred years. Therefore, the maximum average annual amount of ground water in the aquifer that may be allocated for withdrawal pursuant to the data in the paragraphs above for the 8,095 acres of overlying land claimed by the applicant is as follows: Area A = 1,745 acre-feet, Area B = 850 acre-feet, Area C = 160 acre-feet.

10. The ability of wells permitted to withdraw the authorized amount of water from this non-renewable aquifer may be less than the one hundred years upon which the amount of water in the aquifer is allocated, due to anticipated water level declines.

11. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that the replacement water requirements for withdrawal of ground water from the aquifer underlying the subject land area are as follows:

    Area A - Withdrawal of ground water from the aquifer underlying the 3,967 acres of land claimed by the applicant will within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is considered to be not-nontributary ground water. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that withdrawal of ground water from the aquifer underlying the 3,967 acres of land claimed by the applicant would impact the alluvial aquifer of Black Squirrel Creek or its tributaries, which has been determined to be over-appropriated. Commission approval of a replacement plan - pursuant to Section 37-90-107.5, C.R.S., and Rule 5.6 of the Designated Basin Rules - providing for the actual depletion of the alluvial aquifer and adequate to prevent any material injury to existing water rights, would be required prior to approval of well permits for wells to be located on this land area to withdraw the allocated ground water from the aquifer.

    Area B - Withdrawal of ground water from the aquifer underlying the 3,400 acres of land claimed by the applicant will not, within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is nontributary ground water as defined in Rule 4.2.19 of the Designated Basin Rules. Therefore, in accordance with Rule 5.3.6 of the Designated Basin Rules, no more than 98% of the amount of ground water withdrawn annually shall be consumed, as required by the Designated Basin Rules.

    Area C - Withdrawal of ground water from the aquifer underlying the 728 acres of land claimed by the applicant will, within one hundred years, deplete the flow of a natural steam or its alluvial aquifer at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal and, therefore, the ground water is considered to be not-nontributary ground water. In accordance with Rule 5.3.6 of the Designated Basin Rules, it has been determined that withdrawal of ground water from the aquifer underlying the 728 acres of land claimed by the applicant would impact the alluvial aquifer of Black Squirrel Creek or its tributaries, which has been determined to be over-appropriated. Commission approval of a replacement plan - pursuant to Section 37-90-107.5, C.R.S., and Rule 5.6 of the Designated Basin Rules -

providing for the actual depletion of the alluvial aquifer and adequate to prevent any material injury to existing water rights, would be required prior to approval of well permits for wells to be located on this land area to withdraw the allocated ground water from the aquifer.

12. A review of the records in the Office of the State Engineer has disclosed that large-capacity wells located on or in the vicinity of the applicant's claimed overlying land area have previously received allocations, by appropriation, of ground water from the aquifer. Approval of the determination of water right would result in unreasonable impairment to these existing water rights unless terms and conditions are included to prevent such effect. The well permit numbers and other relevant data concerning such rights are set forth and attached hereto as Exhibit C. In accordance with Rule 5.3.3.1 of the Designated Basin Rules, the quantity of ground water in the aquifer underlying Areas A, B and C, which is considered available for allocation has been reduced to the following: Area A - 164,855 acre-feet or a maximum average annual amount of 1,649 acre-feet, Area B - 81,843 acre-feet or a maximum average annual amount of 818 acre-feet and Area C - 14,872 acre-feet or a maximum average annual amount of 149 acre-feet. This reduction was based on a calculation of the area necessary to provide a quantity of water underlying such an area as would be sufficient, for the persons entitled to divert water under existing rights, to divert the allowed maximum (average) annual amount of water from the aquifer for the minimum useful life of the aquifer (100 years). The effect of this calculation is to effectively reduce the land area available for calculating the quantity of water underlying the land claimed by the applicant to as follows: Area A = 3,746.7 acres, Area B = 3,273.7 acres and Area C = 676 acres.

13. In accordance with Rule 5.3.2.4 of the Designated Basin Rules, the average annual amounts of ground water available for allocation from the aquifer arrived at in the preceding paragraph for Areas A, B and C is further reduced to as follows: Area A – 1,643 acre-feet, Area B – 816 acre-feet and Area C – 147 acre-feet to allow for the annual withdrawal of ten small capacity wells which are completed in the aquifer, permit numbers 58885, 35598, 5107, 54053, 845, 139622, 33384, 22204, 1932 and 74076.

14. Pursuant to Section 37-90-107(7)(c)(III), C.R.S., an approved determination of water right shall be considered a final determination of the amount of ground water so determined; except that the Commission shall retain jurisdiction for subsequent adjustment of such amount to conform to the actual local aquifer characteristics from adequate information obtained from well drilling or test holes.

15. In accordance with Section 37-90-107(7), C.R.S., upon Commission approval of a determination of water right, well permits for wells to withdraw the authorized amount of water from the aquifer shall be available upon application, subject to the conditions of this determination and the Designated Basin Rules and subject to approval by the Commission.

16. On February 4, 2004, in accordance with Rule 9.1 of the Designated Basin Rules, a letter was sent to the Upper Black Squirrel Creek Ground Water Management District requesting written recommendations concerning this application. No written recommendations from the district were received.

17. The Commission Staff has evaluated the application relying on the claims to control of the ground water in the aquifer made by the applicant.

18. In accordance with Sections 37-90-107(7) and 37-90-112, C.R.S., the application was published in the Gazette newspaper on February 12 and 19, 2004.

19. No objections to the determination of water right and proposed allocation of ground water were received within the time limit set by statute.

20. In order to prevent unreasonable impairment to the existing water rights of others within the Upper Black Squirrel Creek Designated Ground Water Basin it is necessary to impose conditions on the determination of water right and proposed allocation of ground water. Under conditions as stated in the following Order, no unreasonable impairment of existing water rights will occur from approval of this determination of water right or from the issuance of well permits for wells to withdraw the authorized amount of allocated ground water from the aquifer.

ORDER

In accordance with Section 37-90-107(7), C.R.S., and the Designated Basin Rules, the Colorado Ground Water Commission orders that the application for determination of rights to designated ground water in the Dawson Aquifer underlying 8,095 acres of land, generally described as the W1/2 of Section 1; Sections 2 and 3; the E1/2, the SE1/4 of the NW1/4, the SW1/4 of the SW1/4, and the E1/2 of the SW1/4 of Section 4; the E1/2, a portion of the E1/2 of the W1/2, and the NW1/4 of the NW1/4 of Section 9; Sections 10 and 11; that part of Sections 12, 13, and 14, located northwest of the Highway 24 right-of-way; the NW1/4 and the W1/2 of the SW1/4 of Section 15; most of the E1/2 of Section 16; the E1/2, a portion of the E1/2 of the NW1/4, and a portion of the SW1/4 of Section 21; that part of Sections 22, 23, and 27 located northwest of the Highway 24 right-of-way; the NE1/4 and a portion of the W1/2 of Section 28; a portion of the SE1/4 of Section 29; the N1/2 of the NE1/4 and a portion of the NE1/4 of the NW1/4 of Section 32; and that part of the N1/2 of the NW1/4 of Section 33 located northwest of the Highway 24 right-of-way; all in Township 12 South, Range 64 West of the 6th Principal Meridian, is approved subject to the following conditions:

21. The allocated average annual amount of ground water to be withdrawn from the aquifer shall not exceed the following:

    Area A = 1,643 acre-feet, Area B = 816 acre-feet, Area C = 147 acre-feet.

    The allowed maximum annual amount of withdrawal may exceed the allowed average annual amount of withdrawal as long as the total volume of water withdrawn does not exceed the product of the number of years since the date of approval of this determination times the allowed average annual amount of withdrawal.

22. To conform to actual aquifer characteristics, the Commission may adjust the allocated average annual amount of ground water to be withdrawn from the aquifer based on analysis of geophysical logs or other site-specific data if such analysis indicates that the initial estimate of the volume of water in the aquifer was incorrect.

23. Replacement water requirements shall be as follows:

    a. For the aquifer underlying the above described 3,967 acres of Area A, Commission approval of a replacement plan, providing for actual depletion of affected alluvial aquifers and adequate to prevent any material injury to existing water rights in such alluvial aquifers is required prior to approval of well permits for wells to be located on the overlying land area to withdraw ground water from the aquifer.

        i. Upon withdrawal of the total allowed average amount of water underlying Area A, in any calendar year, the allowed annual average amounts underlying the above described Area B and Area C may be withdrawn through wells located on Area A if an adequate replacement plan for such withdrawals is approved by the Commission.

    b. For the aquifer underlying the above described 3,400 acres of Area B, No more than 98% of the ground water withdrawn annually shall be consumed. The Commission may require well owners to demonstrate periodically that no more than 98% of the water withdrawn is being consumed.

        i. Upon withdrawal of the total allowed average amount of water underlying Area B, in any calendar year, the allowed annual average amounts underlying the above described Area A and Area C may be withdrawn through wells located on Area B if an adequate replacement plan for such withdrawals is approved by the Commission.

    c. For the aquifer underlying the above described 160 acres of Area C, Commission approval of a replacement plan, providing for actual depletion of affected alluvial aquifers and adequate to prevent any material injury to existing water rights in such alluvial aquifers is required prior to approval of well permits for wells to be located on the overlying land area to withdraw ground water from the aquifer

        i. Upon withdrawal of the total allowed average amount of water underlying Area C, in any calendar year, the allowed annual average amounts underlying the above described Area A and Area B may be withdrawn through wells located on Area C if an adequate replacement plan for such withdrawals is approved by the Commission.

24. The use of ground water from this allocation shall be limited to the following uses: domestic, livestock watering, lawn irrigation, commercial, industrial and replacement supply. The place of use shall be limited to the above described 8,095 acre land area.

25. The applicant, or subsequent persons controlling this water right, shall record in the public records of the county - in which the claimed overlying land is located - notice of transfer of any portion of this water right to another within sixty days after the transfer, so that a title examination of the above described 8,095 acre land area, or any part thereof, shall reveal the changes affecting this water right. Such notice shall consist of a signed and dated deed which indicates the determination number, the aquifer, a description of the above described land area, the annual amount of ground water (acre-feet) transferred, name of the recipient, and the date of transfer.

26. Subject to the above conditions, well permits for wells to withdraw the authorized annual amount of water from the aquifer shall be available upon application subject to approval by the Commission and the following conditions:

a. The wells shall be located on the above described 8,095 acre overlying land area. Wells located within any one of the three described areas, designated Area A, Area B and Area C, shall only withdraw the allowed average annual amount of water determined for that area, as indicated in paragraph 21 of this Order, unless the following conditions may be satisfied:

i. Subject to the compliance with the provisions in paragraph 23 of this Order, water may be withdrawn from the aquifer underlying a contiguous claimed area where differing replacement water requirements have effectively divided the claimed overlying land into separate zones.

ii. Well permits for wells to withdraw ground water from the aquifer underlying Area A or Area C may require a replacement plan specific for each area.

b. The wells must be constructed to withdraw water from only the Dawson Aquifer. Upon application for a well permit to construct such a well, the estimated top and base of the aquifer at the proposed well location will be determined by the Commission and indicated on the approved well permit. Plain non-perforated casing must be installed, grouted and sealed to prevent diversion of ground water from other aquifers and the movement of ground water between aquifers.

c. The entire depth of each well must be geophysically logged prior to installing the casing as set forth in Rule 9 of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7.

d. Each well shall be constructed within 200 feet of the location specified on the approved well permit, but must be more than 600 feet from any existing large-capacity well completed in the same aquifer.

e. The wells may withdraw the allowed average annual amount of water from the aquifer together in any combination. The total combined annual withdrawal of the wells shall not exceed the allowed average annual amount described in this Order.

f. A totalizing flow meter or other Commission approved measuring device shall be installed on each well and maintained in good working order by the well owner. Annual diversion records shall be collected and maintained by the well owner and submitted to the Commission or the Upper Black Squirrel Creek Ground Water Management District upon their request.

g. The well owner shall mark the well in a conspicuous place with the permit number and the name of the aquifer. The well owner shall take necessary means and precautions to preserve these markings.

27. A copy of this Findings and Order shall be recorded by the applicant in the public records of the county – in which the claimed overlying land is located - so that a title examination of the above described 8,095 acre overlying land area, or any part thereof, shall reveal the existence of this determination.

Dated this 22nd day of July, 2004.

Hal D. Simpson
Executive Director
Colorado Ground Water Commission

By: _____
Suzanne M. Sellers, P.E.
Designated Basins Chief

Prepared by: EBT

FIND-119-04

GWS-1 (Rev, Sept 1996)

STATE OF COLORADO
OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES

NONTRIBUTARY GROUND WATER LANDOWNERSHIP STATEMENT

I (we) Four Way Ranch Partnership/Spring Creek LLC
(Name)
claim and say that I (we) am (are) the owner(s) of the following described property consisting of 8095 acres in the County of El Paso, State of Colorado:

See Attached Legal Description And Map

and, that the ground water sought to be withdrawn from the Dawson aquifer underlying the above-described land has not been conveyed or reserved to another, nor has consent been given to it's withdrawal by another.

Further, I (we) claim and say that I (we) have read the statements made herein; know the contents hereof; and that the same are true to my (our) own knowledge.

W. [signature] 6/23/03
(Signature) (Date)

Linda Johnson-Conne 6/23/03
(Signature) (Date)

INSTRUCTIONS:

Please type or print neatly in black ink. This form may be reproduced by photocopy or word processing means. See additional instructions on back.

Legal Description: Parcel 4200000164

That part of N2, N2 lying East of Eastonville Road
Sec. 28-12-64
Total 140 Acres

Legal Description: Parcel 4200000165

SW4, That part of S2N2 Lying east of Eastonville Road, Sec 28-12-64
That Part of SE4 Lying east of Eastonville Road Sec 29-12-64
That Part of N2N2 Lying east of Eastonville Road Sec 32-12-64
That Part of N2NW4 Lying west of CRI & P RY Sec 33-12-64
Total 556 Acres

Legal Description: Parcel 4200000190

W2, SE4, W2NE4, Sec 2-12-64
All EX RD Sec 3-12-64
Total 1268.7 Acres

Legal Description: Parcel 4200000191

E2NE4 Sec 4-12-64
Total 87.3 Acres

Legal Description: Parcel 4200000192

SW4NE4, S2NW4, S2 Sec 10-12-64
Total 440 Acres

Legal Description: Parcel 4200000193

N2NW4, E2, Part of S2NW4, SW4 Lying East of W R/W Line of CO. Road, Sec 9-12-64
E2, Part of NE4NW4 Lying East of W R/W Line of CO Road, Sec 16-12-64
Total 900.7 Acres

Legal Description: Parcel 4200000194

W2 W/MR Sec 1-12-64
E2NE4 Sec 2-12-64
SW4 L/2MR, N2, SE4 EX RD, W/MR Sec 11-12-64
All Lying NW of CRI & P RY W/MR Sec 12-12-64
All Lying NW of CRI & P RY W/MR Sec 13-12-64
All Lying NW of CRI & P RY W/MR Sec 14-12-64
That Part of N2 and of N2S2 Lying NWLY OF R/W OF US HWY 24 W/4MR Sec 23-12-64

W2SW4, NW4 Sec 15-12-64
All Lying NW of R/W CRI & P Sec 22-12-64
That Part of NW4NE4 and of NW4 and of NW2SW4 Lying NW of RW of CRI & P RY Sec 27-12-64
Total 3631.7 Acres

Legal Description: Parcel 4200000195

R/W of OLD C&S RY, ALL Lying E of R/W Sec 21-12-64
Total 461.0 Acres

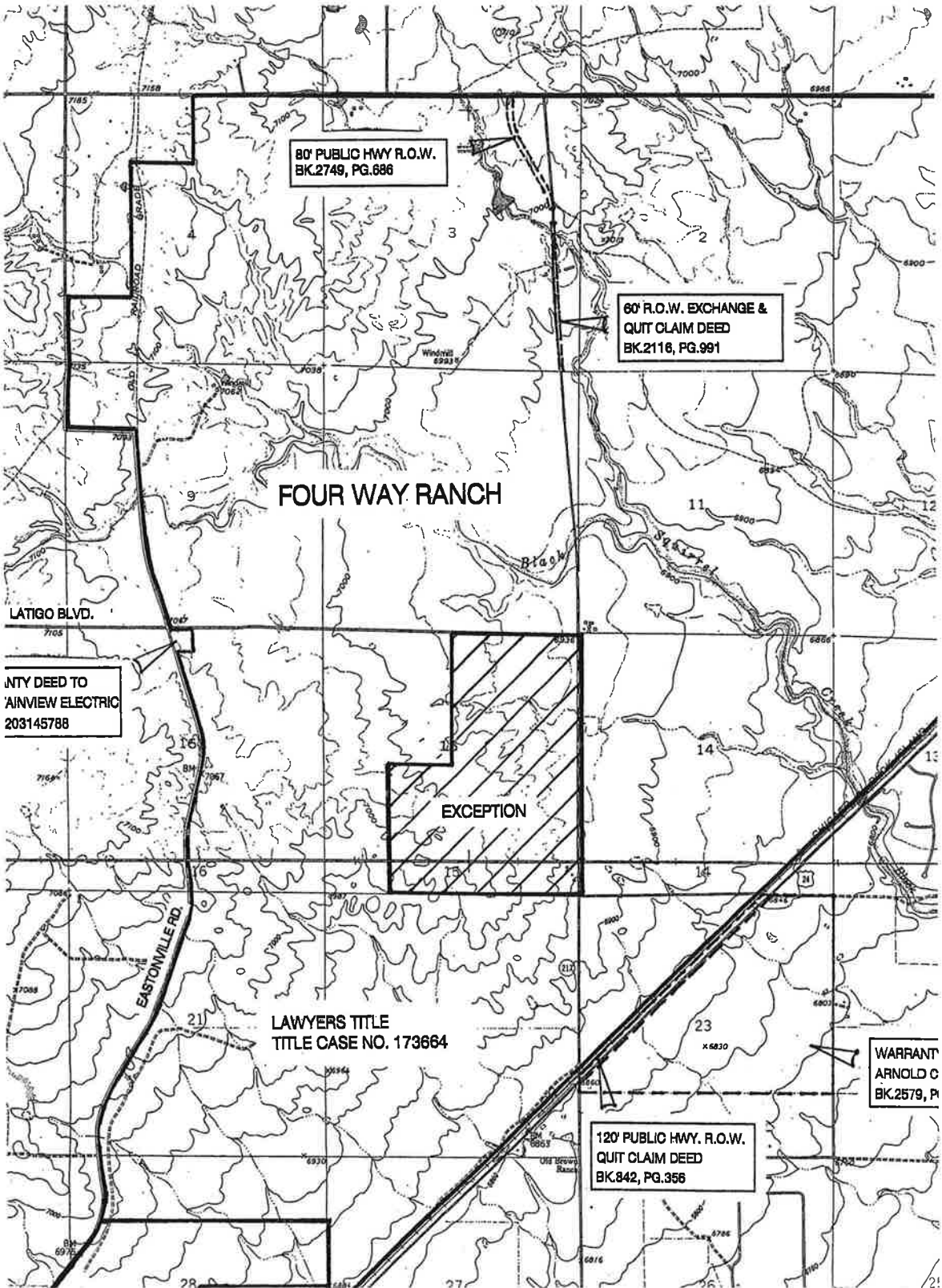
Legal Description: Parcel 4204000001

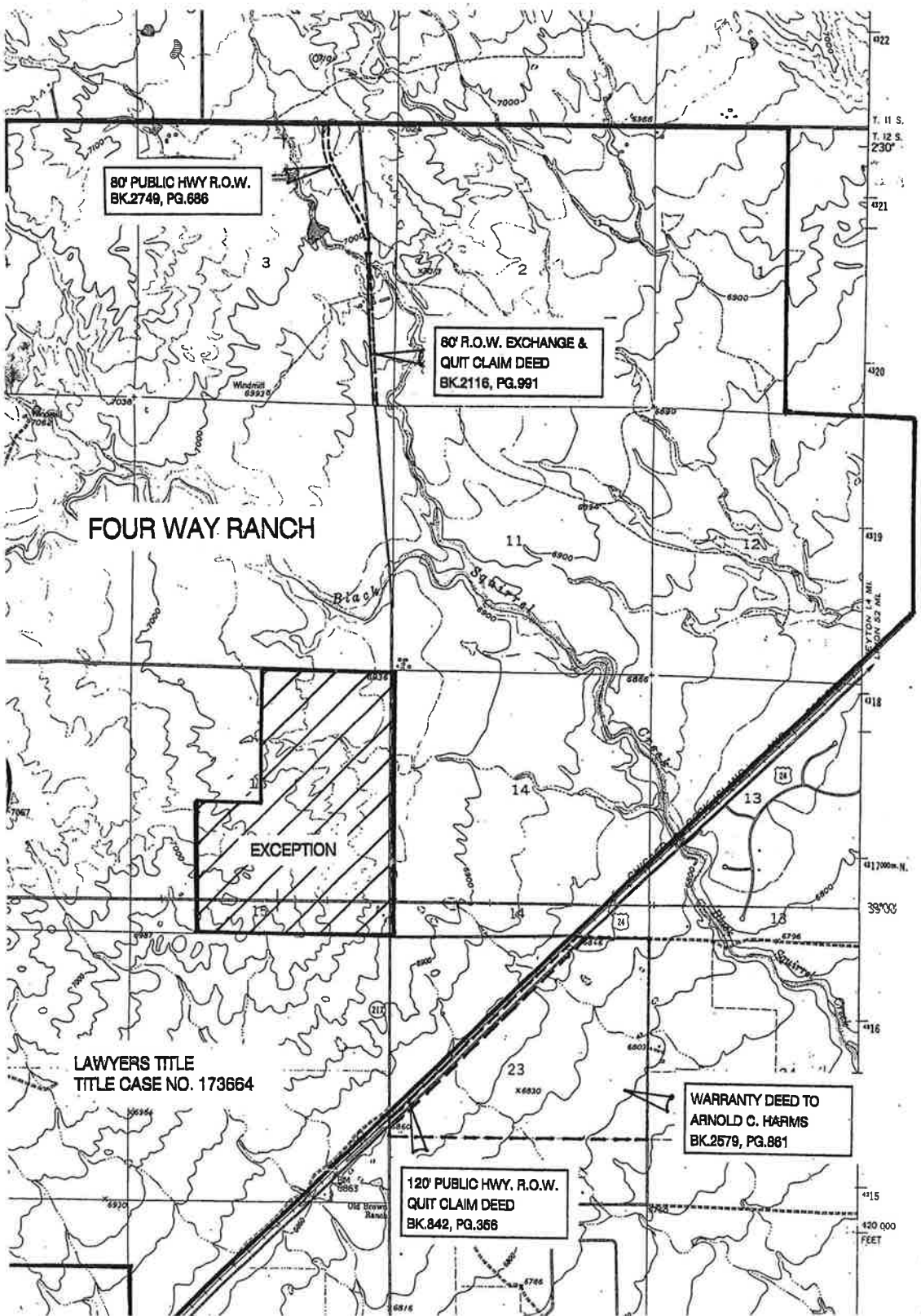
SE4, SW4SW4, E2SW4, SE4NW4, W2NE4, Sec 4-12-64
Total 410.0 Acres

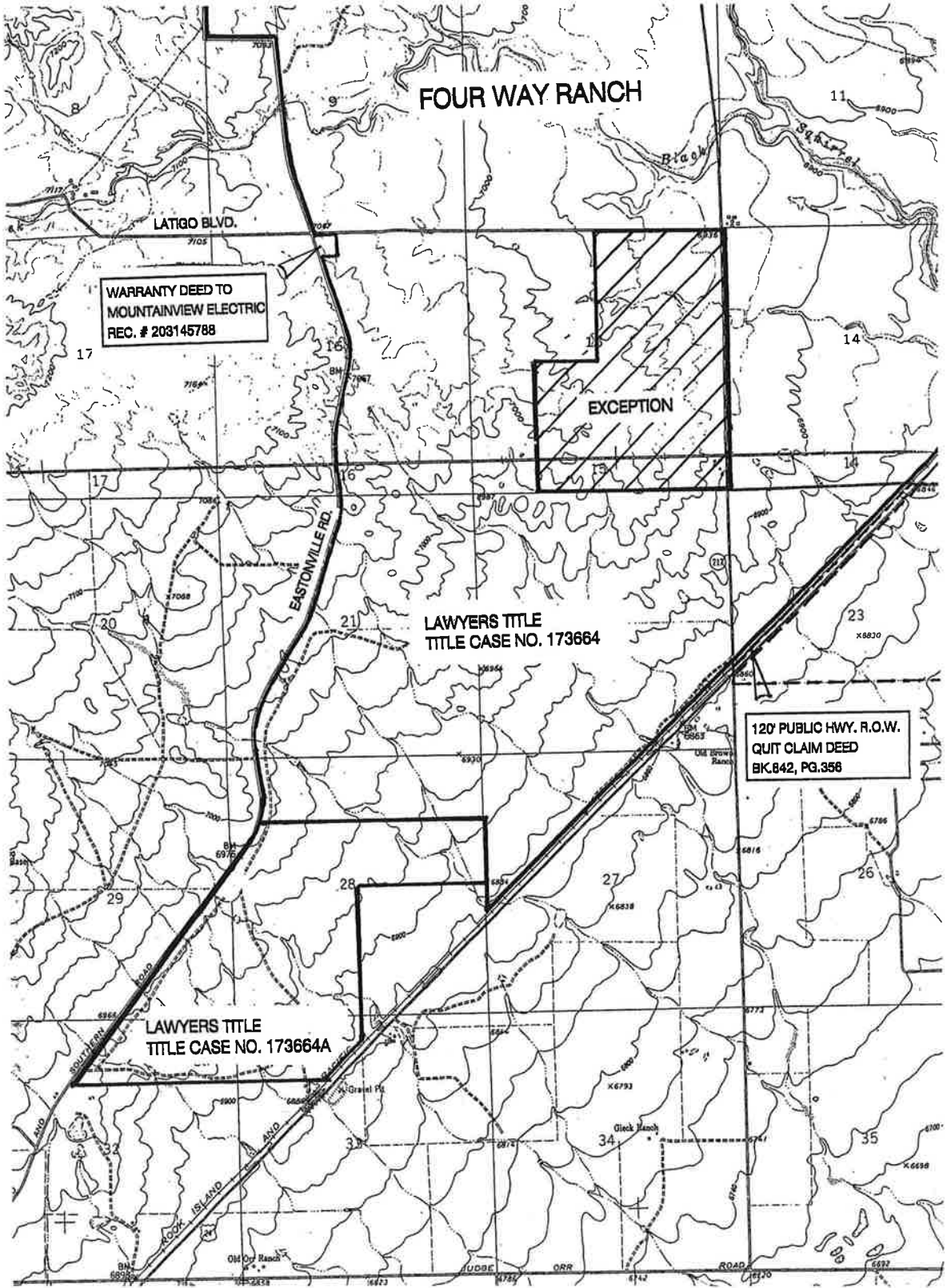
Legal Description Parcel No: 42000000014

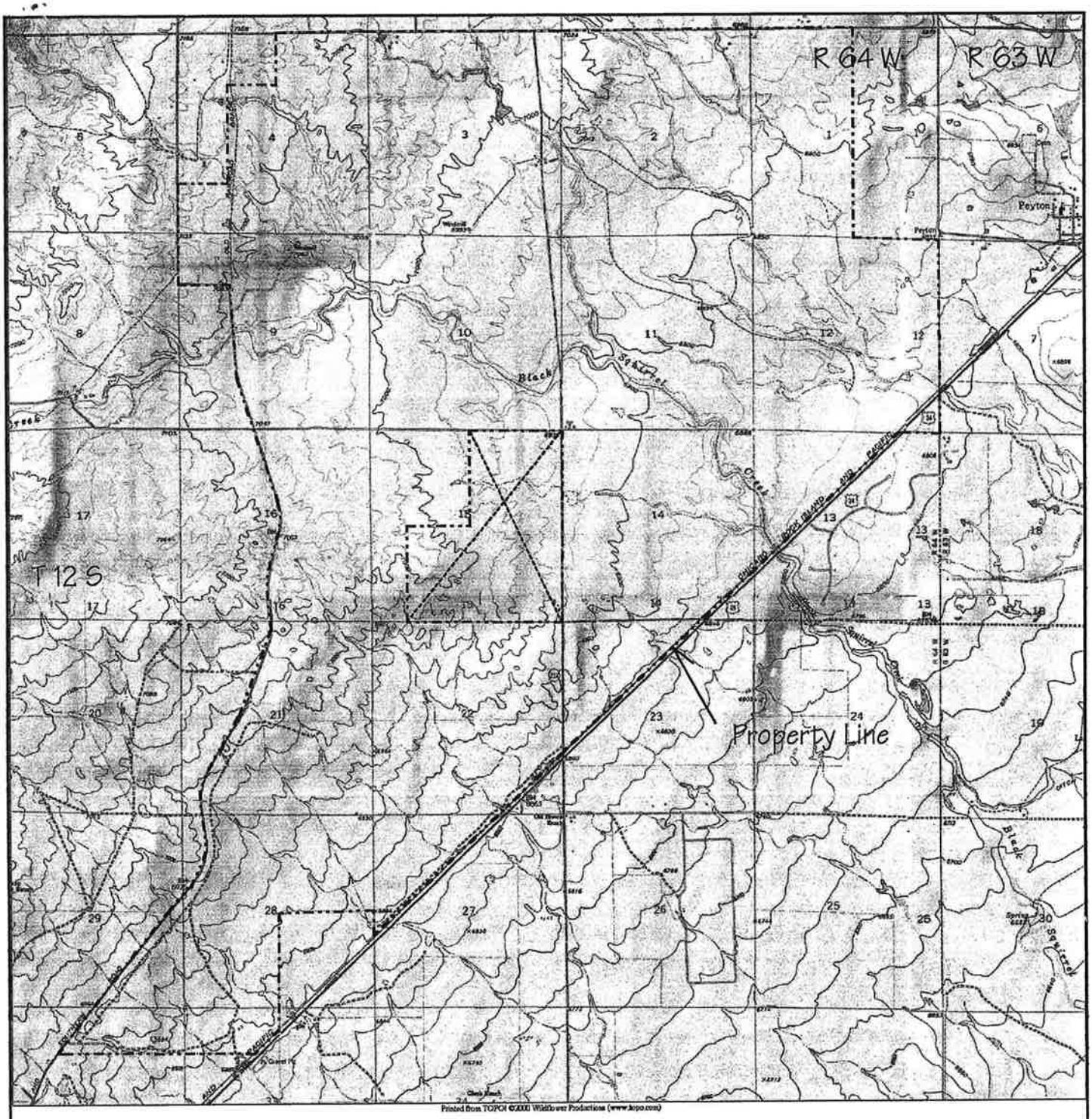
N2N2, SE4NE4 W/MR SEC 10-12-64
Total 200 Acres

Grand Total 8095 Acres


80' PUBLIC HWY R.O.W.
BK.2749, PG.686
60' R.O.W. EXCHANGE &
QUIT CLAIM DEED
BK.2116, PG.991
FOUR WAY RANCH
LATIGO BLVD.
NTY DEED TO
AINVIEW ELECTRIC
203145788
EXCEPTION
EASTONVILLE RD.
LAWYERS TITLE
TITLE CASE NO. 173664
120' PUBLIC HWY. R.O.W.
QUIT CLAIM DEED
BK.842, PG.356
WARRANT
ARNOLD C
BK.2579, P


80' PUBLIC HWY R.O.W.
BK.2749, PG.686
60' R.O.W. EXCHANGE &
QUIT CLAIM DEED
BK.2116, PG.991
FOUR WAY RANCH
EXCEPTION
LAWYERS TITLE
TITLE CASE NO. 173664
WARRANTY DEED TO
ARNOLD C. HARMS
BK.2579, PG.861
120' PUBLIC HWY. R.O.W.
QUIT CLAIM DEED
BK.842, PG.366


FOUR WAY RANCH
LATIGO BLVD.
WARRANTY DEED TO
MOUNTAINVIEW ELECTRIC
REC. # 203145788
EXCEPTION
EASTONVILLE RD.
LAWYERS TITLE
TITLE CASE NO. 173664
120' PUBLIC HWY. R.O.W.
QUIT CLAIM DEED
BK.642, PG.356
LAWYERS TITLE
TITLE CASE NO. 173664A
SOUTHERN PACIFIC
ROCK ISLAND
Old Orr Ranch
Glick Ranch
Old Brown Ranch
Gravel Pit
JUDGE ORR ROAD



Location Map

Wm Curtis Wells & Co.
consulting ground water geologists

N

Scale 1" = 4000'

EXHIBIT A

Figure 1

COMMITMENT FOR TITLE INSURANCE
SCHEDULE A

EFFECTIVE DATE: August 4, 2003 at 7:30 a.m. CASE NO. 173664

POLICY OR POLICIES TO BE ISSUED:

(a) X ALTA OWNER'S POLICY 1992 AMOUNT $
ALTA RESIDENTIAL TITLE INSURANCE POLICY-1987 PURCHASE PRICE
PROPOSED INSURED:

A PURCHASER TO BE DETERMINED

(b) ALTA LOAN POLICY, (10-17-92) AMOUNT $
PROPOSED INSURED:

(c) AMOUNT $
PROPOSED INSURED:

TITLE TO THE FEE SIMPLE ESTATE OR INTEREST IN THE LAND DESCRIBED OR REFERRED TO IN THIS COMMITMENT IS AT THE EFFECTIVE DATE HEREOF VESTED IN :

FOUR WAY RANCH, A COLORADO GENERAL PARTNERSHIP

THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED ON SCHEDULE A-4 ATTACHED

For title questions, please call Clark Hollis at (719) 475-8850.
For closing questions, please call

This Commitment supersedes Commitment No. 173664 C-6, which is hereby canceled.

This commitment is invalid unless the Insuring Provisions and Schedules A & B are attached.

CASE NO. 173664

SCHEDULE A-4 (DESCRIPTION PAGE)

THE WEST HALF OF SECTION 1;

ALL OF SECTION 2;

ALL OF SECTION 3, EXCEPTING THOSE PORTIONS CONVEYED TO EL PASO COUNTY IN DEEDS RECORDED IN BOOK 2116 AT PAGE 991 AND IN BOOK 2749 AT PAGE 686;

THE SOUTHEAST QUARTER, THE NORTHEAST QUARTER, THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER, THE EAST HALF OF THE SOUTHWEST QUARTER AND THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 4;

THE NORTH HALF OF THE NORTHWEST QUARTER, AND THAT PORTION OF THE SOUTH HALF OF THE NORTHWEST QUARTER AND OF THE SOUTHWEST QUARTER LYING EAST OF THE COUNTY ROAD ADJOINING THE RIGHT OF WAY OF THE COLORADO AND SOUTHERN RAILWAY ON THE WEST, AND THE EAST HALF, ALL IN SECTION 9;

ALL OF SECTION 10;

ALL OF SECTION 11;

THE NORTH HALF, THE SOUTHWEST QUARTER, THE NORTH HALF OF THE SOUTHEAST QUARTER AND THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER AND THAT PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER LYING NORTH AND WEST OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD RIGHT OF WAY ALL IN SECTION 12;

ALL OF SECTION 13 LYING NORTH AND WEST OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD RIGHT OF WAY;

THE SOUTHWEST QUARTER, THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER, THE NORTH HALF OF THE SOUTHEAST QUARTER, THE NORTH HALF AND THAT PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER LYING NORTH AND WEST OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD RIGHT OF WAY, ALL IN SECTION 14;

THE NORTHWEST QUARTER AND THE WEST HALF OF THE SOUTHWEST QUARTER OF SECTION 15;

ALL THAT PORTION OF SECTION 16 LYING EAST OF SAID COUNTY ROAD, EXCEPTING THEREFROM, THAT PORTION THEREOF CONVEYED TO MOUNTAIN VIEW ELECTRIC ASSOCIATION, INC. BY DEED RECORDED JUNE 27, 2003 AT RECEPTION NO. 203145788;

THE EAST HALF AND THAT PORTION OF THE WEST HALF OF SECTION 21 LYING EAST OF SAID COUNTY ROAD;

THAT PORTION OF SECTION 22 LYING NORTHWEST OF THE RIGHT OF WAY OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY;

THE NORTH HALF AND THE NORTH HALF OF THE SOUTH HALF OF SECTION 23 EXCEPT THAT PORTION CONVEYED IN WARRANTY DEED RECORDED IN BOOK 2579 AT PAGE 861, AND EXCEPT THAT PORTION

*******CONTINUED**

LEGAL DESCRIPTION
CONTINUED

CASE NO. 173664

CONVEYED TO EL PASO COUNTY IN DEED RECORDED IN BOOK 842 AT PAGE 356, AND EXCEPT ANY PORTION FOUND TO BE LYING WITHIN THE RIGHT OF WAY OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD.

THAT PORTION OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER, AND OF THE NORTHWEST QUARTER, AND OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER LYING NORTHWEST OF THE RIGHT OF WAY OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY ALL IN SECTION 27;

THE NORTH HALF OF THE NORTHEAST QUARTER OF SECTION 28 AND THE NORTH HALF OF THE NORTHWEST QUARTER OF SECTION 28 LYING EAST OF THE COUNTY ROAD (EASTONVILLE ROAD);

ALL IN TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE 6TH P.M., EL PASO COUNTY, COLORADO.

SCHEDULE B--SECTION 1
REQUIREMENTS CASE NO. 173664

THE FOLLOWING ARE THE REQUIREMENTS TO BE COMPLIED WITH:

item a PAYMENT TO OR FOR THE ACCOUNT OF THE GRANTORS OR MORTGAGORS OF THE FULL CONSIDERATION FOR THE ESTATE OR INTEREST TO BE INSURED.

item b PROPER INSTRUMENT(S) CREATING THE ESTATE OR INTEREST TO BE INSURED MUST BE EXECUTED AND FULLY FILED FOR RECORD TO WIT:

1. Warranty Deed from FOUR WAY RANCH, A COLORADO GENERAL PARTNERSHIP vesting fee simple title in the purchaser. (The deed from the partnership must be executed by its general partners, who the public records indicate as being: LINDA D. JOHNSON-CONNE AND W. TRACY LEE, PARTNERS AND CO-MANAGERS.)

item C Such further requirements as may be deemed necessary by the Company when the identity of the proposed insured has been established to the satisfaction of the Company.

RECORDING FEES: $1.00 PER DOCUMENT; $5.00 PER PAGE
TITLE INSURANCE CHARGES: AMOUNT:
OWNER'S POLICY (TBD)

CASE NO. 173664

SCHEDULE B--SECTION 2
EXCEPTIONS

E POLICY OR POLICIES TO BE ISSUED WILL CONTAIN EXCEPTIONS TO THE FOLLOWING UNLESS THE
IE ARE DISPOSED OF TO THE SATISFACTION OF THE COMPANY.

1. Rights or claims of parties in possession not shown by the public records.

2. Easements, or claims of easements, not shown by the public records.

3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, and any facts which a correct survey and inspection of the premises would disclose and which are not shown by the public records.

4. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public records.

5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed insured acquires for value of record the estate or interest or mortgage thereon covered by this Commitment.

6. Any and all unpaid taxes, assessments and unredeemed tax sales.

7. Unpatented mining claims; reservations or exceptions in patents or in acts authorizing issurance thereof; water rights, claims or title to water including but not limited to that certain reservation of all minerals, ores and metals of every kind and character and all coal, asphaltum, oil and other like substances in or under said land and the right of ingress and egress for the purpose of mining, together with enough of the surface of same as may be necessary for the proper and convenient working of such minerals and substances as contained in State School Patent recorded in Book 290 at Page 169 and a reservation of all coal as contained in United States Patent recorded in Book 290 at Page 277. (Sections 15 & 16).

8. Any and all ditch and ditch rights, reservoir and reservoir rights, pipelines and all easements and appurtenances thereto including, but not limited to those associated with the Carrick Ditch and pipeline, the Ford White Ditch No. 2, the Hay Creek Reservoir, the Ford White Ditch No. 1, the Railroad Ditch, the Last Chance Ditch and the First Chance Ditch as evidenced in Deeds recorded in Book 1769 at Page 195 and Book 2233 at Page 646.

*******CONTINUED**

Exceptions numbered NONE are hereby omitted.

IE Owner's Policy to be issued, if any, shall contain the following items in addition to
IE ones set forth above:
.) The Deed of Trust, if any, required under Schedule B-Section 1, item (b).

IIS commitment is invalid unless the Insuring Provisions and schedules A & B are attached

SCHEDULE B
EXCEPTIONS CONTINUED

CASE NO. 173664

9. Rights of others in and to the continued and uninterrupted flow of Black Squirrel Creek and its tributaries as the same may be found to be coursing through the subject premises.

10. Any right, title, claim or interest of the public in and to any roadway or highway including, but not limited to claims associated with the "Road Order" recorded in Book A at Page 78 and with the right of way of West Scott Road as described in instruments recorded in Book 1810 at Page 396 and recorded November 29, 1997 at Reception No. 97136695.

11. Reservation of 3/4 interest of all oil, gas and other minerals as evidenced in Deed recorded in Book 1688 at Page 500 and in Book 1781 at Page 328. (Section 23)

12. Reservation to the Federal Land Bank of Wichita an undivided one-half interest in and to all oil, gas and mineral rights as contained in Book 1128 at Page 83. Mineral Deed to Lee A. Adams conveying one-fourth interest in and to said minerals recorded in Book 1474 at Page 564 and Mineral Deed to Malco Refineries, Inc. conveying three-sixteenths interest in and to said minerals recorded in Book 1475 at Page 438. Notice of Proper Address and Claim of Interest to perpetuate mineral ownership recorded September 28, 1993 in Book 6269 at Page 1094. Conveyance Assignment and Bill of Sale from Atlantic Richfield Company to Morgan Capital Group recorded in Book 6465 at Page 1485. Quit Claim Deed recorded in connection to said reservation on June 23, 1995 in Book 6671 at Page 147, and Personal Representative's Deed recorded May 29, 1998 at Reception No. 98072480. (N 1/2, N 1/2 S 1/2 Section 23)

13. Reservation of all oil, including the right to enter said land to prospect or drill for oil and the right to remove the same. It is understood that if oil should be found, the grantee (Elisha Baker) herein shall receive 1% royalty as evidenced in Book 598 at Page 239. (Section 1)

14. Reservation of oil, including the right to enter said land to prospect or drill for oil and the right to remove the same. It is understood that if oil should be found, the grantee (R. S. Robinson) herein shall receive 1% royalty as evidenced in Book 658 at Page 202. (Sections 1 and 2)

*******CONTINUED**

SCHEDULE B
EXCEPTIONS CONTINUED

CASE NO. 173664

15. Right of way 50 feet in width for Fidelity Ditch, together with the right to build a headgate or dam across the Black Squirrel Creek recorded in Book 402 at Page 544. (Section 13)

16. Reservation to Arthur H. Norden and Eva Norden an undivided one-half interest in and to all mineral, oil rights in or under said land and the right of ingress and egress contained in Book 1286 at Page 355. Mineral Deed to John E. Stanford recorded in Book 2084 at Page 628. Mineral Deed to Harry Goltz recorded in Book 1996 at Page 707. Quit Claim Deed to Claro Royalty, Inc. recorded in Book 2238 at Page 949. (SW 1/4 Section 11, NW 1/4 Section 14)

17. Conveyance of undivided one-half interest in and to all oil, gas, casinghead gas, gasoline Royalty and Royalty in other minerals that may be mined from subject premises, together with the right of ingress and egress for the purpose of mining, drilling and exploring for a period of 35 years or as long thereafter as oil,gas or other minerals is produced or mined from said lands as evidenced in Deed recorded in Book 1265 at Page 294.

18. Inclusion of the subject property within the Black Squirrel Soil Conservation District as evidenced by Certificate recorded August 13, 1945, in Book 957 at Page 277.

19. Right of Way and/or Easement, given to Mountain View Electric, for electrical purposes, as described in instrument, recorded December 21, 1964 in Book 2049 at Page 890.

20. Right of Way and/or Easement, given to the Mountain States Telephone and Telegraph Company, for communication purposes, as described in instrument, recorded April 2, 1973 in Book 2574 at Page 302. (Section 23)

21. Right of Way and/or Easement, given to Mountain View Electric Association, for electrical purposes, as described in instrument, recorded March 29, 1964 in Book 1852 at Pages 370, 374 and 377, recorded June 24, 1968 in Book 2240 at Page 442 and recorded November 8, 1996 at Reception No. 96142336. (Sections 12, 14, 16, 17 and 23)

*******CONTINUED**

SCHEDULE B
EXCEPTIONS CONTINUED

CASE NO. 173664

22. Right of Way and/or Easement, given to American Telephone and Telegraph Company, for communication purposes, the exact location of which is not specified, recorded October 14, 1963 in Book 1980 at Page 448 and recorded November 18, 1963 in Book 1986 at Page 795. Rule and Order recorded in conjunction therewith on April 24, 1997 at Reception No. 97046029.

23. Right of Way and/or Easement, given to Colorado Telephone Company, for communication purposes, as described in instrument, recorded January 9, 1905 in Book 358 at Page 542. Conveyance to the Mountain States Telephone and Telegraph Company recorded in Book 482 at Page 190.

24. Right of Way for pipeline purposes for the benefit of Diamond Shamrock Pipeline Company the existence of which is evidenced by Rule and Order recorded April 24, 1997 at Reception No. 97046029. (Sections 21 and 28)

25. Terms, conditions, provisions, obligations and easements as contained in and created by Temporary Construction Easement Agreements recorded October 4, 2001 at Reception Nos. 201145336, 201145337 and 201145338. (Sections 10 and 11)

26. Right of Way and/or Easement, given to American Telephone and Telegraph Company, for communication purposes, the exact location of which is not specified, recorded May 7, 1956 in Book 1568 at Pages 568 and 570. (Sections 3 and 4)

Informational Note:

The subject premises appears to be affected by Zoning Resolution recorded in Book 1921 at Page 323.

Colorado Revised Statutes S10-11-122 requires that "every title insurance agent or title insurance company" shall provide, along with each title commitment issued, the following statement:

(a) That the subject real property may be located in a special taxing district;

(b) That a certificate of taxes due listing each taxing jurisdiction may be obtained from the county treasurer or the county treasurer's authorized agent;

(c) That information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder or the County Assessor.

COMMITMENT FOR TITLE INSURANCE
SCHEDULE A

EFFECTIVE DATE: August 11, 2003 at 7:30 a.m. CASE NO. 173664A

POLICY OR POLICIES TO BE ISSUED:

(a) X ALTA OWNER'S POLICY 1992 AMOUNT $
ALTA RESIDENTIAL TITLE INSURANCE POLICY-1987 PURCHASE PRICE
PROPOSED INSURED:

A PURCHASER TO BE DETERMINED

(b) ALTA LOAN POLICY, (10-17-92) AMOUNT $
PROPOSED INSURED:

(c) AMOUNT $
PROPOSED INSURED:

3. TITLE TO THE FEE SIMPLE ESTATE OR INTEREST IN THE LAND DESCRIBED OR REFERRED TO IN THIS COMMITMENT IS AT THE EFFECTIVE DATE HEREOF VESTED IN :

SPRING CREEK, LLC, A COLORADO LIMITED LIABILITY COMPANY, AS TO PARCEL A;
MERIDIAN MEADOWS, A COLORADO LIMITED PARTNERSHIP, AS TO PARCEL B

4. THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED ON SCHEDULE A-4 ATTACHED

For title questions, please call Clark Hollis at (719) 475-8850.
For closing questions, please call

This Commitment supersedes Commitment No. 173664A C-6, which is hereby canceled.

CASE NO. 173664A

SCHEDULE A-4 (DESCRIPTION PAGE)

PARCEL A:

THE SOUTH HALF OF THE NORTHEAST QUARTER AND THE SOUTHWEST QUARTER AND THAT PORTION OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF SECTION 28 LYING EAST OF THE COUNTY ROAD (EASTONVILLE ROAD); THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 29 LYING EAST OF SAID COUNTY ROAD; THAT PORTION OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER AND OF THE NORTH HALF OF THE NORTHEAST QUARTER OF SECTION 32 LYING EAST OF SAID COUNTY ROAD, AND THAT PORTION OF THE NORTH HALF OF THE NORTHWEST QUARTER OF SECTION 33, LYING NORTH AND WEST OF THE RIGHT OF WAY OF THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY, ALL IN TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE 6TH P.M., EL PASO COUNTY, COLORADO.

PARCEL B:

THAT PORTION OF THE NORTHEAST QUARTER OF SECTION 29 IN TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE 6TH P.M., EL PASO COUNTY, COLORADO, LYING EAST OF THE COUNTY ROAD (EASTONVILLE ROAD).

SCHEDULE B--SECTION 1
REQUIREMENTS

CASE NO. 173664A

THE FOLLOWING ARE THE REQUIREMENTS TO BE COMPLIED WITH:

item a PAYMENT TO OR FOR THE ACCOUNT OF THE GRANTORS OR MORTGAGORS OF THE FULL CONSIDERATION FOR THE ESTATE OR INTEREST TO BE INSURED.

item b PROPER INSTRUMENT(S) CREATING THE ESTATE OR INTEREST TO BE INSURED MUST BE EXECUTED AND FULLY FILED FOR RECORD TO WIT:

1. Warranty Deed from SPRING CREEK, LLC, A COLORADO LIMITED LIABILITY COMPANY vesting fee simple title in the purchaser. (The deed from the company must be executed by its co-managers, who the public records indicate as being: LINDA D. JOHNSON-CONNE AND W. TRACY LEE, CO-MANAGERS.)

item c Recordation of a Deed from MERIDIAN MEADOWS, A COLORADO LIMITED PARTNERSHIP, to SPRING CREEK, LLC, A COLORADO LIMITED LIABILITY COMPANY. (As to Parcel B)
NOTE: Said Deed must be executed by: see item "d" below.

item d Recordation of Statement of Authority for MERIDIAN MEADOWS, A COLORADO LIMITED PARTNERSHIP evidencing the existence of the entity and authority of the person authorized to execute and deliver instruments affecting title to real property on behalf of the entity, and containing other information required by CRS 38-30-172.

item e Such further requirements as may be deemed necessary by the Company when the identity of the proposed insured has been established to the satisfaction of the Company.

RECORDING FEES: $1.00 PER DOCUMENT; $5.00 PER PAGE
TITLE INSURANCE CHARGES: AMOUNT:
OWNER'S POLICY (TBD)

CASE NO. 173664A

SCHEDULE B--SECTION 2
EXCEPTIONS

E POLICY OR POLICIES TO BE ISSUED WILL CONTAIN EXCEPTIONS TO THE FOLLOWING UNLESS THE
IE ARE DISPOSED OF TO THE SATISFACTION OF THE COMPANY.

1. Rights or claims of parties in possession not shown by the public records.

2. Easements, or claims of easements, not shown by the public records.

3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, and any facts which a correct survey and inspection of the premises would disclose and which are not shown by the public records.

4. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public record.

5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed insured acquires for value of record the estate or interest or mortgage thereon covered by this Commitment.

6. Road Order by the Board of Commissioners of El Paso County, Colorado, which provides for public roads, 30 feet in width, adjacent to all exterior section lines recorded in Book A at Page 78.

7. Inclusion of the subject property within the Black Squirrel Soil Conservation District as evidenced by Certificate recorded August 13, 1945, in Book 957 at Page 277.

8. Right of Way and/or Easement, given to Mountain View Electric, for electrical purposes, as described in instrument, recorded December 21, 1964 in Book 2049 at Page 890.

9. Right of Way and/or Easement, given to American Telephone and Telegraph Company, for communication purposes, as described in instrument, recorded November 18, 1963 in Book 1986 at Page 795.

0. Right of Way and/or Easement, given to Colorado Telephone Company, for communication purposes, as described in instrument, recorded January 9, 1905 in Book 358 at Page 542.

*******CONTINUED**

Exceptions numbered NONE are hereby omitted.

IE Owner's Policy to be issued, if any, shall contain the following items in addition to
IE ones set forth above:
.) The Deed of Trust, if any, required under Schedule B-Section 1, item (b).
!) Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing
.SSUance thereof; water rights, claims or title to water.
)) Any and all unpaid taxes, assessments and unredeemed tax sales.

IIS commitment is invalid unless the Insuring Provisions and Schedules A & B are attached

SCHEDULE B
EXCEPTIONS CONTINUED

CASE NO. 173664A

11. Right of Way for pipeline purposes for the benefit of Diamond Shamrock Pipeline Company the existence of which is evidenced by Lis Pendens recorded October 15, 1996 at Reception No. 96131560.

12. Any right, title or interest in favor of Falcon Properties & Investments for property being assessed under El Paso County Schedule No. 42000-00-232.

INFORMATIONAL NOTE:

The subject premises appears to be affected by Zoning Resolution recorded in Book 1921 at Page 323.

LandAmerica Lawyers Title

Lawyers Title Insurance Corporation

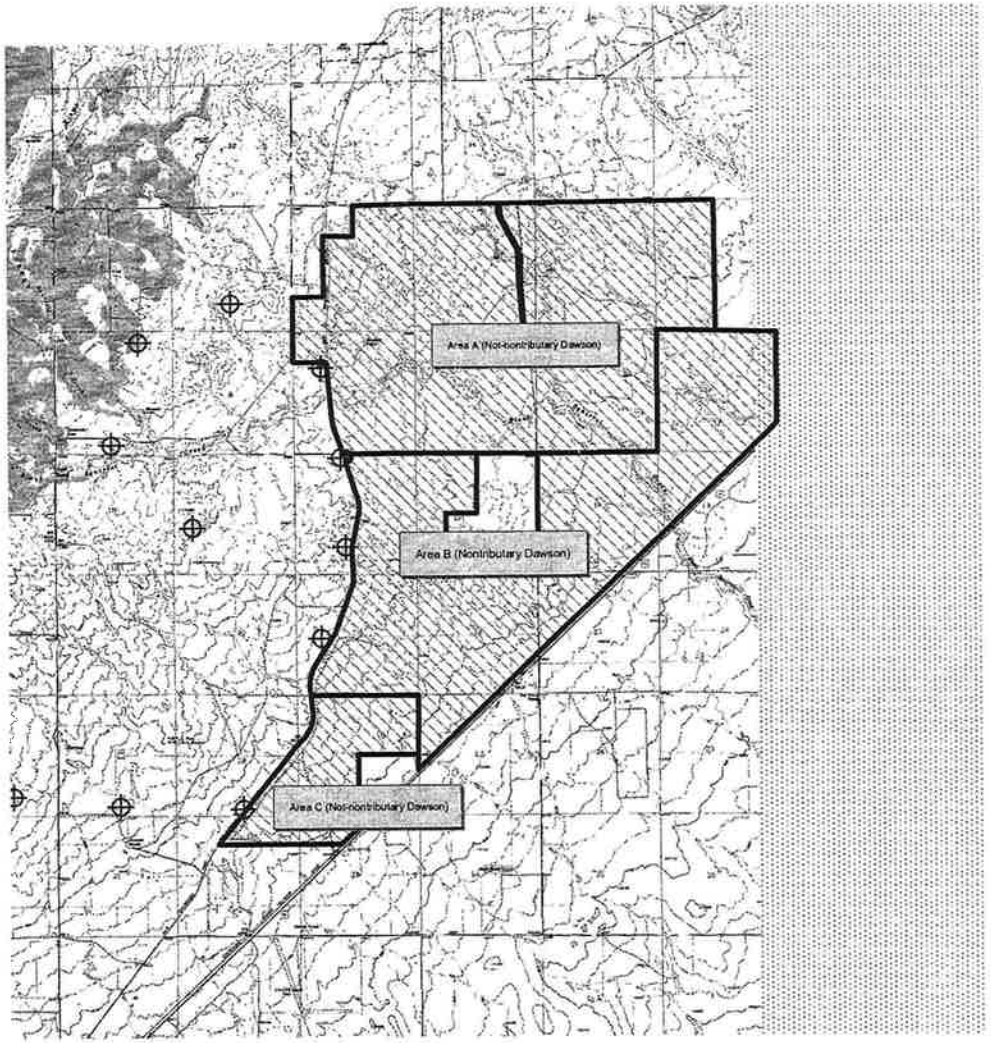
olorado Revised Statutes S10-11-122 requires that "every title insurance gent or title insurance company" shall provide, along with each title ommitment issued, the following statement:

(a) That the subject real property may be located in a special taxing district;

(b) That a certificate of taxes due listing each taxing jurisdiction may be obtained from the county treasurer or the county treasurer's authorized agent;

(c) That information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder or the County Assessor.

EXHIBIT B



1:100265

2000 0 2000 4000 6000 Feet

0.5 0 0.5 1 Miles

DIVISION OF WATER RESOURCES
STATE OF COLORADO

Receipt Number 512830 B
Applicant Four Way Ranch
Dawson aquifer

Sections 1-4, 9-16, 21-23, 27, 28, 29, 32 &33
Township 12 S
Range 64 W
Meridian S

Claimed acreage: 8095
Total calculated acreage = 7925
Area A (NNT Dawson) = 3953 Ac
Area B (NT Dawson) = 3285 Ac
Area C (NNT Dawson) = 687 Ac

Adjusted acreage
Perimeter error (ep)
Pa = 21,177 m, ep = 36 Ac
Pb = 25,018 m, ep = 42 Ac
Pc = 8320 m, ep = 14 Ac

Hwy easement error (ehwy)
ehwy (Area A) = 8 Ac
ehwy (Area B) = 65 Ac
ehwy (Area C) = 17 Ac

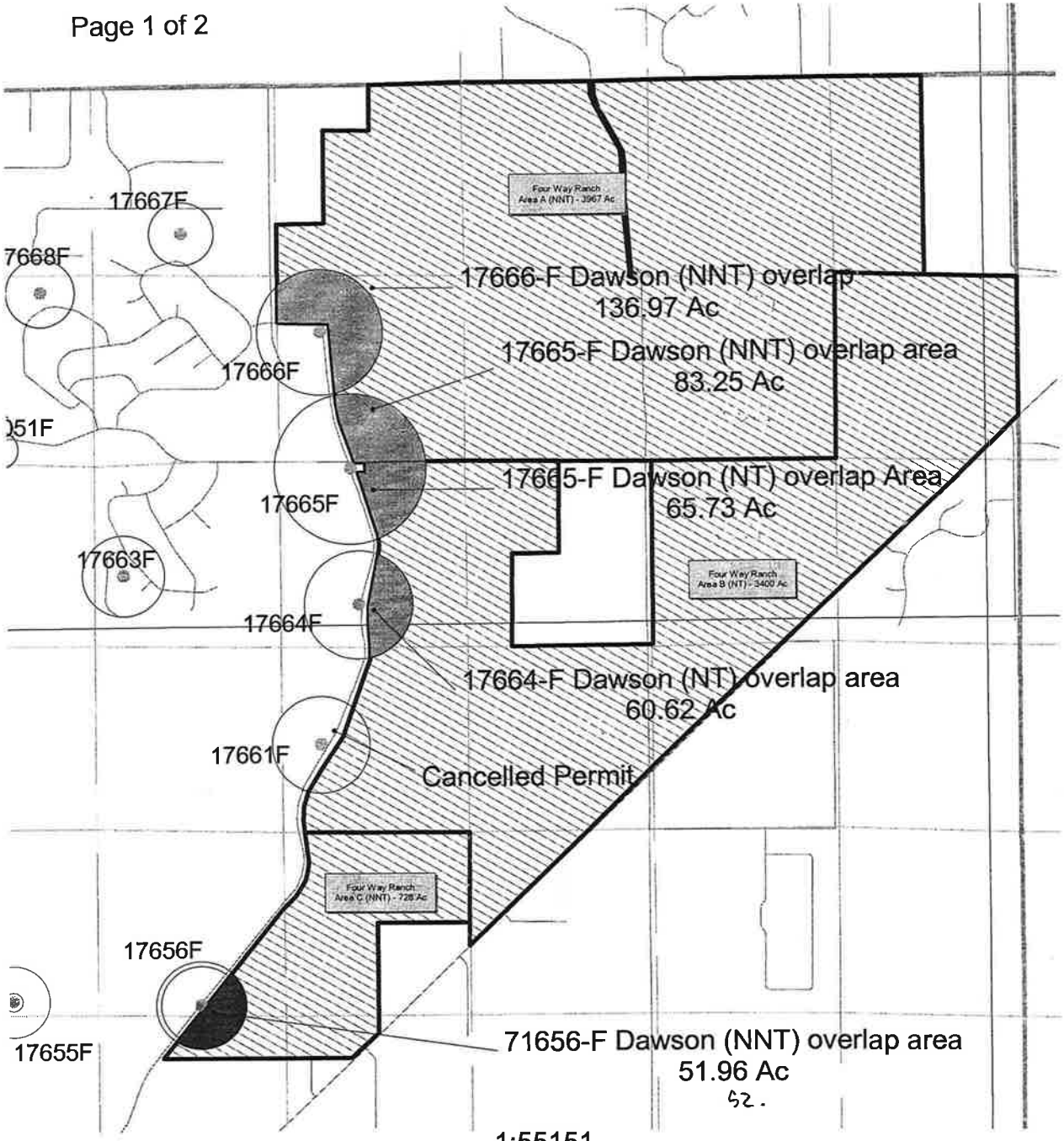
A = 3953 + 36 + 8 = 3997 Ac (49%)
B = 3285 + 42 + 65 = 3392 Ac (42%)
C = 687 + 14 + 17 = 718 Ac (9%)

Final Weighted Acreage Values
Area A = 8095 * 49% = 3967 Ac
Area B = 8095 * 42% = 3400 Ac
Area C = 8095 * 9% = 728 Ac

Office of the State Engineer
Division of Water Resources
Department of Natural Resources

EXHIBIT C

Page 1 of 2



DIVISION OF WATER RESOURCES
STATE OF COLORADO

Four Way Ranch (Receipt No. 512830 B)
Pre-213 Cylinder of appropriation
overlap calculations for
Dawson aquifer

Area A (NNT) Annual Appropriation:
(3967 Ac * 221 SS * 0.2)/100 = 1753.4 AF/yr
Cyl. overlap approp.
□□(219.2 Ac * 221 SS * 0.2)/100 = 96.9 AF/yr
Ann. Approp. minus Cyl.
1753.4 - 96.9 = 1656.5

Area B (NT) Annual Appropriation:
(3400Ac * 127SS*0.2)/100 = 863.6 AF/yr
Cyl. overlap approp.
(126.35Ac * 127SS * 0.2)/100 = 32.1 AF/yr
Ann. Approp. minus Cyl.
863.6 - 32.1 = 831.5 AF/yr

Area C (NNT) Annual Appropriation:
(728Ac * 113SS * 0.2)/100 = 164.5 AF/yr
Cyl. overlap approp.
(52.0Ac * 113SS * 0.2)/100 = 11.75 AF/yr
Ann. Approp. minus Cyl.
164.5 - 11.75 = 152.8

* SS Values from SB-5

- 4wayints4.shp
- 4wayints3.shp
- 4wayints2.shp
- Pre213_20.shp
- Pre213_713.shp
- Pre213_59.shp
- Pre213_412.shp
- cylinder.shp
- ManDist
- Basins
- Parcels
- Twn3co.shp
- Sec3tob.shp
- Qua3_24.shp
- Elpaso_roads.shp

N

Office of the State Engineer
Division of Water Resources
Department of Natural Resources

EXHIBIT C

513-BD

APPLICANT: **Four Way Ranch / Spring Creek, LLC**

AQUIFER: **Dawson**

WELL NUMBERS	1/4	1/4	SEC	TWP	RNG	AF	ST	SY	RADIUS	AREA
17656-F	SW	SE	29	12S	64W	30.3	130	20%	1271	52 Ac
17664-F	SE	SW	16	12S	64W	60	175	20%	1541	60.6 Ac
17665-F (*A)	NE	NW	16	12S	64W	147	220	20%	2152	83.3 Ac
17665-F (*B)	NE	NW	16	12S	64W	147	220	20%	2152	65.7 Ac
17666-F	SW	NW	9	12S	64W	126	275	20%	1782	137 Ac

WELL NUMBER = WELL PERMIT NUMBER, REGISTRATION NUMBER OR WATER COURT CASE AND WELL NUMBER

AF = THE ANNUAL APPROPRIATION OF THE WELL IN ACRE-FEET

ST = THICKNESS OF THE SATURATED AQUIFER MATERIAL AT THE WELL LOCATION IN FEET

SY = SPECIFIC YIELD OF THE SATURATED AQUIFER MATERIAL AT THE WELL LOCATION AS A PERCENT

RADIUS = IS THE RADIUS OF THE CYLINDER OF APPROPRIATION IN FEET

AREA = THE AREA OF THE APPLICANT'S CLAIMED OVERLYING LAND AREA THAT IS OVERLAPPED BY THE CYLINDER OF APPROPRIATION - IN ACRES.

(i) The cylinder of appropriation for each well was computed in accordance with Rule 4.2.15 of the Designated Basin Rules.

(ii) In accordance with Rule 5.3.3.1 of the Designated Basin Rules, the number of acres of overlying land to be used in determining the available water in storage in the subject aquifer shall be reduced by the number of acres of each cylinder that overlaps the claimed land area.

(iii) The cylinder effectively prevents unreasonable impairment to the amount of claimed appropriation for each well.

(iv) Calculation of such a cylinder does not constitute staff clarification or Commission final determination of any water right associated with the subject well. The timely beneficial use and annual appropriations claimed for these wells – the amounts used in the cylinder calculation - are based on the well owner's statements and other information in the well-permit files.

(v) The actual allowed permitted annual appropriation amount for each well may require more complete beneficial use data and clarification, and is subject to verification by the Ground Water Commission and publication for public review prior to issuance of a final permit.

(vi) The well with Permit No. 17656-F is completed to withdraw ground water from both the Denver and Dawson aquifers. The proportion of appropriation from each aquifer is based on the interval of that aquifer through which the well is completed.)

EXHIBIT C

Additional Page

SPECIAL WARRANTY DEED
(Water Rights)

THIS DEED is made this 6 day of ~~October~~ NOVEMBER, 2018 between Spring Creek, LLC, a Colorado limited liability company ("Grantor") and 4 Site Investments, LLC, a Colorado limited liability company ("Grantee").

WITNESSETH, that the Grantor, in consideration of funds paid in hand and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell, convey and confirm, unto the Grantee, its heirs and assigns forever, the ground water, rights to extract ground water, and ground water rights, being in the County of El Paso, State of Colorado, described as follows:

> 20,000 acre-feet of groundwater based on a 100-year supply, or an average of 200 acre-feet annually, of Non-Tributary groundwater in the Dawson aquifer underlying the land in Area B, Exhibit B, and described in Exhibit A to the Colorado Ground Water Commission Findings and Order, Determination No. 513-BD dated July 22, 2004 and recorded with the El Paso County Clerk and Recorder's office on September 10, 2004, Reception No. 204153949, all as quantified in and subject to the terms and provisions of said Groundwater Determination No. 513-BD.
>
> 5,000 acre-feet of groundwater based on a 100-year supply, or an average of 50 acre-feet annually, of Not Non-Tributary groundwater in the Dawson aquifer underlying the land in Area C, Exhibit B, and described in Exhibit A to the Colorado Ground Water Commission Findings and Order, Determination No. 513-BD dated July 22, 2004 and recorded with the El Paso County Clerk and Recorder's office on September 10, 2004, Reception No. 204153949, all as quantified in and subject to the terms and provisions of said Groundwater Determination No. 513-BD.

TOGETHER with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right, title, interest, claim and demand whatsoever of the Grantor, either in law or equity, of, in, and to the above water rights, with the hereditaments and appurtenances, warranted by Grantor to be owned by Grantor free and clear of any and all encumbrances and liens.

TO HAVE AND TO HOLD the said water rights above bargained and described with the appurtenances, unto the Grantee, its heirs and assigns forever. The Grantor, for itself, its heirs and personal representatives or successors, does covenant and agree that it shall and will WARRANT AND FOREVER DEFEND the above-bargained water rights in the quiet and peaceable possession of the Grantee, its heirs and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under the Grantor.

Chuck Broerman
11/06/2018 03:52:28 PM
Doc $0.00 2
Rec $18.00 Pages
El Paso County, CO
218129519

IN WITNESS HEREOF, the Grantor has executed this deed on the date set forth above.

SPRING CREEK, LLC
A Colorado limited liability company

W. Tracy Lee, Manager

Linda Johnson-Conne, Manager

County of El Paso)
) ss.
State of Colorado)

The foregoing SPECIAL WARRANTY DEED (Water Rights) was acknowledged before me this 6 day of ~~October~~ NOVEMBER 2018 by W. Tracy Lee, Manager, Manager, Spring Creek, LLC, a Colorado limited liability company.

Witness my hand and official seal.

My commission expires October 10, 2020.

Notary Public

[SEAL]

KYLIE HAAG
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20164038758
MY COMMISSION EXPIRES OCTOBER 10, 2020

County of Maricopa)
) ss.
State of Arizona)

The foregoing SPECIAL WARRANTY DEED (Water Rights) was acknowledged before me this 31 day of October, 2018 by Linda Johnson-Conne, Manager, Spring Creek, LLC, a Colorado limited liability company.

Witness my hand and official seal.

My commission expires 08-08-21.

Notary Public

[SEAL]

Tiffany Murello-Venjohn
Notary Public
Maricopa, Arizona
My Comm. Expires 08/08/21

Appendix E

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

PRELIMINARY SOIL, GEOLOGY, GEOLOGIC HAZARD, AND WASTEWATER STUDY, GRANDVIEW RESERVE PARCEL NO. 42000-00-396 0 EASTONVILLE ROAD EL PASO COUNTY, COLORADO

Prepared for

4 Site Investments, LLC
c/o Peter Martz
P.O. Box 50223
Colorado Springs, Colorado 80949

Attn: Peter Martz

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Kristen A. Andrew-Hoeser, P.G.
Engineering Geologist

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

COLORADO LICENSED
JOSEPH COLLIN GOODEE JR
23725
1.15.19
PROFESSIONAL ENGINEER

LLL/KAH

Encl.

Entech Job No. 181951
AAprojects/2018/181951 countysoil/geo/ww

TABLE OF CONTENTS

1.0 SUMMARY

Project Location

The project site lies in portions of Sections 21, 22, 27 and 28, Township 12 South, Range 64 West of the 6th Principal Meridian, in El Paso County, Colorado. The site is located approximately 4 miles northeast of Falcon, Colorado, northwest of Highway 24, east of Eastonville Road and west of Elbert Road.

Project Description

Total acreage involved in the project is approximately 765 acres. The proposed site development consists of one-hundred and eighty-four (184) single-family rural residential lots with park and open space areas. The development will utilize individual wells and on-site wastewater treatment systems.

Scope of Report

This report presents the results of our geologic evaluation, treatment of engineering geologic hazard study and wastewater study for individual on-site wastewater treatment systems.

Land Use and Engineering Geology

This site was found to be suitable for the proposed development. Areas were encountered where the geologic conditions will impose some constraints on development and land use. These include areas of artificial fill, potentially expansive soils, unstable slopes, floodplain, seasonal and potentially seasonal shallow groundwater, and areas of ponded water. Based on the proposed development plan, it appears that these areas will have some impact on the development. These conditions will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either avoided or properly mitigated. All recommendations are subject to the limitations discussed in the report.

2.0 GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION

The site is located in portions of Sections 21, 22, 27 and 28, Township 12 South, Range 64 West of the 6th Principal Meridian, of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 4 miles northeast of Falcon, Colorado, northwest of Highway 24, east of Eastonville Road and west of Elbert Road. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site consists of gentle areas to rolling hills that vary from gradually to moderately sloping generally to the southeast. Steep slopes are located along some of the drainages in the eastern portions of the site. The drainages on site flow in southeasterly directions through the site. Water was observed flowing in the drainage in the northeast portion of the site, however, no water was observed flowing in the other drainages. Water was observed ponded behind an earthen dam in the southeastern portion of the site at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included grazing and pasture land. The site contains primarily field grasses and weeds. Site photographs, taken December 13, 2018, are included in Appendix A.

Total acreage involved in the proposed development is approximately 765 acres. One hundred and eighty-four (184) single-family rural residential lots with park and open space areas are proposed. The proposed residential lots are approximately 2.5 to 5 acres in size. The area will be serviced by individual wells and on-site wastewater treatment systems. The proposed Site Plan/Testing Location Map is presented in Figure 3.

3.0 SCOPE OF THE REPORT

The scope of the report will include the following:

- A general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.

- The site will be evaluated for individual on-site wastewater treatment systems in accordance with El Paso Land Development Code.

4.0 FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements and air photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology/Engineering Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on December 13, 2018.

Ten (10) test borings and eight (8) tactile test pits were performed on the site to determine soil and bedrock characteristics and general suitability of the site for the use of on-site wastewater treatment systems. The locations of the test borings and test pits are indicated on the Site Plan/Testing Location Map, Figure 3. The Test Boring and Test Pit Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on select soil samples to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422 and FHA Swell Testing. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

5.0 SOIL, GEOLOGY AND ENGINEERING GEOLOGY

5.1 General Geology

Physiographically, the site lies in the western portion of the Great Plains Physiographic Province. Approximately 18 miles to the west is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southeastern edge of a large structural feature known as the Denver Basin. Bedrock in the area tends to be very gently dipping in a northerly direction (Reference 1). The rocks in the area of the site are sedimentary in nature

and typically Tertiary to Upper Cretaceous in age. The bedrock underlying the site consists of the Dawson Arkose Formation. Overlying this formation are unconsolidated deposits of residual soils, man-made, sheetwash deposits, eolian sands, and alluvial soils of the Quaternary Age. The residual soils are produced by the in-situ action of weathering of the bedrock on site. The alluvial soils were deposited by water in the drainages on the site and as stream terrace deposits and sheetwash deposits. Eolian sands are deposited by the action of prevailing winds. Man-made soils exist as earthen dams and berms. The site's stratigraphy will be discussed in more detail in Section 5.3.

5.2 Soil Conservation Survey

The Natural Resource Conservation Service (Reference 2), previously the Soil Conservation Service (Reference 3) has mapped three soil types on the site (Figure 4). In general, they vary from loam, loamy sands, and sandy loam. The soils are described as follows:

Type	Description
8	Blakeland Loamy Sands, 1-9% slopes
19	Columbine Gravelly Sandy Loam, 0 to 3% slopes
83	Stapleton Sandy Loam, 3 to 8% slopes

Complete descriptions of each soil type are presented in Appendix D. The soils have generally been described to typically have rapid permeabilities. The majority of the soils have been described as good for urban development. Limitations include the hazard of flooding on Soil Type No. 19 in some areas. Some areas of Soil Type 19 have mapped in the floodplain zones that are designated as open space. Roads may need to be designed to minimize frost-heave potential. Possible hazards with soil erosion are present on the site. The erosion potential can be controlled with vegetation. The majority of the soils have been described to have moderate erosion hazards.

5.3 Site Stratigraphy

The Falcon Quadrangle Geology Map showing the site is presented in Figure 5 (Reference 4). The Geology Map prepared for the site is presented in Figure 6. Seven mappable units were identified on this site which are described as follows:

Qaf **Recent Artificial Fill of Holocene Age:** These are man-made fill deposits associated with earthen dams and berms on-site.

Qal **Recent Alluvium of Late Holocene Age:** These materials consist of water deposited sands located along some of the minor drainages across the site.

Qp **Piney Creek Alluvium (Alluvium One and Two) of Early Holocene Age:** These materials consist of low stream-terrace deposits above the current stream channel. The materials typically consist of silty to well graded sand.

Qb **Broadway Alluvium (Alluvium Three) of Late Pleistocene Age:** These materials consist of middle steam terrace deposits. The materials typically consist of silty to clayey gravelly sands.

Qsw **Sheetwash Deposits of Holocene to Late Pleistocene Age:** These materials consist of silty to clayey sands with some cobbles. The material was deposited by the action of sheetwash.

Qes **Eolian Sand of Pleistocene Age:** These materials consist of windblown sand deposits. The materials typically consist of light brown, well-sorted silty sands. The windblown sand deposits tend to have low density and low bearing characteristics.

Qc/Tkd **Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The Dawson Formation typically consists of arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone. Overlying this formation is a variable layer of residual soil. The residual soils were derived from the in-situ weathering of the bedrock materials on-site. These soils consisted of silty to clayey sands, sandy clays and sandy silts.

The soils listed above were mapped from site-specific mapping, the *Geologic Map of the Falcon Quadrangle* distributed by the Colorado Geological Survey in 2012 (Reference 4), and the *Geologic Map of the Denver 1^0 x 2^0 Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 5). The Test Pits were also used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

5.4 Soil Conditions

The soils encountered in the test borings and test pits can be grouped into four general soil and rock types. The soils were classified using the Unified Soil Classification System (USCS). The test pit soils were also classified using the USDA Textural Soil Classification.

Soil Type 1 is well-graded, slightly silty to silty and clayey sand (SW, SM-SW, SM, SC, SC-SM-SW). This material was encountered in all of the test borings and in six of the test pits. The sand was encountered at the existing surface and extended to depths ranging from 1 to 9 feet in the test borings and 2 feet to the termination of the test pits (8 feet). These soils were encountered at medium dense to dense states and at dry to very moist conditions. Samples tested had 5 to 40 percent of the soil size particles passing the No. 200 Sieve. Atterberg Limits Testing resulted in a liquid limit of 17 and a plastic index of 5. FHA Swell Testing on samples of the sand resulted in expansion pressures of 110 and 130 psf, indicating low expansion potential.

Soil Type 2 is a sandy clay (CL). This material was encountered in two of the test borings and four of the test pits. The clays were encountered at depths ranging from the existing surface grade in the test pits and at 9 feet in the test borings and extended to depths up to 9 feet in the test pits and 14 feet in the test borings. The clays were encountered at very stiff consistencies and moist conditions. The samples tested had 74 to 85 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in a liquid limit of 44 and a plastic index of 22. FHA Swell Testing resulted in an expansion pressure of 1020 psf, indicating moderate expansion potential.

Soil Type 3 is a silty to clayey sandstone and very clayey sandstone (SM, SC). This material was encountered nine of the test borings and in two of the test pits. The sandstone was encountered at depths ranging from 1 to 14 feet bgs and extended to depths ranging from 14 to 19 feet or to the termination of the borings and pits (6 to 20 feet). The sandstone was encountered at very dense states and moist to wet conditions. Samples tested had 13 to 42 percent of the soil size particles passing the No. 200 sieve. Atterberg Limits Testing resulted in a liquid limit of 28 and a plastic index of 15.

Soil Type 4 is a sandy to very sandy claystone (CL). This material was encountered six of the test borings and Test Pit No. 6. The claystone was encountered at depths ranging from 9 to 19

feet in the test borings and 2 feet in the test pit and extended to depths ranging from 14 feet to the depths explored (5 to 20 feet). The claystone was encountered at hard consistencies and moist conditions. Samples tested had 59 to 72 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing resulted in a liquid limit of 35 and a plastic index of 21. FHA Swell Testing resulted in expansion pressures 950 and 1580 psf. Swell/Consolidation Testing resulted in a volume change of 0.7 percent. These results indicate the claystone exhibits low to high expansion potential.

The Test Pit Logs are presented in Appendix B. Laboratory Test Results are presented in Appendix C. A Summary of Laboratory Test Results is presented in Table 1. Bedrock depths are summarized in Table 2.

5.5 Groundwater

Groundwater was encountered in seven of the test borings at depths ranging from 4.5 to 19 feet. Additionally, groundwater was encountered in Test Pit Nos. 2, 3 and 7 at 7.5, 8.5 and 6.5 feet respectively. Groundwater was not encountered in the remaining test borings or test pits which were drilled/excavated to depths ranging from 5 to 20 feet. Groundwater depths are summarized in Table 2. Areas of seasonal and potentially seasonal shallow groundwater have been mapped in the drainages on-site. These areas are discussed in the following section. Fluctuation in groundwater conditions may occur due to variations in rainfall and other factors not readily apparent at this time.

It should be noted that in the sandy materials on site, some groundwater conditions might be encountered due to the variability in the soil profile. Isolated sand and gravel layers within the soils, sometimes only a few feet in thickness and width, can carry water in the subsurface. Groundwater may also flow on top of the underlying bedrock. Builders and planners should be cognizant of the potential for the occurrence of such subsurface water features during construction on-site and deal with each individual problem as necessary at the time of construction.

6.0 ENGINEERING GEOLOGY – IDENTIFICATION AND MITIGATION OF GEOLOGIC HAZARDS

As mentioned previously, detailed mapping has been performed on this site to produce an Geology/Engineering Geology Map (Figure 6). This map shows the location of various geologic conditions of which the developers should be cognizant during the planning, design and construction stages of the project. These hazards and the recommended mitigation techniques are as follows:

Artificial Fill

These are man-made fill deposits associated with earthen dams and berms on-site.

Mitigation: Berms were observed along Eastonville Road that can be avoided or easily removed or penetrated by foundations. The earthen dams lie within areas designated as open space and will be avoided by development. Should any uncontrolled fill be encountered beneath foundations, removal and recompaction at 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 will be required.

Loose or Collapsible Soils

Loose soils were not encountered in the test pits, however, the windblown sand deposits are known to have low density. Any loose or collapsible soils encountered beneath foundations or floor slabs will require mitigation.

Mitigation: Any loose or collapsible soils encountered beneath foundations or floor slabs should be overexcavated 2 to 3 feet, moisture-conditioned and recompacted. The soils should be recompacted to 95 percent of the soils maximum Modified Proctor Dry Density ASTM D-1557 at ± 2 percent of optimum moisture content. The reconditioned soils on this site should be observed and tested to verify adequate compaction. Areas requiring recompaction should be determined during the excavation observation.

Expansive Soils

Clays and claystone were encountered in some of the test pits excavated on–site that are potentially expansive. Expansive claystone is commonly encountered within the Dawson Formation. These occurrences are typically sporadic; therefore, none have been indicated on the

maps. These expansive soils, if encountered beneath foundations, can cause differential movement in the structure foundation. These occurrences should be identified and mitigated on an individual basis.

Mitigation: Should expansive soils be encountered beneath the foundation, mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Another alternative in areas of highly expansive soils is the use of drilled pier foundation systems. Typical minimum pier depths are on the order of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be determined after additional investigation of each building site.

Slope Stability and Landslide Hazard

The majority of the slopes in the building areas on site are gently to moderately sloping and do not exhibit any past or potential unstable slopes or landslides. However, the steeply sloping areas along the drainage in the eastern portion of the site have been identified as unstable slopes. These areas are identified on the Geology/Engineering Geology Map, Figure 6. The recommendations for these areas are as follows:

- *Unstable Slope Area*

The area identified with this hazard is located along a portion of a minor drainage where cut banks have created unstable slopes. Considerable care must be exercised in these areas not to create a condition which would tend to activate instability.

Mitigation: Building should be avoided in these areas. The lots most significantly affected by unstable slopes are Lots 18, 84, 106 and 107. The structures on these lots should be set back a minimum of 30 feet from the crest of these slopes. It appears there is sufficient room on the lots to avoid this hazard. Proper control of drainage at both the surface above the slope and the subsurface is extremely important. Areas of ponded water at the surface should be avoided. Utility trenches, basement excavations and other subsurface features should not

be permitted to become water traps which may promote saturation of the subsurface materials. Drainage should not be permitted over the potentially unstable slope but directed in a non-erosive manner away from the slope. Irrigation above these slopes should be kept to a minimum to prevent saturation of the subsurface soils. The use of xeriscape landscaping utilizing native plantings is recommended to reduce the need for irrigation.

Floodplain and Drainage Areas

Portions of the site associated with some of the drainages are mapped within a floodplain zones according to the FEMA Map No. 08041CO556G, dated December 7, 2018 (Figure 7, Reference 6). The floodplain areas have been designated as open space and/or can be avoided by construction. An area of ponded water exists in the floodplain that is designated as open space and will be avoided by development. Additionally, areas of seasonal and potentially seasonal shallow groundwater were observed across the site. In these areas, we would anticipate the potential for periodically high subsurface moisture conditions and frost heave potential. These areas lie within the low-lying areas and minor drainages across the site. Water was observed in the drainage in the northeastern portion of the site, but was not observed in any of the other minor drainages at the time of our site investigation, however, water was observed ponded behind an earthen dam in the southeastern portion of the site. These areas can likely be avoided or properly mitigated by development. The floodplain should be avoided by construction unless site-specific floodplain determination and drainage studies are performed. The potential exists for high groundwater levels during high moisture periods and should structures encroach on these areas the following precautions should be followed.

Mitigation: Foundations must have a minimum 30-inch depth for frost protection. In areas where high subsurface moisture conditions are anticipated periodically, subsurface perimeter drains are recommended to help prevent the intrusion of water into areas below grade. Typical drain details are presented in Figure 8. Some of the minor drainage swales can be avoided or regraded. The main drainage that bisects the site is designated as open space and will be avoided. Any grading in these areas should be done to direct surface flow around construction to avoid areas of ponded water. Finished floors must be located at least one foot above floodplain levels. Specific drainage studies and exact floodplain locations are beyond the scope of this report.

6.1 Relevance of Geologic Conditions to Land Use Planning

We understand that the development will be rural residential lots with areas of park and open space. It is our opinion that the existing geologic and engineering geologic conditions will impose some constraints on the proposed development and construction. The most significant problems affecting development will be those associated with the drainages on site that can be avoided or properly mitigated during construction on each lot. Other hazards on site may be satisfactorily mitigated through proper engineering design and construction practices or avoidance.

The upper materials in the area are typically at medium dense to dense states. Areas of loose soils may be encountered that may require recompaction. The medium dense to dense granular soils encountered in the upper soil profiles of the test pits should provide good support for foundations. Loose soils, if encountered beneath foundations or slabs, will require removal of the upper 2 to 3 feet of material and recompaction. Any uncontrolled fill encountered beneath foundations will require complete removal and recompaction. Expansive soils, although sporadic, were encountered. Expansive clayey sandstone, claystone and associated clayey residual soils are common in the Dawson Formation, and may require mitigation. Foundations anticipated for the site are standard spread footings possibly in conjunction with overexcavation in areas of expansive soils or loose soils. Areas of artificial fill, if encountered beneath foundations will require penetration or recompaction. Areas containing arkosic sandstone will have high allowable bearing conditions. Expansive layers may also be encountered in the soil and bedrock on this site. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Unstable slopes exist along portions of the drainage in the eastern portion of the site where the drainage has eroded cut banks. A 30-foot building setback is recommended from the crest of the unstable slopes. Septic fields should not be located within the building setback as well. The slopes primarily affect Lots 18, 84, 106 and 107. It appears there is sufficient room on the lots to avoid the unstable slopes. Additional reinforcement may be necessary in the foundation to account for additional pressures due to sloping conditions. Tie-beams and/or buttresses may be necessary, depending on site conditions and grading plans.

Areas of seasonal shallow groundwater and potentially seasonal shallow groundwater were encountered on site. Additionally, portions of the site have been mapped in floodplain zones. The floodplain areas are in the designated open space area and can be avoided by development. Water was observed ponded behind an earthen dam in the eastern portion of the site during our site investigation. This area lies in an area designated as open space and will be avoided by development. Due to the size of the lots and the proposed development, the majority of the areas mapped as seasonal or potentially seasonal shallow groundwater can be avoided by construction on the lots. Septic systems are not recommended in these areas due to the potential for shallow groundwater. Regrading can also mitigate some minor drainages on some of the lots. Structures should not block drainages. Any site grading should be done in such a manner as to not create areas of ponded water around structures or septic fields. Finished floor levels must be a minimum of one foot above the floodplain level. Septic fields should not be located in drainage areas due to the potential for periodic high groundwater conditions. Specific floodplain locations and drainage studies are beyond the scope of this report.

In summary, development of the site can be achieved if the items mentioned above are mitigated. These items can be mitigated through proper design and construction or through avoidance. Investigation on each lot is recommended prior to construction.

7.0 ON-SITE WASTEWATER TREATMENT

The site was evaluated for individual and commercial on-site wastewater treatment systems in accordance with El Paso Land Development Code. Eight (8) tactile test pits were performed on the property. The test pits were located in potential locations of future systems. The approximate locations of the test pits are indicated on Figure 3, on the Geology/Engineering Geology Map, Figure 6, and on the Septic Suitability Map, Figure 9. A table showing the results of the Tactile Test Pits is presented in Table 2. Test Pit Logs are included in Appendix B.

The Natural Resource Conservation Service (Reference 2), previously the Soil Conservation Service (Reference 3) has been mapped with three soil descriptions. The Soil Survey Map (Reference 2) is presented in Figure 4, and the Soil Survey Descriptions are presented in Appendix D. The soils are described as having rapid percolation rates. The majority of the soils have been described with moderate permeabilities.

Soils encountered in the tactile test pits consisted of loamy sand to gravelly loamy sand, gravelly sand, sandy clay loam, very sandy clay, silty to very clayey sandstone and sandy claystone. Bedrock was encountered in three of the test pits at depths ranging from 2 to 4 feet. The limiting layers encountered in the test pits are the sandy loam (Soil Type 2), sandy clay loam (Soil Type 3A), sandy clay, silty to clayey sandstone and sandy claystone (Soil Type 4A) which corresponds to LTAR values of 0.80 to 0.15 gallons per day per square foot. The conditions encountered in the Test Pit Nos. 1 and 5 through 8 will require a designed system. Groundwater was encountered in Test Pit Nos. 2, 3 and 7 at depths ranging from 6.5 to 8.5 feet. Areas where shallow bedrock or groundwater are encountered may require designed systems. Additional investigation may identify areas where suitable for conventional systems could be used.

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems (OWTS) and that contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to El Paso County and State Guidelines and properly maintained. Based on the testing performed as part of this investigation designed systems will likely be required for many of the lots. A Septic Suitability Map is presented in Figure 9. Areas where OWTS sites are not recommended are indicated on Figure 9. Individual soil testing is required on the lots prior to construction. Absorption fields must be located a minimum of 100 feet from any well, including those on adjacent properties. Absorption fields must also be located a minimum of 50 feet from any drainages, floodplains or ponded areas and 25 feet from dry gulches.

8.0 ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 7), the area is mapped with upland deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 8), areas of the site are mapped with upland deposits: probable aggregate resource (U4). According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 9), the area of the site has been mapped with some areas as "Good" and some as "Little or No Potential" for industrial minerals depending on geologic deposits. Considering the abundance of similar materials through

the region and the close proximity to developed land, they would be considered to have little significance as an economic resource.

According to *the Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 9), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "Poor" for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site (Reference 9).

The site has been mapped as "Fair" for oil and gas resources (Reference 9). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

9.0 EROSION CONTROL

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

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type

of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.

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

10.0 CLOSURE

It is our opinion that the existing geologic engineering and geologic conditions will impose some minor constraints on development and construction of the site. The majority of these conditions can be avoided by construction. Others can be mitigated through proper engineering design and construction practices. The proposed development and use is consistent with anticipated geologic and engineering geologic conditions.

It should be pointed out that because of the nature of data obtained by random sampling of such variable and non-homogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Individual investigations for building sites and septic systems will be required prior to construction. Construction and design personnel should be made familiar with the contents of this report. Reporting such discrepancies to Entech Engineering, Inc. soon after they are discovered would be greatly appreciated and could possibly help avoid construction and development problems.

This report has been prepared for 4 Site Investments, LLC for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

BIBLIOGRAPHY

1. Bryant, Bruce; McGrew, Laura W, and Wobus, Reinhard A. 1981. *Geologic Structure Map of the Denver 1° x 2° Quadrangle, North-Central Colorado.* Sheet 2. U.S. Geologic Survey. Map I-1163.

2. Natural Resource Conservation *Service,* September 23, 2016. *Web Soil Survey.* United States Department Agriculture, http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

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

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

5. Bryant, Bruce; McGrew, Laura W. and Wobus, Reinhard A. 1981. *Geologic Map of the Denver 1° x 2° Quadrangle, North-Central Colorado.* U.S. Geologic Survey. Map 1-1163.

6. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Number 08041CO556G.

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

8. Schwochow, S.D.; Shroba, R.R. and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties.* Colorado Geological Survey. Special Publication 5-B.

9. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board.* Colorado Geological Survey. Open-File Report 03-07.

TABLES

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT 4 SITE INVESTMENTS, LLC
PROJECT GRANDVIEW RESERVE
JOB NO. 181951

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	USDA SOIL TYPE	UNIFIED CLASS.	SOIL DESCRIPTION
1	TP-2	2-3			5.8						2A	SM-SW	SAND, SLIGHTLY SILTY
1	TP-3	2-3			6.5						2A	SM-SW	SAND, SLIGHTLY SILTY
1	TP-3	8-9			18.4						3A	SC	SAND, CLAYEY
1	TP-4	5-6			4.9						1	SW	SAND
1	TP-7	5-6			17.5						2A	SM	SAND, SILTY
1	3	2-3			23.3							SM	SAND, SILTY
1	6	5			20.9							SM	SAND, SILTY
1	1	5			12.1				130			SM	SAND, SILTY
1	4	2-3			7.1							SM-SW	SAND, SLIGHTLY SILTY
1	5	5			9.9	17	5	0.02				SC-SM-SW	SAND, SLIGHTLY SILTY, CLAYEY
1	8	5			19.2							SM	SAND, SILTY
1	9	5			39.8				110			SM	SAND, VERY SILTY
2	TP-8	5-6			84.8				1020		4A	CL	CLAY, SANDY
2	10	10			73.6	44	22	<0.01				CL	CLAY, SANDY
3	TP-1	4-5			16.2						4A	SM	SANDSTONE, SILTY
3	TP-5	4-5			42.3						4A	SC	SANDSTONE, VERY CLAYEY
3	3	10			15.2							SM	SANDSTONE, SILTY
3	6	20			35.8							SC	SANDSTONE, CLAYEY
3	2	2-3			14.0	28	15	<0.01				SC	SANDSTONE, CLAYEY
3	4	15			12.9							SM	SANDSTONE, SILTY
3	7	2-3			14.4							SM	SANDSTONE, SILTY
4	3	15	12.8	112.7						0.7%		CL	CLAYSTONE, SANDY
4	TP-6	2-3			61.6				950		4A	CL	CLAYSTONE, VERY SANDY
4	9	15			71.9				1580			CL	CLAYSTONE, SANDY
4	1	10			59.0							CL	CLAYSTONE, VERY SANDY
4	2	10			62.3	35	21	0.00				CL	CLAYSTONE, SANDY

Table 2: Summary of Depths to Bedrock and Groundwater

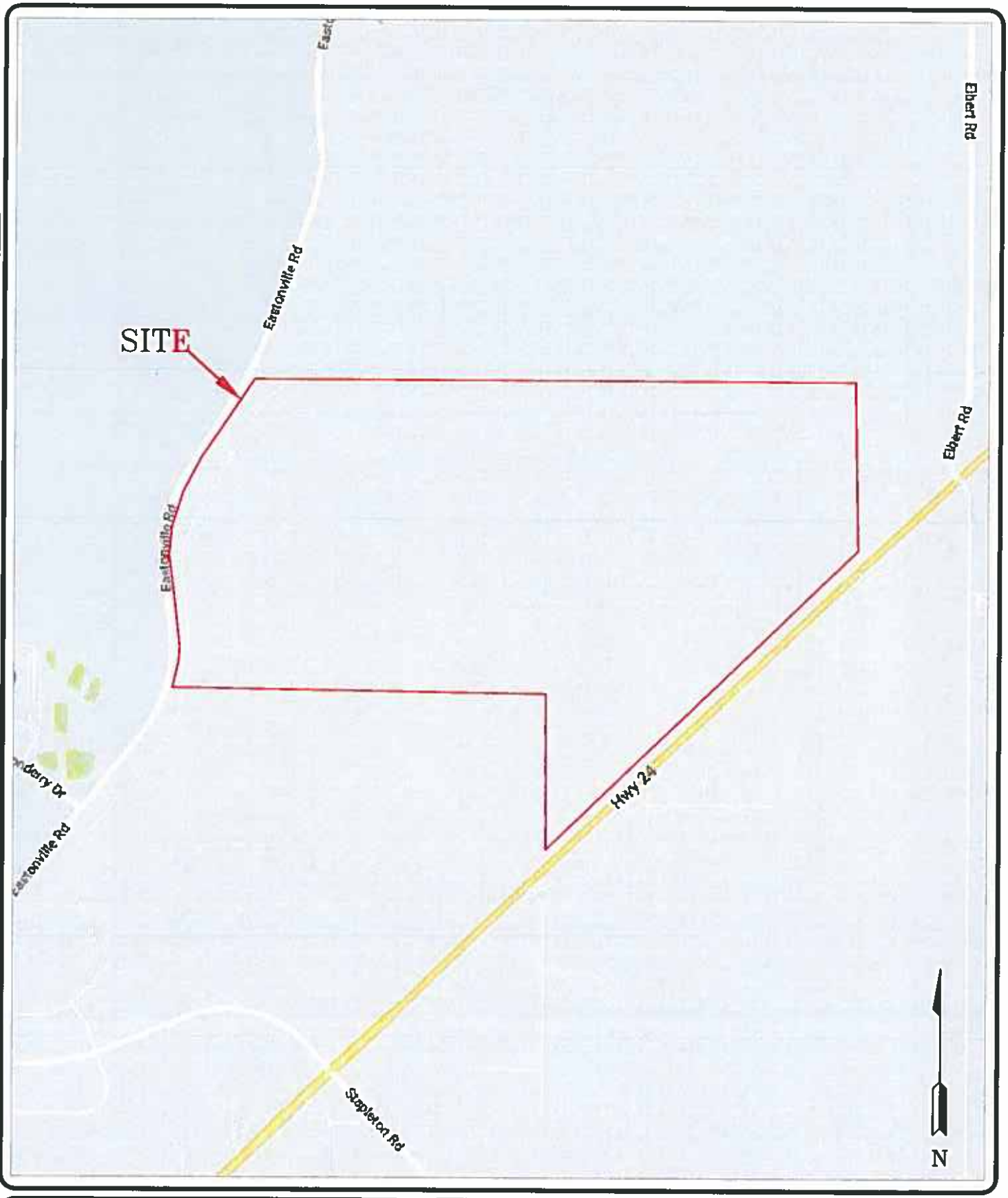
Test No.	Depth to Bedrock (ft.)	Depth to Groundwater (ft.)
TB-1	9	6
TB-2	1	12.5
TB-3	8	>20
TB-4	9	11.5
TB-5	9	13
TB-6	8	>20
TB-7	1	8
TB-8	14	4.5
TB-9	9	>15
TB-10	14	19
TP-1	4	>6
TP-2	>8	7.5
TP-3	>9	8.5
TP-4	>8	>8
TP-5	4	>6
TP-6	2	>5
TP-7	>8	6.5
TP-8	>8	>8

Table 3: Summary Tactile Test Pit Results

Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Seasonally Occurring Groundwater (ft.)
1	4A*	0.15*	4*	N/A
2	2A	0.60	N/A	7.5
3	2A	0.60	N/A	8.5
4	2A	0.60	N/A	N/A
5	4A*	0.15*	4*	N/A
6	4A*	0.15*	2*	N/A
7	4A*	0.15*	N/A	6.5
8	4A*	0.15*	N/A	N/A

*- Conditions that will require an engineered OWTS

FIGURES



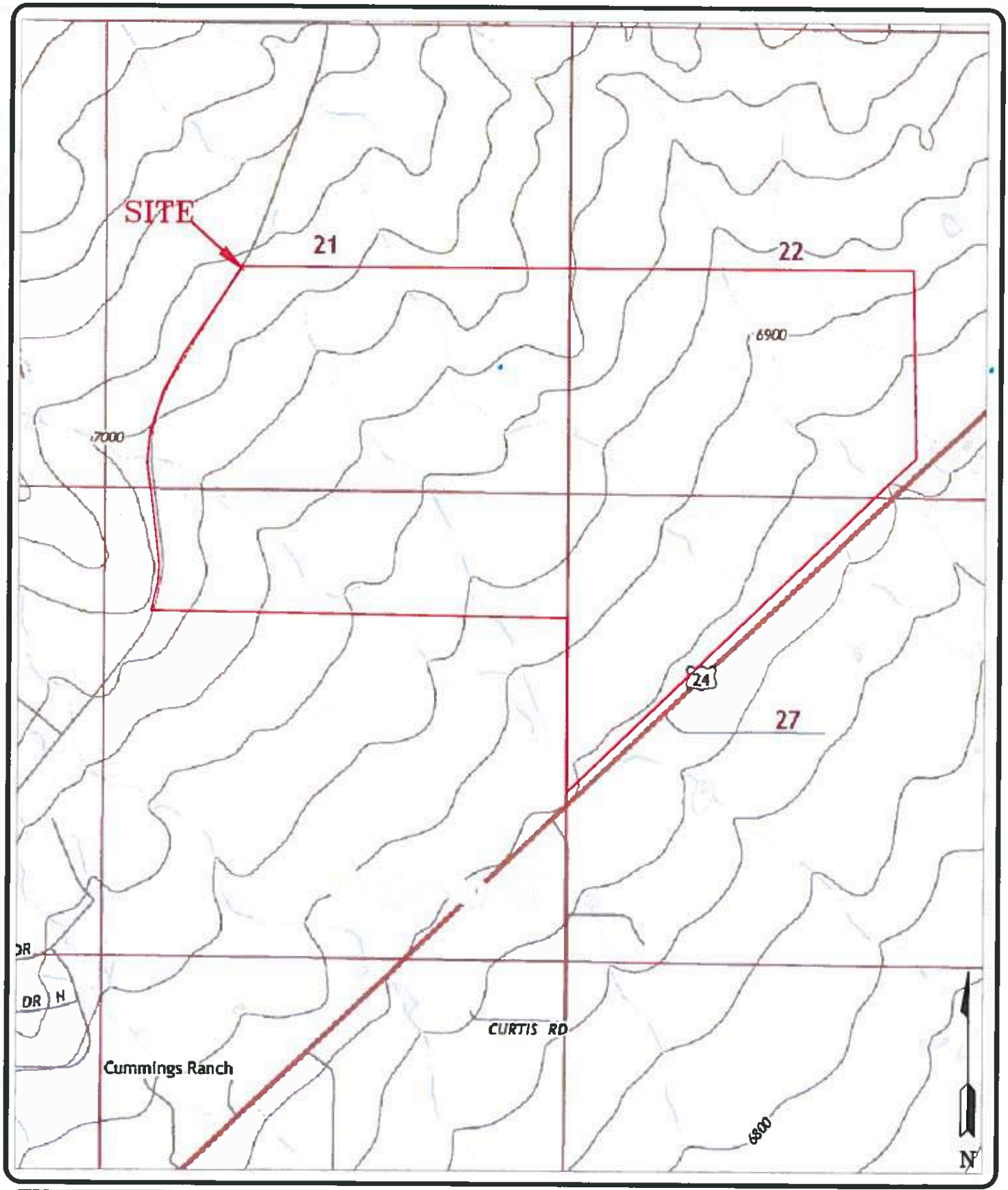
ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

VICINITY MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN:	DATE:	CHECKED:	DATE:
LLL	12/12/18		1/15/19

JOB NO.: 181951

FIG NO.: 1



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

USGS MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN:	DATE:	CHECKED:	DATE:
LLL	12/12/18		/ /

JOB NO.: 181951

FIG NO.: 2

REVISION	BY

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

EASTONVILLE ROAD

HIGHWAY 24

OPEN SPACE
9.5 ACRES

TRACT A
58.4 ACRES TP-1

60'-ROW RURAL COLLECTOR (MINOR)

TB - approximate test boring location

TP - approximate test pit location

P1 - approximate location and direction of photograph

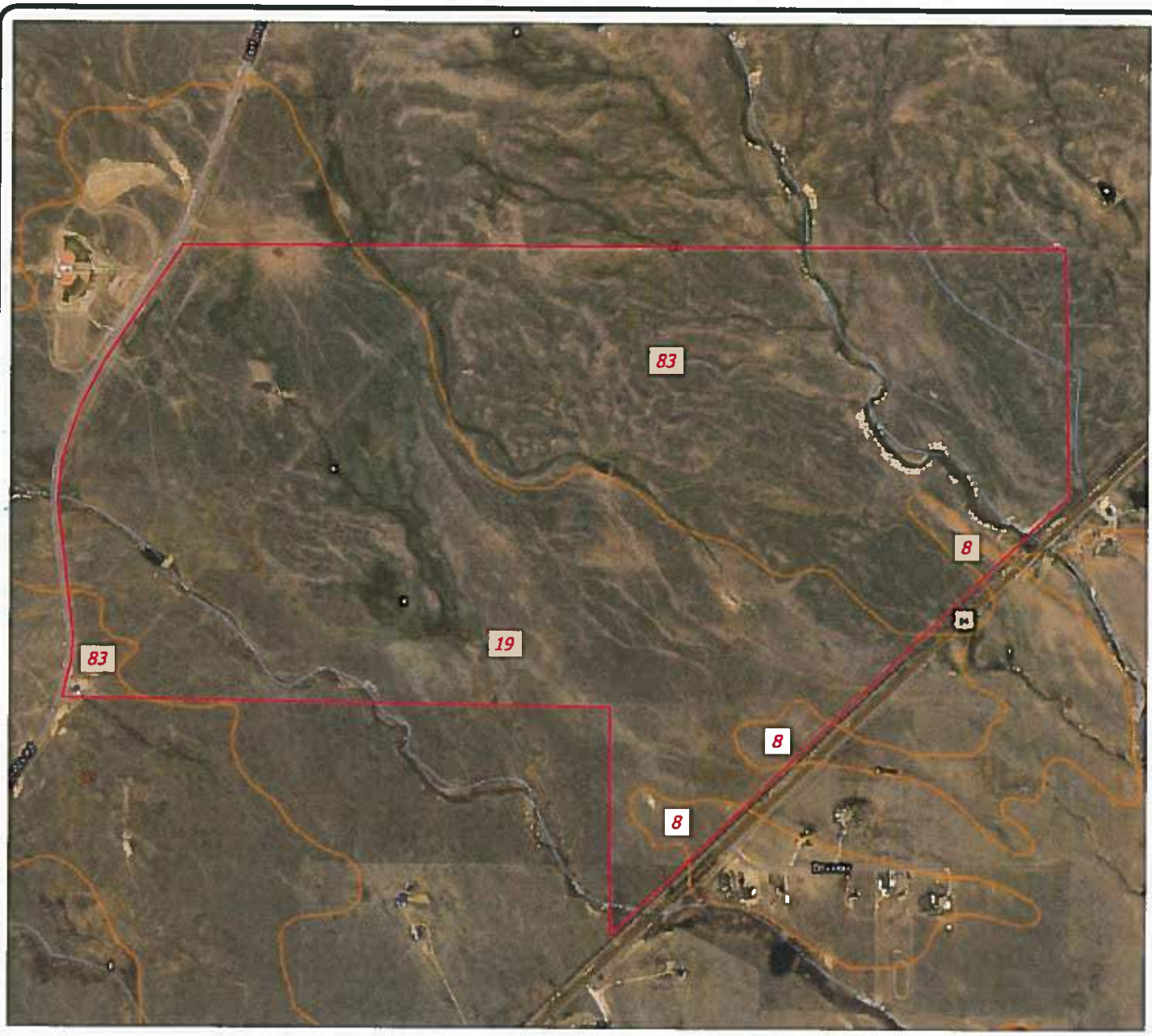
N

300 150 0 300 600

ORIGINAL SCALE: 1" = 300'

SITE PLAN/TESTING LOCATION MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN	LLL/TLC
CHECKED	
DATE	1/14/19
SCALE	AS SHOWN
JOB NO.	181951
FIGURE No.	3



N

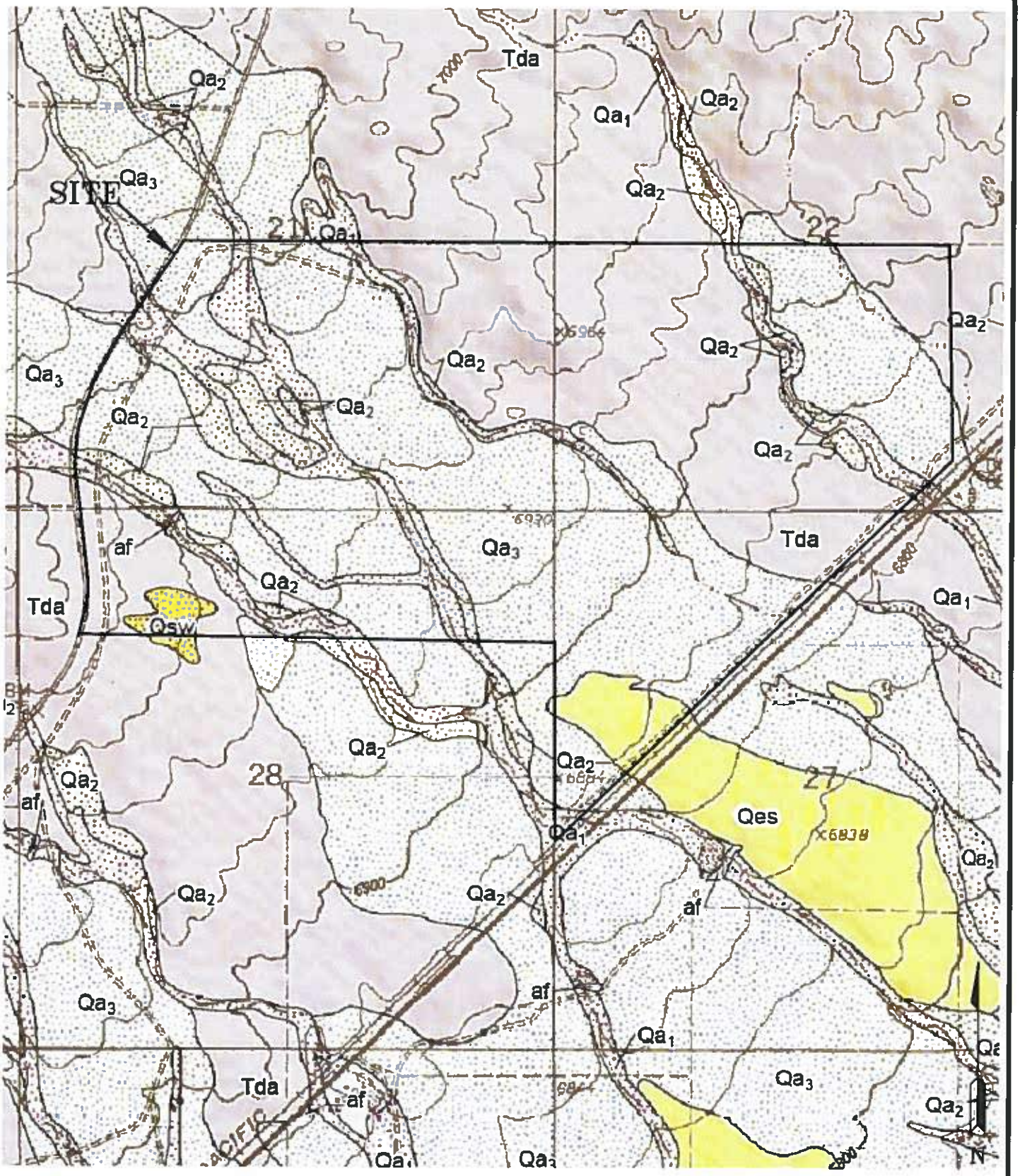
ENTECH ENGINEERING, INC.
595 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

SOIL SURVEY MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN:	DATE:	CHECKED:	DATE:
LLL	12/12/18		1/14/19

JOB NO.: 181951

FIG NO.: 4



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

FALCON QUADRANGLE GEOLOGIC MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN:	DATE:	CHECKED:	DATE:
LLL	12/12/18		1/14/19

JOB NO.: 181951

FIG NO.: 5

EASTONVILLE ROAD

OPEN SPACE
9.5 ACRES

TRACT A
58.4 ACRES

HIGHWAY 24

60' ROW RURAL COLLECTOR (MINOR)

LEGEND

Qaf - Artificial Fill of Holocene Age:
artificial fill associated with erosion berms

Qal - Recent Alluvium of Holocene Age:
recent alluvium located in several of the minor drainages on-site

Qp - Piney Creek Alluvium Two of Early Holocene Age:
low stream terrace deposits above current stream channel

Qb - Broadway Alluvium of Late Pleistocene Age:
stream terrace deposited sands

Qsw - Sheetwash of Holocene to Late Pleistocene Age:
silty to clayey sand sheetwash deposits

Qes - Eolian Sand of Quaternary Age:
silty to clayey sand sheetwash deposits

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

fp - floodplain
us - unstable slope
psw - potentially seasonal shallow groundwater area
sw - seasonal shallow groundwater area
w - flowing water

⊕ - approximate test boring and pit locations

N

300 150 0 300 600
ORIGINAL SCALE: 1" = 300'

REVISION	BY

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

GEOLOGY/ENGINEERING GEOLOGY MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN	LLL/TLC
CHECKED	
DATE	1/14/19
SCALE	AS SHOWN
JOB NO.	181951
FIGURE No.	6

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 (EL 987)	Base Flood Elevation line and value; elevation in feet* Base Flood Elevation value where uniform within zone; elevation in feet*
A — A	Cross section line
23 — 23	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4775000mN	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

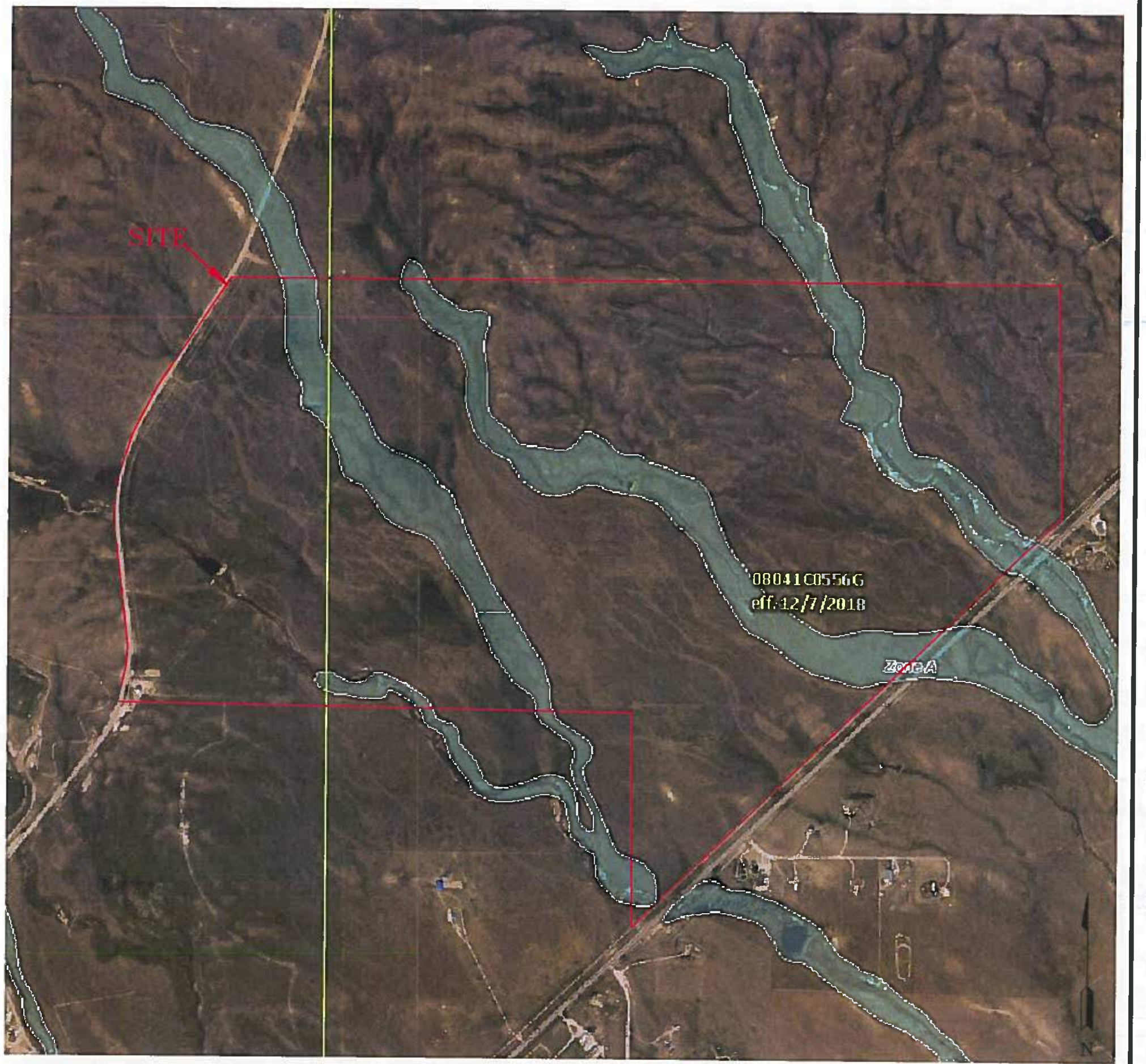
MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

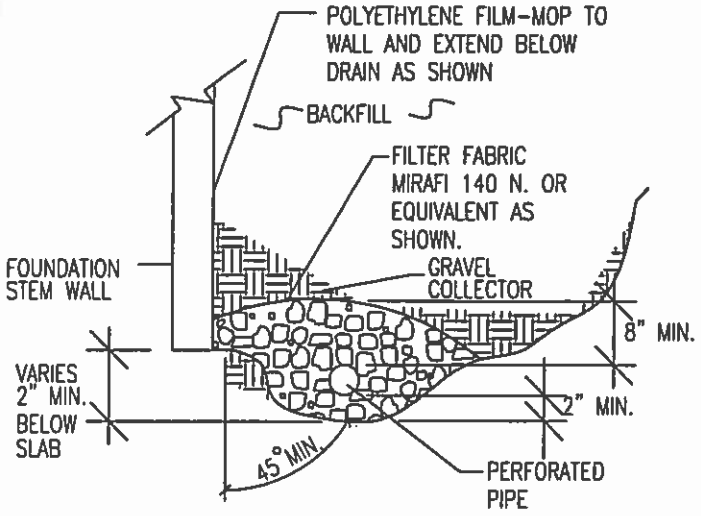


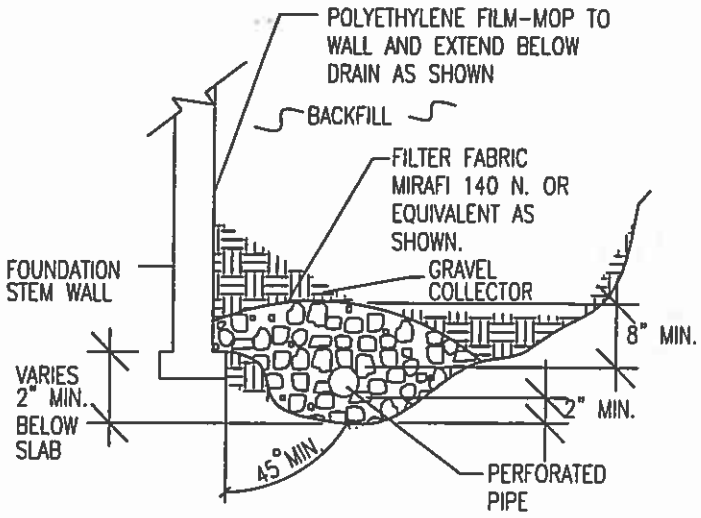
REVISION	BY

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

FLOODPLAIN MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN	LEL
CHECKED	
DATE	12/12/18
SCALE	AS SHOWN
JOB NO.	181951
FIGURE No.	7





NOTES:

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

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

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

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

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

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

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

PERIMETER DRAIN DETAIL

DRAWN:	DATE: 12/19/16	DESIGNED: DS	CHECKED:

JOB NO.: 181951

FIG NO.: 8

EASTONVILLE ROAD

HIGHWAY 24

OPEN SPACE
9.5 ACRES

TRACT A
58.4 ACRES

80' ROW RURAL COLLECTOR (MINOR)

LEGEND

- Areas where septic systems are not recommended
- Areas where designed septic system may be required due to potential shallow bedrock.
- Area where conventional septic systems may be used unless shallow groundwater, shallow bedrock, or unsuitable soils are encountered requiring designed systems.
- Approximate test boring and pit locations

N

300 150 0 300 600
ORIGINAL SCALE: 1" = 300'

REVISION	BY

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

SEPTIC SUITABILITY MAP
GRANDVIEW RESERVE
EASTONVILLE ROAD
EL PASO COUNTY, CO.
FOR: 4 SITE INVESTMETNS, LLC

DRAWN	LLL/TLC
CHECKED	
DATE	1/14/19
SCALE	AS SHOWN
JOB NO.	181951
FIGURE No.	9

APPENDIX A: Site Photographs

1

Looking west from the southwestern portion of the site.

December 13, 2018

2

Looking northeast from the southwestern portion of the site.

December 13, 2018

Job No. 181951

3

Looking southwest from the southeastern portion of the site.

December 13, 2018

4

Looking northeast from the southeastern portion of the site.

December 13, 2018

Job No. 181951

5

Looking northwest along drainage in eastern portion of the site.

December 13, 2018

6

Looking southwest along man-made dam in the central portion of the site.

December 13, 2018

Job No. 181951

7

Looking west from the central portion of the site.

December 13, 2018

8

Looking southeast from the northwestern portion of the site.

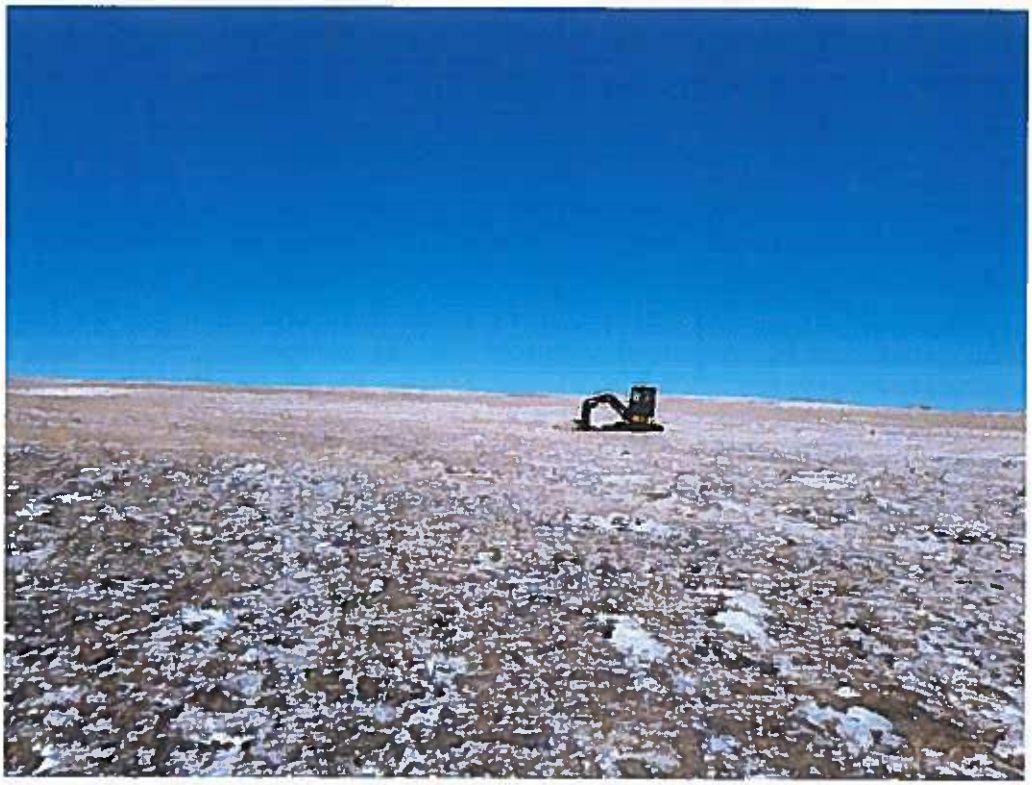
December 13, 2018

Job No. 181951

9

Looking west from the northeastern portion of the site.

December 13, 2018



10

Looking northeast from the northeastern portion of the site.

December 13, 2018

Job No. 181951

APPENDIX B: Test Boring and Test Pit Logs

TEST BORING NO. 1
DATE DRILLED 11/28/2018
Job # 181951

REMARKS

38° 59' 16" N,
104° 33' 49" W

WATER @ 6', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
						2' TOPSOIL, SAND, SILTY FINE TO COARSE GRAINED, BROWN TO TAN, DENSE TO MEDIUM DENSE, DRY TO VERY MOIST
			31	1.8	1	
5			24	9.7	1	MEDIUM DENSE, DRY TO MOIST
10			50/6"	10.0	4	CLAYSTONE, VERY SANDY, BLUE GRAY, HARD, MOIST
15			50/6"	12.8	3	SANDSTONE, CLAYEY, FINE TO COARSE GRAINED, GRAY, VERY DENSE, WET
20						

TEST BORING NO. 2
DATE DRILLED 11/28/2018
CLIENT 4 SITE INVESTMENTS, LLC
LOCATION GRANDVIEW RESERVE

REMARKS

38° 59' 19" N,
104° 33' 22" W

WATER @ 12.5', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
					1	1' TOPSOIL, SAND, SILTY, BROWN
			50/10"	5.1	3	SANDSTONE, CLAYEY, FINE TO COARSE GRAINED, TAN, VERY DENSE TO DENSE, MOIST
5			48	9.6	3	
10			28/6"	11.8	4	CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST
15			37/6"	8.8	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, BROWN, VERY DENSE, MOIST
20						

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

TEST BORING LOG

DRAWN	DATE	CHECKED:	DATE: 1/15/19

JOB NO: 181951
FIG NO: B- 1

TEST BORING NO. 3
DATE DRILLED 11/28/2018
Job # 181951

REMARKS

DRY TO 20', 12/18/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			25	4.7	1
			21	11.8	1
5					
			50 6"	8.8	3
10					
			50 5"	13.8	4
15					
			50 5"	12.3	4
20					

SAND, SILTY TO CLAYEY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, MOIST

VERY MOIST LENSES

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

CLAYSTONE, SANDY, BROWN TO GRAY BROWN, HARD, MOIST

TEST BORING NO. 4
DATE DRILLED 11/28/2018
CLIENT 4 SITE INVESTMENTS, LLC
LOCATION GRANDVIEW RESERVE

REMARKS

38° 59' 04" N,
104° 33' 09" W

WATER @ 11.5', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			23	2.2	1
5			20	3.4	1
			50	10.5	3
10					
			30 3"	8.3	3
15					
			40 7"	12.3	4
20					

1' TOPSOIL, SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, DRY TO MOIST

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

CLAYSTONE, SANDY, BLUE GRAY, HARD, MOIST

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

TEST BORING LOG

DRAWN	DATE	CHECKED:	DATE
			1/15/19

JOB NO. 181951
FIG NO. B- 2

TEST BORING NO. 5
DATE DRILLED 11/28/2018
Job # 181951

REMARKS

38° 59' 05" N,
104° 32' 44" W

WATER @ 13', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			25	12.7	1
5			20	7.9	1
10			50	12.3	3
15			50 11"	13.2	4
20					

1" TOPSOIL, SAND, SLIGHTLY SILTY, SLIGHTLY CLAYEY, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE, MOIST

CLAY LENSES

SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, VERY MOIST

CLAYSTONE, SANDY, GRAY, HARD, MOIST

TEST BORING NO. 6
DATE DRILLED 11/28/2018
CLIENT 4 SITE INVESTMENTS, LLC
LOCATION GRANDVIEW RESERVE

REMARKS

DRY TO 20', 12/18/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
			34	0.7	1
5			31	3.9	1
10			50 7"	13.7	3
15			50 7"	10.9	3
20			50 3"	12.4	3

6" TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, DENSE, DRY TO MOIST

SANDSTONE, CLAYEY, FINE TO MEDIUM GRAINED, BROWN, VERY DENSE, MOIST

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

TEST BORING LOG

DRAWN:	DATE	CHECKED:	DATE:
			1/15/19

JOB NO. 181951
FIG NO.: B- 3

TEST BORING NO. 7
DATE DRILLED 11/28/2018
Job # 181951

REMARKS

38° 58' 52" N,
104° 33' 44" W

WATER @ 8', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
					1	1' TOPSOIL, SAND, SILTY, BROWN
			50/6"	3.8	3	SANDSTONE, SILTY, FINE TO COARSE GRAINED, TAN, VERY DENSE, MOIST TO VERY MOIST
5			50/9"	9.6	3	
10			50/11"	10.9	3	
15						
20						

TEST BORING NO. 8
DATE DRILLED 11/28/2018
CLIENT 4 SITE INVESTMENTS, LLC
LOCATION GRANDVIEW RESERVE

REMARKS

38° 58' 48" N,
104° 33' 25" W

WATER @ 4.5', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	
			21	7.7	1	1.5', TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, MEDIUM DENSE, MOIST TO VERY MOIST
5			16	10.0	1	
10			40	14.1	2	CLAY, SANDY, GRAY BROWN, VERY STIFF, MOIST
15			50/6"	9.0	3	SANDSTONE, CLAYEY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST
20						

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

TEST BORING LOG

DRAWN	DATE	CHECKED:	DATE: 1/15/19

JOB NO. 181951
FIG NO. B- 4

TEST BORING NO. 9
DATE DRILLED 11/28/2018
Job # 181951

REMARKS

38° 58' 44" N,
104° 32' 59" W

DRY TO 15.5', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
1' TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, MOIST			25	3.9	1
SAND, VERY SILTY, FINE GRAINED, GRAY BROWN, MEDIUM DENSE, VERY MOIST	5		16	18.9	1
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST	10		30/6"	12.1	4
	15		50/10"	15.7	4
	20				

TEST BORING NO. 10
DATE DRILLED 11/28/2018
CLIENT 4 SITE INVESTMENTS, LLC
LOCATION GRANDVIEW RESERVE

REMARKS

38° 59' 05" N,
104° 32' 44" W

WATER @ 19', 11/30/18

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
1' TOPSOIL, SAND, SILTY, FINE TO COARSE GRAINED, BROWN, MEDIUM DENSE, DRY TO MOIST			17	1.4	1
	5		18	3.7	1
CLAY, SANDY, DARK BROWN, VERY STIFF, MOIST	10		30	19.9	2
SANDSTONE, CLAYEY, FINE TO MEDIUM GRAINED, BLUE GRAY, VERY DENSE, MOIST	15		32/6"	9.7	3
▼	20		37/4"	10.4	3

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

TEST BORING LOG

DRAWN	DATE	CHECKED	DATE
			1/15/19

JOB NO. 181951
FIG NO. B- 5

TEST PIT NO. 1
DATE EXCAVATED 12/13/2018
Job # 181951

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Dry to 6', 12/13/18						
topsoil sandy loam, brown	1					
sandy loam, fine to coarse grained, tan	2			gr	w	2A
	3					
	4					
weathered to formational silty sandstone, tan	5			ma		4A
	6					
	7					
	8					
	9					
	10					

TEST PIT NO. 2
DATE EXCAVATED 12/13/2018
CLIENT 4 Site Investments, LLC
LOCATION Grandview Reserve

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Water at 7.5', 12/13/18						
topsoil sandy loam, brown	1					
gravelly sandy loam, fine to coarse grained, tan	2			gr	w	2A
	3					
	4					
	5					
gravelly sand, fine to coarse grained, tan to gray	6			sg		1
	7					
*groundwater at 7.5'	8					
	9					
	10					

Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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

TEST PIT LOG

DRAWN:	DATE	CHECKED	DATE
			1/15/19

JOB NO. 181951
FIG NO. B-6

TEST PIT NO. 3
DATE EXCAVATED 12/13/2018
Job # 181951

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Water at 8.5', 12/13/18						
topsoil sandy loam, brown	1					
gravelly sandy loam, fine to coarse grained, tan	2			gr	w	2A
	3					
	4					
gravelly sand, fine to coarse grained, tan	5			sg		1
	6					
	7					
	8					
gravelly sandy clay loam, fine to coarase grained, fgray ▼	9			ma		3A
*groundwater at 8.5'	10					

TEST PIT NO. 4
DATE EXCAVATED 12/13/2018
CLIENT 4 Site Investments, LLC
LOCATION Grandview Reserve

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Dry to 8', 12/13/18						
topsoil sandy loam, brown	1					
gravelly sandy loam, fine to coarse grained, tan	2			gr	w	2A
	3					
gravelly sand, fine to coarse grained, tan	4			sg		1
	5					
	6					
	7					
	8					
	9					
	10					

Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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

TEST PIT LOG

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

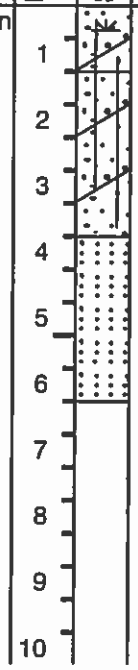
JOB NO: 181951
FIG NO: B-7

TEST PIT NO. 5
DATE EXCAVATED 12/13/2018
Job # 181951

REMARKS

Dry to 6', 12/13/18

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil sandy clay loam, brown					
sandy clay loam, light brown			gr	w	3A
weathered to formational very clayey sandstone, light brown			ma		4A

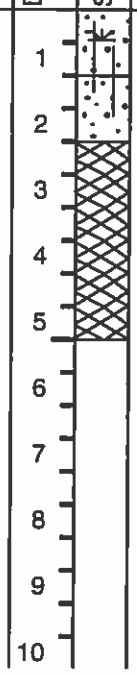


TEST PIT NO. 6
DATE EXCAVATED 12/13/2018
CLIENT 4 Site Investments, LLC
LOCATION Grandview Reserve

REMARKS

Dry to 5', 12/13/18

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil sandy loam, brown					
sandy loam, fine to coarse grained, tan			gr	w	2A
weathered to formational very sandy claystone, tan			ma		4A



Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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

TEST PIT LOG

DRAWN	DATE	CHECKED:	DATE:
			1/15/19

JOB NO.: 181951
FIG NO.: B-8

TEST PIT NO. 7
DATE EXCAVATED 12/13/2018
Job # 181951

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Water at 6.5', 12/13/18						
topsoil sandy loam, brown	1					
gravelly sandy loam, fine to coarse grained, tan	2			gr	w	2A
	3					
	4					
	5					
	6					
sandy clay, gray ▼	7			ma		4A
*groundwater at 6.5'	8					
	9					
	10					

TEST PIT NO. 8
DATE EXCAVATED 12/13/2018
CLIENT 4 Site Investments, LLC
LOCATION Grandview Reserve

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
Dry to 8', 12/13/18						
topsoil sandy clay loam, brown	1					
sandy clay loam, light brown	2			gr	m	3
	3					
	4					
very sandy clay, light brown	5			gr	w	4A
	6					
	7					
	8					
	9					
	10					

Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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

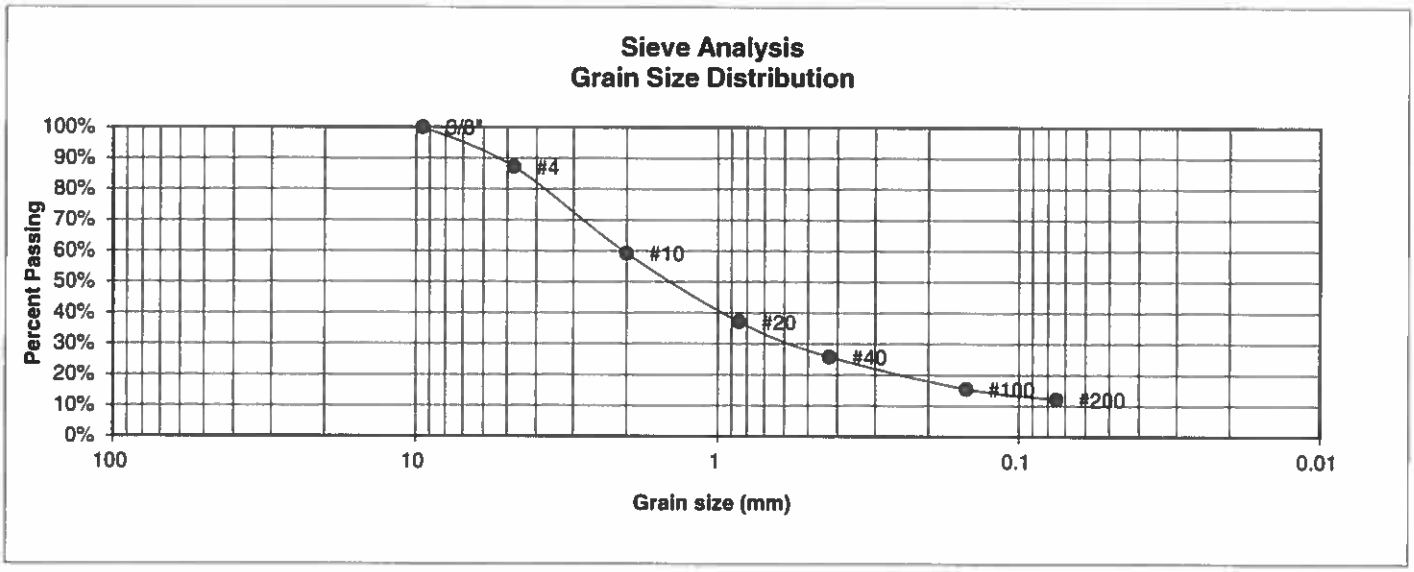
TEST PIT LOG

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951
FIG NO. B-9

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	1	JOB NO.	181951
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	87.2%
10	59.3%
20	37.1%
40	25.9%
100	15.5%
200	12.1%

Atterberg Limits

Plastic Limit

Liquid Limit

Plastic Index

Swell

Moisture at start	7.2%
Moisture at finish	17.8%
Moisture increase	10.6%
Initial dry density (pcf)	103
Swell (psf)	130

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

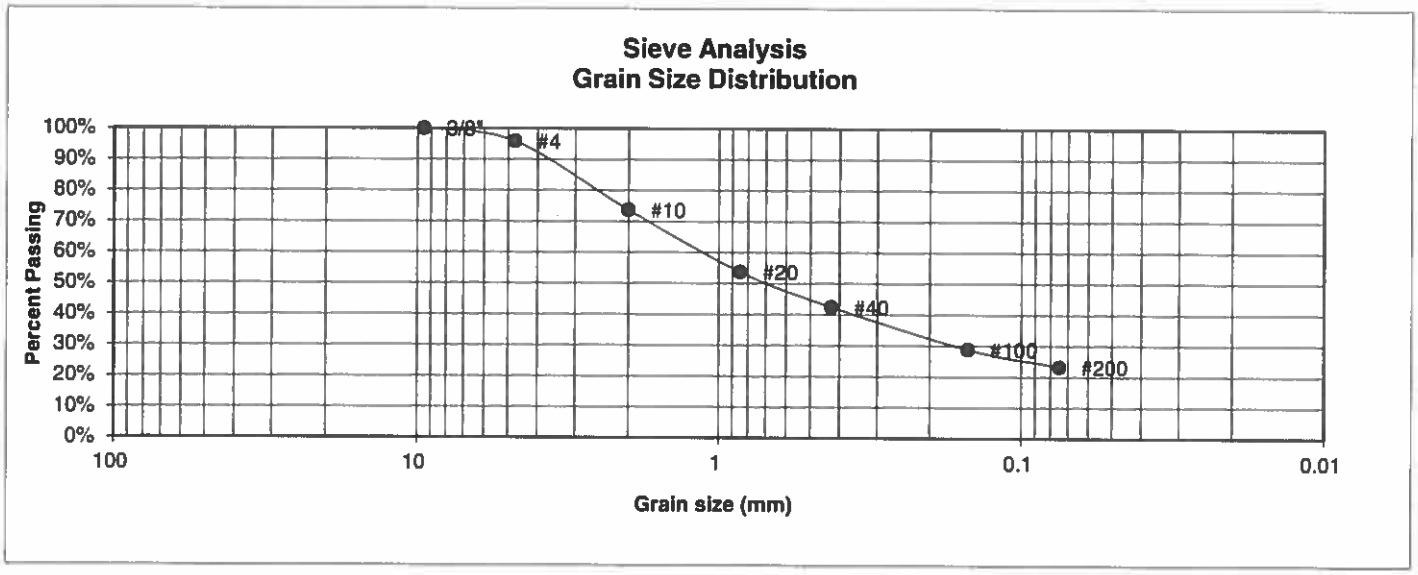
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-1

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	3	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.9%
10	73.7%
20	53.8%
40	42.4%
100	28.8%
200	23.3%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

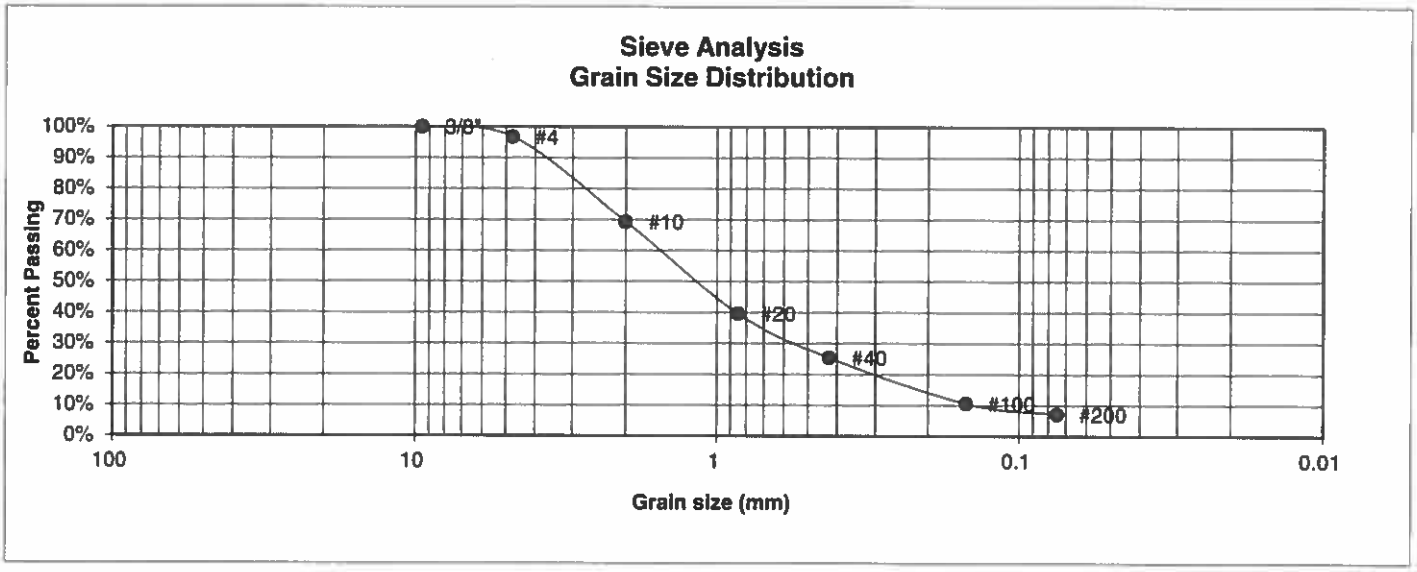
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		a	1/15/19

JOB NO.: 181951

FIG NO.: C-2

UNIFIED CLASSIFICATION	SM-SW	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	4	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.8%
10	69.3%
20	39.6%
40	25.4%
100	10.6%
200	7.1%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

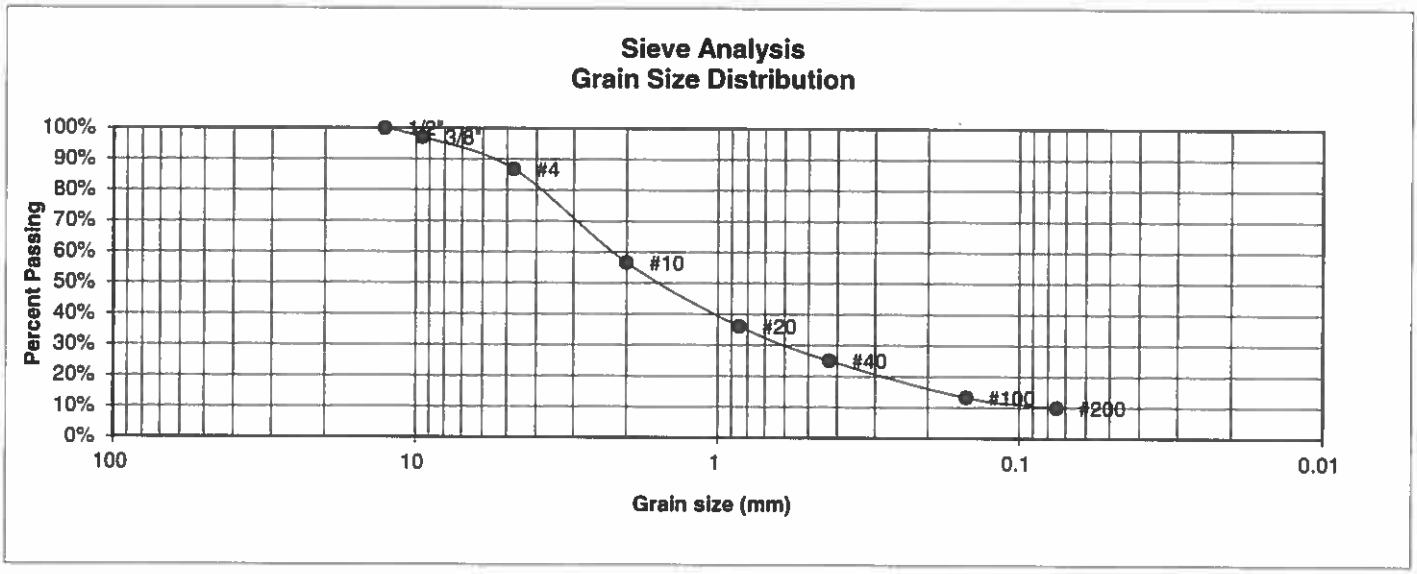
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-3

UNIFIED CLASSIFICATION	SC-SM-SW	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	5	JOB NO.	181951
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.1%
4	86.8%
10	56.6%
20	36.1%
40	25.1%
100	13.2%
200	9.9%

Atterberg Limits

Plastic Limit	12
Liquid Limit	17
Plastic Index	5

Swell

Moisture at start

Moisture at finish

Moisture increase

Initial dry density (pcf)

Swell (psf)

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

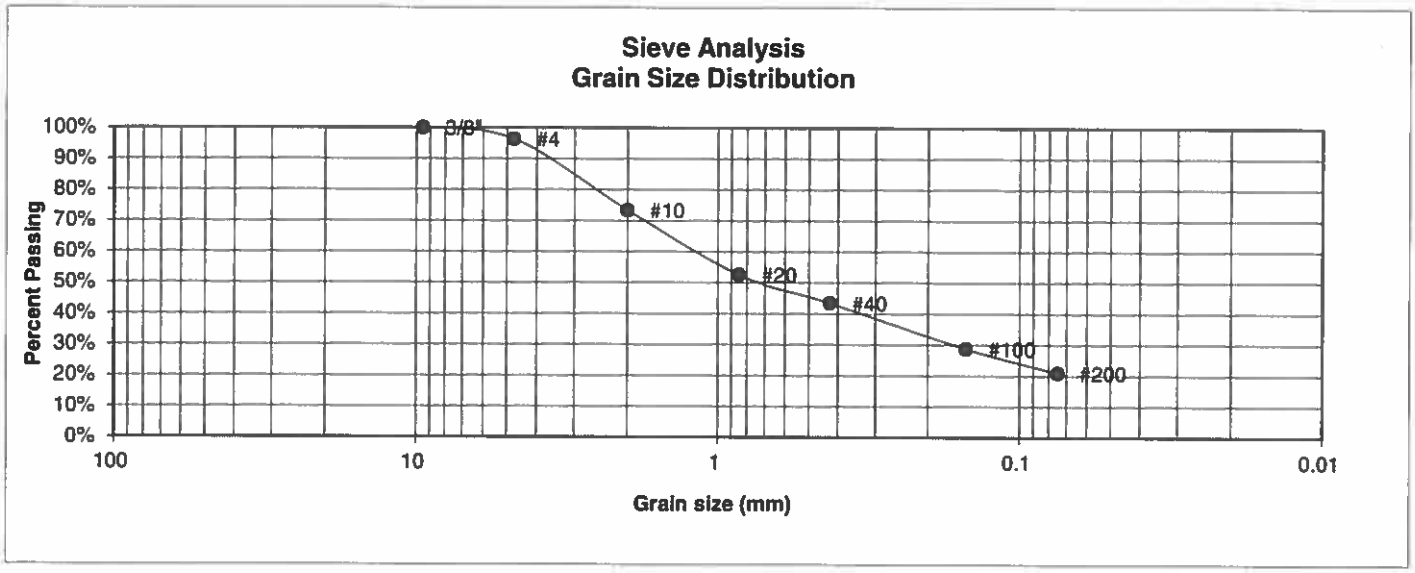
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO.: 181951

FIG NO.: C-4

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	6	JOB NO.	181951
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.4%
10	73.4%
20	52.6%
40	43.4%
100	28.8%
200	20.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

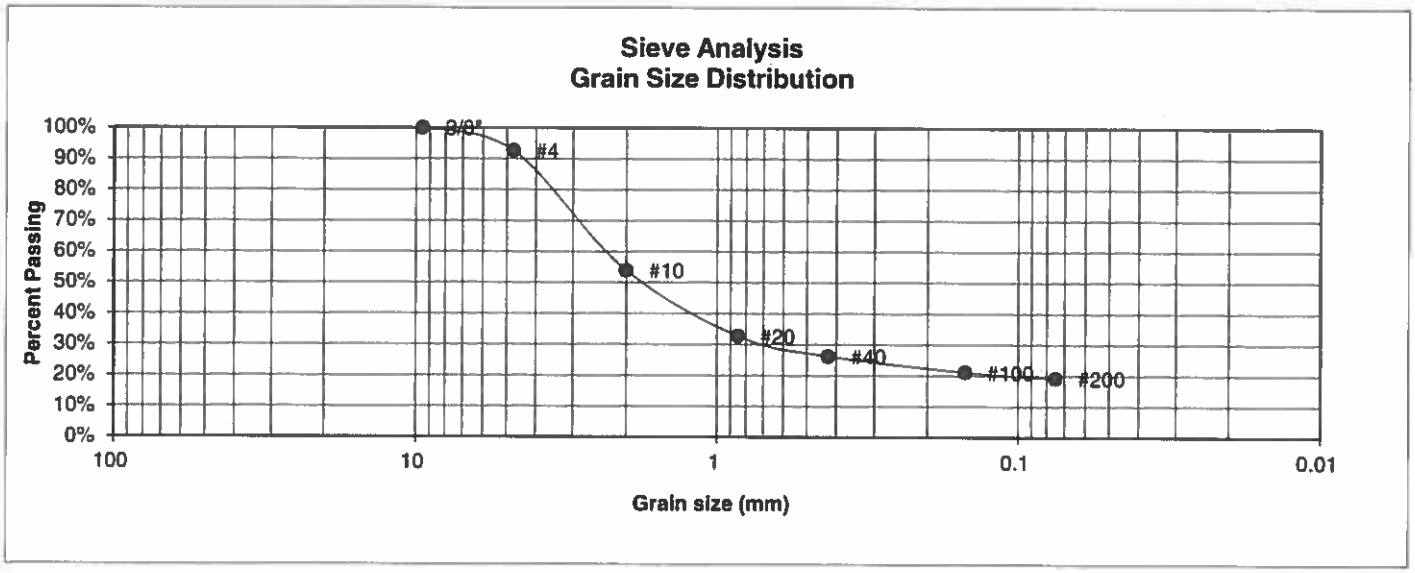
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED	DATE:
			1/15/14

JOB NO. 181951

FIG NO. C-5

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	8	JOB NO.	181951
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.6%
10	53.9%
20	32.7%
40	26.3%
100	21.1%
200	19.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

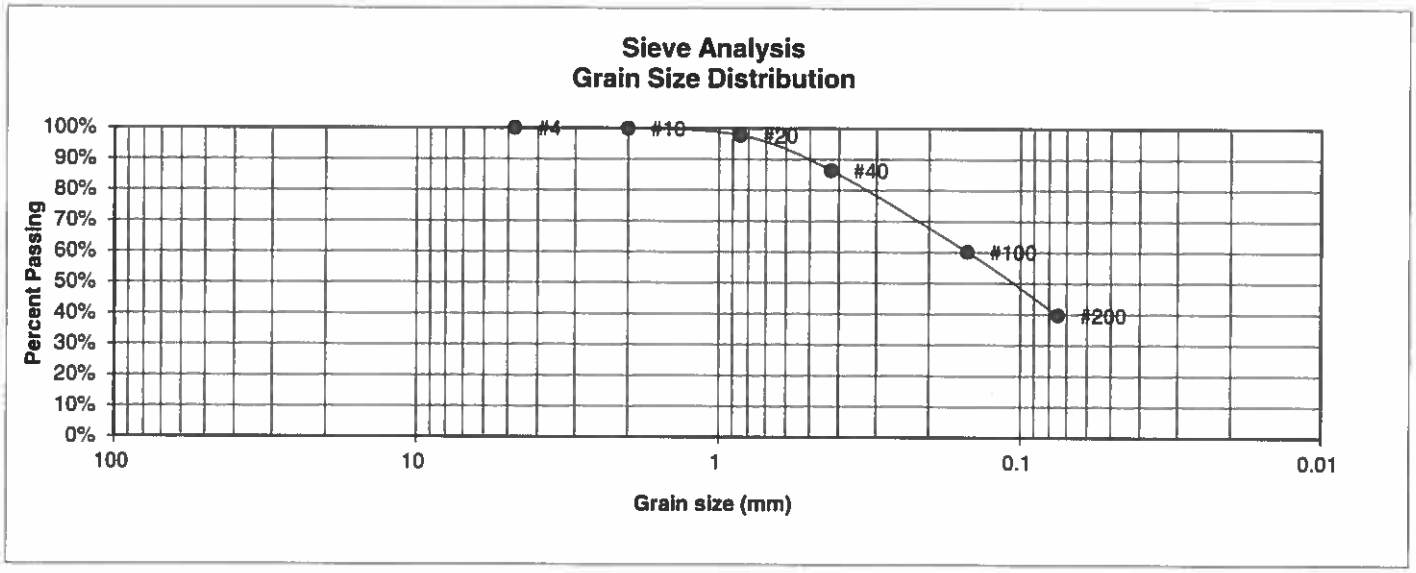
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED	DATE
			1/15/19

JOB NO. 181951

FIG NO. C-6

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	9	JOB NO.	181951
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.9%
20	97.8%
40	86.5%
100	60.2%
200	39.8%

Atterberg Limits

Plastic Limit	
Liquid Limit	
Plastic Index	

Swell

Moisture at start	9.0%
Moisture at finish	20.3%
Moisture increase	11.3%
Initial dry density (pcf)	99
Swell (psf)	110

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

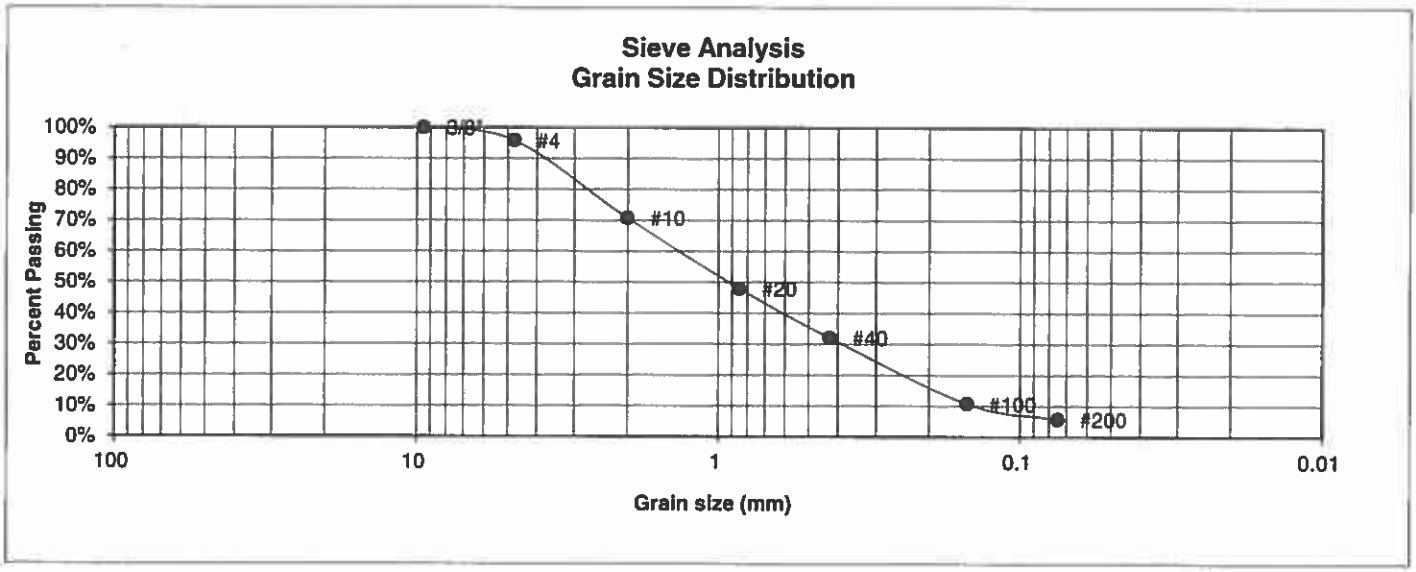
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 11/15/19

JOB NO.: 181951

FIG NO.: C-7

UNIFIED CLASSIFICATION	SM-SW	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-2	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.8%
10	70.7%
20	48.0%
40	32.0%
100	10.7%
200	5.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

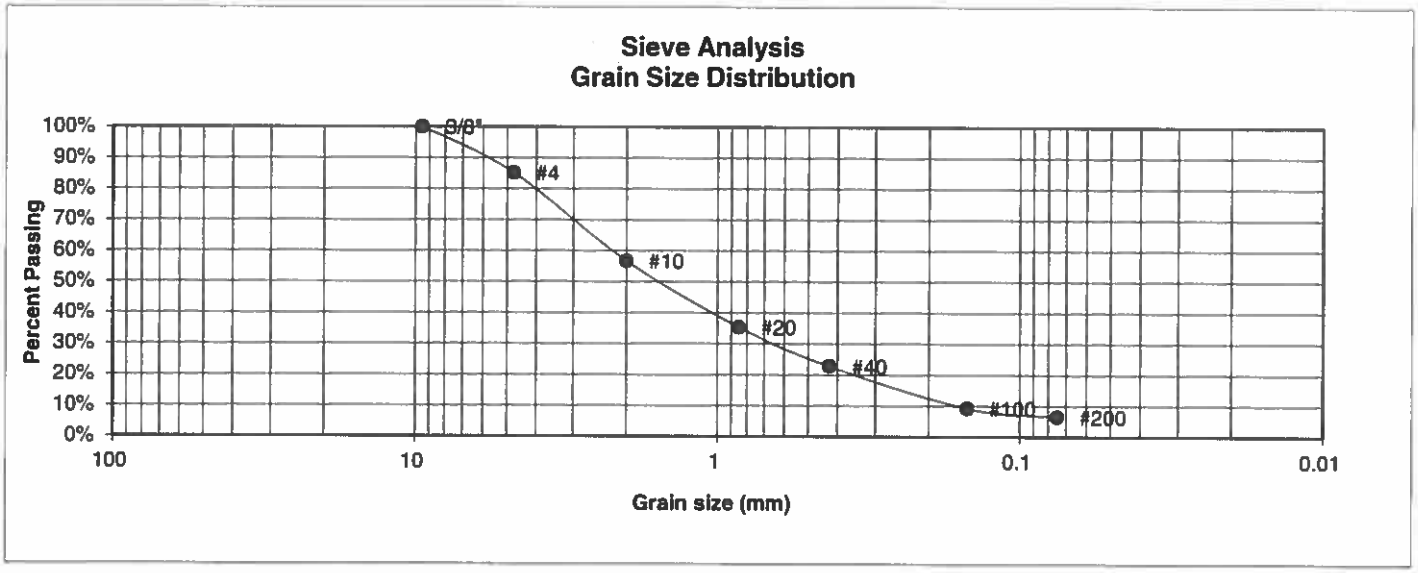
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO C-8

UNIFIED CLASSIFICATION	SM-SW	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-3	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	85.2%
10	56.8%
20	35.4%
40	22.8%
100	9.2%
200	6.5%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

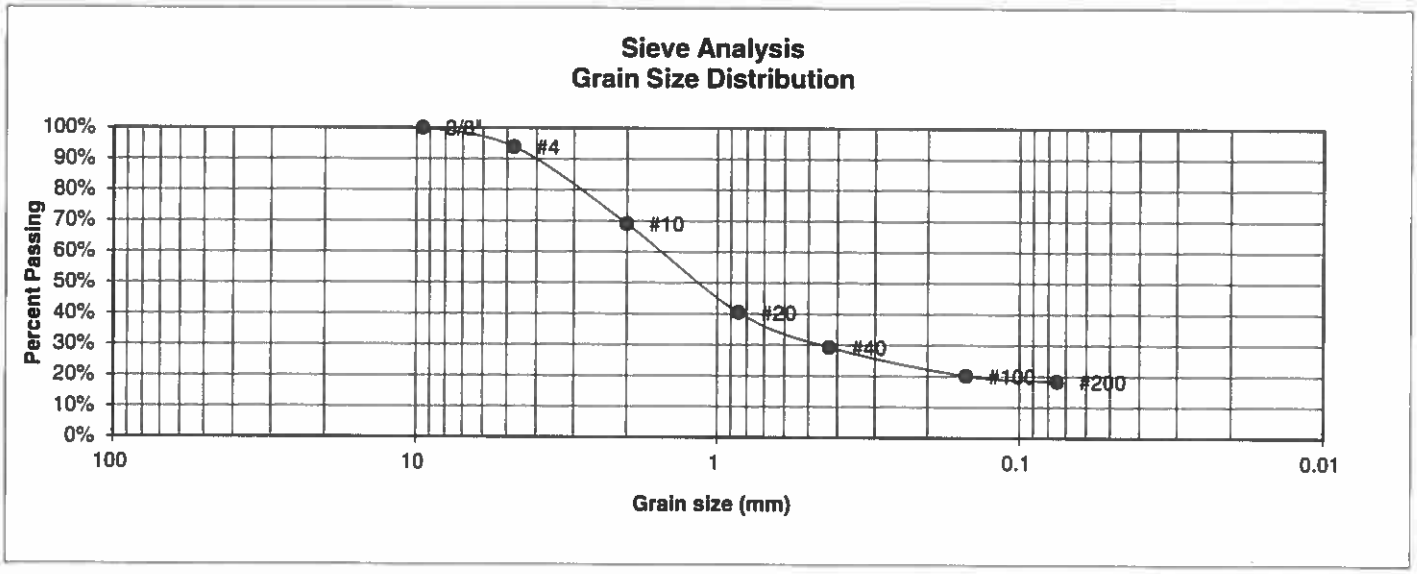
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO.: 181951

FIG NO.: C-9

UNIFIED CLASSIFICATION	SC	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-3	JOB NO.	181951
DEPTH (FT)	8-9	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	93.9%
10	69.1%
20	40.4%
40	29.3%
100	20.1%
200	18.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

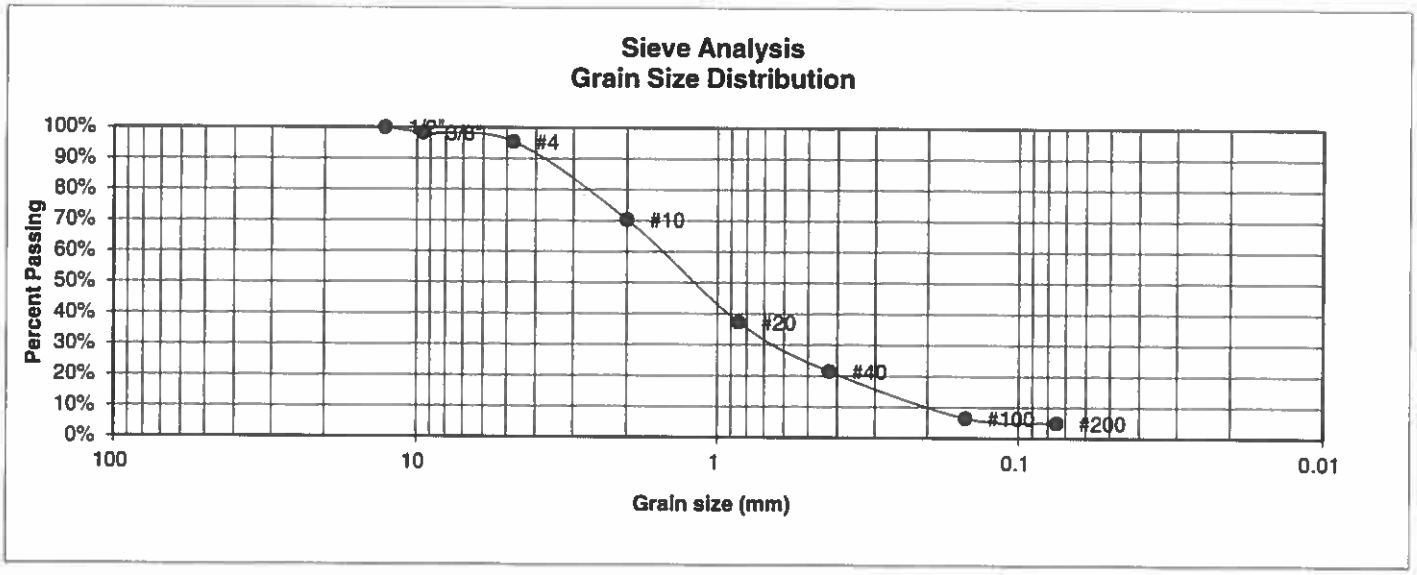
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-10

UNIFIED CLASSIFICATION	SW	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-4	JOB NO.	181951
DEPTH (FT)	5-6	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.3%
4	95.5%
10	70.4%
20	37.3%
40	21.5%
100	6.5%
200	4.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

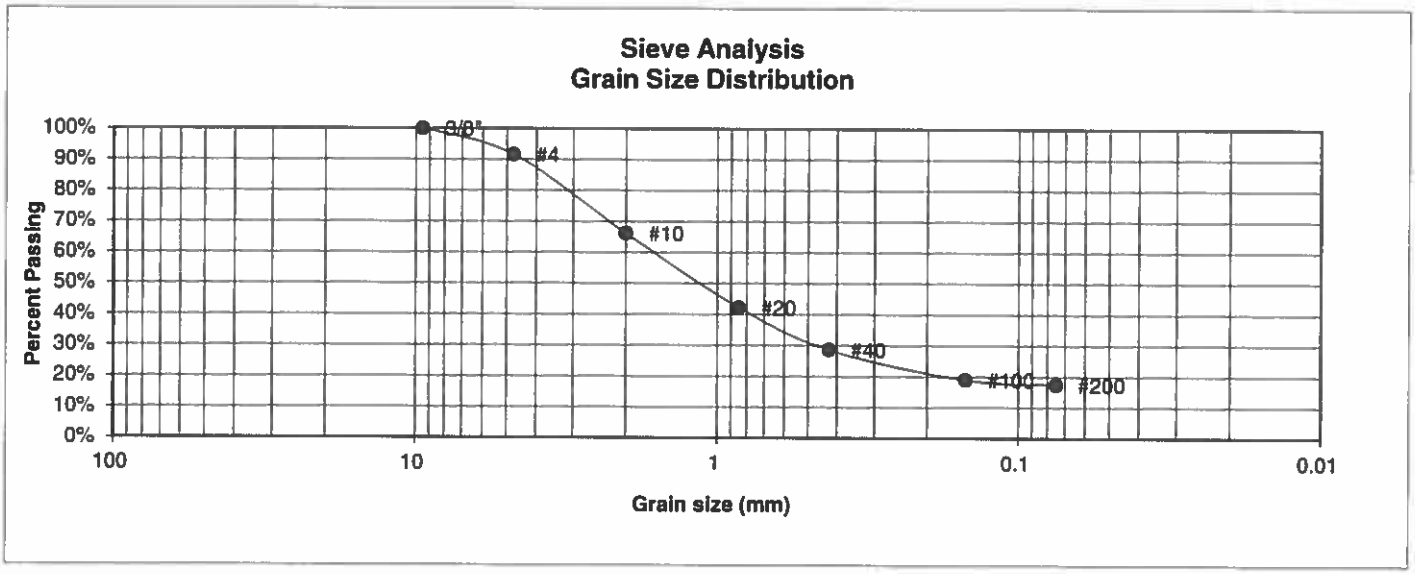
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED:	DATE:
			1/15/14

JOB NO. 181951

FIG NO. C-11

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	1	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-7	JOB NO.	181951
DEPTH (FT)	5-6	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.6%
10	66.2%
20	42.2%
40	28.6%
100	18.9%
200	17.5%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

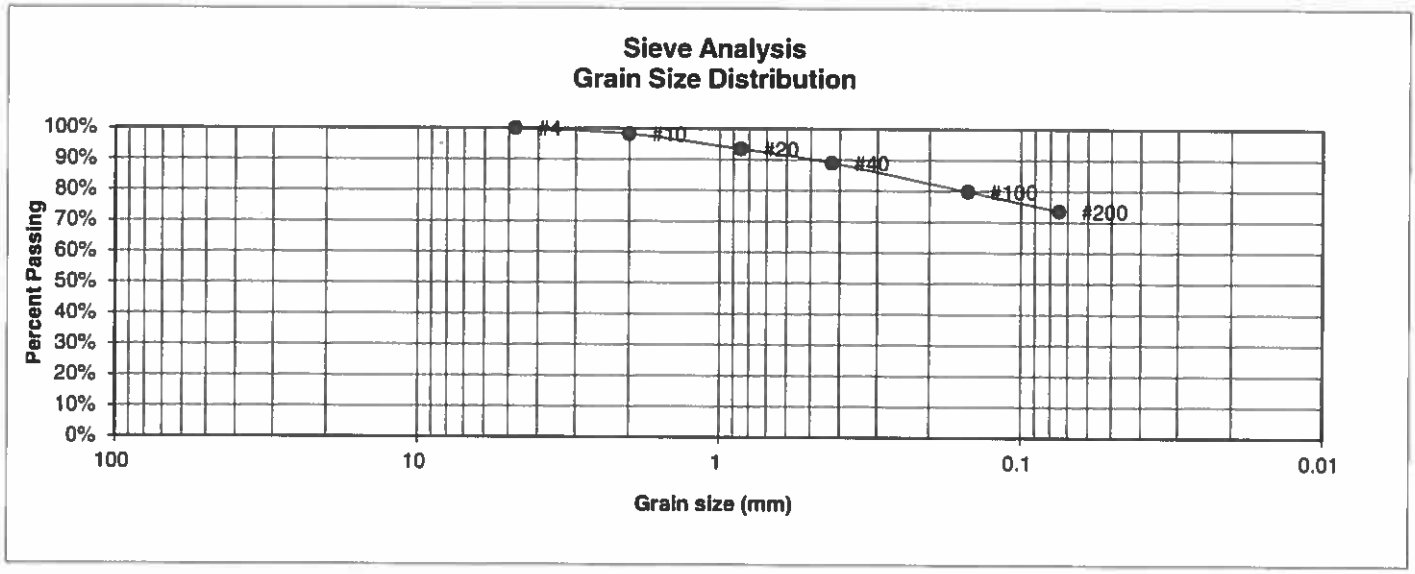
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
			1/15/19

JOB NO.: 181951

FIG NO.: C-12

UNIFIED CLASSIFICATION	CL	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	2	PROJECT	GRANDVIEW RESERVE
TEST BORING #	10	JOB NO.	181951
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.2%
20	93.4%
40	89.0%
100	79.9%
200	73.6%

Atterberg Limits	
Plastic Limit	22
Liquid Limit	44
Plastic Index	22

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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

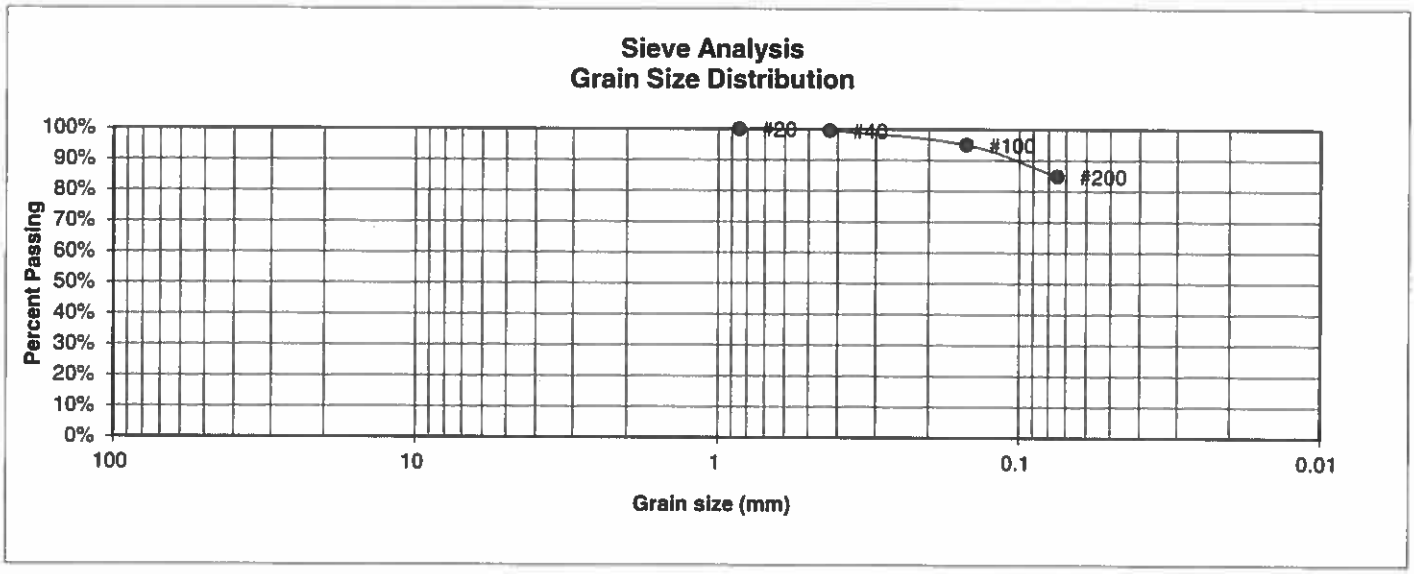
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO: 181951

FIG NO: C-13

UNIFIED CLASSIFICATION	CL	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	2	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-8	JOB NO.	181951
DEPTH (FT)	5-6	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.5%
100	95.0%
200	84.8%

Atterberg Limits

Plastic Limit	
Liquid Limit	
Plastic Index	

Swell

Moisture at start	11.3%
Moisture at finish	23.1%
Moisture increase	11.7%
Initial dry density (pcf)	99
Swell (psf)	1020

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

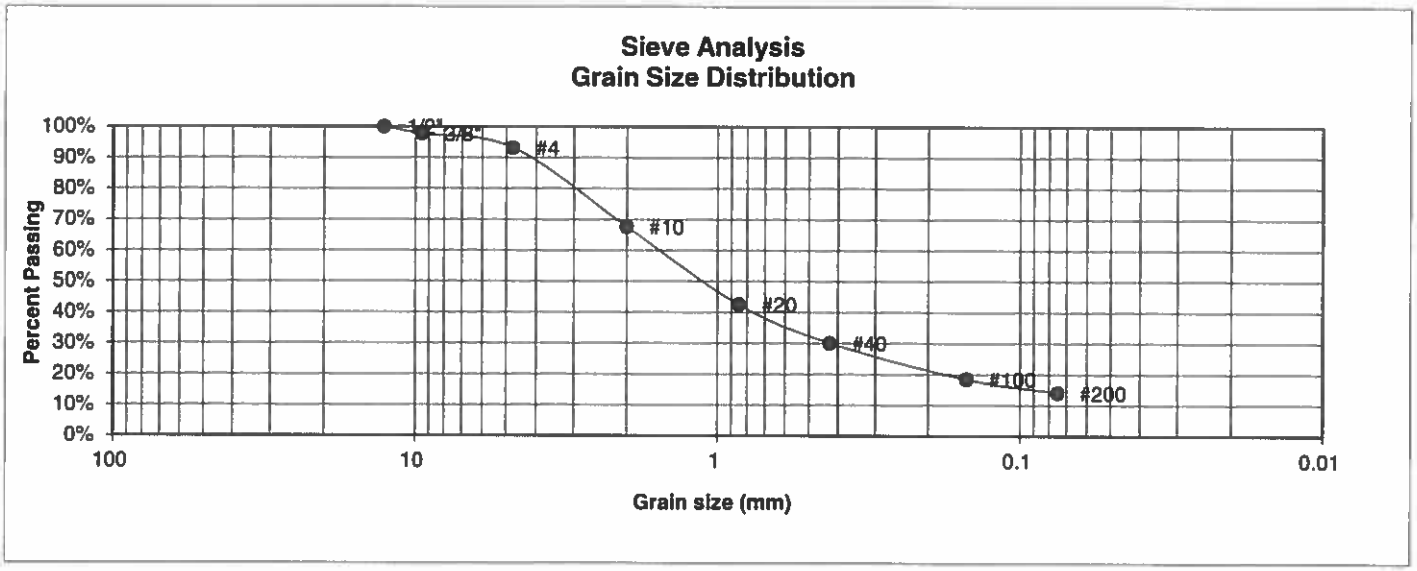
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-14

UNIFIED CLASSIFICATION	SC	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	2	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.7%
4	93.2%
10	67.7%
20	42.5%
40	30.1%
100	18.4%
200	14.0%

Atterberg Limits	
Plastic Limit	13
Liquid Limit	28
Plastic Index	15

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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

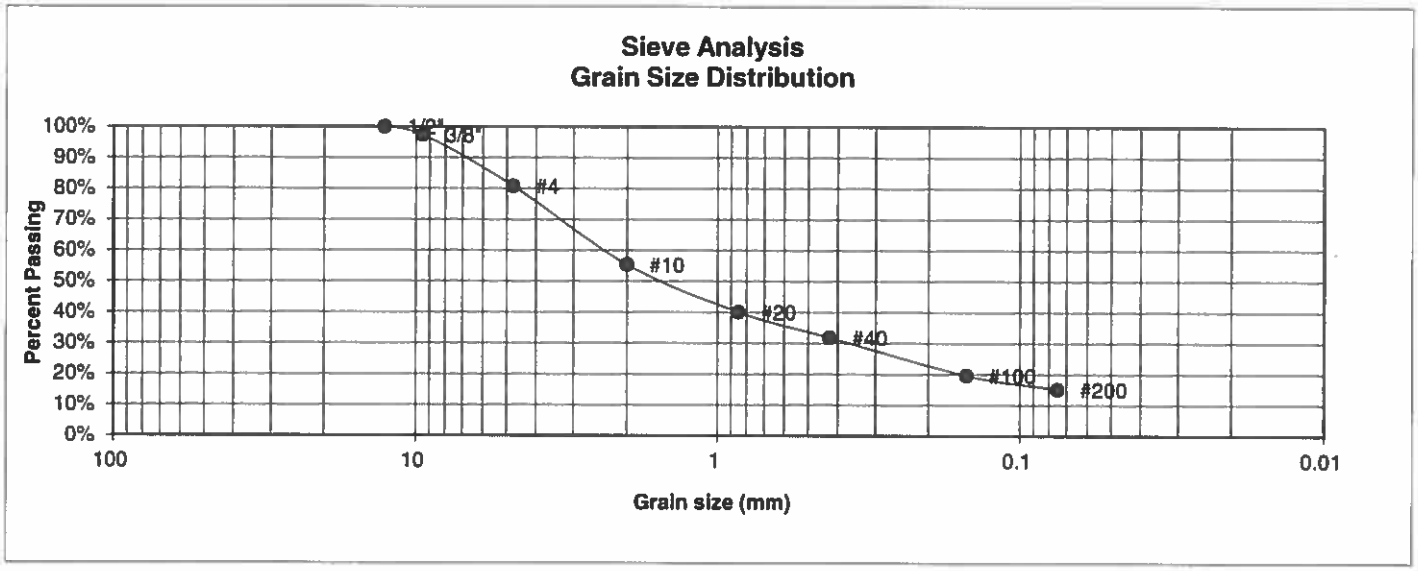
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-15

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	3	JOB NO.	181951
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	97.4%
4	80.8%
10	55.4%
20	40.1%
40	31.9%
100	19.6%
200	15.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

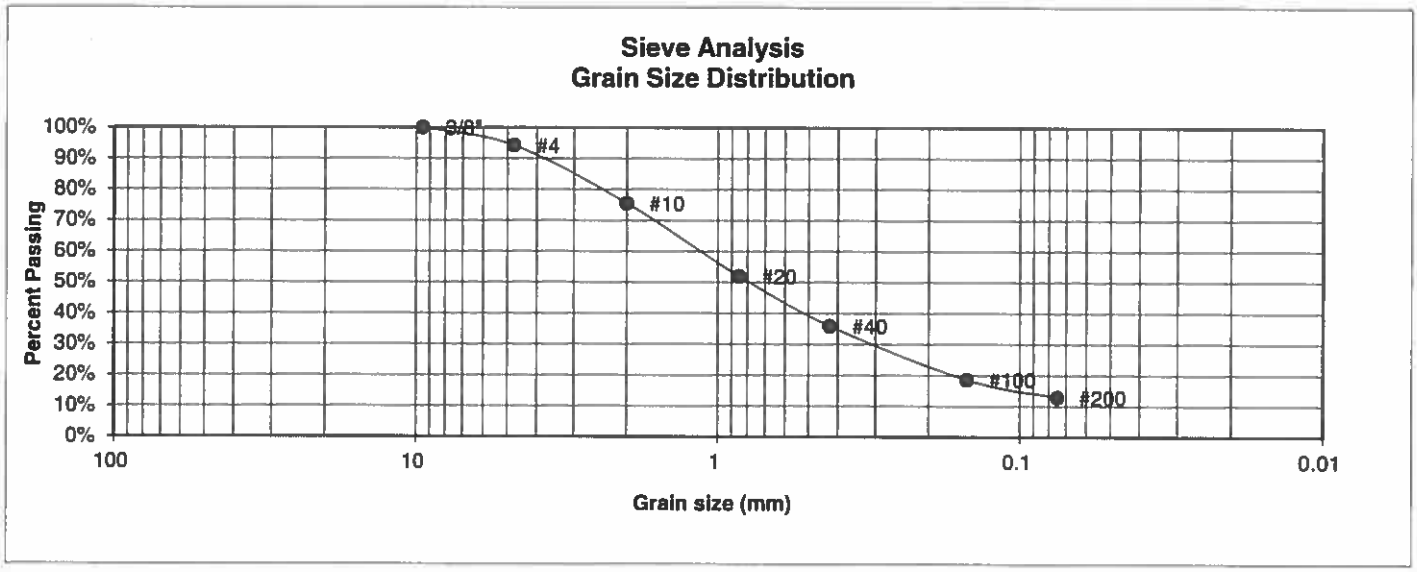
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			7/R/19

JOB NO. 181951

FIG NO. C-16

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	4	JOB NO.	181951
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	94.2%
10	75.6%
20	52.0%
40	35.9%
100	18.6%
200	12.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

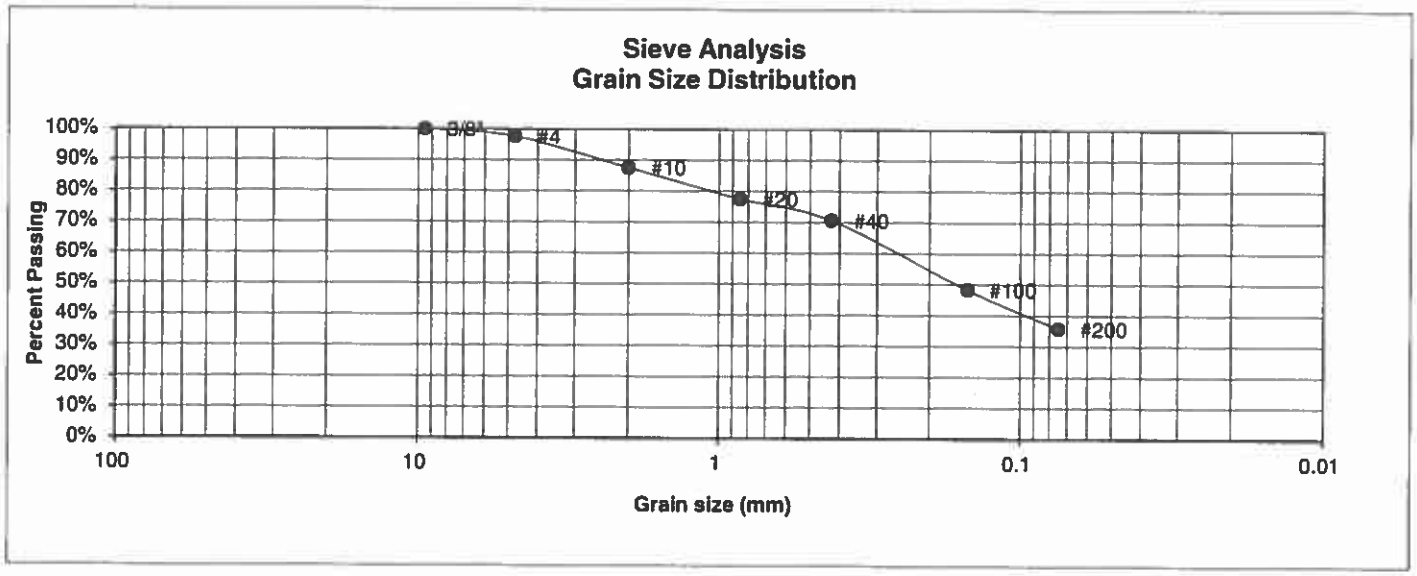
LABORATORY TEST RESULTS

DRAWN:	DATE.	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-17

UNIFIED CLASSIFICATION	SC	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	6	JOB NO.	181951
DEPTH (FT)	20	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.6%
10	87.5%
20	77.5%
40	70.6%
100	48.3%
200	35.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

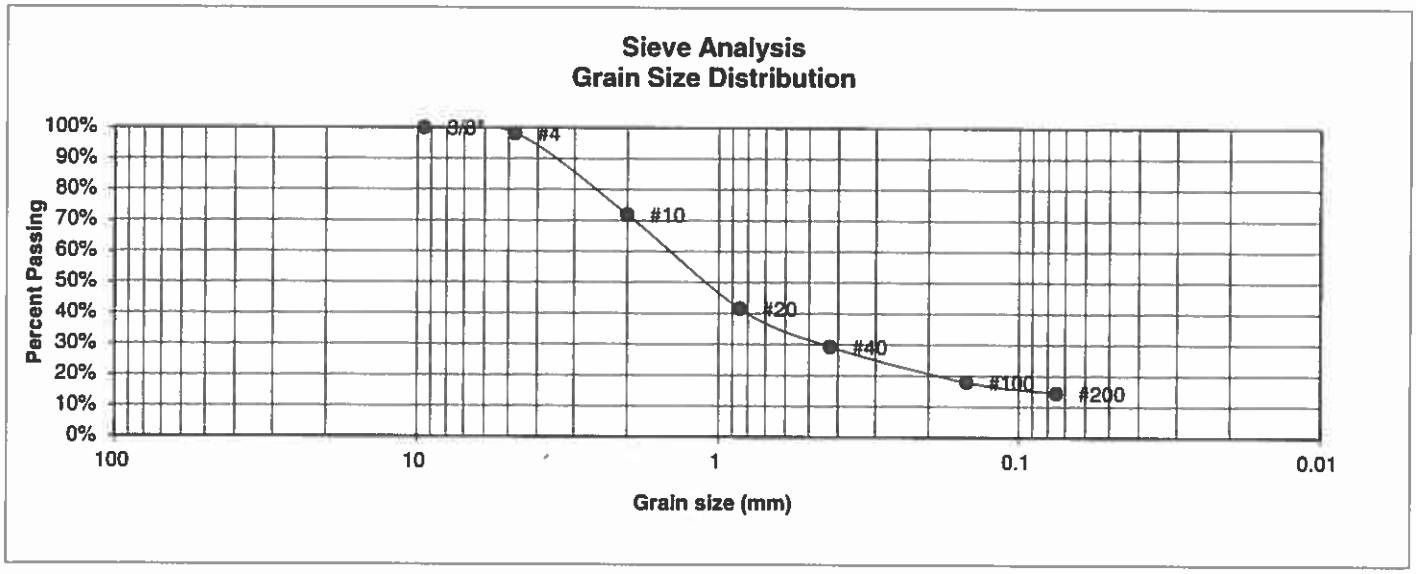
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-18

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	7	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.2%
10	71.9%
20	41.5%
40	29.3%
100	17.9%
200	14.4%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

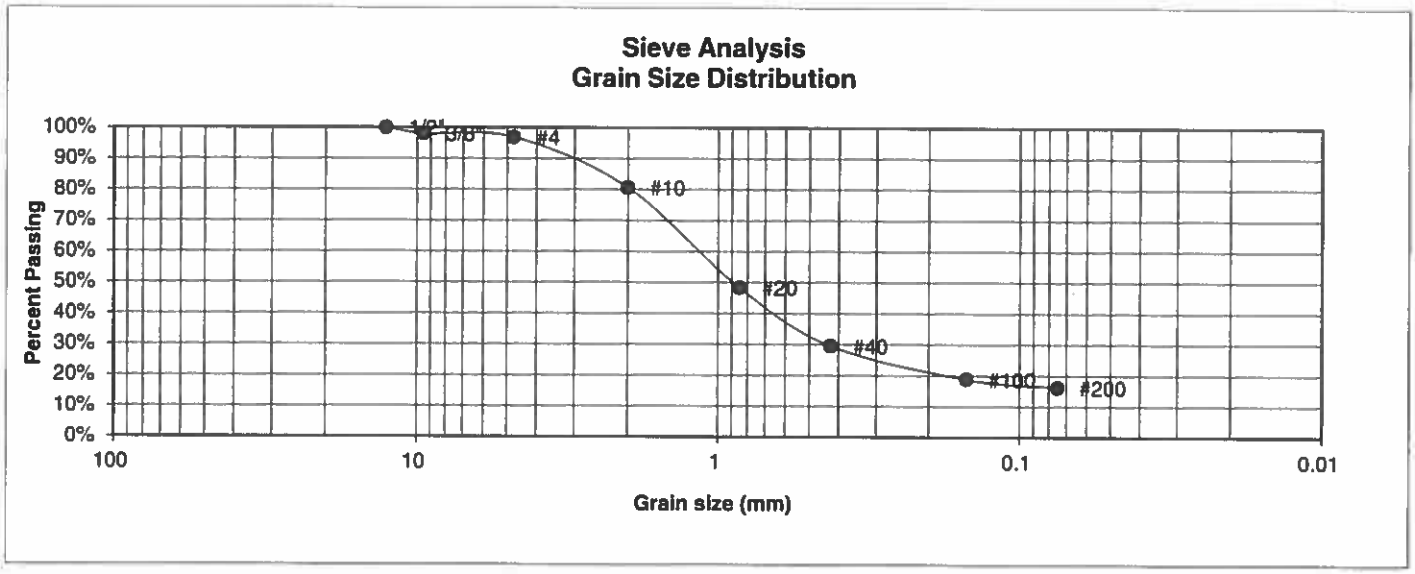
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE: 7/15/19

JOB NO.: 181951

FIG NO.: C-19

UNIFIED CLASSIFICATION	SM	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-1	JOB NO.	181951
DEPTH (FT)	4-5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.1%
4	96.9%
10	80.7%
20	48.3%
40	29.5%
100	18.8%
200	16.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

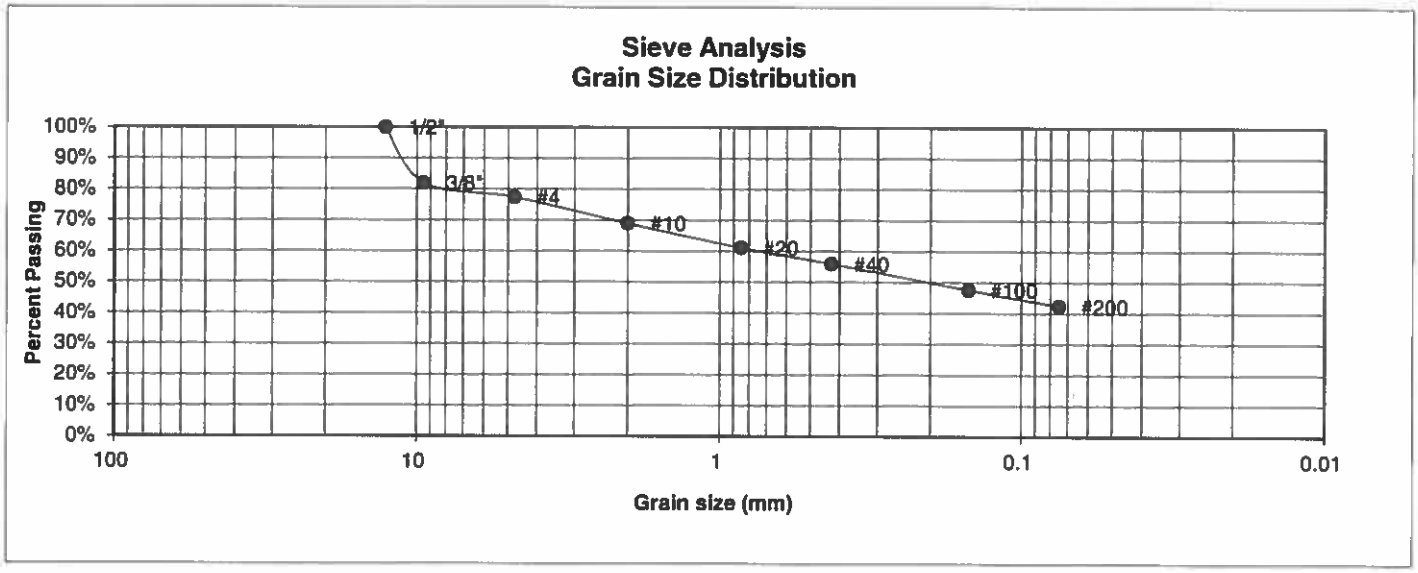
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO.: 181951

FIG NO.: C-20

UNIFIED CLASSIFICATION	SC	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	3	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-5	JOB NO.	181951
DEPTH (FT)	4-5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	82.0%
4	77.4%
10	69.0%
20	61.1%
40	55.9%
100	47.6%
200	42.3%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

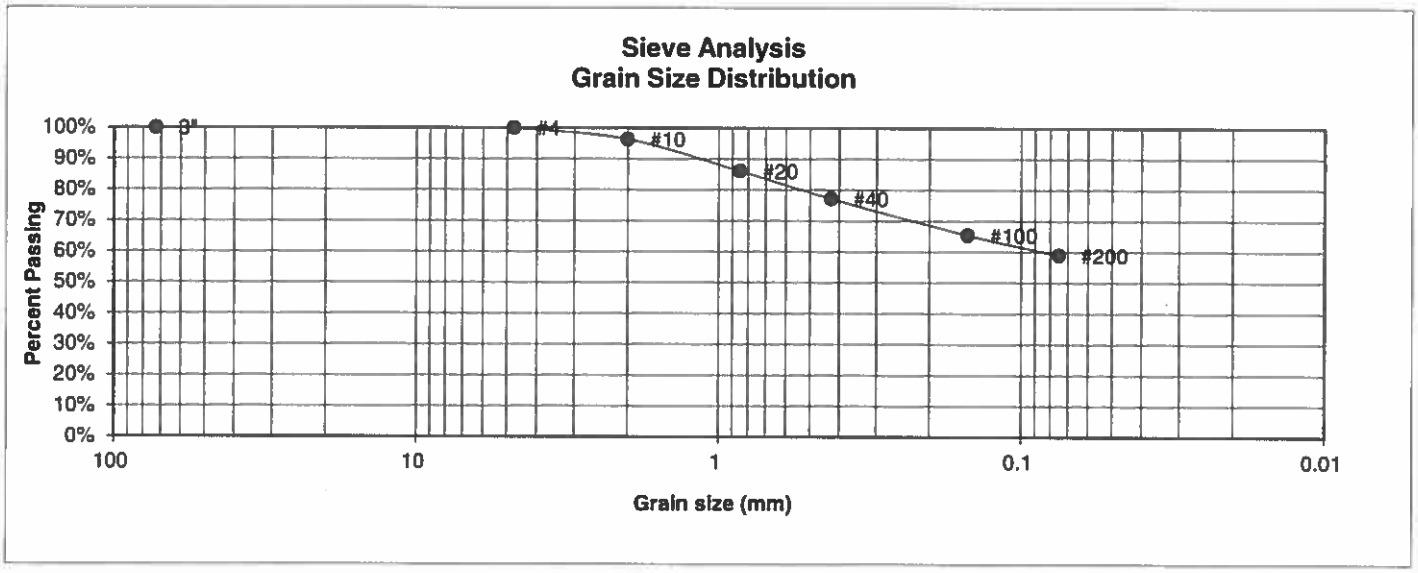
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-21

UNIFIED CLASSIFICATION	CL	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	4	PROJECT	GRANDVIEW RESERVE
TEST BORING #	1	JOB NO.	181951
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	100.0%
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	96.4%
20	86.1%
40	77.2%
100	65.4%
200	59.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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

LABORATORY TEST RESULTS

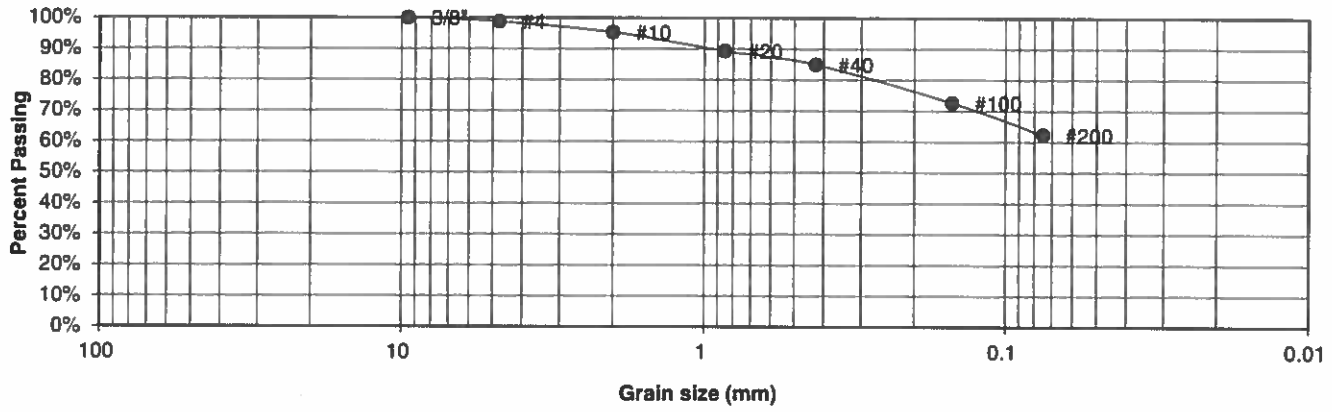
DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO. 181951

FIG NO. C-22

UNIFIED CLASSIFICATION	CL	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	4	PROJECT	GRANDVIEW RESERVE
TEST BORING #	2	JOB NO.	181951
DEPTH (FT)	10	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.8%
10	95.4%
20	89.3%
40	85.0%
100	72.6%
200	62.3%

Atterberg Limits	
Plastic Limit	14
Liquid Limit	35
Plastic Index	21

Swell	
Moisture at start	
Moisture at finish	
Moisture increase	
Initial dry density (pcf)	
Swell (psf)	

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

LABORATORY TEST RESULTS

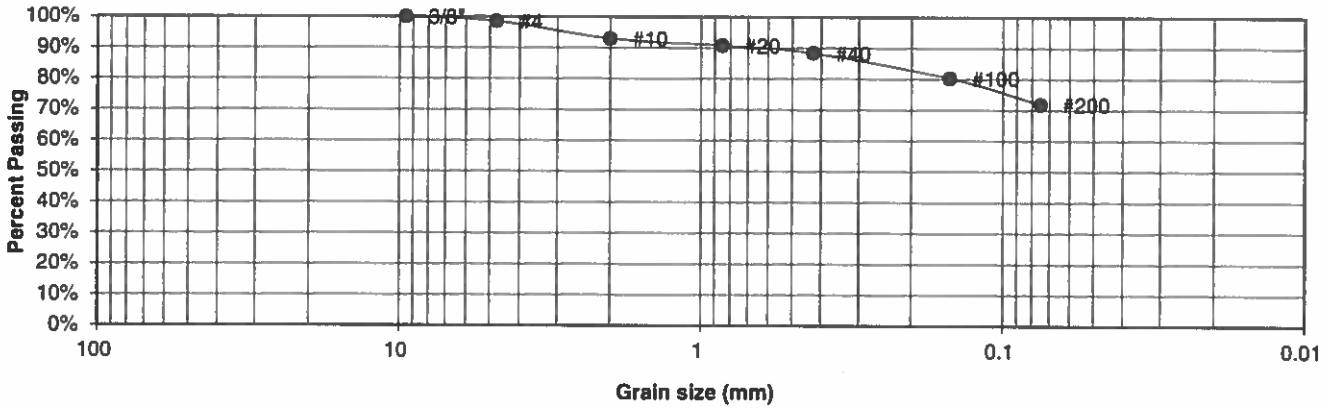
DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

JOB NO.: 181951

FIG NO.: C-23

UNIFIED CLASSIFICATION	CL	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	4	PROJECT	GRANDVIEW RESERVE
TEST BORING #	9	JOB NO.	181951
DEPTH (FT)	15	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.5%
10	93.0%
20	90.8%
40	88.3%
100	80.3%
200	71.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell

Moisture at start	7.9%
Moisture at finish	15.7%
Moisture increase	7.8%
Initial dry density (pcf)	99
Swell (psf)	1580

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

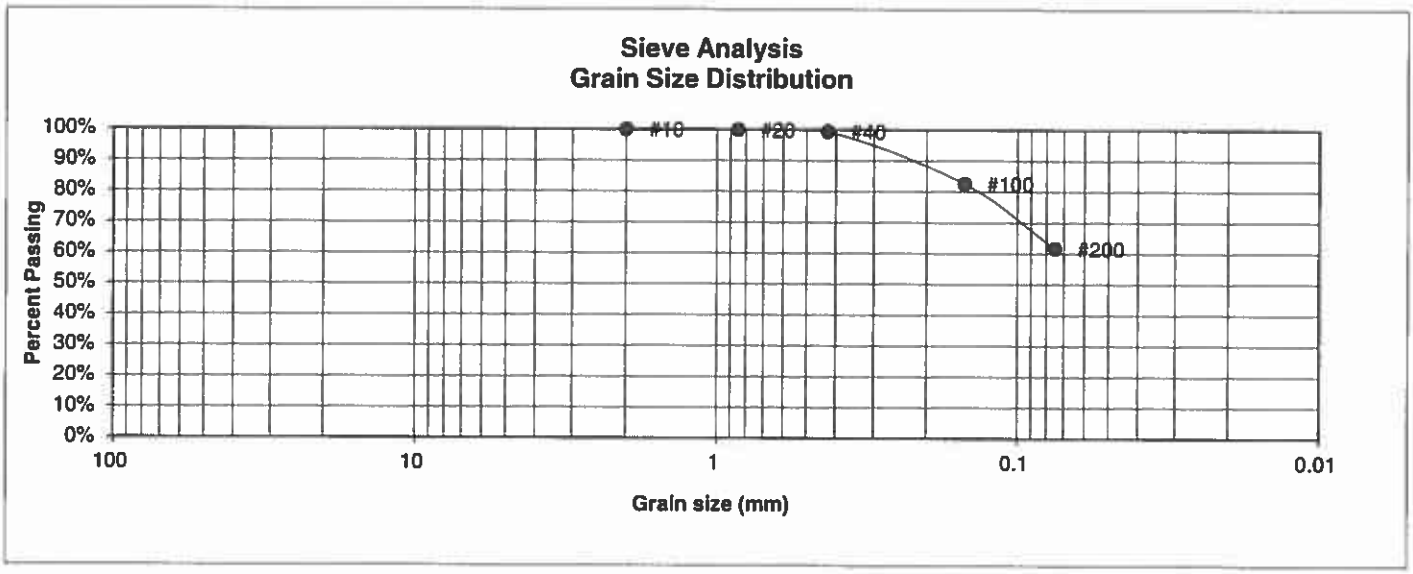
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED	DATE
			1/15/19

JOB NO. 181951

FIG NO. C-24

UNIFIED CLASSIFICATION	CL	CLIENT	4 SITE INVESTMENTS, LLC
SOIL TYPE #	4	PROJECT	GRANDVIEW RESERVE
TEST BORING #	TP-6	JOB NO.	181951
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	99.9%
40	99.4%
100	82.6%
200	61.6%

Atterberg Limits	
Plastic Limit	
Liquid Limit	
Plastic Index	

Swell	
Moisture at start	9.3%
Moisture at finish	26.4%
Moisture increase	17.1%
Initial dry density (pcf)	95
Swell (psf)	950

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

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
			1/15/19

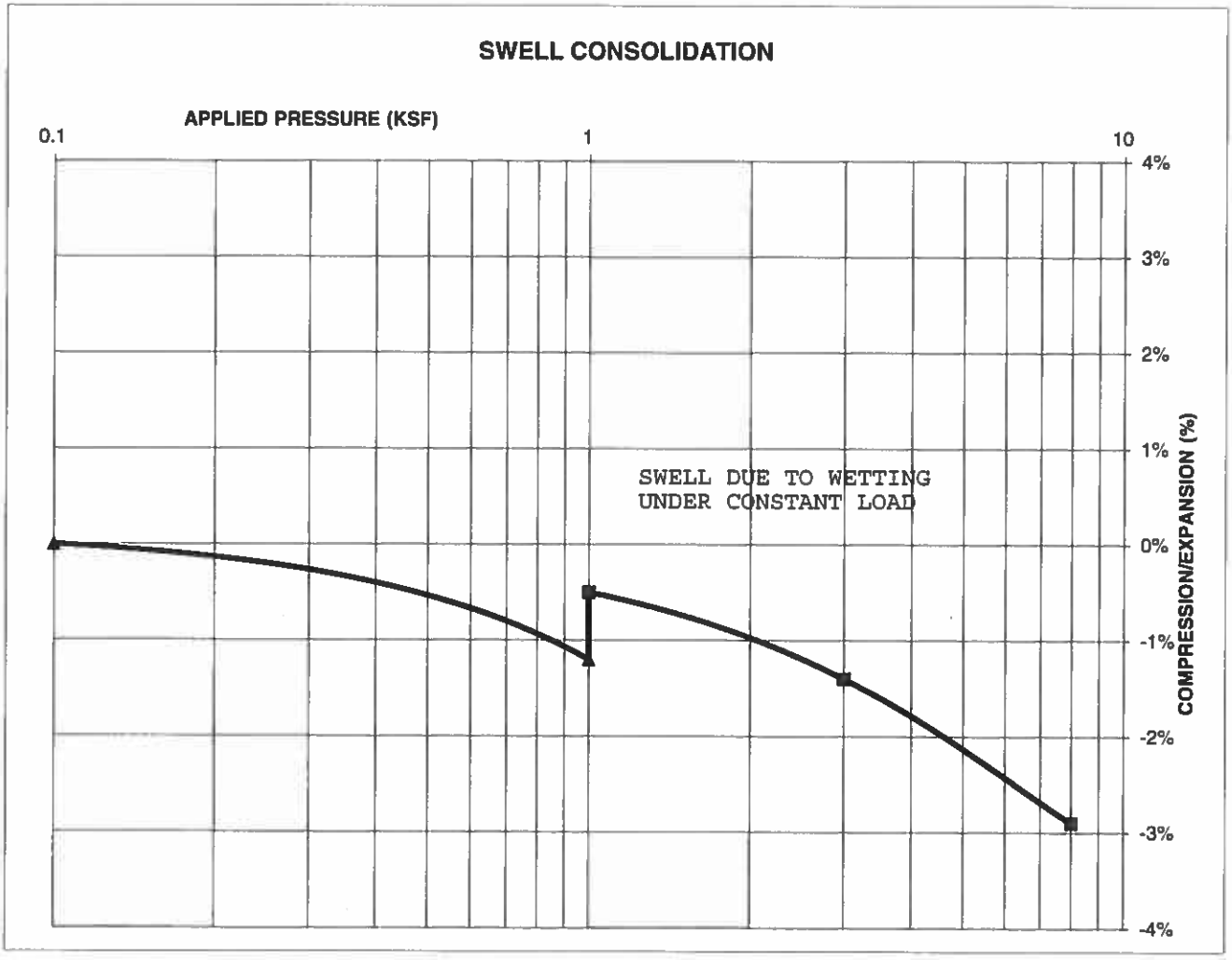
JOB NO. 181951

FIG NO. C-25

CONSOLIDATION TEST RESULTS

TEST BORING #	3	DEPTH(ft)	15
DESCRIPTION	CL	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			113
NATURAL MOISTURE CONTENT			12.8%
SWELL/CONSOLIDATION (%)			0.7%

JOB NO. 181951
CLIENT 4 SITE INVESTMENTS, LLC
PROJECT GRANDVIEW RESERVE



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

SWELL CONSOLIDATION
TEST RESULTS

DRAWN	DATE	CHECKED	DATE
			1/15/19

JOB NO. 181951
FIG NO. C-26

CLIENT	4 SITE INVESTMENTS, LLC	JOB NO.	181951
PROJECT	GRANDVIEW RESERVE	DATE	12/4/2018
LOCATION	GRANDVIEW RESERVE	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-2	2-3	3	SC	<0.01
TB-2	10	4	CL	0.00
TB-5	5	1	SC-SM-SW	0.02
TB-10	10	2	CL	<0.01

QC BLANK PASS

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

LABORATORY TEST
SULFATE RESULTS

DRAWN:	DATE	CHECKED	DATE
			1/15/19

JOB NO. 181951

FIG NO. C-27

APPENDIX D: Soil Survey Descriptions

8—Blakeland loamy sand, 1 to 9 percent slopes. This deep, somewhat excessively drained soil formed in alluvial and eolian material derived from arkosic sedimentary rock on uplands. The average annual precipitation is about 15 inches, the average annual air temperature is about 47 degrees F, and the average frost-free period is about 135 days.

Typically, the surface layer is dark grayish brown loamy sand about 11 inches thick. The substratum, to a depth of 27 inches, is brown loamy sand; it grades to pale brown sand that extends to a depth of 60 inches.

Included with this soil in mapping are small areas of Bresser sandy loam, 0 to 3 percent slopes; Bresser sandy loam, 3 to 5 percent slopes; Truckton sandy loam, 0 to 3 percent slopes; Truckton sandy loam, 3 to 9 percent slopes; and Stapleton sandy loam, 3 to 8 percent slopes. In some areas, mainly north of Colorado Springs in the Cottonwood Creek area, arkosic beds of sandstone and shale are at a depth of 0 to 40 inches.

Permeability of this Blakeland soil is rapid. Effective rooting depth is 60 inches or more. Available water capacity is low to moderate. Organic matter content of the surface layer is medium. Surface runoff is slow, the hazard of erosion is moderate, and the hazard of soil blowing is severe.

Most areas of this soil are used for range, homesites, and wildlife habitat.

Native vegetation is dominantly western wheatgrass, side-oats grama, and needleandthread. This soil is best suited to deep-rooted grasses.

Proper range management is necessary to prevent excessive removal of plant cover from the soil. Interseeding improves the existing vegetation. Deferment of grazing in spring increases plant vigor and soil stability. Proper location of livestock watering facilities helps to control grazing.

Windbreaks and environmental plantings are fairly well suited to this soil. Blowing sand and low available water capacity are the main limitations for the establishment of trees and shrubs. The soil is so loose that trees need to be planted in shallow furrows and plant cover needs to be maintained between the rows. Supplemental irrigation may be needed to insure survival. Trees that are best suited and have good survival are Rocky Mountain juniper, eastern redcedar, ponderosa pine, and Siberian elm. Shrubs that are best suited are skunkbush sumac, lilac, and Siberian peashrub.

This soil is suited to wildlife habitat. It is best suited to habitat for openland and rangeland wildlife. Rangeland wildlife, such as pronghorn antelope, can be encouraged by developing livestock watering facilities, properly managing livestock grazing, and reseeding range where needed.

This soil has good potential for urban development. Soil blowing is a hazard if protective vegetation is removed. Special erosion control practices must be provided to minimize soil losses. Capability subclass VIe.

19—Columbine gravelly sandy loam, 0 to 3 percent slopes. This deep, well drained to excessively drained soil formed in coarse textured material on alluvial terraces and fans and on flood plains. Elevation ranges from 6,500 to 7,300 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 47 degrees F, and the average frost-free period is about 135 days.

Typically, the surface layer is grayish brown gravelly sandy loam about 14 inches thick. The underlying material is light yellowish brown very gravelly loamy sand.

Included with this soil in mapping are small areas of Stapleton sandy loam, 3 to 8 percent slopes; Blendon sandy loam, 0 to 3 percent slopes; Louviers silty clay loam, 3 to 18 percent slopes; and Fluvaquentic Haplaquolls, nearly level. In places the parent arkose beds of sandstone or shale are at a depth of 0 to 40 inches.

Permeability of this Columbine soil is very rapid. Effective rooting depth is 60 inches or more. Available water capacity is low to moderate. Surface runoff is slow, and the hazard of erosion is slight to moderate.

This soil is used mainly for grazing livestock and for wildlife habitat. It is also used for homesites.

Native vegetation is mainly western wheatgrass, sideoats grama, needleandthread, and little bluestem. The main shrub is true mountainmahogany.

Proper location of livestock watering facilities helps to control grazing.

Windbreaks and environmental plantings are fairly well suited to this soil. Blowing sand and low available water capacity are the principal limitations to the establishment of trees and shrubs. The soil is so loose that trees need to be planted in the rows. Supplemental irrigation may be needed to insure survival. Trees that are best suited and have good survival are Rocky Mountain juniper, eastern redcedar, ponderosa pine, and Siberian elm. Shrubs that are best suited are skunkbush sumac, lilac, and Siberian peashrub.

Rangeland wildlife, such as pronghorn antelope, cottontail, coyote, and scaled quail, is best adapted to life on this droughty soil. Forage production is typically loam, and proper livestock grazing management is necessary if wildlife and livestock share the range. Livestock watering developments are also important and are used by various wildlife species.

The main limitation of this soil for urban development is a hazard of flooding in some areas. Care must be taken when locating septic tank absorption fields because of possible pollution as a result of the very rapid permeability of this soil. Capability subclass VIe.

83—Stapleton sandy loam, 3 to 8 percent slopes. This deep, noncalcareous, well drained soil formed in sandy alluvium derived from arkosic bedrock on uplands. Elevation ranges from 6,500 to 7,300 feet. The average annual precipitation is about 15 inches, the average annual air temperature is about 47 degrees F, and the average frost-free period is about 135 days.

Typically, the surface layer is grayish brown sandy loam about 11 inches thick. The subsoil is grayish brown gravelly sandy loam about 6 inches thick. The substratum extends to a depth of 60 inches or more. It is pale brown gravelly sandy loam in the upper part and grades to gravelly loamy sand in the lower part.

Included with this soil in mapping are small areas of Louviers silty clay loam, 3 to 18 percent slopes; Blakeland loamy sand, 1 to 9 percent slopes; Columbine gravelly sandy loam, 0 to 3 percent slopes; and Fluvaquentic Haplaquolls, nearly level. Also included are areas where arkose beds of sandstone and shale are at a depth of 0 to 40 inches. Included areas make up about 20 percent of the mapped acreage.

Permeability of this Stapleton soil is rapid. Effective rooting depth is 60 inches or more. Available water capacity is moderate. Surface runoff is slow, and the hazards of erosion and soil blowing are moderate.

This soil is used as rangeland, for wildlife habitat, and as homesites.

Native vegetation is mainly western wheatgrass, sideoats grama, needleandthread, and little bluestem. The predominant shrub on this soil is true mountainmahogany. Yucca occurs in some areas.

Deferred grazing late in summer and in fall improves the condition of the range. Properly locating livestock watering facilities helps to control grazing.

Windbreaks and environmental plantings are generally suited to this soil. Soil blowing is the principal limitation for the establishment of trees and shrubs. This limitation can be overcome by cultivating only in the tree rows and leaving a strip of vegetation between the rows. Supplemental irrigation may be needed when planting and during dry periods. Trees that are best suited and have good survival are Rocky Mountain juniper, eastern redcedar, ponderosa pine, Siberian elm, Russian-olive, and hackberry. Shrubs that are best suited are skunkbush sumac, lilac, and Siberian peashrub.

This soil is suited to habitat for openland and rangeland wildlife. Rangeland wildlife, such as pronghorn antelope, can be encouraged by developing livestock watering facilities, properly managing livestock grazing, and reseeding range where needed.

The main limitation of this soil for urban use is frost-action potential. Special design of roads and streets is necessary to minimize frost heave damage. Special practices must be provided to minimize water erosion and soil blowing on construction sites where vegetation has been removed. Access roads must have adequate cut-slope grade and be provided with drains to control surface runoff. Capability subclass IVe.