

FACILITY PLANNING REPORT

FOR

Tierra Tres Subdivision

Bastrop County, Texas

PREPARED BY:

VanGarD Engineering, Inc.

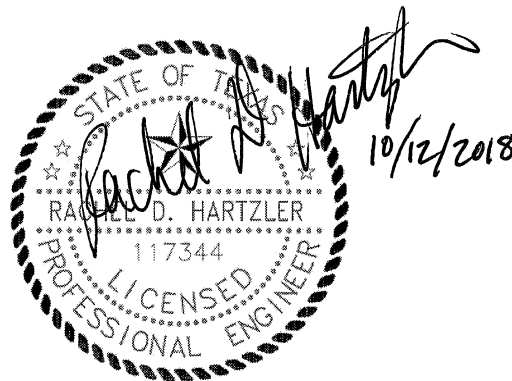
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Firm Registration #F-5398

October 2018



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Summary

This report is to accompany the preliminary plat submittal for Tierra Tres Subdivision. The proposed subdivision is located on the east side of State Highway (SH) 95, just south of the intersection between SH 95 and Texas Ranger Drive in Bastrop County, Texas. No portion of the proposed subdivision lies within the limits or extraterritorial jurisdiction (ETJ) of any incorporated city or municipality. The 34.67 acre tract is currently undeveloped and is covered with a mixture of weeds, grass, mesquite brush, and trees.

The proposed development of the subject tract includes 7 residential lots with a minimum lot size of 4.667 acres.

This project will be served by private on-site water wells and on-site sewer facilities (OSSFs). All of the proposed lots are 1.0 acres or greater as required for Class I OSSFs.

An overall site plan showing the proposed subdivision is attached as **Exhibit A**.

Soil Evaluation

An evaluation of the mapped soils on-site was performed to evaluate the suitability of the soils for On-Site Sewage Facilities. According to the Custom Soil Resources Report from the USDA-NRCS run on October 3, 2018, the soils on the site consist of Edge fine sandy loam, 1 to 5 percent slopes; Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded; Edge gravelly fine sandy loam, 3 to 8 percent slopes; Robco-Tanglewood complex, 1 to 5 percent slopes; and Tabor fine sandy loam, 1 to 3 percent slopes.

The NRCS Custom Soil Resources Report is attached as **Exhibit B**.

OSSF Recommendations

Based on the soil conditions given in the NRCS Soil Survey, the table below shows which OSSFs are suitable for each of the soil conditions found on the site.

Soil Description	Map Symbol	Acres in AOI	Disinfection, Surface Application	Septic Tank Absorption Field	Septic Tank, Gravity Disposal	Septic Tank, Leaching Chamber	Septic Tank, Subsurface Drip Irrigation
Edge fine sandy loam, 1 to 5 percent slopes	AfC	2.6	U	U	U	U	U
Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	AfC2	24.6	U	S	S	S	U
Edge gravelly fine sandy loam, 3 to 8 percent slopes	AtD	6.2	U	S	S	S	U
Robco-Tanglewood complex, 1 to 5 percent slopes	DeC	1.5	U	U	U	U	U
Tabor fine sandy loam, 1 to 3 percent slopes	TfB	3.8	U	U	U	U	U

S = Suitable

U = Unsuitable

Based on the suitability determined in the table above, we are recommending a combination of septic tanks and absorption fields or gravity disposal for all of the proposed lots.

Design Flows

The subdivision consists of large single-family lots, and the anticipated number of bedrooms served per lot is 3. For a 3-bedroom single family home with water saving devices, per 30 TAC §285.91(3), the daily wastewater usage rate is 360 gpd, therefore:

$$Q = 360 \text{ gpd}$$

$$30 \text{ TAC } 285.91 (3)$$

Water Service

Water service to the lots will be supplied by private on-site wells. New water wells will be located a minimum of 100 feet from on-site sewage facilities and a minimum of 100 feet from property lines.

There were no existing water wells observed within a 100-foot perimeter of this project.

FEMA 100-Year Floodplain

No portion of this property lies within any Special Flood Hazard Areas, according to FEMA FIRM Panels 48021C0225E and 48021C0215E, dated January 19, 2006. The Firmette is attached as **Exhibit C**.

Drainage

The subject tract is located on a high point with stormwater runoff draining in two directions. Part of the site lies within the Big Sandy Creek Watershed, contributing to the Colorado River Basin, and the remainder of the site drains to Piney Creek, which drains directly to the Colorado River.

Four existing drainage areas were identified on the site. Each of the drainage areas is delineated and labeled on the attached Drainage Area Map. The Drainage Area Map includes a topographic map of the site and is included as **Exhibit D**. There are two existing ponds on the site. Peak discharge calculations were computed using the Rational Method. The NRCS TR-55 Method was used to calculate the time of concentration.

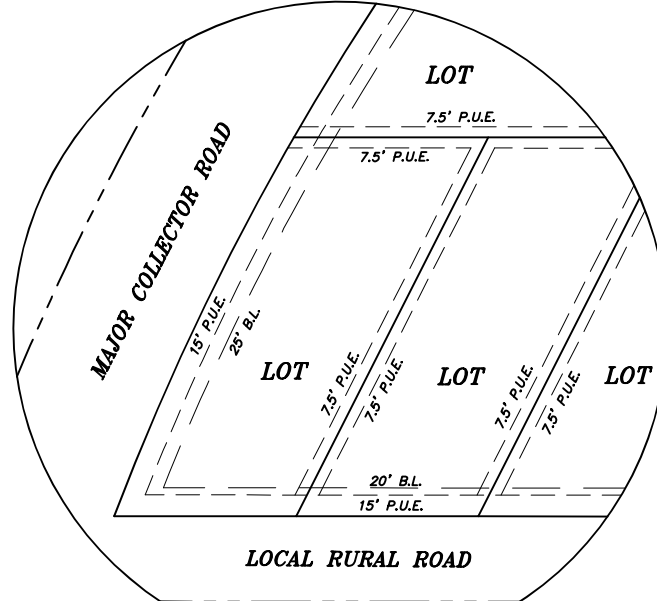
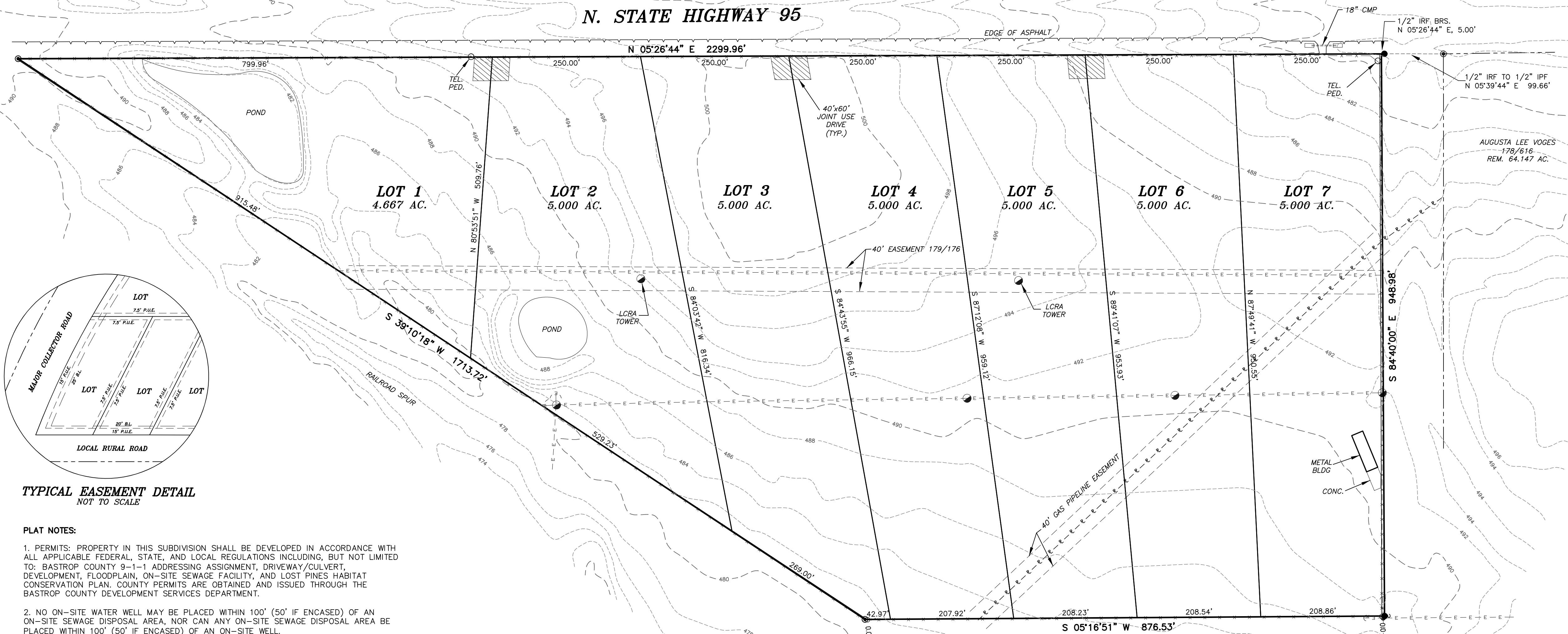
Stormwater runoff will be conveyed by overland sheet flow and culverts at the driveways, where necessary. No stormwater detention is proposed due to the small percentage of new impervious cover and drainage calculations showing that improvements in ground cover offsets the impact of new impervious cover. In the fully developed condition, stormwater discharge from the site will remain similar in nature to the existing conditions.

The topography of the site has moderate slopes that should not interfere with the suitability of any of the recommended OSSFs.

EXHIBIT A

Overall Site Plan

PRELIMINARY PLAT TIERRA TRES SUBDIVISION



TYPICAL EASEMENT DETAIL
NOT TO SCALE

- PLAT NOTES:**
- PERMITS: PROPERTY IN THIS SUBDIVISION SHALL BE DEVELOPED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS INCLUDING, BUT NOT LIMITED TO: BASTROP COUNTY 9-1-1 ADDRESSING ASSIGNMENT, DRIVEWAY/CULVERT, DEVELOPMENT, FLOODPLAIN, ON-SITE SEWAGE FACILITY, AND LOST PINES HABITAT CONSERVATION PLAN. COUNTY PERMITS ARE OBTAINED AND ISSUED THROUGH THE BASTROP COUNTY DEVELOPMENT SERVICES DEPARTMENT.
 - NO ON-SITE WATER WELL MAY BE PLACED WITHIN 100' (50' IF ENCASED) OF AN ON-SITE SEWAGE DISPOSAL AREA, NOR CAN ANY ON-SITE SEWAGE DISPOSAL AREA BE PLACED WITHIN 100' (50' IF ENCASED) OF AN ON-SITE WELL.
 - EACH LOT SHALL HAVE A 50' WATER WELL SETBACK ADJACENT TO PROPERTY LINES. PROPERTY OWNERS AND/OR REGISTERED WATER WELL INSTALLERS ARE RESPONSIBLE TO DETERMINE APPROPRIATE LOCATIONS FOR SAME, IF NOT SPECIFIED HEREIN. FURTHER INFORMATION AND REGISTRATION OF ON-SITE WATER WELLS IS OBTAINED AND ISSUED THROUGH THE LOST PINES GROUNDWATER CONSERVATION DISTRICT.
 - INDIVIDUAL ON-SITE SEWAGE FACILITY DESIGNS MUST BE SUBMITTED FOR APPROVAL FOR EACH LOT AND BUILT TO TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND THE REQUIREMENTS OF THE BASTROP COUNTY ORDER FOR ON-SITE SEWAGE FACILITIES PRIOR TO OCCUPATION OF THE RESIDENCE.
 - NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER AND ELECTRIC DISTRIBUTION SYSTEMS AND WASTEWATER COLLECTION FACILITIES.
 - IT IS UNDERSTOOD THAT ON APPROVAL OF THIS PLAT BY THE COMMISSIONERS COURT OF BASTROP COUNTY, TEXAS, THAT THE CONSTRUCTION OF ALL BRIDGES, CULVERTS, STREETS, ROADS AND OTHER PUBLIC THOROUGHFARES DELINEATED AND SHOWN ON THIS PLAT, SHALL REMAIN THE RESPONSIBILITY OF THE OWNER AND/OR DEVELOPER OF THE TRACT OF LAND COVERED BY THIS PLAT, IN ACCORDANCE WITH PLANS AND SPECIFICATION PRESCRIBED BY THE COMMISSIONERS COURT OF BASTROP COUNTY, TEXAS. THE COURT ASSUMES NO OBLIGATION TO CONSTRUCT ANY BRIDGES, CULVERTS, STREETS, ROADS OR PUBLIC THOROUGHFARES SHOWN ON THIS PLAT, OR OF CONSTRUCTING ANY BRIDGES OR CULVERTS IN CONNECTION THEREWITH.
 - UPON APPROVAL OF THIS PLAT BY THE COMMISSIONERS COURT FOR FILING AND SUBSEQUENT ACCEPTANCE OF MAINTENANCE OF STREETS BY BASTROP COUNTY, IT IS UNDERSTOOD THAT PLACEMENT OF ANY AND ALL TRAFFIC CONTROL DEVICES REQUIRING SIGNAGE SUCH AS STREET NAMES, SPEED LIMITS, STOP SIGNS, YIELD SIGNS, ETC., SHALL BE THE SOLE RESPONSIBILITY OF THE DEVELOPER UNDER THE DIRECTION OF THE COMMISSIONERS COURT AND/OR THE COUNTY ENGINEER.
 - NEITHER APPROVAL OF A SUBDIVISION PLAT BY THE BASTROP COUNTY COMMISSIONERS COURT, NOR THE FILING/RECORDING OF AN APPROVED SUBDIVISION PLAT CONSTITUTES ACCEPTANCE BY BASTROP COUNTY OF ANY DEDICATION OF THE ROADS/STREETS DEPICTED ON THE PLAT. ONLY THE BASTROP COUNTY COMMISSIONERS COURT, ACTING AS A BODY, HAS THE AUTHORITY TO ACCEPT ROADS/STREETS INTO THE BASTROP COUNTY ROAD SYSTEM FOR COUNTY MAINTENANCE. INDIVIDUAL MEMBERS OF THE BASTROP COUNTY COMMISSIONERS COURT HAVE NO AUTHORITY TO BIND BASTROP COUNTY BY SEPARATE ACTION. UNTIL BASTROP COUNTY, THROUGH ITS COMMISSIONERS COURT, ACCEPTS A ROAD/STREET THAT HAS BEEN DEDICATED IN A PLAT, SAID ROAD/STREET IS NOT A COUNTY ROAD, AND IS NOT SUBJECT TO COUNTY MAINTENANCE.
 - ANY OBSTRUCTION IN THE COUNTY AND/OR TxDOT ROW MUST BE REMOVED AT THE OWNER'S EXPENSE.
 - NO STRUCTURES MAY BE BUILT IN ANY EASEMENT. ANY EXISTING STRUCTURES LOCATED IN A PUBLIC UTILITIES EASEMENT MUST BE REMOVED AT UTILITY COMPANY DISCRETION.
 - ALL DRIVEWAYS IN THIS SUBDIVISION MUST BE CONSTRUCTED TO FACILITATE DRAINAGE ALONG THE ROW. THE DEVELOPER AND/OR PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF DRIVEWAYS IN ACCORDANCE WITH BASTROP COUNTY SPECIFICATIONS, WHICH MAY INCLUDE CULVERT PIPE INSTALLATION. A PERMIT MUST BE OBTAINED FROM BASTROP COUNTY PRIOR TO THE CREATION OF A DRIVEWAY. ACCESS TO STATE HIGHWAYS IS REGULATED BY TxDOT AND THEREFORE MUST BE APPROVED AND CONSTRUCTED TO ITS STANDARDS.
 - THIS SUBDIVISION DOES NOT LIE WITHIN THE CITY LIMITS OR EXTRA TERRITORIAL JURISDICTION (ETJ) OF ANY MUNICIPALITY.
 - ALL CORNER LOTS WITHIN THIS DEVELOPMENT MAY ACCESS ONLY ONE STREET AND MUST TAKE THEIR ACCESS FROM THE MINOR OF THE TWO STREETS.

STATE OF TEXAS
COUNTY OF BASTROP

I, ROSE PIETSCH, CLERK OF THE COUNTY COURT OF BASTROP COUNTY, TEXAS, DO HEREBY CERTIFY THAT ON THE _____ DAY OF _____, 2018, AD., THE COMMISSIONERS COURT OF BASTROP COUNTY, TEXAS, APPROVE THIS PRELIMINARY PLAN.

WITNESS MY HAND AND SEAL OF OFFICE OF THE COUNTY COURT OF BASTROP COUNTY, TEXAS, THIS THE _____ DAY OF _____, 2018, AD.,

ROSE PIETSCH DEPUTY COUNTY CLERK
BASTROP COUNTY, TEXAS

DEPUTY

THE COMMISSIONERS COURT APPROVAL OF THE PRELIMINARY PLAN SHALL EXPIRE ONE YEAR AFTER THE DATE OF APPROVAL UNLESS A FINAL PLAT IS SUBMITTED FOR ALL OR PART OF THE AREA COVERED BY THE PRELIMINARY PLAN. THE COMMISSIONERS COURT MAY GRANT A SIX-MONTH EXTENSION OF TIME TO SUBMIT A FINAL PLAT, PROVIDED THE SUB-DIVIDER REQUEST SUCH EXTENSION IN WRITING SHOWING GOOD CAUSE PRIOR TO THE ONE YEAR EXPIRATION DATE.

UTILITY SERVICE PROVIDERS:

WATER SERVICE IS PROVIDED BY: AQUA WATER SUPPLY CORPORATION
WASTEWATER SERVICE IS PROVIDED BY: INDIVIDUAL ON-SITE SEWAGE FACILITIES
ELECTRIC SERVICE IS PROVIDED BY: BLUEBONNET ELECTRIC COOPERATIVE

FLOOD PLAN NOTE:

NO PORTION OF THIS SUBDIVISION LIES WITHIN THE 100 YEAR SPECIAL FLOOD HAZARD AREA (1% ANNUAL CHANCE OF FLOODING AREA) AS IDENTIFIED BY THE FLOOD INSURANCE RATE MAP, PANEL NO. 48021C0225E, EFFECTIVE JANUARY 19, 2006 FOR THE COMMUNITY BASTROP COUNTY, COMMUNITY NUMBER 481193.

FLOOD WARNING: THE DEGREE OF FLOOD PROTECTION REQUIRED BY THE BASTROP COUNTY FLOOD DAMAGE PREVENTION ORDER IS CONSIDERED REASONABLE FOR REGULATORY PURPOSES AND IS BASED ON SCIENTIFIC AND ENGINEERING CONSIDERATIONS. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN-MADE OR NATURAL CAUSES. ACCEPTANCE OF THIS PLAT BY THE COMMISSIONERS COURT DOES NOT IMPLY THAT LAND OUTSIDE THE AREAS OF SPECIAL FLOOD HAZARDS OR USES PERMITTED WITHIN SUCH AREAS WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. NOR SHALL ACCEPTANCE OF THIS PLAT CREATE LIABILITY ON THE PART OF BASTROP COUNTY OR ANY OFFICIAL OR EMPLOYEE THEREOF FOR ANY FLOOD DAMAGES THAT RESULT FROM RELIANCE ON THE INFORMATION CONTAINED WITHIN THIS PLAT OR ANY ADMINISTRATION DECISION LAWFULLY MADE THEREUNDER.

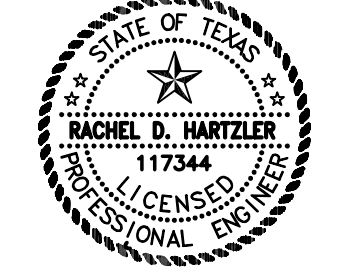
EROSION AND SEDIMENTATION CONTROLS ARE REQUIRED FOR CONSTRUCTION ON EACH LOT, INCLUDING SINGLE-FAMILY, DUPLEX, AND MULTI-FAMILY CONSTRUCTION.

APPROVAL OF THIS PLAT BY COMMISSIONERS COURT OF BASTROP COUNTY, TEXAS, DOES NOT CONSTITUTE A VERIFICATION OF ALL DATA, INFORMATION AND CALCULATIONS SUPPLIED BY THE APPLICANT. THE ENGINEER OF RECORD IS SOLELY RESPONSIBLE FOR THE COMPLETENESS, ACCURACY AND ADEQUACY OF HIS/HER SUBMITTAL, WHETHER OR NOT THE PLAT HAS BEEN REVIEWED FOR COMPLIANCE OF REGULATIONS BY BASTROP COUNTY ENGINEER AND/OR PLATS REVIEW STAFF.

STATE OF TEXAS
COUNTY OF BASTROP

I, RACHEL D. HARTZLER, DO HEREBY CERTIFY THAT THIS SUBDIVISION SATISFIES THE ENGINEERING REQUIREMENTS OF THE SUBDIVISION REGULATIONS OF BASTROP COUNTY, TEXAS.

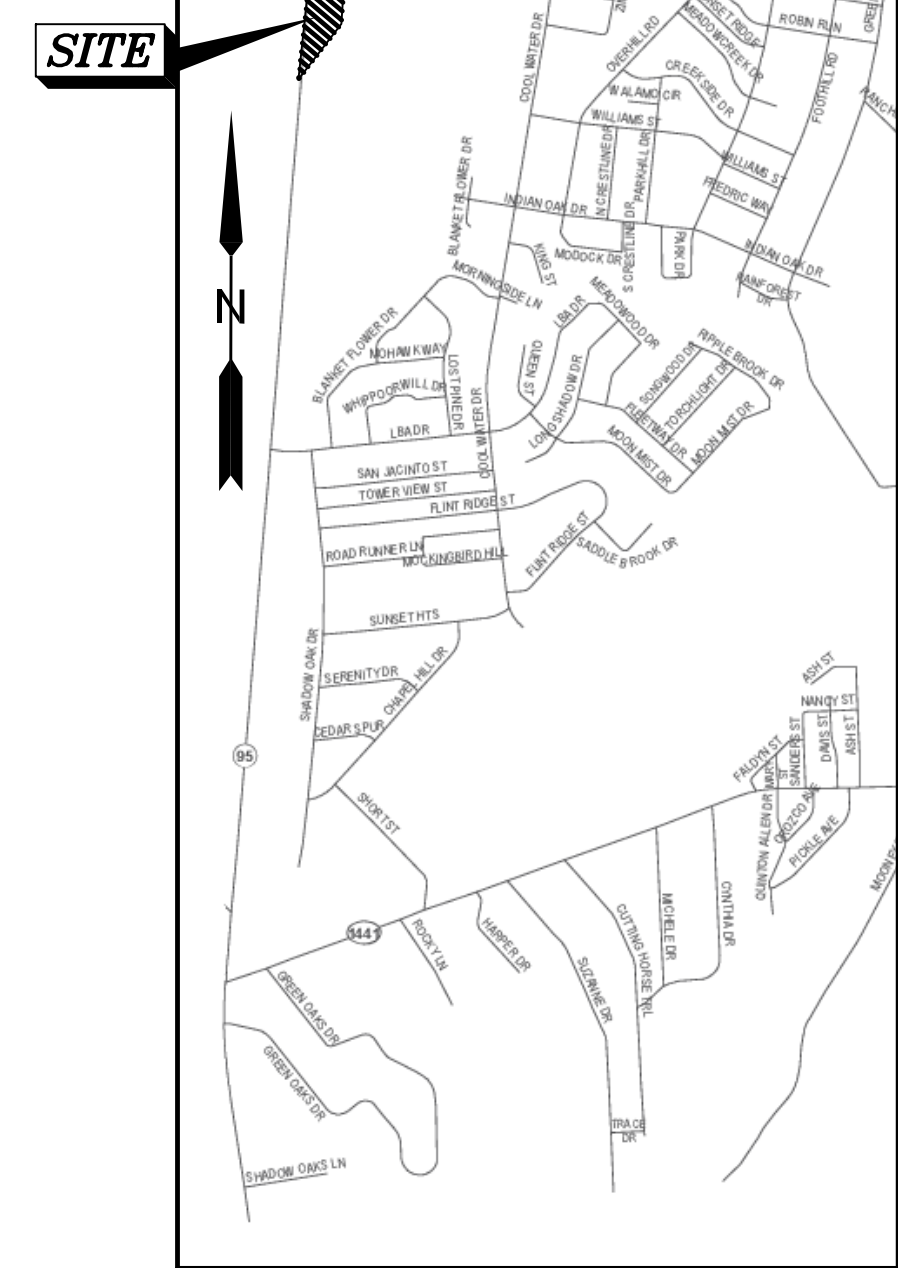
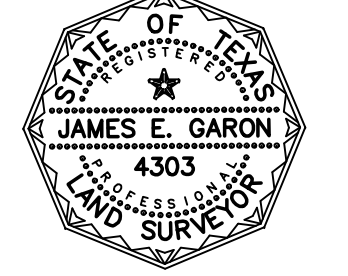
RACHEL D. HARTZLER, P.E.
PROFESSIONAL ENGINEER NO. 117344
P.O. BOX 1917
BASTROP, TEXAS 78602 512-303-4185



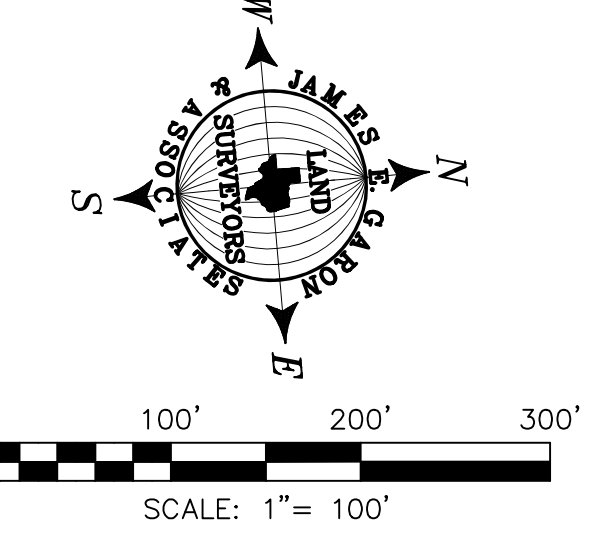
STATE OF TEXAS
COUNTY OF BASTROP

I, JAMES E. GARON, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON-THE-GROUND SURVEY OF THE LAND, AND THAT THE CORNER MONUMENTS SHOWN WERE PROPERLY PLACED, UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS OF BASTROP COUNTY, TEXAS.

JAMES E. GARON
REGISTERED PROFESSIONAL LAND SURVEYOR
REG. NO. 4303
P.O. BOX 1917
BASTROP, TEXAS 78602
PH. 512-303-4185 FAX 512-321-2107
JAMESGARON.COM



VICINITY MAP
N.T.S.



- LEGEND**
- CALCULATED POINT
 - 1/2" REBAR FOUND (UNLESS NOTED)
 - 1/2" REBAR SET W/CAP
 - STAMPED I.E. GARON RPLS 4303
 - 1/2" PIPE FOUND (UNLESS NOTED)
 - IRON ROD W/CAP FOUND
 - CONCRETE HIGHWAY MONUMENT FOUND
 - COTTON SPINDLE FOUND
 - 60d NAIL FOUND
 - 60d NAIL SET
 - FENCE POST FOUND
 - TREE (SIZE & TYPE NOTED)
 - WIRE FENCE
 - WOOD FENCE
 - CHAIN LINK FENCE
 - POWER POLE
 - OVERHEAD ELECTRIC LINE
 - DOWN GUY
 - RESTRICTIVE COVENANTS
 - (R.C.)
 - (BRG-DIST)

OWNER:

TIERRA TRES, LLC
2206 Tower Drive
Austin, TX 78703
512-992-4232

ENGINEER:

VanGarD Engineering, Inc.
Rachel D. Hartzler, P.E.
185 McAllister Road
Bastrop, TX 78602
Phone: (512) 303-4185
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SURVEYOR:

James E. Garon & Associates, Inc.
James E. Garon, R.P.L.S.
Firm Reg. #10058400
185 McAllister Rd.
P.O. Box 1917
Bastrop, Texas 78602
512-303-4185

PRELIMINARY PLAT TIERRA TRES SUBDIVISION

REFERENCE: TIERRA TRES, LLC G.F. NO.
ADDRESS: SH 95 (R36847)
LEGAL DESCRIPTION 34.667 ACRES, ISAAC HARRIS LEAGUE, A-38 IN BASTROP COUNTY, TEXAS

FILE: Co\bastrop\sur\isaac harris A38\47418-prelim FLD. BK.:

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EXHIBIT B

Soil Survey

Custom Soil Resource Report for **Bastrop County, Texas**



Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

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

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

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

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

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

Custom Soil Resource Report

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

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

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

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

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

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

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

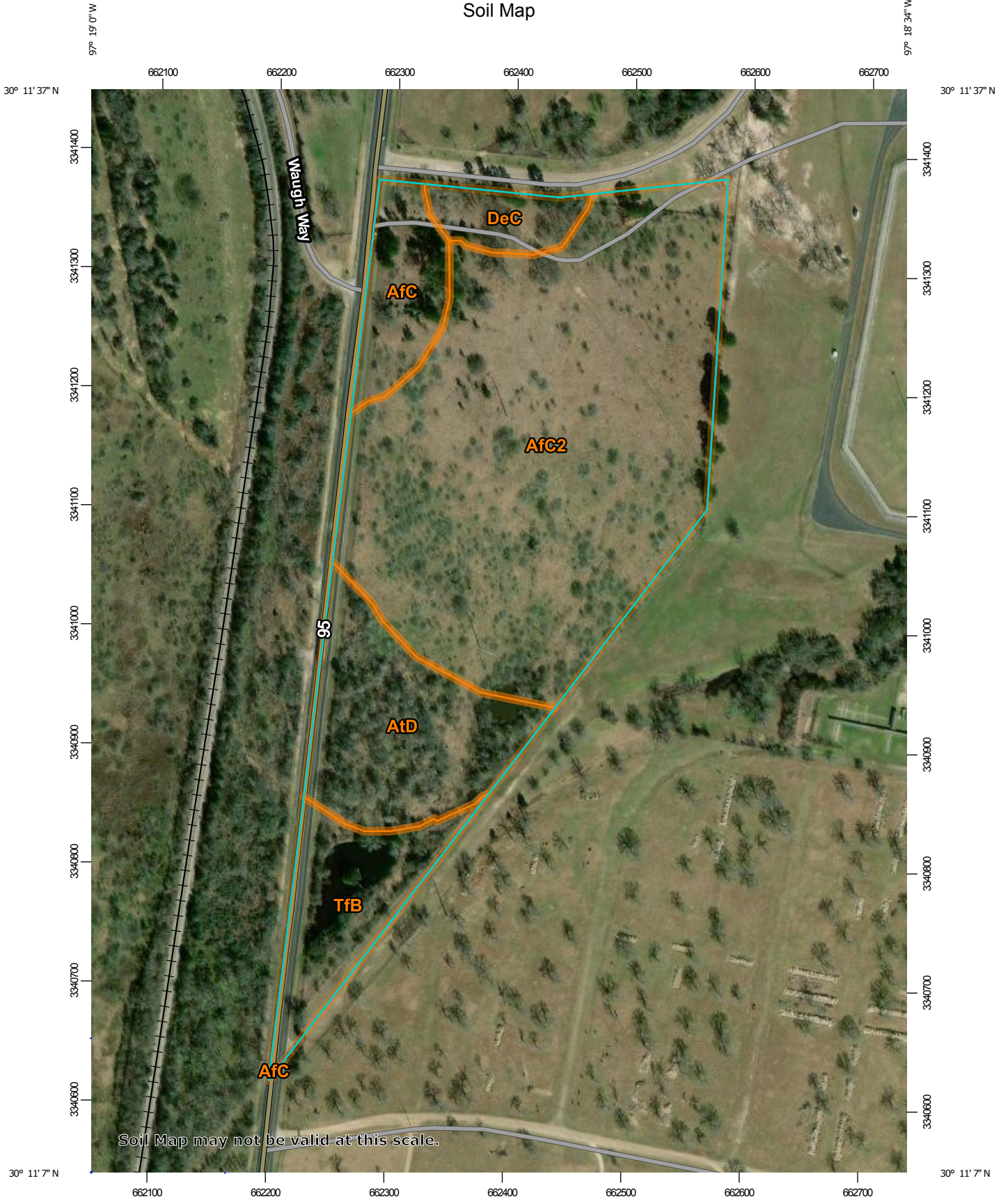
Custom Soil Resource Report

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

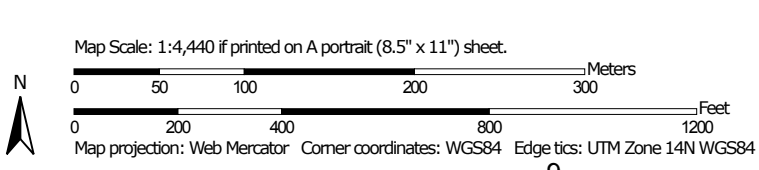
Soil Map

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

Custom Soil Resource Report Soil Map




Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Bastrop County, Texas
 Survey Area Data: Version 16, Sep 14, 2018

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

Date(s) aerial images were photographed: Oct 5, 2015—Nov 30, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AfC	Edge fine sandy loam, 1 to 5 percent slopes	2.6	6.8%
AfC2	Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	24.6	63.6%
AtD	Edge gravelly fine sandy loam, 3 to 8 percent slopes	6.2	16.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	1.5	3.8%
TfB	Tabor fine sandy loam, 1 to 3 percent slopes	3.8	9.9%
Totals for Area of Interest		38.7	100.0%

Map Unit Descriptions

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

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

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

Custom Soil Resource Report

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Bastrop County, Texas

AfC—Edge fine sandy loam, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2shgf
Elevation: 280 to 600 feet
Mean annual precipitation: 34 to 45 inches
Mean annual air temperature: 66 to 69 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Edge and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edge

Setting

Landform: Ridges, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone

Typical profile

A - 0 to 12 inches: fine sandy loam
Bt1 - 12 to 34 inches: clay
Bt2 - 34 to 46 inches: clay loam
BCt - 46 to 50 inches: clay loam
C/B - 50 to 74 inches: loam
C - 74 to 80 inches: silt loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e

Custom Soil Resource Report

Hydrologic Soil Group: D
Ecological site: Claypan Savannah (R087AY003TX)
Hydric soil rating: No

Minor Components

Crockett

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Southern Claypan Prairie (R086AY004TX)
Hydric soil rating: No

AfC2—Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2shgg
Elevation: 280 to 610 feet
Mean annual precipitation: 34 to 45 inches
Mean annual air temperature: 66 to 69 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Edge, moderately eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edge, Moderately Eroded

Setting

Landform: Ridges, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy and clayey residuum derived from eocene age, stratified, sandstone and mudstone

Typical profile

A - 0 to 11 inches: fine sandy loam
Bt1 - 11 to 29 inches: clay
Bt2 - 29 to 43 inches: clay loam
BCt - 43 to 48 inches: sandy clay loam
C/B - 48 to 75 inches: loam
C - 75 to 80 inches: silt loam

Custom Soil Resource Report

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: Claypan Savannah (R087AY003TX)
Hydric soil rating: No

Minor Components

Crockett, moderately eroded

Percent of map unit: 10 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Southern Claypan Prairie (R086AY004TX)
Hydric soil rating: No

AtD—Edge gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: f6c9
Elevation: 300 to 500 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 64 to 68 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Edge and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Edge

Setting

Landform: Ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Convex

Parent material: Residuum weathered from shale and siltstone in the wilcox formation of eocene age

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam

H2 - 5 to 16 inches: sandy clay

H3 - 16 to 32 inches: sandy clay

H4 - 32 to 48 inches: sandy clay loam

H5 - 48 to 75 inches: loam

H6 - 75 to 80 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 15.0

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Claypan Savannah (R087AY003TX)

Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent

Hydric soil rating: No

DeC—Robco-Tanglewood complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2wg9h

Elevation: 220 to 610 feet

Mean annual precipitation: 35 to 45 inches

Mean annual air temperature: 67 to 69 degrees F

Frost-free period: 252 to 275 days

Farmland classification: Farmland of statewide importance, if drained

Map Unit Composition

Robco and similar soils: 46 percent

Tanglewood and similar soils: 25 percent

Minor components: 29 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Robco

Setting

Landform: Ridges

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Sandy, clayey, and loamy residuum weathered from sandstone, claystone, and shale of eocene age

Typical profile

A - 0 to 11 inches: loamy fine sand

E - 11 to 26 inches: loamy fine sand

Btg1 - 26 to 31 inches: sandy clay loam

Btg2 - 31 to 39 inches: sandy clay loam

Bt/C - 39 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: About 18 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Gypsum, maximum in profile: 1 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 8.3 inches)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: Sandy (R087AY006TX)
Hydric soil rating: No

Description of Tanglewood

Setting

Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy, clayey, and loamy residuum weathered from sandstone, claystone, and shale of eocene age

Typical profile

A - 0 to 5 inches: loamy fine sand
E - 5 to 23 inches: loamy fine sand
Btg1 - 23 to 33 inches: sandy clay loam
Btg2 - 33 to 68 inches: clay
Btg3 - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 20 to 46 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: Sandy (R087AY006TX)
Hydric soil rating: No

Minor Components

Rader

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Sandy Loam (R087AY005TX)

Custom Soil Resource Report

Hydric soil rating: No

Silstid

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (R087AY006TX)
Hydric soil rating: No

Tabor

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Sandy Loam (R087AY005TX)
Hydric soil rating: No

Edge

Percent of map unit: 5 percent
Landform: Ridges, ridges
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Claypan Savannah (R087AY003TX)
Hydric soil rating: No

Straber

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (R087AY006TX)
Hydric soil rating: No

Gasil

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy Loam (R087AY005TX)
Hydric soil rating: No

Padina

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope

Custom Soil Resource Report

Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Deep Sand (R087AY007TX)
Hydric soil rating: No

TfB—Tabor fine sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2wssr
Elevation: 140 to 630 feet
Mean annual precipitation: 34 to 44 inches
Mean annual air temperature: 67 to 69 degrees F
Frost-free period: 244 to 276 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tabor and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tabor

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy and clayey alluvium derived from sandstone and shale

Typical profile

A - 0 to 6 inches: fine sandy loam
E - 6 to 13 inches: fine sandy loam
Btss - 13 to 43 inches: clay
Btg - 43 to 80 inches: clay loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 8 to 23 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Custom Soil Resource Report

Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: Sandy Loam (R087AY005TX)
Hydric soil rating: No

Minor Components

Axtell

Percent of map unit: 10 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Claypan Savannah (R087AY003TX)
Hydric soil rating: No

Chazos

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy Loam (R087AY005TX)
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Sanitary Facilities

Sanitary Facilities interpretations are tools designed to guide the user in site selection for the safe disposal of sewage and solid waste. Example interpretations include septic tank absorption fields, sewage lagoons, and sanitary landfills.

Septic System; Disinfection, Surface Application (TX)

The Septic System; Disinfection, Surface Application (TX) interpretation is a tool for assessing soil limitations for surface septic systems designed to treat household effluent. Suburban dwellings and farm and ranch homesteads, outbuildings, and recreational facilities require a means to safely dispose of effluent. The ratings are not intended to substitute for or replace the need for an onsite soil investigation to determine a site's soil restrictions and suitability. The interpretation ratings simply identify limiting soil features that can be found in the soil mapping unit and that may exist on site.

The Texas Commission on Environmental Quality publishes criteria and rules governing the location and installation of Disinfection, Surface Application systems. These rules and criteria are contained in "Texas Commission on Environmental Quality - TCEQ; Chapter 285: On-Site Sewage Facilities". Onsite investigation, evaluation, and system design must be conducted by a qualified professional in compliance with TCEQ policy, rules, and design guidelines.

Septic System; Disinfection, Surface Applications are surface application systems consisting of small diameter pressurized lines containing pressure reducing emitters that distribute disinfected effluent on the soil surface. The system is a evapotranspiration system that utilizes vegetation and evaporation for treatment and utilization of effluent.

Custom Soil Resource Report

Soil properties and qualities that affect the treatment of the effluent are surface pH, depth to a seasonal high water table, depth to bedrock, depth to a cemented pan, and susceptibility to flooding or ponding. Shallow depth to bedrock, ice, or a cemented pan interferes with installation. Excessive slope may result in lateral seepage and surfacing of the effluent in down-slope areas. In addition, soil erosion is a hazard where absorption fields are installed in steep soils.

Ratings are both numerical and verbal. Numerical ratings or values indicate the relative severity or degree of limitation for individual soil restrictive (limiting) features. Ratings are shown for limiting soil features as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00), and the point at which the soil feature is not a limitation (0.00). Non-limiting soil features with a numerical rating of zero are not listed.

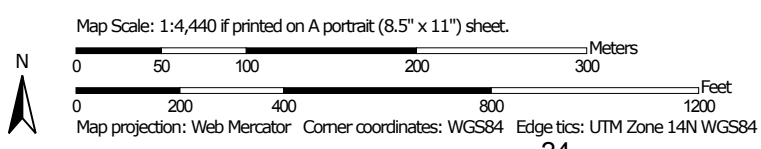
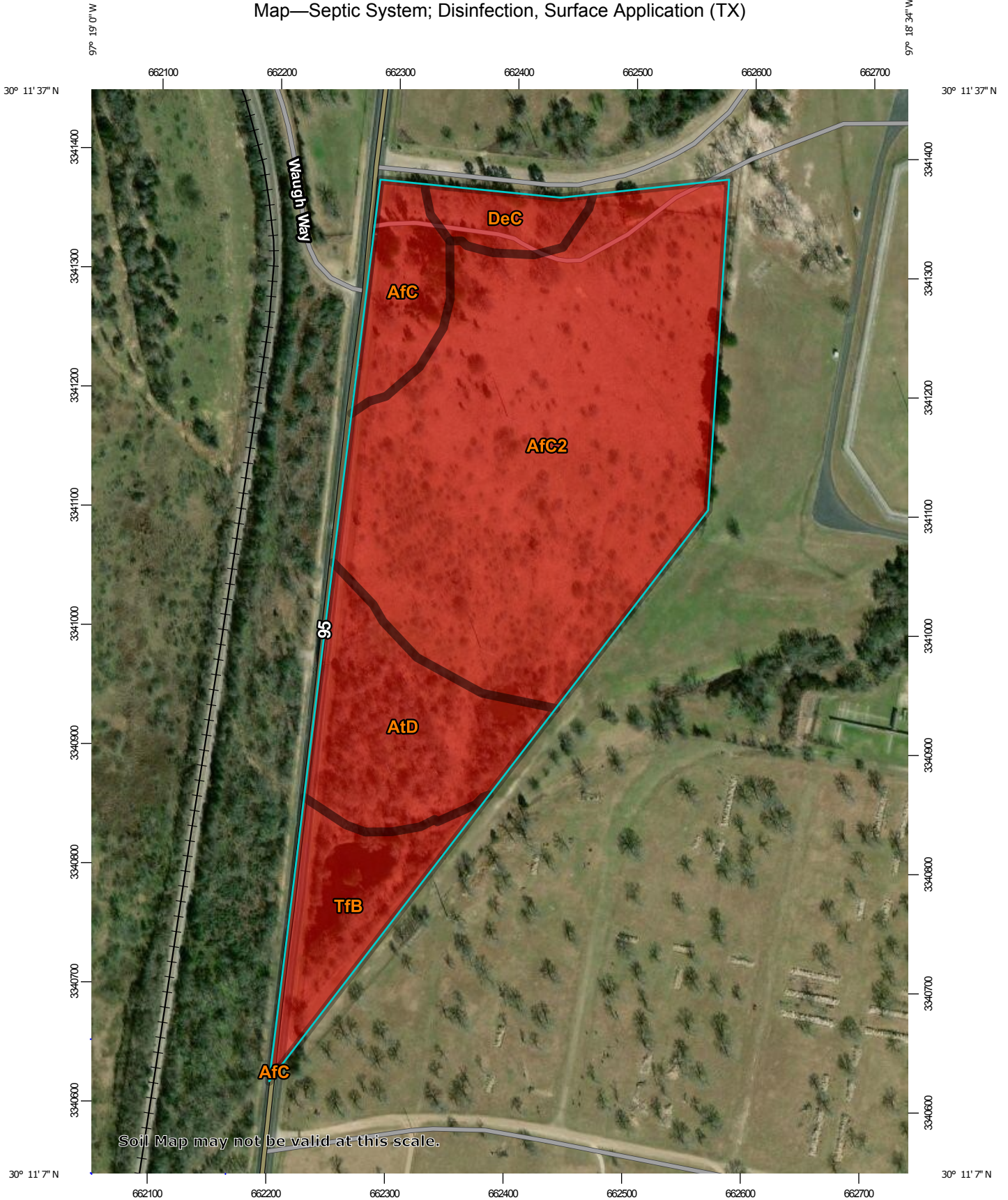
Rating class terms indicate the extent to which the soils are limited by the soil features that affect the soil interpretation. Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating process. The "not limited" class (numerical value for the most restrictive feature = 0) indicates that the soil has no limiting features for the specified use. The "somewhat limited" class (numerical value for the most restrictive feature .01 to .99) indicates that the soil has limiting features for the specified use that can be overcome with proper planning, design, installation, and management. The effort required to overcome a soil limitation increases as the numerical rating increases. The "very limited" class (numerical value for the most restrictive feature = 1.00) indicates that the soil has one or more very limiting features that can only be overcome with special planning, major soil modification, special design, or significant management practices.

Lesser soil restrictive features have a lower numerical value than the maximum used to rate the soil. They are identified to provide the user with additional information about soil limitations for the specific use. Lesser soil restrictive features also need to be considered in planning, design, installation, and management.

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

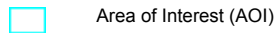
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation is needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Septic System; Disinfection, Surface Application (TX)



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Background



Aerial Photography

Soils

Soil Rating Polygons



Very limited



Somewhat limited



Not limited



Not rated or not available

Soil Rating Lines



Very limited



Somewhat limited



Not limited



Not rated or not available

Soil Rating Points



Very limited



Somewhat limited



Not limited



Not rated or not available

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

MAP INFORMATION

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 Web Soil Survey URL:
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Soil Survey Area: Bastrop County, Texas
 Survey Area Data: Version 16, Sep 14, 2018

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

Date(s) aerial images were photographed: Oct 5, 2015—Nov 30, 2017

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Tables—Septic System; Disinfection, Surface Application (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AfC	Edge fine sandy loam, 1 to 5 percent slopes	Very limited	Edge (90%)	pH < 6.0 or > 9.0 (1.00)	2.6	6.8%
AfC2	Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	Very limited	Edge, moderately eroded (90%)	pH < 6.0 or > 9.0 (1.00)	24.6	63.6%
AtD	Edge gravelly fine sandy loam, 3 to 8 percent slopes	Very limited	Edge (95%)	pH < 6.0 or > 9.0 (1.00)	6.2	16.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	Very limited	Robco (46%)	pH < 6.0 or > 9.0 (1.00)	1.5	3.8%
			Tanglewood (25%)	pH < 6.0 or > 9.0 (1.00)		
TfB	Tabor fine sandy loam, 1 to 3 percent slopes	Very limited	Tabor (85%)	pH < 6.0 or > 9.0 (1.00)	3.8	9.9%
Totals for Area of Interest					38.7	100.0%

Rating	Acres in AOI	Percent of AOI
Very limited	38.7	100.0%
Totals for Area of Interest	38.7	100.0%

Rating Options—Septic System; Disinfection, Surface Application (TX)

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified
Tie-break Rule: Higher

Septic Tank Absorption Field (TX)

The Septic Tank Absorption Field (TX) interpretation is a tool for assessing soil limitations for septic systems designed to treat household effluent. Suburban dwellings and farm and ranch homesteads, outbuildings, and recreational facilities require a means to safely dispose of effluent. The ratings are not intended to substitute for or replace the need for an onsite soil investigation to determine a site's soil restrictions and suitability. The interpretation ratings simply identify limiting soil features that can be found in the soil mapping unit and that may exist on site.

Custom Soil Resource Report

Texas Commission on Environmental Quality publishes criteria and rules governing the location and installation of Septic Tank Absorption Fields. These rules and criteria are contained in "Texas Commission on Environmental Quality - TCEQ; Chapter 285: On-Site Sewage Facilities". Onsite investigation, evaluation, and system design must be conducted by a qualified professional in compliance with TCEQ policy, rules, and design guidelines.

Septic tank absorption fields are subsurface systems of perforated pipe that distribute effluent from a septic tank into the natural soil. The centerline depth of the pipe is assumed to be 18 inches or deeper. Only the soil between depths of 18 and 60 inches is considered in making the ratings. Soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction and maintenance of the system, and those that may affect public health.

Soil properties and qualities that affect the absorption of the effluent are depth to a seasonal high water table, depth to bedrock, depth to a cemented pan, and susceptibility to flooding or ponding. Shallow depth to bedrock, ice, or a cemented pan interferes with installation. Excessive slope may cause lateral seepage and surfacing of the effluent in down-slope areas. In addition, soil erosion is a hazard where absorption fields are installed in steep soils. Some soils are underlain by loose sand and gravel or fractured bedrock at a depth less than 2 feet below the distribution lines. In these soils, the absorption field may not adequately filter the effluent, particularly when the system is new; consequently, ground water supplies may be contaminated.

Ratings are both numerical and verbal. Numerical ratings or values indicate the relative severity or degree of limitation for individual soil restrictive (limiting) features. Ratings are shown for limiting soil features as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00), and the point at which the soil feature is not a limitation (0.00). Non-limiting soil features with a numerical rating of zero are not listed.

Rating class terms indicate the extent to which the soils are limited by the soil features that affect the soil interpretation. Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating process. The "not limited" class (numerical value for the most restrictive feature = 0) indicates that the soil has no limiting features for the specified use. The "somewhat limited" class (numerical value for the most restrictive feature .01 to .99) indicates that the soil has limiting features for the specified use that can be overcome with proper planning, design, installation, and management. The effort required to overcome a soil limitation increases as the numerical rating increases. The "very limited" class (numerical value for the most restrictive feature = 1.00) indicates that the soil has one or more very limiting features that can only be overcome with special planning, major soil modification, special design, or significant management practices.

Lesser soil restrictive features have a lower numerical value than the maximum used to rate the soil, and they are identified to provide the user with additional information about soil limitations for the specific use. Lesser soil restrictive features also need to be considered in planning, design, installation, and management.

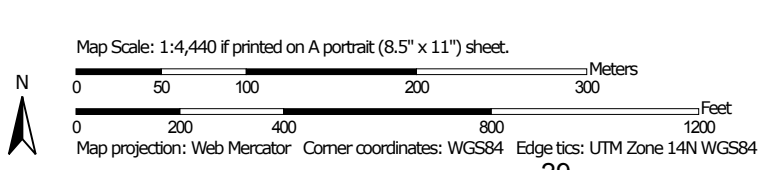
Custom Soil Resource Report

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation is needed to validate these interpretations and to confirm the identity of the soil on a given site.

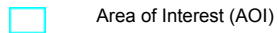
This interpretation for Texas differs from the national interpretation in that does not consider permafrost in the ratings. It also uses different limits for evaluating the affects of depth to bedrock, cemented pan, and water table, flooding, ponding, texture, seepage, and percolation on the interpretation.

Custom Soil Resource Report Map—Septic Tank Absorption Field (TX)



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Background



Aerial Photography

Soils

Soil Rating Polygons



Very limited



Somewhat limited



Not limited



Not rated or not available

Soil Rating Lines



Very limited



Somewhat limited



Not limited



Not rated or not available

Soil Rating Points



Very limited



Somewhat limited



Not limited



Not rated or not available

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Bastrop County, Texas
 Survey Area Data: Version 16, Sep 14, 2018

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

Date(s) aerial images were photographed: Oct 5, 2015—Nov 30, 2017

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Custom Soil Resource Report

Tables—Septic Tank Absorption Field (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AfC	Edge fine sandy loam, 1 to 5 percent slopes	Very limited	Edge (90%)	Clayey (1.00)	2.6	6.8%
AfC2	Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	Not limited	Edge, moderately eroded (90%)		24.6	63.6%
			Crockett, moderately eroded (10%)			
AtD	Edge gravelly fine sandy loam, 3 to 8 percent slopes	Not limited	Edge (95%)		6.2	16.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	Somewhat limited	Robco (46%)	Depth to saturated zone (0.44)	1.5	3.8%
			Tanglewood (25%)	Depth to saturated zone (0.89)		
			Rader (5%)	Depth to saturated zone (0.92)		
			Straber (5%)	Depth to saturated zone (0.86)		
TfB	Tabor fine sandy loam, 1 to 3 percent slopes	Very limited	Tabor (85%)	Depth to saturated zone (1.00)	3.8	9.9%
				Clayey (1.00)		
Totals for Area of Interest					38.7	100.0%

Rating	Acres in AOI	Percent of AOI
Not limited	30.8	79.5%
Very limited	6.5	16.7%
Somewhat limited	1.5	3.8%
Totals for Area of Interest	38.7	100.0%

Rating Options—Septic Tank Absorption Field (TX)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Septic Tank, Gravity Disposal (TX)

The Septic Tank, Gravity Disposal (TX) interpretation is a tool for assessing soil limitations for septic systems designed to treat household effluent. Suburban dwellings and farm and ranch homesteads, outbuildings, and recreational facilities require a means to safely dispose of effluent. The ratings are not intended to substitute for or replace the need for an onsite soil investigation to determine a site's soil restrictions and suitability. The interpretation ratings simply identify limiting soil features that can be found in the soil mapping unit and that may exist on site.

The Texas Commission on Environmental Quality publishes criteria and rules governing the location and installation of Septic Tank, Gravity Disposal systems. These rules and criteria are contained in "Texas Commission on Environmental Quality - TCEQ; Chapter 285: On-Site Sewage Facilities". Onsite investigation, evaluation, and system design must be conducted by a qualified professional in compliance with TCEQ policy, rules, and design guidelines.

Septic tanks, gravity disposal are gravity absorptive drain fields or bottomless chambers that are linked together with solid walled pipe. These gravity disposal systems allow effluent to percolate through an absorptive drain field for treatment. The centerline depth is assumed to be 18 inches or deeper. Only the soil between depths of 18 and 60 inches is considered in making the ratings. Soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction and maintenance of the system, and those that may affect public health.

Soil properties and qualities that affect the absorption of the effluent are depth to a seasonal high water table, depth to bedrock, depth to a cemented pan, and susceptibility to flooding or ponding. Shallow depth to bedrock, ice, or a cemented pan interferes with installation. Excessive slope may result in lateral seepage and surfacing of the effluent in down-slope areas. In addition, soil erosion is a hazard where absorption fields are installed in steep soils.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth less than 2 feet below the distribution lines. In these soils, the absorption field may not adequately filter the effluent, particularly when the system is new; consequently, ground water supplies may be contaminated.

Ratings are both numerical and verbal. Numerical ratings or values indicate the relative severity or degree of limitation for individual soil restrictive (limiting) features. Ratings are shown for limiting soil features as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00), and the point at which the soil feature is not a limitation (0.00). Non-limiting soil features with a numerical rating of zero are not listed.

Rating class terms indicate the extent to which the soils are limited by the soil features that affect the soil interpretation. Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating

Custom Soil Resource Report

process. The "not limited" class (numerical value for the most restrictive feature = 0) indicates that the soil has no limiting features for the specified use. The "somewhat limited" class (numerical value for the most restrictive feature .01 to .99) indicates that the soil has limiting features for the specified use that can be overcome with proper planning, design, installation, and management. The effort required to overcome a soil limitation increases as the numerical rating increases. The "very limited" class (numerical value for the most restrictive feature = 1.00) indicates that the soil has one or more very limiting features that can only be overcome with special planning, major soil modification, special design, or significant management practices.

Lesser soil restrictive features have a lower numerical value than the maximum used to rate the soil, and they are identified to provide the user with additional information about soil limitations for the specific use. Lesser soil restrictive features also need to be considered in planning, design, installation, and management.

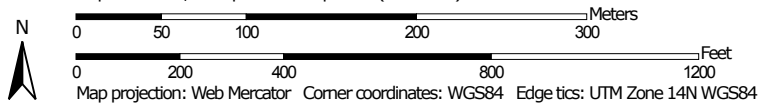
The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

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Custom Soil Resource Report
Map—Septic Tank, Gravity Disposal (TX)




Map Scale: 1:4,440 if printed on A portrait (8.5" x 11") sheet.




MAP LEGEND

Area of Interest (AOI)





 Area of Interest (AOI)

Background





 Aerial Photography

Soils





Soil Rating Polygons

-  Very limited
-  Somewhat limited
-  Not limited
-  Not rated or not available


Soil Rating Lines

-  Very limited
-  Somewhat limited
-  Not limited
-  Not rated or not available






Soil Rating Points

-  Very limited
-  Somewhat limited
-  Not limited
-  Not rated or not available

Water Features

 Streams and Canals

Transportation

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

MAP INFORMATION

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

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

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

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

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Soil Survey Area: Bastrop County, Texas
 Survey Area Data: Version 16, Sep 14, 2018

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

Date(s) aerial images were photographed: Oct 5, 2015—Nov 30, 2017

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

Custom Soil Resource Report

Tables—Septic Tank, Gravity Disposal (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AfC	Edge fine sandy loam, 1 to 5 percent slopes	Very limited	Edge (90%)	Clayey (1.00)	2.6	6.8%
AfC2	Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	Not limited	Edge, moderately eroded (90%)		24.6	63.6%
			Crockett, moderately eroded (10%)			
AtD	Edge gravelly fine sandy loam, 3 to 8 percent slopes	Not limited	Edge (95%)		6.2	16.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	Somewhat limited	Robco (46%)	Depth to saturated zone (0.44)	1.5	3.8%
			Tanglewood (25%)	Depth to saturated zone (0.89)		
			Rader (5%)	Depth to saturated zone (0.92)		
			Straber (5%)	Depth to saturated zone (0.86)		
TfB	Tabor fine sandy loam, 1 to 3 percent slopes	Very limited	Tabor (85%)	Depth to saturated zone (1.00)	3.8	9.9%
				Clayey (1.00)		
Totals for Area of Interest					38.7	100.0%

Rating	Acres in AOI	Percent of AOI
Not limited	30.8	79.5%
Very limited	6.5	16.7%
Somewhat limited	1.5	3.8%
Totals for Area of Interest	38.7	100.0%

Rating Options—Septic Tank, Gravity Disposal (TX)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Septic Tank, Subsurface Drip Irrigation (TX)

The Septic Tank, Subsurface Drip Irrigation (TX) interpretation is a tool for assessing soil limitations for septic systems designed to treat household effluent. Suburban dwellings and farm and ranch homesteads, outbuildings, and recreational facilities require a means to safely dispose of effluent. The ratings are not intended to substitute for or replace the need for an onsite soil investigation to determine a site's soil restrictions and suitability. The interpretation ratings simply identify limiting soil features that can be found in the soil mapping unit and that may exist on site.

The Texas Commission on Environmental Quality publishes criteria and rules governing the location and installation of Septic Tank, Subsurface Drip Irrigation systems. These rules and criteria are contained in "Texas Commission on Environmental Quality - TCEQ; Chapter 285: On-Site Sewage Facilities". Onsite investigation, evaluation, and system design must be conducted by a qualified professional in compliance with TCEQ policy, rules, and design guidelines.

Septic tank, subsurface drip irrigation systems are systems consisting of small diameter pressurized lines containing pressure reducing emitters in the upper part of the natural soil. The system is a evapotranspiration system that utilizes vegetative treatment and evaporation for treatment and utilization of secondary effluent.

Soil properties and qualities that affect the treatment of the effluent are surface pH, depth to a seasonal high water table, depth to bedrock, depth to a cemented pan, and susceptibility to flooding or ponding. Shallow depth to bedrock or a cemented pan interferes with installation. Excessive slope may result in lateral seepage and surfacing of the effluent in down-slope areas. In addition, soil erosion is a hazard where absorption fields are installed in steep soils.

Ratings are both numerical and verbal. Numerical ratings or values indicate the relative severity or degree of limitation for individual soil restrictive (limiting) features. Ratings are shown for limiting soil features as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00), and the point at which the soil feature is not a limitation (0.00). Non-limiting soil features with a numerical rating of zero are not listed.

Rating class terms indicate the extent to which the soils are limited by the soil features that affect the soil interpretation. Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating process. The "not limited" class (numerical value for the most restrictive feature = 0) indicates that the soil has no limiting features for the specified use. The "somewhat limited" class (numerical value for the most restrictive feature .01 to .99) indicates that the soil has limiting features for the specified use that can be overcome with proper planning, design, installation, and management. The effort required to overcome a soil limitation increases as the numerical rating increases. The "very limited" class (numerical value for the most restrictive feature = 1.00) indicates that the soil has one or more very limiting features that can only be overcome with special planning, major soil modification, special design, or significant management practices.

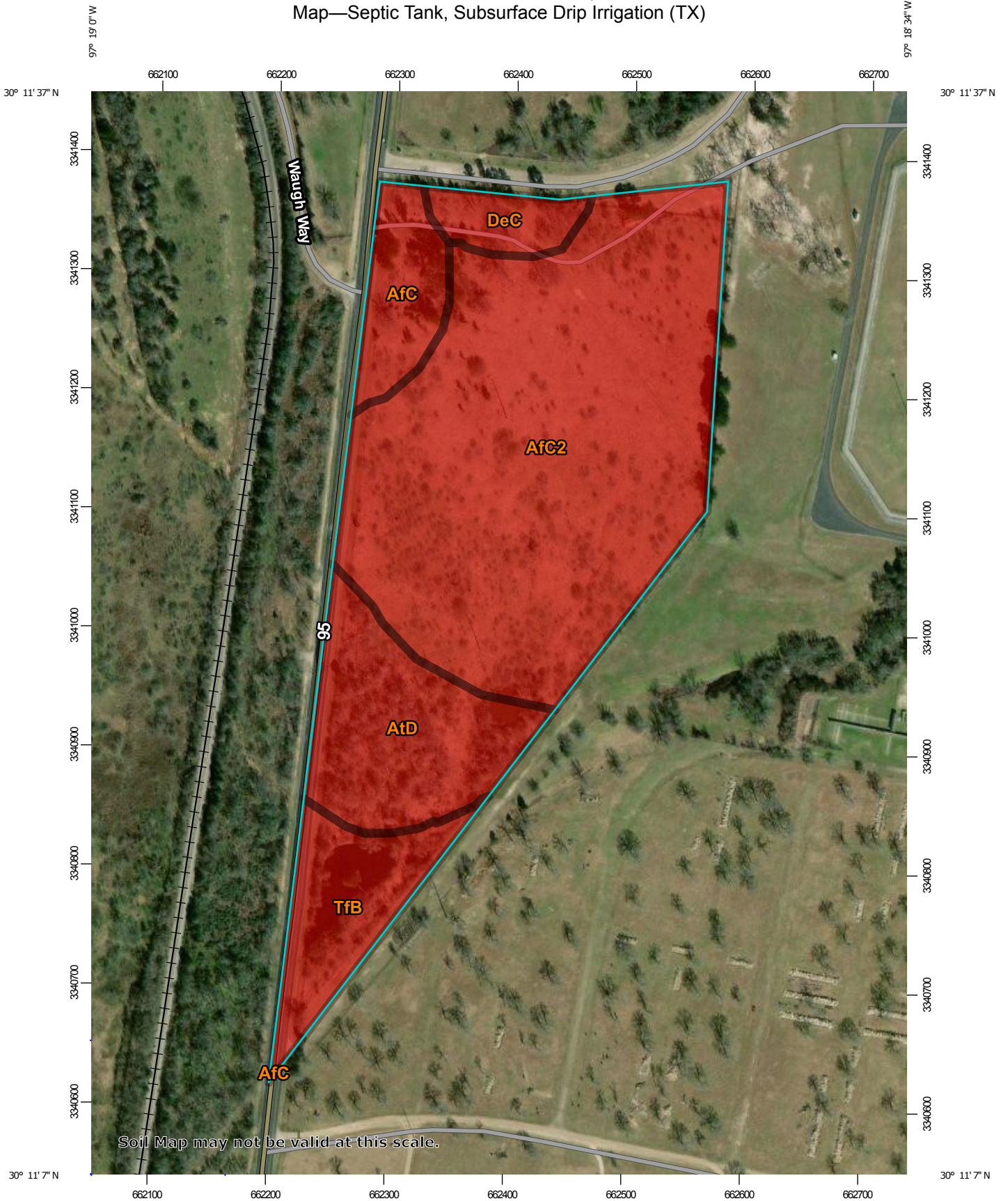
Custom Soil Resource Report

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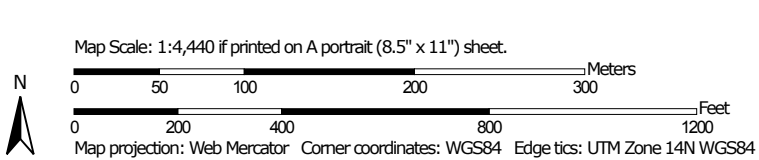
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
















Custom Soil Resource Report
 Map—Septic Tank, Subsurface Drip Irrigation (TX)



Soil Map may not be valid at this scale.



MAP LEGEND

- Area of Interest (AOI)**
 -  Area of Interest (AOI)
- Background**
 -  Aerial Photography
- Soils**
 - Soil Rating Polygons**
 -  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
 - Soil Rating Lines**
 -  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
 - Soil Rating Points**
 -  Very limited
 -  Somewhat limited
 -  Not limited
 -  Not rated or not available
- Water Features**
 -  Streams and Canals
- Transportation**
 -  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads

MAP INFORMATION

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Custom Soil Resource Report

Tables—Septic Tank, Subsurface Drip Irrigation (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AfC	Edge fine sandy loam, 1 to 5 percent slopes	Very limited	Edge (90%)	pH < 6.0 or > 9.0 (1.00)	2.6	6.8%
AfC2	Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	Very limited	Edge, moderately eroded (90%)	pH < 6.0 or > 9.0 (1.00)	24.6	63.6%
AtD	Edge gravelly fine sandy loam, 3 to 8 percent slopes	Very limited	Edge (95%)	pH < 6.0 or > 9.0 (1.00)	6.2	16.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	Very limited	Robco (46%)	Depth to saturated zone (1.00)	1.5	3.8%
				pH < 6.0 or > 9.0 (1.00)		
			Tanglewood (25%)	Depth to saturated zone (1.00)		
				pH < 6.0 or > 9.0 (1.00)		
TfB	Tabor fine sandy loam, 1 to 3 percent slopes	Very limited	Tabor (85%)	Depth to saturated zone (1.00)	3.8	9.9%
				pH < 6.0 or > 9.0 (1.00)		
Totals for Area of Interest					38.7	100.0%

Rating	Acres in AOI	Percent of AOI
Very limited	38.7	100.0%
Totals for Area of Interest	38.7	100.0%

Rating Options—Septic Tank, Subsurface Drip Irrigation (TX)

Aggregation Method: Dominant Condition
Component Percent Cutoff: None Specified
Tie-break Rule: Higher

Septic Tank, Leaching Chamber (TX)

The Septic Tank Leaching Chamber (TX) interpretation is a tool for assessing soil limitations for septic systems designed to treat household effluent. Suburban dwellings and farm and ranch homesteads, outbuildings, and recreational facilities require a means to safely dispose of effluent. The ratings are not intended to substitute for or replace the need for an onsite soil investigation to determine a site's soil restrictions and suitability. The interpretation ratings simply identify limiting soil features that can be found in the soil mapping unit and that may exist on site.

The Texas Commission on Environmental Quality publishes criteria and rules governing the location and installation of Septic Tank Leaching Chamber systems. These rules and criteria are contained in "Texas Commission on Environmental Quality - TCEQ; Chapter 285: On-Site Sewage Facilities". Onsite investigation, evaluation, and system design must be conducted by a qualified professional in compliance with TCEQ policy, rules, and design guidelines.

Septic tank leaching chambers are similar to an absorptive drainfield, however, the effluent is deposited into bottomless chambers that are linked together with solid walled pipe and are allowed a reduction in the absorptive drainfield sizing formula. The centerline depth of the chambers is assumed to be 18 inches or deeper. Only the soil between depths of 18 and 60 inches is considered in making the ratings. Soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction and maintenance of the system, and those that may affect public health.

Soil properties and qualities that affect the absorption of the effluent are depth to a seasonal high water table, depth to bedrock, depth to a cemented pan, and susceptibility to flooding or ponding. Shallow depth to bedrock, ice, or a cemented pan interferes with installation. Excessive slope may result in lateral seepage and surfacing of the effluent in down-slope areas. In addition, soil erosion is a hazard where absorption fields are installed in steep soils.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth less than 2 feet below the bottom of the chambers. In these soils, the absorption field may not adequately filter the effluent, particularly when the system is new; consequently, ground water supplies may be contaminated.

Ratings are both numerical and verbal. Numerical ratings or values indicate the relative severity or degree of limitation for individual soil restrictive (limiting) features. Ratings are shown for limiting soil features as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00), and the point at which the soil feature is not a limitation (0.00). Non-limiting soil features with a numerical rating of zero are not listed.

Rating class terms indicate the extent to which the soils are limited by the soil features that affect the soil interpretation. Verbal soil rating classes are based on the highest numerical rating for the most limiting soil feature(s) considered in the rating

Custom Soil Resource Report

process. The "not limited" class (numerical value for the most restrictive feature = 0) indicates that the soil has no limiting features for the specified use. The "somewhat limited" class (numerical value for the most restrictive feature .01 to .99) indicates that the soil has limiting features for the specified use that can be overcome with proper planning, design, installation, and management. The effort required to overcome a soil limitation increases as the numerical rating increases. The "very limited" class (numerical value for the most restrictive feature = 1.00) indicates that the soil has one or more very limiting features that can only be overcome with special planning, major soil modification, special design, or significant management practices.

Lesser soil restrictive features have a lower numerical value than the maximum used to rate the soil. They are identified to provide the user with additional information about soil limitations for the specific use. Lesser soil restrictive features also need to be considered in planning, design, installation, and management.

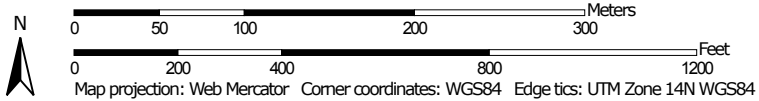
The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation is needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report Map—Septic Tank, Leaching Chamber (TX)

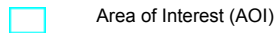


Map Scale: 1:4,440 if printed on A portrait (8.5" x 11") sheet.



MAP LEGEND

Area of Interest (AOI)



Area of Interest (AOI)

Background



Aerial Photography

Soils

Soil Rating Polygons



Very limited



Somewhat limited



Not limited



Not rated or not available

Soil Rating Lines



Very limited



Somewhat limited



Not limited



Not rated or not available

Soil Rating Points



Very limited



Somewhat limited



Not limited



Not rated or not available

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Bastrop County, Texas
 Survey Area Data: Version 16, Sep 14, 2018

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

Date(s) aerial images were photographed: Oct 5, 2015—Nov 30, 2017

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

Custom Soil Resource Report

Tables—Septic Tank, Leaching Chamber (TX)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
AfC	Edge fine sandy loam, 1 to 5 percent slopes	Very limited	Edge (90%)	Clayey (1.00)	2.6	6.8%
AfC2	Edge fine sandy loam, 2 to 5 percent slopes, moderately eroded	Not limited	Edge, moderately eroded (90%)		24.6	63.6%
			Crockett, moderately eroded (10%)			
AtD	Edge gravelly fine sandy loam, 3 to 8 percent slopes	Not limited	Edge (95%)		6.2	16.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	Somewhat limited	Robco (46%)	Depth to saturated zone (0.44)	1.5	3.8%
			Tanglewood (25%)	Depth to saturated zone (0.89)		
			Rader (5%)	Depth to saturated zone (0.92)		
			Straber (5%)	Depth to saturated zone (0.86)		
TfB	Tabor fine sandy loam, 1 to 3 percent slopes	Very limited	Tabor (85%)	Depth to saturated zone (1.00)	3.8	9.9%
				Clayey (1.00)		
Totals for Area of Interest					38.7	100.0%

Rating	Acres in AOI	Percent of AOI
Not limited	30.8	79.5%
Very limited	6.5	16.7%
Somewhat limited	1.5	3.8%
Totals for Area of Interest	38.7	100.0%

Rating Options—Septic Tank, Leaching Chamber (TX)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
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- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

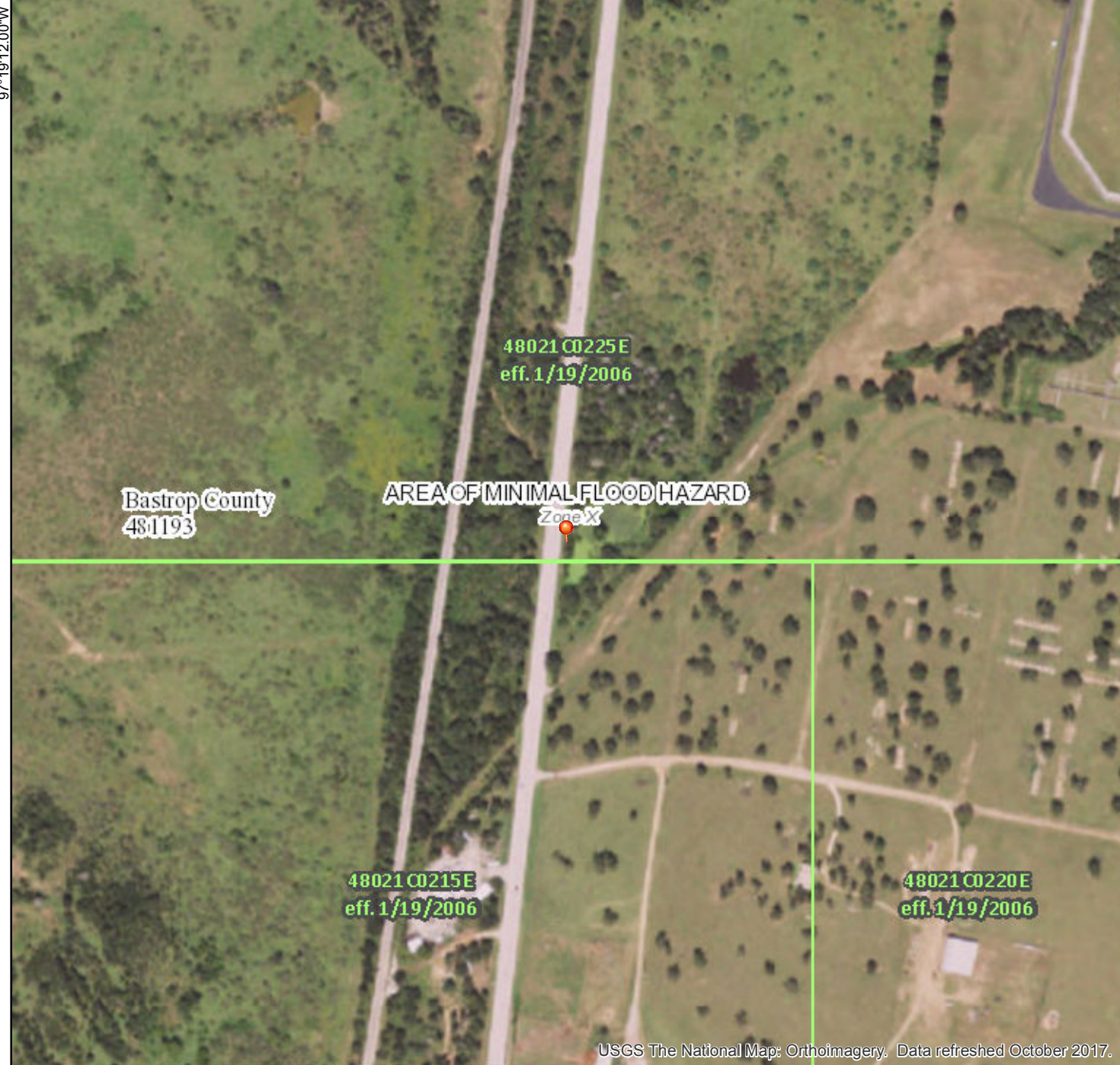
EXHIBIT C

FEMA Firmette

National Flood Hazard Layer FIRMette



30°11'31.38"N



USGS The National Map: Orthoimagery. Data refreshed October 2017. 0 250 500 1,000 1,500 2,000 Feet 1:6,000 30°11'0.28"N

Legend

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

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

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

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

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

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

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

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

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

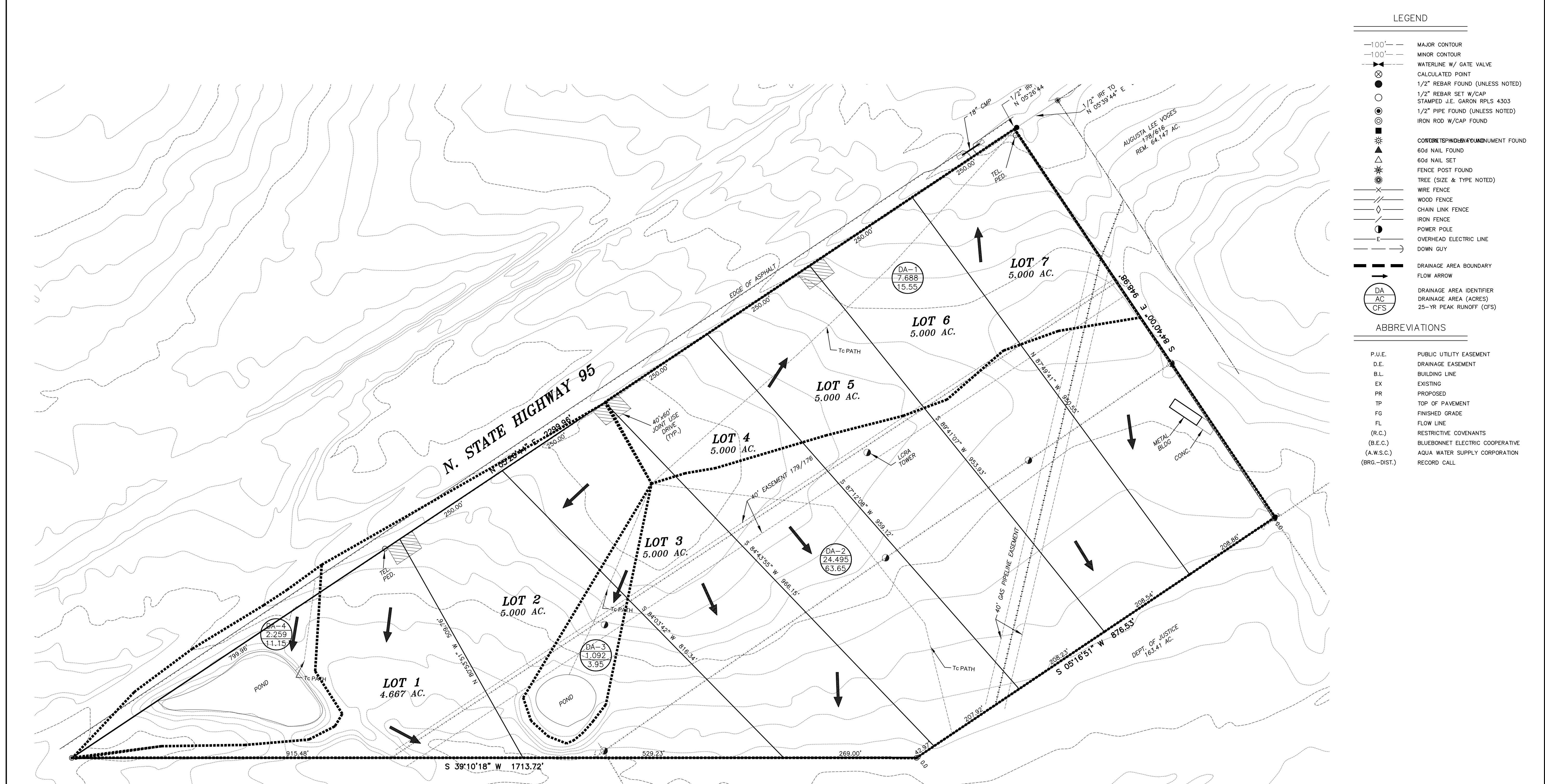
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/3/2018 at 1:18:43 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

97°18'34.54"W

EXHIBIT D

Drainage Area Map



- LEGEND**
- 100'— MAJOR CONTOUR
 - 100'--- MINOR CONTOUR
 - WATERLINE W/ GATE VALVE
 - ⊗ CALCULATED POINT
 - 1/2" REBAR FOUND (UNLESS NOTED)
 - ⊙ 1/2" REBAR SET W/CAP
 - ⊚ STAMPED J.E. GARON RPLS 4303
 - ⊛ 1/2" PIPE FOUND (UNLESS NOTED)
 - ⊜ IRON ROD W/CAP FOUND
 - ⊞ CONCRETE SPINDLE FOUND
 - ⊟ 60d NAIL FOUND
 - ⊠ 60d NAIL SET
 - ⊡ FENCE POST FOUND
 - ⊢ TREE (SIZE & TYPE NOTED)
 - ⊣ WIRE FENCE
 - ⊤ WOOD FENCE
 - ⊥ CHAIN LINK FENCE
 - ⊦ IRON FENCE
 - ⊧ POWER POLE
 - ⊨ OVERHEAD ELECTRIC LINE
 - ⊩ DOWN GUY
 - DRAINAGE AREA BOUNDARY
 - FLOW ARROW
 - ⊙ DA AC CFS DRAINAGE AREA IDENTIFIER
 - ⊙ DRAINAGE AREA (ACRES)
 - ⊙ 25-YR PEAK RUNOFF (CFS)

- ABBREVIATIONS**
- P.U.E. PUBLIC UTILITY EASEMENT
 - D.E. DRAINAGE EASEMENT
 - B.L. BUILDING LINE
 - EX EXISTING
 - PR PROPOSED
 - TP TOP OF PAVEMENT
 - FG FINISHED GRADE
 - FL FLOW LINE
 - (R.C.) RESTRICTIVE COVENANTS
 - (B.E.C.) BLUEBONNET ELECTRIC COOPERATIVE
 - (A.W.S.C.) AQUA WATER SUPPLY CORPORATION
 - (BRG.-DIST.) RECORD CALL

NO.	DATE	REVISIONS	BY

VanGard Engineering, Inc.
 CIVIL ENGINEERING CONSULTANTS
 FIRM REGISTRATION # F-5398
 P.O. Box 1917
 Bastrop, Texas 78602
 (512) 303-4185
 FAX (512) 321-2107

DRAINAGE AREA MAP
TIERRA TRES SUBDIVISION
BASTROP COUNTY, TEXAS

EXISTING GROUND COVER TABLE

Ground Cover Description	AREA (ft ²)	AREA (AC)	CN
DA-1			
Existing Structures	1,932	0.044	0.95
Woods-grass combination (HSG A), Fair condition	74,052	1.700	0.25
Woods-grass combination (HSG D), Fair condition	258,905	5.944	0.4
TOTAL	334,889	7.688	
Impervious Cover			0.6%
Weighted CN-value			0.37
DA-2			
Woods-grass combination (HSG D), Fair condition	1,067,017	24.495	0
TOTAL	1,067,017	24.495	
Impervious Cover			0.0%
Weighted CN-value			0.40
DA-3			
Woods-grass combination (HSG D), Fair condition	38,213	0.877	0.4
Pond Surface Area	9,343	0.214	0.95
TOTAL	47,556	1.092	
Impervious Cover			0.0%
Weighted CN-value			0.51
DA-4			
Woods-grass combination (HSG D)	71,059	1.631	0.4
Pond Surface Area	27,353	0.628	0.95
TOTAL	98,412	2.259	
Impervious Cover			0.0%
Weighted CN-value			0.55

PROPOSED GROUND COVER TABLE

Ground Cover Description	AREA (ft ²)	AREA (AC)	C
DA-1			
Impervious cover (50% of Lots 4, 5, 6, & 7 + existing i.c.)	21,932	0.503	0.95
Lawn (HSG D, 75% cover)	174,240	4.000	0.25
Woods-grass combination (HSG A), Fair condition	74,052	1.700	0.25
Woods-grass combination (HSG D), Fair condition	64,665	1.485	0.4
TOTAL	334,889	7.688	
Impervious Cover			6.5%
Weighted CN-value			0.32
DA-2			
Impervious cover (Lots 1, 2 & 3 + 50% Lots 4, 5, 6, & 7)	50,000	1.148	0.95
Lawn (HSG D, 75% cover)	130,680	3.000	0.25
Woods-grass combination (HSG D), Fair condition	886,337	20.347	0
TOTAL	1,067,017	24.495	
Impervious Cover			4.7%
Weighted CN-value			0.41
DA-3			
Woods-grass combination (HSG D), Fair condition	38,213	0.877	0.4
Pond Surface Area	9,343	0.214	1
TOTAL	47,556	1.092	
Impervious Cover			0.0%
Weighted CN-value			0.51
DA-4			
Woods-grass combination (HSG D)	71,059	1.631	0.4
Pond Surface Area	27,353	0.628	1
TOTAL	98,412	2.259	
Impervious Cover			0.0%
Weighted CN-value			0.55

EXISTING CONDITIONS PEAK DISCHARGE (CFS)

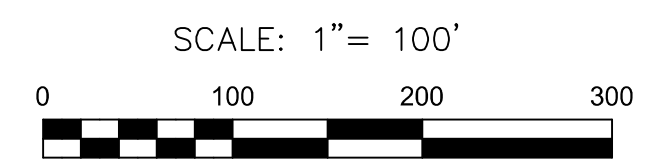
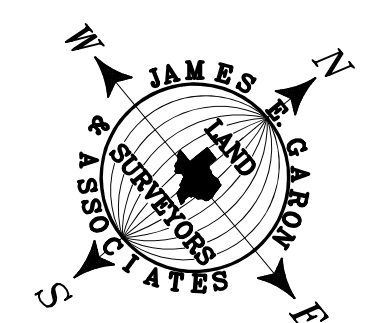
DRAINAGE AREA	ACREAGE (AC)	IMP. COVER (%)	Tc (mins.)	Weighted C-Value	2-YR	10-YR	25-YR	50-YR	100-YR
DA-1	7.688	0.6	17.6	0.37	10.23	15.36	18.36	20.89	23.75
DA-2	24.495	0.0	16.7	0.40	36.17	54.25	64.83	73.69	83.70
DA-3	1.092	0.0	12.8	0.51	2.32	3.48	4.14	4.68	5.30
DA-4	2.259	0.0	7.8	0.55	6.28	9.36	11.09	12.42	13.95

FULLY DEVELOPED CONDITIONS PEAK DISCHARGE (CFS)

DRAINAGE AREA	ACREAGE (AC)	IMP. COVER (%)	Tc (mins.)	Weighted C-Value	2-YR	10-YR	25-YR	50-YR	100-YR
DA-1	7.688	6.5	19.0	0.32	8.51	12.79	15.31	17.44	19.84
DA-2	24.495	4.7	18.1	0.41	35.62	53.48	63.97	72.82	82.80
DA-3	1.092	0.0	14.2	0.51	2.22	3.32	3.96	4.49	5.09
DA-4	2.259	0.0	7.8	0.55	6.28	9.36	11.09	12.42	13.95

PRE-DEVELOPMENT / POST-DEVELOPMENT COMPARISON TABLE

DRAINAGE AREA	2-YR	10-YR	25-YR	50-YR	100-YR	
Pre-Development Peak Discharge (CFS) at DP-1	DA-1	10.23	15.36	18.36	20.89	23.75
Post-Development Peak Discharge (CFS) at DP-1	DA-1	8.51	12.79	15.31	17.44	19.84
Pre-Development Peak Discharge (CFS) at DP-2	DA-2	36.17	54.25	64.83	73.69	83.70
Post-Development Peak Discharge (CFS) at DP-2	DA-2	35.62	53.48	63.97	72.82	82.80
Pre-Development Peak Discharge (CFS) at DP-3	DA-3	2.32	3.48	4.14	4.68	5.30
Post-Development Peak Discharge (CFS) at DP-3	DA-3	2.22	3.32	3.96	4.49	5.09
Pre-Development Peak Discharge (CFS) at DP-4	DA-4	6.28	9.36	11.09	12.42	13.95
Post-Development Peak Discharge (CFS) at DP-4	DA-4	6.28	9.36	11.09	12.42	13.95



THIS DRAWING IS FOR REVIEW & COMMENTS ONLY! (NOT FOR CONSTRUCTION)

OCTOBER 12, 2018