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SOIL, GEOLOGY, GEOLOGIC HAZARD, AND WASTEWATER STUDY, DANCING WOLF ESTATES SUBDIVISION FILING NO. 4 NE OF HODGEN ROAD AND HIGHWAY 83 EL PASO COUNTY, COLORADO

Prepared for

David and Alyce McElhoes
16605 Dancing Wolf Way
Colorado Springs, Colorado 80908

March 12, 2019
Revised September 19, 2019

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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Reviewed by:

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Encl.

Entech Job No. 182043
AAprojects/2018/182043 countysoil/geo/ww.

PUD-18-002
VR-18-002

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1.0 SUMMARY

Project Location

The project lies in a portion of the SE¼ of Section 22, Township 11 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 4½ miles southeast of Monument, Colorado.

Project Description

Total acreage involved in the project is approximately 25.16 acres. The proposed development consists of the replatting of Lots 1-3 Dancing Wolf Estates and Lots 1-2 Dancing Wolf Estates III, into two residential/community commercial lots (Lots 1 and 2, Filing No. 4) and six single-family rural residential lots (Lots 3-8, Filing No. 4). Existing houses are located on Lot 2 of Dancing Wolf Estates and Lots 1 and 2 of Dancing Wolf Estates III. The existing houses will remain. The new lots 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 seasonal shallow groundwater and seasonal shallow groundwater areas. Based on the proposed development plan, it appears that these areas will have some minor impacts 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 a portion of the SE¼ of Section 22, Township 11 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 4½ miles southeast of Monument, Colorado, northeast of Hodgen Road and Highway 83. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is gradually to moderately sloping generally to the northeast and northwest along a drainage that bisects the site. The drainage is a Tributary of West Cherry Creek that flows in a northerly direction through the central portion of the site. Water was not observed in the drainage 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 and a rural residential development. The site contains primarily field grasses and weeds with areas of ponderosa pines in the northeastern portion of the site. Several existing houses are located in the Dancing Wolf Estates Subdivision. Filing 4 of the subdivision consists of three lots that have existing houses and five undeveloped lots. Site photographs, taken December 27, 2018, are included in Appendix A.

Total acreage involved in the proposed development is approximately 25.16 acres. Two residential/community commercial lots (Lots 1 and 2, Filing No. 4) and six single-family rural residential lots (Lots 3-8, Filing No. 4) are proposed as part of the replat. Three with existing houses and five undeveloped lots. The proposed lots are approximately 2.5 to 2.8 acres each. The lots will be serviced by individual wells and on-site wastewater treatment systems. The Site Plan as currently platted is presented in Figure 3. The proposed Site Plan as replatted is presented in Figure 4.

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 27, 2018.

Two (2) test pits were performed on the site to determine general suitability of the site for the use of on-site wastewater treatment systems. The locations of the test pits are indicated on the Site Plan/Test Pit Location Maps, Figures 3 and 4. The 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 some of the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422, and Atterberg Limits, ASTM D-4318. Results of the laboratory testing are included in Appendix C. A Summary of Laboratory Test Results is presented in Table 1.

Portions of the site were previously investigated by others. Test Boring Logs and Laboratory Testing results from previous investigations were also used in evaluating the site and are included in Appendix D.

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 along the Palmer Divide. Approximately 8 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 northwesterly 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, 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 major drainage on site and as stream terrace deposits. Man-made soils exist as earthen dams and roadway embankments on the site. 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 5). In general, they vary from sandy loam to loamy sands. The soils are described as follows:

Type	Description
21	Cruckton Sandy Loam, 1-9% slopes
26	Elbeth Sandy Loam, 8-15% slopes
92	Tomah-Crowfoot Loamy Sands, 3-8% slopes

Complete descriptions of each soil type are presented in Appendix E. The soils have generally been described to typically have moderate to moderately rapid permeabilities. Roads may need to be designed to minimize frost-heave potential. Moderate shrink-swell potential in the subsoil has been described for Soil Type 26. 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 slight to moderate erosion hazards (Reference 3).

5.3 Site Stratigraphy

The Monument Quadrangle Geology Map showing the site is presented in Figure 6 (Reference 4). The Geology Map prepared for the site is presented in Figure 7. Four mappable units were identified on this site which are described as follows:

Qal **Recent Alluvium of Holocene Age:** These are recent deposits that have been deposited along the drainage that exists on-site. These materials typically consist of silty to clayey sands and sandy clays. Some of these alluviums contain highly organic soils.

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

QTa **Alluvium of Palmer Divide of Pleistocene to Tertiary Age:** These materials consist of water-deposited stream terrace deposits. They typically consist of silty to clayey sands with gravelly lenses and may contain areas of pebble and cobble lenses.

Tkd **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 Monument Quadrangle* distributed by the Colorado Geological Survey in 2003 (Reference 4), the *Geologic Map of the Colorado Springs-Castle Rock Area*, distributed by the US Geological Survey in 1979 (Reference 5), and the *Geologic Map of the Denver 1^0 x 2^0 Quadrangle*, distributed by the US Geological Survey in 1981 (Reference 6). 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 7.

5.4 Soil Conditions

The soils encountered in the Test Pits can be grouped into two general soil types. The test pit soils were classified using the Unified Soil Classification System (USCS). The test pit soils were also classified using the USDA Texture Soil Classification. The soils encountered in the Test Pits consisted of silty sand (SM), very sandy clay-silt (CL-ML) and sandy clay (CL).

Soil Type 1 is a silty sand (SM). This material was encountered Test Pit No. 2. The sand was encountered at the existing surface and extended to the termination of the test pit (8 feet). These soils were encountered at moderate to low densities and moist conditions. Samples tested had 13 percent of the soil sized particles passing the No. 200 Sieve. Atterberg Limits Testing resulted in the silty sand being non-plastic.

Soil Type 2 is very sandy clay-silt and sandy clay (CL-ML, CL). This material was encountered in Test Pit No. 1. The clay was encountered at the existing surface grade and extended to the termination of the test pit (8 feet). The clay was encountered at firm consistencies and dry to moist conditions. Samples tested had 57 to 69 percent of the soil sized particles passing the No. 200 sieve. Atterberg limits testing resulted in liquid limits of 21 and 27 and plastic indexes of 7 and 12. FHA Swell Testing on a sample of clay resulted in an expansion pressure of 670 psf, which is in the low expansion range.

The Test Pit Logs 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.

5.5 Groundwater

Groundwater was not encountered in the test pits which were excavated to 8 feet. Areas of seasonal and potentially seasonal shallow groundwater have been mapped in low-lying areas and in the drainage 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 7). 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 roadway embankments and the earthen dam on-site.

Mitigation: The earthen dam and roadway embankments will be avoided by the development. Should any uncontrolled fill be encountered beneath foundations, removal and recompaction at 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 will be required.

Expansive Soils

Expansive soils were encountered in the test pits excavated on–site. Additionally, expansive soils were encountered in some of the test borings drilled by others (Appendix D). Expansive clay soils and claystone commonly encountered within the Dawson Formation and the overlying residual soils. These occurrences are typically sporadic; therefore, none have been indicated on the maps. These expansive, if encountered beneath foundations, can cause differential movement in the structure foundation. These occurrences should be identified and mitigated on an individual lot 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% 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.

Floodplain and Seasonal Shallow Groundwater Area

The site is not mapped within any floodplains according to the FEMA Map No. 08041CO285G, dated December 7, 2018 (Figure 8, Reference 7). Areas of potentially seasonal shallow and 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 low-lying areas and along the drainage in the central portion of the site. Water was not observed in any of the drainages or the pond at the time of our site investigation. These areas can likely be avoided or properly mitigated by development. 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 9. Any grading in these areas should be done to direct surface flow around construction to avoid areas of ponded water. All organic material would be completely removed prior to any fill placement. Specific drainage studies are beyond the scope of this report.

6.1 Relevance of Geologic Conditions to Land Use Planning

As mentioned, we understand that the development will be rural residential. It is our opinion that the existing geologic and engineering geologic conditions will impose some minor 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 site grading. Other hazards on site may be satisfactorily mitigated through proper engineering design and construction practices.

The upper materials are typically at medium dense states and firm consistencies. The granular soils encountered in the upper soil profiles of the test pits should provide good support for foundations. Expansive soils although sporadic were encountered. Expansive clay soils, clayey sandstone and claystone 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 containing arkosic sandstone will have high allowable bearing conditions. Difficult excavation should be anticipated in areas of shallow bedrock. Expansive layers may also be encountered in the soil and bedrock on this site. Areas of expansive soils encountered on site are sporadic; therefore, none have been indicated on the maps. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas of seasonal shallow groundwater and potentially seasonal shallow groundwater were encountered on site. A pond area and earthen dam are located in the northeastern portion of the site. Water was not observed in the pond area or drainages on-site. Due to the size of the lots and the proposed development, these areas can be avoided by construction. Structures should not block drainages. Septic fields should not be located in these areas due to the potential for periodic high groundwater conditions.

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 on-site wastewater treatment systems in accordance with El Paso Land Development Code. Two (2) test pits were excavated on the site. The approximate locations of the test pits are indicated on Figures 3 and 4, on the Geology/Engineering Geology Map, Figure 7, and on the Septic Suitability Maps, Figure 10. A table showing the results of the test pits is presented in Table 2.

Several structures with septic fields and wells currently exist on the site. Available El Paso County Health Department records for existing septic system located in Filing 4 are included in Appendix F. These records indicate the existing fields have been installed.

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 5, and the Soil Survey Descriptions are presented in Appendix E. The soils are described as having moderate to moderately rapid percolation rates.

Soils encountered in the tactile test pits consisted of silty to sandy clay and gravelly sandy loam. The limiting layers encountered in the test pits are the silty and sandy clay, and sandy loam, which corresponds to an LTAR values of 0.20 to 0.50 gallons per day per square foot. Bedrock or signs of groundwater were not encountered in the test pits. Absorption fields must be maintained a minimum of 4 feet above groundwater or bedrock, or confining layer. Should groundwater or bedrock be encountered within 6 feet of the surface, designed systems will be required.

In summary, it is our opinion the site is suitable for individual and commercial 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 may be required for the lots. Septic Suitability Map is presented in Figure 10. Individual soil testing is required on each lot 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 8), portions of the area are mapped with steam terrace deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 9), areas of the site are not mapped with any resources. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 10), the area of the site has been mapped as "Good" for industrial minerals. However, considering the silty to clayey nature of much of these materials and 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 10), 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 10).

The site has been mapped as "Fair" for oil and gas resources (Reference 10). 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 are 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 David and Alyce McElhoes, 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 Wabus, 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. Thorson, Jon P. and Madole, Richard F., 2003. *Geologic Map of the Monument Quadrangle, El Paso County, Colorado.* Colorado Geological Survey. Open-File Report 02-40.

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

6. 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.

7. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado.* Map Number 08041CO285G

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

9. 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.

10. 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 DAVID & ALYCE MCELHOES
PROJECT DANCING WOLF SUBDIVISION F4
JOB NO. 182043

SOIL TYPE	TEST PIT NO.	DEPTH (FT)	WATER (%)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	FHA SWELL (PSF)	USDA SOIL TYPE	UNIFIED CLASSIFI CATION	SOIL DESCRIPTION
1	2	2-3	3.6	13.1	NV	NP		2	SM	SAND, SILTY
1	2	5-6	3.1	13.0				2A	SM	SAND, SILTY
2	1	2-3	3.8	56.5	21	7		4	CL-ML	CLAY-SILT, VERY SANDY
2	1	5-6	8.4	69.1	27	12	670	4	CL	CLAY, SANDY

Table 2: Summary Tactile Test Pit Results

Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Seasonally Occurring Groundwater (ft.)
1	2A	0.50	N/A	N/A
2	4*	0.20*	N/A	N/A

*- Conditions that will require an engineered OWTS

FIGURES

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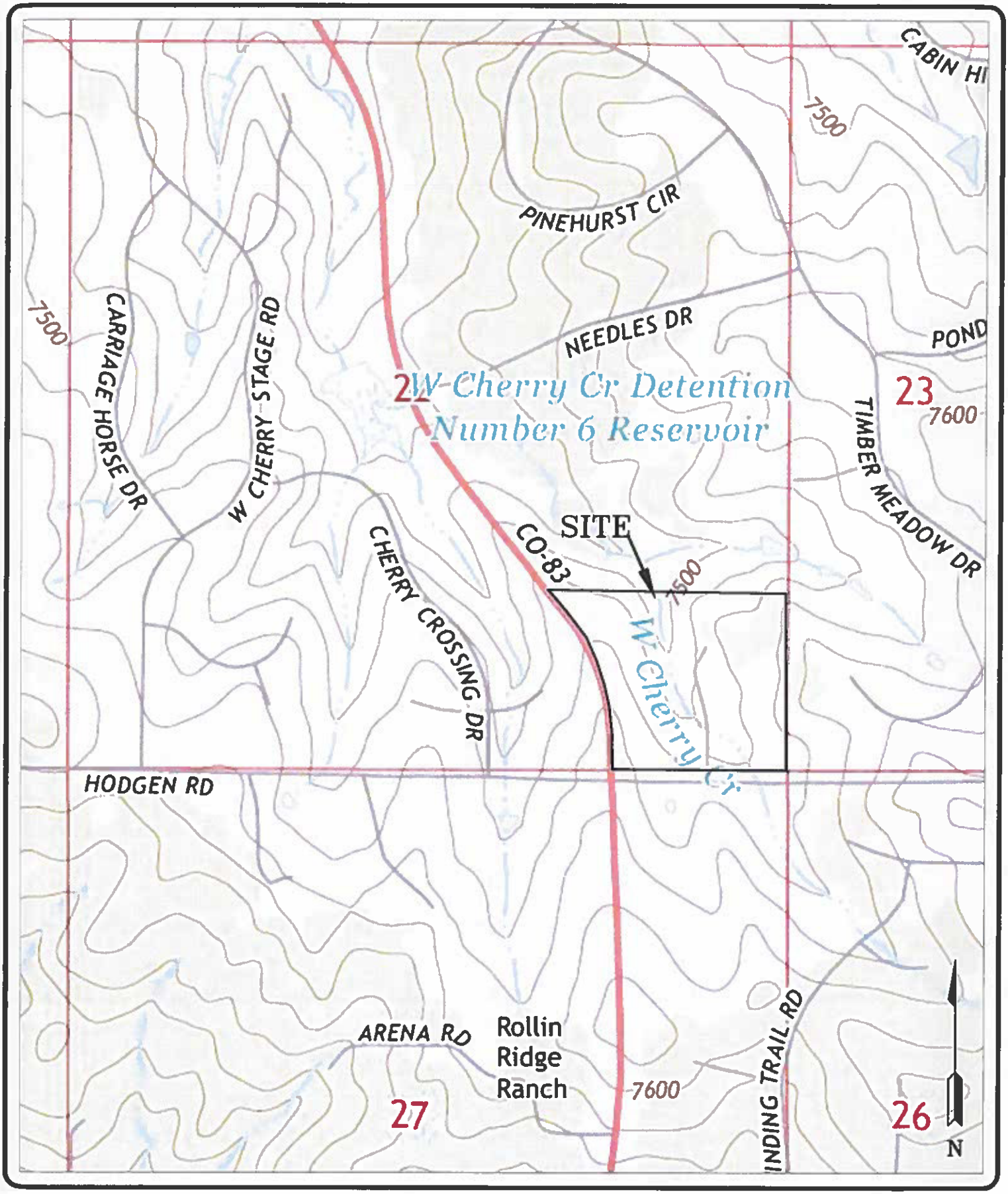
VICINITY MAP DANCING WOLF ESTATES SUBDIVISION FIL. 4 NW OF HODGEN ROAD AND HIGHWAY 83 EL PASO COUNTY, CO. FOR: DAVID AND ALYCE MCELHOES			
DRAWN: LLL	DATE: 1/10/19	CHECKED:	DATE:

JOB NO.: 182043

FIG NO.: 1



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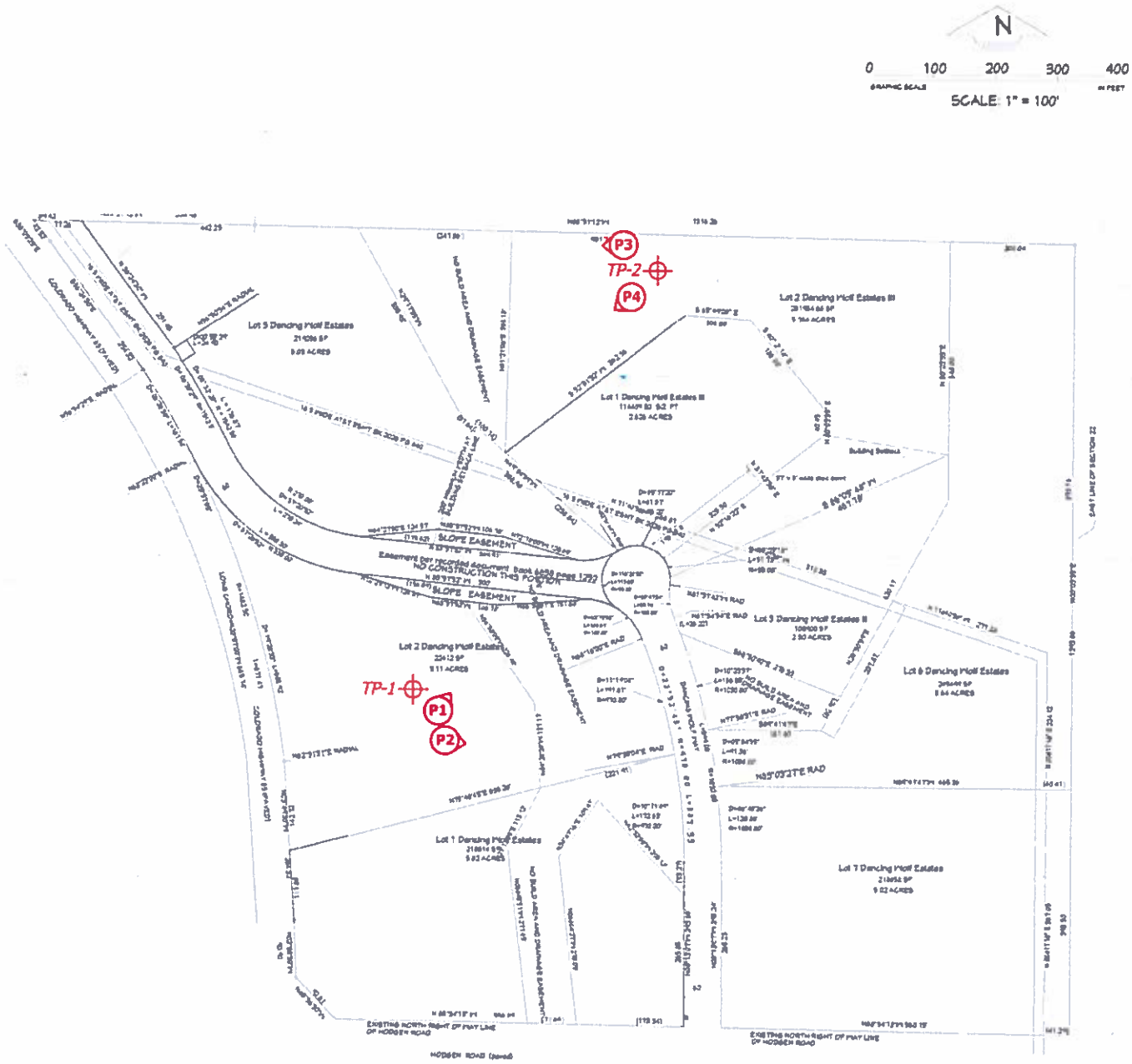
USGS MAP
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 2



TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

P2 - APPROXIMATE TEST PIT LOCATION AND NUMBER

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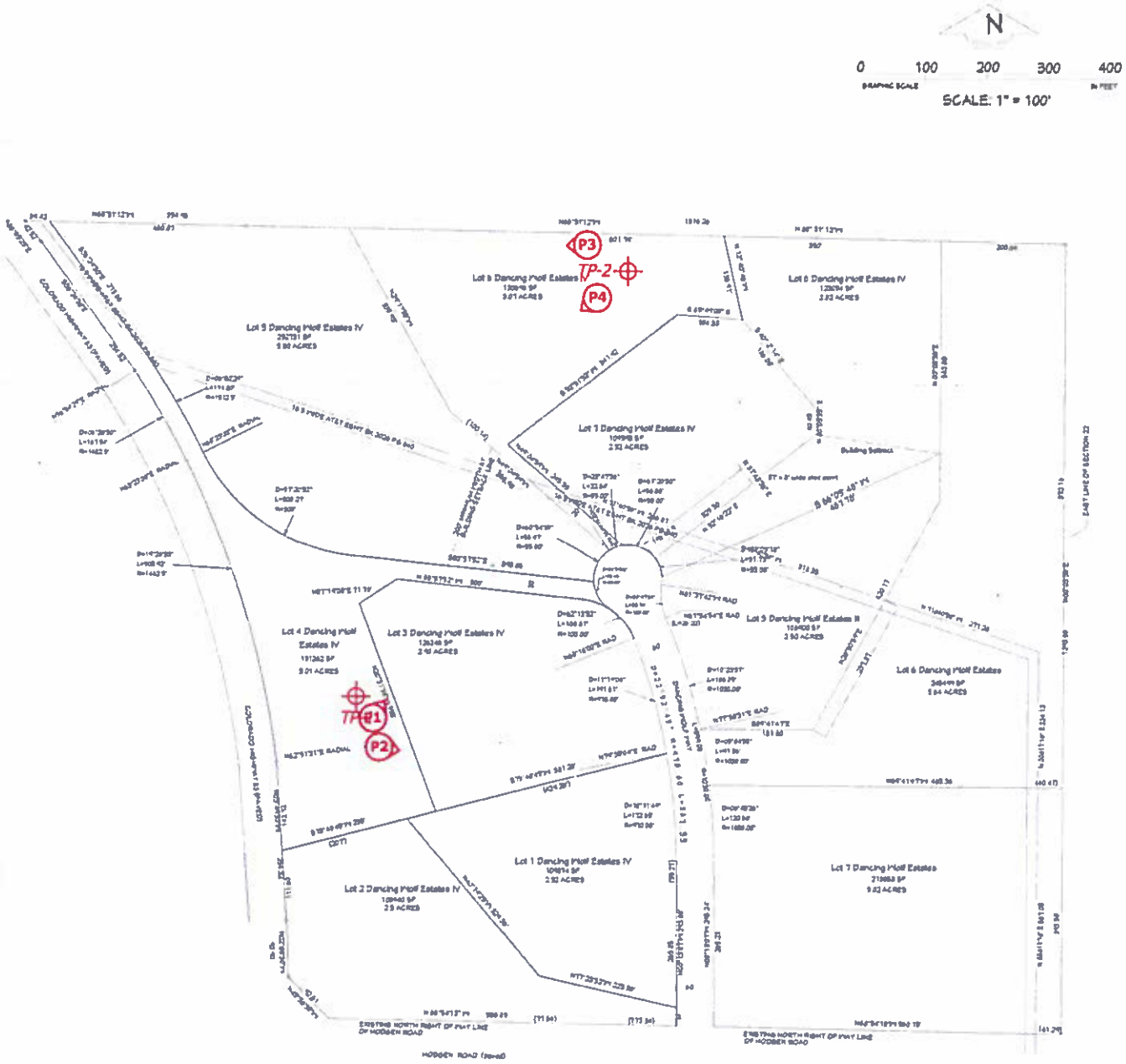
SITE PLAN AS PLATTED DANCING WOLF ESTATES SUBDIVISION FIL. 4 NW OF HODGEN ROAD AND HIGHWAY 83 EL PASO COUNTY, CO. FOR: DAVID AND ALYCE MCELHOES			
DRAWN: LLL	DATE: 1/10/19	CHECKED:	DATE:

JOB NO.: 182043

FIG NO.: 3



TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

P2 - APPROXIMATE TEST PIT LOCATION AND NUMBER

ENTECH ENGINEERING, INC.
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SITE PLAN AS REPLATTED
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 4

N

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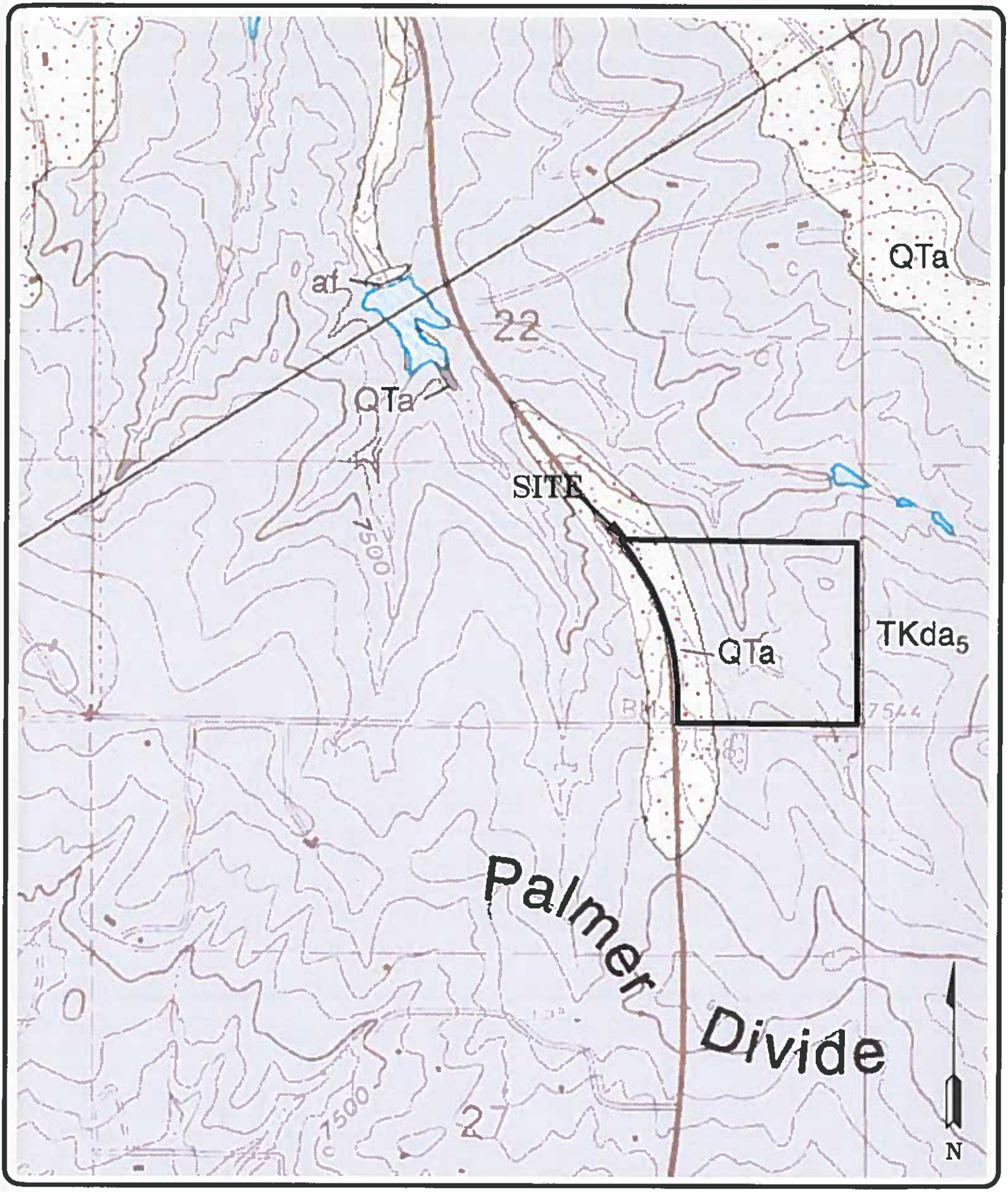
SOIL SURVEY MAP
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 5



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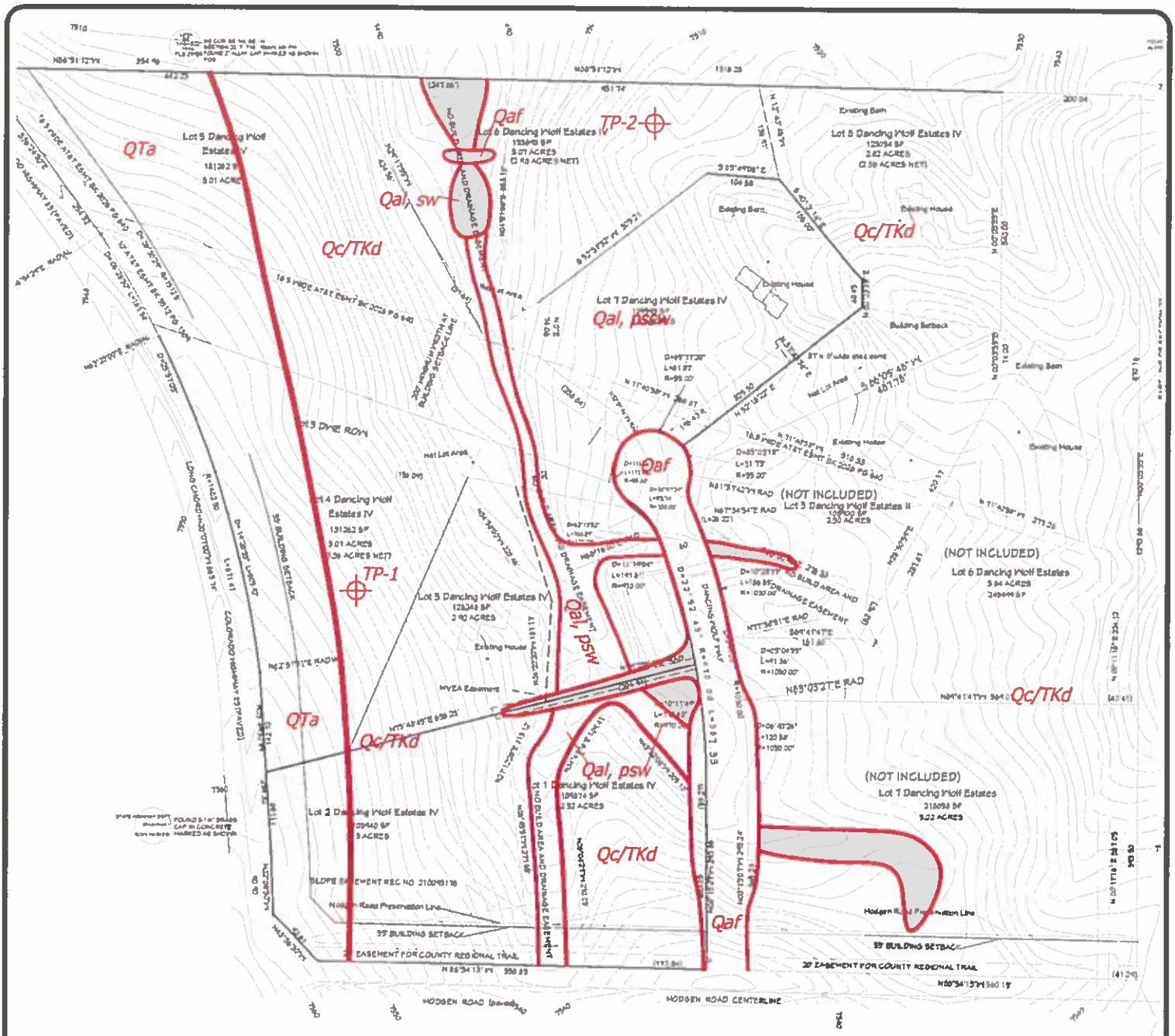
COLORADO SPRINGS, CO. 80907 (719) 531-5599

MONUMENT QUADRANGLE GEOLOGIC MAP
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 6



LEGEND:

Qaf	-	Artificial Fill of Holocene Age: man-made fill deposits
Qal	-	Recent Alluvium of Quaternary Age: recent water deposited materials
QTa	-	Alluvium of Palmer Divide of Quaternary Age: water deposited stream terrace deposits
QC/TKda	-	Dawson Formation of Tertiary to Cretaceous Age: arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone
psw	-	potentially seasonal shallow groundwater area
sw	-	seasonal shallow groundwater area

TP- APPROXIMATE TEST PIT LOCATION AND NUMBER

N

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GEOLOGY MAP
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 7

N

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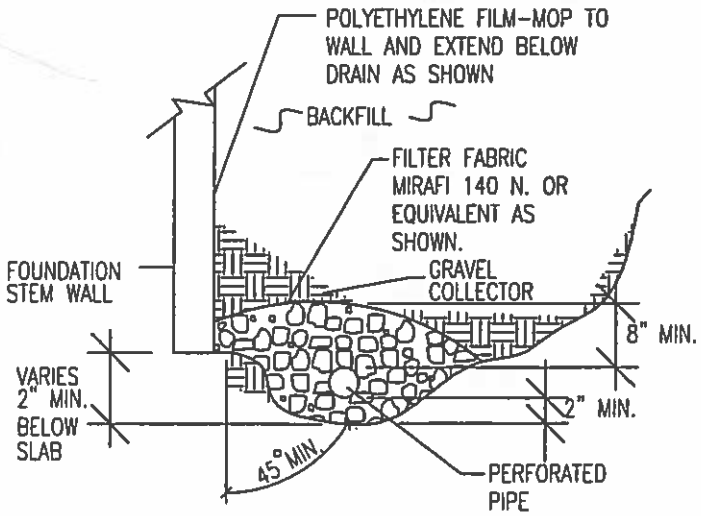
COLORADO SPRINGS, CO. 80907 (719) 531-5599

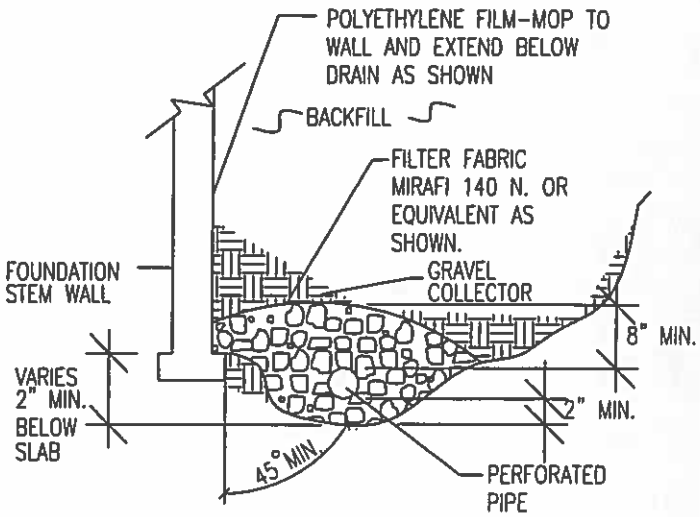
FEMA FLOODPLAIN MAP
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 8





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.

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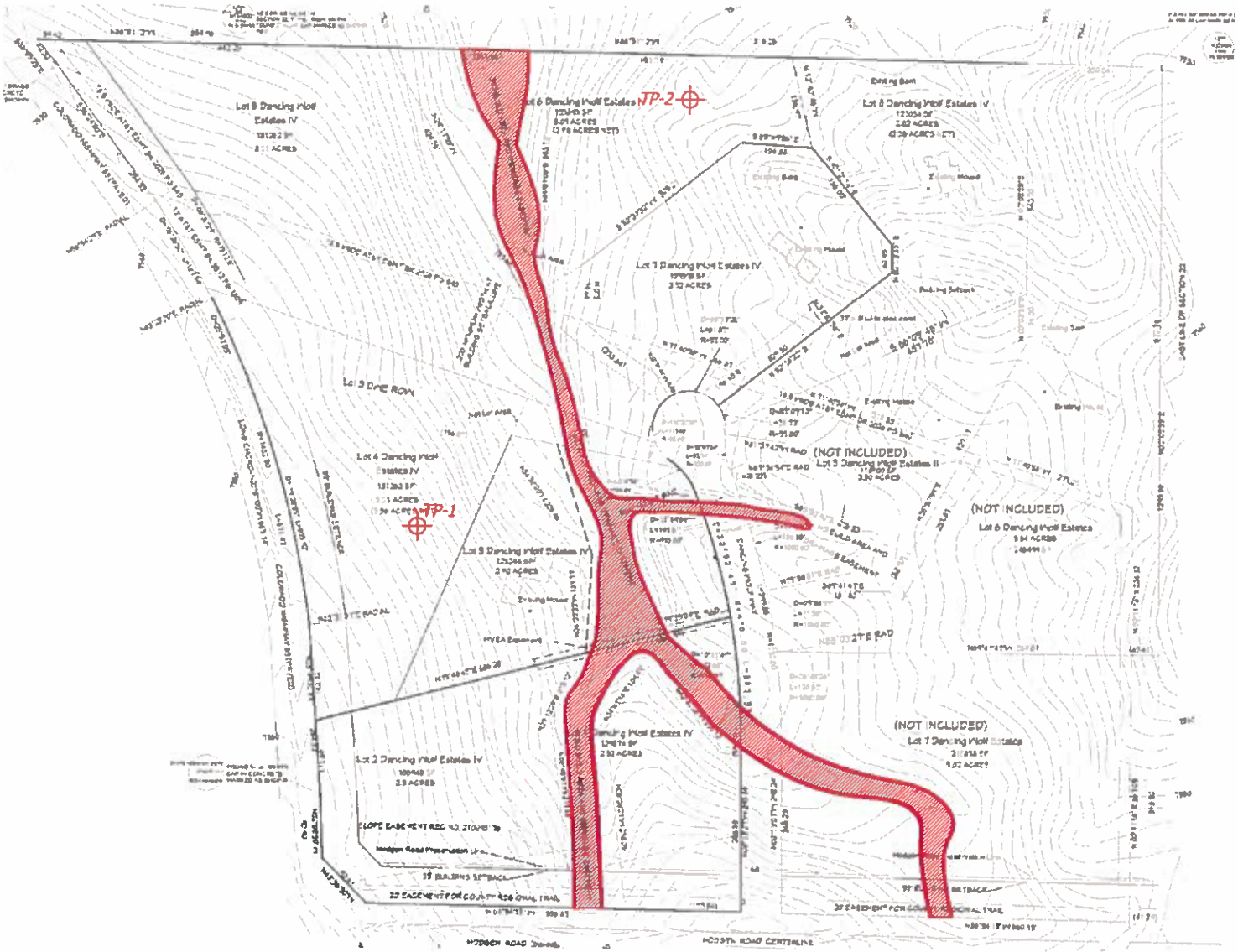
PERIMETER DRAIN DETAIL

DRAWN:	DATE:	DESIGNED:	CHECKED:
	1/10/19	DS	

JOB NO.: 182043

FIG NO.: 9



LEGEND:

- AREAS NOT SUITABLE FOR OWTS

*- WATER WELLS MUST BE A MINIMUM OF 100 FT FROM OWTS ABSORPTION FIELDS

N

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

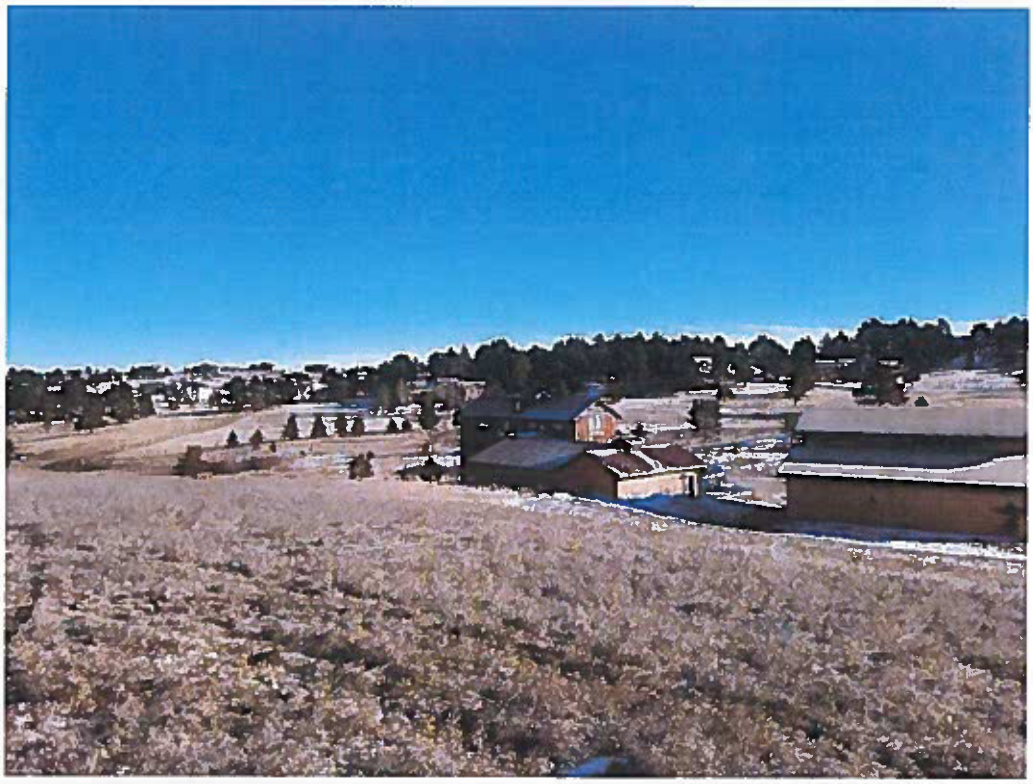
SEPTIC SUITABILITY MAP
DANCING WOLF ESTATES SUBDIVISION FIL. 4
NW OF HODGEN ROAD AND HIGHWAY 83
EL PASO COUNTY, CO.
FOR: DAVID AND ALYCE MCELHOES

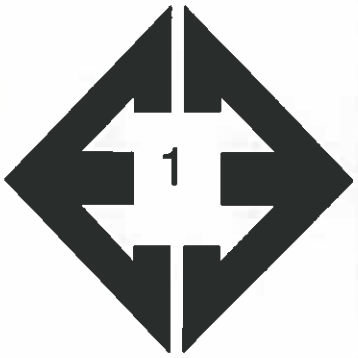
DRAWN:	DATE:	CHECKED:	DATE:
LLL	1/10/19		

JOB NO.: 182043

FIG NO.: 10

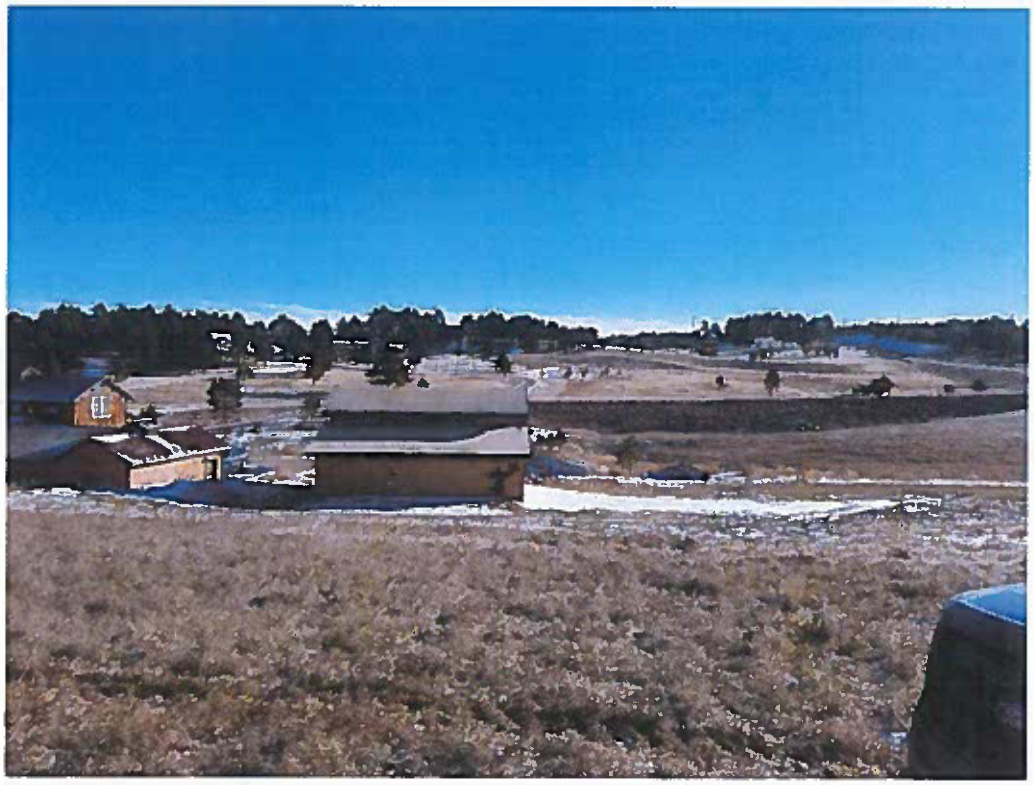
APPENDIX A: Site Photographs

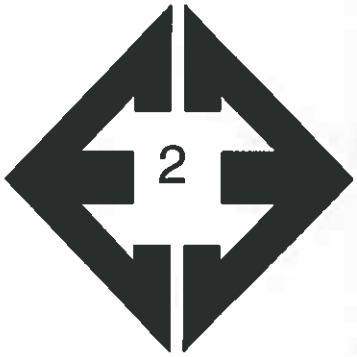




Looking northeast from the southwestern portion of the site.

December 27, 2018





Looking east from the southwestern portion of the site.

December 27, 2018

Job No. 182043

3

Looking west from the northern portion of the site.

December 27, 2018

4

Looking southwest from the northern portion of the site.

December 27, 2018

Job No. 182043

APPENDIX B: Test Pit Logs

TEST PIT NO. 1
DATE EXCAVATED 12/27/2018
Job # 182043

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil silty clay, brown	1					
silty clay, light brown	2			bl	m	4
	3					
	4					
sandy clay, light brown	5			bl	m	4
	6					
	7					
	8					
	9					
	10					

TEST PIT NO. 2
DATE EXCAVATED 12/27/2018
CLIENT DAVID AND ALYCE MCELHOES
LOCATION DANCING WOLF ESTATES SUB. F4

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

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

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

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

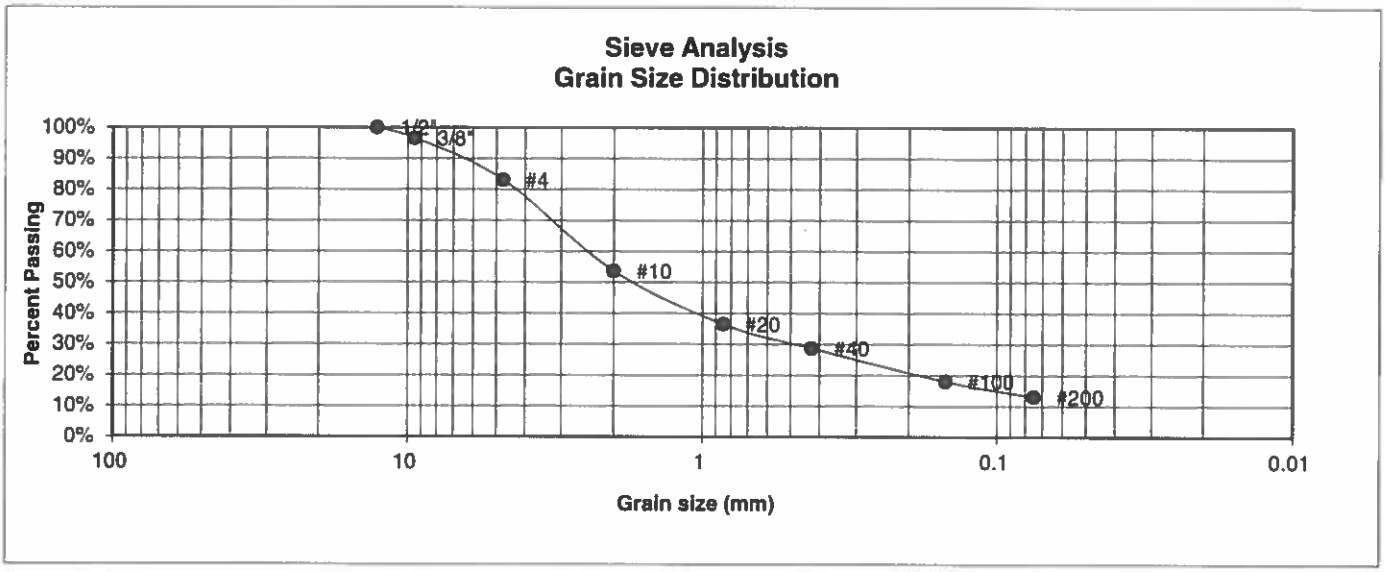
TEST PIT LOG

DRAWN:	DATE:	CHECKED: LLL	DATE: 1/10/19

JOB NO.: 182043
FIG NO.: B-1

APPENDIX C: Laboratory Test Results

TEST PIT NO.	2	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	182043
CLIENT	DAVID & ALYCE MCELHOES				
PROJECT	DANCING WOLF ESTATES				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	96.6%
4	83.1%
10	53.7%
20	36.5%
40	28.7%
100	18.0%
200	13.1%

Atterberg Limits	
Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

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

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

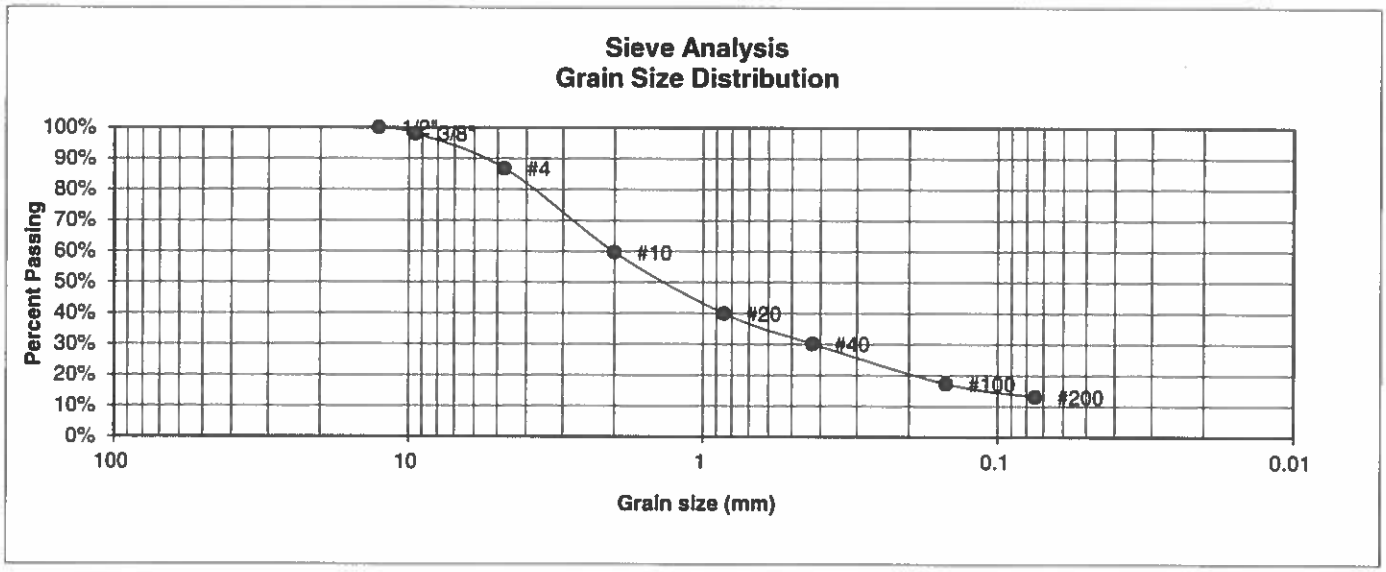
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	1/10/19

JOB NO.: 182043

FIG NO.: L-1

TEST PIT NO.	2	UNIFIED CLASSIFICATION	SM	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	182043
CLIENT	DAVID & ALYCE MCELHOES				
PROJECT	DANCING WOLF ESTATES				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.1%
4	86.9%
10	59.7%
20	40.0%
40	30.2%
100	17.3%
200	13.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

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

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

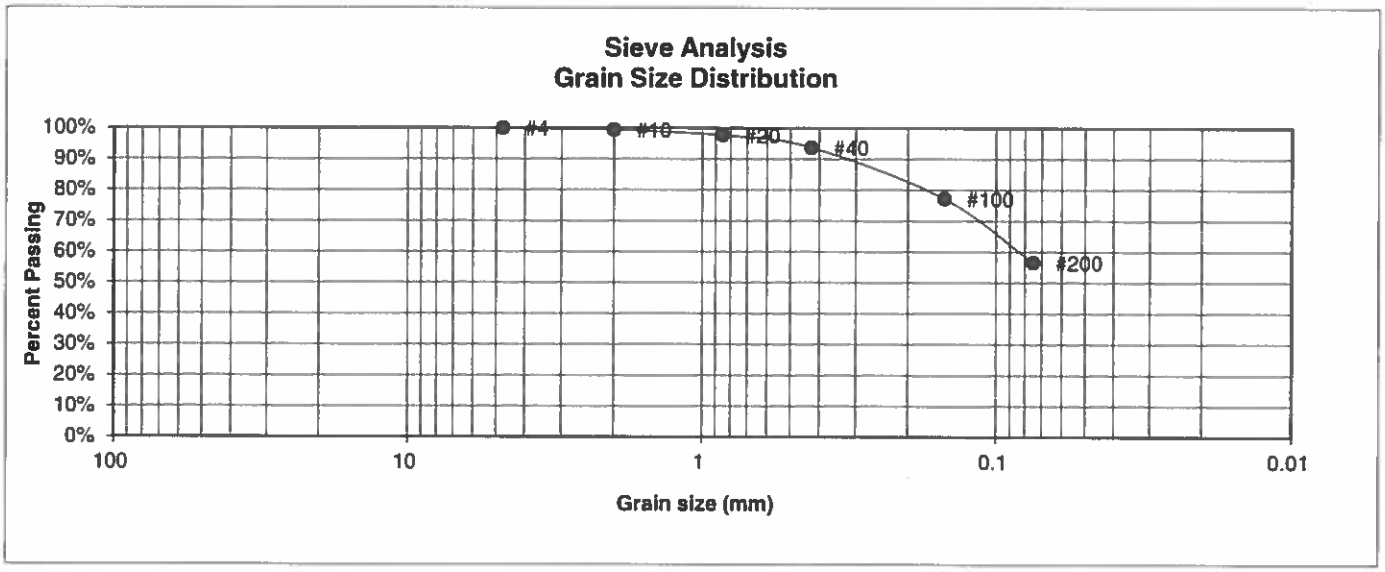
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	1/10/19

JOB NO.: 182043

FIG NO.: L-2

TEST PIT NO.	1	UNIFIED CLASSIFICATION	CL-ML	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	182043
CLIENT	DAVID & ALYCE MCELHOES				
PROJECT	DANCING WOLF ESTATES				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.4%
20	97.7%
40	93.7%
100	77.2%
200	56.5%

Atterberg Limits	
Plastic Limit	14
Liquid Limit	21
Plastic Index	7

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

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COLORADO SPRINGS, COLORADO 80907

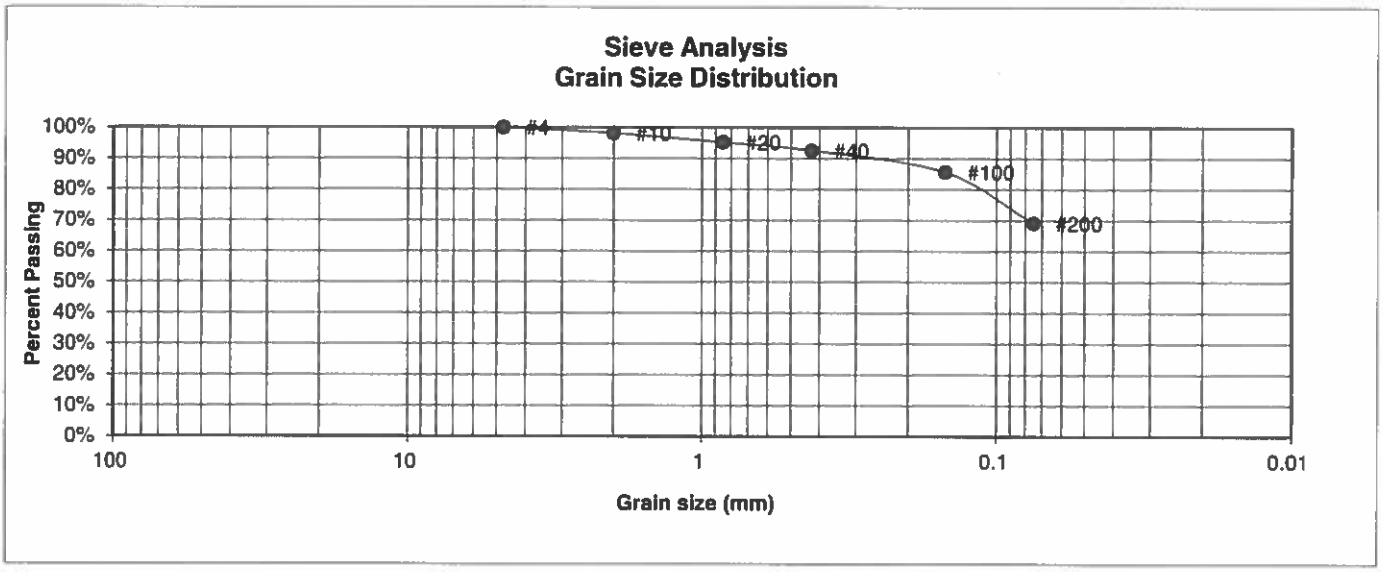
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	1/10/19

JOB NO.: 182043

FIG NO.: C-3

TEST PIT NO.	1	UNIFIED CLASSIFICATION	CL	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	182043
CLIENT	DAVID & ALYCE MCELHOES				
PROJECT	DANCING WOLF ESTATES				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.2%
20	95.2%
40	92.6%
100	85.7%
200	69.1%

Atterberg Limits	
Plastic Limit	15
Liquid Limit	27
Plastic Index	12

Swell	
Moisture at start	10.9%
Moisture at finish	21.6%
Moisture increase	10.8%
Initial dry density (pcf)	98
Swell (psf)	670

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED: LLL	DATE: 1/10/19

JOB NO.: 182043

FIG NO.: L-4

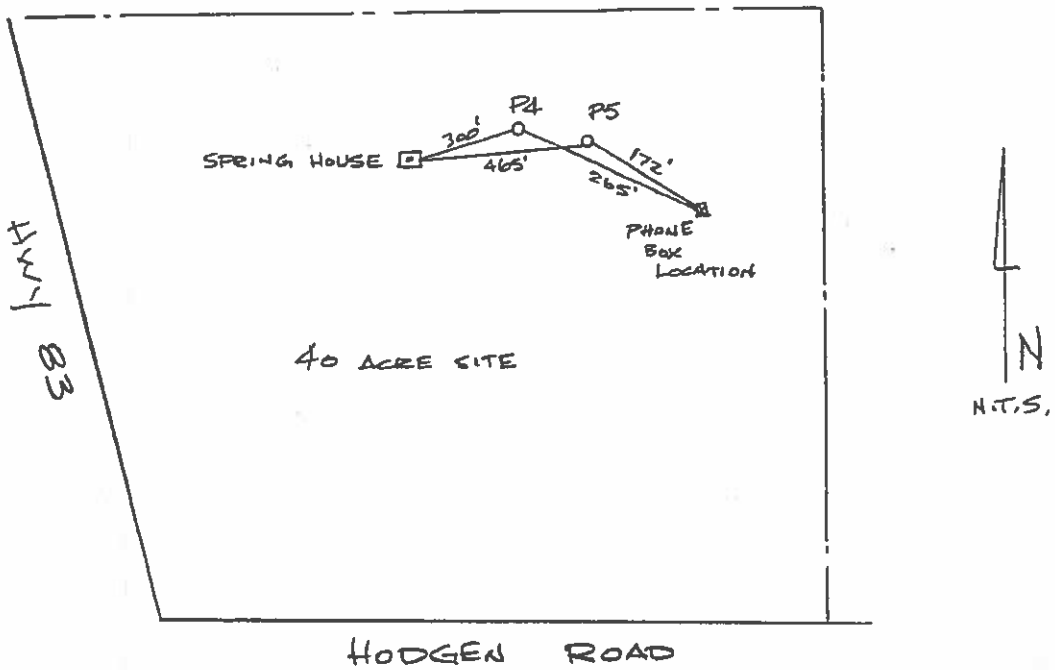
APPENDIX D: Test Boring Logs and Testing Results from Previous Investigations

TEST BORING NO. P4
DATE DRILLED: 3-28-96
REMARKS: PROFILE HOLE DRY 3-29-96

Depth (ft)	Symbol	Samples	Blows per ft.	Water Content %	Soil Type
	SAND, SILTY TO CLAYEY, BROWN, DENSE, MOIST				
5			33	6.4	
	SANDSTONE, SILTY TO CLAYEY, BROWN, DENSE, MOIST				
10			50/10"	6.2	
15			50/10"	8.9	
20			BULK	9.7	
25					

TEST BORING NO. P5
DATE DRILLED: 3-28-96
REMARKS: PROFILE HOLE DRY 3-29-96

Depth (ft)	Symbol	Samples	Blows per ft.	Water Content %	Soil Type
	SAND, SILTY TO CLAYEY, BROWN, MEDIUM DENSE, MOIST				
5			18	25.2	
	SANDSTONE, SILTY TO CLAYEY, BROWN, DENSE, MOIST				
10			50/10"	7.9	
15			BULK	7.3	
20					
25					



RMG ENGINEERS
5555 ERINDALE DRIVE SUITE 205
COLORADO SPRINGS CO 80918
(719)548-0600 FAX 548-9476

PROFILE HOLE LOGS AND LOCATION DIAGRAM

JOB. 26710B

FIG. 1

FRONT RANGE GEOTECHNICAL INC.

DRILL LOGS

JOB#: 11473

TEST BORING NO.: TH-1

DATE: 05/29/2003

0-16" TOPSOIL

16"-12' SAND

fine grained

moderate density

low-moderate moisture content

low clay content

non-plastic

tan-buff color

12'-15' SANDSTONE

fine-medium grained

very-high density

moderate moisture content

low clay content

low plasticity

tan-buff color

DEPTH (in ft.)	SYMBOL	SAMPLES	BLOW COUNT	WATER %	SOIL TYPE
6			13/12"	4.5	SM
16			72/12"	7.3	

JOB#: 11473

TEST BORING NO.: TH-2

DATE: 05/29/2003

0-12" TOPSOIL

12"-8' SILTY/CLAY

fine grained

moderate density

moderate moisture content

low sand content

moderate plasticity

tan color

8'-15' SAND

fine-medium grained

high density

moderate moisture content

low clay content

low plasticity

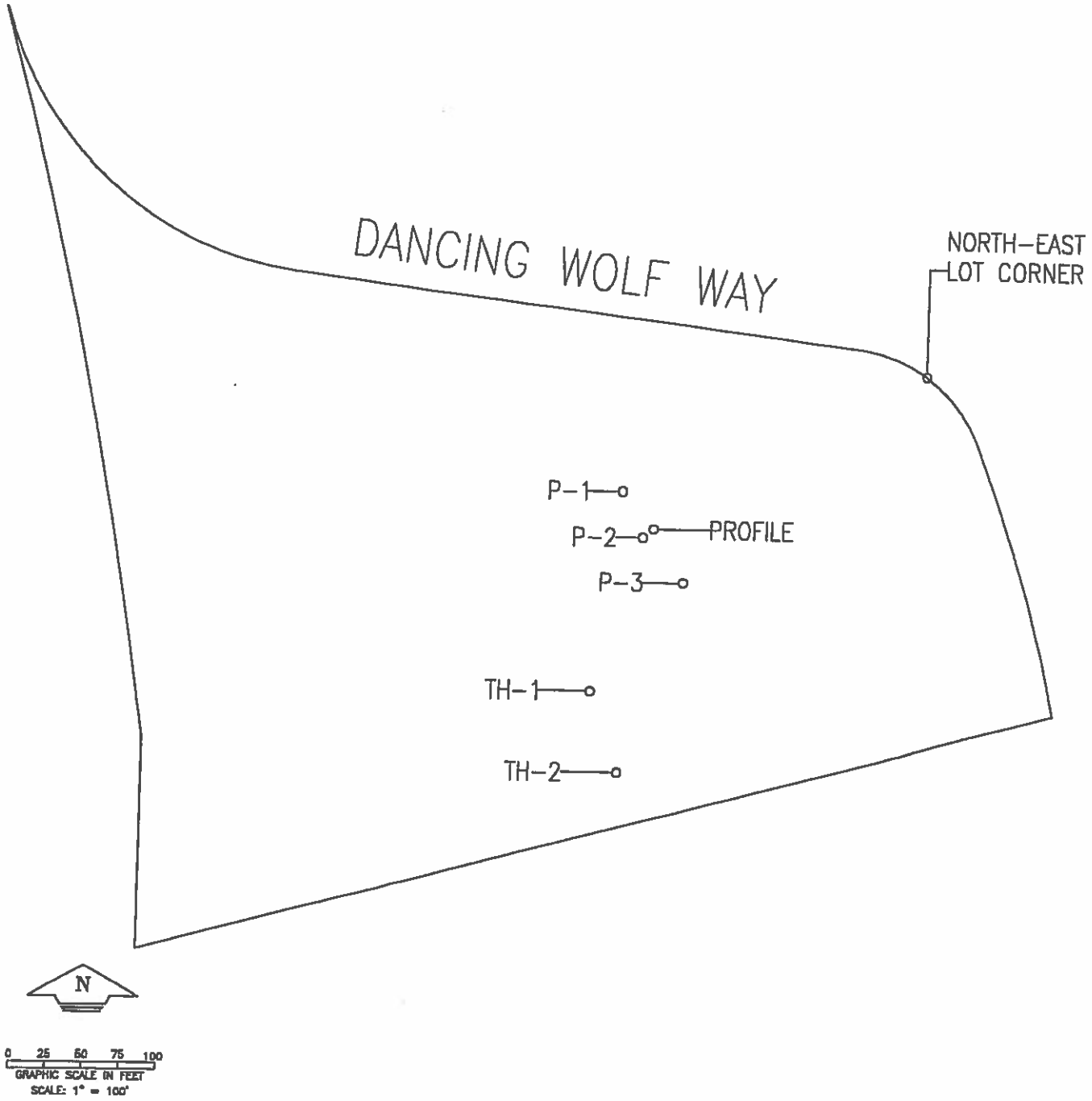
tan-buff color

DEPTH (in ft.)	SYMBOL	SAMPLES	BLOW COUNT	WATER %	SOIL TYPE
6			18/12"	9.1	CL/ML
10			31/12"	5.2	

FRONT RANGE GEOTECHNICAL INC.

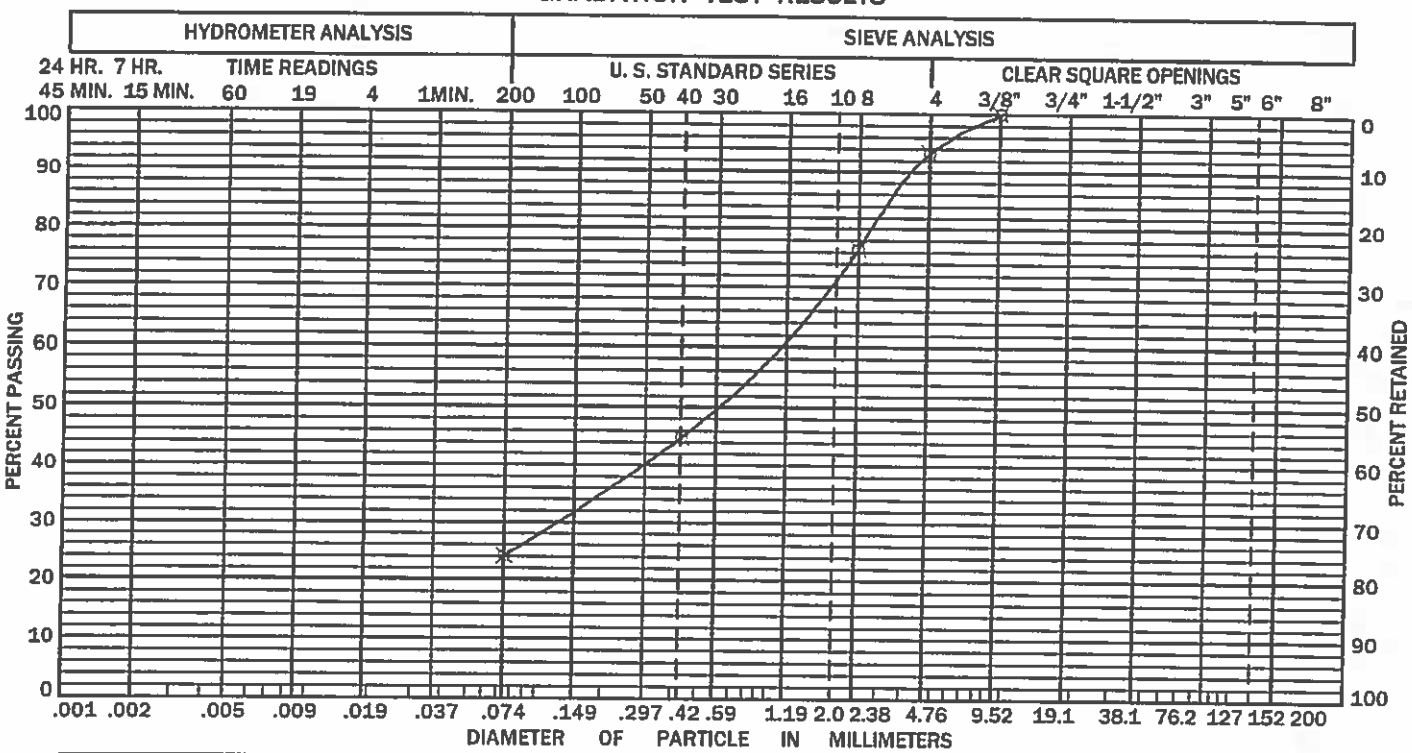
SITE MAP

Lot 2, Filing #1,
Dancing Wolf Estates Subdivision,
Dancing Wolf Way,
El Paso County,
Colorado,
Job #11473



FRONT RANGE GEOTECHNICAL INC.

GRADATION TEST RESULTS



CLAY TO SILT	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

CLASSIFICATION SM

GRAVEL 6.4 %

SAND 69.5 %

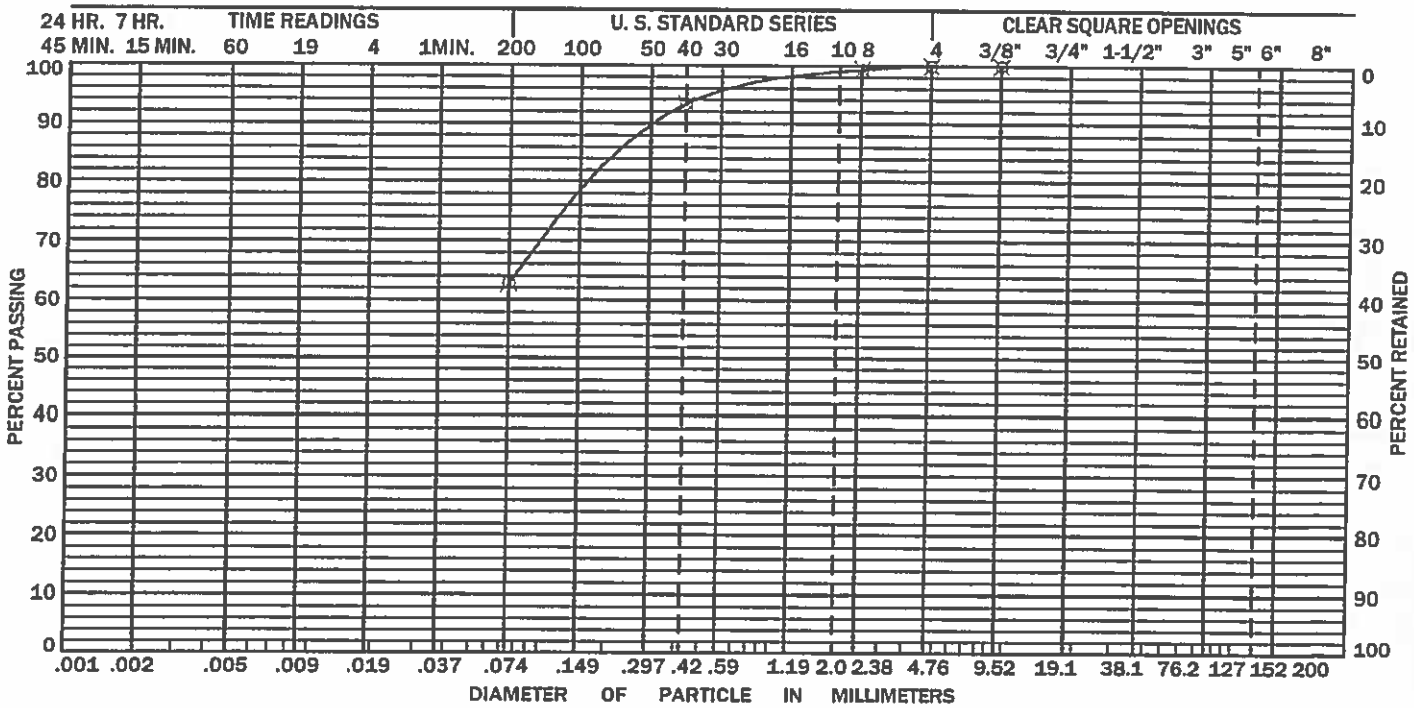
FINES 24.1 %

SAMPLE# 1 HOLE# TH-1 DEPTH 5 FEET

NOTES: 4.5 % Moisture content

LL = Could Not Be Determined

PL = Non-Plastic



CLAY TO SILT	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

CLASSIFICATION CL/ML

GRAVEL 0.0 %

SAND 37.1 %

FINES 62.9 %

SAMPLE# 1 HOLE# TH-2 DEPTH 5 FEET

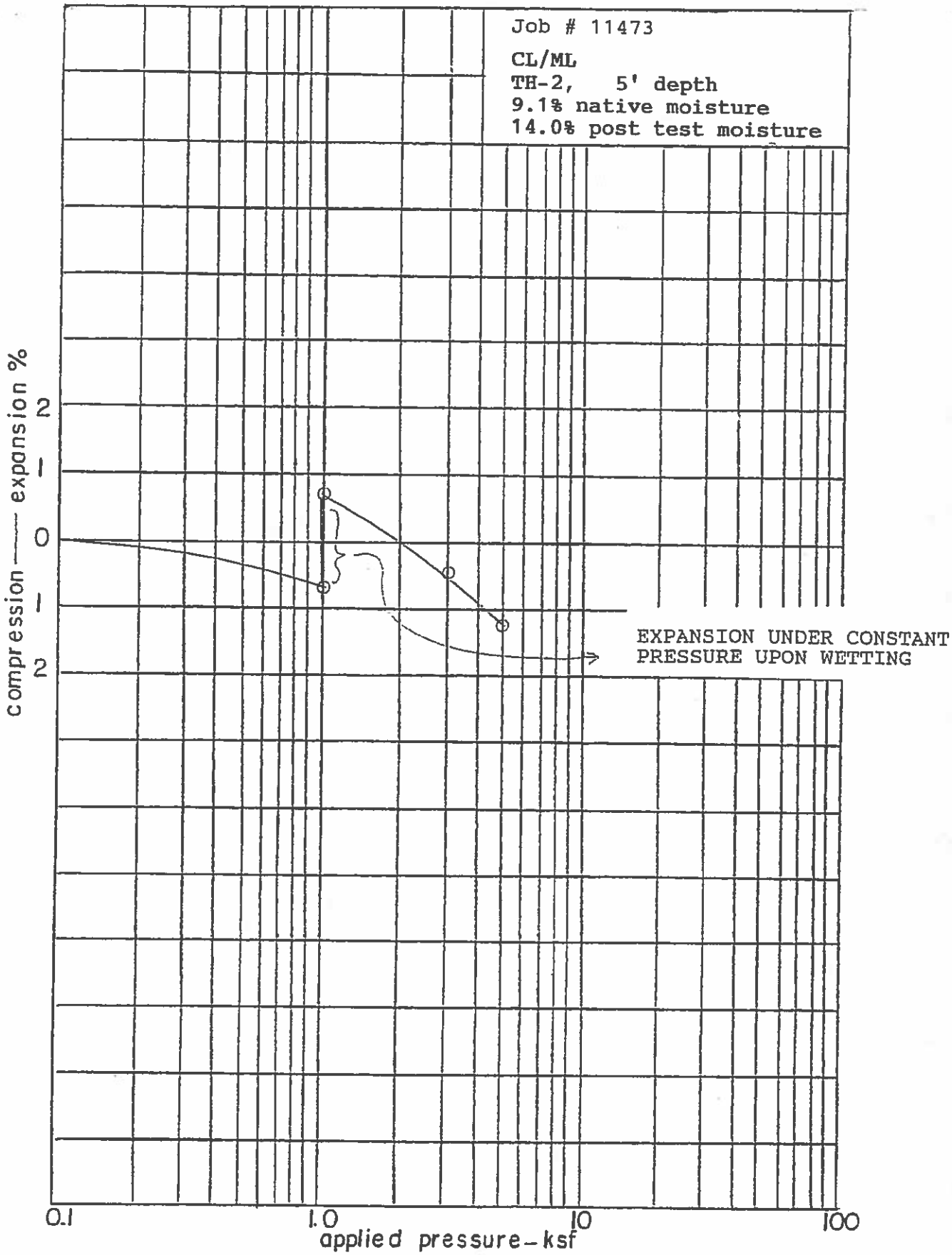
NOTES: 9.1 % Moisture content

LL = 24.9 %

PL = 20.5 %

PI = 4.4 %

Job #: 11473 By: KO 05/30/2003



SWELL-CONSOLIDATION TEST
RESULTS

APPENDIX E: Soil Survey Descriptions

El Paso County Area, Colorado

21—Cruckton sandy loam, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 367s
Elevation: 7,200 to 7,600 feet
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 42 to 46 degrees F
Frost-free period: 110 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Cruckton

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 11 inches: sandy loam
Bt - 11 to 28 inches: sandy loam
C - 28 to 60 inches: loamy coarse sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

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

El Paso County Area, Colorado

26—Elbeth sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 367y
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Elbeth

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose

Typical profile

A - 0 to 3 inches: sandy loam
E - 3 to 23 inches: loamy sand
Bt - 23 to 68 inches: sandy clay loam
C - 68 to 74 inches: sandy clay loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

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

Data Source Information

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

El Paso County Area, Colorado

92—Tomah-Crowfoot loamy sands, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 36b9
Elevation: 7,300 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Tomah and similar soils: 50 percent
Crowfoot and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tomah

Setting

Landform: Alluvial fans, hills
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from arkose and/or residuum weathered from arkose

Typical profile

A - 0 to 10 inches: loamy sand
E - 10 to 22 inches: coarse sand
C - 48 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Description of Crowfoot

Setting

Landform: Alluvial fans, hills

Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 12 inches: loamy sand
E - 12 to 23 inches: sand
Bt - 23 to 36 inches: sandy clay loam
C - 36 to 60 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Divide (R049BY216CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

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

Data Source Information

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

APPENDIX F: El Paso County Health Department Septic Records

EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT
INDIVIDUAL SEWAGE DISPOSAL SYSTEM INSPECTION FORM

Permit # ON0005140
Date August 4, 2004
#612 200 3036

APPROVED: Yes ✓ No ____ Environmental Health Specialist: Brad Wallace

Address 16605 Dancing Wolf Way Owner Alyce Melhoes
Legal Description Lot 2, Dancing Wolf Estates III
Residence ✓ # Bedrooms 6 Commercial I ____ System Installer J+K Excavating

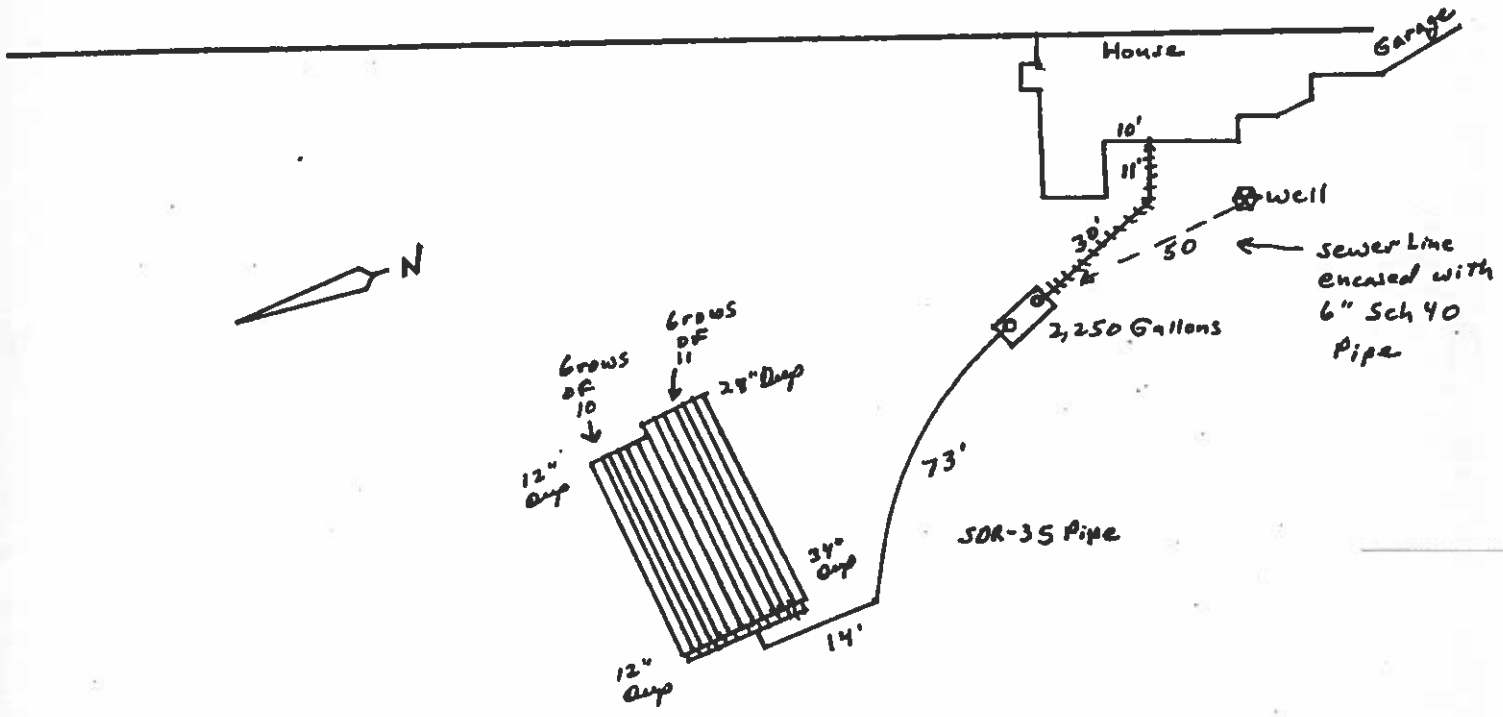
SEPTIC TANK:
Commercial ✓ Noncommercial ____ Construction Material Pre-Cast Concrete Capacity Gallon 2,250 Gallons

DISPOSAL FIELD:
Trench: Depth (Range) ____ Width ____ Total Length ____ Sq. Ft. ____
Bed: Depth (Range) ____ Length ____ Width ____ Sq. Ft. ____
Depth of Rock ____ Under PVC ____ Type of cover on Rock ____

DRYWELLS: # of Pits ____ Rings (Pit 1) ____ Rings (Pit 2) ____ Working Depth #1 ____ #2 ____
Size (L x W) #1 ____ #2 ____ Total Sq. Ft. ____

ROCKLESS SYSTEMS:
Standard Chamber: Type Infiltrators #Chambers 126 Sq. Ft./Chamber 15.5 Bed X Trench ____
High Profile Units: Type Chamber ____ #Chambers ____ Sq. Ft./Chamber ____ Bed ____ Trench ____
Reduction Allowed 35 % Sq. Ft. Required 2,993 Depth (Range) 12" to 34"
Sq. Ft. Installed ____ Equivalent Sq. Ft. Installed with Reduction 3004 FT²
Engineer Design: Y (N) Engineering Firm ____
Approval letter provided? Y N
Well installed at time of septic system inspection? (Y) N Public Water? ____
*Approval will be revoked if in the future the well is found to be within 50 feet of the septic tank and/or 100 feet of the disposal field.

NOTES: Well Greater Than 128' To Leach Field.



EL PASO COUNTY

DEPARTMENT OF HEALTH AND ENVIRONMENT

301 S Union Blvd, Colorado Springs, Colorado 719-575-8636

INDIVIDUAL SEWAGE DISPOSAL SYSTEM PERMIT

OWNER NAME:	ALYCE MCELHOES	PERMIT NUMBER:	ON0005140
ADDRESS:	16605 DANCING WOLF WAY	DATE PERMITTED:	9/3/2003
CITY,STATE,ZIP:	COLORADO SPRINGS CO 80908	PHONE NUMBER:	7193378124
INSTALLED BY:			

This permit is issued in accordance with 25-10-107 Colorado Revised Statues. PERMIT EXPIRES upon completion-installation of sewage-disposal system or at the end of twelve (12) months from date of issue- whichever occurs first-(unless work is in progress). If both a building and an ISDS permit are issued for the same property and construction has not commenced prior to the expiration date of the building permit, the ISDS permit shall expire at the same time as the building permit. This permit is revokable if all stated requirements are not met.
Sewage disposal system to be installed by an El Paso County Licensed System Contractor or the property owner.

THIS PERMIT DOES NOT DENOTE APPROVAL OF ZONING AND ACREAGE REQUIREMENTS.

Rosemary C. Baker-Martin

DIRECTOR, EL PASO COUNTY DEPARTMENT OF HEALTH AND ENVIRONMENT

PERMIT EXPIRATION DATE :
Expires twelve months from date of issue

Ted Darden / 578-3167
ENVIRONMENTALIST / PHONE NUMBER*

* NOTE: FOR INSPECTIONS CALL 575-8699 BEFORE 8:30 A.M. OF THE DAY TO BE INSPECTED.
(WEEKENDS & HOLIDAYS EXCLUDED)
LEAVE THE ENTIRE SEWAGE DISPOSAL SYSTEM UNCOVERED FOR FINAL INSPECTION.

WATER SOURCE: WELL

MINIMUM SEPTIC TANK SIZE : 2,000 GALLONS MINIMUM ABSORPTION AREA REQUIRED 2,993 SQ FT

PLANNING DEPARTMENT [redacted] ENUMERATION [redacted] FLOOD PLAIN [redacted] WASTEWATER [redacted]

COMMENTS:

CONSTRUCT THE LEACH FIELD IN THE PERCOLATION TEST LOCATION (AVOID THE AREA OF PERCOLATION HOLE #2 IF POSSIBLE). NO PORTION OF THE LEACH FIELD EXCAVATION MAY EXCEED 36 INCHES BELOW NATIVE GROUND SURFACE. KEEP THE LEACH FIELD AWAY FROM DRAINAGE AREAS AND MAINTAIN ALL MINIMUM SEPARATIONS. THE LEACH FIELD MUST BE AT LEAST 128 FEET FROM ANY WELL.

The Health Office shall assume no responsibility in case of failure or inadequacy of a sewage-disposal system, beyond consulting in good faith with the property owner or representative. Free access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with requirements of this law.

FOR ADMINISTRATIVE USE ONLY

Permit Ready: _____ Called 9/4/03 JAK Mailed

Final Inspection Requested: BY: John - J & K Exc. Date Called In: 8/3/04 4:15 pm

Phone # 331-4321 Septic Site will be ready: _____

481-2417

El Paso County, CO
Public Health
Prevent • Promote • Protect

Environmental Health Division
1675 W. Garden of the Gods Rd., Suite 2044
Colorado Springs, CO 80907
(719) 578-3199 phone
(719) 575-8664 fax
www.elpasocountyhealth.org

ON-SITE WASTEWATER SYSTEM INSPECTION FORM

PERMIT # ON0033359

DATE 10/2/14

APN# 6122004001

APPROVED YES [X] NO [ ] Environmental Health Specialist: Neil Mayes

Address: 16570 Dancing Wolf C/S CO 80908 Owner

Residence X #Bedrooms 4/5 Commercial System Installer Itk Excavating

SEPTIC TANK: Construction Material Precast Concrete Capacity Gallon 1500

DISPOSAL FIELD:

Trench: Depth (Range) Width Total Length Sq. Ft.

Bed: Depth (Range) Width Total Length Sq. Ft.

Depth of Rock Under PVC Type of cover on Rock

DRYWELLS: # of Pits Rings(Pit 1) Rings(Pit2) Working Depth #1 #2

Size (L x W) #1 #2 Total Sq. Ft

ROCKLESS SYSTEMS:

Standard Chamber: Type Arc 36 #Chambers 56 Sq. Ft./Chamber 15 Bed Trench X

High Profile Units: Type #Chambers Sq. Ft./Chamber Bed Trench

Reduction Allowed % Sq. Ft. Required 840 Depth (Range)

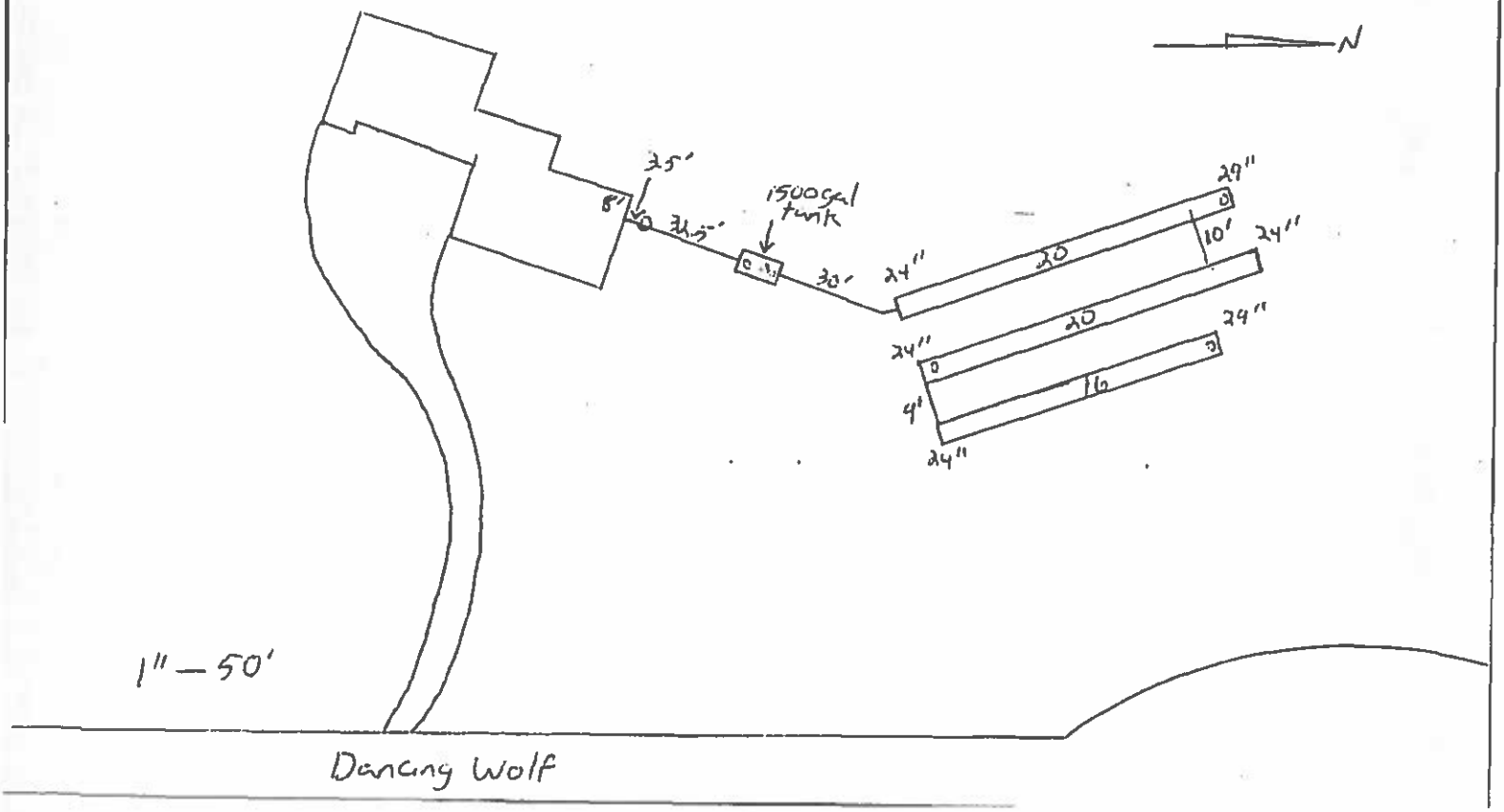
Sq. Ft. Installed 840 Equivalent Sq. Ft. Installed with Reduction

Engineer Design: Y[ ] N[X] Engineering Firm Approval Letter Provided: Y[ ] N[ ]

Well installed at time of septic inspection: Y[ ] N[X] Public Water: Y[ ] N[X]

*Approval will be revoked if in the future the well is found to be within 50 feet of the septic tank and/or 100 feet of the disposal field.

Notes:



Notify Environmental Health of any change of ownership, type of business activity, business name, or billing address by calling (719) 578-3199. Failure to notify Environmental Health may result in late penalties, Permit/License denial or revocation, and business closure. PERMITS/LICENSES TO OPERATE AND ANNUAL FEE PAYMENTS ARE NOT TRANSFERABLE. Permits become void on change of ownership. New owners must apply and pay for a new Permit(s)/License(s) prior to beginning operation.

Attn: ALYCE AND DAVID MCELHOES
16570 DANCING WOLF
COLORADO SPRINGS, CO 80908

El Paso County, CO
Public Health
Prevent • Promote • Protect

EL PASO COUNTY PUBLIC HEALTH
ENVIRONMENTAL HEALTH DIVISION
1675 W. GARDEN OF THE GODS ROAD, SUITE 2044
COLORADO SPRINGS, CO 80907
PHONE: (719) 578-3199 FAX: (719) 578-3188
www.elpasocountyhealth.org

NEW SYSTEM PERMIT - OWTS

Valid From 9/22/2014 To 9/22/2015

PERMITEE : ALYCE AND DAVID MCELHOES
16570 DANCING WOLF
COLORADO SPRINGS, CO 80908

OWNER NAME : **ALYCE AND DAVID MCELHOES**

Onsite ID: ON0033359
Tax Schedule # : 6122004001
Permit Issue Date: 09/22/2014
Dwelling Type: RESIDENTIAL
# of Bedrooms (if Res): 5
Proposed Use (if Comm):
Designed Gallons/Day:
Water Source: PRIVATE WELL

System Installation Requirements:

- **A minimum horizontal distance of 25 feet shall be maintained from all no build and drainage easements.**
- **If changes are made, a new design document shall be submitted to the health department prior to a final inspection being conducted.**

The OWTS must be installed per the stamped and approved Design Document dated 09/22/2014.

This permit is issued in accordance with 25-10-106 Colorado Revised Statutes. The PERMIT EXPIRES upon completion/installation of the Onsite Wastewater Treatment System, or at the end of twelve (12) months from date of issue, whichever occurs first. If both a Building Permit and an Onsite Wastewater Treatment System Permit are issued for the same property and construction has not commenced prior to the expiration date of the Building Permit, the Onsite Wastewater Permit shall expire at the same time as the Building Permit. This permit is revocable if all stated requirements are not met. The Onsite Wastewater Treatment System must be installed by an El Paso County Licensed System Contractor, or the property owner.

The Health Officer shall assume no responsibility in case of failure or inadequacy of an Onsite Wastewater Treatment System, beyond consulting in good faith with the property owner or representative. Access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with the requirements of this law (permit).

Inspection request line: Call (719) 575-8699 before 8:30 a.m. of the day that the inspection is requested
Weekends & Holidays excluded.

Authorized By: Environmental Health Specialist

El Paso County, CO
Public Health

Prevent • Promote • Protect

Environmental Health Division

1675 W. Garden of the Gods Rd., Suite 2044
Colorado Springs, CO 80907
(719) 578-3199 phone
(719) 578-3188 fax
www.elpasocountyhealth.org

SR000 1281 / AR000 5291 Ck# 3110

APPLICATION FOR AN ON-SITE WASTEWATER TREATMENT SYSTEM PERMIT

Legal: Lot 2 Dancing Wolf Estates

☑ NEW PERMIT ☐ MAJOR REPAIR PERMIT ☐ MINOR REPAIR PERMIT

Owner Alyce + David McElhoes Daytime Phone 719 337 8124
System Installer J+K Excavation Daytime Phone 719 481 2417
Property Address 16570 Dancing Wolf City and Zip Colo Sps. 80908
Owners Mailing Address 16605 Dancing Wolf C.S. CO 80908
Email Address alyce@customcoloradohomes.com Fax #
Tax Schedule # 6127004001 Lot Size 5.11 acres
Site Located Inside City Limits ☐ Yes ☑ No Primary Contact ☑ Owner ☐ Contractor
Proposed Use: ☑ Single Family ☐ Multi-Family ☐ Commercial
Water Supply: ☑ Well ☐ Cistern ☐ Municipal Number of Bedrooms 5
☑ Pick Up: 337-8124 (719) ☐ Fax: ☐ Email:

CURRENT FEES AS APPROVED BY THE EL PASO COUNTY BOARD OF HEALTH

New Permit: $630.00 (EPCPH Charge) + $147.00 (EPC Planning Dept. Surcharge) + $23.00 (CDPHE Surcharge) = $800.00
Major Repair Permit: $515.00 (EPCPH Charge) + $23.00 (CDPHE Surcharge) = $538.00
Minor Repair Permit: $230.00 (EPCPH Charge) + $23.00 (CDPHE Surcharge) = $253.00

- All Payments are due at the time of application submittal; by cash, check or major credit card (Visa / MC)
- This permit will expire one year from the date of issuance.

I certify that the information provided on this application is in compliance with Section 8.3, Chapter 8 of the Onsite Wastewater System (OWS) Regulations of the El Paso County Board of Health. I also authorize the assigned representative of El Paso County Public Health to enter onto this property in order to obtain information necessary for the issuance of a permit.

Applicants Signature: [signature] Date: 4/8/14

Site Insp. Date: 4/10/14 Perc. Rate: .37 Permit # ON0033059

E.H.S. Review Notes:

Date to: E.P.C. Development Services 4/8/14 Flood Plain and Enumerations 4/8/14

Permit Requirements:

1750 Min. Septic Tank Capacity 1571 Min. Absorption Area

E.H. Specialist [signature] Date 4/11/14 ☒ Approved ☐ Denied

Reviewed 2014 approved fee (11/20/13)

NM