

**PRELIMINARY GEOTECHNICAL EXPLORATION
AND ENGINEERING SERVICES REPORT**

CONDUCTED FOR:

State Road 82 Development – Due Diligence
State Road 82
Fort Myers, Lee County, Florida

PREPARED FOR:

Mr. Troy Newberg
Director of Development
Milhaus Development LLC
2002 E. 4th Avenue
Tampa, Florida 33605

16 December 2021
YPC Project No. 21GY258



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Mr. Troy Newberg
Director of Development
Milhaus Development LLC
2002 E. 4th Avenue
Tampa, Florida 33605

16 December 2021

Subject: *Preliminary Geotechnical Exploration and Engineering Services Report*
State Road 82 Development – Due Diligence
State Road 82
Fort Myers, Lee County, Florida

YPC Project No. 21GY258

Dear Mr. Newberg:

YPC Consulting Group, P.L. is pleased to submit the *Preliminary Geotechnical Exploration Services Report* for the project referenced above.

It has been a pleasure to work for you on this project. Please contact us should you have any questions or if you require additional information.

copies to: 1, Mr. Troy Newberg
 via email only: troy.newberg@milhaus.com

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- | | |
|--|---|
| • <i>Geotechnical Engineering</i> | • <i>Pre-Condition Surveys</i> |
| • <i>Construction Materials Testing</i> | • <i>Threshold Inspection Services</i> |
| • <i>Pile Monitoring Services</i> | • <i>Vibration Monitoring Services</i> |

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1.0 INTRODUCTION

1.1 Terms of Reference

YPC Consulting Group, P.L. (YPC) was retained by the Client to provide preliminary geotechnical exploration and engineering services for the State Road 82 Development – Due Diligence project located off State Road 82 in Fort Myers, Lee County, Florida (hereafter referred to as the "project site"). Please refer to **Figure 1** for a Project Site Location and Vicinity Map. These services were performed in general accordance with YPC Proposal No. 21603YFM dated 1 October 2020, and subsequent written authorization by the Client.

1.2 Project Description

The preliminary geotechnical scope of services for the proposed project includes advancing test borings at the site to determine the general subsurface soil conditions for the proposed 3 to 4-story multi-family buildings. A total of seven (7) test borings were originally planned in coordination with the Client, but test borings SB-2, SB-4, and SB-7 were deleted due to access problems and time constraints. Preliminary maximum anticipated column and wall loads of 50 kips and 18 kip/ft, respectively, for the 4-story structures were provided by the Client for our evaluation. It is understood that the information compiled from the field exploration program by YPC will be utilized by the Client for due diligence purposes only.

1.3 Purpose and Scope of Work

The purpose of the preliminary geotechnical exploration services completed by YPC for the project was to describe, in general terms, soil and groundwater conditions encountered at the project site. To achieve this purpose, the scope of services has included the elements listed below.

- ▶ exploring subsurface soil and groundwater conditions by advancing four (4) Standard Penetration Test (SPT) borings to the depths of approximately 30-ft below the existing ground surface (egs) throughout the project site;
- ▶ recording groundwater levels in the test borings;
- ▶ grouting the test borings in general accordance with regulatory requirements;
- ▶ evaluating generalized boring data as well as groundwater conditions;
- ▶ performing visual inspection of all soil samples and laboratory tests on the selected samples for soil classification purposes;

- ▶ providing observations and comments for use by the Client in the due diligence evaluation process; and,
- ▶ compiling the field exploration data, laboratory test data, and observations and comments in this report of findings.

2.0 FIELD EXPLORATION AND LABORATORY INSPECTION & TESTING PROGRAMS

2.1 Field Exploration Program

The field exploration program, consisting of the elements described in Section 1.3 above, was performed in general accordance with relevant portions of applicable testing procedures on 11 December 2021.

The test borings were advanced by a drilling subcontractor, under the supervision of an YPC engineer, using a mud-rotary procedure. Representative soil samples were obtained using split-barrel sampling procedures. In this procedure, a 2-in. outer-diameter, split-barrel sampler is driven into the soil by a 140-lb hammer with a free-fall of 30-in. The number of blows required to drive the sampler through a 12-in. interval is termed the Standard Penetration Resistance, or "N", value, and is indicated for each sample on the boring logs. The "N" value is an indication of the relative density of granular soils in-situ.

Soil samples obtained during the field exploration program were sealed immediately in the field and brought to YPC's laboratory for further examination and testing. The test boring locations were selected in coordination with the Client and staked in the field by a YPC engineer's representative. The test borings were advanced at the approximate locations illustrated in the Project Layout and Test Location Plan presented in **Figure 2**. No survey was performed by YPC, so test boring locations presented in **Figure 2** should be considered approximate.

2.2 Laboratory Inspection and Testing Programs

Laboratory inspection of soil samples is generally performed to assist in the classification of soils based on their mechanical and physical behavior. It is noted that the indicated boundaries between soil types are approximate, and that actual transition between soil types may be gradual. Tests were performed on selected samples retrieved for this project to determine moisture contents and partial particle size distributions including percent passing a #200 U. S. standard sieve (i.e., percent silt and/or clay particles). All soil samples were visually inspected by a geotechnical engineer and classified in general accordance with the Unified Soil Classification System (USCS), modified as necessary to describe typical southwest Florida conditions. Laboratory test results are indicated on the individual boring log profiles presented in **Figure 3**.

3.0 SITE, GROUNDWATER, AND SOIL CONDITIONS

3.1 Site Features

The project site is located off State Road 82 west of Lightard Knott Lane in Fort Myers, Lee County, Florida. The project site has some very low areas that flood during the rainy season and a section of wetland. The project site is partially vegetated with trees, bushes, and tall grass. The east portion of the project site was previously utilized for agricultural purposes. The western portion of the site contains a cypress head. Existing residential and agricultural buildings are to the north of the main property under consideration, and a residential building currently occupies the northern portion of the project site.

3.2 Groundwater Conditions

At the time of the field exploration program, groundwater levels were recorded at approximately 1.5-ft to 2.0-ft below the eggs in the test borings. It is noted that any groundwater table will be subject to fluctuation due to seasonal climatic changes, construction and development activities, rainfall variations, surface-water runoff, the extent of artificial drainage, tidal influences, and other site-specific factors. Since groundwater level variations are anticipated, design drawings and specification should incorporate such possibilities and provide for dewatering, as required, during construction.

3.3 Subsurface Soils

General subsurface soil conditions at the boring locations are described below (please refer to **Figure 2** for the Project Layout and Test Location Plan and **Figure 3** for boring log profiles).

TEST BORING ID	APPROXIMATE DEPTHS TO BOTTOM OF STRATUM (ft)	SOIL DESCRIPTIONS
SB-1, SB-3, SB-5	9.5 ~ 11.5	poorly-graded sand (SP)
	26.0 ~ 28.0	silty sand (SM)
	30.0	weathered sandy limestone (WLS)
SB-6	10.0	poorly-graded sand (SP)
	30.0	Weathered fractured/sandy limestone (WLS)

3.4 Historical Aerial Imagery Review

As part of our preliminary geotechnical exploration program, YPC reviewed available historical aerial imagery for the project site. Historical imagery can sometimes reveal features or previous activities that might influence subsurface conditions, such as the excavation or backfilling of ponds, borrow pits, or mines. It is noted that historical aerial imagery is a

limited but often useful tool for site evaluation.

For this project site YPC reviewed historical aerial imagery for the years 2021, 2016, 2010, 2005, and 1999. No other unusual features of prior activities were identified from these images. The historical aerial imageries are presented in **APPENDIX A**.

4.0 OBSERVATIONS AND COMMENTS

Based on current conditions and data obtained during the field exploration and visual inspection of soil samples for this project, observations and comments are presented below:

- ▶ Subsurface soils generally consist of poorly-graded sand (SP), silty sand (SM), and weathered fractured/sandy limestone (WLS) to the boring termination depths 30-ft below the eggs.
- ▶ Poorly-graded sand (SP) can generally be used as embankment fill or fill beneath structures. Any silty sand (SM) containing more than 15% fines (i.e., more than 15% passing the #200 Standard U.S. sieve) should be effectively mixed with clean sands to reduce the overall fines contents to less than 15%, or their use should be restricted to landscape areas and maintenance berms.
- ▶ Excavation of predominantly sandy soils (SP and SM) and weathered and/or fractured limestone (WLS), can generally be achieved with normal heavy-duty earthwork equipment. Although no hard limestone was encountered at the test boring locations, the presence of very hard limestone at various depths and other locations cannot be ruled out.
- ▶ The preliminary anticipated structural loading conditions indicated in **Section 1.2** of this report will create increased vertical stresses in the very loose sandy (SP and SM) soils encountered at the project site within the foundation influence zone. Our evaluations based on the assumptions indicated in **Section 1.2** of this report will result in estimated total long-term settlements of up to 2.41-in. and differential settlements up to 1.88-in. with little or no fill to be placed if the soils are not improved prior to construction. The total settlement will increase if fill is to be placed as expected since fill creates an area surcharge load. It is YPC's preliminary opinion that the very loose sandy soils in the proposed building areas should be improved using vibro-replacement (VR) method in order to consolidate the sandy soils and minimize settlement prior to construction. Specific VR recommendations or other alternative foundation systems can only be provided in the future after a more detailed and specific subsurface geotechnical exploration program is completed. For estimation purposes, VR should generally extend to depths of 2B below column footings and 4B below wall footings, where B is the minimum footing dimension. It is

noted that VR is a specialty system and should be designed and implemented by a specialty engineer and contractor. YPC can assist by providing supplemental borings in specific building areas after the site plan is finalized.

5.0 LIMITATIONS

This preliminary geotechnical services report has been prepared for the exclusive use of the Client. No other warranty is expressed nor implied. It is noted that the information presented in this report address only soils and deposits that would normally be influenced by the proposed construction. The scope of services does not include an evaluation of deep soil or rock conditions where limestone cavities may exist due to sinkhole activity. Deep borings/ soundings, geophysical exploration, and/or resistivity surveys would be required in order to evaluate the structural condition and stability of deep soil and rock formations, and is beyond the scope of services for this project.

This report has been prepared to aid in the evaluation of the property and to assist the owner and/or engineer in planning and design of this project. The scope of services is limited to the specific project and locations described herein, and the description of the project as described herein represents YPC's understanding of significant project aspects related to soil characteristics. In the event that any changes in the design or location of the structures as outlined in the report are planned, YPC must be informed so that the changes can be reviewed and the conclusions of this report modified or approved in writing. **Any conclusions or recommendations made by others based on the data contained herein are not the responsibility of YPC, unless we are advised of the same in writing and given the opportunity to review those conclusions and recommendations.**

The analyses and recommendations submitted in this report are based upon the data obtained from field exploration program at locations indicated in the Project Layout and Test Location Plan presented in **Figure 2**, as well as any other information discussed in this report. In the performance of a subsurface exploration, specific information is obtained at specific locations at specific times. However, it is known that site and subsurface conditions can change over time. Additionally, variations in soil and rock exist on most sites between test locations. The nature and extent of such variations may not become evident until after the start of construction. If variations appear, it will be necessary to re-evaluate the recommendations of this report after performing on-site observations during the construction period and/or performing supplemental tests.

It is the responsibility of the Client to see that the recommendations in this report are brought to the attention of all concerned parties. Because of the possibility of unanticipated subsurface conditions occurring, it is recommended that a "changed condition" clause be provided in contracts with the general contractor and with subcontractors involved in foundations or earthwork construction. Furthermore, it is necessary that YPC be retained to review the site preparations and foundation phases of construction. Otherwise, no

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16 December 2021

responsibility for construction compliance with the design concepts, plans, specifications, and recommendations presented herein can be assumed.

The reproduction of any portion of this report in plans or other engineering documents supplied to parties other than the Client or assigned parties must bear the language indicating that the information contained in the report is for general information only, and that neither the Client nor YPC are liable to such parties.

6.0 ACKNOWLEDGMENT

YPC appreciates the opportunity to work with you on this project. Please contact us should you have any questions concerning this report or if you require additional information.

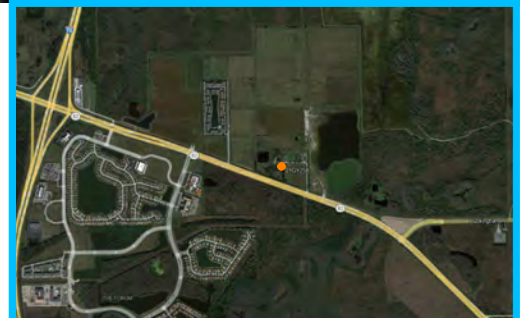
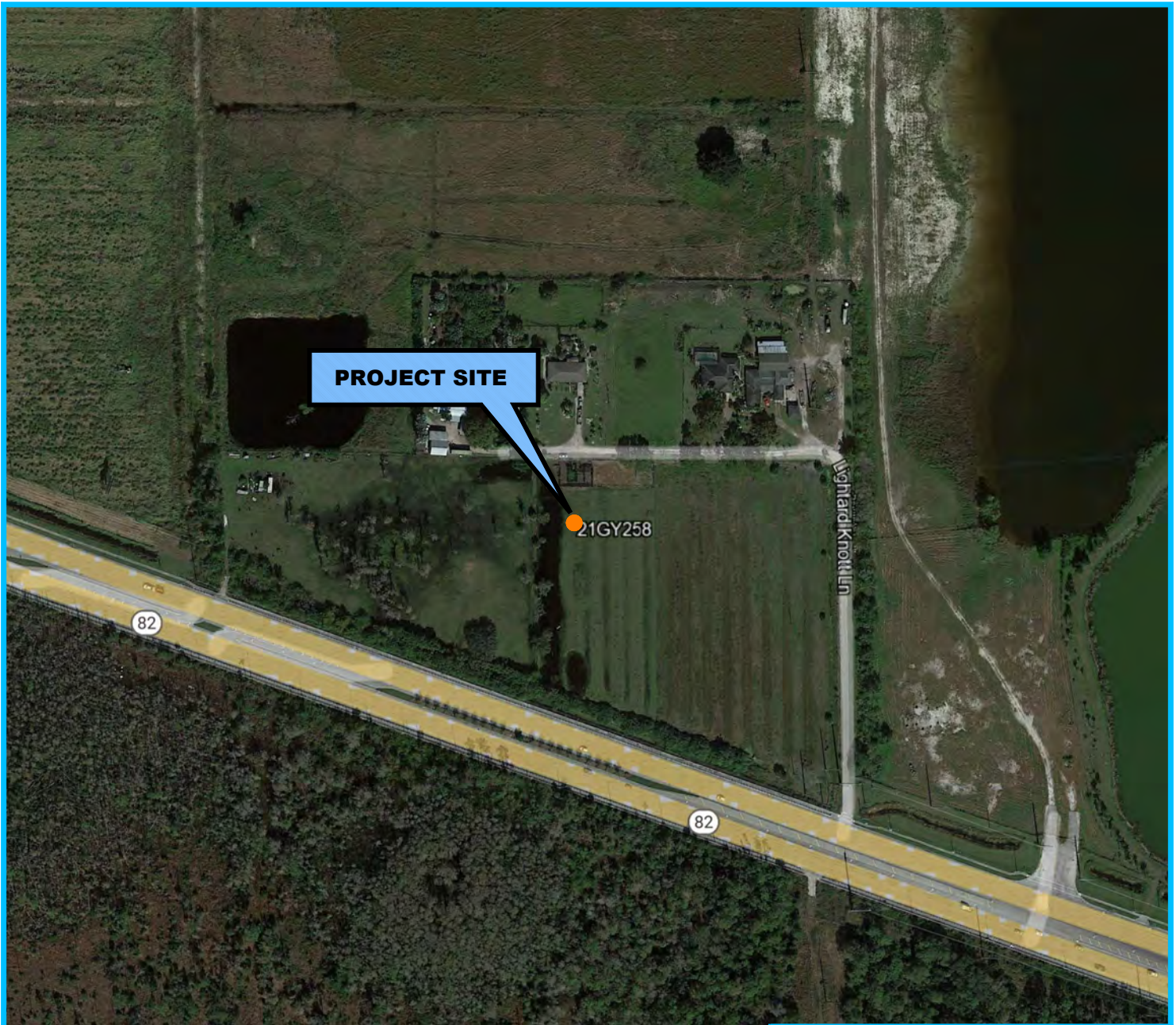
Sincerely,

YPC Consulting Group, P.L.
Florida Certificate of Authorization No. 28233


*This document has been electronically signed
& sealed using a digital signature by:*

Yen-Po Chiu, P.E.
Senior Project Manager
Florida Registration No. 62391

*Printed copies of this document are not considered signed and sealed and
the signature must be verified on any electronic copies.*



WGS84
 LAT: N 26.630714°
 LONG: W 81.785089°
 21GY258.dwg (12-13-2021)

TITLE Project Site Location and Vicinity Map			SOURCE Google Earth	FIGURE NO. 1
	DATE	13th December 2021	Preliminary Geotechnical Exploration and Engineering Services Report State Road 82 Development – Due Diligence State Road 82 Fort Myers, Lee County, Florida for: Mr. Troy Newberg Milhaus Development LLC Tampa, Florida	
	DRAWN BY	JBC		
	CHECKED BY	YPC		
	SCALE	nts		
	PROJECT NO.	21GY258		



LEGEND	
SB-1 	Standard Penetration Boring(s) Location and Identification.

21GY258.dwg (12-13-2021)

NO.	REVISIONS	DATE	BY	NAME	DATE		SEAL	PROJECT NAME Preliminary Geotechnical Exploration and Engineering Services Report State Road 82 Development – Due Diligence State Road 82, Fort Myers, Lee County, Florida	CLIENT Mr. Troy Newberg Milhaus Development LLC Tampa, Florida	SHEET TITLE		Figure No.
				DESIGNED						Project Layout and Test Location Plan		2
				DRAWN	JBC							
				CHECKED	YPC					Base Plan Acquired from:		PROJECT NO.
				APPROVED	YPC					Google Earth		21GY258

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16 December 2021

APPENDIX A

HISTORICAL IMAGERY / AERIAL PHOTOGRAPHS

Historical Imagery

2021

Legend



Google Earth

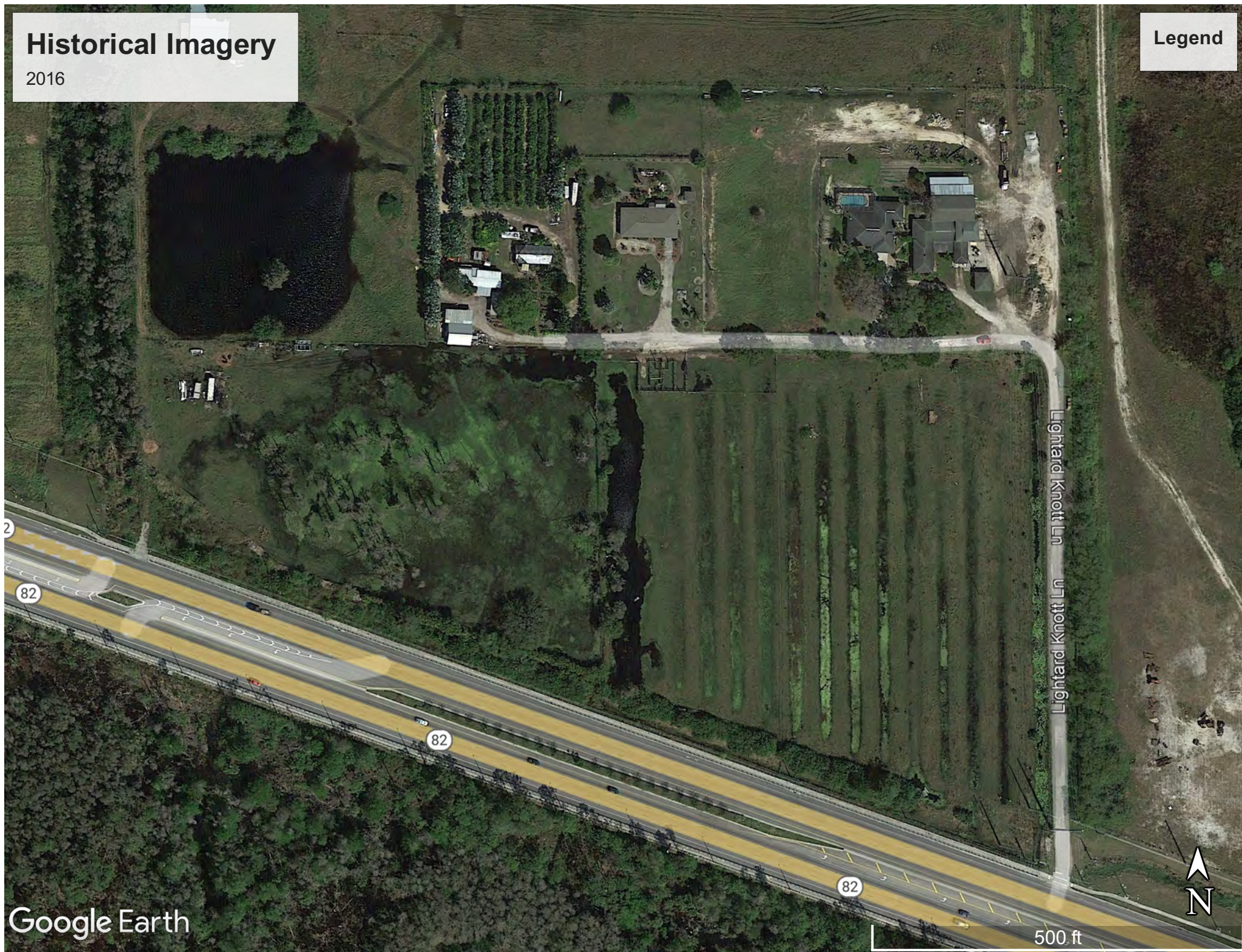


500 ft

Historical Imagery

2016

Legend



Historical Imagery

2010

Legend

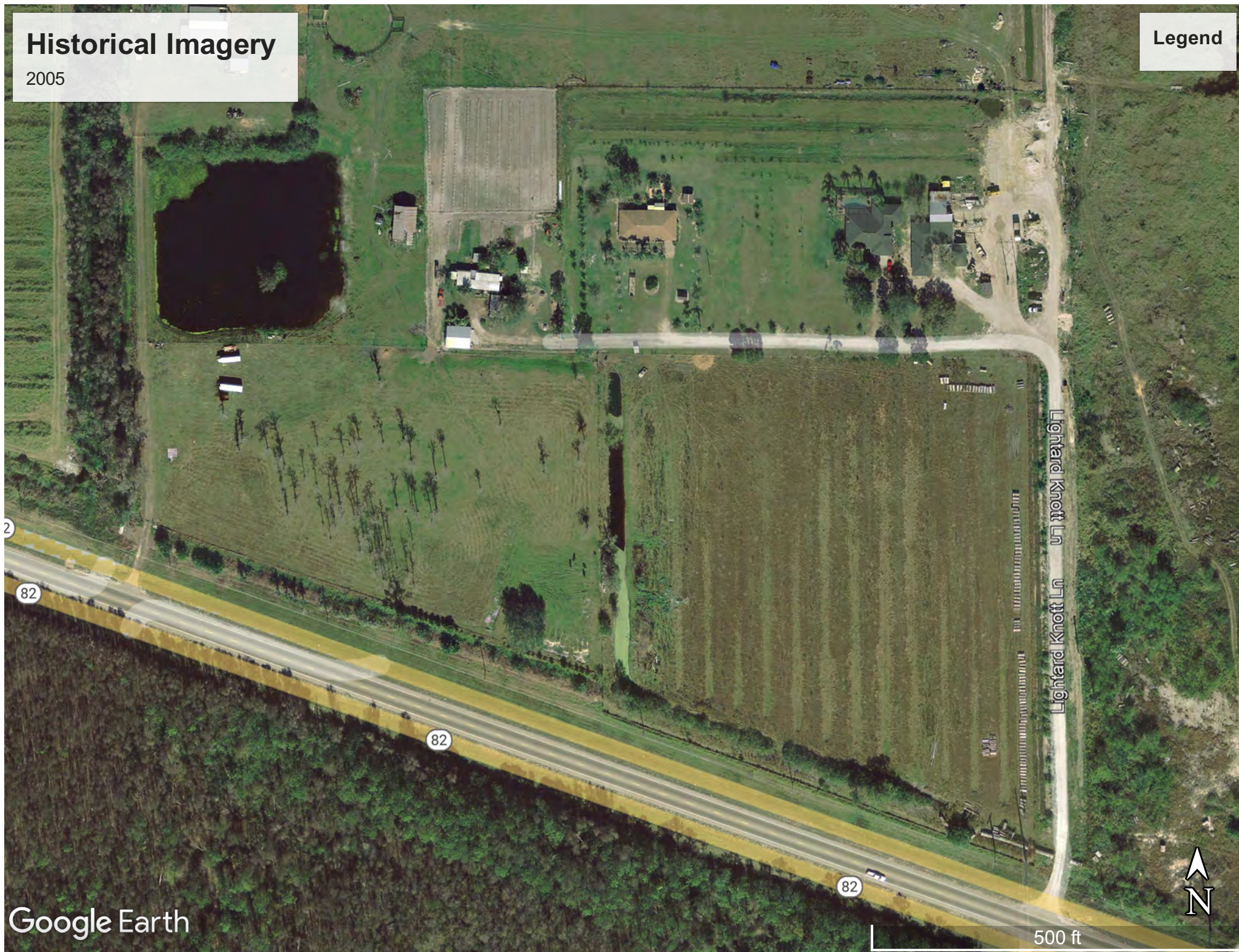


Google Earth

Historical Imagery

2005

Legend



Historical Imagery

1999

Legend



Google Earth

Image U.S. Geological Survey