C&T ENGINEERING

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Suite 106-102
Franklin, TN 3706

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May 25, 2022

Imer Development
1909 Columbia Avenue
Franklin, Tennessee 37064

Subject: **HYDROLOGIC DETERMINATION REPORT**
Old Columbia Road Property
(Parcel # 111 040.00, 111 040.01 and 111 040.03)
Dickson, Dickson County, Tennessee
C&T Project No. 03-22021

C&T Engineering and Inspection, LLC has completed Hydrologic Determination Services for natural resource features located on the property located near the intersection of Old Columbia Rd and Bishop Ln on Old Columbia Rd (Parcel # 111 040.00, 111 040.01 and 111 040.03) in Dickson, Dickson County, Tennessee. Please see attached a formal report summarizing the findings of the assessment.

We appreciate the opportunity to provide these services to you and look forward to working with you again in the future. If you have any questions regarding this report, please do not hesitate to contact me.

Sincerely,

C&T Engineering and Inspection, LLC

C. Brandon Garrett, CPESC, TN-QHP

Senior Environmental Scientist/Project Manager

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INTRODUCTION

C&T Engineering and Inspection, LLC (Consultant) performed a Hydrologic Determinations and Wetland Delineations on natural resource features located on the property of the planned development located off of Old Columbia Road in Dickson, Dickson County, Tennessee (Parcel # 111 040.00, 111 040.01 and 111 040.03) (+/- 16.5 acres) (See **Figure 1** - Site Location Map). The hydrologic determination of the features located onsite were conducted on May 13, 2022 by Brandon Garrett, QHP-1130TN15. During this field review, information was gathered regarding any drainage feature present onsite. Any drainage features observed were to be analyzed following the Tennessee Department of Environment and Conservation (TDEC) standard operating procedures for Hydrologic Determinations. Field data sheets completed during the course of the delineation are provided in **Appendix IV**. Also, during this field review, information was gathered following the routine three parameter approach to wetland delineation as published by the U.S. Army Corps of Engineers (USACE), 1987 edition (Technical Report Y-87-1). USACE wetland field data sheets completed during the course of the delineation are provided in **Appendix V**.

SITE DESCRIPTION

The Subject Property includes approximately 16.5 acres of gently sloping mixture of pastureland and woodland. One vacant home and two associated outbuildings were located onsite near the southwestern property corner. Two channels were observed on the property. One located along the eastern property boundary flowing north and one along the northern property boundary flowing west/northwest. One pond was located in the wooded portion of the property near the eastern boundary. No other drainage features or potential wetlands were observed on the property. C&T investigated the entire 16.5 acres of the Subject Property. The surroundings of the proposed project include residential properties and vacant property.

The site is located on the Burns, Tennessee US Geological Survey 7.5 Minute Topographic Quadrangle dated 2016 and the elevation ranges from 875 feet at the northeastern property corner to 935 feet near the center of the property. (**Figure 1**).

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SITE INFORMATION

The Subject Property includes approximately 16.5 acres of mixed pastureland and woodland and includes one vacant home with associated outbuildings. Two channels were observed on the property one flowing north along the eastern side of the property and one flowing west/northwest along the northern property boundary. One pond was identified near the eastern property boundary. The surroundings of the proposed project include mostly residential and vacant properties.

During the site investigation no other drainage features, wetlands or ponds were identified or observed. Johnson's Branch was labeled on the Burns, Tennessee US Geological Survey 7.5 Minute Topographic Quadrangle dated 2016 for the subject property along the eastern property boundary. No other water resources were identified on the above-mentioned topographic map. The site layout can be found in (**Appendix I**) section of this report.

NATIONAL WETLANDS INVENTORY (NWI) MAP

The NWI map was reviewed to identify any previously mapped wetlands within the boundaries of the site. The NWI map did not identify any wetlands or potential wetlands on the property **(Appendix II).** Johnson's Branch was identified on The US Fish and Wildlife National Wetland Inventory Map (NWI).

SOIL SURVEY

As shown in (**Appendix III)**, the site is predominantly underlain by soils listed in **Table 1** located below. None of the listed soils were found to be hydric in the Dickson County hydric soils list.

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Symbol	Soil Name	Description	Hydric
StC	Sengtown-Urban Land Complex 2 to 12 percent slopes	Clayey residuum weathered from cherty limestone	NO

Source: NRCS Web Soil Survey

ON-SITE FINDINGS

Two drainage features were identified during the site assessment. Both channels located on the property were scored as 4 different features due to subsurface flow observed in both channels. One pond was identified during the field assessment. No wetlands were identified on the property. During this field review, information was gathered following the routine three parameter approach to wetland delineation as published by the U.S. Army Corps of Engineers (USACE), 1987 edition (Technical Report Y-87-1). USACE wetland field data sheets completed during the course of the delineation are provided in **Appendix V.** Approximate locations of sample points are also shown on figures in **Appendix I**. If present, wetland boundaries were flagged with pink wetland flagging.

The following drainage features were identified on-site:

- **STR-1 (Johnson's Creek)** – Enters property at southeastern property corner at **Latitude: N36.065968° Longitude: W-87.345012°** runs along eastern property boundary and appears to go subsurface near a driveway crossing at **Latitude: N36.066418° Longitude: W-87.344489°**. Two primary indicators for stream were observed (presence of naturally occurring groundwater connection, flowing water in channel and 7 days since last precipitation). Secondary indicators were also evaluated. The channel displayed weak to moderate geomorphic secondary indicators. Iron oxidizing bacteria was observed at culvert crossing underneath Bishop Ln. Macrobenthos observed included mayfly larvae, scuds and isopods throughout the STR-1 reach. The flow in the stream appears to go subsurface near a driveway culvert crossing at the ending latitude longitude coordinates mentioned above. Downstream, below this location all secondary indicator scores dramatically decrease with

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the channel structure weakening and upland rooted plants observed in the channel. The channel from starting to finish coordinates listed above scored 23 on the HDFD sheet and is considered a stream as part of this assessment.

- **WWC**-1 – Begins at **Latitude: N36.066557° Longitude: W-87.344538°** at the culvert outlet below Bishop Ln and across and downstream from STR-1 ending coordinates and leaving the property at **Latitude: N36.068304° Longitude: W-87.343337°.** The channel displayed weak secondary indicator scores through all three sub-categories. No flow was observed throughout the channel reach assessed. No macrobenthos was observed with exception to isopods in low amounts. Rooted plants were observed in the channel in multiple locations. No other biological indicators were observed and no other hydrology indicators with exception to weak scores for wrack lines and sediment observed on debris. The channel ultimately scored 15 on the HDFD sheet indicating a wet weather conveyance.
- **STR-2 –** Begins at northwestern property corner at **Latitude: N36.067731° Longitude: W-87.346949°** and ending at the location of subsurface flow into an open sinkhole/karst feature throat at **Latitude: N36.068105° Longitude: W-87.343529°.** The channel displayed two primary indicators for stream (flowing water in channel and 7 days since last significant rainfall, presence of naturally occurring groundwater connection). Secondary indicators were also evaluated. The channel included mostly moderate geomorphological indicator scores, weak to moderate hydrologic and biological indicator scores. Macrobenthos observed included mayfly larvae, scuds, isopods and stonefly larvae. Leopord frogs were also observed in channel in some locations. The channel scored 26.5 on the HDFD sheet indicating a stream.
- **WWC-2 –** Begins just downstream of location of subsurface flow into open karst feature throat at Latitude: N36.067956° Longitude:W-87.345150° and ends at intersection with WWC-1 at Latitude:N36.068105° Longitude: W-87.343529°. The channel included moderate to strong geomorphological secondary indicators but mostly weak to non-existent scores for hydrology and biology. The channel ultimately scored 19.5 on the HDFD sheet. Based on the observations detailed above and on the associated HD field data

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sheets,although the score is normally considered a stream, this channel does not appear to carry flow except for large rainfall events and C&T is considering this channel a WWC as part of this HD assessment.

- **WWC-3 -** Channel begins at edge of pasture at Latitude: N36.067024° Longitude: W-87.346521° and ends at intersection with STR-2 at Latitude: N36.067721° Longitude: W-87.346105°. No primary indicators were observed but secondary indicators were evaluated. The channel scored weak in all secondary indicators. No flow was observed, no macrobenthos was observed, fibrous roots and upland plants were observed within the channel during the assessment. No macrobenthos was observed during the assessment. The channel ultimately scored 8.5 on the HDFD sheet indicating a wet weather conveyance.

The following additional surface water features were observed on the property.

- **Pond A – Latitude: N36.065963° Longitude: W-87.345586°**

No wetlands were observed within the property boundaries.

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Any wetland boundaries are marked with pink wetland flagging in the field. Any wetland area identified in this study is subject to verification by the U.S. Army Corps of Engineers (USACE) and the Tennessee Department of Environment and Conservation (TDEC). After field verification by these two regulatory agencies, the area should then be surveyed and tied to the property boundaries. Any boundaries indicated on the enclosed site maps (**Appendix I**) are general based on visual observations related to obvious features in the landscape along with a handheld GPS unit and not the result of a field survey. Because of this, exact wetland boundaries and overall acreage are subject to change based on a field survey (by a TN registered surveyor) of the approved delineation flagging.

More information regarding on-site findings of the drainage features can be found in the field data sheets included in **Appendix IV.** Photographs taken during the investigation are included in **Appendix VI**.

I certify under penalty of law that this report and all attachments are, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. As specified in Tennessee Code Annotated Section 39-16-1702 (a)(4), this declaration is made under penalty of perjury.

C. Brandon Garrett, TN-QHP #1130-15

Senior Environmental Scientist/Project Manager

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Appendix I

Figures

FIGURE 1-SITE LOCATION MAP
OLD COLUMBIA ROAD PROPERTY
DICKSON, DICKSON COUNTY, TENNESSEE
C&T PROJECT NO. 03-22021

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1113 MURFREESBORO RD
SUITE 102-106
FRANKLIN, TENNESSEE 37064
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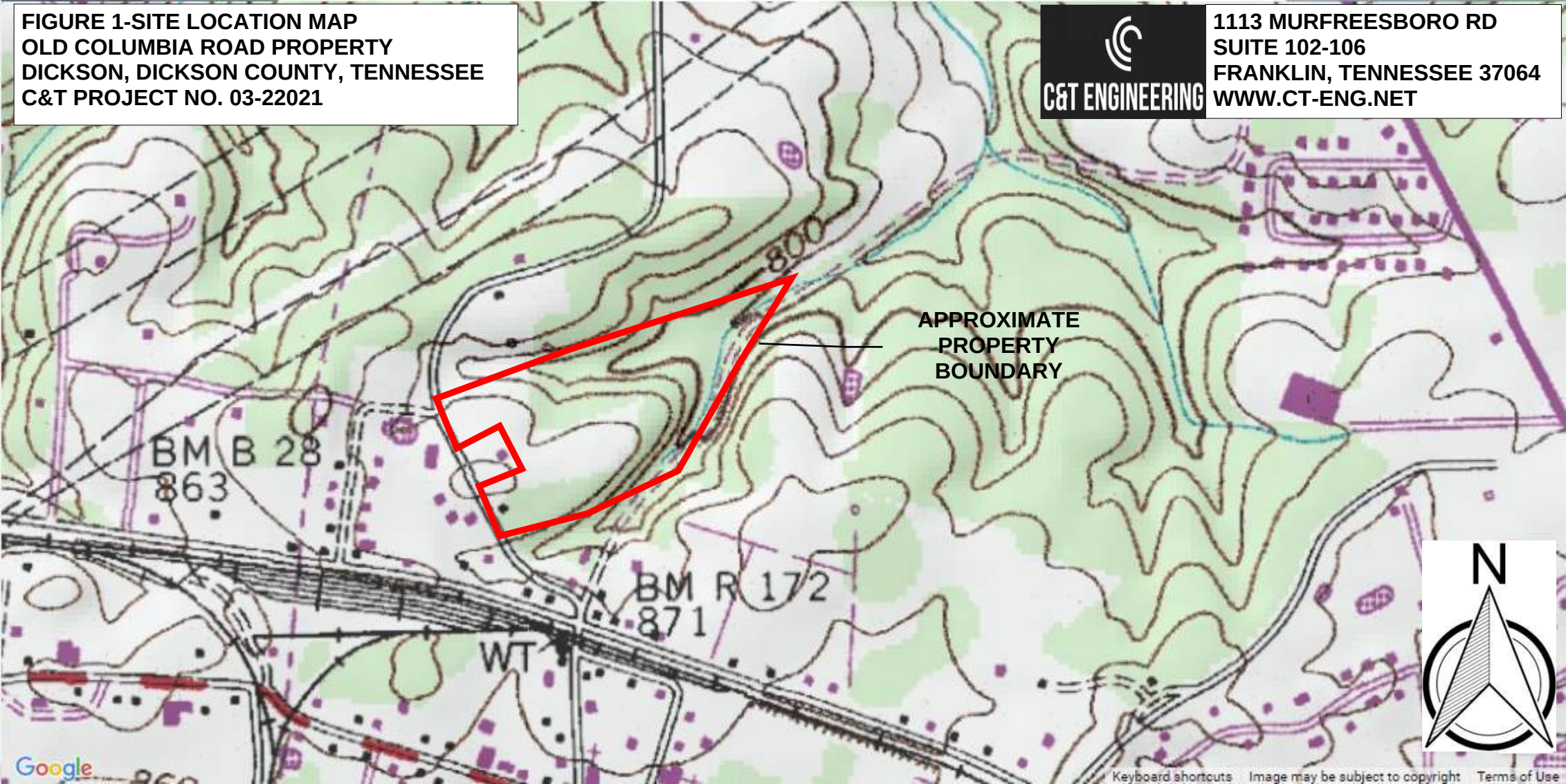

FIGURE 2-SITE LAYOUT
OLD COLUMBIA ROAD PROPERTY
DICKSON, DICKSON COUNTY, TENNESSEE
C&T PROJECT NO. 03-22021

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FRANKLIN, TENNESSEE 37064
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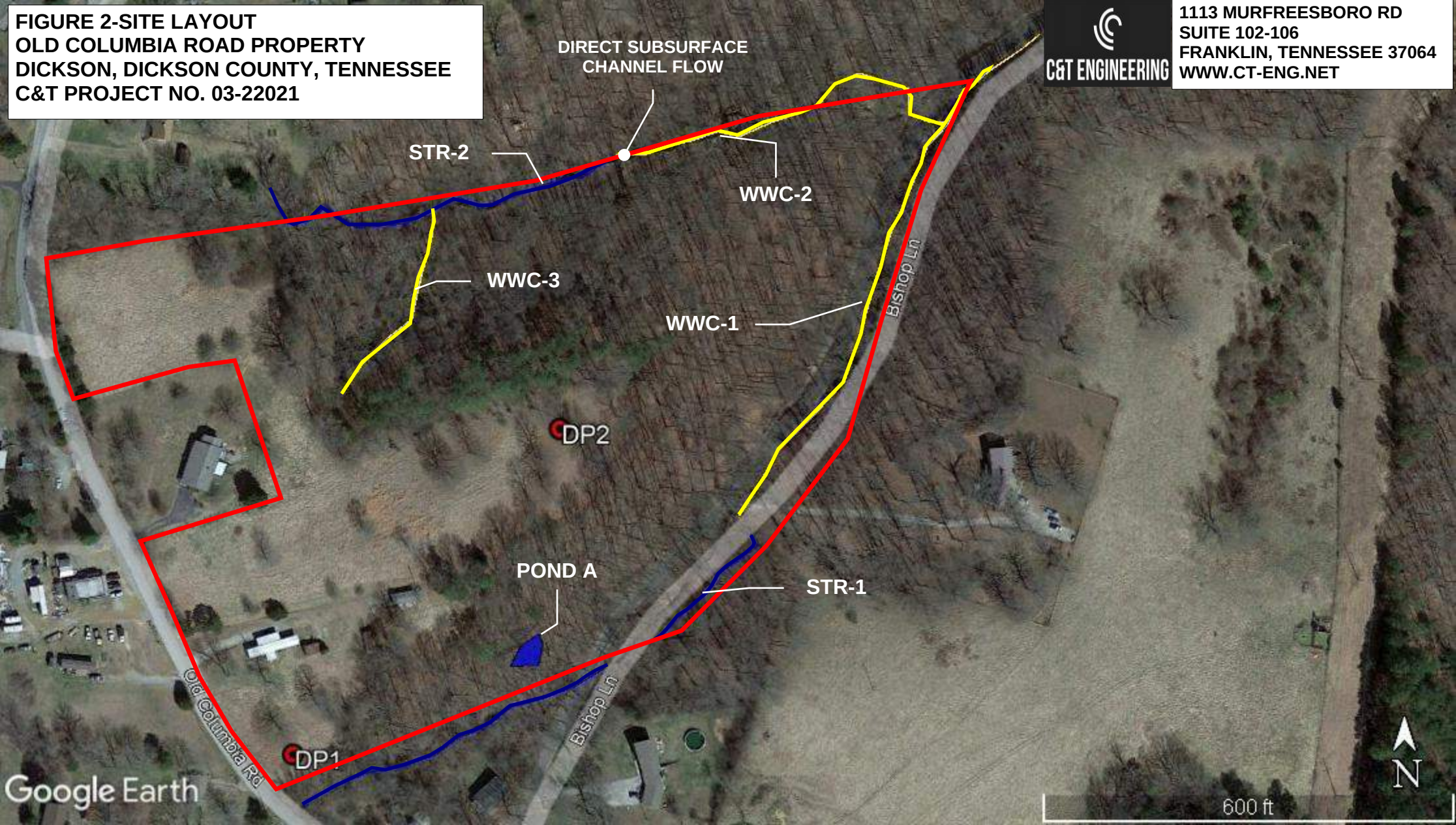

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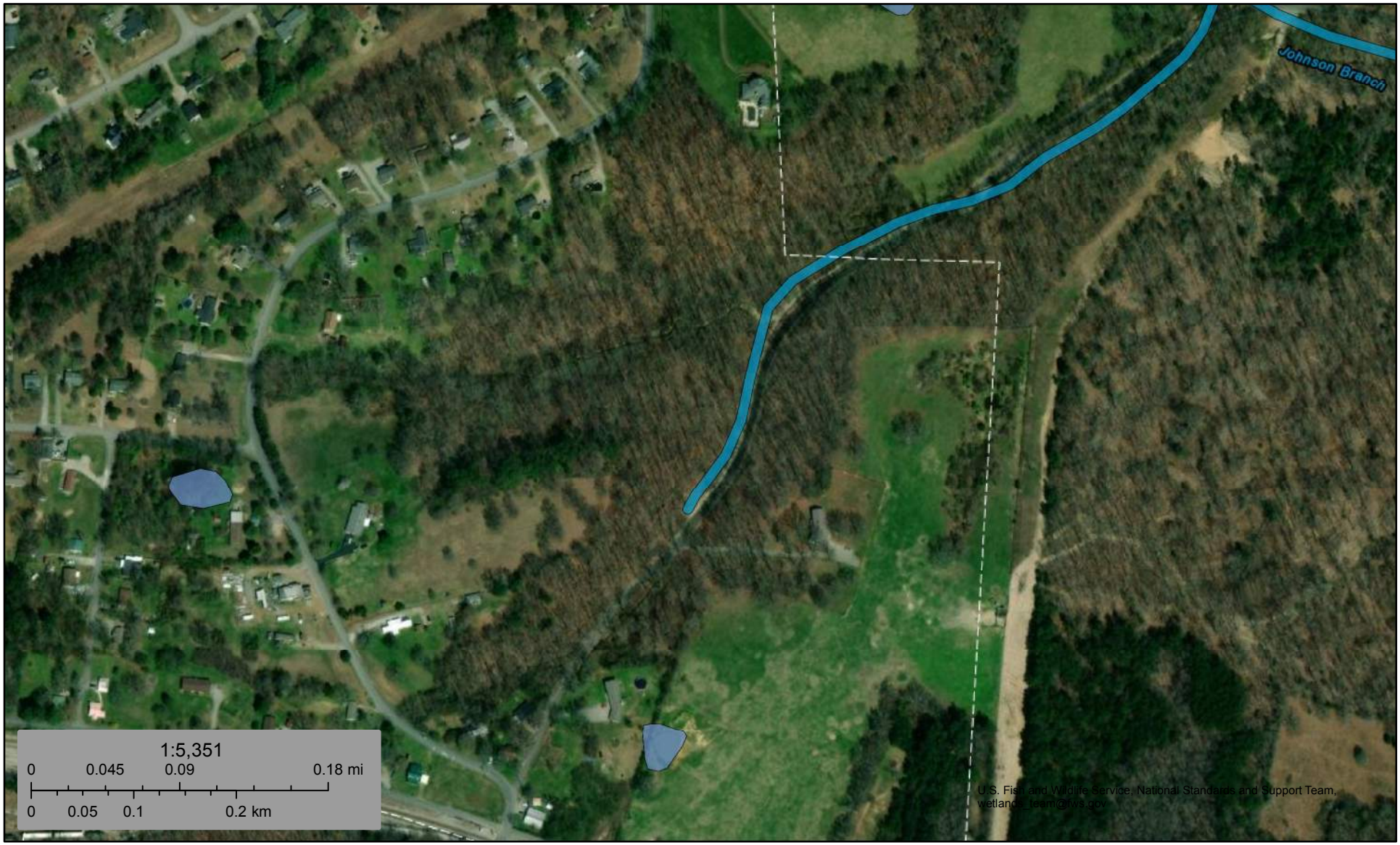
Appendix II

National Wetland Inventory Maps

U.S. Fish and Wildlife Service
National Wetlands Inventory

Wetlands



May 23, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

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Appendix III

NRCS Soil Survey Maps

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Dickson County, Tennessee

May 23, 2022

Preface

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

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil Map

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

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,650 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Dickson County, Tennessee
Survey Area Data: Version 16, Sep 10, 2021

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

Date(s) aerial images were photographed: Mar 21, 2021—May 1, 2021

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
StC	Sengtown-Urban land complex, 2 to 12 percent slopes	17.8	100.0%
Totals for Area of Interest		**17.8**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Dickson County, Tennessee

StC—Sengtown-Urban land complex, 2 to 12 percent slopes

Map Unit Setting

National map unit symbol: kpj6
Elevation: 600 to 1,300 feet
Mean annual precipitation: 48 to 55 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 185 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Sengtown and similar soils: 45 percent
Urban land: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sengtown

Setting

Landform: Hillslopes
Landform position (three-dimensional): Crest
Parent material: Clayey residuum weathered from cherty limestone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 15 inches: gravelly silty clay loam
H3 - 15 to 60 inches: gravelly clay

Properties and qualities

Slope: 2 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 25 percent
Hydric soil rating: No

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Appendix IV

HD Field Data Sheets

STR-1

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: NEAREST-JOHNSON BRANCH	Date/Time: 5/13/2022
Assessors/Affiliation: BRANDON GARRETT- QHP 1130-TN15	Project ID : 03-22021
Site Name/Description: OLD COLUMBIA RD PLANNED RESIDENTIAL DEVELOPMENT	
Site Location: OLD COLUMBIA RD AT BISHOP LANE-DICKSON TN	
HUC (12 digit): 051302040502-JONES CREEK UPPER	Lat/Long:
Previous Rainfall (7-days) : 0.20 (ALL ON MAY 6)	N36.066067 W-87.344846
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : NOAA.GOV	
Watershed Size : +/- 30 ACRES	County: DICKSON
Soil Type(s) / Geology : SENGTOWN-URBAN LAND COMPLEX	Source NRCS
Surrounding Land Use : RESIDENTIAL/VACANT WOODED/AGRICULTURAL	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 23

Justification / Notes :

Secondary Field Indicator Evaluation

STR-1

A. **Geomorphology** (Subtotal = 9.5)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0		1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. **Hydrology** (Subtotal = 3.5)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 10)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 23

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel shows moderate to weak geomorphic secondary indicators. flow observed off property near southwestern property corner and continues onto property just across bishop ln and continues flowing north to driveway crossing and flow dissipates and appears to go subsurface. channel continues across bishop lane and along western portion of bishop lane but geomorphic features are much weaker as well as biology and hydrology (this portion is scored seperate as WWC-1). STR-1 portion east of Bishop lane and south of property boundary included mayfly larvae, scuds, isopods in various locations, iron oxidizing bacteria was observed at culvert outlet at first bishop lane crossing.

STR-2

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: NEAREST-JOHNSON BRANCH	Date/Time: 5/13/2022
Assessors/Affiliation: BRANDON GARRETT- QHP 1130-TN15	Project ID : 03-22021
Site Name/Description: OLD COLUMBIA RD PLANNED RESIDENTIAL DEVELOPMENT	
Site Location: OLD COLUMBIA RD AT BISHOP LANE-DICKSON TN	
HUC (12 digit): 051302040502-JONES CREEK UPPER	Lat/Long:
Previous Rainfall (7-days) : 0.20 (ALL ON MAY 6)	N36.067777 W-87.345955
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : NOAA.GOV	
Watershed Size : +/- 50 ACRES	County: DICKSON
Soil Type(s) / Geology : SENGTOWN-URBAN LAND COMPLEX	Source NRCS
Surrounding Land Use : RESIDENTIAL/VACANT WOODED/AGRICULTURAL	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate **Slight** Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = Stream

Secondary Indicator Score (if applicable) = 26.5

Justification / Notes :

Secondary Field Indicator Evaluation

STR-2

A. **Geomorphology** (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0		1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. **Hydrology** (Subtotal = 5)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 10)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 26.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel shows moderate to weak geomorphic secondary indicators. Flow was observed on property from N36.067672 W-87.346786 to a sinkhole/karst feature where the flow appears to go subsurface at N36.067935 W-87.345790. Along the reach assessed mayfly larvae, scuds, stonefly larvae and isopods were observed in abundance throughout. Leopard frogs were observed in one location but no other amphibians were observed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: NEAREST-JOHNSON BRANCH	Date/Time: 5/13/2022
Assessors/Affiliation: BRANDON GARRETT- QHP 1130-TN15	Project ID : 03-22021
Site Name/Description: OLD COLUMBIA RD PLANNED RESIDENTIAL DEVELOPMENT	
Site Location: OLD COLUMBIA RD AT BISHOP LANE-DICKSON TN	
HUC (12 digit): 051302040502-JONES CREEK UPPER	Lat/Long:
Previous Rainfall (7-days) : 0.20 (ALL ON MAY 6)	N36.066651 W-87.364444
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : NOAA.GOV	
Watershed Size : +/- 15 ACRES	County: DICKSON
Soil Type(s) / Geology : SENGTOWN-URBAN LAND COMPLEX	Source NRCS
Surrounding Land Use : RESIDENTIAL/VACANT WOODED/AGRICULTURAL	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 15

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-1

A. **Geomorphology** (Subtotal = 7)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0		1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. **Hydrology** (Subtotal = 2)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 6)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel shows mostly weak indicators from the culvert outlet underneath Bishop Lane at Lat: N36.066552 Long: W-87.344563 until it leaves the property. No flow was observed throughout the reach, the only macroinvertebrates observed were isopods(earthworms were observed underneath some rocks in some locations).Virginia creeper was observed growing in the channel bottom at some locations, daisy and johnson grass appeared in channel bottom in some locations although, the majority of the channel was clear of upland vegetation. No flow was observed throughout and little to no biology or hydrology indicators were observed.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: NEAREST-JOHNSON BRANCH	Date/Time: 5/13/2022
Assessors/Affiliation: BRANDON GARRETT- QHP 1130-TN15	Project ID : 03-22021
Site Name/Description: OLD COLUMBIA RD PLANNED RESIDENTIAL DEVELOPMENT	
Site Location: OLD COLUMBIA RD AT BISHOP LANE-DICKSON TN	
HUC (12 digit): 051302040502-JONES CREEK UPPER	Lat/Long:
Previous Rainfall (7-days) : 0.20 (ALL ON MAY 6)	N36.066651 W-87.364444
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : NOAA.GOV	
Watershed Size : +/- 25 ACRES	County: DICKSON
Soil Type(s) / Geology : SENGTOWN-URBAN LAND COMPLEX	Source NRCS
Surrounding Land Use : RESIDENTIAL/VACANT WOODED/AGRICULTURAL	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 19.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-2

A. **Geomorphology** (Subtotal = 12)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0		1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. **Hydrology** (Subtotal = 2.5)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 5)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel reach and area assessed begins just downstream of location of flow observed going subsurface from STR-2. The channel below this location shows moderate to strong geomorphic secondary indicators with well structured features such as bed/bank features, soil sorting, and deposition bars. Although the area scored well in geomorphology, the secondary indicators for hydrology were very weak to non-existent and biology indicators were also very weak with vegetation found in channel and fibrous roots observed in channel, the only macrobenthos observed included isopods. This area appears to contain high flows most likely during rainfall events, but based on what has been observed most flow most likely goes subsurface at the sinkhole/karst feature location observed were STR-2 flows were seen going underground. This channel might have carried more flow in the past prior to the throat of the sinkhole/karst feature opening up and flow going subsurface. Based on observations the channel downstream from karst feature appears to be a wet weather conveyance.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: NEAREST-JOHNSON BRANCH	Date/Time: 5/13/2022
Assessors/Affiliation: BRANDON GARRETT- QHP 1130-TN15	Project ID : 03-22021
Site Name/Description: OLD COLUMBIA RD PLANNED RESIDENTIAL DEVELOPMENT	
Site Location: OLD COLUMBIA RD AT BISHOP LANE-DICKSON TN	
HUC (12 digit): 051302040502-JONES CREEK UPPER	Lat/Long:
Previous Rainfall (7-days) : 0.20 (ALL ON MAY 6)	N36.066651 W-87.364444
Precipitation this Season vs. Normal : abnormally wet elevated **average** low abnormally dry unknown Source of recent & seasonal precip data : NOAA.GOV	
Watershed Size : +/- 5 ACRES	County: DICKSON
Soil Type(s) / Geology : SENGTOWN-URBAN LAND COMPLEX	Source NRCS
Surrounding Land Use : RESIDENTIAL/VACANT WOODED/AGRICULTURAL	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe **Moderate** Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = 8.5

Justification / Notes :

Secondary Field Indicator Evaluation

WWC-3

A. **Geomorphology** (Subtotal = 5)	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0		1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. **Hydrology** (Subtotal = 1.5)	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. **Biology** (Subtotal = 2)	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : Channel displayed little to no secondary indicators in all three sub-categories. No macrobenthos was observed in the channel. The channel at some points appears to dissapear. Upland vegetation was observed in the channel and fibrous roots were observed in channel as well. The channel intersects STR-2 and had much more stronger geomorphic features near the intersection with STR-2. Although, put together with the weaker scores near the head of the channel the overall scores were weak. Overall this channel is considered a wet weather conveyance based on observation.

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Appendix V

Wetland Field Data Sheets

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Old Columbia Rd Property City/County: Dickson/Dickson Sampling Date: 5/13/22

Applicant/Owner: Imer Development State: TN Sampling Point: DP-1

Investigator(s): Brandon Garrett Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%):

Subregion (LRR or MLRA): Lat: 36.065493 Long: -87.346820 Datum: Upland

Soil Map Unit Name: Sengtown-Urban Land Complex NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No ✓	**Is the Sampled Area within a Wetland?** **Yes** **No ✓**
Hydric Soil Present?	Yes	No ✓	
Wetland Hydrology Present?	Yes	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No ✓	Depth (inches):
Water Table Present?	Yes	No ✓	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No ✓	Depth (inches):

Wetland Hydrology Present? Yes No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP-1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba	10	NO	FACU
2. Carya tomentosa	20	YES	FACU
3. Juniperus virginiana	10	NO	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. Ligustrum sinense	20	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20	= Total Cover	
Herb Stratum (Plot size:)			
1. Schedonorous arundenacea	40	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	40	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	100	x 4 =	400
UPL species		x 5 =	
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/4	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Old Columbia Rd Property City/County: Dickson/Dickson Sampling Date: 5/13/22

Applicant/Owner: Imer Development State: TN Sampling Point: DP-2

Investigator(s): Brandon Garrett Section, Township, Range:

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%):

Subregion (LRR or MLRA): Lat: 36.066855 Long: -87.345478 Datum: Upland

Soil Map Unit Name: Sengtown-Urban Land Complex NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No ✓	**Is the Sampled Area within a Wetland?** **Yes** **No ✓**
Hydric Soil Present?	Yes	No ✓	
Wetland Hydrology Present?	Yes	No ✓	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No ✓	Depth (inches):
Water Table Present?	Yes	No ✓	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No ✓	Depth (inches):

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: DP-2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus alba	10	NO	FACU
2. Carya tomentosa	10	YES	FACU
3. Juniperus virginiana	20	NO	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size:)			
1. Ligustrum sinense	30	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	30	= Total Cover	

Herb Stratum (Plot size:)			
1. Schedonorous arundenacea	30	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	30	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
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FAC species		x 3 =	
FACU species	100	x 4 =	400
UPL species		x 5 =	
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4

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___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/4	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

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Appendix VI

Field Photographs

Photograph 1: View of Pond A located near the southern property boundary.

Photograph 2: Downstream view of STR-1 just below road crossing under Bishop Ln (N36.066003 W-87.344987)

Photograph 3: Upstream view of STR-1 at culvert from Bishop Ln crossing from previous photo location.

Photograph 4: Upstream view of STR-1 (N36.066141 W-87.344280)

Photograph 5: Downstream view of STR-1 from previous photograph location.

Photograph 6 : Upstream view of STR-1 near second crossing underneath Bishop Ln (N36.066343 W-87.344516)

Photograph 7: Downstream view of STR-1 from previous photograph location.

Photograph 8: Downstream view of WWC-1 (N36.066523 W-87.344529)

Photograph 9: Downstream view of WWC-1 (N36.066878 W-87.344217)

Photograph 10: Alternate downstream view of WWC-1 from previous photograph location.

Photograph 11: Upstream view of WWC-1 (N36.066984 W-87.344107)

Photograph 12: Downstream view of WWC-1 from previous photograph location.

Photograph 13: Downstream view of WWC-1 at intersection with WWC-2 (N36.068127 W-87.343490)

Photograph 14: Upstream view of WWC-2 from previous photograph location.

Photograph 15: Upstream view of WWC-2 (N36.068159 W-87.343632)

Photograph 16: Upstream view of WWC-2 (N36.068295 W-87.343876)

Photograph 17: Upstream view of WWC-2 (N36.068093 W-87.344336)

Photograph 18: Upstream view of STR-2 at point of subsurface flow beginning of WWC-2 downstream (N36.067962 W-87.345152)

Photograph 19: location of flow going subsurface from previous photograph location.

Photograph 20: Closeup view of point of STR-2 subsurface flow from previous photograph location.

Photograph 21: Upstream view of STR-2 (N36.067862 W-87.345480)

Photograph 22: Upstream view of STR-2 (N36.067856 W-87.345595)

Photograph 23: Upstream view of STR-2 (N36.067770 W-87.345858)

Photograph 24: Downstream view of STR-2 from previous photograph location.

Photograph 25: Upstream view of WWC-3 just above intersection with STR-2 (N36.067653 W-87.346085)

Photograph 26: Downstream view of WWC3 from previous photograph location.

Photograph 27: Downstream view of WWC-3 (N36.067275 W-87.346215)

Photograph 28: Upstream view of WWC-3 from previous photograph location.

Photograph 29: Typical view of topography and vegetation observed along the northeastern portion of property.

Photograph 30: Alternate view of topography and vegetation along the northeastern portion of property.

Photograph 31: View of topography and vegetation along the wooded eastern portion of the property.

Photograph 32: View looking southeast from just above beginning of WWC-3.

Photograph 33: View looking southwest from previous photograph location.

Photograph 34: View looking northeast across property (N36.066579 W-87.346041)

Photograph 35: View looking northeast from near southwestern property corner.

Photograph 36: Downstream view of STR-1 from just south of property boundary near southwestern property corner.

Climatological Data for DICKSON, TN - March 2022

Date	Temperature				HDD	CDD	Precipitation
	Maximum	Minimum	Average	Departure			
2022-03-01	75	23	49.0	4.0	16	0	0.00
2022-03-02	78	35	56.5	11.2	8	0	0.00
2022-03-03	M	M	M	M	M	M	M
2022-03-04	80	42	61.0	15.2	4	0	0.00
2022-03-05	74	56	65.0	18.9	0	0	0.00
2022-03-06	78	65	71.5	25.1	0	7	0.00
2022-03-07	72	36	54.0	7.3	11	0	0.64
2022-03-08	46	34	40.0	-7.0	25	0	0.07
2022-03-09	53	36	44.5	-2.8	20	0	0.19
2022-03-10	60	36	48.0	0.4	17	0	0.00
2022-03-11	62	28	45.0	-2.9	20	0	0.00
2022-03-12	32	19	25.5	-22.6	39	0	0.00
2022-03-13	58	21	39.5	-8.9	25	0	0.00
2022-03-14	66	39	52.5	3.8	12	0	0.00
2022-03-15	68	47	57.5	8.5	7	0	0.22
2022-03-16	61	51	56.0	6.7	9	0	0.07
2022-03-17	74	46	60.0	10.4	5	0	0.00
2022-03-18	67	50	58.5	8.6	6	0	0.00
2022-03-19	63	41	52.0	1.7	13	0	0.00
2022-03-20	69	33	51.0	0.4	14	0	0.00
2022-03-21	74	41	57.5	6.6	7	0	0.00
2022-03-22	73	53	63.0	11.8	2	0	1.20
2022-03-23	61	44	52.5	1.0	12	0	0.64
2022-03-24	59	37	48.0	-3.8	17	0	0.00
2022-03-25	52	41	46.5	-5.6	18	0	0.00
2022-03-26	60	37	48.5	-3.9	16	0	0.00
2022-03-27	55	31	43.0	-9.7	22	0	0.00
2022-03-28	58	38	48.0	-5.1	17	0	0.00
2022-03-29	76	42	59.0	5.6	6	0	0.00
2022-03-30	81	58	69.5	15.8	0	5	0.05
2022-03-31	72	41	56.5	2.5	8	0	0.88

Observations for each day cover the 24 hours ending at the time given below (Local Standard Time).
Max Temperature : 8pm
Min Temperature : 8pm
Precipitation : 8pm

Climatological Data for DICKSON, TN - April 2022

Date	Temperature				HDD	CDD	Precipitation
	Maximum	Minimum	Average	Departure			
2022-04-01	57	36	46.5	-7.8	18	0	0.00
2022-04-02	64	34	49.0	-5.6	16	0	0.00
2022-04-03	65	37	51.0	-3.9	14	0	0.00
2022-04-04	74	43	58.5	3.2	6	0	0.00
2022-04-05	61	51	56.0	0.4	9	0	0.66
2022-04-06	65	46	55.5	-0.4	9	0	0.15
2022-04-07	60	50	55.0	-1.2	10	0	0.00
2022-04-08	54	36	45.0	-11.5	20	0	0.03
2022-04-09	59	36	47.5	-9.3	17	0	0.00
2022-04-10	81	36	58.5	1.4	6	0	0.00
2022-04-11	71	58	64.5	7.1	0	0	0.60
2022-04-12	79	60	69.5	11.8	0	5	1.22
2022-04-13	85	54	69.5	11.5	0	5	0.85
2022-04-14	68	43	55.5	-2.7	9	0	0.43
2022-04-15	72	40	56.0	-2.5	9	0	0.00
2022-04-16	67	51	59.0	0.2	6	0	0.83
2022-04-17	M	M	M	M	M	M	M
2022-04-18	57	41	49.0	-10.4	16	0	0.81
2022-04-19	M	M	M	M	M	M	M
2022-04-20	72	39	55.5	-4.4	9	0	0.00
2022-04-21	79	56	67.5	7.3	0	3	0.18
2022-04-22	84	55	69.5	9.1	0	5	0.00
2022-04-23	85	62	73.5	12.8	0	9	0.00
2022-04-24	83	63	73.0	12.1	0	8	0.00
2022-04-25	76	54	65.0	3.8	0	0	0.28
2022-04-26	M	M	M	M	M	M	M
2022-04-27	M	M	M	M	M	M	M
2022-04-28	M	M	M	M	M	M	M
2022-04-29	83	59	71.0	8.9	0	6	0.00
2022-04-30	81	64	72.5	10.1	0	8	0.00
Sum	1782	1204	-	-	174	49	6.04
Average	71.3	48.2	59.7	1.1	-	-	-
Normal	70.9	46.2	58.6	-	223	29	4.93

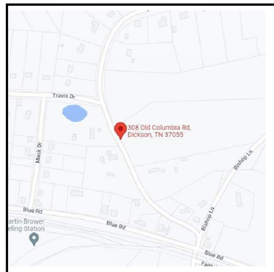
Observations for each day cover the 24 hours ending at the time given below (Local Standard Time). Observation times may have changed during this period.
Max Temperature : 8pm, 7pm
Min Temperature : 8pm, 7pm
Precipitation : 8pm, 7pm

Climatological Data for DICKSON, TN - May 2022

Date	Temperature				HDD	CDD	Precipitation
	Maximum	Minimum	Average	Departure			
2022-05-01	80	57	68.5	5.9	0	4	0.23
2022-05-02	85	50	67.5	4.7	0	3	0.14
2022-05-03	84	61	72.5	9.4	0	8	0.14
2022-05-04	74	54	64.0	0.7	1	0	0.00
2022-05-05	82	53	67.5	4.0	0	3	0.03
2022-05-06	74	54	64.0	0.2	1	0	0.20
2022-05-07	59	51	55.0	-9.0	10	0	0.00
2022-05-08	75	**46**	60.5	-3.7	4	0	0.00
2022-05-09	83	54	68.5	4.1	0	4	0.00
2022-05-10	89	72	80.5	15.8	0	16	0.00
2022-05-11	90	62	76.0	11.1	0	11	0.00
2022-05-12	**91**	75	83.0	17.9	0	18	0.00
2022-05-13	90	72	81.0	15.6	0	16	0.00
2022-05-14	87	61	74.0	8.4	0	9	0.00
2022-05-15	88	61	74.5	8.7	0	10	0.00
2022-05-16	80	60	70.0	3.9	0	5	0.00
2022-05-17	85	54	69.5	3.2	0	5	0.00
2022-05-18	86	57	71.5	4.9	0	7	0.00
2022-05-19	**91**	68	79.5	12.7	0	15	0.00
2022-05-20	89	71	80.0	12.9	0	15	0.00
2022-05-21	90	67	78.5	11.2	0	14	0.30
2022-05-22	72	58	65.0	-2.6	0	0	**0.34**
2022-05-23	M	M	M	M	M	M	M
2022-05-24	M	M	M	M	M	M	M
2022-05-25	M	M	M	M	M	M	M
2022-05-26	M	M	M	M	M	M	M
2022-05-27	M	M	M	M	M	M	M
2022-05-28	M	M	M	M	M	M	M
2022-05-29	M	M	M	M	M	M	M
2022-05-30	M	M	M	M	M	M	M
2022-05-31	M	M	M	M	M	M	M
Sum	1824	1318	-	-	16	163	1.38
Average	82.9	59.9	71.4	6.3	-	-	-
Normal	76.4	53.7	65.1	-	61	62	4.31

Above Normals represent the month through 2022-05-22.

Observations for each day cover the 24 hours ending at the time given below (Local Standard Time).
Max Temperature : 7pm
Min Temperature : 7pm
Precipitation : 7pm



ARNOLD MURPHY, ETUX
DEED BOOK 229, PAGE 131, R.O.D.C., TN.
MAP 111, PARCEL 010.03

STEPHEN SHAW, ETUX
DEED BOOK 597, PAGE 929, R.O.D.C., TN.
MAP 111, PARCEL 010.04

GAITHER BAGSBY, ETUX
DEED BOOK 225, PAGE 335, R.O.D.C., TN.
MAP 111, PARCEL 010.05

WYATT HARPER, ETUX
DEED BOOK 223, PAGE 138, R.O.D.C., TN.
MAP 111, PARCEL 010.06

LINDA HAYES, TRUSTEE
DEED BOOK 1269, PAGE 441, R.O.D.C., TN.
MAP 111, PARCEL 022.04

S 87°10'55" E
501.84'

N 77°53'42" E
118.67'

N 88°04'24" W
274.05'

S 20°24'59" W
268.99'

N 06°00'54" E
126.67'

S 14°59'04" E
157.01'

N 24°29'07" W
38.80'

N 65°31'53" E
295.67'

S 24°29'07" E
251.29'

S 65°30'55" W
295.73'

N 24°29'05" W
180.00'

S 33°14'38" E
320.30'

S 53°06'26" W
249.48'

S 68°16'57" W
280.67'

S 37°34'51" W
94.04'

N 34°59'10" E
59.80'

719880.8 SQ. FT.
16.53 ACRES

OLD COLUMBIA ROAD

BISHOP LANE

LOT 1, IMER DEVELOPMENT, LLC
PLAT CAB M, PAGE 2, R.O.D.C., TN.

EQUITY PROPERTIES OF TN., LLC
DEED BOOK 595, PAGE 875, R.O.D.C., TN.
MAP 111, PARCEL 038.00

DONNA DUNNAGAN ETAL
DEED BOOK 824, PAGE 785, R.O.D.C., TN.
MAP 111, PARCEL 039.00

0′ 50′ 100′ 150′

SCALE:1"=50'

GENERAL NOTES:
1. PLAN PREPARED FOR:
IMER DEVELOPMENT, LLC
1909 COLUMBIA AVE.
FRANKLIN, TN 37064
2 . DEED REFERENCE:
DEED BOOK 1523, PAGE 1255, R.O.D.C., TN.
& DEED BOOK 455, PAGE 475, R.O.C.C., TN.
3. TAX MAP 111, PARCEL 40 , 40.01, 40.02
4. BEARINGS ARE BASED UPON
TN STATE PLANE COORDINATES
5. SURVEY IS SUBJECT TO ALL THE
FINDINGS AN ACCURATE TITLE SEARCH
WOULD REVEAL.
6. PHYSICALLY EVIDENT UTILITIES ARE
SHOWN BUT NOT WARRANTED.
CONTRACTOR SHALL CONTACT 811, 72
HOURS PRIOR TO ANY EXCAVATION
AS PRESCRIBE BY STATE LAW.
7. THIS IS CATEGORY I SURVEY PER
THE STANDARDS OF PRACTICE OF THE
TENNESSEE BOARD FOR LAND
8. THIS PROPERTY IS SHOWN AS
ZONE "X" ON THE FEMA FIS
MAP NO. 47043C0253 C DATED 9/25/2009
9. THIS PROPERTY IS ZONED R-1
THE MINIMUM BUILDING SETBACKS ARE:
FRONT=30', SIDE=15', REAR=25'

LEGEND

- PK NAIL FOUND
- IRON PIN FOUND
- IRON PIN SET
- EXISTING SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- TEMPORARY ELECTRIC METER
- EXISTING LIGHT POLE
- EXISTING POWER POLE
- ROAD CENTER LINE
- WATER SERVICE
- OVERHEAD ELECTRIC SERVICE
- EASEMENT LINE
- SETBACK LINE
- PROPERTY LINE
- EXISTING FENCE
- CATCH BASIN
- GAS VALVE

BOUNDARY SURVEY
IMER DEVELOPMENT, LLC
OLD COLUMBIA ROAD
CITY OF DICKSON, TN

Ahler & Associates, LLC
CONSULTING ENGINEERS & LAND SURVEYORS
P.O. BOX 1636
SPRING HILL, TN 37174
PH 615.481.3106
FAX: 615.523.1517

SURVEYING
PLANNING
DESIGN
CIVIL

SEAL
JOSEPH E. AHLER
REGISTERED LAND SURVEYOR
STATE OF TENNESSEE
TENNESSEE NO. 1434

BOUNDARY SURVEY-IMER DEVELOPMENT, LLC
OLD COLUMBIA ROAD
CITY OF DICKSON, TENNESSEE

ISSUE:	MARK	DATE	DESCRIPTION
	-	3/16/22	ORIGINAL ISSUE

PROJECT NO:	NUMBER
DWG. FILE:	DWGFILE
DRAWN BY:	JEA
CHK'D BY:	JEA

SHEET DESCRIPTION
BOUNDARY SURVEY
-

S1.0

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118.67'

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786.50

N 20°24'59" W
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794.23

860.53

N 24°29'07" W
358.04'

N 65°31'53" E
295.67'

LOT 1, IMER DEVELOPMENT, LLC
PLAT CAB M, PAGE 2, R.O.D.C., TN.

S 24°29'07" E
351.29'

OLD COLUMBIA ROAD

877.84

S 65°30'53" W
295.73'

880.46

BENCH MARK: PK NAIL
IN PAVEMENT ELEV=
883.80' (NAVD 83)

882.38

876.43

N 24°29'07" W
330.00'

874.57

S 24°29'07" E
320.31'

S 53°06'26" W
249.48'

DONNA DUNNAGAN, ETAL
DEED BOOK 824, PAGE 705, R.O.D.C., TN.
MAP 111, PARCEL 039.00

856.58

852.76

EQUITY PROPERTIES OF TN., LLC
DEED BOOK 595, PAGE 875, R.O.D.C., TN.
MAP 111, PARCEL 038.00

S 68°16'57" W
280.69'

N 37°38'51" W
94.00'

N 34°09'10" E
59.00'

BISHOP LANE

842.36

848.38

0' 50' 100' 150'

SCALE: 1"=50'

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TOPOGRAPHIC SURVEY
IMER DEVELOPMENT, LLC
OLD COLUMBIA ROAD
CITY OF DICKSON, TN

Ahler & Associates, LLC
CONSULTING ENGINEERS & LAND SURVEYORS
P.O. BOX 1636
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SURVEYING
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SEAL
JOSEPH E. AHLER
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TENNESSEE NO. 1434

TOPOGRAPHIC SURVEY-IMER DEVELOPMENT, LLC
OLD COLUMBIA ROAD
CITY OF DICKSON, TENNESSEE

ISSUE:	MARK	DATE	DESCRIPTION
	-	5/17/22	ORIGINAL ISSUE

PROJECT NO:	NUMBER
DWG. FILE:	DWGFILE
DRAWN BY:	JEA
CHK'D BY:	JEA

SHEET DESCRIPTION
TOPOGRAPHIC SURVEY
-

S2.0

Tennessee Department of Environment & Conservation

This is to certify that

C Brandon Garrett

successfully completed the one-day
Tennessee Hydrologic Determination Refresher Course

September 8, 2021

Jonathon Burr, DWR

Timothy Gangaware, TNWRRC

TDEC
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

This certifies that the recipient has earned 6 Professional Development Hours

TNQHP
TENNESSEE QUALIFIED HYDROLOGIC PROFESSIONAL