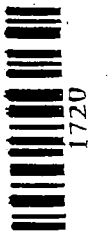

Bound Reports
1720

SCOTT BUSINESS & INDUSTRIAL CENTER

ENVIRONMENTAL RESOURCE PERMIT
SUPPORT DOCUMENT

July, 2003

89927 1-

Griffey Engineering, Inc.
2001 Old Highway 441, Suite 2
Mount Dora, Florida 32757
Project # 03006SP

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SECTION A

ENVIRONMENTAL ASSESSMENT

SCOTT SITE
LAKE COUNTY, FLORIDA

ENVIRONMENTAL SUPPORT DOCUMENT
(#2002/8)

Prepared For:

GRIFFEY ENGINEERING, INC.
2001 Old U.S. Highway 441, Suite 2
Mt. Dora, Florida 32757

Prepared By:

LPG EXPRESS SERVICES, INC.
2001 W. Old U.S. Highway 441, Suite 5
Mt. Dora, Florida 32757
(352) 735-0345/(352) 383-3877-fax
Email: LPG1Express@aol.com

July 2003

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SCOTT SITE
LAKE COUNTY, FLORIDA

ENVIRONMENTAL SUPPORT DOCUMENT

1.0 INTRODUCTION

The proposed project is to construct two (2) warehouses totaling 21,500 square feet, associated parking, and the stormwater management system within the 2.10 ± acre site located off of Hancock Road, known as Lots 8 and 9 of Pine Valley Industrial Park within Section 27, Township 22 South, Range 26 East, Lake County, Florida (Figures 1 and 2).

On February 12, 2003 LPG Express Services, Inc. (LPGESI) conducted a Preliminary Environmental Assessment of the site. The Preliminary Environmental Assessment conducted included the following elements: review of land use communities; review of soil types; and field review for the occurrence and the potential for occurrence of listed species of flora and fauna.

2.0 SITE CHARACTERISTICS

2.1 Topography

Review of the U.S.G.S. Topography map indicates that the site ranges in elevation from 130' NGVD within the northeast corner to a high elevation of 135' NGVD within the southeastern portion of the site (Figure 3). The site appears to slope from the southeast to the northeast.

2.2 Soils

According to the USDA – National Resource Conservation Service Soil Survey for Lake County, Florida, the subject property contains the following soil type (Figure 4):

Candler sand, 0 to 5% slopes (13) - This soil type is nearly level to gently sloping, and excessively drained. The water table is at a depth of more than 120 inches.

The Florida Association of Soil Scientists does not consider the above soil type to be hydric.

2.3 Vegetative Communities

The vegetative communities on the site were reviewed during the field investigation conducted on February 12, 2003. The area was mapped utilizing the Florida Land Use Cover and Forms Classification System (FLUCFCS, FDOT, 1999) (Figure 5). One (1) land use and cover type was identified within the project boundaries. The following presents a brief description of the land use and cover class mapped for the property site:

190 Other Land

The site is undeveloped (2.10 ± acres) with dominant herbaceous vegetation consisting of bahia grass (*Paspalum notatum*), Spanish needles (*Bidens alba*), natal grass (*Rhyncheletrum repens*), hairy indigo (*Indigofera hirsute*), camphor weed (*Heterotheca subaxillaris*), dog fennel (*Eupatorium capillifolium*), prickly pear cactus (*Opuntia humifusa*), and broomsedge (*Andropogon virginicus*). Trees are scattered across the site within clusters consisting of live oak (*Quercus virginiana),* black cherry (*Prunus serotina*), and slash pine (*Pinus elliottii*). The shrub canopy within the open areas was sparse and consists of scattered saw palmetto (*Serenoa repens*), and lantana (*Lantana camara*).

2.4 Protected Species

The project site was surveyed for the occurrence and potential for occurrence of species listed by either the Florida Fish and Wildlife Conservation Commission (FFWCC), U.S. Fish and Wildlife Service (USFWS), or the Florida Department of Agriculture (FDA) based on known habitat preference and geographical distribution. Survey methods established by the FFWCC were utilized, including pedestrian transects within the project boundary to ensure broad coverage of the site.

2.4.1 Protected Flora

No species protected by the FDA or the USFWS were observed within the subject site. Based on known geographic distribution, the probability of occurrence is considered low for protected flora species due to the lack of suitable habitat.

2.4.2 Protected Fauna

There was evidence of one (1) listed fauna species observed within the subject site, the gopher tortoise (*Gopherus polyphemus*). Two (2) active burrows were observed along the northern property boundary and one (1) active burrow was observed within the

southern property boundary. The gopher tortoise is protected as a "Species of Special Concern" by the FFWCC.

With the presence of gopher tortoise burrows, there is also a potential for several listed commensal species (species which utilize gopher tortoise burrows) to exist on the site. These species include the Florida mouse (*Peromyscus floridanus*), gopher frog (*Rana areolata aesopus*), indigo snake (*Drymarchon corais couperi*), and Florida pine snake (*Pituophis melanoleucus magitus*). No sightings or observations of species indicators of burrow commensal species were made during the field review.

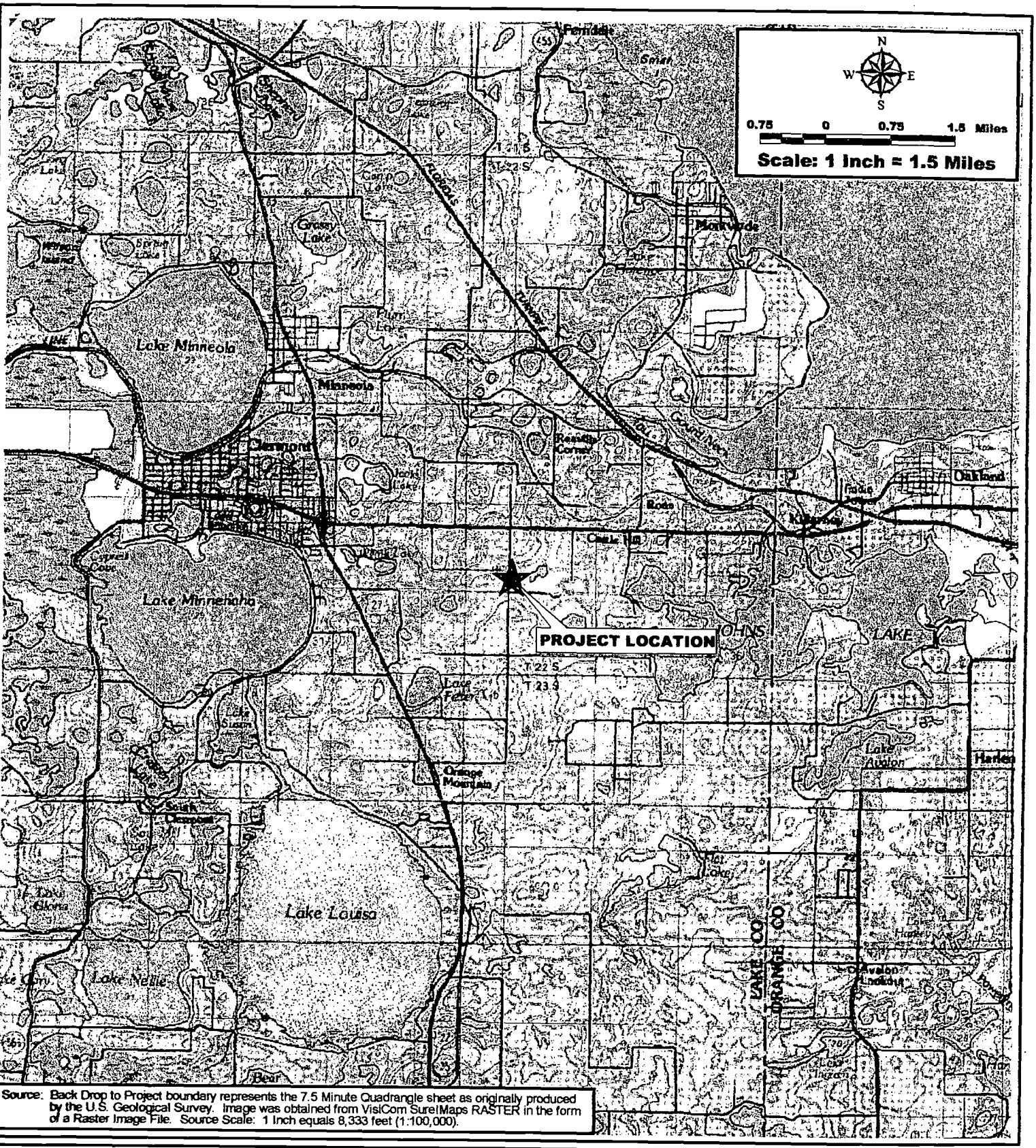
A gopher tortoise relocation permit will be obtained from the FFWCC prior to construction.

3.0 PROPOSED PROJECT

The proposed project consists of the construction of two (2) warehouses for a total of 21,500 square feet, associated parking, and the stormwater management system. The entire site is classified as uplands and the likelihood of occurrence for protected flora is deemed low due to the lack of suitable habitat. Evidence of one (1) listed fauna species the gopher tortoise was observed along the northern and southern property boundary. Prior to construction, appropriate permits will be obtained from the FFWCC.

The Division of Historical Resources (DHR) conducted a search of the Florida Master Site File for any previously recorded cultural resources on the subject site. According to DHR no previously recorded cultural resources were recorded for the subject site (Appendix A).

FIGURES



Source: Back Drop to Project boundary represents the 7.5 Minute Quadrangle sheet as originally produced by the U.S. Geological Survey. Image was obtained from VisiCom SurfMaps RASTER in the form of a Raster Image File. Source Scale: 1 Inch equals 8,333 feet (1:100,000).

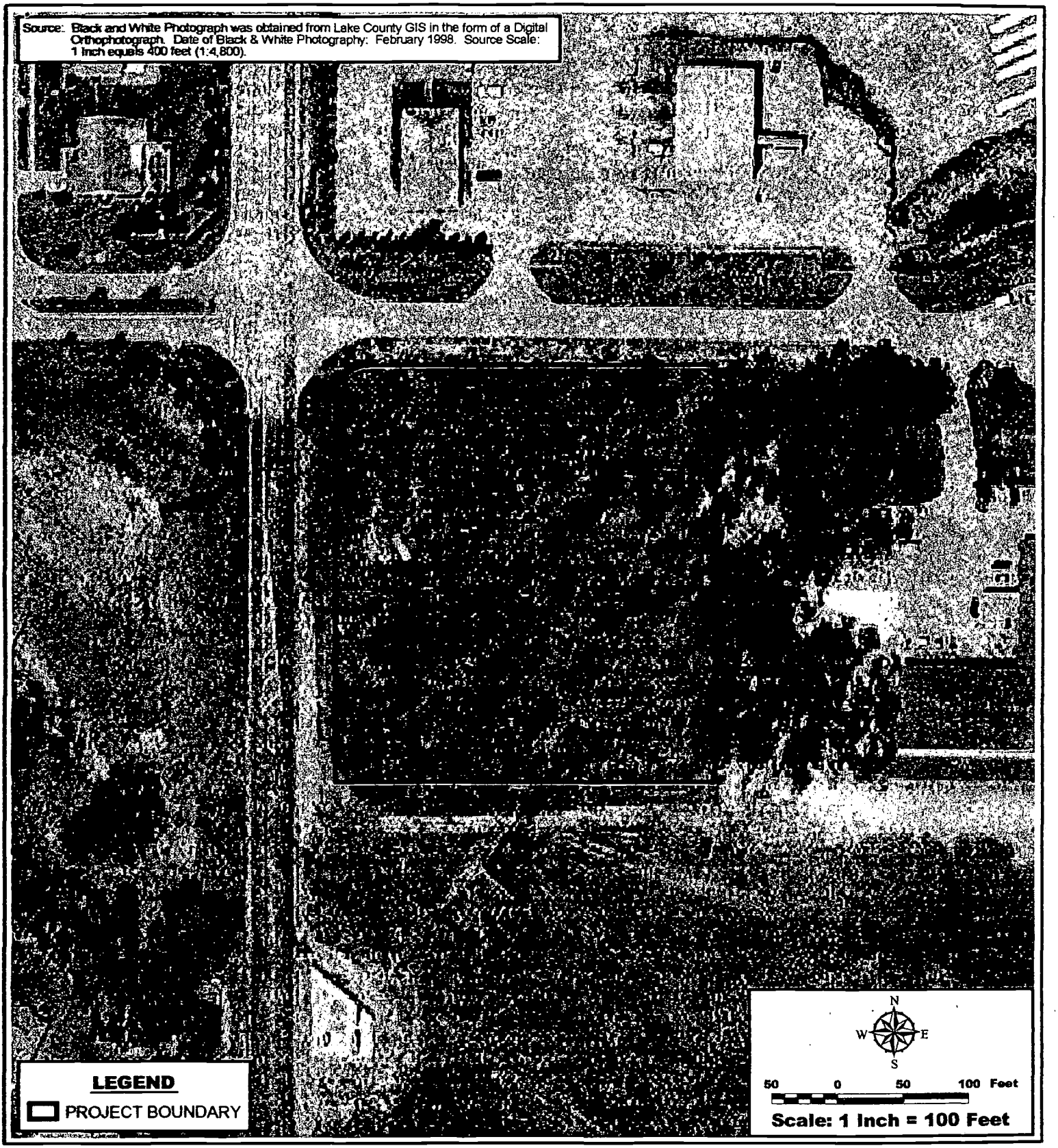
SCOTT SITE
LAKE COUNTY, FLORIDA

FIGURE 1

LOCATION MAP

Project No.: 2002/8	File: 2002-801.apr	Date: 2/12/03	Created By: NTL

LPG Express Services Inc.
2001 OLD U.S. HWY 441, Suite 5 / (352) 735-0345
Mount Dora, Florida 32757 / Fax: (352) 383-3677



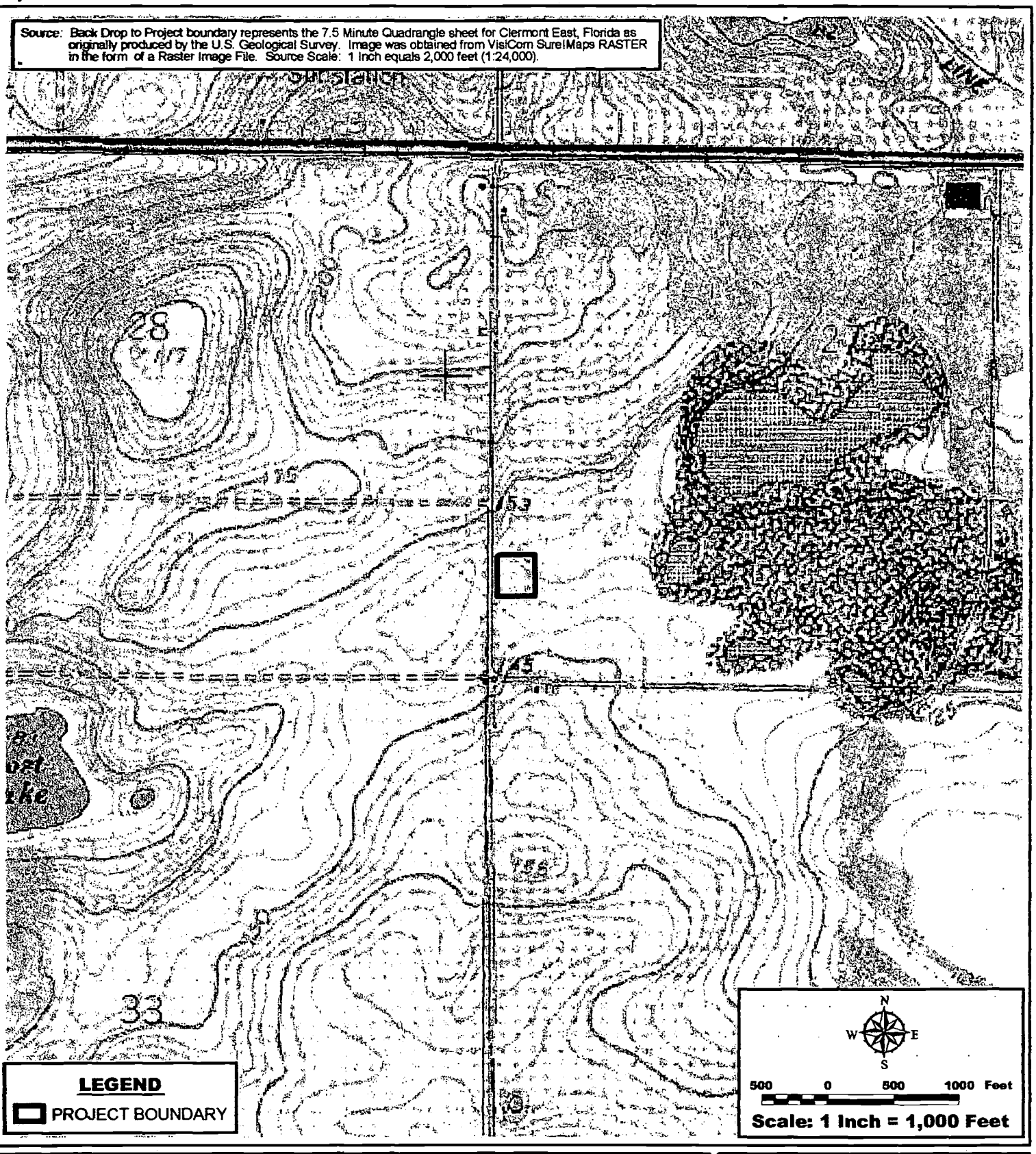
SCOTT SITE
LAKE COUNTY, FLORIDA

FIGURE 2

GIS AERIAL MAP

Project No.: 2002/8	File: 2002-801.apr	Date: 2/12/03	Created By: NTL

LPG Express Services Inc.
2001 OLD U.S. HWY 441, Suite 5 / (352) 735-0346
Mount Dora, Florida 32757 / Fax: (352) 383-3877



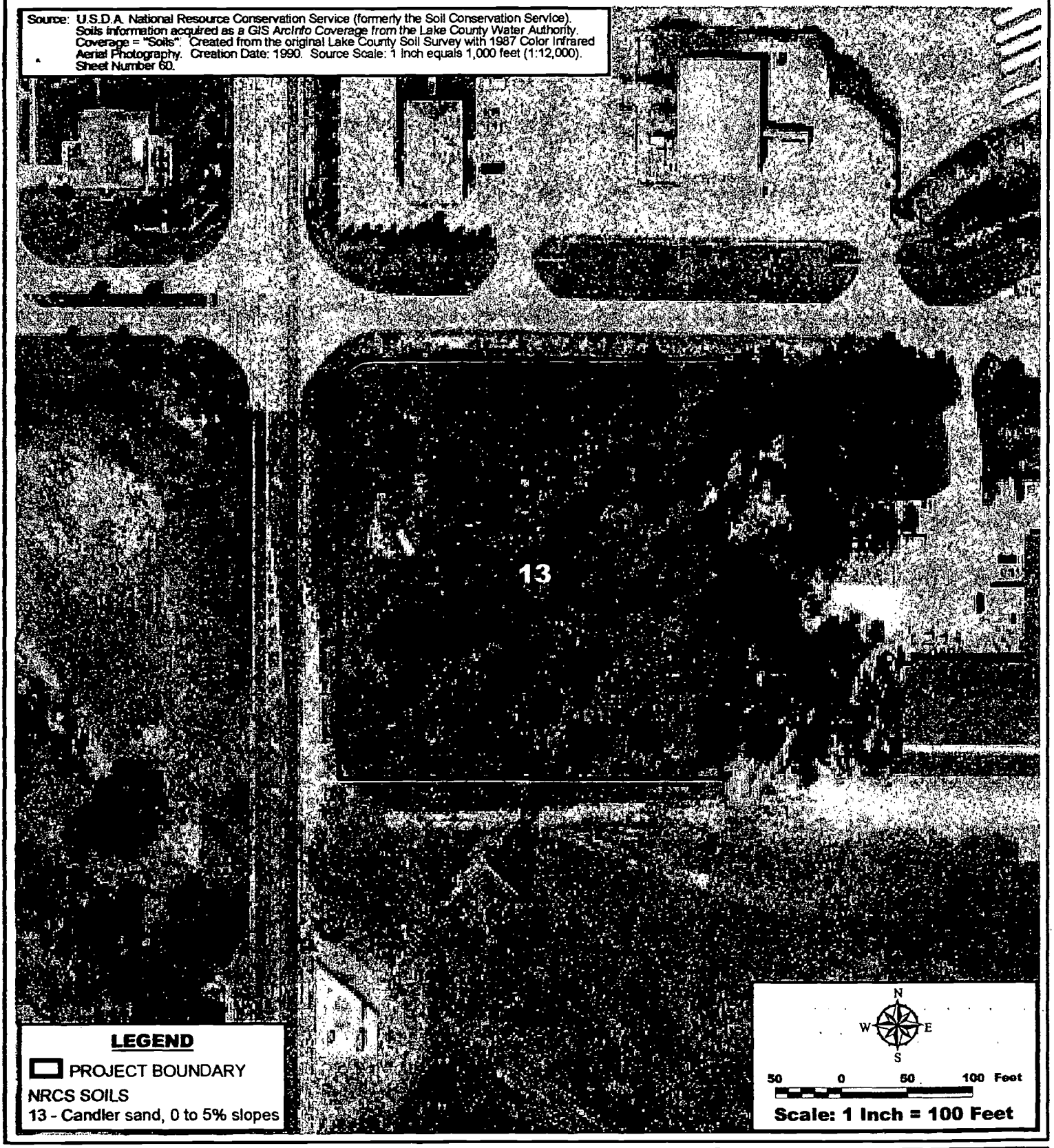
SCOTT SITE
LAKE COUNTY, FLORIDA

FIGURE 3

USGS TOPOGRAPHY MAP

Project No.: 2002/8	File: 2002-801.apr	Date: 2/12/03	Created By: NTL

LPG Express Services Inc.
2001 OLD U.S. HWY 441, Suite 5 / (352) 735-0345
Mount Dora, Florida 32757 / Fax: (352) 383-3877



SCOTT SITE
LAKE COUNTY, FLORIDA

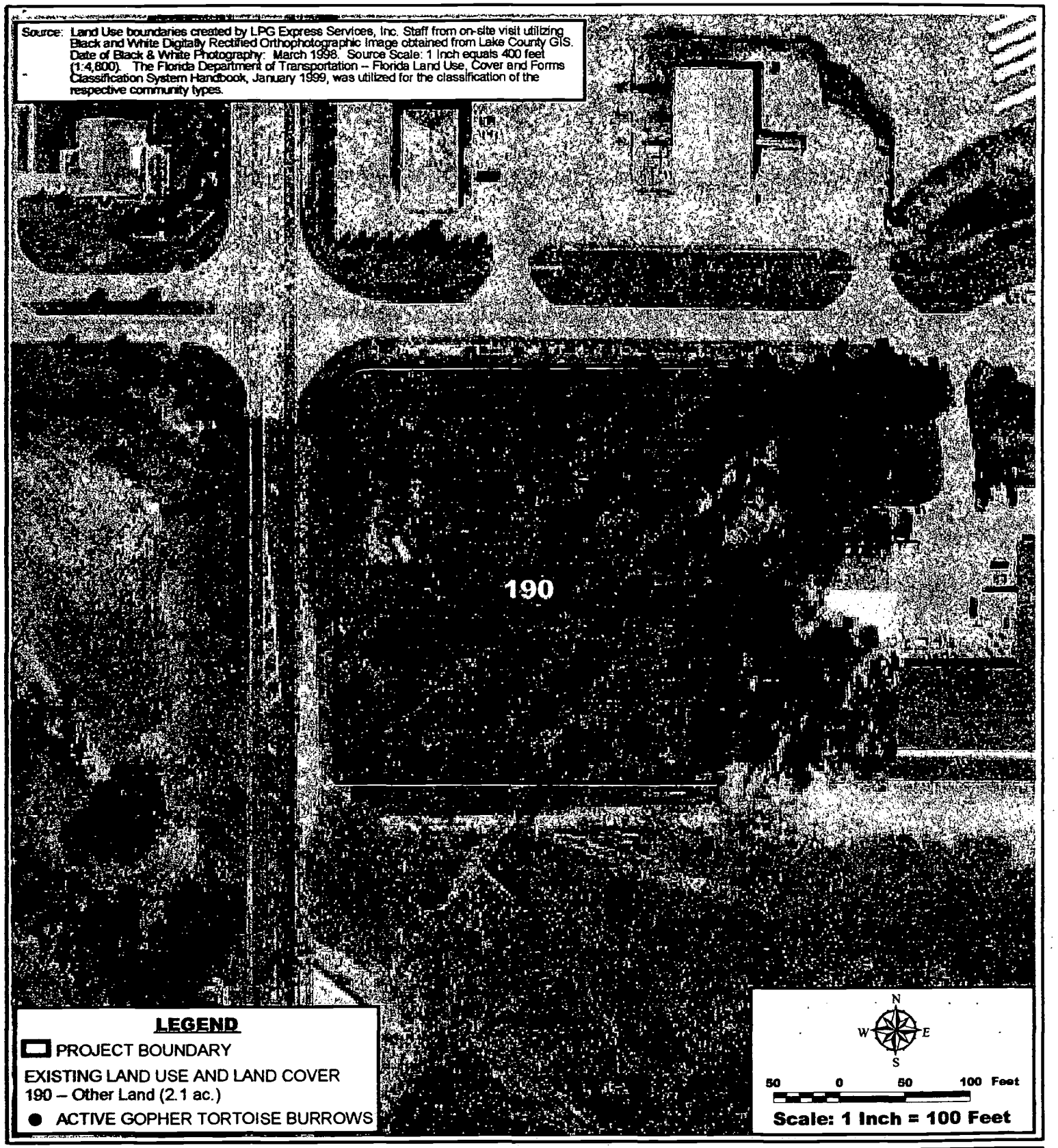
FIGURE 4

SOILS MAP

Project No.: 2002/8	File: 2002-801.apr	Date: 2/12/03	Created By: NTL

LPG Express Services Inc.
2001 OLD U.S. HWY 441, Suite 8 / (352) 735-0346
Mount Dora, Florida 32757 / Fax: (352) 383-3877

Source: Land Use boundaries created by LPG Express Services, Inc. Staff from on-site visit utilizing Black and White Digitally Rectified Orthophotographic Image obtained from Lake County GIS. Date of Black & White Photography: March 1998. Source Scale: 1 Inch equals 400 feet (1:4,800). The Florida Department of Transportation – Florida Land Use, Cover and Forms Classification System Handbook, January 1999, was utilized for the classification of the respective community types.



LEGEND

PROJECT BOUNDARY

EXISTING LAND USE AND LAND COVER
190 – Other Land (2.1 ac.)

ACTIVE GOPHER TORTOISE BURROWS

N
W E
S

50 0 50 100 Feet

Scale: 1 Inch = 100 Feet

SCOTT SITE
LAKE COUNTY, FLORIDA

FIGURE 5

LAND USE MAP

Project No.: 2002/8	File: 2002-801.apr	Date: 2/13/03	Created By: NTL

LPG Express Services Inc.
2001 OLD U.S. HWY 441, Suite 5 / (352) 735-0346
Mount Dora, Florida 32757 / Fax: (352) 383-3877

APPENDICES

APPENDIX A

DIVISIONS OF FLORIDA DEPARTMENT OF STATE
Office of the Secretary
Office of International Relations
Division of Elections
Division of Corporations
Division of Cultural Affairs
Division of Historical Resources
Division of Library and Information Services
Division of Licensing
Division of Administrative Services

MEMBER OF THE FLORIDA CABINET
State Board of Education
Trustees of the Internal Improvement Trust Fund
Administration Commission
Florida Land and Water Adjudicatory Commission
Siting Board
Division of Bond Finance
Department of Revenue
Department of Law Enforcement
Department of Highway Safety and Motor Vehicles
Department of Veterans' Affairs

FLORIDA DEPARTMENT OF STATE
Glenda E. Hood
Secretary of State
DIVISION OF HISTORICAL RESOURCES

April 18, 2003

Sherie Lindh
LPG Environmental & Permitting Services, Inc.
2001 Old US Hwy. 441, Suite 1
Mt. Dora, FL. 32757
FAX # (352) 383-3877

Dear Ms. Lindh,

In response to your inquiry of April 18th, 2003, the Florida Master Site File lists no previously recorded cultural resources or surveys in the following parcels:

T22S, R26E, Section 27

In interpreting the results of our search, please remember the following points:

- **Areas which have not been completely surveyed, such as yours, may contain unrecorded archaeological sites, unrecorded historically important structures, or both.**
- **As you may know, state and federal laws require formal environmental review for some projects. Record searches by the staff of the Florida Master Site File do not constitute such a review of cultural resources. If your project falls under these laws, you should contact the Compliance Review Section of the Bureau of Historic Preservation at 850-245-6333 or at this address.**

Sincerely,

Patrick Gensler
Data Analyst, Florida Master Site File
Division of Historical Resources
R. A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399-0250

Phone: 850-245-6440
State SunCom: 205-6440
Fax line: 850-245-6439
Email: *fmsfile@mail.dos.state.fl.us*
Web: *http://www.dos.state.fl.us/dhr/msf/*

SECTION B

STORMWATER SUMMARY & CALCULATIONS

SCOTT BUSINESS AND INDUSTRIAL CENTER
STORMWATER CALCULATIONS

PROJECT DESCRIPTION

This project is for the construction of two (2) commercial office/warehouse buildings located in unincorporated Lake County, Florida, Section 27, Township 22S, Range 26E. The project site is located off Pine Valley Blvd. in what is known as lots 8 and 9 of the Pine Valley Industrial Park. The project area is 2.59-acres with a total impervious area of 1.80-acres. The percent impervious for the project is therefore computed as 69.61%. The proposed construction includes a 10,500 sf building, a 11,000 sf building, parking lot with two (2) access driveways, sidewalks, swales, and two (2) water retention areas (WRA). Stormwater runoff will be conveyed to the WRA by overland flow, sheet flow, and storm sewer piping system. Stormwater runoff in excess of the required retention volume will exit the WRA through an on-site outfall weir. Stormwater runoff leaving the site will discharge in the same location as in the pre-development condition. No wetlands are located within the project area.

SUMMARY

Stormwater treatment for the project will be handled in a dry retention pond. The pond must retain sufficient volume to provide water quality treatment as well as the required retention volume to minimize phosphorus pollutant loading to the Lake Apopka hydrologic drainage basin. The following is a summary of the design criteria required for WRA and the quantities provided in WRA.

WATER QUALITY

Area	Criteria	Required	Provided
Basin/WRA	Treatment Volume	12,887 cf	16,250 cf
	Volume Recovery Time	72 hrs	2.4 hrs
	Pre/Post-development Phosphorus Loading at 1" of Retention Over the Area	0.52 kg/yr	0.22 kg/yr

*For simplification of the stormwater calculations the quantities provided in both WRA were summed and analyzed as one pond.

WATER QUANTITY

Area	Criteria	Required	Provided
Basin/WRA	Mean Annual Storm	0.22 cfs	0.21 cfs

* 25-year, 96-hour storm event routed with infiltration

The subsequent sections of this report contain the detailed information and calculations developed for this analysis.

DRY RETENTION POND

TREATMENT VOLUME:

Area = 112,871 sf

Off-site= 0 sf
Area

Total Area= 112,871 sf

Impervious Area:

Pavement	57,071 sf
Building	21,500 sf
∑ Imperv. Area	78,571 sf

% Impervious = 69.61%

Total Impervious = 78,571 sf

Pervious Area:

Pervious Area: 34,300 sf

Retention Volume Required:

Offline:

V = ½" x 112,871 sf / (12 "/ft) or V = 1¼" x 78,571 sf / (12 "/ft)
V = 4,703 cf V = 8,184 cf

Online:

V = ½" x 112,871 sf / (12 "/ft)
V = 4,703 cf

Total Retention Required:

VReq'd = 8,184 + 4,703

VReq'd = 12,887 cf

PHOSPHORUS LOADING VOLUME:

Area =	112,871 sf	
Off-site= Area	0 sf	
Retention= Depth	1.73 in	
Total Area=		112,871 sf
Impervious Area:		
Pavement		57,071 sf
Building		21,500 sf
Σ Imperv. Area		78,571 sf
% Impervious =		69.61%
Total Impervious =		78,571 sf
Pervious Area:		
Pervious Area:		34,300 sf

Retention Volume Required:

V = 1.7276 in x 112,871 sf / (12 "/ft)
V = 16,250 cf

Site-Specific Pre-/Post- Pollutant Loading Analysis

Existing Condition	Land Use	Soil Type	Total P Loading (kg/ac-yr)		Basin Acreage (acres)		Inflow Mass Loading (kg/yr)	Treatment System	Inches of Retention Over Basin Area (inches)	Pollutant Removal Efficiency (%)	Outflow Mass Loading (kg/yr)
Basin 1	OPEN	HSG A	0.004	X	2.10	=	0.01				0.01
Basin 2	HWY 75%	HSG A	1.053	X	0.49	=	0.52				0.52
Basin 3											
Basin 4											
Basin 5											
Basin 6											
Basin 7											
Basin 8											
Basin 9											
Basin 10											
					2.59		0.52				0.52

Proposed Condition	Land Use	Soil Type	Total P Loading (kg/ac-yr)		Basin Acreage (acres)		Inflow Mass Loading (kg/yr)	Treatment System	Inches of Retention Over Basin Area (inches)	Pollutant Removal Efficiency (%)	Outflow Mass Loading (kg/yr)
Basin 1	COMM	HSG A	0.899	X	2.10	=	1.89	Dry Retention	*1.73*	91	0.17
Basin 2	HWY 75%	HSG A	1.053	X	0.49	=	0.52	Dry Retention	*1.73*	91	0.05
Basin 3											
Basin 4											
Basin 5											
Basin 6											
Basin 7											
Basin 8											
Basin 9											
Basin 10											
					2.59		2.40				0.22

POND VOLUME:

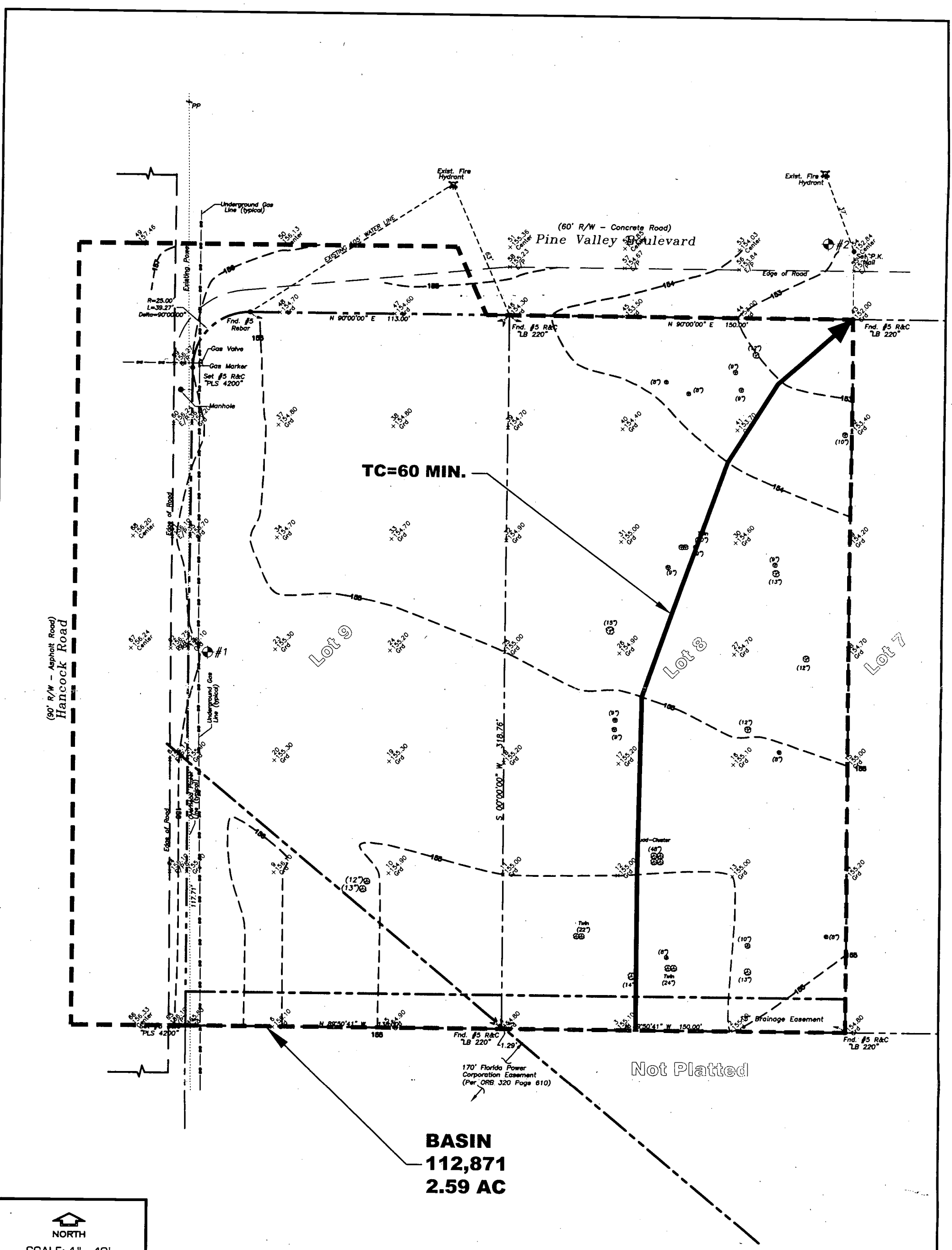
The storage provided within the WRA was determined using the following stage storage relationship.

DRY RETENTION POND						
Elev.	Δd (FT)	Area (SF)	Avg.Area (SF)	ΔV (CF)	ΣV (CF)	ΣV (AC-FT)
150		198			0	0.00
	1		868	868		
151		1,537			868	0.02
	1		2,630	2,630		
152		3,722			3,497	0.08
	1		5,606	5,606		
153		7,489			9,103	0.21
	1		9,530	9,530		
154		11,570			18,632	0.43

TOP OF TREAT. VOLUME	ELEV.	VOLUME (CF)
	153.00	9,103
==>	153.40	12,887
ELEV.	154.00	18,632

VOLUME PROV.	VOLUME (CF)	ELEV.
	9,103	153.00
==>	16,250	153.75
(CF)	18,632	154.00

	Required	Provided
Treatment Volume	12,887	16,250



Donald A. Griffey, PE #36799
GRIFFEY ENGINEERING, INC.
2001 OLD HWY 441, SUITE 2
MOUNT DORA, FL 32757

SCOTT BUSINESS & INDUSTRIAL CENTER
LAKE COUNTY, FLORIDA
PRE-DEVELOPMENT DRAINAGE BASIN MAP

GRIFFEY ENGINEERING
2001 OLD HWY 441, SUITE 2
MOUNT DORA, FLORIDA 32757
(352) 383-4786
FAX (352) 383-0828

FILE#: 03006SPN	DATE: 7/1/03	REVISED:	DRAWN: GSH

TIME OF CONCENTRATION AND TRAVEL TIME Version 2.10

Project : SCOTT BUSINESS & INDUSTRIAL CE User: GSH Date: 06-17-2003

County : LAKE State: FL Checked: ____ Date: _____

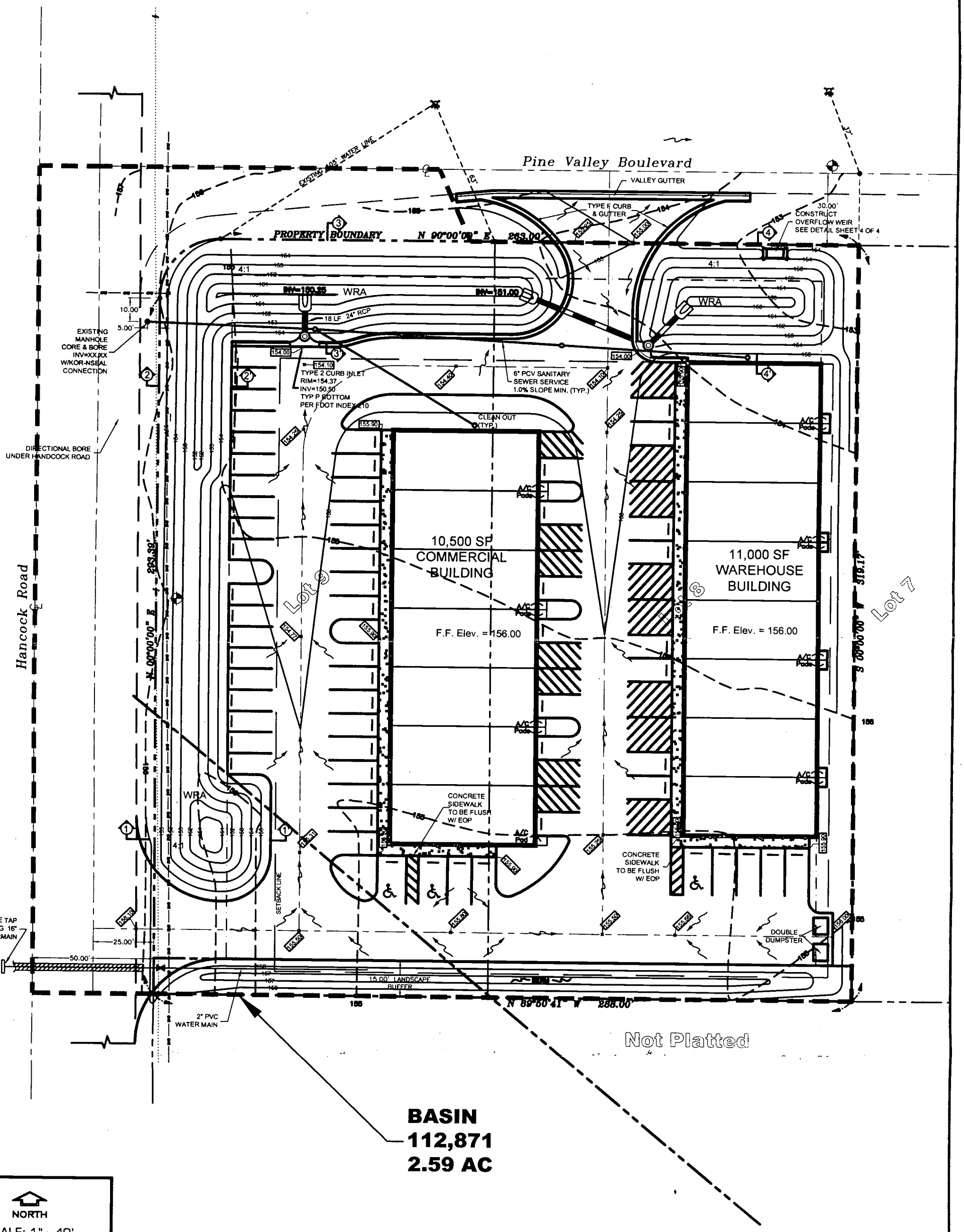
Subtitle:

---------- Subarea #1 - PRE ----------

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	4.6	300	.0090	H					0.989
Shallow Concent'd		45.5	.0090	U					0.008
								Time of Concentration =	1.00*
									=====

--- Sheet Flow Surface Codes ---

A Smooth Surface	F Grass, Dense	--- Shallow Concentrated ---
B Fallow (No Res.)	G Grass, Burmuda	--- Surface Codes ---
C Cultivated < 20 % Res.	H Woods, Light	P Paved
D Cultivated > 20 % Res.	I Woods, Dense	U Unpaved
E Grass-Range, Short	J Range, Natural	



SCOTT BUSINESS & INDUSTRIAL CENTER
LAKE COUNTY, FLORIDA
POST-DEVELOPMENT DRAINAGE BASIN MAP

Donald A. Griffey, PE #36799
GRIFFEY ENGINEERING, INC.
2001 OLD HWY 441, SUITE 2
MOUNT DORA, FL 32757

GRIFFEY ENGINEERING
2001 OLD HWY 441, SUITE 2
MOUNT DORA, FLORIDA 32757
(352) 383-4786
FAX (352) 383-0828

FILE#: 03006SPN	DATE: 7/1/03	REVISED:	DRAWN: GSH

SCOTT BUSINESS & INDUSTRIAL CEN MEAN ANNUAL, 24-HOUR

PRE-DEVELOPMENT

DESCRIPTION	AREAS				CURVE #
EXISTING PAVEMENT	17,049	FT^2	0.39	ACRES	98
WOODS GRASS COMB. - FAIR - TYPE	95,822	FT^2	2.20	ACRES	43
		FT^2	0.00	ACRES	
		FT^2	0.00	ACRES	
		FT^2	0.00	ACRES	
		FT^2	0.00	ACRES	
TOTAL AREA	112,871	FT^2	2.59	ACRES	
PRECIPITATION	4.2	INCHES			
COMPOSITE CURVE #	51.31				
S = (1000/CN)-10	9.49				
Q = [P-(0.2)*(S)]^2/[P+(0.8)*(S)]	0.45	INCHES			
PRE-DEVELOPMENT VOLUME	**4,227**	**FT^3**	**0.097**	**ACRE-FT**	

POST-DEVELOPMENT

DESCRIPTION	AREAS				CURVE #
GRASS OPEN SPACE - GOOD - TYPE /	34,300	FT^2	0.79	ACRES	39
BUILDING	21,500	FT^2	0.49	ACRES	98
PARKING	57,071	FT^2	1.31	ACRES	98
		FT^2	0.00	ACRES	
		FT^2	0.00	ACRES	
		FT^2	0.00	ACRES	
TOTAL AREA	112,871	FT^2	2.59	ACRES	
PRECIPITATION	4.2	INCHES			
COMPOSITE CURVE #	80.07				
S = (1000/CN)-10	2.49				
Q = [P-(0.2)*(S)]^2/[P+(0.8)*(S)]	2.21	INCHES			
POST-DEVELOPMENT VOLUME	**20,823**	**FT^3**	**0.478**	**ACRE-FT**	
PRE-POST VOLUME	**16,597**	**FT^3**	**0.381**	**ACRE-FT**	

BASIN MEAN ANN.

PONDS Version 3.2.0155
Retention Pond Recovery - Refined Method
Copyright 2000
Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	03006SPN -- Scott Business and Industrial Center
Simulation Description:	Scenario 1 - Treatment Volume Drawdown Analysis Scenario 2 - Pre-development Mean Annual Hydrograph Scenario 3 - Post-development Mean Annual Routing
Project Number:	03006SPN
Engineer :	GSH
Supervising Engineer:	DAG
Date:	06-20-2003

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	146.00
Water Table Elevation, [WT] (ft datum):	146.50
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	55.00
Fillable Porosity, [n] (%):	30.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	45.0
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	9530.0

Geometry Data

Equivalent Pond Length, [L] (ft):	498.0
Equivalent Pond Width, [W] (ft):	7.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
150.00	198.0
151.00	1537.0
152.00	3722.0
153.00	7489.0
154.00	11570.0

Discharge Structures

Discharge Structure #1 is active as weir

Structure Parameters

Description: Outfall Weir

Weir elevation, (ft datum):	153.75
Weir coefficient:	3.13
Weir length, (ft):	10
Weir exponent:	1.5

Tailwater - disabled, free discharge

Discharge Structure #2 is inactive

Discharge Structure #3 is inactive

Scenario Input Data

Scenario 1 :: 12887 ft³ Treatment Volume Drawdown Analysis

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 12887

Initial ground water level (ft datum) default, 146.50

Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.000
0.250	2.500
0.500	3.000
1.000	3.500
1.500	4.000

Scenario 2 :: Pre-development Mean Annual Hydrograph

Hydrograph Type: Inline SCS
• **Modflow Routing: Not routed**
Repetitions: 1

Basin Area (acres)	2.590
Time Of Concentration (minutes)	60.0
DCIA (%)	0.0
Curve Number	51.31
Design Rainfall Depth (inches)	4.2
Design Rainfall Duration (hours)	24.0
Shape Factor	UHG 323
Rainfall Distribution	SCS Type II Florida Modified

Initial ground water level (ft datum) default, 146.50

No times after storm specified.

Scenario 3 :: Post-development Mean Annual Routing

Hydrograph Type: Inline SCS
• **Modflow Routing: Routed without infiltration**
Repetitions: 1

Basin Area (acres)	2.590
Time Of Concentration (minutes)	10.0
DCIA (%)	0.0
Curve Number	80.07
Design Rainfall Depth (inches)	4.2
Design Rainfall Duration (hours)	24.0
Shape Factor	UHG 323
Rainfall Distribution	SCS Type II Florida Modified

Initial ground water level (ft datum) default, 146.50

No times after storm specified.

Summary of Results :: *Scenario 1 :: 12887 ft³ Treatment Volume Drawdown Analysis*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	146.50		
Maximum	0.002	153.45		
Inflow				
Rate - Maximum - Positive	0.002		2147.8330	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			12887.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			12887.0
Infiltration				
Rate - Maximum - Positive	0.002		0.1031	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			0.6
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			12887.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
Discharge Structure 1 - simple weir				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	0.00		12887.0
72 Hour Stage and Infiltration Volume	72.000	0.00		12887.0

Detailed Results :: *Scenario 1 :: 12887 ft³ Treatment Volume Drawdown Analysis*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	2147.8330	0.0000	146.500	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	2147.8330	0.0000	153.450	0.10305	0.00000	12887.0	0.6	0.0	U/P
2.400	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
6.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
12.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
24.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
36.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
48.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
60.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
72.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
84.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry
96.000	0.0000	0.0000	----	----	----	12887.0	12887.0	0.0	dry

Summary of Results :: *Scenario 2 :: Pre-development Mean Annual Hydrograph*

	Time (hours)	Stage (ft datum)	Rate (ft^3/s)	Volume (ft^3)
Stage				
Minimum	Not Available	Not Available		
Maximum	Not Available	Not Available		
Inflow				
Rate - Maximum - Positive	12.933		0.2181	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	29.200			4238.5
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	29.467			4238.5
Infiltration				
Rate - Maximum - Positive	Not Available		Not Available	
Rate - Maximum - Negative	Not Available		Not Available	
Cumulative Volume - Maximum Positive	Not Available			Not Available
Cumulative Volume - Maximum Negative	Not Available			Not Available
Cumulative Volume - End of Simulation	Not Available			Not Available
Combined Discharge				
Rate - Maximum - Positive	12.933		0.2181	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	29.200			4238.5
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	29.467			4238.5
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

Summary of Results :: *Scenario 3 :: Post-development Mean Annual Routing*

	Time (hours)	Stage (ft datum)	Rate (ft^3/s)	Volume (ft^3)
Stage				
Minimum	0.000	150.00		
Maximum	16.600	153.79		
Inflow				
Rate - Maximum - Positive	12.022		3.9023	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.844			20876.6
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	24.911			20876.6
Infiltration				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	24.911			0.0
Combined Discharge				
Rate - Maximum - Positive	16.622		0.2101	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.911			4912.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	24.911			4912.4
Discharge Structure 1 - simple weir				
Rate - Maximum - Positive	16.622		0.2101	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.911			4912.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	24.911			4912.4
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

SECTION C

GEOTECHNICAL INVESTIGATION

Andreyev Engineering, Inc.

SANFORD OFFICE
4055 St. John's Parkway
Sanford, Florida 32771
407-330-7763
Fax: 407-330-7765

▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

Date: June 18, 2003
AEI Project No: TPGT-03-039

TO: **Griffey Engineering Inc.**
2001 Old Highway 441, Suite 2
Mount Dora, FL. 32757
Attn: Mr. Don Griffey, P.E.

SUBJECT: **Geotechnical Investigation, Scott Business and Industrial Center, Stormwater Retention System, Clermont, Lake County, Florida**

Dear Mr. Griffey:

As requested, Andreyev Engineering, Inc. (AEI) has completed a geotechnical investigation for the subject site. The following report presents the results of our field and laboratory investigation along with evaluation and recommendations for stormwater retention pond design and recovery analysis.

SITE LOCATION AND DESCRIPTION

The subject site is located northeast of the intersection of Pine Valley Road and Hancock Road in Clermont, Lake County, Florida. We understand that the site will be developed for use as a commercial building and warehouse facility with paved parking and driveway areas. The associated stormwater runoff will be routed into a retention area as shown on the attached site plan labeled **Figure 1**.

PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to explore shallow subsurface conditions at the proposed retention area to determine it's suitability for stormwater retention. The field exploration consisted of drilling one (1) auger boring to a depth of 12 feet within the proposed retention area. In addition, an undisturbed tube sample was collected to assess the hydraulic conductivity of the shallow soils.

Samples were recovered from the boring and returned to AEI's laboratory for visual classification and stratification. All samples were reviewed by a Geotechnical Engineer in our laboratory and classified using the Unified Soil Classification System (USCS). The approximate boring location is shown on **Figure 1** and results of the boring in profile form are presented on **Figure 2**. On the soil profiles, horizontal lines designating the interface between differing materials represent approximate boundaries. The actual transition between layers is typically gradual.

Hydraulic conductivity was measured in our laboratory using a falling head test on the undisturbed tube sample recovered from the retention area. The result of this test is shown on **Figure 2** next to the tested depth.

SUBSURFACE CONDITIONS

Three (3) soil strata were identified in the boring. The predominant subsurface soil consists of fine sand (Strata 1 and 2) from the ground surface to a depth of 9 feet, followed by slightly clayey to clayey fine sand (Strata 3) to the boring termination depth of 12 feet.

The laboratory permeability test measured the vertical hydraulic conductivity at the proposed retention area location at a depth of 3 to 3.5 feet below the existing ground surface. Soil hydraulic conductivity measured 56.2 feet per day at the location of boring AB-1. The test result is shown next to the tested depth on **Figure 2**.

The groundwater table was not encountered within the drilled depth of the boring. Based on the soil stratigraphy, antecedent rainfall, and our local experience, the seasonal high groundwater table is estimated to occur below the terminated depth of the boring. The potentiometric surface is estimated to occur well below the drilled depth of the boring, however, the Stratum 3 clayey soils are considered poorly permeable soils and can cause temporary perching of groundwater above these soils during periods of heavy or extended rainfall.

EVALUATION AND RECOMMENDATIONS

Based on the boring and permeability test, the site is considered suitable for construction and long-term performance of a dry stormwater retention pond. The well drained and highly permeable nature of the surficial sandy soils should be suitable for dry retention pond design. The Strata 1 and 2 soils excavated from the retention area should be suitable for general fill purposes. For the purposes of retention area recovery and groundwater mounding analyses, the seasonal high groundwater level should be assumed just above the Strata 3 soils.

For analysis and design purposes the following aquifer characteristics should be assumed. These aquifer characteristics were interpreted from the results of the field and laboratory investigation, adjusting for depth and soil variability:

Parameters	Retention Area
Depth to Aquifer Base	9 feet *
Depth to Seasonal High Groundwater Table	8.5 feet *
Average Horizontal Hydraulic Conductivity	55 ft/day
Unsaturated Vertical Hydraulic Conductivity	45 ft/day
Soil Storage Coefficient	0.30

*- below existing ground surface

CLOSURE

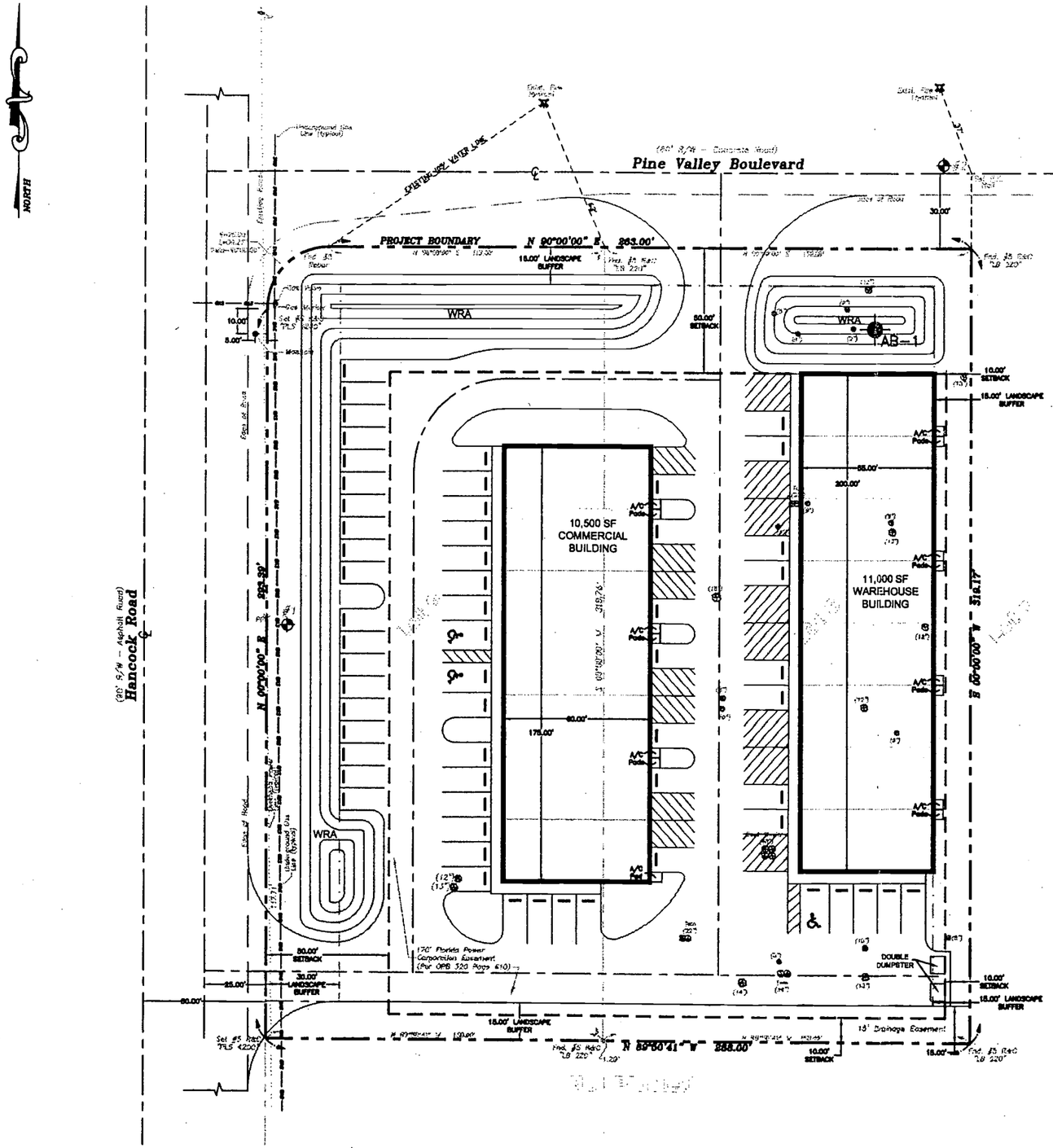
AEI appreciates the opportunity to participate in this project, and we trust that the information herein is sufficient for your immediate needs. If you have any questions or comments concerning the contents of this report, please do not hesitate to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.

Raymond W. Jones, P.E.
Project Engineer
Florida Registration No. 58079

FIGURES



LEGEND

AUGER BORING LOCATION

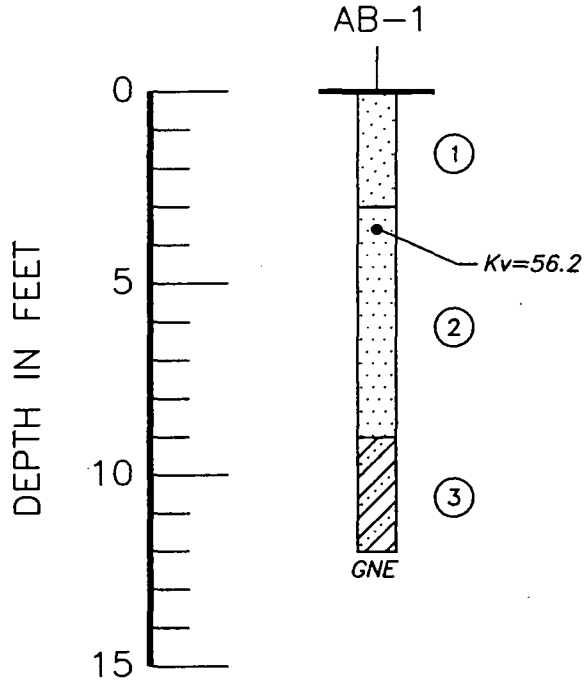
Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
SCOTT BUSINESS & INDUSTRIAL CENTER
PINE VALLEY BLVD.
CLERMONT, LAKE COUNTY, FL.

SCALE:	DATE: 6/17/03	ENGINEER: RJ
1"=50'	PN: TPGT-03-060	DRAWN BY: AS

SITE MAP

FIGURE 1



LEGEND

1 DARK BROWN FINE SAND (SP)

2 ORANGISH BROWN FINE SAND (SP)

3 ORANGISH BROWN SLIGHTLY CLAYEY TO CLAYEY FINE SAND (SP–SC)(SC)

(SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL

GNE GROUNDWATER NOT ENCOUNTERED

Kv VERTICAL COEFFICIENT OF PERMEABILITY, IN FEET PER DAY

89927 1

Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
SCOTT BUSINESS & INDUSTRIAL CENTER
PINE VALLEY BLVD.
CLERMONT, LAKE COUNTY, FL.

SCALE:	DATE: 6/17/03	ENGINEER: RJ
1"=5'	PN: TPGT–03–060	DRAWN BY: AS

SOIL PROFILES

FIGURE 2