Draft Environmental Assessment for Phase II Air Cargo Facility Development

Volume 2: Appendices

Lakeland Linder International Airport
Polk County, Florida

April 2021

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LIST OF APPENDICES

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APPENDIX A

Agency Coordination

A.1 Early Agency Coordination and Comments

A.2 USFWS Consultation

A.3 SHPO Consultation

A.4 Tribal Consultation

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APPENDIX A.1

Early Agency Coordination and Comments

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AECOM
7650 West Courtney Campbell
Causeway
Tampa, FL 33607
www.aecom.com
813.675.6843 tel

May 4, 2020

Mr. Chris Stahl
Clearinghouse Coordinator
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000

Re: State Clearinghouse Review for Phase II Air Cargo Development at Lakeland Linder International Airport (LAL), Polk County, Florida

Dear Mr. Stahl:

The City of Lakeland, Florida (City), through its Airports department, is proposing to implement Phase II of development of an air cargo facility at the Lakeland Linder International Airport (LAL), hereinafter referred to as the Proposed Project. The City, in coordination with the Federal Aviation Administration (FAA), is requesting review of the Proposed Project's early consistency with the Florida Coastal Management Program.

Additionally, the City and FAA are requesting early agency input on any environmental concerns and issues that should be considered in the environmental planning and permitting process for the Proposed Project. To accomplish this we would like to receive your comments relative to the proposed improvements as they relate to your specific area of expertise or regulatory jurisdiction, including permitting or mitigation requirements.

The enclosed **Figure 1** shows the extent of the Proposed Project, which is comprised of the following actions:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;
- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.

- Construct approximately 19,350 SY of pavement for aircraft ground support equipment staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

In order to sufficiently address any preliminary key project issues and maintain the project schedule, the City and FAA are requesting an expedited 30-day review of the Proposed Project. Please respond to me at the address provided below and feel free to contact me if you have any questions or concerns.

Sincerely,

Paul K. Sanford

Paul K. Sanford
AECOM Project Manager
7650 West Courtney Campbell Causeway
Tampa, FL 33607
813.675.6843
paul.sanford@aecom.com

Enclosure (1)

Copy: Gene Conrad, City of Lakeland
Peter Green, FAA
File

Local Agency Distribution List (Example Letter Attached)

Ms. Patricia M. Steed
Executive Director
Central Florida Regional Planning Council
555 E. Church Street
Bartow, FL 33830

Mr. Sean Malott
President and CEO
Central Florida Development Council
5908 Hillside Heights Drive
Lakeland, FL 33812

Mr. Tony Delgado
City Manager
City of Lakeland
228 S. Massachusetts Avenue
Lakeland, FL 33801

Mr. Heath Frederick
Public Works Director
City of Lakeland
228 S. Massachusetts Avenue
Lakeland, FL 33801

Water Utilities Engineering
City of Lakeland
501 E. Lemon Street
Lakeland, FL 33801

Mr. Joel Ivy
General Manager
Lakeland Electric
501 E. Lemon Street
Lakeland, FL 33801

Mr. Bill Beasley
Manager
Polk County
330 W. Church St.
Drawer BC01
P.O. Box 9005
Bartow, Florida 33831-9005

Mr. Steve Scruggs
President
Lakeland Economic Development Council
502 E. Main Street
Lakeland, FL 33801

Commissioner Charles Lake
Chairperson
Polk Transportation Planning Organization
330 W. Church Street
Drawer TS05
Bartow, FL 33830

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AECOM
7650 West Courtney Campbell
Causeway
Tampa, FL 33607
www.aecom.com
813.675.6843 tel

July 10, 2020

Mr. Sean Malott
President and CEO
Central Florida Development Council
5908 Hillside Heights Drive
Lakeland, FL 33812

Re: Environmental Assessment for Phase II Air Cargo Development at Lakeland Linder International Airport (LAL), Polk County, Florida

Dear Mr. Malott:

The City of Lakeland, Florida (City), through its Airports department, is proposing to implement Phase II of development of an air cargo facility at the Lakeland Linder International Airport (LAL), hereinafter referred to as the Proposed Project. The Proposed Project is an expansion of an air cargo facility already under construction that will be operated by the existing tenant.

The Phase II expansion is being contemplated to accommodate future flexibility for expanded operations, and therefore the timeline and internal decision for this expansion has not been finalized. However, given that network and customer demand could increase in the near foreseeable future, it has been decided to perform the preliminary environmental planning and permitting actions to support eventual construction, such that all parties could ensure due diligence in complying with all applicable federal, state and local environmental regulations and requirements. Therefore, in accordance with the National Environmental Policy Act of 1969 (NEPA) and Federal Aviation Administration (FAA) implementing regulations, the City is preparing an Environmental Assessment (EA) to consider and document the potential air quality, noise, traffic-related, social, economic, and environmental impacts associated with the Proposed Project.

On behalf of the City and FAA, we would like to receive early input relative to the proposed improvements as they relate to your specific area of expertise or regulatory jurisdiction, including any permitting or mitigation requirements.

The enclosed **Figure 1** shows the extent of the Proposed Project, which is comprised of the following actions:

- Construct up to 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct up to approximately 69,000 square yards (SY) of paved truck court to accommodate up to 370 additional truck bays;
- Construct up to approximately 42,500 SY of paved vehicle parking lot to accommodate up to 1,120 additional parking spaces;
- Construct approximately up to 29,200 SY of concrete aircraft parking apron to accommodate up to three additional Boeing 767-300 aircraft parking positions.
- Construct up to approximately 19,350 SY of pavement for aircraft ground support equipment staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

In order to sufficiently address any preliminary key project issues and maintain the project schedule, your written comments are requested within 30 days of receipt of this letter. Please respond to me at the address provided below and feel free to contact me if you have any questions or concerns.

Sincerely,

Paul K. Sanford
AECOM Project Manager
7650 West Courtney Campbell Causeway
Tampa, FL 33607
813.675.6843
paul.sanford@aecom.com

Enclosure (1)

Copy: Gene Conrad, City of Lakeland
Peter Green, FAA
File

From: Stahl, Chris <Chris.Stahl@dep.state.fl.us>
Sent: Wednesday, June 17, 2020 2:51 PM
To: Sanford, Paul <paul.sanford@aecom.com>
Cc: State_Clearinghouse <State.Clearinghouse@dep.state.fl.us>
Subject: [EXTERNAL] State Clearance Letter for FL202005068934C- Phase II Air Cargo Development At Lakeland Linder International Airport, Polk County, Florida.

June 17, 2020

Paul Sanford
AECOM
7650 W. Courtney Campbell Causeway
Tampa, Florida 33607-1462

RE: Federal Aviation Administration - Scoping Notice - Environmental Assessment - Phase II Air Cargo Development at Lakeland Linder International Airport, Polk County, Florida.
SAI # FL202005068934C

Dear Paul:

Florida State Clearinghouse staff has reviewed the proposal under the following authorities: Presidential Executive Order 12372; § 403.061(42), Florida Statutes; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Southwest Florida Water Management District has communicated that a preapplication meeting with District Environmental Resource Permit (ERP) staff is encouraged prior to any site work. For assistance or additional information concerning the District's ERP program, please contact Robbin McGill, Senior Professional Engineer, at (813) 985-7481, ext. 2072, or robbinmcgill@watermatters.org.

The Florida Fish and Wildlife Conservation Commission has reviewed the proposed action and independently submitted comments. These have been attached to this letter and are incorporated hereto.

Based on the information submitted and minimal project impacts, the state has no objections to allocation of federal funds for the subject project and, therefore, the funding award is consistent with the Florida Coastal Management Program (FCMP). The state's final concurrence of the project's consistency with the FCMP will be determined during any environmental permitting processes, in accordance with Section 373.428, Florida Statutes, if applicable.

Sincerely,

Chris Stahl

Chris Stahl, Coordinator
Florida State Clearinghouse
Florida Department of Environmental Protection
3800 Commonwealth Blvd., M.S. 47
Tallahassee, FL 32399-2400
ph. (850) 717-9076
State.Clearinghouse@floridadep.gov

May 26, 2020

Paul K. Sanford
AECOM Project Manager
7650 West Courtney Campbell Causeway
Tampa, FL 33607
paul.sanford@aecom.com

Re: Phase II Air Cargo Development at Lakeland Linder International Airport (SAI # FL202005068934C), Polk County

Dear Mr. Sanford:

Florida Fish and Wildlife Conservation Commission (FWC) staff reviewed the proposed Phase II Air Cargo Development at Lakeland Linder International Airport and provides the following comments and recommendations for your consideration in accordance with Chapter 379, Florida Statutes (F.S.), and pursuant to the federal National Environmental Policy Act (NEPA), and the Coastal Zone Management Act/Florida's Coastal Management Program.

Project Description

The City of Lakeland, in coordination with the Federal Aviation Administration, requests early agency input to implement Phase II in the development of an air cargo facility at the Lakeland Linder International Airport (LAL) located south of Drane Field Road in Polk County. The proposed project would consist of a 464,000 square foot (SF) expansion of a sorting and office building and 160,000 square yards of paving for a paved truck court, vehicle parking lot, aircraft parking apron, staging area, and a new access road from Drane Field Road. There would be other modifications to the airport's stormwater management system, installation of security features, airfield lighting, and signage. The construction and improvements would take place in existing disturbed and maintained lands, existing airport operations lands, and herbaceous/forested uplands and wetlands adjacent to operations.

Potentially Affected Resources

The request did not include a listed species assessment or other environmental information; however, FWC staff conducted a geographic information system (GIS) analysis of the project area and found that the project area is located near, within, or adjacent to:

- One or more wood stork (*Mycteria americana*, Federally Threatened [FT]) nesting core foraging areas (CFA). The CFA consists of an 18.6-mile radius around the nesting colony.

- U.S. Fish and Wildlife Service (USFWS) Consultation Areas for:
  - Florida grasshopper sparrow *(Ammodramus savannarum floridanus,* Federally Endangered [FE])
  - Florida scrub jay *(Aphelocoma coerulescens,* Federally Threatened [FT])
  - Audubon's crested caracara *(Polyborus plancus audubonii,* FT)
  - Everglade snail kite *(Rostrhamus sociabilis plumbeus,* FE)

- Potential habitat for federally and state-listed species:
  - Gopher tortoise (*Gopherus polyphemus*, State Threatened [ST])
  - Least tern *(Sternula antillarum,* ST)
  - Florida sandhill crane *(Antigone canadensis pratensis,* ST)

- Southeastern American kestrel (*Falco sparverius paulus*, ST)
- Eastern indigo snake *(Drymarchon corais couperi,* FT)

Comments and Recommendations

Gopher Tortoise

The cleared and maintained herbaceous lands may provide potential habitat for the gopher tortoise. The applicant should refer to the FWC's Gopher Tortoise Permitting Guidelines (Revised January 2017) at http://www.myfwc.com/license/wildlife/gopher-tortoise-permits/ for survey methodology and permitting guidance prior to any development activity. Specifically, the permitting guidelines include methods for avoiding impacts as well as options and state requirements for minimizing, mitigating, and permitting potential impacts of the proposed activities. If you have any questions regarding gopher tortoise permitting, please contact Kyle Brown by phone at (863) 648-3200 or at Kyle.Brown@MyFWC.com.

Least Tern

Clearing that creates large areas of open sandy conditions may create conditions conducive for beach-nesting bird nesting, and there are historically active rooftop nesting sites less than 10-miles from the project site. Cleared sites such as areas that have undergone surface scraping may attract ground-nesting species such as least terns during nesting season. Least tern nests have been documented on a variety of disturbed sites, including construction sites. Least terns deposit their eggs in shallow depressions or scrapes in the substrate, possibly lined with pebbles, grasses, or coquina shells. Egg-laying usually begins in late April or early May, and colonies may range in size from a few breeding pairs to many hundreds. FWC staff recommends the following measures to reduce nesting potential during construction:

- Conduct construction activities outside of the breeding season (generally April through August) if feasible, or,
- If the site is cleared during the breeding season, clear the site only when ready to build, and
- Avoid leaving cleared areas with little to no activity for an extended amount of time.

If nesting is observed, the applicant can contact FWC staff to discuss necessary nest buffers and potential permitting alternatives. For additional information, please refer to FWC's Breeding Bird Protocol for Florida's Seabirds and Shorebirds located at http://www.myflorida.com/apps/vbs/adoc/F15907_1241AttachmentDBreedingBirdProtocolForFloridasSeabirdsAndShorebirds.pdf.

Southeastern American Kestrel

Suitable habitat for southeastern American kestrel may be found within the proposed project area, particularly in the southern portion of the site where there are trees and a freshwater marsh. FWC staff recommends that the applicant conduct kestrel surveys from April to August within suitable habitat areas. Surveys from May to July are ideal to avoid confusion with the migratory subspecies of American kestrel (*Falco sparverius*). Survey guidelines, reporting criteria, and habitat needs for the southeastern American kestrel can be found at https://myfwc.com/media/18576/american_kestrel_technical_report_1993.pdf. If surveys encounter active nest cavities, we recommend avoiding project activities within 150 meters (492 feet) of the nest tree during the breeding season (mid-March to June). If nesting is discovered after construction has begun or if maintaining the recommended buffer is not possible, we recommend that the applicant contact FWC staff identified below to discuss potential permitting needs. In areas of suitable kestrel habitat, we recommend retaining snags whenever possible.

Florida Sandhill Crane

The cleared and maintained lands may provide foraging habitat for the Florida sandhill crane, and the freshwater emergent marshes on the western portion of the site may provide potential nesting habitat for this species. FWC staff recommends that surveys for nesting Florida sandhill cranes be conducted prior to construction activities and during the December through August breeding season. If construction occurs over several years, it may be necessary to conduct surveys each year as Florida sandhill cranes do not nest in the same location every year. If active nests are identified onsite, the Florida Sandhill Crane Species Conservation Measures and Permitting Guidelines recommend that the nest site be buffered by 400 feet to avoid disturbance by human activities. If nesting is discovered after construction has begun or if maintaining the recommended buffer is not possible, the applicant can contact FWC staff identified below to discuss potential permitting needs. Additional information and guidance for conducting Florida sandhill crane surveys can be found in the Florida Sandhill Crane Species Conservation Measures and Permitting Guidelines at https://myfwc.com/media/11565/final-florida-sandhill-crane-species-guidelines-2016.pdf. FWC staff would also like to note that Florida sandhill cranes do not nest in the same location every year, so if construction occurs over several years, it may be necessary to determine if nesting is occurring each year.

Federal Species

This site may also contain habitat suitable for the federally listed species identified above. FWC staff recommends coordination with USFWS South Florida Ecological Services Office (ESO) as necessary for information regarding potential impacts on these species. The USFWS South Florida ESO can be contacted at (772) 562-3909.

FWC staff appreciates the opportunity to provide input on this project and looks forward to working with the applicant throughout the permitting process. If you have specific technical questions regarding the content of this letter, please contact Jim Keltner at (239) 332-6972 x9209 or by email at James.Keltner@MyFWC.com. All other inquiries may be sent to ConservationPlanningServices@MyFWC.com.

Sincerely,

Jason Hight
Land Use Planning Program Administrator
Office of Conservation Planning Services

jh/jdk
Lakeland Linder International Airport Cargo Development Phase II_41734_05262020

CC: Chris Stahl, Florida State Clearinghouse, State.Clearinghouse@floridadep.gov

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From: Sanford, Paul
To: Norman, Tia; Hartsfield, Sam
Subject: FW: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA
Date: Monday, August 10, 2020 10:51:05 AM
Attachments: image001.png

For record…I'm forwarding a second in a moment.

V/r,

Paul Sanford
National U.S. Air Force NEPA Program Manager/
SE Civil Aviation Environmental Planning Lead
D +1-813-675-6843
Cisco Internal +1856843
paul.sanford@aecom.com

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7650 West Courtney Campbell Causeway
Tampa, Florida 33607, USA
T +1-813-286-1711
aecom.com

Built to deliver a better world

From: Conrad, Gene <Gene.Conrad@lakelandgov.net>
Sent: Monday, August 10, 2020 1:41 PM
To: Sanford, Paul <paul.sanford@aecom.com>
Subject: [EXTERNAL] FW: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Eugene B. Conrad III, C.M.
Airport Director
Lakeland Linder International Airport

From: Barmby, Charles
Sent: Wednesday, July 15, 2020 7:37 AM
To: Willey, Jason <Jason.Willey@lakelandgov.net>; Conrad, Gene <Gene.Conrad@lakelandgov.net>; Travis, Nicole <Nicole.Travis@lakelandgov.net>
Cc: Maio, Teresa <Teresa.Maio@lakelandgov.net>; Stovall, Jennifer (City Hall) <Jennifer.Stovall@lakelandgov.net>
Subject: RE: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Thanks for the clarification, Jason. In addition to addressing Teresa's comments, are any turn lane modifications expected on Drane Field Road that should be considered in the EA? A frontage sidewalk will be required along Drane Field Road and an enhanced landscaped buffer (including potential berming) to somewhat hide the proposed truck parking area should also be anticipated in the layout. What is the proposed with of the access road (and what impact does that have on impervious area calculations)? We'll want to ensure that trucks don't stage on Drane Field Road.

Thank you for the opportunity to comment.

Chuck

Charles Barmby, AICP CTP
Business Development & Transportation Manager
Community & Economic Development
City of Lakeland
p. 863.834.6028
f. 863.834.8432

From: Willey, Jason
Sent: Tuesday, July 14, 2020 2:25 PM
To: Barmby, Charles <Charles.Barmby@lakelandgov.net>; Conrad, Gene <Gene.Conrad@lakelandgov.net>; Travis, Nicole <Nicole.Travis@lakelandgov.net>
Cc: Maio, Teresa <Teresa.Maio@lakelandgov.net>; Stovall, Jennifer (City Hall) <Jennifer.Stovall@lakelandgov.net>
Subject: RE: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Thanks Chuck, at this time I think we can hold off on DRT in the short-term. The attachment is related to the Environmental Assessment (EA) that AECOM is completing for the Airport. Based on the previous project and the current EA, construction on phase II could still be 1 to 2 years away. In short, the tenant would like to keep phase II confidential until a plan to move forward has been developed based on their needs and the EA.

Thanks
Jason

From: Barmby, Charles
Sent: Tuesday, July 14, 2020 2:02 PM
To: Conrad, Gene <Gene.Conrad@lakelandgov.net>; Travis, Nicole <Nicole.Travis@lakelandgov.net>
Cc: Maio, Teresa <Teresa.Maio@lakelandgov.net>; Willey, Jason <Jason.Willey@lakelandgov.net>
Subject: RE: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Thanks, Gene:

We should run this concept through the DRT—we have a meeting next Wednesday and can add it to the agenda to meet the timeline stated in the letter.

Chuck

From: Conrad, Gene
Sent: Tuesday, July 14, 2020 1:59 PM
To: Travis, Nicole <Nicole.Travis@lakelandgov.net>
Cc: Barmby, Charles <Charles.Barmby@lakelandgov.net>; Maio, Teresa <Teresa.Maio@lakelandgov.net>; Willey, Jason <Jason.Willey@lakelandgov.net>
Subject: FW: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Nicole,

AECOM, on behalf of the airport, is circulating the attached. Just wanted to make sure you and your team were aware of the proposed expansion and if you had any comments, etc.

Feel free to send comments to me and I will make sure they are incorporated.

Thank you!

Gene

Eugene B. Conrad III, C.M.
Airport Director
Lakeland Linder International Airport

From: Stovall, Jennifer (City Hall)
Sent: Tuesday, July 14, 2020 1:50 PM
To: Conrad, Gene <Gene.Conrad@lakelandgov.net>; Delgado, Tony <Anthony.Delgado@lakelandgov.net>
Cc: Sherrouse, Shawn <Shawn.Sherrouse@lakelandgov.net>; Willey, Jason <Jason.Willey@lakelandgov.net>
Subject: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Hi Gene,

Tony received the attached letter today. Are you preparing a response?

Thanks!

From: [Sanford, Paul]
To: [Norman, Tia]; [Hartsfield, Sam]
Subject: FW: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA
Date: Monday, August 10, 2020 10:51:00 AM

Second one…

V/r,

Paul Sanford
National U.S. Air Force NEPA Program Manager/
SE Civil Aviation Environmental Planning Lead
D +1-813-675-6843
Cisco Internal +1856843
paul.sanford@aecom.com

AECOM
7650 West Courtney Campbell Causeway
Tampa, Florida 33607, USA
T +1-813-286-1711
aecom.com

Built to deliver a better world

From: Conrad, Gene <Gene.Conrad@lakelandgov.net>
Sent: Monday, August 10, 2020 1:41 PM
To: Sanford, Paul <paul.sanford@aecom.com>
Subject: [EXTERNAL] FW: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Eugene B. Conrad III, C.M.
Airport Director
Lakeland Linder International Airport

From: Maio, Teresa
Sent: Tuesday, July 14, 2020 3:08 PM
To: Willey, Jason <Jason.Willey@lakelandgov.net>; Barmby, Charles <Charles.Barmby@lakelandgov.net>; Conrad, Gene <Gene.Conrad@lakelandgov.net>; Travis, Nicole <Nicole.Travis@lakelandgov.net>
Cc: Stovall, Jennifer (City Hall) <Jennifer.Stovall@lakelandgov.net>
Subject: RE: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Is there a concept B that rotates the new sort building 90 degrees to form an L-shaped footprint with the Phase I building to allow the additional parking and truck court to shift south and west, away from Drane Field and to allow cross docks oriented east to west on the north end of the new sort building?

Teresa Maio
Planning and Housing Manager
Community and Economic Development
City of Lakeland

From: Willey, Jason
Sent: Tuesday, July 14, 2020 2:25 PM
To: Barmby, Charles <Charles.Barmby@lakelandgov.net>; Conrad, Gene <Gene.Conrad@lakelandgov.net>; Travis, Nicole <Nicole.Travis@lakelandgov.net>
Cc: Maio, Teresa <Teresa.Maio@lakelandgov.net>; Stovall, Jennifer (City Hall) <Jennifer.Stovall@lakelandgov.net>
Subject: RE: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Thanks Chuck, at this time I think we can hold off on DRT in the short-term. The attachment is related to the Environmental Assessment (EA) that AECOM is completing for the Airport. Based on the previous project and the current EA, construction on phase II could still be 1 to 2 years away. In short, the tenant would like to keep phase II confidential until a plan to move forward has been developed based on their needs and the EA.

Thanks
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From: Barmby, Charles
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Subject: RE: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Thanks, Gene:

We should run this concept through the DRT—we have a meeting next Wednesday and can add it to the agenda to meet the timeline stated in the letter.

Chuck

From: Conrad, Gene
Sent: Tuesday, July 14, 2020 1:59 PM
To: Travis, Nicole <Nicole.Travis@lakelandgov.net>

Cc: Barmby, Charles <Charles.Barmby@lakelandgov.net>; Maio, Teresa <Teresa.Maio@lakelandgov.net>; Willey, Jason <Jason.Willey@lakelandgov.net>
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Nicole,

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Feel free to send comments to me and I will make sure they are incorporated.

Thank you!

Gene

Eugene B. Conrad III, C.M.
Airport Director
Lakeland Linder International Airport

From: Stovall, Jennifer (City Hall)
Sent: Tuesday, July 14, 2020 1:50 PM
To: Conrad, Gene <Gene.Conrad@lakelandgov.net>; Delgado, Tony <Anthony.Delgado@lakelandgov.net>
Cc: Sherrouse, Shawn <Shawn.Sherrouse@lakelandgov.net>; Willey, Jason <Jason.Willey@lakelandgov.net>
Subject: Written Comments Requested ~Letter from AECOM re EA Phase II Air Cargo Dev @ LLIA

Hi Gene,

Tony received the attached letter today. Are you preparing a response?

Thanks!

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Florida's Crossroads of Opportunity

Board of County Commissioners

330 West Church Street
PO Box 9005 • Drawer GM01
Bartow, Florida 33831-9005

POLK COUNTY

PHONE: 863-534-6467
FAX: 863-534-6543
www.polk-county.net

OFFICE OF PLANNING AND DEVELOPMENT

August 11, 2020

Paul K. Sanford
AECOM
7650 W. Courtney Campbell Causeway
Tampa, FL 33607
Sent Via Email: paul.sanford@aecom.com

Re: Environmental Assessment for Phase II Air Cargo Development at Lakeland Linder International Airport (LAL), Polk County, Florida

Dear Mr. Sanford,

Thank you for the opportunity to provide comment on the proposed Phase II Air Cargo Development at Lakeland Linder Airport. Since this property is within the City of Lakeland's jurisdiction, the County's primary area of regulatory authority is the review and approval of connection(s) or improvements to any county road facilities.

In this case, the proposed use will gain primary access to Drane Field Road by way of Kidron and Kelvin Howard Roads, both of which are city-maintain roads. Any connections or improvements associated with this development should be submitted to the County, accompanied by a major traffic study. Without fully understanding the proposed impacts to Drane Field Road and other nearby county roads, it is difficult for our staff to comment on any traffic-related impacts.

Drane Field Road is a county-maintained urban collector from County Line Road to SR 572 (Airport Road). The remainder of Drane Field Road is state-maintained. Over 60 percent of road frontage along the county-maintained portion of Drane Field Road is located in the city's jurisdiction. Due to the increased traffic from this project and others being approved by the City along this roadway, the County would like to discuss a more equitable ownership arrangement for the westerly segment of Drane Field Road.

Thank you for the opportunity to provide preliminary comments and we look forward to future opportunities to comment as the proposed project is further along. Please contact me at 863-534-6454 or chandrafrederick@polk-county.net with any questions.

Sincerely,

Chandra C. Frederick
Assistant County Manager

Copy: William D. Beasley, County Manager
Tony Delgado, City Manager
Jay Jarvis, Polk County Roads and Drainage Division Director
Heath Frederick, City of Lakeland Public Works Director
Chuck Barmby, Business Development & Transportation Manager, City of Lakeland

APPENDIX A.2

USFWS Consultation

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, FL 32960-3559
Phone: (772) 562-3909 Fax: (772) 562-4288
http://fws.gov/verobeach

In Reply Refer To: May 08, 2020
Consultation Code: 04EF2000-2020-SLI-0368
Event Code: 04EF2000-2020-E-02220
Project Name: Phase II Air Cargo Facility Development EA at LAL

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, FL 32960-3559
(772) 562-3909

Project Summary

Consultation Code: 04EF2000-2020-SLI-0368

Event Code: 04EF2000-2020-E-02220

Project Name: Phase II Air Cargo Facility Development EA at LAL

Project Type: TRANSPORTATION

Project Description: Phase II Air Cargo Facility Development EA at LAL

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/27.993463489938144N82.03855443416727W

Counties: Polk, FL

Endangered Species Act Species

There is a total of 33 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Florida Panther *Puma (=Felis) concolor coryi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1763 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/8/office/41420.pdf	Endangered
Puma (=mountain Lion) *Puma (=Felis) concolor (all subsp. except coryi)* Population: FL No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6049	Similarity of Appearance (Threatened)

Birds

NAME	STATUS
Audubon's Crested Caracara *Polyborus plancus audubonii* Population: FL pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8250	Threatened
Everglade Snail Kite *Rostrhamus sociabilis plumbeus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7713 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/1221/office/41420.pdf	Endangered
Florida Grasshopper Sparrow *Ammodramus savannarum floridanus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/32	Endangered
Florida Scrub-jay *Aphelocoma coerulescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6174	Threatened
Ivory-billed Woodpecker *Campephilus principalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8230	Endangered
Whooping Crane *Grus americana* Population: U.S.A. (CO, ID, FL, NM, UT, and the western half of Wyoming) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential
Wood Stork *Mycteria americana* Population: AL, FL, GA, MS, NC, SC No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8477 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/124/office/41420.pdf	Threatened

Reptiles

NAME	STATUS
American Alligator *Alligator mississippiensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/776	Similarity of Appearance (Threatened)
Bluetail Mole Skink *Eumeces egregius lividus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2203 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/178/office/41420.pdf	Threatened
Eastern Indigo Snake *Drymarchon corais couperi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened
Sand Skink *Neoseps reynoldsi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4094 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/179/office/41420.pdf	Threatened

Flowering Plants

NAME	STATUS
Avon Park Harebells *Crotalaria avonensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7093	Endangered
Britton's Beargrass *Nolina brittoniana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4460	Endangered
Carter's Mustard *Warea carteri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5583	Endangered
Florida Bonamia *Bonamia grandiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2230	Threatened
Florida Ziziphus *Ziziphus celata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2950	Endangered
Highlands Scrub Hypericum *Hypericum cumulicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2940	Endangered
Lewton's Polygala *Polygala lewtonii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6688	Endangered
Papery Whitlow-wort *Paronychia chartacea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1465	Threatened
Pigeon Wings *Clitoria fragrans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/991	Threatened
Pygmy Fringe-tree *Chionanthus pygmaeus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1084	Endangered
Sandlace *Polygonella myriophylla* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5745	Endangered
Scrub Blazingstar *Liatris ohlingerae* No critical habitat has been designated for this species.	Endangered

NAME	STATUS
Species profile: https://ecos.fws.gov/ecp/species/864	
Scrub Buckwheat *Eriogonum longifolium var. gnaphalifolium* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5940	Threatened
Scrub Lupine *Lupinus aridorum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/736	Endangered
Scrub Mint *Dicerandra frutescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/799	Endangered
Scrub Plum *Prunus geniculata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2238	Endangered
Short-leaved Rosemary *Conradina brevifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2929	Endangered
Wide-leaf Warea *Warea amplexifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/412	Endangered
Wireweed *Polygonella basiramia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1718	Endangered

Lichens

NAME	STATUS
Florida Perforate Cladonia *Cladonia perforata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7516	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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From: Sanford, Paul
Sent: Friday, June 12, 2020 9:52 AM
To: Norman, Tia
Subject: FW: Proposed Air Cargo Facility Expansion, Lakeland Linder International Airport - Request for Consultation
Attachments: 200513_LAL Air Cargo EA_Biological Assessment.pdf; LAL Amazon PH2 Expansion - USFWS Letter 6-10-20.pdf

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From: Green, Peter M (FAA) <peter.m.green@faa.gov>
Sent: Wednesday, June 10, 2020 1:55 PM
To: verobeach@fws.gov
Cc: 'Conrad, Gene' <Gene.Conrad@lakelandgov.net>; Sanford, Paul <paul.sanford@aecom.com>
Subject: [EXTERNAL] Proposed Air Cargo Facility Expansion, Lakeland Linder International Airport - Request for Consultation

Dear Mr. Wrublik,

The City of Lakeland has requested approval from the Federal Aviation Administration to expand an air cargo facility at the Lakeland-Linder International Airport. The attached letter serves as FAA's request to initiate Section 7 consultation with the US Fish and Wildlife Service. I am also forwarding a copy of the Biological Assessment that was prepared for the project.

Let me know if you have any questions about the proposed project, the Biological Assessment, or FAA's determinations.

Regards,

Peter Green

Peter M. Green, AICP
Environmental Protection Specialist
Orlando Airports District Office
Federal Aviation Administration
8427 SouthPark Circle
Orlando, Florida 32819
407-487-7296
peter.m.green@faa.gov

U.S. Department
of Transportation
Federal Aviation Administration

Orlando Airports District Office
8427 SouthPark Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7720
Fax: (407) 487-7135

June 10, 2020

[via email: verobeach@fws.gov.]

Mr. John M. Wrublik
South Florida Ecological Services Office
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960-3559

RE: Section 7 Consultation
Phase II Air Cargo Development
Lakeland-Linder International Airport (Polk County, Florida)

Dear Mr. Wrublik,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals. These federal actions are subject to provisions found in the *Endangered Species Act* (ESA). The actions are also subject to the *National Environmental Policy Act* (NEPA) and an Environmental Assessment is currently being prepared to meet FAA's obligations under NEPA.

The purpose of this letter is to initiate informal consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the ESA and its implementing regulations at 50 CFR Part 402. The enclosed Biological Assessment provides additional project information and evaluates the project's effect on special status fish, wildlife, and plant species.

Project Information

All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays; Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;

- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The air cargo facility expansion will be designed to accommodate Boeing 767 and 737 cargo aircraft. The Phase II Cargo Development project is expected to generate 16 additional aircraft operations[1] per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Species Evaluation

The proposed action has been reviewed for its effects on federally-listed threatened and endangered species, and designated critical habitat. Based on the analysis contained in the attached Biological Assessment (BA), FAA has determined that the Eastern indigo snake (*Drymarchon corais couperi*), Florida scrub jay (*Aphelocoma coerulescens*), Wood stork (*Mycteria americana*), Audubon's crested caracara (*Polyborus plancus audubonii*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*) occur or has the potential to occur in the vicinity of the airport and project site.

The Action Area for the project is 70.3 acres in size. As described in the BA, approximately 42 acres of upland habitat is located within the action area. Most of this upland is cleared and maintained as grassed field. In addition, 28 acres of wetland habitat and 0.3-acre of Other Surface Waters are located in the action area. The Action Area contains no Critical Habitat. The BA identifies species-specific avoidance, minimization, and compensation measures. The proposed wetland habitat impacts would be mitigated through the purchase of mitigation credits from the Alafia River Mitigation Bank. Prior to construction, the City will re-survey the project site for crested caracara nests and bald eagle nests. The City will also implement Standard Protection Measures for the Eastern indigo snake.

After reviewing the status of the affected species, the effects of the Proposed Action, and the proposed conservation measures to avoid, minimize, and compensate for effects to listed species, the FAA has determined that the project would not affect the Florida scrub jay. Audubon's crested caracara, and the Everglade snail kite. The FAA has also determined the project may affect, but is not likely to adversely affect, the Eastern indigo snake and wood stork.

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[1] An aircraft operation is defined as one aircraft takeoff or one landing. An aircraft that visits an airport generates two operations.

Request for Concurrence

FAA appreciates USFWS's review of the proposed action and the Biological Assessment. Please let us know if the USFWS concurs with our effect determinations listed above.

If you have any questions or would like to discuss the project, you can reach me at peter.m.green@faa.gov or (407) 487-7296.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist

Enclosure

cc. Mr. Gene Conrad, City of Lakeland

Green, Peter M (FAA)

From: Green, Peter M (FAA)
Sent: Thursday, September 17, 2020 10:12 AM
To: Wrublik, John
Subject: RE: Lakeland-Linder International Airport Cargo Development
Attachments: 200901_LAL EA_Response to FWS RAI_rev0.pdf

Good morning John,

Attached is a copy of the consultant's report on the functional assessment of wood stork foraging habitat and proposed mitigation at the Alafia River Mitigation Bank.

Let me know if you have any questions or need additional information.

Regards,

Peter

From: Wrublik, John <john_wrublik@fws.gov>
Sent: Thursday, June 18, 2020 10:09 AM
To: Green, Peter M (FAA) <peter.m.green@faa.gov>
Subject: Lakeland-Linder International Airport Cargo Development

Peter,

Thank you for your consultation request for the project referenced above dated June 10, 2020. I currently don't have enough information to initiate informal consultation for the project. Please have the applicant's consultant provide me with the following:

A report providing the results of a functional assessment of the wood stork foraging habitat (i.e., wetlands) to be lost due to the project and the wood stork foraging habitat (wetlands) to be provided as compensation for the project. The assessment should follow the Service's wood stork foraging assessment methodology found at: https://www.fws.gov/verobeach/BirdsPDFs/20120712_WOST%20Forage%20Assessment%20Methodology_Appendix.pdf

> Wood Stork Foraging Habitat Assessment Methodology July 12, 2012
>
> Wood Stork Foraging Habitat Assessment Methodology (July 12, 2012) Page 3 Parameter 2 – Wetland Hydroperiod Hydroperiod: The hydroperiod of a wetland can affect the density of wood stork prey species. For example, studies of Everglades fish populations using a variety of quantitative sampling
>
> www.fws.gov

In addition, I noticed that the Federal Aviation Administration (FAA) determined that the project may affect, but is not likely to adversely affect the Eastern indigo snake. The Service notes that we do not have records of Eastern indigo snakes occurring on or near the project site, and sightings of this species on the project site have not been reported. As such, the Service finds that this species is not reasonably certain to occur on the project site. I recommend that the FAA change its determination for the the Eastern indigo snake from may affect, not likely to adversely affect to no effect. If this acceptable to the FAA, you can let me know by return email. If you have any questions, please let me know.

regards John

AECOM
7650 West Courtney Campbell Causeway
Tampa, Florida 33607
www.aecom.com
813-286-1711 tel

Memorandum

To	Peter Green, FAA Orlando Airports District Office	Page	1
CC	Paul Sanford, AECOM		
Subject	Response to Request for Additional Information for the Phase II Air Cargo Facility Development at Lakeland Linder International Airport Biological Assessment Consultation\ Consultation Code: 04EF2000-2020-SLI-0368		
From	Tia Norman, AECOM		
Date	September 1, 2020		

Introduction

On June 10, 2020, the Federal Aviation Administration (FAA) submitted a Biological Assessment (BA) for the Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL) Environmental Assessment (EA) to the U.S. Fish and Wildlife Service (USFWS), South Florida Field Office for review and requested USFWS' concurrence with the effects determinations.

On June 18, 2020, the USFWS responded to the BA with a Request for Additional Information via email that stated the following:

A report providing the results of a functional assessment of the wood stork foraging habitat (i.e., wetlands) to be lost due to the project and the wood stork foraging habitat (wetlands) to be provided as compensation for the project. The assessment should follow the Service's wood stork foraging assessment methodology found at: https://www.fws.gov/verobeach/BirdsPDFs/20120712_WOST%20Forage%20Assessment%20Methodology_Appendix.pdf.

As mentioned in the BA and based on USFWS data, the Biological Study Area (BSA) established for the EA is located within the 18.6-mile radius core foraging area (CFA) of three active wood stork nesting colonies, (see Figure 5-1 of the BA). Based on the 2013 Wildlife Hazard Assessment conducted at LAL, wood storks have been observed foraging within herbaceous wetlands and other surface waters on Airport property. In order to make a determination of the Proposed Project's potential effect on the wood stork, the construction impacts were assessed using USFWS' *Wood Stork Effect Determination Key* (May 2010). Using this key, the following steps were followed to determine the effect of the Proposed Project on the wood stork:

A. A review of FNAI and USFWS information indicates that the Proposed Project is located more than 2,500 feet from an active wood stork colony site. The nearest active wood stork colony is located approximately four miles northeast of the BSA.
B. The Proposed Project will impact more than 0.5 acre of suitable foraging habitat (SFH).
C. The Proposed Projet is located within the CFA of three active wood stork nesting colonies. The nearest active wood stork colony is located approximately four miles northeast of the BSA.
D. Impacts to SFH have been avoided and minimized to the extent practicable; compensation (FWS-approved mitigation bank or as provided in accordance with Mitigation Rule 33 CFR Part 332) for unavoidable impacts is proposed in accordance with the CWA section 404(b)(1)

guidelines; and habitat compensation replaces the foraging value matching the hydroperiod of the wetlands affected and provides foraging value similar to, or higher than, that of impacted wetlands.

Based on this assessment, it was determined that the Proposed Project "may affect, but is not likely to adversely affect" the wood stork.

In an effort to gather the information needed for USFWS to initiate Section 7 Consultation, a Wood Stork Foraging Analysis has been prepared per the USFWS-approved "Wood Stork Foraging Habitat Assessment Methodology" dated July 12, 2012 (herein referred to as the "Methodology". The following sections outline the methodology and calculation of prey-base analysis, the assessment of loss of suitable foraging biomass, and potential mitigation alternatives. The goal of the exercise was to determine the amount of compensation required to offset the loss of suitable wood stork foraging habitat associated with the Proposed Project.

Foraging Assessment Methodology

Wood stork foraging biomass calculations were conducted for all wetlands impacted by the Proposed Project that can be considered potential wood stork foraging habitat. The Proposed Project will result in a total of 23.7 acres of impact to potential wood stork foraging habitat. **Table 1** below lists the acreage of proposed impact, by wetland number and classification, to suitable wood stork foraging habitat within the BSA. The locations of individual wetlands are depicted on Figure 3-1 in the BA.

Table 1: Proposed Impacts to Suitable Wood Stork Foraging Habitat

ID	FLUCFCS Code[1]	USFWS Classification[2]	Acres of Impacts
Wetlands			
WL 1	630	PFO1/3C	1.2
WL 2	631	PFO1/2C	9.9
WL 2	621	PFO2C	1.4
WL 6	631	PFO1/2C	11.2
		Total	**23.7**

[1] Florida Department of Transportation (FDOT), Florida Land Use, Cover and Forms Classification System (FLUCFCS) Handbook, 3rd Edition (FDOT, 1999).
[2] FWS, Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al., 1979).
Notes: PFO2C = palustrine, forested, needle-leaved deciduous, seasonally flooded; PFO1/3C = palustrine, forested, broad-leaved deciduous/needle-leaved evergreen, seasonally flooded; PFO1/2C = palustrine, forested, needle-leaved/broad-leaved deciduous, seasonally flooded

Wetlands were evaluated based on four parameters in accordance with the Methodology: the density of the vegetation within suitable wood stork foraging habitat, the hydroperiod of each impacted wetland, the size of available prey, and potential competition from other wading bird species.

To calculate the wood stork foraging biomass potentially lost as a result of the Proposed Project, each impacted wetland was assigned an appropriate hydroperiod class based on data collected during field reviews. Hydroperiod classes range from Class 1, which includes inundation for 0-60 days, to Class 7, which includes inundation for 330-365 days per year. The FWS defines wetlands that are inundated for 0 to 180 days per year as having a "short hydroperiod" and includes Classes 1 through 3. Wetlands inundated for 180 days to 360 days per year are considered as having a "long hydroperiod" and include Classes 4 through 7 (as provided in Parameter 2- Wetland Hydroperiod of the Methodology). All wetlands included in the foraging analysis for the Proposed Project have short hydroperiods (between Class 1 and Class 3). The hydroperiod class table is found in Table WSM 4 of the Methodology. **Table 2** below lists the hydroperiod class and length, the total acres of proposed impact, and the percent cover of nuisance/exotic vegetation (i.e. melaleuca or Brazilian pepper) for each wetland, by number and Florida Land Use, Cover and Forms Classification System (FLUCFCS) (FDOT 1999) category, included in the foraging analysis.

Table 2: Summary of Hydroperiod Class and Percent Cover by Exotic Species

Wetland ID & FLUCFCS Classifications		Total Direct Impact Area (acres)	Hydroperiod Class[1]	Percent Cover of Nuisance/Exotic Vegetation	Length of Hydroperiod[2]
WL 1	630	1.2	1	0-25	Short
WL 2	621/631	11.3	1	0-25	Short
WL 6	631	11.2	1	0-25	Short
Total		**23.7**			

[1] As defined by the FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012 (Table WSM 4).
[2] As defined by the FWS in the Wood stork Foraging Habitat Assessment Methodology, *Parameter 2- Wetland Hydroperiod*, Page 3.

Prior to conducting biomass calculations, the acreage of impact to each wetland was converted to square meters (m^2). The conversion of 23.7 acres of total direct impact to wetlands equates to 95,910.5 m^2. This information is summarized below in **Table 3**.

The total biomass per hydroperiod class was established using Table WSM 11 in the Methodology. Each wetland was assigned a total biomass number based on class according to Table WSM 11. Using Table WSM 3 from the Methodology, each wetland was assigned a Wood Stork Foraging Suitability Index ranging from 1.00 for exotic coverage between 0-25 percent cover and 0.64 for exotic coverage between 26-50 percent. The forage biomass loss for each class is provided in **Table 4** below.

Table 3: Summary by Hydroperiod Class

Hydroperiod Class[1]	Total Direct Impact Area (acres)	Total Direct Impact Area (m^2)[2]	Average Percent Nuisance/Exotic Vegetation
Class 1	23.7	95,910.5	0.0

[1] As defined by the FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012 (Table WSM 4).
[2] Acres converted to m^2 as stated in the Summary of the factors affecting vulnerability of wetland habitats to wood stork foraging in the action area, FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012.

Table 4: Forage Biomass Lost by Class and Hydroperiod

Hydroperiod Class[1]	Area (m^2)	Foraging Suitability Index	Total Biomass	Forage Biomass Lost (Kilograms)[2]
Class 1	95,910.5	1.00	0.1008 gram/m^2	9.67
			Total Biomass Lost	**9.67**

[1] As defined by the FWS Wood Stork Foraging Habitat Methodology dated July 12, 2012.
[2] Calculations based on total direct impact area (m^2) multiplied by the total biomass hydroperiod and the exotic suitability foraging index. The total was divided by 1000 to convert to kilograms. As defined by the FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012.

According to Kahl's estimate (1964), 201 kg of forage is required for a successful wood stork nest. Because this project shows a total biomass loss of 9.67 kilograms, the calculation represents the loss of 0.05 nest. **Table 5** summarizes the anticipated wood stork forage biomass lost as a result of the Proposed Project.

Conclusion

The June 2020 BA concluded that the Proposed Project "may affect, but is not likely to adversely affect" the wood stork; to compensate for the loss of wood stork foraging habitat, the City is committed to purchasing USFWS-approved wood stork credits from a mitigation bank that, at a minimum, offset 9.67 kilograms of short hydroperiod forage biomass losses. The Alafia River Mitigation Bank (ARMB) services the Alafia River watershed and provides forested wetland mitigation credits. ARMB is a 468-acre site located north of Lithia Springs in Hillsborough County. Forested wetland mitigation credits at ARMB were approved by SWFWMD in May 2017 and by USACE in April 2018. Mitigation bank credits at ARMB can be used to offset impacts to wood stork foraging habitat. At ARMB, the conversion factor for the short hydroperiod is 10.2 kilograms per credit. Therefore, to compensate for the loss of 9.67 kilograms of short hydroperiod forage biomass, approximately 0.95 wetland credits would be required. For the preparation of the EA for the Project Project, wetland impacts were assessed using the Uniform Mitigation Assessment Methodology (UMAM), Chapter 62-345, Florida Administrative Code. Based on the UMAM analyses performed, construction of the Proposed Project will result in the functional loss of approximately 10.9 credits (includes permanent and secondary wetland impacts). The City has already reserved and/or purchased approximately 10.1 federal/state wetland credits from the ARMB for wetland impacts resulting from the Proposed Project and is coordinating with ARMB to acquire an additional 1.5 wetland credits. Therefore, it is anticipated that prior to construction of the Proposed Project, the City will have purchased approximately 11.6 federal/state wetland credits from the ARMB to offset the loss of 23.7 acres (10.9 units) of wetland function with approximately 0.7 wetland credit in excess for potential future impacts to wetland functions at LAL.

Pursuant to the 2010 *USFWS Wood Stork Effect Determination Key* the Proposed Project is not located within 2,500 feet (0.47 mile) of an active nesting wood stork colony, and suitable foraging habitat will be compensated in accordance with Section 404(b) of the Clean Water Act and the USFWS *Habitat Management Guidelines for the Wood Stork in the Southeast Region* through purchase of federal credits at a Service-approved mitigation bank. Additionally, the wetland habitats associated the proposed habitat compensation plan will provide equal foraging value to that of the impacted wetlands. Based on this information, it has been determined that the previous finding of "may affect, but is not likely to adversely affect" regarding the wood stork remains valid for the Proposed Project.

Table 5: Summary of Wood Stork Forage Biomass Lost

Wetland ID & FLUCFCS Classifications		Total Direct Impact Area (acres)	Hydroperiod Class[1]	Total Direct Impact Area (m^2)[2]	Percent Cover by Exotic Species	Total Biomass per Hydroperiod (grams/m^2)[3]	Exotic Foraging Suitability Index[4]	Forage Biomass Lost (Kilograms)[5]	Length of Hydroperiod[6]
WL 1	630	1.2	1	4,856.2	0	0.1008	1.00	0.49	Short
WL 2	621/631	11.3	1	45,729.5	0	0.1008	1.00	4.61	Short
WL 6	631	11.2	1	45,324.8	0	0.1008	1.00	4.57	Short
Project Total		**23.7**		**95,910.5**				**9.67**	

[1] As defined by the FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012. (Table WSM 4).
[2] Acres converted to m^2 as stated in the summary of the factors affecting vulnerability of wetland habitats to wood stork foraging in the action area, FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012.
[3] Total Fish and Crayfish Biomass per period as per Table WSM 11, FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012.
[4] Exotic Foraging Suitability Index per Table WSM 3, FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012.
[5] Calculations based on total direct impact area (m^2) multiplied by the total biomass hydroperiod and the exotic suitability foraging index. The total was divided by 1000 to convert to kilograms, as defined by the FWS Wood Stork Foraging Habitat Assessment Methodology dated July 12, 2012.
[6] As defined by the FWS in the Wood stork Foraging Habitat Assessment Methodology, *Parameter 2- Wetland Hydroperiod,* Page 3.

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U.S. Department of Transportation
Federal Aviation Administration

Orlando Airports District Office
8427 SouthPark Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7720
Fax: (407) 487-7135

U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960
772-562-3909 Fax 772-562-4288

FWS Log No. 04EF2000-2020-I-0853

The U.S. Fish and Wildlife Service has reviewed the information provided and finds that the proposed action is not likely to adversely affect any federally listed species or designated critical habitat protected by the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et. seq.). A record of this consultation is on file at the South Florida Ecological Service Office.

This fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

Roxanna Hinzman, Field Supervisor 9/23/2020 Date

June 10, 2020

Mr. John M. Wrublik
South Florida Ecological Services Office
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960-3559

RE: Section 7 Consultation
Phase II Air Cargo Development
Lakeland-Linder International Airport (P

Dear Mr. Wrublik,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals. These federal actions are subject to provisions found in the *Endangered Species Act* (ESA). The actions are also subject to the *National Environmental Policy Act* (NEPA) and an Environmental Assessment is currently being prepared to meet FAA's obligations under NEPA.

The purpose of this letter is to initiate informal consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the ESA and its implementing regulations at 50 CFR Part 402. The enclosed Biological Assessment provides additional project information and evaluates the project's effect on special status fish, wildlife, and plant species.

Project Information

All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays; Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;

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APPENDIX A.3

SHPO Consultation

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

May 6, 2020

[Via email - CompliancePermits@DOS.MyFlorida.com]

Timothy A. Parsons, Ph.D.
Director, Division of Historical Resources
and State Historic Preservation Officer
R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399

RE: Section 106 Consultation and Area of Potential Effect
Phase II Air Cargo Development
Lakeland-Linder International Airport (Polk County, Florida)

Dear Dr. Parsons,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals.

The proposed project constitute an "undertaking" subject to the *National Historic Preservation Act* (Section 106) and its implementing regulations at 36 CFR Part 800. This letter is intended to initiate consultation and seek concurrence on the undertaking's proposed Area of Potential Effect (APE). The project also requires the preparation of an Environmental Assessment (EA) in accordance with the *National Environmental Policy Act*. The EA is being prepared separately from, but concurrent with, this consultation process.

Proposed Undertaking

The proposed project is described below and depicted on the enclosed **Figure 1**. The project site is approximately 60 acres in size. All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;

- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to accommodate Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 16 additional aircraft operations[1] per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Proposed Area of Potential Effect

The construction and operations of the proposed facility was reviewed to identify an appropriate APE for the evaluation of potential impacts on historic, archaeological, and cultural resources. Based on a review of the proposed project, the Direct Effects portion of the APE includes the areas where ground disturbance is expected to occur. The Direct Effects APE is depicted on **Figure 1**.

The Indirect Effects APE was delineated to include the area likely to be exposed, and newly exposed, to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.[2] The extent of the APE is also considered appropriate for the evaluation of other effects, such as those associated with air emissions and visual effects. The Indirect Effects APE is depicted on **Figure 2**.

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1 An aircraft operation is defined as one aircraft takeoff or one landing. An aircraft that visits an airport generates two operations.

2 The Day-Night Average Sound Level (DNL) represents aircraft sound levels averaged over a 24-hour period, with penalties to account for the increased sensitivity to noise events that occur at night.

Pursuant to Title 36 CFR Section 800.4, Identification of Historic Properties, the FAA is seeking comments on the proposed APE for this undertaking. If possible, please let us know within 15 days of receipt of this letter indicating if you concur with the APE as defined. Please direct correspondence and questions to me at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist

Enclosures (2)

Copy: Mr. Gene Conrad, Lakeland-Linder International Airport
Mr. Paul Sanford, AECOM

The Florida State Historic Preservation Officer ☐ concurs/☐ does not concur with the APE proposed in this letter for SHPO/FDHR Project File Number ____________________.
Comments:
Timothy A. Parsons, Ph.D., Director, and State Historic Preservation Officer Florida Division of Historical Resources   Date: ____________________

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

October 20, 2020

[Via email - CompliancePermits@DOS.MyFlorida.com]

Timothy A. Parsons, Ph.D.
Director, Division of Historical Resources
and State Historic Preservation Officer
R.A. Gray Building
500 South Bronough Street
Tallahassee, Florida 32399

RE: Determination of Effect
Phase II Air Cargo Development
Lakeland-Linder International Airport (Polk County, Florida)

Dear Dr. Parsons,

As part of the Federal Aviation Administration's (FAA's) Section 106 review, and pursuant to 36 CFR §800.4, the FAA has undertaken identification efforts for the Phase 2 Air Cargo Development project at the Lakeland-Linder International Airport (LAL). Based on the results of these efforts the FAA has determined a finding of no effect is appropriate for this undertaking.

Proposed Undertaking and Area of Potential Effect

As described in our letter dated May 6, 2020, the City of Lakeland requested approval from the FAA to expand an air cargo facility at LAL. The existing facility and the proposed Phase II expansion will be operated as an air cargo sorting and distribution facility. The facility expansion project includes the construction of additional warehouse space, office space, aircraft parking apron, truck courts, vehicle parking spaces, and support buildings. The Area of Potential Effects (APE) described in the letter as having two components: 1) areas where ground disturbance and construction activities would occur and 2) a broader area likely to be exposed, and newly exposed, to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.

Tribal Consultation

The FAA initiated Section 106 consultation with the following Native American tribes: Miccosukee Tribe of Indians of Florida, Muscogee (Creek) Nation, Poarch Band of Creek Indians, Seminole Nation of Oklahoma, and the Seminole Tribe of Florida. Of those tribes the

Seminole Tribe of Florida and the Muscogee (Creek) Nation expressed interest in participating in consultation. The other tribes did not respond to the FAA's correspondence. All project documentation and this determination of effect letter will be provided to those tribes participating in the consultation.

Identification Efforts

A review of available literature, maps, and information was conducted to identify recorded resources and understand the history and environment of land within the APE. This research was followed by a pedestrian surface inspection and a subsurface survey (shovel testing) to identify potentially significant archaeological, cultural, and historical resources within direct effects portion of the APE. The effort also identified any structures over 50 years in age within the indirect effects portion of the APE. For your review, the results of the research and surveys are contained in the Phase IB Cultural Resource Assessment Survey[1] report enclosed with this letter.

Historic Properties in the APE

A majority of the Direct Effects portion of the APE is comprised of previously disturbed land associated with the airfield and land routinely used for construction staging. The Direct Effects APE also includes several large wetlands. Shovel tests showed no observable natural soil stratigraphy as past development and activities have greatly impacted the area. No historic cultural materials were recovered from the shovel tests.

No resources within the APE are listed in the National Register of Historic Places. Resources within the APE which were, or may have been, built 50 or more years ago were located, researched, and assessed. Eleven resource groups located on- and off-airport were identified for evaluation. The structures were evaluated against National Register eligibility criteria. The evaluation indicated that the Aaron E. and Maude Morgan House and the English Family House are each potentially eligible for listing for listing in the National Register under Criterion C. Neither of these properties would be affected by project construction. Additionally, the properties are well outside of existing and future DNL 65 airport noise contours and are distant from the airport viewshed.

Based on the results of surveys, no further archaeological work was recommended. No historic properties would be affected by the Proposed Project.

Finding of Effect

Based on the results of the studies and an assessment of effects on historic properties, the FAA has determined that this undertaking will have no effect on historic properties. Please review this finding and the enclosed documentation and provide either your concurrence or non-concurrence within 30 days.

[1] *Phase IB Cultural Resources Assessment Survey for Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL)*. AECOM. September 2020.

The documentation provided herein meets the regulatory standard for documenting this effect determination. If you have questions or concerns regarding this finding or the sufficiency of documentation, please contact me at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist

Enclosure

Copy: Mr. Gene Conrad, Lakeland-Linder International Airport
Mr. Paul Sanford, AECOM

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RON DESANTIS
Governor

LAUREL M. LEE
Secretary of State

Peter M. Green
Environmental Protection Specialist
Orlando Airports District Office
Federal Aviation Administration
8427 SouthPark Circle
Orlando, Florida 32819

February 19, 2021

RE: DHR Project File No.: 2020-2420
Determination of Effect, Phase II Air Cargo Development, Lakeland-Linder International Airport (Polk County, Florida), Phase IB Cultural Resources Assessment Survey

Dear Mr. Green:

Our office received and reviewed the above referenced project for possible effects on historic properties listed, or eligible for listing, on the *National Register of Historic Places* (NRHP). The review was conducted in accordance with Section 106 of the *National Historic Preservation Act of 1966*, as amended, and its implementing regulations in *36 CFR Part 800: Protection of Historic Properties*.

In September 2020, AECOM conducted the above referenced cultural resources assessment survey (CRAS) on behalf of the Federal Aviation Administration (FAA) in compliance with requirements for Section 106. AECOM identified no archaeological resources and fifteen historic structure. AECOM recommended two structures as eligible for listing in the NRHP, the Aaron E. and Maude Morgan House (PO8453) and the English Family House (PO8454). AECOM recommended no further work in the APE and stated that the project house have no effect to historic properties.

Based on the results of the survey as well as previous surveys in the vicinity, the FAA determined that the undertaking will have no effect to historic properties. Our office concurs with the FAA's determination of no effect and we find the submitted report to be complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code*.

If you have any questions, please contact me by email at *Jason.Aldridge@dos.myflorida.com* or by telephone at 850-245-6344.

Sincerely,

Jason Aldridge

Jason Aldridge
Deputy State Historic Preservation Officer
for Compliance and Review

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APPENDIX A.4

Tribal Consultation

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

May 6, 2020

[Via email - THPOCompliance@semtribe.com]

Mr. Bradley Mueller
Compliance Review Supervisor
Tribal Historic Preservation Office
Seminole Tribe of Florida
30290 Josie Billie Highway, PMB 1004
Clewiston, Florida 33440

RE: Section 106 Consultation and Area of Potential Effect
Phase II Air Cargo Development
Lakeland –Linder International Airport (Polk County, Florida)

Dear Mr. Mueller,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals.

The proposed project constitute an "undertaking" subject to the *National Historic Preservation Act* (Section 106) and its implementing regulations at 36 CFR Part 800. This letter is intended to initiate consultation and seek concurrence on the undertaking's proposed Area of Potential Effect (APE). The project also requires the preparation of an Environmental Assessment (EA) in accordance with the *National Environmental Policy Act*. The EA is being prepared separately from, but concurrent with, this consultation process.

Proposed Undertaking

The Proposed Undertaking is described below and depicted on the enclosed Figure 1. The project site is approximately 60 acres in size. All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;

- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to accommodate Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 16 additional aircraft operations[1] per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Proposed Area of Potential Effect

The construction and operations of the proposed facility was reviewed to identify an appropriate APE for the evaluation of potential impacts on historic, archaeological, and cultural resources. Based on a review of the proposed project, the Direct Effects portion of the APE includes the areas where ground disturbance is anticipated to take place. The Direct Effects APE is depicted on Figure 1.

The Indirect Effects APE was delineated to include the area likely to be exposed to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.[2] The extent of the APE is also considered appropriate for the evaluation of other effects, such as those associated with air emissions. The Indirect Effects APE is depicted on Figure 2.

The FAA has identified your tribe as potentially having an interest in the project area. Pursuant to 36 CFR § 800.2(c)(2)(B)(ii), the FAA is seeking input on properties of cultural or religious significance that may be affected by the undertaking, and inviting you to participate in government-to-government consultation in the Section 106 consultation process.

---

[1] An aircraft operation is defined as one aircraft takeoff or one landing. An aircraft that visits an airport generates two operations.

[2] The Day-Night Average Sound Level (DNL) represents aircraft sound levels averaged over a 24-hour period, with penalties to account for the increased sensitivity to noise events that occur at night.

Please contact me within 30 days of the receipt of this letter to confirm your intent to participate in this Section 106 consultation. I can be reached at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist
FAA Orlando Airports District Office

Enclosures (2)

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

May 6, 2020

[Via email - kevind@miccosukeetribe.com]

Mr. Kevin Donaldson
Environmental Specialist
Historic and Cultural Preservation Department
Miccosukee Tribe of Indians of Florida
Tamiami Station
PO Box 440021
Miami, Florida 33144

RE: Section 106 Consultation and Area of Potential Effect
Phase II Air Cargo Development
Lakeland –Linder International Airport (Polk County, Florida)

Dear Mr. Donaldson,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals.

The proposed project constitute an "undertaking" subject to the *National Historic Preservation Act* (Section 106) and its implementing regulations at 36 CFR Part 800. This letter is intended to initiate consultation and seek concurrence on the undertaking's proposed Area of Potential Effect (APE). The project also requires the preparation of an Environmental Assessment (EA) in accordance with the *National Environmental Policy Act*. The EA is being prepared separately from, but concurrent with, this consultation process.

Proposed Undertaking

The Proposed Undertaking is described below and depicted on the enclosed Figure 1. The project site is approximately 60 acres in size. All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;

- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;
- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to accommodate Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 16 additional aircraft operations[1] per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Proposed Area of Potential Effect

The construction and operations of the proposed facility was reviewed to identify an appropriate APE for the evaluation of potential impacts on historic, archaeological, and cultural resources. Based on a review of the proposed project, the Direct Effects portion of the APE includes the areas where ground disturbance is anticipated to take place. The Direct Effects APE is depicted on Figure 1.

The Indirect Effects APE was delineated to include the area likely to be exposed to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.[2] The extent of the APE is also considered appropriate for the evaluation of other effects, such as those associated with air emissions. The Indirect Effects APE is depicted on Figure 2.

The FAA has identified your tribe as potentially having an interest in the project area. Pursuant to 36 CFR § 800.2(c)(2)(B)(ii), the FAA is seeking input on properties of cultural or religious

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[1] An aircraft operation is defined as one aircraft takeoff or one landing. An aircraft that visits an airport generates two operations.

[2] The Day-Night Average Sound Level (DNL) represents aircraft sound levels averaged over a 24-hour period, with penalties to account for the increased sensitivity to noise events that occur at night.

significance that may be affected by the undertaking, and inviting you to participate in government-to-government consultation in the Section 106 consultation process.

Please contact me within 30 days of the receipt of this letter to confirm your intent to participate in this Section 106 consultation. I can be reached at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist
FAA Orlando Airports District Office

Enclosures (2)

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

May 6, 2020

[Via email - section106@mcn-nsn.gov]

Ms. Corrain Loe-Zepeda
Tribal Historic Preservation Officer
Historic and Cultural Preservation Department
Muscogee (Creek) Nation Cultural Preservation
Post Office Box 580
Okmulgee, Oklahoma 74447

RE: Section 106 Consultation and Area of Potential Effect
Phase II Air Cargo Development
Lakeland –Linder International Airport (Polk County, Florida)

Dear Ms. Loe-Zepeda,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals.

The proposed project constitute an "undertaking" subject to the *National Historic Preservation Act* (Section 106) and its implementing regulations at 36 CFR Part 800. This letter is intended to initiate consultation and seek concurrence on the undertaking's proposed Area of Potential Effect (APE). The project also requires the preparation of an Environmental Assessment (EA) in accordance with the *National Environmental Policy Act*. The EA is being prepared separately from, but concurrent with, this consultation process.

Proposed Undertaking

The Proposed Undertaking is described below and depicted on the enclosed Figure 1. The project site is approximately 60 acres in size. All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;

- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
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- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
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- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to accommodate Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 16 additional aircraft operations[1] per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Proposed Area of Potential Effect

The construction and operations of the proposed facility was reviewed to identify an appropriate APE for the evaluation of potential impacts on historic, archaeological, and cultural resources. Based on a review of the proposed project, the Direct Effects portion of the APE includes the areas where ground disturbance is anticipated to take place. The Direct Effects APE is depicted on Figure 1.

The Indirect Effects APE was delineated to include the area likely to be exposed to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.[2] The extent of the APE is also considered appropriate for the evaluation of other effects, such as those associated with air emissions. The Indirect Effects APE is depicted on Figure 2.

The FAA has identified your tribe as potentially having an interest in the project area. Pursuant to 36 CFR § 800.2(c)(2)(B)(ii), the FAA is seeking input on properties of cultural or religious significance that may be affected by the undertaking, and inviting you to participate in government-to-government consultation in the Section 106 consultation process.

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[1] An aircraft operation is defined as one aircraft takeoff or one landing. An aircraft that visits an airport generates two operations.

[2] The Day-Night Average Sound Level (DNL) represents aircraft sound levels averaged over a 24-hour period, with penalties to account for the increased sensitivity to noise events that occur at night.

Please contact me within 30 days of the receipt of this letter to confirm your intent to participate in this Section 106 consultation. I can be reached at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist
FAA Orlando Airports District Office

Enclosures (2)

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

May 6, 2020

[Via email - lhaikey@pci-nsn.gov]

Mr. Larry D. Haikey
Tribal Historic Preservation Officer
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, Alabama 36502

RE: Section 106 Consultation and Area of Potential Effect
Phase II Air Cargo Development
Lakeland –Linder International Airport (Polk County, Florida)

Dear Mr. Haikey,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals.

The proposed project constitute an "undertaking" subject to the *National Historic Preservation Act* (Section 106) and its implementing regulations at 36 CFR Part 800. This letter is intended to initiate consultation and seek concurrence on the undertaking's proposed Area of Potential Effect (APE). The project also requires the preparation of an Environmental Assessment (EA) in accordance with the *National Environmental Policy Act*. The EA is being prepared separately from, but concurrent with, this consultation process.

Proposed Undertaking

The Proposed Undertaking is described below and depicted on the enclosed Figure 1. The project site is approximately 60 acres in size. All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;
- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;

- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to accommodate Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 16 additional aircraft operations[1] per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Proposed Area of Potential Effect

The construction and operations of the proposed facility was reviewed to identify an appropriate APE for the evaluation of potential impacts on historic, archaeological, and cultural resources. Based on a review of the proposed project, the Direct Effects portion of the APE includes the areas where ground disturbance is anticipated to take place. The Direct Effects APE is depicted on Figure 1.

The Indirect Effects APE was delineated to include the area likely to be exposed to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.[2] The extent of the APE is also considered appropriate for the evaluation of other effects, such as those associated with air emissions. The Indirect Effects APE is depicted on Figure 2.

The FAA has identified your tribe as potentially having an interest in the project area. Pursuant to 36 CFR § 800.2(c)(2)(B)(ii), the FAA is seeking input on properties of cultural or religious significance that may be affected by the undertaking, and inviting you to participate in government-to-government consultation in the Section 106 consultation process.

[1] An aircraft operation is defined as one aircraft takeoff or one landing. An aircraft that visits an airport generates two operations.

[2] The Day-Night Average Sound Level (DNL) represents aircraft sound levels averaged over a 24-hour period, with penalties to account for the increased sensitivity to noise events that occur at night.

Please contact me within 30 days of the receipt of this letter to confirm your intent to participate in this Section 106 consultation. I can be reached at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist
FAA Orlando Airports District Office

Enclosures (2)

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

May 6, 2020

[Via email - leader.bs@sno-nsn.gov]

Brigita Leader, MS
Interim Director/TCNS Coordinator
Historic Preservation Office
Seminole Nation of Oklahoma
Post Office Box 1498
Wewoka, Oklahoma 74884

RE: Section 106 Consultation and Area of Potential Effect
Phase II Air Cargo Development
Lakeland –Linder International Airport (Polk County, Florida)

Dear Ms. Leader,

The City of Lakeland, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to expand an air cargo facility at the Lakeland-Linder International Airport (LAL). The existing facility and the proposed Phase II expansion will be operated by Amazon Air as an air cargo sorting and distribution facility. The proposed project, which is described below, requires FAA actions and approvals.

The proposed project constitute an "undertaking" subject to the *National Historic Preservation Act* (Section 106) and its implementing regulations at 36 CFR Part 800. This letter is intended to initiate consultation and seek concurrence on the undertaking's proposed Area of Potential Effect (APE). The project also requires the preparation of an Environmental Assessment (EA) in accordance with the *National Environmental Policy Act*. The EA is being prepared separately from, but concurrent with, this consultation process.

Proposed Undertaking

The Proposed Undertaking is described below and depicted on the enclosed Figure 1. The project site is approximately 60 acres in size. All project components would be constructed on airport property. Major project elements include:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;

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- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

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Proposed Area of Potential Effect

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The Indirect Effects APE was delineated to include the area likely to be exposed to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher.[2] The extent of the APE is also considered appropriate for the evaluation of other effects, such as those associated with air emissions. The Indirect Effects APE is depicted on Figure 2.

The FAA has identified your tribe as potentially having an interest in the project area. Pursuant to 36 CFR § 800.2(c)(2)(B)(ii), the FAA is seeking input on properties of cultural or religious significance that may be affected by the undertaking, and inviting you to participate in government-to-government consultation in the Section 106 consultation process.

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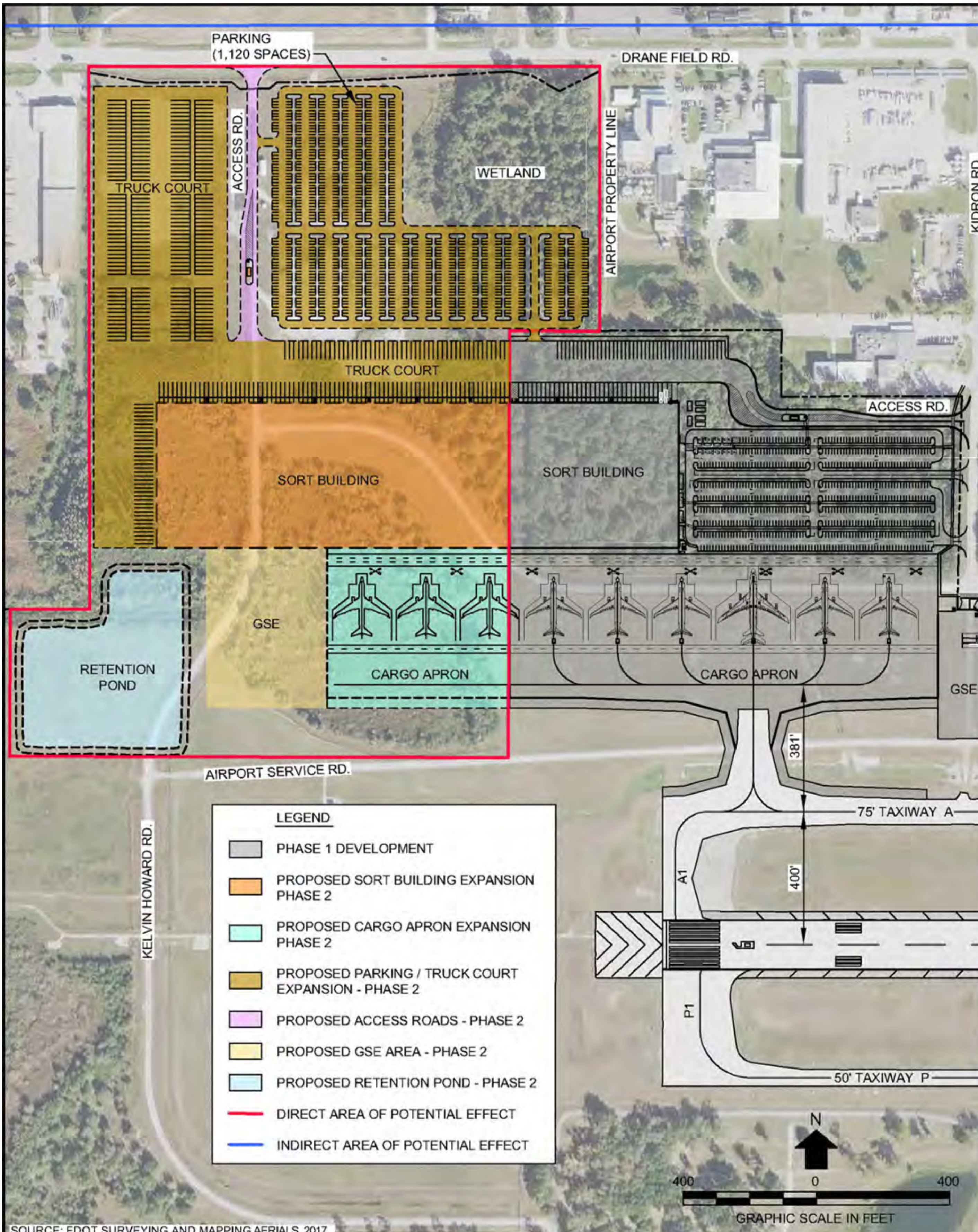
[2] The Day-Night Average Sound Level (DNL) represents aircraft sound levels averaged over a 24-hour period, with penalties to account for the increased sensitivity to noise events that occur at night.

Please contact me within 30 days of the receipt of this letter to confirm your intent to participate in this Section 106 consultation. I can be reached at (407) 487-7296 or via email at peter.m.green@faa.gov.

Sincerely,

Peter M. Green, AICP
Environmental Protection Specialist
FAA Orlando Airports District Office

Enclosures (2)



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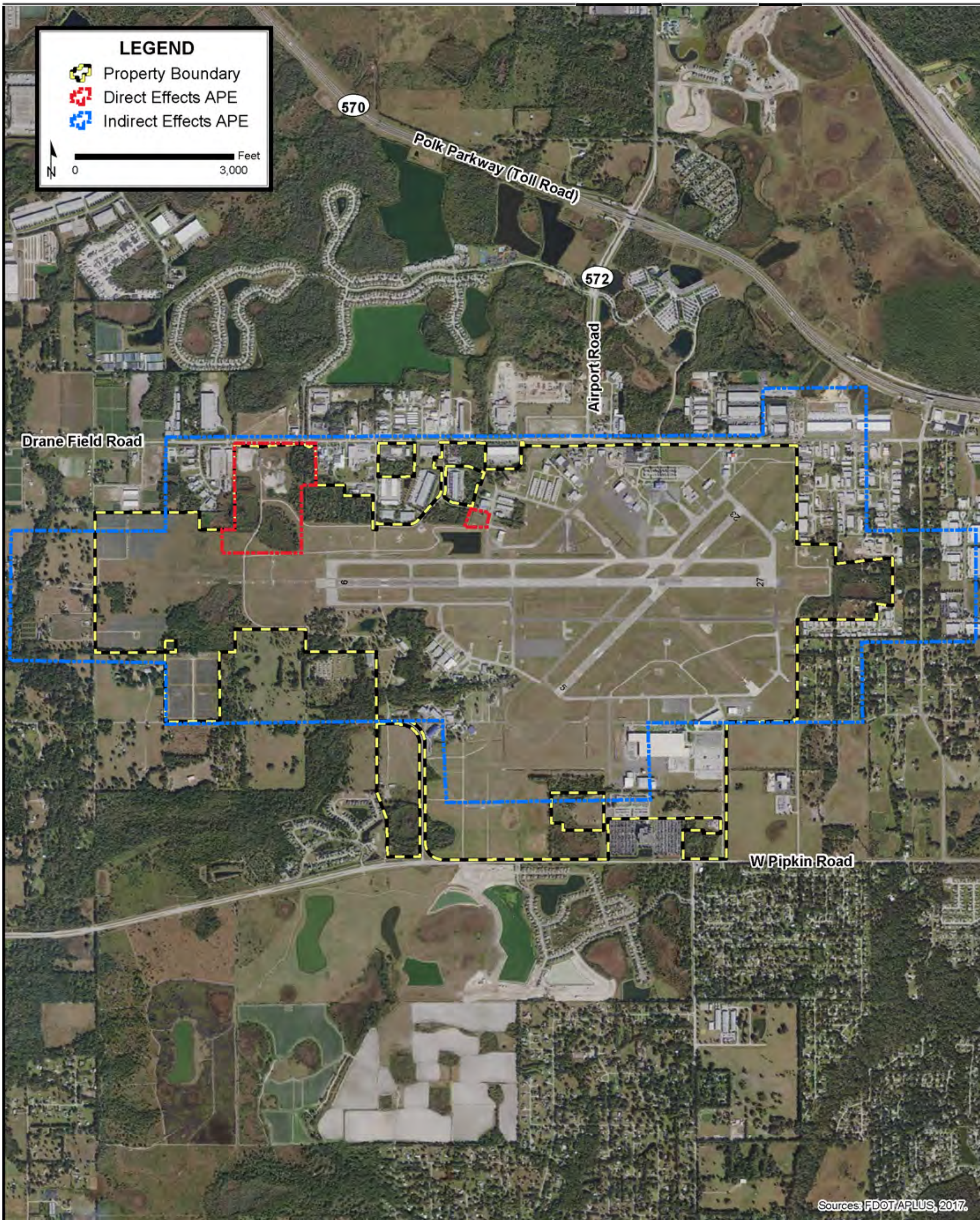
LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT

PROPOSED PROJECT AREA OF POTENTIAL EFFECT- DIRECT EFFECTS

FIGURE 1



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT

AREAS OF POTENTIAL EFFECT

FIGURE 2

Path C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\200408_Figure 2 Areas of Potential Effect for Coord_rev0.mxd, Date Saved: 5/4/2020 8:58:03 AM

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From: Green, Peter M (FAA) <peter.m.green@faa.gov>
Sent: Monday, June 08, 2020 7:34 AM
To: 'Conrad, Gene' <Gene.Conrad@lakelandgov.net>; Sanford, Paul <paul.sanford@aecom.com>
Subject: [EXTERNAL] FW: FAA- Phase II Air Cargo Development Project, Lakeland-Linder International Airport, Polk County, Florida
Importance: High

Gene / Paul,

The Seminole Tribe of Florida agrees with the Area of Potential Effect for historic resources, provided that the APE contains the areas for construction staging, storage, and borrow material. Please confirm whether or not the APE includes these construction-related items.

Regards,

Peter

From: Bradley Mueller <bradleymueller@semtribe.com>
Sent: Friday, June 05, 2020 1:44 PM
To: Green, Peter M (FAA) <peter.m.green@faa.gov>
Subject: FAA- Phase II Air Cargo Development Project, Lakeland-Linder International Airport, Polk County, Florida

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

TRIBAL HISTORIC PRESERVATION OFFICE
SEMINOLE TRIBE OF FLORIDA
30290 JOSIE BILLIE HIGHWAY
PMB 1004
CLEWISTON, FL 33440
THPO PHONE (863) 983-6549
FAX (863) 902-1117
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TRIBAL OFFICERS
MARCELLUS W. OSCEOLA JR.
CHAIRMAN
MITCHELL CYPRESS
VICE CHAIRMAN
LAVONNE ROSE
SECRETARY
PETER A. HAHN
TREASURER

June 5, 2020

Peter M. Green, AICP
Environmental Protection Specialist
FAA Orlando District Airport Districts Office
8427 South Park Circle, Suite 524
Orlando, FL 32891
Phone: 407-487-7296
Email: peter.m.green@faa.gov

Subject: FAA- Phase II Air Cargo Development Project, Lakeland-Linder International Airport, Polk County, Florida
THPO Compliance Tracking Number: 0032438

Dear Mr. Green,

Thank you for contacting the Seminole Tribe of Florida – Tribal Historic Preservation Office (STOF-THPO) Compliance Section regarding the Phase II Air Cargo Development Project, Lakeland-Linder International Airport, Polk County, Florida. The proposed undertaking does fall within the STOF Area of Interest. We have reviewed the documents you provided and agree with your APE determinations provided that the APE for direct effects also incorporates all temporary staging or equipment storage areas, and any borrow locations if fill material will be needed. We would like to continue to consult with the FAA on this as the project proceeds. Please keep us updated and feel free to contact us with any questions or concerns.

Respectfully,

Bradley M. Mueller

Bradley M. Mueller, MA, Compliance Specialist
STOF-THPO, Compliance Review Section
30290 Josie Billie Hwy, PMB 1004
Clewiston, FL 33440

Office: 863-983-6549 ext 12245
Fax: 863-902-1117
Email: bradleymueller@semtribe.com
Web: www.stofthpo.com

Green, Peter M (FAA)

From: Green, Peter M (FAA)
Sent: Tuesday, June 23, 2020 7:57 AM
To: Section106
Subject: RE: Section 106 Consultation - Air Cargo Facility Expansion Lakeland-Linder Intl Airport

Hello Robin,

Thank you for your response. We will provide copies of the Cultural Resource Assessment and the Environmental Assessment for the Muscogee (Creek) Nation's review and comment. We anticipate sending you the Cultural Resource Assessment in July and the Draft EA in September 2020.

Best regards,

Peter

From: Section106 <Section106@mcn-nsn.gov>
Sent: Monday, June 22, 2020 4:13 PM
To: Green, Peter M (FAA) <peter.m.green@faa.gov>
Subject: Re: Section 106 Consultation - Air Cargo Facility Expansion Lakeland-Linder Intl Airport

Good afternoon Mr. Green,

Thank you for sending the correspondence regarding the proposed air cargo facility expansion at Lakeland-Linder International Airport located in Polk County, Florida. Polk County is located within the Muscogee (Creek) Nation's historic area of interest and is of importance to us. Before the Muscogee Nation can comment of the possibility of this undertaking affecting any Cultural Resources, the Muscogee Nation requests the finalized EA mentioned within the correspondence. I will provide a response/comment upon receipt of the EA. Please feel free to contact me if there are any questions or concerns.

Thank you,

Robin Soweka Jr.
Historic and Cultural Preservation Department | Cultural Resource Specialist
Muscogee (Creek) Nation
P.O. Box 580 | Okmulgee, OK 74447
T 918.732.7726
F 918.758.0649
http://www.muscogeenation-nsn.gov/

From: Green, Peter M (FAA) <peter.m.green@faa.gov>
Sent: Wednesday, May 6, 2020 6:37 PM
To: Section106 <Section106@mcn-nsn.gov>
Subject: Section 106 Consultation - Air Cargo Facility Expansion Lakeland-Linder Intl Airport

Dear Ms. Loe-Zepeda,

An air cargo services provider has proposed the expansion of an existing air cargo facility at the Lakeland-Linder international Airport. Federal Aviation Administration actions associated with the proposed project require consultation under Section 106 of the National Historic Preservation Act. FAA appreciates your review of the project and letting us know if the Muscogee (Creek) Nation has an interest in the project area and would like to participate in the Section 106 consultation process.

Regards,

Peter Green

Peter M. Green, AICP
Environmental Protection Specialist
Orlando Airports District Office
Federal Aviation Administration
8427 SouthPark Circle
Orlando, Florida 32819
407-487-7296
peter.m.green@faa.gov

U.S. Department
of Transportation
**Federal Aviation
Administration**

Orlando Airports District Office
8427 South Park Circle, Suite 524
Orlando, FL 32819
Phone: (407) 487-7220
Fax: (407) 487-7135

October 20, 2020

[Via email: THPOCompliance@semtribe.com]

Mr. Bradley Mueller, MA
Compliance Specialist
Tribal Historic Preservation Office
Seminole Tribe of Florida
30290 Josie Billie Highway, PMB 1004
Clewiston, Florida 33440

RE: Determination of Effect
Phase II Air Cargo Development
Lakeland-Linder International Airport (Polk County, Florida)

Dear Mr. Mueller,

As part of the Federal Aviation Administration's (FAA's) Section 106 review, and pursuant to 36 CFR §800.4, the FAA has undertaken identification efforts for the Phase 2 Air Cargo Development project at the Lakeland-Linder International Airport (LAL). Based on the results of these efforts the FAA has determined a finding of no effect is appropriate for this undertaking.

Proposed Undertaking and Area of Potential Effect

As described in our letter dated May 6, 2020, the City of Lakeland requested approval from the FAA to expand an air cargo facility at LAL. The existing facility and the proposed Phase II expansion will be operated as an air cargo sorting and distribution facility. The facility expansion project includes the construction of additional warehouse space, office space, aircraft parking apron, truck courts, vehicle parking spaces, and support buildings. The Area of Potential Effects (APE) described in the letter as having two components: 1) areas where ground disturbance and construction activities would occur and 2) a broader area likely to be exposed, and newly exposed, to aircraft noise levels of Day-Night Average Sound Level (DNL) 65 and higher. The APE includes all construction staging and storage areas.

Identification Efforts

A review of available literature, maps, and information was conducted to identify recorded resources and understand the history and environment of land within the APE. This research was followed by a pedestrian surface inspection and a subsurface survey (shovel testing) to identify potentially significant archaeological, cultural, and historical resources within direct effects portion of the APE. The effort also identified any structures over 50 years in age within the indirect effects portion of the APE. For your review, the results of the research and surveys are contained in the Phase IB Cultural Resource Assessment Survey[1] report enclosed with this letter.

Historic Properties in the APE

A majority of the Direct Effects portion of the APE is comprised of previously disturbed land associated with the airfield and land routinely used for construction staging. The Direct Effects APE also includes several large wetlands. Shovel tests showed no observable natural soil stratigraphy as past development and activities have greatly impacted the area. No historic cultural materials were recovered from the shovel tests.

No resources within the APE are listed in the National Register of Historic Places. Resources within the APE which were, or may have been, built 50 or more years ago were located, researched, and assessed. Eleven resource groups located on- and off-airport were identified for evaluation. The structures were evaluated against National Register eligibility criteria. The evaluation indicated that the Aaron E. and Maude Morgan House and the English Family House are each potentially eligible for listing for listing in the National Register under Criterion C. Neither of these properties would be affected by project construction. Additionally, the properties are well outside of existing and future DNL 65 airport noise contours and are distant from the airport viewshed. Based on the results of surveys, no further archaeological work was recommended. No historic properties would be affected by the Proposed Project.

Finding of Effect

Based on the results of the studies and an assessment of effects on historic properties, the FAA has determined that this undertaking will have no effect on historic properties. Please review this finding and the enclosed documentation and provide either your concurrence or non-concurrence within 30 days.

If you have questions or concerns regarding this finding or the sufficiency of documentation, please contact me at (407) 487-7296 or via email at peter.m.green@faa.gov.

Respectfully,

Peter M. Green, AICP
Environmental Protection Specialist

Enclosure

---

[1] *Phase IB Cultural Resources Assessment Survey for Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL)*. AECOM. September 2020.

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APPENDIX B

FCMP Coastal Consistency Summary

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Florida Coastal Management Program Consistency Review Summary

Statute	Scope	Consistency
Chapter 161: Beach and Shore Preservation	Provides for beach and shoreline protection through regulation of coastal construction	Construction of the Proposed Project would not take place in an area seaward of a Coastal Construction Control Line or Mean High Water Line. No secondary or cumulative impacts are anticipated as potential water quality impacts are expected to be minimized through use of best management practices (BMPs) during construction. No significant operational impacts are expected when compared against the No-Action Alternative.
Chapter 163, Part II: Growth Policy – County and Municipal Planning; Land Development Regulation	Requires local governments to develop comprehensive plans that encourage appropriate use of land and resources in a manner consistent with public interest	Both Polk County and the City of Lakeland have published and continue to update Comprehensive Plans for regional land use planning and growth. A County Airport Impact District (AID) overlay is established to ensure that the operation of public use airports is compatible with surrounding land uses with minimal conflicts between the two. Polk County has established development criteria for providing aviation-compatible land uses and activities in the AID.
Chapter 186: State and Regional Planning	Requires the preparation of state and regional plans that promote governmental coordination and guide state and regional programs and functions.	As part of the NEPA process, the Proposed Project has been coordinated with Federal, state and local governments and agencies, including the Florida Department of Environmental Protection State Clearinghouse, for compatibility with state and regional planning. See **Appendix A** of this Environmental Assessment (EA) for a complete list of coordinating agencies.
Chapter 252: Emergency Management and Disaster Preparedness, Response and Mitigation	Provides for planning and implementation of the state's response to, efforts to recover from, and the control of natural, technological and manmade disasters	The Proposed Project would not have an effect on the ability of the state to respond to or recover from natural or manmade disasters
Chapter 253: State Lands	Addresses state administration (i.e., acquisition, leasing, disposal, management) of public lands	The Proposed Project would be constructed entirely on Airport property and would not involve use of state lands or submerged lands.
Chapter 258: State Parks and Preserves	Administration and management of state parks and preserves	The Proposed Project would not directly impact state parks, recreational areas or preserves. Secondary or indirect impacts to

Statute	Scope	Consistency
Chapter 259: Land Acquisition for Conservation or Recreation	Acquisition of land for environmental and recreation purposes	environmental or social resources related to these facilities are not anticipated. Opportunity for recreation on state lands would not be affected.
Chapter 260: Recreational Trails System	Acquisition of land and development of recreational trails system	
Chapter 375: Multipurpose, Outdoor Recreation, Land Acquisition, Management and Conservation	Planning for multipurpose outdoor recreation and conservation	
Chapter 267: Historical Resources	Addresses management and preservation of state's historical and archaeological resources	The Proposed Project is not expected to affect historic or archaeological resources. No significant indirect impacts (i.e., noise, air quality) to applicable resources are expected. During the Section 106 consultations, the Seminole Tribe of Florida concurred with the designated Areas of Potential Effect and stated they will continue to consult with the FAA throughout the EA process as the Proposed Project falls within the tribe's area of interest. The Muscogee (Creek) Nation also stated that the Proposed Project falls within the tribe's area of interest and requested that they receive a copy of the Draft EA once finalized for review and comment. On February 19, 2021, the State Historic Preservation Officer submitted a letter in response to the Cultural Resources Assessment Survey concurring with the FAA's determination of no effect to historic properties.
Chapter 288: Commercial Development and Capital Improvements	Promotes development of general business, trade and tourism components of the state economy	The Proposed Project improves air cargo handling and processing capacity, allowing for the increased movement of goods into, out of, and through the region. Polk County Comprehensive Plan Objectives 2.402-A and 2.402-B direct the County to maintain programs designed to expand and enhance the County's traditional economic base and to promote retention and expansion of existing businesses within the County. The Proposed Project supports these objectives.
Chapter 334: Transportation Administration	Establishes state policy for planning and development of transportation systems	No adverse impact to the administration or planning of transportation systems is expected. The Proposed Project will be included on the Lakeland Linder International Airport (LAL) Airport Layout Plan (ALP) prior to the Federal Aviation Administration finding participation or approval. City and County Comprehensive Plans incorporate Airport ALP and Master Plan updates into Comprehensive Plan updates to ensure continued coordination of regional planning elements including transportation.
Chapter 339: Transportation Finance and Planning	Addresses the finance and planning needs of the state's transportation system	

Statute	Scope	Consistency
Chapter 373: Water Resources	Addresses water resources and their quality	Implementation of project-specific erosion control and pollution prevention measures would minimize the potential for exceeding applicable water quality standards during construction. The Proposed Project would not introduce activities having significant potential to generate new or higher levels of pollutants to surface waters. The Proposed Project could have negligible to minor impacts on surface water and groundwater. Temporary, indirect, negligible adverse impacts from soil disturbance could create non-point source water pollution; however, BMPs would be utilized to reduce the chance of impacts on surface water resources. The Proposed Project could impact up to 28.4 acres of floodplains. All floodplain impacts would occur on LAL property. The Proposed Project would generate no measurable change in flood elevations. Floodplain impacts during construction would be minimized by applying construction period erosion and sedimentation controls. Design measures would be implemented to avoid/minimize impacts to floodplains, in accordance with local floodplain management policies and regulations. Adverse indirect impacts to beneficial floodplain values, cultural features, or wildlife habitat is not expected. The Proposed Project could directly impact up to 23.9 acres of wetlands and up to 0.3 acre of other surface waters. Potential secondary impacts to the habitat functions of wetlands within 25 feet of the direct impacts include up to 1.0 additional acre of wetlands. Design measures would be implemented to avoid/minimize impacts to wetlands and other surface waters. Proposed mitigation includes the purchase of state and federally-approved wetland credits from the Alafia River Mitigation Bank. Overall, there would be no significant impacts to water resources as a result of the Proposed Project.

Statute	Scope	Consistency
Chapter 376: Pollutant Discharge Prevention and Removal	Regulates transfer, storage, and transportation of pollutant discharges in state waters or affecting coastlines, recreation, or marine-related livelihood	During construction, the contractor would be required to prepare project-specific Spill Prevention Control and Countermeasures Plan documenting measures to prevent accidental release to the environment and, should they occur, the corrective action to minimize environmental impacts. Project-specific BMPs would be implemented for the operation of the Proposed Project in accordance with existing or modified stormwater discharge permit conditions. The Proposed Project would not alter the types of hazardous and other regulated materials used at LAL (e.g., cleaning solvents, lubricants). No involvement and impact associated with hazardous materials or wastes is anticipated. The Proposed Project would not involve the transfer of pollutants between vessels; between onshore facilities and vessels; between offshore facilities and vessels; or between terminal facilities within jurisdiction of the state and state waters.
Chapter 377: Energy Resources	Addresses regulation, planning, and development of energy resources of the state	Implementation of the Proposed Project would not cause unsupportable demands on available natural resources or energy supplies, and construction and operation of the Proposed Project would not require consumable natural resources that would be considered in short supply in Polk County.
Chapter 379: Fish and Wildlife Conservation	Addresses management and protection of fish and wildlife in the state	The Proposed Project would result in permanent impacts to approximately 53 acres of existing terrestrial and wetland habitats. Much of the proposed areas of direct impact have been previously affected by anthropogenic activities at LAL, including land clearing and roadway construction. The Proposed Project would have minimal impact on natural habitats, wildlife, and listed plant and animal species. The area's inventory of habitat and vegetative cover types is expected to provide suitable temporary or permanent habitat for

Statute	Scope	Consistency
		common species of displaced wildlife. In order to avoid or minimize potential impacts to listed species that have the potential to occur within the Proposed Project area, measures to be implemented by LAL in coordination with the U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) as necessary include pre-construction species surveys, implementation of USFWS- and FWC-approved protection measures for federal- and state-listed species, and compensatory wetland mitigation. Based on the findings and commitments of the Biological Assessment (BA) and this EA, a determination has been made that the Proposed Project is not likely to adversely affect any state or federally listed plant or animal species. On 24 September 2020, the USFWS concurred with findings and commitments of the BA. The Proposed Project will not impact critical habitat designated by Congress in 50 CFR 424.
Chapter 380: Land and Water Management	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development	The Proposed Project would be developed consistent with local land and water management plans. The Proposed Project is subject to local permit, stormwater, and environmental requirements and review. The Proposed Project will require coordination with and authorization from the U.S. Army Corps of Engineers and the Southwest Florida Water Management District.
Chapter 381: Public Health, General Provisions	Establishes public policy affecting public health of the state	The Proposed Project does not involve the construction of an onsite sewage treatment and disposal system. Construction activities associated with the Proposed Project are governed by regulations established by the Occupational Safety and Health Administration. The types and quantities of hazardous materials stored and hazardous wastes generated on site would not change as a result of the Proposed Project. The Proposed Project would not impact public policy or management in regard to sanitation, communicable diseases, or public health.

Statute	Scope	Consistency
Chapter 388: Mosquito Control	Provides funding authority and development of criteria for arthropod control effort in the state	The Proposed Project would not affect local arthropod (mosquito) control efforts or contribute to increased propagation of mosquitos.
Chapter 403: Environmental Control	Establishes state regulatory policy for certain environmental resources (i.e., water quality, air quality, waste disposal)	The construction and operation of the Proposed Project would include project-specific BMPs and pollution prevention measures. The Proposed Project is not expected to exceed applicable state water quality standards or have substantial and longer-term water quality impacts. The Proposed Project would marginally increase aircraft and surface vehicle operations at LAL. Although airport operations and associated emissions would increase with the Proposed Project, the increases are not significant according to established criteria. LAL is located within an attainment area for all criteria air pollutants. Construction wastes would be collected, transported, recycled, and disposed of in compliance with applicable state and local regulations. No potential issues regarding solid or hazardous wastes have been identified.
Chapter 553: Building Construction Standards	Provides a mechanism for the uniform adoption, updating, amendment, interpretation, and enforcement of a single, unified state building code, to be called the Florida Building Code	The Proposed Project would not affect the Building Construction Standards of the State of Florida. The project proponent would obtain and comply with all applicable permits as required by law.
Chapter 582: Soil and Water Conservation	Provides for the control and prevention of soil erosion	A Stormwater Pollution Prevention Plan would be developed and followed, and BMPs addressing erosion and sediment controls would be implemented to minimize impact to soils and water quality. The Proposed Project would be consistent with current and future land use plans and zoning ordinances established for the LAL area, and with the current characteristic features of the area and landscape, and would not result in any significant impacts to land use. The Proposed Project would not affect soils or farmland

Statute	Scope	Consistency
		within a Soil and Water Conservation District and would not convert prime farmland.
Chapter 597: Aquaculture	Establishes public policy concerning the cultivation of aquatic organisms	The Proposed Project has no activities related to or affecting the cultivation of marine species. The Proposed Project activities would not affect aquaculture.

Source: Florida Statutes, as identified in table.

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APPENDIX C
Air Quality Documentation

C.1 Air Monitoring Data Summary
C.2 Air Quality Technical Report

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APPENDIX C.1

Air Monitoring Data Summary

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Air Monitoring Data Summary (2017-2019)

Pollutant	Averaging Time	Level	Form	Concentration (Monitor ID, Distance from LAL)				
				12-105-6006 3.2 Miles	12-105-6005 3.3 Miles	12-057-3002 12 Miles	12-057-1073 21 Miles	12-057-0113 26 Miles
Carbon monoxide [76 FR 54294, Aug 31, 2011]	8-hour	9 ppm	Not to be exceeded more than once per year	--	--	--	--	Not Exceeded
	1-hour	35 ppm		--	--	--	--	Not Exceeded
Lead [81 FR 71906, October 18, 2016]	Rolling 3 month average	0.15 µg/m³	Not to be exceeded	--	--	--	Not Exceeded	--
Nitrogen dioxide [75 FR 6474, Feb 9, 2010] [77 FR 20218, April 3, 2012]	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	--	--	--	--	37.000
	Annual	53 ppb	Annual mean	--	--	--	--	9.013
Ozone [80 FR 65292, Oct 26, 2015]	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	0.068	0.0677	0.066	--	--
Particle Pollution [78 FR 3085, Jan 15, 2013]	$PM_{2.5}$ Annual (primary)	12 µg/m³	Annual mean, averaged over 3 years	7.665	--	8.291	--	8.359
	$PM_{2.5}$ Annual (secondary)	15 µg/m³	Annual mean, averaged over 3 years					
	$PM_{2.5}$ 24-hour	35 µg/m³	98th percentile, averaged over 3 years	15.067	--	18.867	--	21.100
	PM_{10} 24-hour	150 µg/m³	Not to be exceeded more than once per year on average over 3 years	--	--	Not Exceeded	--	--
Sulfur dioxide	1-hour	75 ppb	99th percentile of 1-hour daily maximum	--	22.267	9.000	--	--

Pollutant	Averaging Time	Level	Form	Concentration (Monitor ID, Distance from LAL)				
				12-105-6006 3.2 Miles	12-105-6005 3.3 Miles	12-057-3002 12 Miles	12-057-1073 21 Miles	12-057-0113 26 Miles
[77 FR 20218, April 3, 2012]			concentrations, averaged over 3 years					
[75 FR 35520, Jun 22, 2010]	3-hour	0.5 ppm	Not to be exceeded more than once per year	--	Not Exceeded	Not Exceeded	--	--

-- = not monitored; FR = Federal Register; ppb = parts per billion; ppm = parts per million; μg/m^3 = micrograms per cubic meter of air
Sources: FR, as above; and EPA AirData (https://www.epa.gov/outdoor-air-quality-data), accessed January 28, 2020

APPENDIX C.2

Air Quality Technical Report

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Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL) Environmental Assessment

Air Quality Technical Report

Prepared for:

City of Lakeland, Florida
and
Federal Aviation Administration

Prepared by:

AECOM

November 2020

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ACRONYMS AND ABBREVIATIONS

ACEIT	Airport Construction Emissions Inventory Tool
AEDT	Aviation Environmental Design Tool
APU	Auxiliary Power Unit
AVMT	Annual Vehicle Miles of Travel
BMP	Best Management Practice
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalent
EA	Environmental Assessment
EF	Emissions Rate
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse Gas
GSE	Ground Support Equipment
HP	Horsepower
I-4	Interstate 4
LAL	Lakeland Linder International Airport
MOVES	Motor Vehicle Emissions Simulator
mph	miles-per-hour
NO_x	Nitrogen Oxides
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter equal to or less than 2.5 micrometers in diameter
PM_{10}	Particulate Matter equal to or less than 10 micrometers in diameter
SO_2	Sulfur Dioxide
SSA	Socioeconomic Study Area
TGO	Touch and Go
TPY	Tons Per Year
TSP	Total Suspended Particulate
VOC	Volatile Organic Compounds

CHAPTER 1 INTRODUCTION

This *Air Quality Technical Report* details the assessment scope, calculation methodology, input data and other technical information used in the analysis of air quality impacts associated with Environmental Assessment (EA) for the proposed Phase II Air Cargo Facility Development at the Lakeland Linder International Airport (i.e., LAL, or the Airport), hereinafter referred to as the Proposed Project.

1.1. ANALYSIS METHODOLOGY

1.1.1. CONSTRUCTION EMISSIONS

Construction period emission inventories of the following criteria pollutants and their precursors were prepared for the Proposed Project: carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter (PM), and volatile organic compounds (VOC). Greenhouse gas (GHG) emissions, expressed in metric tons of carbon dioxide equivalent (CO_2e) emissions, were also computed. The inventories include annual emissions from the following construction emissions sources: off-road equipment, on-road vehicles, and fugitive sources including asphalt paving and dust generation from site-wide construction activities. Off-road equipment and on-road vehicle emissions were computed using **Equations 1** and **2**, respectively.

Annual hours of off-road equipment operation and on-road annual vehicle miles of travel (AVMT) were derived using an engineering estimate of probable materials quantities and construction cost developed for the proposed expanded air cargo sort building, air cargo aircraft ramp, ground support equipment (GSE) ramp, taxilane, employee parking, truck yard, and stormwater retention pond. This information was input to the Airport Cooperative Research Program Airport Construction Emissions Inventory Tool (ACEIT), which then estimates the number and types of equipment to be used on the project and the deployment schedule (monthly and annually). Annual construction equipment and vehicle activity is summarized on T**able 1.1-1.**

Equation 1:

$$\text{Emissions}_{(tpy)} = \sum_{v=i}^{n} EF_v \times HP_v \times \frac{\text{hours}}{\text{day}} \times \frac{\text{days}}{\text{year}} \div 2{,}000 \div 453.59$$

Where:

$\text{Emissions}_{(tpy)}$= annual emissions (tons per year)

EF_v= emissions rate for equipment v(i)…v(n) (grams per horsepower-hour of operation)

HP_v= rated horsepower for equipment v(i)…v(n)

2,000 = pounds per ton

453.59 = grams per pound

Equation 2:

$$\text{Emissions}_{(\text{tpy})} = \sum_{v=i}^{n} EF_v \times \frac{\text{miles}}{\text{day}} \times \frac{\text{days}}{\text{year}} \div 2{,}000 \div 453.59$$

Where:

$\text{Emissions}_{(\text{tpy})}$ = annual emissions (tons per year)

EF_v = emissions rate for vehicle v(i)…v(n) (grams per mile)

2,000 = pounds per ton

453.59 = grams per pound

Table 1.1-1 Estimated Annual Construction Activity

Off-road Equipment	**Fuel**	**Annual Operating Hours**
		2021
40 Ton Rough Terrain	Diesel	321.6
40 Ton Rough Terrain Crane	Diesel	240.0
90 Ton Crane	Diesel	960.0
90 Ton Crane Supplemental Hoisting	Diesel	240.0
Air Compressor	Gasoline	207.2
Asphalt Paver	Diesel	231.4
Backhoe	Diesel	1,281.6
Caisson Drilling Rig	Gasoline	400.0
Chain Saw	Gasoline	216.0
Chipper/Stump Grinder	Diesel	216.0
Concrete Boom Pump	Gasoline	720.0
Concrete Pump	Gasoline	324.0
Concrete Ready Mix Trucks	Gasoline	1,800.0
Concrete Saws	Gasoline	194.8
Concrete Truck	Diesel	2,077.5
Concrete Truck Pump	Gasoline	1,140.0
Crane	Diesel	30.0
Curb/Gutter Paver	Diesel	32.9
Distributing Tanker	Diesel	129.4
Dozer	Diesel	2,494.4
Dump Truck	Diesel	838.0
Dump Truck (12 cy)	Diesel	5,002.0
Excavator	Diesel	1,662.6
Flatbed Truck	Diesel	1,203.2
Fork Truck	Diesel	6,083.2
Forklift	Diesel	480.0
Front Loader	Diesel	556.8
Front Loader for Subgrade Materials	Diesel	158.4
Generator	Gasoline	240.0
Grader	Diesel	62.0
Grout Mixer	Gasoline	1,600.0
Grout Wheel Truck	Diesel	240.0
High Lift	Diesel	3,361.6
Hydroseeder	Gasoline	78.7
Loader	Diesel	190.3
Man Lift	Diesel	6,400.0

Off-road Equipment	Fuel	Annual Operating Hours
		2021
Man Lift (Fascia Construction)	Diesel	40.0
Material Deliveries	Diesel	120.0
Off-Road Truck	Diesel	78.7
Other General Equipment	Gasoline	2,352.7
Pickup Truck	Diesel	4,836.3
Pile Driver	Gasoline	160.0
Pumps	Gasoline	72.0
Roller	Diesel	1,674.9
Rubber Tired Loader	Diesel	194.8
Scraper	Diesel	1,356.7
Skid Steer Loader	Diesel	245.4
Slip Form Paver	Diesel	194.8
Surfacing Equipment (Grooving)	Gasoline	288.2
Survey Crew Trucks	Diesel	29.2
Ten Wheelers- Material Delivery	Diesel	120.0
Tool Truck	Diesel	7,843.2
Tower Crane	Diesel	1,960.0
Tractor Trailer- Material Delivery	Diesel	5,998.4
Tractor Trailer- Steel Deliveries	Diesel	480.0
Tractor Trailer- Stone Delivery	Diesel	398.4
Tractor Trailer with Boom Hoist- Curbs Del & Place	Diesel	81.6
Tractor Trailers- Rebar Deliveries	Diesel	760.0
Tractor Trailers Temp Fac.	Diesel	13.6
Tractors/Loader/Backhoe	Diesel	341.9
Trencher	Diesel	240.0
Trencher for U/G Piping	Diesel	398.4
Trenchers	Diesel	12.4
Trowel Machine	Gasoline	760.0
Trowel Machines (4) machines	Gasoline	480.0
Truck for Topsoil & Seed Del&Spread	Diesel	81.6
Vibratory Compactor	Gasoline	65.8
Water Truck	Diesel	840.0

Source: ACEIT, 2020

Because construction equipment and vehicle emissions rates contained in ACEIT are not sufficiently representative of local conditions, equipment and vehicle emissions rates were instead generated using the current version of the U.S. Environmental Protection Agency Motor Vehicle Emissions Simulator (EPA MOVES2014b). MOVES2014b was invoked at the project-level using input databases specific to Polk County, Florida. Input databases were adapted from EPA's most recent National Emissions Inventory, which incorporates Polk County-specific information to the extent it was submitted to the EPA by state and local air quality and transportation agencies.

Vehicle age distributions, inspection and maintenance programs (to the extent applied), fuel supply and other data were held constant for future years; that is, projections or adjustments were not applied unless available from locally-developed data. A summer design hour representative of a July weekday in Polk County from 1600 to 1700 was selected for emissions rate modeling based on the worst-case temperature/humidity hourly condition, according to the MOVES

'ZoneMonthHour' input database. Emissions rates for on-road vehicles were generated for five mile-per-hour (mph) increments ranging from 5 to 65 mph. For the purposes of emissions calculations, it was assumed that all on-road vehicles would travel at an average speed of 35 miles per hour. **Tables 1.1-2a** and **1.1-2b** specify the annual off-road equipment and on-road vehicle emissions rates applied in the analysis.

Equation 3 was used to estimate dust emissions from site-wide construction activities, adapted from EPA's AP-42 methodology.[1] EPA studies have concluded that ten percent of the dust emissions in the PM_{10} or less size fractions are $PM_{2.5}$.[2] Therefore, uncontrolled PM_{10} dust emissions were factored by 0.10 to derive the $PM_{2.5}$ component. Further, dust suppression and erosion control Best Management Practices (BMPs) during construction, such as site watering and track-out prevention measures, will ensure that PM impacts from construction activities are minimized. According to EPA, adherence to these BMPs can result in a dust control efficiency of 75 percent, which was applied to the calculation to represent controlled PM emissions.[3]

Estimation of annual evaporative VOC emissions from asphalt curing is based upon the EPA methods outlined in AP-42[4] as well as the Emissions Inventory Improvement Program.[5] **Equation 4** outlines this method. Because the asphalt characterization is not known, assuming that 35 percent of liquefied asphalt is diluent that can evaporate as VOC, 95 percent of this diluent would evaporate during asphalt curing, and that the density of the diluent is 1.98 pounds per liter of diluent applied.

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[1] U.S. Environmental Protection Agency. *Compilation of Air Pollutant Emissions Factors (AP-42). Fifth Edition, Volume I Chapter 13: Miscellaneous Sources*. 1995.

[2] Pace, Thompson G. *Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions From PM10.* Presented at the Environmental Protection Agency 14th International Emission Inventory Conference. Las Vegas, NV, 2005

[3] U.S. Environmental Protection Agency. *Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures*. OAQPS, EPA-450/2-92-004. 1992.

[4] U.S. Environmental Protection Agency. *Compilation of Air Pollutant Emission Factors (AP-42). Fifth Edition Volume I Chapter 4.5: Asphalt Paving Operations*. 1995.

[5] U.S. Environmental Protection Agency. *Emissions Inventory Improvement Program (EIIP), Volume III: Chapter 17, "Asphalt Paving"*. 2001.

Table 1.1-2a 2021 Off-Road Equipment Emissions Rates

Equipment	Fuel Type	Load	Horsepower	2021 Emission Rate (grams per horsepower-hour at operating load)						
				CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Cranes	Diesel	0.43	237.70	0.181	0.788	0.034	0.033	0.004	0.050	530.991
Air Compressors	Gasoline	0.56	5.19	208.961	2.116	0.378	0.348	0.007	9.954	1,247.391
Pavers	Diesel	0.59	134.60	0.274	1.028	0.068	0.066	0.004	0.044	536.789
Tractors/Loaders/Backhoes	Diesel	0.21	87.17	3.079	3.233	0.518	0.502	0.005	0.593	694.627
Bore/Drill Rigs	Gasoline	0.79	2.21	205.168	1.984	0.318	0.293	0.007	9.606	1,247.879
Chain Saws < 6 HP (com)	Gasoline	0.7	3.92	266.029	1.528	9.748	8.968	0.004	73.339	710.950
Chippers/Stump Grinders (com)	Diesel	0.43	84.47	1.756	3.637	0.319	0.310	0.005	0.350	589.629
Pumps	Gasoline	0.69	4.63	207.004	2.048	0.347	0.320	0.007	10.529	1,247.644
Cement & Mortar Mixers	Gasoline	0.59	8.37	275.340	1.688	0.109	0.100	0.006	9.774	1,061.043
Concrete/Industrial Saws	Gasoline	0.78	4.53	266.029	1.528	9.748	8.968	0.004	63.532	710.949
Off-highway Trucks	Diesel	0.59	419.90	0.142	0.376	0.027	0.026	0.004	0.024	536.802
Crawler Tractor/Dozers	Diesel	0.59	136.10	0.211	0.801	0.053	0.052	0.004	0.032	536.802
Excavators	Diesel	0.59	137.60	0.175	0.589	0.045	0.043	0.004	0.026	536.805
Forklifts	Diesel	0.59	85.48	0.158	0.948	0.029	0.029	0.004	0.014	596.142
Generator Sets	Gasoline	0.68	8.82	275.368	1.634	0.113	0.104	0.006	8.503	1,060.742
Graders	Diesel	0.59	231.20	0.162	0.493	0.032	0.031	0.004	0.030	536.802
Aerial Lifts	Diesel	0.21	60.46	3.613	4.546	0.488	0.473	0.005	0.761	694.387
Commercial Turf Equipment (com)	Gasoline	0.6	5.22	205.057	1.981	0.316	0.291	0.007	7.604	1,247.892
Other General Industrial Eqp	Gasoline	0.54	4.29	211.553	2.207	0.420	0.386	0.007	10.070	1,247.056
Rollers	Diesel	0.59	84.76	0.806	1.697	0.134	0.130	0.004	0.067	596.082
Rubber Tire Loaders	Diesel	0.59	136.30	0.304	1.118	0.075	0.073	0.004	0.051	536.778
Scrapers	Diesel	0.59	422.50	0.335	0.918	0.051	0.049	0.004	0.048	536.780
Skid Steer Loaders	Diesel	0.21	57.67	4.328	4.811	0.720	0.698	0.006	0.946	693.699
Surfacing Equipment	Gasoline	0.49	8.92	278.743	1.694	0.124	0.114	0.006	6.560	1,060.494
Trenchers	Diesel	0.59	61.02	0.922	2.979	0.120	0.116	0.004	0.146	596.005
Plate Compactors	Gasoline	0.55	4.41	205.471	1.995	0.323	0.297	0.007	8.704	1,247.840

Source: EPA MOVES2014b

Table 1.1-2b On-Road Vehicle Emissions Rates

Vehicle Type	Fuel Type	2021 Emission Rate (grams per vehicle mile traveled)						
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Light commercial truck	Diesel	3.055	1.032	0.088	0.044	0.005	0.171	620.833
Single unit short-haul truck	Diesel	1.679	3.477	0.404	0.250	0.010	0.512	1,174.359
Passenger car	Gasoline	3.698	0.183	0.044	0.009	0.006	0.165	327.538
Passenger truck	Gasoline	6.649	0.461	0.049	0.011	0.009	0.269	447.292

Source: EPA MOVES2014b

Equation 3:**

$$PM_{10(tpy)} = EF_{TSP} \times \frac{days}{year} \times \frac{acres}{day} \times 0.45 \div 2{,}000$$

Where:

$PM_{10(tpy)}$= annual PM_{10} dust emissions (tons per year)

EF_{TSP}= total suspended particulate (TSP) emissions rate (80 pounds per acre-day)

0.45 = estimated ratio of PM_{10} to TSP

2,000 = pounds per ton

**Represents uncontrolled emissions of PM_{10}. Controlled emissions are derived by applying a 75% control factor.

$PM_{2.5} = PM_{10} \times 0.10$

Equation 4:

$$VOC_{(tpy)} = A \times AR \times VD \times EF \times D \div 2{,}000$$

Where:

$VOC_{(tpy)}$= annual VOC paving emissions (tons per year)

A = area of pavement in square meters(m^2)

AR = asphalt application rate (0.679 liter/m^2)

VD = volume fraction of diluent (0.35)

AF = mass fraction of diluent which evaporates as VOC (0.95)

D = solvent density (1.98 pounds/liter)

2,000 = pounds per ton

1.1.2. Operational Emissions

Operations of aircraft (Boeing 767-300 and 737-800), aircraft Auxiliary Power Unit (APU), and Ground Support Equipment (GSE), would change as a result of the expanded air cargo facilities described by the EA Proposed Project. Additionally, an increase in truck traffic and employee commute trips would result from increased cargo handling activities. Operations of stationary combustion sources and on-airport motor vehicles would not be expected to increase substantially as a result of the Proposed Project. Therefore, operational emissions estimates for the future year conditions in the EA with the Proposed Project Alternatives, include emissions from aircraft, APUs, GSE, cargo truck traffic, and air cargo facility employee vehicles. Emissions from aircraft, APUs, and GSE were estimated using Federal Aviation Administration's Aviation Environmental Design Tool (AEDT). Air emission analyses for airports are required to use AEDT for these sources. Emissions from cargo trucks and employee commutes were estimated using **Equation 2**, using emission rates obtained from MOVES.

Noise modeling performed for the EA using AEDT was used as a basis for the air quality analysis. The noise modeling accounted for air cargo aircraft operations derived from the expected rates of use at the cargo facility under the No-Action and Proposed Project Alternatives. APU and GSE operations were derived using default values for the Boeing 767 and Boeing 737 in AEDT.

Criteria pollutant emission rates for air cargo aircraft, APUs, and associated GSE are built into AEDT, using Boeing 767 aircraft with the GE 2GE054 engine and Boeing 737 with the CFM International 4CM039 engine (representative of proponent in-use aircraft fleet), and using default rates for APU and GSE. The aircraft fleet mix, associated engines, and number of operations used to develop the operations emissions inventory are provided in T**ables 1.1-3a** through **1.1-3c**.

Default GHG emission rates for air cargo aircraft are built into AEDT and were used for this analysis. GHG emissions from APUs and GSE are not built into AEDT. GHG emissions from these sources were calculated using AEDT default operating times and fuel flow rates for specific equipment, pounds per gallon for each assigned fuel type, and the GHG emission rate per gallon of each fuel. Fuel based emission rates applied to the AEDT-derived fuel consumption for GSE and APU correspond to 21.095 pounds/gallon for CO_2, 0.000595248 pounds/gallon for CH_4 and 0.000683433 pounds/gallon for N_2O for Jet A; 22.5091702 pounds/gallon for CO_2, 0.001256633 pounds/gallon for CH_4 and 0.000573201 pounds/gallon for N_2O for diesel; and 19.3565636 pounds/gallon for CO_2, 0.00110231 pounds/gallon for CH_4 and 0.000485016 pounds/gallon for N_2O for gasoline. Global warming potentials used to convert individual GHG emissions of CO_2, CH_4 and N_2O to carbon dioxide equivalent (CO_2e) emissions are 1, 21 and 310, respectively.

Additional cargo truck and cargo facility employee vehicle commute operations were derived for travel within the EA Socioeconomic Study Area (SSA), using roadway segment distances and total vehicle trip data derived from the traffic study completed for the EA. A traffic analysis was performed to assess the number of cargo truck and passenger vehicles trips that would result from operation of the Proposed Project, as detailed in **Appendix F** of the EA. AVMT were derived for travel between the air cargo facility and the SSA boundary, assuming that 35 percent of vehicles would use Drane Field Road and County Line Road north to Interstate 4 (I-4); 15 percent of vehicles would use Drane Field Road and County Line Road to locations south of the SSA; 25 percent of vehicles would use Drane Field Road, Airport Road north to Polk Parkway, and Polk Parkway to I-4; and 25 percent would use Drane Field Road east to Polk Parkway and Polk Parkway to areas outside the SSA (see **Figure 1.1-1**). A weighted average speed of 60 mph for motor vehicles was derived from road segment speed limits, segment distances, and the percentage of traffic expected to use each road segment within the SSA. T**able 1.1.-4** details the total number of motor vehicle trips and AVMT used in the emissions analysis.

Table 1.1-3a 2019 Aircraft Fleet Mix and Activity

Aircraft Model	Engine	2019 Existing Condition			
		Arrival	Departure	TGO*	Total
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	TPE331-3	106	106	-	212
Agusta A-109 250B17 NONE	250B17B	40	40	-	80
Airbus A320-200 Series 2CM018 NONE	CFM56-5B4/2 DAC	2	2	-	4
BEC58P	TIO-540-J2B2	5,012	5,012	1,089	11,113
Bell 206L-4T Long Ranger 250B17 NONE	250B17B	13	13	-	26
Boeing 727-200 Series 1PW004 NONE	JT8D-7 series Smoke Fix	1	1	-	2
Boeing 737-800 Series 4CM039 NONE	CFM56-7B20/2	5	5	-	10
Boeing 757-200 Series 4PW073 NONE	PW2040	2	2	-	4
Boeing CH-46 Sea Knight T588F NONE	T58-GE-8F	17	17	-	34
Boeing DC-10-10 Series 3GE076 NONE	CF6-50E1 Low emissions fuel nozzle	1	1	-	2
Boeing F/A-18 Hornet F4044 NONE	F404-GE-400	24	24	-	48
Bombardier Challenger 600 5GE084 NONE	CF34-3B	443	443	-	886
Bombardier Global 5000 Business 4BR009 NONE	BR700-710A2-20	69	69	-	138
Bombardier Learjet 35 1AS002 NONE	TFE731-3	1,476	1,476	-	2,952
CASA CN-235-100 CT79B NONE	CT7-9B	60	60	83	203
Cessna 150 Series O200 NONE	O-200	6,993	6,993	11,045	25,031
Cessna 172 Skyhawk IO360 NONE	IO-360-B	493	493	-	986
Cessna 182 IO360 NONE	IO-360-B	695	695	-	1,390
Cessna 206 TIO540 IO-540-AC	TIO-540-J2B2	490	490	-	980
Cessna 208 Caravan PT6A14 NONE	PT6A-114	808	808	-	1,616
Cessna 441 Conquest II TPE10A NONE	TPE331-10A	648	648	-	1,296
Cessna 500 Citation I 1PW038 NONE	JT15D-5C	563	563	-	1,126
Cessna 550 Citation II 1PW036 NONE	JT15D-4series	498	498	-	996
Cessna 650 Citation III 1AS001 NONE	TFE731-2-2B	44	44	-	88
Cessna 680 Citation Sovereign 7PW078 NONE	PW306B Annular	194	194	-	388
Cessna 750 Citation X 6AL024 NONE	AE3007C1 Type 2	78	78	-	156
COMSEP	TIO-540-J2B2	2,040	2,040	692	4,772
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	PT6A-20	3,984	3,984	-	7,968
Eclipse 500 / PW610F NONE	PW610F Annular	50	50	-	100

Aircraft Model	Engine	2019 Existing Condition			
		Arrival	Departure	TGO*	Total
Embraer ERJ145 6AL008 NONE	AE3007A1/1 Type 1	1	1	-	2
Gulfstream G400 6RR042 NONE	TAY 611-8C Transply IIJ	262	262	-	524
Gulfstream G500 4BR003 NONE	BR700-715B1-30	69	69	-	138
Hughes 500D 250B17 NONE	250B17B	66	66	-	132
Israel IAI-1125 Astra 1AS002 NONE	TFE731-3	76	76	-	152
Lockheed C-130 Hercules T56A14 NONE	T56-A-14	347	347	960	1,654
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	T56-A-14	360	360	-	720
McDonnell Douglas A-4 Skyhawk J52P4 NONE	J52-P-408	30	30	-	60
Mitsubishi MU-300 Diamond 1PW037 NONE	JT15D-5, -5A, -5B	123	123	-	246
Piper PA-24 Comanche TIO540 NONE	TIO-540-J2B2	11,723	11,723	20,615	44,061
Piper PA-30 Twin Comanche IO320 NONE	IO-320-D1AD	636	636	-	1,272
Piper PA-42 Cheyenne Series PT6A41 NONE	PT6A-41	164	164	-	328
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	TIO-540-J2B2	159	159	-	318
Rockwell T-2 Buckeye J852 NONE	J85-GE-2	34	34	-	68
7Saab 340-A CT7-5 NONE	CT7-5	272	272	-	544
Sikorsky SH-60 Sea Hawk T70041 NONE	T700-GE-401 -401C	246	246	-	492
T-38 Talon J855HA NONE	J85-GE-5H (w/AB)	40	40	-	80
	Total	**39,457**	**39,457**	**34,484**	**113,398**

Sources: AECOM, 2020; AEDT.
Notes: *TGO = Touch and go operation;
Values may reflect rounding.

Table 1.1-3b 2022 Aircraft Fleet Mix and Activity

Aircraft Model	Engine	2022 No Action				2022 Proposed Project			
		Arrival	Departure	TGO*	Total	Arrival	Departure	TGO*	Total
1985 1-ENG COMP	TIO-540-J2B2	2,714	2,714	697	6,125	2,714	2,714	697	6,125
Aerospatiale SA-350D Astar (AS-350)	TPE331-3	385	385	-	770	385	385	-	770
Agusta A-109	250B17B	144	144	-	288	144	144	-	288
Airbus A319-100 Series	CFM56-5B9/2P DAC	210	210	-	420	210	210	-	420
Airbus A320-200 Series	CFM56-5B4/2 DAC	90	90	-	180	90	90	-	180
Bell 206L-4T Long Ranger	250B17B	48	48	-	96	48	48	-	96
Boeing 737-800 Series	CFM56-7B20/2	373	373	-	746	373	373	-	746
Boeing 737-800 Series (Cargo)	CFM56-7B20/2	2,190	2,190	-	4,380	4,928	4,928	-	9,856
Boeing 757-200 Series	PW2040	184	184	-	368	184	184	-	368
Boeing 767-300 ER Freighter	CF6-80C2B7F	1,460	1,460	-	2,920	1,643	1,643	-	3,286
Boeing F/A-18 Hornet	F404-GE-400	26	26	-	52	26	26	-	52
Bombardier Challenger 600	CF34-3B	625	625	-	1,250	625	625	-	1,250
Bombardier Global 5000 Business	BR700-710A2-20	97	97	-	194	97	97	-	194
Bombardier Learjet 35	TFE731-3	2,084	2,084	-	4,168	2,084	2,084	-	4,168

Aircraft Model	Engine	2022 No Action				2022 Proposed Project			
		Arrival	Departure	TGO*	Total	Arrival	Departure	TGO*	Total
CASA CN-235-100	CT7-9B	67	67	48	182	67	67	48	182
Cessna 150 Series	O-200	9,290	9,290	11,133	29,713	9,290	9,290	11,133	29,713
Cessna 172 Skyhawk	IO-360-B	656	656	-	1,312	656	656	-	1,312
Cessna 182	IO-360-B	925	925	-	1,850	925	925	-	1,850
Cessna 206	TIO-540-J2B2	651	651	-	1,302	651	651	-	1,302
Cessna 208 Caravan	PT6A-114	471	471	-	942	471	471	-	942
Cessna 441 Conquest II	TPE331-10A	377	377	1,148	1,902	377	377	1,148	1,902
Cessna 500 Citation I	JT15D-5C	796	796	-	1,592	796	796	-	1,592
Cessna 550 Citation II	JT15D-4series	704	704	-	1,408	704	704	-	1,408
Cessna 650 Citation III	TFE731-2-2B	62	62	-	124	62	62	-	124
Cessna 680 Citation Sovereign	PW306B Annular	274	274	-	548	274	274	-	548
Cessna 750 Citation X	AE3007C1 Type 2	110	110	-	220	110	110	-	220
DeHavilland DHC-6-100 Twin Otter	PT6A-20	2,320	2,320	-	4,640	2,320	2,320	-	4,640
Eclipse 500 / PW610F	PW610F Annular	70	70	-	140	70	70	-	140
Gulfstream G400	TAY 611-8C Transply IIJ	369	369	-	738	369	369	-	738
Gulfstream G500	BR700-715B1-30	97	97	-	194	97	97	-	194
Hughes 500D	250B17B	241	241	-	482	241	241	-	482
Israel IAI-1125 Astra	TFE731-3	107	107	-	214	107	107	-	214

Aircraft Model	Engine	2022 No Action				2022 Proposed Project			
		Arrival	Departure	TGO*	Total	Arrival	Departure	TGO*	Total
Lockheed C-130 Hercules	T56-A-14	381	381	556	1,318	381	381	556	1,318
Lockheed P-3 Orion ANP:P3A	T56-A-14	396	396	-	792	396	396	-	792
Mitsubishi MU-300 Diamond	JT15D-5, -5A, -5B	174	174	-	348	174	174	-	348
Piper PA-24 Comanche	TIO-540-J2B2	15,583	15,583	20,780	51,946	15,583	15,583	20,780	51,946
Piper PA-30 Twin Comanche	IO-320-D1AD	370	370	-	740	370	370	-	740
Piper PA-42 Cheyenne Series	PT6A-41	95	95	-	190	95	95	-	190
Raytheon Beech Baron 58	TIO-540-J2B2	2,912	2,912	6,503	12,327	2,912	2,912	6,503	12,327
Robinson R44 Raven / Lycoming O-540-F1B5	TIO-540-J2B2	1,649	1,649	-	3,298	1,649	1,649	-	3,298
Saab 340-A	CT7-5	158	158	-	316	158	158	-	316
Sikorsky SH-60 Sea Hawk	T700-GE-401 -401C	692	692	-	1,384	692	692	-	1,384
	Total	**50,629**	**50,629**	**40,865**	**142,123**	**53,549**	**53,549**	**40,865**	**147,963**

Sources: AECOM, 2020; AEDT.
Notes: *TGO = Touch and go operation;
Values may reflect rounding.

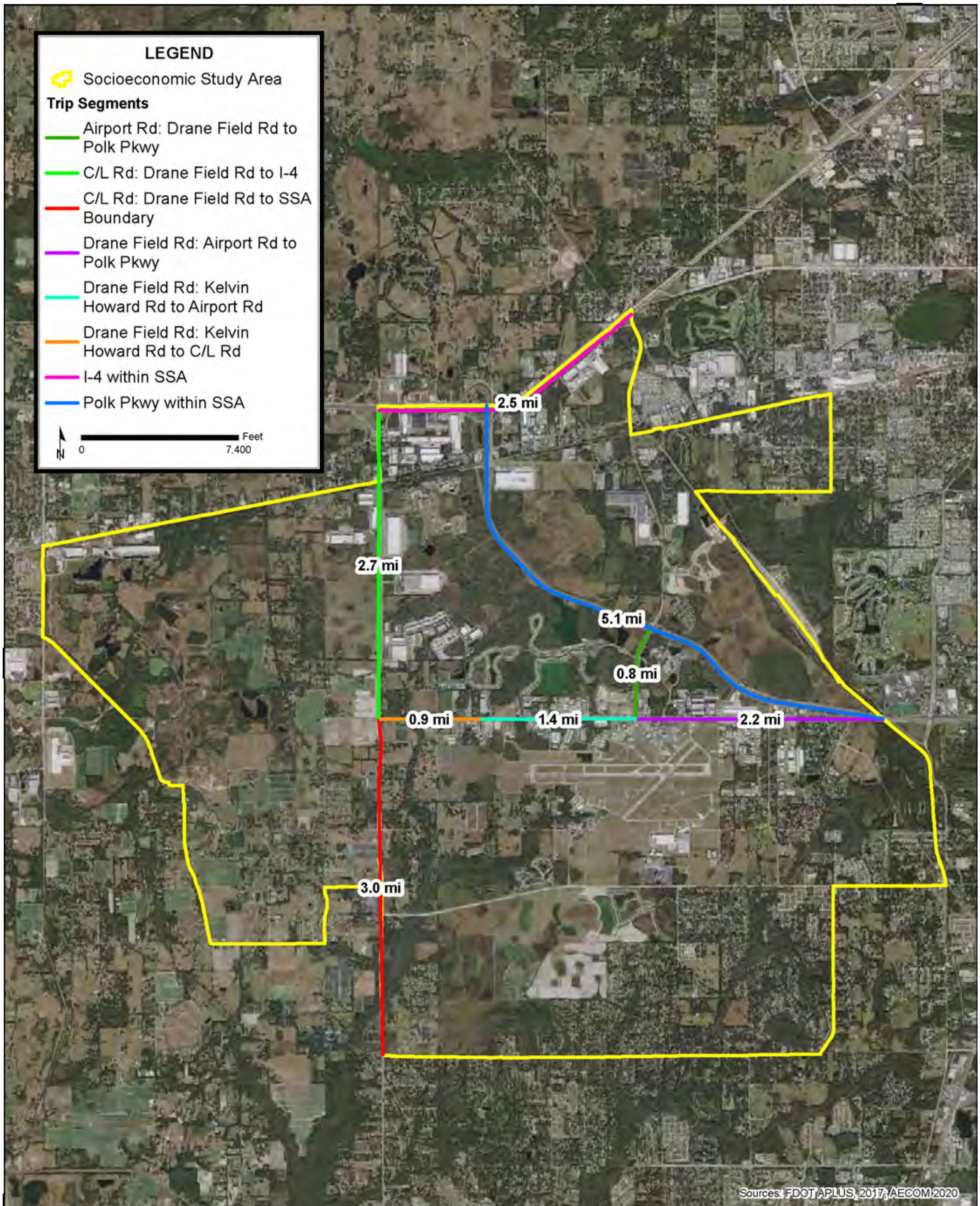
Table 1.1-3c 2027 Aircraft Fleet Mix and Activity

Aircraft Model	Engine	2027 No Action				2027 Proposed Project			
		Arrival	Departure	TGO*	Total	Arrival	Departure	TGO*	Total
1985 1-ENG COMP	TIO-540-J2B2	3,071	3,071	893	7,035	3,071	3,071	893	7,035
Aerospatiale SA-350D Astar (AS-350)	TPE331-3	788	788	-	1,576	788	788	-	1,576
Agusta A-109	250B17B	295	295	-	590	295	295	-	590
Airbus A319-100 Series	CFM56-5B9/2P DAC	244	244	-	488	244	244	-	488
Airbus A320-200 Series	CFM56-5B4/2 DAC	104	104	-	208	104	104	-	208
Bell 206L-4T Long Ranger	250B17B	98	98	-	196	98	98	-	196
Boeing 737-800 Series	CFM56-7B20/2	431	431	-	862	431	431	-	862
Boeing 737-800 Series (Cargo)	CFM56-7B20/2	2,190	2,190	-	4,380	6,023	6,023	-	12,046
Boeing 757-200 Series	PW2040	212	212	-	424	212	212	-	424
Boeing 767-300 ER Freighter	CF6-80C2B7F	1,460	1,460	-	2,920	2,008	2,008	-	4,015
Boeing F/A-18 Hornet	F404-GE-400	26	26	-	52	26	26	-	52
Bombardier Challenger 600	CF34-3B	953	953	-	1,906	953	953	-	1,906
Bombardier Global 5000 Business	BR700-710A2-20	148	148	-	296	148	148	-	296
Bombardier Learjet 35	TFE731-3	3,176	3,176	-	6,352	3,176	3,176	-	6,352

Aircraft Model	Engine	2027 No Action				2027 Proposed Project			
		Arrival	Departure	TGO*	Total	Arrival	Departure	TGO*	Total
CASA CN-235-100	CT7-9B	68	68	106	242	68	68	106	242
Cessna 150 Series	O-200	10,526	10,526	14,271	35,323	10,526	10,526	14,271	35,323
Cessna 172 Skyhawk	IO-360-B	742	742	-	1,484	742	742	-	1,484
Cessna 182	IO-360-B	1,047	1,047	-	2,094	1,047	1,047	-	2,094
Cessna 206	TIO-540-J2B2	737	737	-	1,474	737	737	-	1,474
Cessna 208 Caravan	PT6A-114	538	538	-	1,076	538	538	-	1,076
Cessna 441 Conquest II	TPE331-10A	431	431	1,200	2,062	431	431	1,200	2,062
Cessna 500 Citation I	JT15D-5C	1,212	1,212	-	2,424	1,212	1,212	-	2,424
Cessna 550 Citation II	JT15D-4series	1,072	1,072	-	2,144	1,072	1,072	-	2,144
Cessna 650 Citation III	TFE731-2-2B	94	94	-	188	94	94	-	188
Cessna 680 Citation Sovereign	PW306B Annular	418	418	-	836	418	418	-	836
Cessna 750 Citation X	AE3007C1 Type 2	168	168	-	336	168	168	-	336
DeHavilland DHC-6-100 Twin Otter	PT6A-20	2,652	2,652	-	5,304	2,652	2,652	-	5,304
Eclipse 500 / PW610F	PW610F Annular	107	107	-	214	107	107	-	214
Gulfstream G400	TAY 611-8C Transply IIJ	563	563	-	1,126	563	563	-	1,126
Gulfstream G500	BR700-715B1-30	148	148	-	296	148	148	-	296
Hughes 500D	250B17B	492	492	-	984	492	492	-	984
Israel IAI-1125 Astra	TFE731-3	163	163	-	326	163	163	-	326

Aircraft Model	Engine	2027 No Action				2027 Proposed Project			
		Arrival	Departure	TGO*	Total	Arrival	Departure	TGO*	Total
Lockheed C-130 Hercules	T56-A-14	388	388	1,228	2,004	388	388	1,228	2,004
Lockheed P-3 Orion ANP:P3A	T56-A-14	403	403	-	806	403	403	-	806
Mitsubishi MU-300 Diamond	JT15D-5, -5A, -5B	265	265	-	530	265	265	-	530
Piper PA-24 Comanche	TIO-540-J2B2	17,644	17,644	26,636	61,924	17,644	17,644	26,636	61,924
Piper PA-30 Twin Comanche	IO-320-D1AD	423	423	-	846	423	423	-	846
Piper PA-42 Cheyenne Series	PT6A-41	109	109	-	218	109	109	-	218
Raytheon Beech Baron 58	TIO-540-J2B2	3,595	3,595	7,040	14,230	3,595	3,595	7,040	14,230
Robinson R44 Raven / Lycoming O-540-F1B5	TIO-540-J2B2	2,456	2,456	-	4,912	2,456	2,456	-	4,912
Saab 340-A	CT7-5	181	181	-	362	181	181	-	362
Sikorsky SH-60 Sea Hawk	T700-GE-401 -401C	803	803	-	1,606	803	803	-	1,606
Total		**60,643**	**60,643**	**51,374**	**172,660**	**65,023**	**65,023**	**51,374**	**181,420**

Sources: AECOM, 2020; AEDT.
Notes: *TGO = Touch and go operation;
Values may reflect rounding.



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LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

ROADWAY SEGMENTS INCLUDED IN AIR QUALITY ANALYSIS

FIGURE 1.1-1

Table 1.1-4 Estimated Annual Motor Vehicle Operations Activity

Description	2019 Existing Conditions	
Passenger Vehicle VMT	283,004,537	
Heavy Truck VMT	14,894,976	
Total	**297,899,513**	
Description	**2022 No-Action**	**2022 Proposed Project**
Passenger Vehicle VMT	285,161,025	296,537,163
Heavy Truck VMT	66,071,561	71,864,569
Total	**351,232,586**	**368,401,732**
Description	**2027 No-Action**	**2027 Proposed Project**
Passenger Vehicle VMT	306,797,060	324,925,101
Heavy Truck VMT	75,866,582	89,252,580
Total	**382,663,642**	**414,177,681**

Sources: AECOM, 2020
Note: 2022 and 2027 No-Action includes traffic increases resulting from Phase I Cargo Facility Development

Emission rates, (including vehicle age distributions, inspection and maintenance programs, to the extent applied, fuel supply and other data) for cargo trucks and employee vehicles were derived using MOVES, as described in **Section 1.1.1** above. Cargo trucks were assumed to be single utility short-haul diesel trucks. Private passenger vehicles, including employee vehicles, were assumed to be gasoline passenger cars. Emission rates used for the analysis of motor vehicle emissions are shown in **Table 1.1-5**.

Table 1.1-5 On-road Vehicle Emission Rates

Vehicle Type	Fuel Type	Average Speed (mph)	2019 Emission Rates (Grams per VMT)						
			CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Cargo Trucks	Diesel	60	1.460	2.827	0.210	0.270	0.007	0.431	782.731
Passenger Vehicles	Gasoline	60	3.458	0.247	0.005	0.016	0.006	0.177	303.303
Vehicle Type	**Fuel Type**	**Average Speed (mph)**	**2022 Emission Rates (Grams per VMT)**						
			CO	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO_2e**
Cargo Trucks	Diesel	60	1.124	2.053	0.148	0.203	0.007	0.312	775.843
Passenger Vehicles	Gasoline	60	2.971	0.175	0.005	0.016	0.006	0.142	281.268
Vehicle Type	**Fuel Type**	**Average Speed (mph)**	**2027 Emission Rates (Grams per VMT)**						
			CO	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**	**CO_2e**
Cargo Trucks	Diesel	60	0.672	1.307	0.082	0.131	0.006	0.167	759.664
Passenger Vehicles	Gasoline	60	2.311	0.102	0.005	0.015	0.005	0.108	239.603

Source: EPA MOVES2014b

Operations emissions for cargo truck and passenger vehicle traffic were further refined to account for increased idling emissions resulting from potential intersection delays associated with the Proposed Project. As discussed in the EA, a traffic analysis was conducted for the Proposed Project, in which estimated significant delays could result at the intersection of Kidron Road and Drane Field Road. Two traffic mitigation options are presented in the EA for this intersection: 1) add dedicated turning lanes at the intersection and retain the existing stop sign, and 2) add dedicated turn lanes and replace the existing stop sign with a traffic signal. Idle times were calculated for the Proposed Project without intersection delay mitigation, and with each of the proposed mitigation strategies, as described in **Appendix F** of the EA. Idle emissions were calculated for each study year using average idle times for the No-Action Alternative and for the Proposed Project with no traffic mitigation, with mitigation option 1, and with mitigation option 2, using **Equation 5**. Idle emission rates derived from MOVES2014b are presented in **Table 1.1-6**. Total passenger vehicle and cargo truck emissions presented in the EA include in-transit emissions and idle emissions at this intersection, for each scenario described above.

Equation 5:

$$\text{Emissions}_{(tpy)} = \sum_{v=i}^{n} EF_V \times \frac{\text{hours}}{\text{trip}} \times \frac{\text{trips}}{\text{year}} \div 2{,}000 \div 453.59$$

Where:

$\text{Emissions}_{(tpy)}$= annual emissions (tons per year)

EF_V= emissions rate for vehicle type v(i)…v(n) (grams per hour of idling)

2,000 = pounds per ton

453.59 = grams per pound

Table 1.1-6 On-road Vehicle Idling Emission Rates

Vehicle Type	Fuel Type	2019 Emission Rates (Grams per Idle Hour)						
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Cargo Trucks	Diesel	12.421	29.406	2.801	3.044	0.057	6.345	6,673.072
Passenger Vehicles	Gasoline	7.362	1.970	0.045	0.051	0.070	1.406	3,551.162
Vehicle Type	**Fuel Type**	**2022 Emission Rates (Grams per Idle Hour)**						
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	**VOC**	CO_2e
Cargo Trucks	Diesel	9.929	19.971	2.097	2.279	0.056	4.537	6,595.336
Passenger Vehicles	Gasoline	4.534	1.151	0.042	0.047	0.064	1.068	3,268.623
Vehicle Type	**Fuel Type**	**2027 Emission Rates (Grams per Idle Hour)**						
		CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	**VOC**	CO_2e
Cargo Trucks	Diesel	6.047	12.232	1.127	1.225	0.054	2.423	6,457.424
Passenger Vehicles	Gasoline	1.709	0.478	0.037	0.042	0.055	0.797	2,774.403

Source: EPA MOVES2014b

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APPENDIX D

Biological Assessment

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Environmental Assessment
for
Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL)

Biological Assessment

Prepared for:

City of Lakeland
Federal Aviation Administration

Prepared by:

AECOM

May 2020

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1.0 INTRODUCTION

The City of Lakeland (City), through their Airports Department, is undertaking an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA). The EA is being completed to support Phase II of ongoing air cargo facility development at Lakeland Linder International Airport (LAL or Airport), hereinafter referred to as the Proposed Project. The Proposed Project is an extension of development already underway to support air cargo service operations of Amazon Air at LAL. The purpose of the EA is to identify and consider the potential environmental impacts associated with the Proposed Project and any reasonable alternatives.

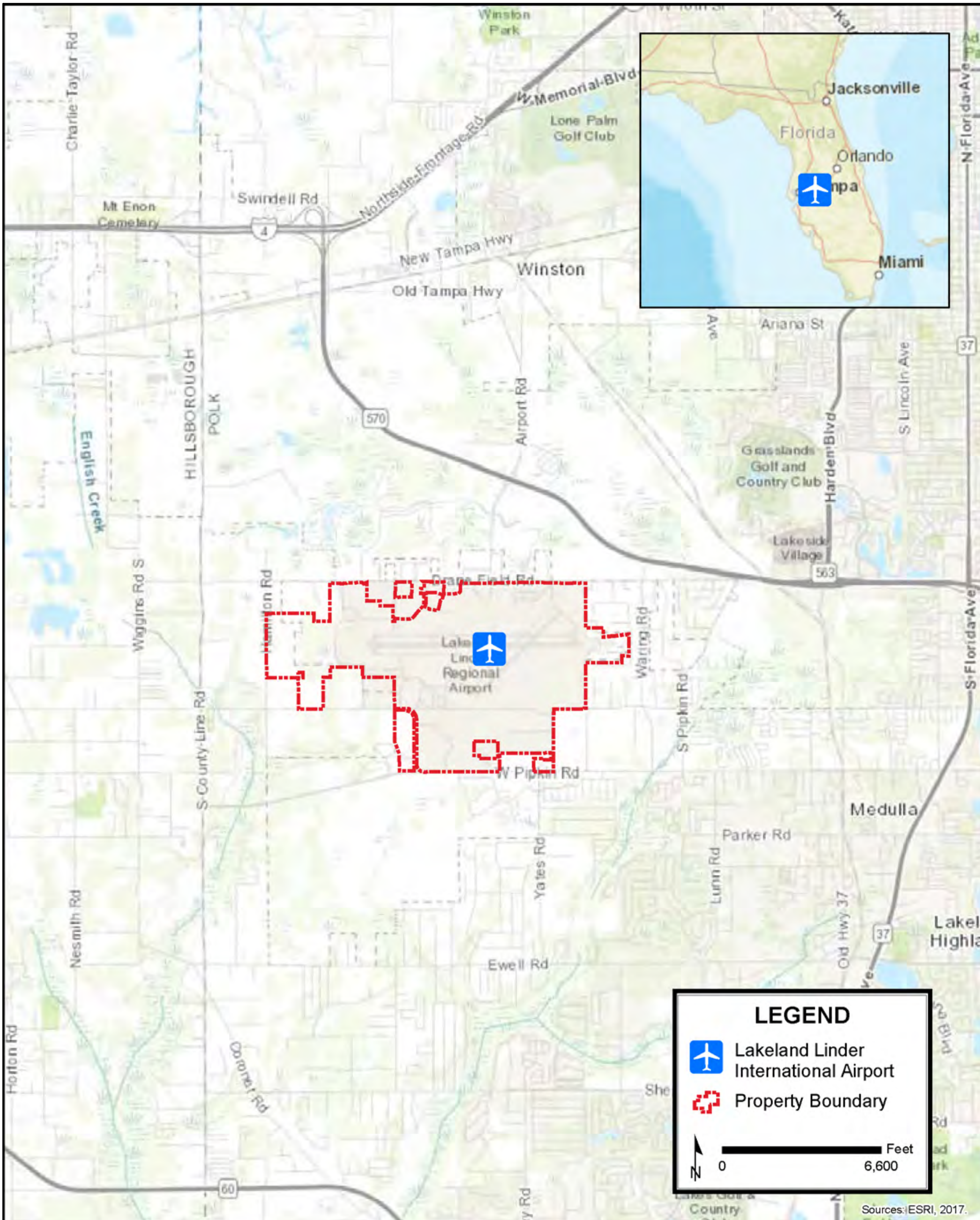
The Federal Aviation Administration (FAA) is the lead federal agency and is seeking to initiation informal consultation with the U.S. Fish and Wildlife Service (USFWS) per 50 Code of Federal Regulations (CFR) 402.13, as amended. To support the completion of consultation between the FAA and the USFWS under Section 7 of the Endangered Species Act of 1973, as amended (ESA), this Biological Assessment (BA) has been prepared to identify potential impacts to listed species within the study area of the Proposed Project. This BA is intended to: (1) describe the Proposed Project at LAL; (2) discuss the biology and distribution of plant and animal species that have the potential to be present in the project vicinity and have protection under the ESA; and (3) determine the potential effect of the Proposed Project on such ESA protected species. Preparation of this BA included field inspections by qualified biologists of habitats within and adjacent to the Action Area, as well as literature and database reviews. Details on the study methodologies and results are provided below.

1.1. AIRPORT DESCRIPTION

LAL is publicly owned and operated by the City of Lakeland. The Airport is located on approximately 1,710 acres in central Florida's Polk County, less than one mile east of the Hillsborough County Line, and approximately 3.5 miles south of Interstate Highway 4, five miles southwest of the City of Lakeland, and 27 miles east of Tampa International Airport (TPA). **Figure 1-1** depicts the location of the Airport as it relates to the City of Lakeland and surrounding areas.

The City holds an operating certificate issued under Title 14 CFR Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*[1], which allows the airport to allow scheduled air carrier service. At this time there is no scheduled air carrier service at LAL. The airport serves public, private, and corporate users that operate a mixed fleet of helicopters, single and twin-engine propeller aircraft, corporate jets, commercial aircraft (maintenance, repair), and military aircraft.

[1] CFR Part 139 requires FAA to issue Airport Operating Certificates to airports that serve scheduled and unscheduled air carrier aircraft with more than 30 seats. LAL meets this requirement. To maintain this certificate, LAL must meet certain operational and safety standards.



Path: C:\Users\a.norman\Desktop\Amazon\GIS\mxd\BA\Figure 1-1 Project Location_rev0.mxd, Date Saved: 5/5/2020 10:31:43 AM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

PROJECT LOCATION

FIGURE 1-1

The FAA's National Plan of Integrated Airport Systems (NPIAS) report identifies five-year funding needs for airports eligible to receive Airport Improvement Program grants. Each airport is classified based on annual enplanements (departing passengers). The 2019-2023 NPIAS (published on October 3, 2018)[2] classifies LAL as a national reliever airport. A reliever airport defined in the FAA's authorizing statute at 49 United States Code (U.S.C.), section 47102, as "an airport the Secretary designates to relieve congestion at a commercial service airport and to provide more general aviation access to the overall community." U.S. enplanements in 2017 were approximately 840 million, of which LAL recorded 223 (0.000027 percent).

1.2. DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Project is an expansion of an air cargo facility already under construction (Phase I) that will be operated by Amazon Air. Construction of Phase I is nearing completion. The Phase II expansion is being contemplated to accommodate expanded operations. A notional layout for the Proposed Project is shown on **Figure 1-2a** based on facility sizing needs. The Proposed Project would be developed on an approximate 60-acre site in the northwest quadrant of LAL, immediately west and adjacent to the Phase I development already in progress. All project components would be constructed on airport. Specific construction and operational activities included in the Proposed Project are listed below:

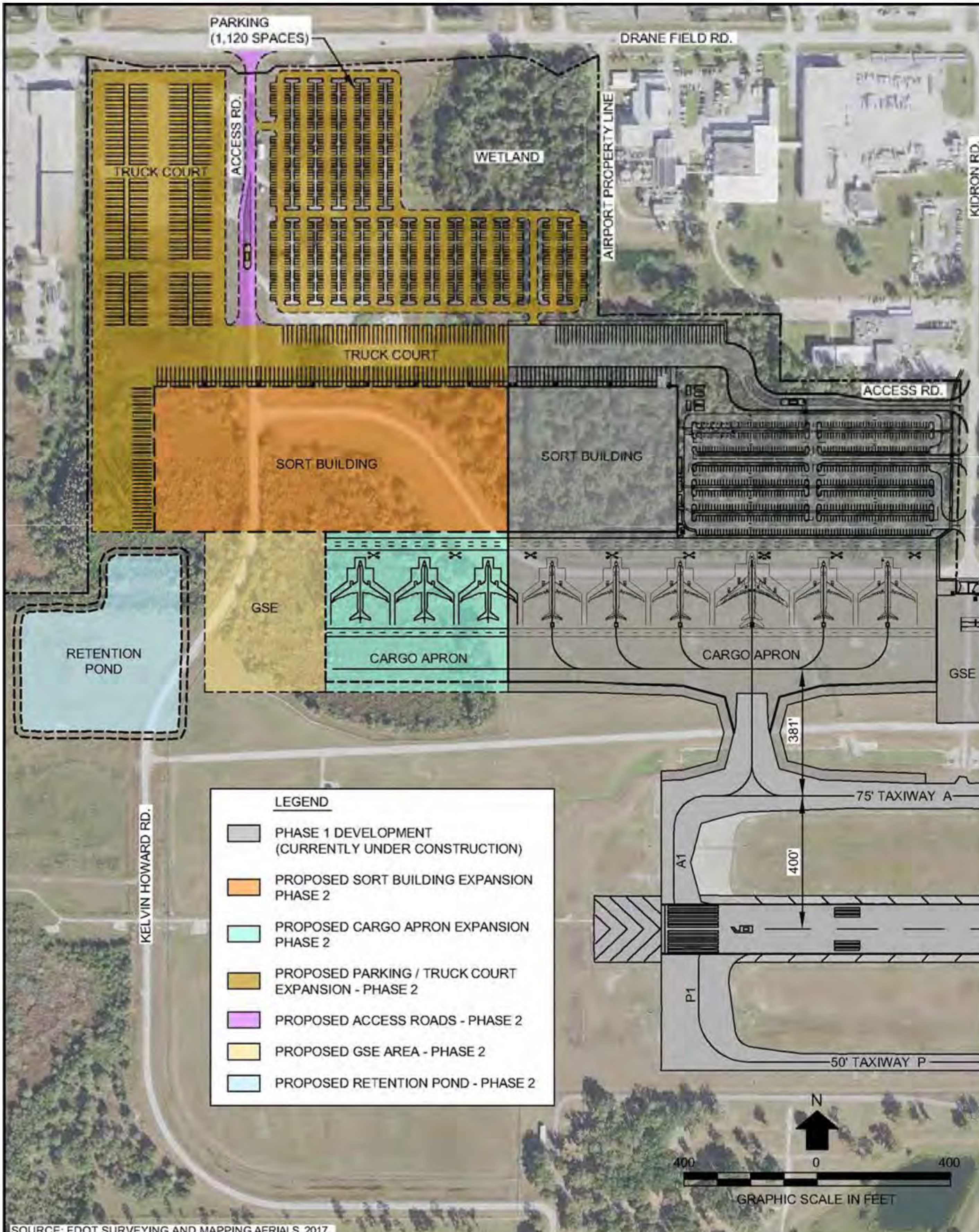
- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;
- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.
- Construct approximately 19,350 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to approve Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 16 additional aircraft operations per day at LAL during the facility's first year of operation (2022) and 24 additional daily operations in 2027. Similarly, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

[2] DOT, FAA. Report to Congress: National Plan of Integrated Airport Systems 2019-2023, 2018.

Additionally, to accommodate the potential need for additional aviation fueling capacity at LAL, a fuel farm is being proposed in an area separate from the Proposed Project footprint, at the intersection of Air Park Drive and Taxiway H (**Figure 1-2b**). Current projections indicate need for between six to eight aboveground tanks providing a total of 850,000 gallons of Jet A fuel capacity. There is potential for a small portion of this capacity to be dedicated to off-road equipment fuel (e.g., gasoline, diesel or hydrogen) if usage needs dictate once the facility is operational.

Due to the location and design of the Proposed Project shown in **Figures 1-2a** and **1-2b**, the Proposed Project will result in modification to potential habitat and permanent fill of wetlands. Impacts to potential upland and wetland habitats are discussed in detail in **Section 6.0**.



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EA PROPOSED PROJECT

FIGURE 1-2a

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C:\Civil 3D Projects\Amazon\FIG 1-2b.dwg 05/05/2020 13:16

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EA PROPOSED PROJECT FUEL FARM

FIGURE 1-2b

2.0 METHODOLOGY

The purpose of this BA is to describe the existing environmental conditions of the study area and the potential impacts to wetlands, other surface waters, and federal and state listed species that could occur as a result of the Proposed Project. The Action Area for the BA encompasses the construction footprint of the Proposed Project and comprises a total of 70.3 acres (**Figure 2-1**).

The potential presence of state and federally listed species within the Action Area was assessed by review of the following:

- Listed species accounts;
- 2013 Wildlife Hazard Assessment (WHA) completed at LAL (Environmental Science Associates, 2013);
- 2020 Wildlife Hazard Management Plan (WHMP) for LAL (LAL, 2020);
- U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) listings of species known to occur or potentially occurring in Charlotte County;
- Online database sources from the USFWS, FWC, and Florida Natural Areas Inventory (FNAI); and
- Field observations of habitats and wildlife species.

2.1. AGENCY COORDINATION

As part of the NEPA process, an Advance Notification of the Proposed Project was sent to the Florida Department of Environmental Protection (FDEP) State Clearinghouse requesting comments on the Proposed Project. Through this process, the Clearinghouse will request comments from the FWC on potential effects of the Proposed Project on listed species and potential permit requirements (see **Appendix A**). In addition, an official species list was requested from the USFWS Information for Planning and Consultation (IPaC) database (consultation code 04EF2000-2020-SLI-0368) and is provided in **Appendix A.**

2.2. DATA COLLECTION AND FIELD REVIEW

Documented occurrences of rare species likely to occur within Polk County were obtained from FNAI's Searchable Tracking List website (FNAI, 2020).

The following information was reviewed prior to the field review to characterize habitat features and land use patterns within the Action Area:

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ACTION AREA

FIGURE 2-1

Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\BA\Figure 2-1 Biological Study Areas_rev0.mxd, Date Saved: 5/14/2020 7:46:16 AM


LEGEND
Action Area
N
Feet
0
1,000

- U.S. Geological Survey 7.5 minute Topographical Quadrangle Map, Nichols, FL, 2018;
- Aerial photographs (Florida Department of Transportation [FDOT] Aerial Photo Look-up System [APLUS], 2017);
- U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS), *Web Soil Survey of Polk County, Florida.* (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) (NRCS, 2019);
- Florida Association of Professional Soil Scientists, *Hydric Soils of Florida Handbook*, Fourth Edition (Hurt, 2007);
- FDOT, *Florida Land Use, Cover and Forms Classification System Handbook* (FLUCFCS), Third edition (FDOT, 1999);
- Southwest Florida Water Management District (SWFWMD), FLUCFCS GIS Database (SWFWMD, 2017);
- USFWS, *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, *et al.,* 1979); and
- FDEP, Map Direct Gateway (http://ca.dep.state.fl.us/mapdirect/gateway.jsp), (FDEP, 2020).

AECOM environmental scientists familiar with Florida's natural communities conducted a field review within the Action Area on April 29, 2020. During the field review, each vegetative community and land use type within the Action Area was visually inspected to assess approximate boundaries and document dominant vegetation. Exotic plant infestations and other disturbances such as erosion and existing structures (i.e. riprap) were noted. Field activities also included identifying wildlife and signs of wildlife usage within the Action Area and within adjacent habitats.

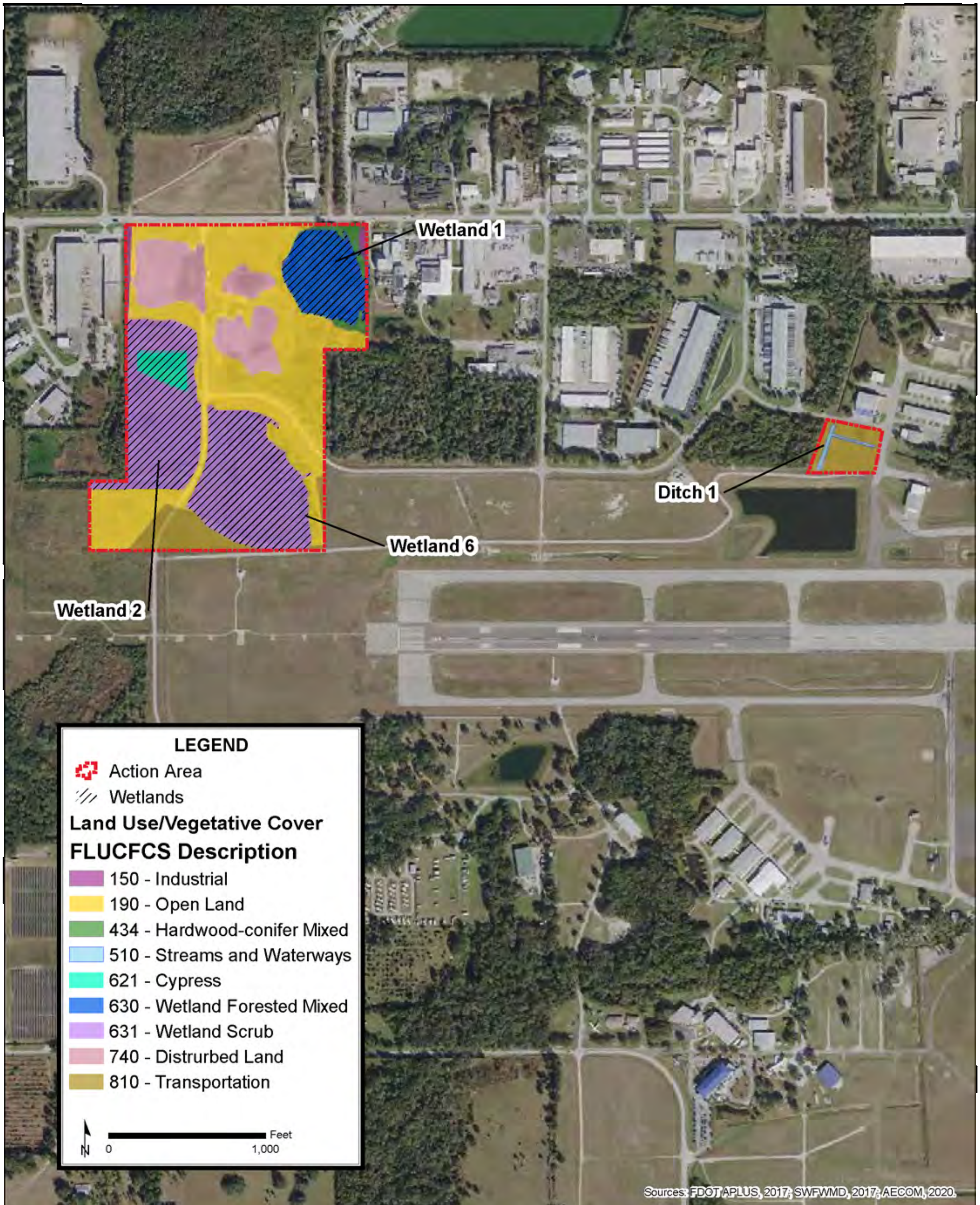
3.0 EXISTING LAND USES AND VEGETATIVE COVER

Based on in-house and field reviews, five upland community types, three wetland community types, and one surface water community type are present within the Action Area (**Figure 3-1**). All vegetative habitats and land uses within the Action Area were classified using FLUCFCS (FDOT 1999). Wetland habitats were also classified using the *USFWS Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et. al., 1979). A summary description of each land use/vegetative cover type is provided below. T**able 3-1** summarizes the acreage of each land use/vegetative cover type within the Action Area.

3.1. UPLAND LAND USE/VEGETATIVE COVER

<u>Industrial</u>
FLUCFCS: 150

The Industrial category encompasses those land uses where manufacturing, assembly or processing of materials and products are accomplished. Within the Action Area, industrial land use is located at the northwest and northeast margins of the Action Area adjacent to off-airport developed land, and comprises approximately 0.6 acre of the Action Area.



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EXISTING LAND USE/ VEGETATIVE COVER

FIGURE 3-1

Open Land
FLUCFCS: 190

Open land includes undeveloped land within urban areas that does not typically exhibit any structures or any indication of intended use. Open land comprises approximately 26.3 acres of the Action Area and is includes mostly mowed/maintained Bahia grass (*Paspalum notatum*). It is a dominant cover type throughout the Action Area.

Hardwood-Conifer Mixed
FLUCFCS: 434

This vegetative cover type is reserved for those forested areas in which neither upland conifers nor hardwoods achieve a 66 percent crown canopy dominance. Within the Action Area, these areas predominantly consist of live oak (*Quercus virginiana*), slash pine (*Pinus elliottii*), wax myrtle (*Morella cerifera*), cogon grass (*Imperata cylindrica*), and muscadine grape (*Vitis rotundifolia*). Hardwood-conifer mixed is located in the northeast portion of the Action Area south of Drane Field Road adjacent to Wetland 1, and comprises approximately 0.9 acre of the Action Area.

Disturbed
FLUCFCS: 740

Disturbed lands are those areas which have been changed due primarily to human activities other than mining. Disturbed lands are located in the northwest portion of the Action Area west of Kelvin Howard Road and in the north-central portion east of Kelvin Howard Road and north of Air Park Drive. These areas are currently used as staging areas for the construction of Phase I Air Cargo Facility east of the Proposed Project area. This land use type comprises approximately 8.3 acres of the Action Area.

Transportation
FLUCFCS: 810

Transportation facilities are used for the movement of people and goods. Within the Action Area, this land use type includes unpaved areas adjacent to the airfield that are dominated by ruderal grasses that are regularly mowed as part of airport maintenance and operations. This land use type also includes portions of roadway on Airport property. The transportation land use comprises approximately 5.8 acres of the Action Area.

Table 3-1: Existing Land Use and Vegetative Communities within the Action Area

Vegetative Community/ Land Use	FLUCFCS[1] Code	USFWS Classification[2]	Acres in Action Area
Uplands			
Industrial	150	N/A	0.6
Open Land	190	N/A	26.3
Hardwood-Conifer Mixed	434	N/A	0.9
Disturbed	740	N/A	8.3
Transportation	810	N/A	5.8
		Subtotal Uplands	***41.9***
Wetlands			
Cypress	621	PFO2C	1.4
Wetland Forested Mixed	630	PFO1/3C	5.6
Wetland Scrub	631	PFO1/2C	21.1
		Subtotal Wetlands	***28.1***
Other Surface Waters			
Streams and Waterways	510	PUBx	0.3
		Subtotal Other Surface Waters	***0.3***
		TOTAL	**70.3**

[1] FDOT, 1999.
[2] Cowardin, Lewis M., *et.al.* 1979.
Notes: NA = Not applicable; PFO2C = palustrine, forested, needle-leaved deciduous, seasonally flooded; PFO1/3C = palustrine, forested, broad-leaved deciduous/needle-leaved evergreen, seasonally flooded; PFO1/2C = palustrine, forested, needle-leaved/broad-leaved deciduous, seasonally flooded; PUBx = palustrine, unconsolidated bottom, excavated

3.2. WETLAND AND OTHER SURFACE WATER LAND USE/VEGETATIVE COVER

Streams and Waterways
FLUCFCS: 510
USFWS: PUBx – Palustrine, Unconsolidated Bottom, Excavated

Streams and waterways include linear water bodies such as rivers, creeks, canals, and ditches. Within the Action Area, this classification type includes an upland-cut drainage ditch (Ditch 1) that is seasonally inundated by surface water during the wet season and intermittently flooded after rainfall events in the dry season. This ditch is located in the proposed fuel area and consists of steep slopes and a sandy bottom. Vegetation within the ditch consists of primrose willow (*Ludwigia peruviana*), camphorweed (*Pluchea rosea*), elderberry (*Sambucus canadensis*), pennywort (*Hydrocotyle* spp.), and dogfennel (*Eupatorium capillifolium*). Ditch 1 is part of a stormwater management system that directs water into the stormwater pond directly south of the ditch. It is under the jurisdiction of the SWFWMD through Environmental Resource Permit Number 49002237.068 issued in October 2010. This ditch comprises approximately 0.3 acre of the Action Area. During the April 29, 2020 field review, the ditch was inundated with approximately 12 inches of water and various fish species were observed.

Cypress
FLUCFCS: 621
USFWS: PFO2C – Palustrine, Forested, Needle-leaved Deciduous, Seasonally Flooded

Within the Action Area, this community type is composed of bald cypress (*Taxodium distichum*) which is either pure or predominant. Within the Action Area, approximately 1.4 acres of cypress wetland occur west of Kelvin Howard Road and comprise the central portion of Wetland 2.

Wetland Forested Mixed
FLUCFCS: 630
USFWS: PFO1/3C – Palustrine, Forested, Broad-leaved Deciduous/Needle-leaved Evergreen, Seasonally Flooded

This category includes mixed wetlands forest communities in which neither hardwoods or conifers achieve a 66 percent dominance of the crown canopy composition. This area consists of Wetland 1 and predominantly consists of water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), slash pine, red maple (*Acer rubrum*), Carolina willow (*Salix caroliniana*), Virginia chain fern (*Woodwardia virginica*), and primrose willow. Wetland forested mixed comprises approximately 5.6 acres and is located east of Kelvin Howard Road south of Drane Field Road in the northeast section of the Action Area.

Wetland Scrub
FLUCFCS: 631
USFWS: PFO1/2C – Palustrine, Forested, Broad-leaved/Needle-leaved Deciduous, Seasonally Flooded

Wetland scrub is associated with topographic depressions and poorly drained soils consisting of low scrub species. Within the Action Area, this consists of Wetland 6 and the north and south portions of Wetland 2. During the April 29, 2020 field review, these areas appeared to be transitioning into forested wetland community types. Dominant vegetative species include cypress, Carolina willow, red maple, sweet bay (*Magnolia virginiana*), saltbush (*Baccharis halimifolia*), elderberry, Virginia chain fern, primrose willow, and poison ivy (*Toxicodendron radicans*). The outer fringe of these areas consist of Brazilian pepper (*Schinus terebinthifolia*), peppervine (*Nekemias arborea*), cogon grass, and wax myrtle. Wetland scrub comprises approximately 21.1 acres of the Action Area.

4.0 WILDLIFE

The open areas within the Action Area provide potential habitat for various lizards, snakes, field birds, gallinaceous birds, shrews, rats, rabbits, skunks, coyotes, and bobcats. However, these areas are regularly mowed which limits the amount of sufficient cover provided to these species. The forested and scrub wetlands in the Action Area provide potential habitat for various songbirds, snakes, wading birds, and small mammals. The drainage ditch (Ditch 1) provides potential habitat for freshwater turtles, wading birds, fish, and frogs. The utilization of these habitats on the Airport property by large-bodied mammals (i.e., deer, feral pigs, coyotes, etc.) is limited due to existing security fencing around the Airport property, the ongoing activities of the Phase 1 construction, and roadways. During the April 29, 2020 field review, red-winged blackbirds (*Agelaius phoeniceus*) were observed within the forested wetlands and various fish were observed within Ditch 1.

An FAA-approved WHMP is implemented at LAL and was last revised on January 26, 2020. As part of the WHMP, the City, as the Airport Sponsor, is responsible for implementing measures that will minimize and/or eliminate hazardous wildlife on Airport property. Based on a WHA conducted in June 2013, wildlife groups were identified as having the most significant threat to air operations at LAL. These groups were identified as:

- Large wading birds such as Florida sandhill cranes, wood storks, and great egrets.
- Medium-sized wading birds that forage or fly in groups such as cattle egrets and white ibis;
- Large raptors such as bald eagles, hawks, osprey, and vultures;
- Small birds that fly in flocks or groups such as red-winged blackbirds and swallows;
- Large/medium-sized mammals such as coyotes, feral hogs, bobcats, and raccoons.

In July 2013, a Depredation permit and a Migratory Depredation Wildlife Permit was obtained from the USFWS that is renewed annually and authorizes the City to legally take, using methods specified by USFWS, listed species and migratory bird species that pose a threat to human safety.

5.0 LISTED SPECIES

The Action Area was evaluated for potential occurrences of federally and state listed plant and animal species. For a listed species to be considered potentially occurring within the Action Area, appropriate habitat for reproduction, nesting, foraging, feeding, or resting must be present in the Action Area and the Action Area must be located within the species' geographical range. Federally listed species are those plant and animal species protected by the federal government pursuant to the ESA. Federally listed species are classified as endangered or threatened. State listed species are those plant and animal species managed by the state of Florida pursuant to Chapter 5B-40 Florida Administrative Code (F.A.C.) and Chapter 68A-27 F.A.C, respectively. State listed species are classified as endangered, threatened, species of special concern (animals), or commercially exploited (plants). During the April 29, 2020 field review, the Action Area was assessed for the presence of, or potential use by, federally and state listed plant and animal species. The following literature and online data sources were used to collect information concerning the potential presence of federally and/or state listed species within the Action Area:

- USFWS, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12, updated April 8, 2019 (USFWS, 2019);
- USFWS, IPaC (https://ecos.fws.gov/ipac) (USFWS, 2020);

- FWC, *Florida's Endangered Species, Threatened Species, and Species of Special Concern*, Chapter 68A-27 F.A.C, updated December 2018 (FWC, 2018);
- FWC, Eagle Nest Locator website (http://myfwc.com/eagle/eaglenests/nestlocator.aspx) (FWC, 2020);
- FNAI, Polk County Tracking List, (http://fnai.org/bioticssearch.cfm), updated April 2019 (FNAI, 2019);
- Florida Department of Agriculture & Consumer Services, Division of Plant Industry (FDACS), 2010 *Notes on Florida's Endangered and Threatened Plants: Botany Contribution No. 38, 5th edition*; and
- Nature*Serve* Explorer maps and database (http://www.natureserve.org/explorer/), (NatureServe, 2020).

The listed species with potential to occur within the Action Area are described below. **Table 5-1** provides a summary of the listed and protected species with potential to occur within the Action Area.

Table 5-1: Listed Species[1] Potentially Occurring within Action Area

Scientific Name	Common Name	Federal Status[2]	State Status[3]	Habitat Preference
Plants				
Agrimonia incisa	Incised groove-bur	NL	T	Longleaf pine-deciduous scrub oak, sandy or sandy loam; open pine woods or mixed pine-oak woods, bluffs, small clearings and old roads.
Ophioglossum palmatum	Hand fern	NL	E	Forested wetlands typically at the base of cabbage palms.
Pecluma ptilota var. bourgeauana	Comb (swamp) polypody	NL	E	Rockland hammocks, strand swamps, and wet woods; often on tree bases and fallen logs.
Platanthera integra	Yellow fringeless orchid	NL	E	Marshes, swamps, acid bogs, low pine barrens.
Salix floridana	Florida willow	NL	E	Wet, mucky soils in bottomland forests, floodplains, hydric hammocks, swamps, edges of spring-runs, and streams
Thelypteris serrata	Toothed maiden fern	NL	E	Cypress swamps, sloughs, floodplains.
Reptiles				
Drymarchon corais couperi	Eastern indigo snake	T	T	Various habitats with the exception of open water.
Gopherus polyphemus	Gopher tortoise	C	T	Dry upland habitats, including disturbed habitats such as pastures, old fields, and road shoulders.
Birds				
Antigone canadensis pratensis	Florida sandhill crane	NL	T	Prairies, freshwater marshes, and pastures.
Aphelocoma	Florida scrub jay	T	T	Fire-dominated xeric oak

Scientific Name	Common Name	Federal Status[2]	State Status[3]	Habitat Preference
coerulescens				communities on well drained sandy soils. ***LAL is located within USFWS Consultation Area for the Florida scrub jay.**
Athene cunicularia floridana	Florida burrowing owl	NL	T	High, sparsely vegetated, sandy ground. Natural habitats include dry prairie and sandhill. Makes extensive use of ruderal areas such as pastures, airports, road right-of-ways, and vacant spaces in residential areas.
Egretta caerulea	Little blue heron	NL	T	Permanently and seasonally flooded wetlands, streams, lakes, and swamps, and in manmade impoundments and ditches.
Egretta tricolor	Tricolored heron	NL	T	Permanently and seasonally flooded wetlands, streams, lakes, and swamps, and in manmade impoundments and ditches.
Falco sparverius Paulus	Southeastern American kestrel	NL	T	Open pine habitats, woodland edges, prairies and pastures.
Mycteria americana	Wood stork	T	T	Nests in inundated forested wetlands. Forages in freshwater marshes, swamps, flooded pastures.
Polyborus plancus audubonii	Audubon's crested caracara	T	T	Open country with scattered cabbage palms, cabbage palm/live oak hammocks, and shallow ponds/sloughs. ***LAL is located within USFWS Consultation Area for the crested caracara.**
Rostrhamus sociabilis plumbeus	Everglade snail kite	E	E	Large, open freshwater marshes and lakes; open water areas without emergent vegetation required for foraging; nests 1-5 m above water in low shrub/tree, sawgrass, maidencane habitat. ***LAL is located within USFWS Consultation Area for the snail kite.**
Other Species of Concern				
Haliaeetus leucocephalus	Bald eagle	NL[4]	NL[4]	Nests in tall trees. Forages near bodies of water.
Ursus americanus floridanus	Florida black bear	NL[5]	NL[5]	A wide variety of forested communities including forested wetlands.

Note:

T = Threatened; E = Endangered; NL = Not Listed; C = Candidate
[1] As reported by the "FNAI Tracking List, Polk County" http://www.fnai.org. (FNAI, 2020) and the USFWS IPaC "Official Species List" (USFWS, 2020).
[2] As listed by the USFWS in 50 CFR 17 (http://www.fws.gov/endangered/), updated April 2019 (USFWS, 2019).
[3] Plant species listed by the FDACS pursuant to Chapter 5B-40, F.A.C, updated 2010 (FDACS, 2010). Animal species listed by the FWC pursuant to Rules 68A-27.003 through 68A-27.005, F.A.C. (http://myfwc.com/wildlifehabitats/imperiled/), updated December 2018 (FWC, 2018).
[4] The bald eagle is neither state nor federally listed; however, this species is federally protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle is also managed in Florida by the FWC's bald eagle rule (Chapter 68A-16.002, F.A.C).
[5] The Florida black bear is no longer state-listed; however, this species is managed in Florida by the FWC's Florida Black Bear Conservation rule (68A-4.009, F.A.C.).

5.1. FLORA

A review of state and federally listed plants that occur within Polk County and their preferred habitats was performed prior to field reviews. No listed plant species have been documented within the Action Area based on information from FNAI and USFWS. The field review did not detect the occurrence of any protected plant species within the Action Area.

5.1.1. FEDERALLY LISTED SPECIES

Based on the existing habitat types occurring within the Action Area, no federally listed plant species documented within Polk County have the potential to occur within the Action Area.

5.1.2. STATE LISTED SPECIES

Incised groove-bur (*Agrimonia incisa*)
The incised groove-bur is listed as threatened by the FDACS and is a member of the Rosaceae (rose) family. This species is most commonly found in the fire-maintained longleaf pine-oak communities. However, it occasionally has been found on old roads and disturbed mixed pine-oak woods. Marginally suitable habitat for this species occurs within the Action Area within the small areas of hardwood-conifer mixed habitat.

Hand fern (*Ophioglossum palmatum*)
Hand fern is listed as endangered by the FDACS and is a member of the Ophioglossaceae (adder's-tongue) family. This species is found within hydric hammocks typically at the base of cabbage palms. Marginally suitable habitat for hand fern occurs within the Action Area within the forested wetlands; however, cabbage palms have not been observed to be a dominant vegetative species within the wetlands.

Comb (swamp) polypody (*Pecluma ptilota var. bourgeauana*)
Comb (swamp) polypody is listed as endangered by the FDACS and is a member of the Polypodiaceae (fern) family. This species is found in rockland hammocks, strand swamps, and wet woods, often at the base of trees and fallen logs. Suitable habitat for this species is available within the Action Area within the forested wetlands.

Yellow fringeless orchid (*Platanthera integra*)

The yellow fringeless orchid is listed as endangered by the FDACS and is a member of the Orchidaceae (orchid) family. This species is typically found in both forested and herbaceous wetlands including wet pine flatwoods, wet prairies, marshes, bogs, and swamps. It is thought to be fire dependent throughout its range where it doesn't get overwhelmed by other plant species or shaded out by pines and hardwoods. Marginally suitable habitat for this species occurs within the Action Area within the forested wetlands.

Florida willow (*Salix floridana*)
Florida willow is listed as endangered by the FDACS and is a member of the Salicaceae (willow) family. This species occurs in very wet, calcareous soils, typically in forested floodplains, hydric hammocks, edges of spring runs, and roadside ditches. Suitable habitat for this species occurs within the Action Area within the forested wetlands and Ditch 1.

Toothed maiden fern (*Thelypteris serrata*)
The toothed maiden fern is listed as endangered by the FDACS and is a member of the Thelypteridaceae (marsh fern) family. This species generally is found in freshwater swamps, cypress domes, and bogs. Suitable habitat for the toothed maiden fern occurs within the Action Area within the forested wetlands.

5.2. FAUNA

5.2.1. FEDERALLY LISTED SPECIES

Eastern indigo snake (*Drymarchon corais couperi*)
The eastern indigo snake is listed as threatened by the USFWS. The snake can be found in a variety of habitats including mesic flatwoods, swamps, wet prairies, xeric pinelands, and scrub areas. It may use gopher tortoise burrows for shelter to escape hot or cold ambient temperatures within its range. While suitable habitat is present for this species in the Action Area, no eastern indigo snakes or gopher tortoise burrows were observed during the April 2020 field review.

Florida scrub jay (*Aphelocoma coerulescens*)
The Florida scrub jay is listed as threatened by the USFWS and is typically found in early successional stages of fire-dominated xeric oak communities located on well-drained, sandy soils. Preferred habitat consists of scrub oaks between three and ten feet tall with open sand and scattered clumps of herbaceous vegetation. The Action Area is located within the USFWS Consultation Area for the scrub jay. However, no xeric oak scrub communities are located inside the Action Area and no scrub jays were observed within the Action Area during the April 2020 field review.

Wood stork (*Mycteria americana*)
The wood stork is listed as threatened by the USFWS. This wading bird species is opportunistic and uses various habitat types, including forested wetlands, freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures, and ditches for feeding. A specialized feeding

technique commonly referred to as "groping" limits the wood stork to feeding in shallow water. This species can be expected to use the ditches and marshes within the Action Area for seasonal foraging; however, existing wildlife hazard management activities actively discourage foraging on Airport property. The USFWS has defined the core foraging area (CFA) for the wood stork in Polk County as an 18.6-mile radius from breeding colonies. Based on information provided by the USFWS, the Action Area is located within the 18.6-mile radius CFA of three active wood stork nesting colonies. As shown on **Figure 5-1**, the closest colony is approximately four miles northeast of the Action Area. Based on the 2013 WHA, wood storks have been observed foraging within wetlands and other surface waters on Airport property. Suitable foraging and nesting habitat is available within the Action Area. During the April 2020 field review, no wood storks were observed within or adjacent to the Action Area.

Audubon's crested caracara (*Polyborus plancus audubonii*)

The Audubon's crested caracara is listed as threatened by the USFWS and inhabits open country, such as dry prairie and pasturelands with scattered cabbage palms, cabbage palm/live oak hammocks, and shallow ponds and sloughs. This species requires cabbage palms or live oaks with low-growing surrounding vegetation for nesting. Although the Action Area is located within the USFWS Consultation Area for this species, no suitable foraging or nesting habitat is available within the Action Area and no individuals or nests were observed within the Action Area during the April 2020 field review.

Everglade snail kite (*Rostrhamus sociabilis plumbeus*)

The Everglade snail kite is federally listed as endangered by the USFWS due to habitat degradation and loss. This species prefers large open freshwater marshes and lakes with shallow water and feeds exclusively on apple snails (*Pomacea paludosa*). The Action Area is located within the USFWS Consultation Area for the snail kite. However, suitable foraging habitat does not exist for this species in the Action Area and no snail kites or apple snails were observed during the April 2020 field review.

Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\BA\Figure 5-1 Wood Stork Rookery_rev0.mxd, Date Saved: 5/14/2020 7:48:59 AM

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PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

ACTIVE WOOD STORK ROOKERIES

FIGURE 5-1

5.2.2. STATE LISTED SPECIES

Gopher tortoise (*Gopherus polyphemus*)
The gopher tortoise is listed as threatened by the FWC and is considered a candidate species by USFWS due to habitat loss, degradation, and a declining number of individuals. The gopher tortoise requires well-drained, loose, sandy soils for burrowing, and low-growing herbs and grasses for food. Marginally suitable habitat for this species is present within the Action Area and based on the 2013 WHA, gopher tortoise burrows have been observed at LAL; however, no gopher tortoise burrows were observed within the Action Area during the April 2020 field review.

Florida burrowing owl (*Athene cunicularia floridana*)
The Florida burrowing owl is listed as threatened by the FWC. This species inhabits high, sparsely vegetated, sandy ground including dry prairie, pastures, airports, and road rights-of-way for nesting. Within the Action Area, marginally suitable habitat for this species is available. However, during the April 2020 field review, no burrowing owls or burrows were observed within the Action Area.

Little blue heron (*Egretta caerulea*) and tricolored heron (*Egretta tricolor*)
The little blue heron and tricolored heron are both listed as threatened by the FWC. These wading birds nest and forage among both fresh and saltwater habitats such as freshwater marshes, coastal beaches, mangrove swamps, cypress swamps, hardwood swamps, wet prairies and bay swamps. Suitable nesting habitat for these wading birds is available within the Action Area within the forested wetlands and suitable foraging habitat is available within the drainage ditch. Based on the WHA, these wading birds have been observed foraging throughout the wetlands on Airport property. During the 2020 field review, no wading birds were observed within or adjacent to the Action Area.

Southeastern American kestrel (*Falco sparverius paulus*)
The southeastern American kestrel is listed as threatened by FWC and is non-migratory. The species utilizes open habitats for foraging and nests in tree cavities. Habitats such as pine scrub, dry prairies, mixed pine and hardwood forests, and pine flatwoods are preferable for the southeastern American kestrel. Based on the 2013 WHA, kestrels have been observed within the AOA at LAL. However, suitable habitat for the southeastern American kestrel is not available within the Action Area and none were observed during the April 2020 field review.

Florida sandhill crane (*Antigone canadensis pratensis*)
The Florida sandhill crane is listed as threatened by the FWC. The sandhill crane is associated with shallow freshwater areas, pasture, and open woods habitats. Habitats such as wet and dry prairies, marshes, and marshy lake margins are preferred. Marginally suitable habitat for this species is available in the Action Area. Based on the 2013 WHA, sandhill cranes have been observed foraging at LAL. During the April 2020 field review, no sandhill cranes or nests were observed within the Action Area.

5.2.3. OTHER SPECIES OF CONCERN

Bald eagle (*Haliaeetus leucocephalus*)

Though the bald eagle has been removed from federal and state listings, it is still protected by the Bald and Golden Eagle Protection Act in accordance with 16 U.S.C. Section 668 and the Migratory Bird Treaty Act in accordance with 16 USC Sections 703-712. The bald eagle typically uses riparian habitat associated with coastal areas, lake shorelines, and river banks. The nests are generally located near water bodies that provide a dependable food source. The FWC online bald eagle nest locator website indicates that the nearest document nest is located approximately one mile northwest of the Action Area. Based on the 2013 WHA, bald eagles have been observed at LAL, though sitings are rare. During the April 2020 field review, no bald eagles or nests were observed within the Action Area.

Florida Black Bear (*Ursus americanus floridanus*)

Although the Florida black bear has been removed from the state listing, it is still protected and managed by the FWC pursuant to the Florida Black Bear Conservation Rule 68A-4.009, F.A.C. The Florida black bear can be found statewide in a number of habitats including mixed hardwood pine communities, cabbage palm hammock and forested wetland systems. This species tends to den alone within tree cavities, river banks, logs or caves. They will also seek shelter on the ground in palmetto thickets, gallberry, fetterbush, and sweet pepperbush. Marginally suitable habitat for the black bear is available within the proposed project areas in the forested upland and wetland areas. Established by the FWC, a Bear Management Unit (BMU) is a geographic location bounded by county and/or state borders with one of the seven Florida black bear subpopulations within it. The goal of a BMU is to provide a defined area within which FWC can have a community-focused effort to effectively manage and conserve Florida black bears (FWC, 2019). According to FWC, LAL is located within the South Central BMU where their occurrence is classified as “occasional”. No black bears have been observed at LAL and only marginally suitable habitat for the black bear is present within the Action Area.

6.0 EFFECTS OF PROPOSED PROJECT

Implementation of the Proposed Project will result in the conversion of approximately 54.6 acres of land use/vegetative cover to Transportation use (FLUCFCS 810). It is anticipated that 5.8 acres of land use/vegetative cover will convert into Reservoir (FLUCFCS 534) as a result of the proposed retention pond (see **Figures 1-2a** and **1-2b** for Proposed Project layout). T**able 6-1** lists the vegetative communities and land uses that will be converted to Transportation use or Reservoir use by the Proposed Project.

Table 6-1: Vegetative Community/Land Use Conversions Resulting from the Proposed Project

Vegetative Community/Land Use	FLUCFCS Code[1]	USFWS Classification[2]	Acres Converted to Transportation (FLUCFCS 810)	Acres Converted to Reservoir (FLUCFCS 534)	Total
Uplands					
Industrial	150	N/A	0.4	--	0.4
Open Land	190	N/A	22.8	3.5	26.3
Hardwood-Conifer Mixed	434	N/A	0.3	--	0.3
Disturbed	740	N/A	8.3	--	8.3
Transportation	810	N/A	--	1.1	1.1
		Subtotal Uplands	***31.8***	***4.6***	***36.4***
Wetlands					
Cypress	621	PFO2C	1.4	--	1.4
Wetland Forested Mixed	630	PFO1/3C	1.2	--	1.2
Wetland Scrub	631	PFO1/2C	19.9	1.2	21.1
		Subtotal Wetlands	***22.5***	***1.2***	***23.7***
Other Surface Waters					
Streams and Waterways	510	PUBx	0.3	--	0.3
		Subtotal Other Surface Waters	***0.3***	***0.0***	***0.3***
		Total	**54.6**	**5.8**	**60.4**

Notes:
[1] FDOT, 1999
[2] Cowardin, Lewis M., *et.al.* 1979.

To offset the loss of wetland functions and values, all wetland impacts will be mitigated to satisfy all mitigation requirements of 33 USC 1344 and Part IV, Chapter 373, Florida Statutes. The City proposes to purchase wetland credits from the Alafia River Mitigation Bank to offset the loss of wetland functions and values. Measures will be implemented to minimize impacts to listed pecies as summarized in **Section 7.0.**

Table 6-2 summarizes the proposed land use and vegetative cover types resulting from the implementation of the Proposed Project.

Table 6-2: Existing and Proposed Land Use and Vegetative Communities Within the Action Area

Vegetative Community/Land Use	FLUCFCS[1] Code	USFWS Classification[2]	Existing Acres in Action Area	Proposed Acres in Action Area
Uplands				
Industrial	150	N/A	0.6	0.2
Open Land	190	N/A	26.3	0.0
Hardwood-Conifer Mixed	434	N/A	0.9	0.6
Disturbed	740	N/A	8.3	0.0
Transportation	810	N/A	5.8	59.3
		Subtotal Uplands	***41.8***	***60.1***
Wetlands				
Cypress	621	PFO2C	1.4	0.0
Wetland Forested Mixed	630	PFO1/3C	5.6	4.4
Wetland Scrub	631	PFO1/2C	21.1	0.0
		Subtotal Wetlands	***28.1***	***4.4***
Other Surface Waters				
Streams and Waterways	510	PUBx	0.3	0.0
Reservoir	534	POWx	0.0	5.8
		Subtotal Other Surface Waters	***0.3***	***5.8***
		Total	**70.3**	**70.3**

[1] FDOT, 1999.
[2] Cowardin, Lewis M., *et.al.* 1979.
POWx = Palustrine, open water, excavated

6.1. EFFECTS ON LISTED SPECIES

The Proposed Project would result in permanent modification of habitats potentially utilized by listed and protected species. The potential effect of the habitat impacts on state and federally listed species with potential to occur within the Action Area are discussed below.

6.1.1. FLORA

6.1.1.1. FEDERALLY LISTED SPECIES

Based on the existing habitat types occurring within the Action Area, no federally listed plant species documented within Polk County have the potential to occur within the Action Area.

6.1.1.2. STATE LISTED SPECIES

Incised groove-bur

The incised groove-bur is most commonly found in the fire-maintained longleaf pine-oak communities, occasionally is found on old roads and disturbed mixed pine-oak woods. Though marginally suitable habitat for this species occurs within the Action Area within the small areas of hardwood-conifer mixed habitat, none of these species were detected within or adjacent to the Action Area during the April 2020 field review and none have been documented at LAL.

Based on this information, the Proposed Project is not anticipated to affect the incised groove-bur.

Hand fern

Hand fern is found within hydric hammocks typically at the base of cabbage palms. Only marginally suitable habitat for hand fern occurs within the Action Area within the forested wetlands; however, cabbage palms have not been observed to be a dominant vegetative species within these wetlands, no hand ferns were detected within or adjacent to the Action Area, and none have been documented at LAL. Based on this information, the Proposed Project is not anticipated to affect the hand fern.

Comb (swamp) polypody

Comb (swamp) polypody is found in rockland hammocks, strand swamps, and wet woods, often at the base of trees and fallen logs. Suitable habitat for this species is available within the Action Area within the forested wetlands. No polypody was detected within or adjacent to the Action Area and none have been documented at LAL. Based on this information, the Proposed Project is not anticipated to affect the comb (swamp) polypody.

Yellow fringeless orchid

The yellow fringeless orchid is typically found in both forested and herbaceous wetlands including wet pine flatwoods, wet prairies, marshes, bogs, and swamps. It is thought to be fire dependent throughout its range where it doesn't get overwhelmed by other plant species or shaded out by pines and hardwoods. Marginally suitable habitat for this species occurs within the Action Area within the forested wetlands. However, these areas are not fire-dominated, no yellow fringeless orchid was detected within or adjacent to the Action Area, and none have been documented at LAL. Based on this information, the Proposed Project is not anticipated to affect the yellow fringeless orchid.

Florida willow

Florida willow is found in very wet, calcareous soils, typically in forested floodplains, hydric hammocks, edges of spring runs, and roadside ditches. Suitable habitat for this species occurs within the Action Area within the forested wetlands and Ditch 1. No Florida willow was detected within or adjacent to the Action Area and none have been documented at LAL. Based on this information, the Proposed Project is not anticipated to affect the Florida willow.

Toothed maiden fern

The toothed maiden fern generally is found in freshwater swamps, cypress domes, and bogs. Suitable habitat for the toothed maiden fern occurs within the Action Area within the forested wetlands. No Florida willow was detected within or adjacent to the Action Area and none have been documented at LAL. Based on this information, the Proposed Project is not anticipated to affect the Florida willow.

6.1.2. FAUNA

6.1.2.1. FEDERALLY LISTED SPECIES

Eastern indigo snake
While no eastern indigo snakes were observed during the field reviews, suitable habitat for this species is present within the Action Area. To minimize potential impacts to the eastern indigo snake, LAL will commit to use the USFWS-approved *Standard Protection Measures for the Eastern Indigo Snake* (updated August 2013) (see **Appendix B**) as part of the Proposed Project. In addition, the Proposed Project will impact less than 25 acres of marginally suitable indigo snake habitat and there are no known gopher tortoise burrows within the Action Area. The most recent (August 1, 2017) USFWS Eastern Indigo Snake Programmatic Effect Determination Key was used to evaluate potential effects on this species. The result of this evaluation indicates that the Proposed Project "may affect, but is not likely to adversely affect" the eastern indigo snake.

Florida scrub jay
Though the Action Area is located within the USFWS Consultation Area for the Florida scrub jay, no xeric oak scrub communities are located inside the Action Area and no scrub jays were observed within the Action Area during field reviews. Based on this information, a determination that the Proposed Project will have "no effect" on the Florida scrub jay is recommended.

Wood stork
Suitable foraging habitat for the wood stork is available within the Action Area within the wetlands. Based on USFWS data, the Action Area is located within the CFA of three active wood stork nesting colonies (**Figure 5-1**) and individuals have been observed foraging within the Action Area. Compensation for suitable foraging habitat will be provided within the service area of an USFWS-approved wetland mitigation bank or wood stork conservation bank (preferably located within the CFA of wood stork foraging habitat lost). Based on these commitments and the 2010 FWS Programmatic Concurrence Letter for the Wood Stork, a determination that the Proposed Project "may affect, but is not likely to adversely affect" the wood stork is recommended.

Audubon's crested caracara
The Action Area is located within the USFWS Consultation Area for the Audubon's crested caracara; however, suitable foraging or nesting habitat is not available within the Action Area and no individuals or nests were observed within the Action Area during the field review. Based on this information, a determination that the Proposed Project will have "no effect" on the crested caracara is recommended.

Everglade snail kite
Though the Action Area is located within the USFWS Consultation Area for the Everglade snail kite, no suitable foraging or nesting habitat is available within the Action Area and no snail kites or apple snails were observed during the field review. Wetland values and functions lost as a result of project construction will be mitigated. Based on this information, a determination that the Proposed Project will have "no effect" on the snail kite is recommended.

6.1.2.2. STATE LISTED SPECIES

Gopher tortoise
Marginally suitable habitat for the gopher tortoise is available within the Action Area and burrows have been observed at LAL based on the 2013 WHA. However, no gopher tortoise burrows were observed within the Action Area during the April 2020 field review. Prior to construction of the Proposed Project, surveys of the appropriate habitats will be conducted for the presence of gopher tortoise burrows. If gopher tortoises or their burrows are found in or within 25 feet of the construction limits of the Proposed Project, coordination with the FWC will be implemented to secure permits needed to relocate the gopher tortoises prior to construction. Based on these commitments, the Proposed Project is not anticipated to affect the gopher tortoise.

Florida burrowing owls
Marginally suitable habitat for the Florida burrowing owls is available within the Action Area; however, none were observed within the Action Area during the field review and none had been documented in the 2013 WHA. To avoid any potential impacts to this species, LAL will resurvey appropriate upland habitats within the Proposed Project area for burrowing owls or their burrows prior to construction. If any burrows are located in the project area, LAL will coordinate with FWC to develop and implement the appropriate protection criteria prior to construction. With this commitment, the Proposed Project is not anticipated to affect the Florida burrowing owl.

Little blue heron and tricolored heron
Suitable foraging and roosting habitat for the little blue heron and tricolored heron is available within the Action Area and individuals have been observed at LAL. As part of the Proposed Project, adverse wetland impacts will be mitigated as necessary to prevent a net loss of wetland habitat functions and values. Based on this information, the Proposed Project is not anticipated to affect the little blue heron and tricolored heron.

Southeastern American kestrel
Based on the 2013 WHA, several southeastern American kestrels were observed foraging in the AOA and perched on existing signs and fences within the Airport property. However, no nests have been observed or documented within the Action Area. Prior to construction of the Proposed Project, informal surveys will be conducted for the presence of the southeastern American kestrel. If any individuals or nests are observed, coordination with FWC will be implemented. With this commitment, the Proposed Project is not anticipated to affect the southeastern American kestrel.

Florida sandhill crane
Marginally suitable foraging habitat is available within the Action Area for the Florida sandhill crane and several individuals have been observed foraging on Airport property. As part of the construction of the Proposed Project, all wetland impacts will be mitigated to prevent a net loss of wetland functions and values. In addition, LAL will resurvey the project area for sandhill crane nests prior to construction. If Florida sandhill crane nests are found within the Proposed Project area, LAL will coordinate with the FWC prior to construction to minimize adverse

impacts to this species to the greatest extent possible. With this commitment, the Proposed Project is not anticipated to affect the Florida sandhill crane.

6.1.2.3. OTHER SPECIES OF CONCERN

Federal

Based on the FWC online database, one **bald eagle** nest is documented within one mile of the Action Area. No bald eagle nests were observed within the Action Area during the field review. For these reasons, it has been determined that the Proposed Project will not affect the bald eagle. Pursuant to the USFWS bald eagle guidelines, any disturbance within 1,000 feet of a bald eagle nest requires additional coordination and potential permitting with the USFWS. To avoid any potential impacts to this species, LAL will resurvey appropriate upland habitats within 1,000 feet of the Proposed Project area for bald eagle nests prior to construction. If a bald eagle nest is found within 1,000 feet of the Proposed Project area, LAL will coordinate with USFWS to secure any and all approvals regarding this species.

State

The project area is located within the South Central BMU where the occurrence of the **Florida black bear** is "occasional". No Florida black bears were observed within the Action Area during the field review and only marginally suitable habitat occurs within the Action Area. LAL is bounded by a perimeter fence which typically keeps large mammals, such as the black bear, away from airport activities. Additional measures to be taken to minimize conflict with bears during construction activities include:

- Following best management practices during construction;
- Requiring clean construction sites with wildlife-resistant containers for workers to use for food-related and other wildlife-attractant refuse; and
- Requiring frequent trash removal and the use of proper food storage and removal on work sites.

6.2. CRITICAL HABITAT

The Action Area was also evaluated for the occurrence of listed species critical habitat designated by Congress in 50 CFR 424. No designated critical habitat for any federally listed species occurs within the Action Area. Based on this information, it has been determined that the Proposed Project will have "no effect" on any critical habitat.

7.0 CONSERVATION MEASURES

If environmentally approved, the FAA will require the City to implement the following conservation measures to minimize potential impacts to listed species discussed in this BA as part of this Proposed Project:

7.1. FEDERALLY LISTED SPECIES

1. Prior to and during construction, the City will be required to implement the USFWS-approved Standard Protection Measures for the Eastern Indigo Snake (updated August 2013) (see **Appendix B**);

2. During the permitting phase of the Proposed Projects, the City will purchase wetland mitigation credits from the Alafia River Mitigation Bank to offset wetland functions and values potentially used by the wood stork and Everglade snail kite;

3. Prior to construction, the City will be required to resurvey appropriate habitats within the project area to confirm the presence or absence of crested caracara nests. If any of these species or their nests are present, the City will coordinate with the USFWS to minimize the Proposed Project impacts and obtain the necessary permits; and

4. Prior to construction, the City will be required to resurvey appropriate habitats within 1,000 feet of the Proposed Project area for bald eagle nests. If a bald eagle nest is found within 1,000 feet of the Proposed Project, the City will coordinate with the USFWS to secure any and all approvals regarding this species.

7.2. STATE LISTED SPECIES

1. During the permitting phase of the Proposed Projects, the City will purchase wetland mitigation credits from the Alafia River Mitigation Bank to offset wetland functions and values potentially used by the little blue heron, tricolored heron, and Florida sandhill crane;

2. Prior to construction, the City will be required to resurvey appropriate habitats within the project area to confirm the presence or absence of gopher tortoises, Florida burrowing owls, southeastern American kestrel nests, and Florida sandhill crane nests. If any of these species or their nests are present, the City will coordinate with the FWC to minimize the Proposed Project impacts and obtain the necessary permits; and

3. To prevent black bear encounters during construction activities, contractors will follow best management practices; keep construction sites clean with wildlife-resistant containers for workers to use for food-related and other wildlife-attractant refuse; and frequently remove trash and use proper food storage on work sites.

8.0 SUMMARY

The Proposed Project would result in permanent impacts to approximately 50.6 acres of existing terrestrial and wetland habitats. The Proposed Action Area has been previously affected by anthropogenic activities at the Airport, including regular mowing and maintenance of the open grassy areas. No federally listed species or designated critical habitat are expected to be adversely affected by the Proposed Project. **Table 8-1** provides the project impact determination for federally and state listed species. Based on the findings and commitments of this BA, a determination has been made that the Proposed Project is not likely to adversely affect any state or federally listed plant or animal species.

Table 8-1: Project Impact Determination on Listed Species

Project Impact Determination	Federally Listed Species
"May affect, not likely to adversely affect"	Eastern indigo snake (*Drymarchon corais couperi*) Wood stork (*Mycteria americana*)
"No effect"	Florida scrub jay (*Aphelocoma coerulescens*) Audubon's crested caracara (*Polyborus plancus audubonii*) Everglade snail kite (*Rostrhamus sociabilis plumbeus*)
Project Impact Determination	**State Listed Species**
Will not affect	Gopher tortoise (*Gopherus polyphemus*) Little blue heron (*Egretta caerulea*) Tricolored heron (*Egretta tricolor*) Southeastern American kestrel (*Falco sparverius paulus*) Florida sandhill crane (*Antigone canadensis pratensis*) State listed plant species Florida burrowing owl (*Athene cunicularia floridana*)

9.0 REFERENCES

Cowardin, *et al.,* 1979. Cowardin, L.M., V. Carter, F.C. Golet, E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131pp.

Environmental Science Associates, 2013. Lakeland Linder Regional Airport Wildlife Hazard Assessment. Prepared by Environmental Science Associates, October 1, 2013.

FDACS, 2010. *Notes on Florida's Endangered and Threatened Plants*. Botany Section Contribution No. 38, 5th edition. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, 2010.

FDEP, 2020. FDEP Map Direct Gateway. Accessed January 2020 from http://ca.dep.state.fl.us/mapdirect/gateway.jsp).

FDOT, 1999. *Florida Land Use, Cover and Forms Classification System Handbook*, 3rd Edition, Florida Department of Transportation, 1999.

FDOT APLUS, 2017. 2017 Aerial Images of Polk and Hillsborough Counties received from Florida Department of Transportation's Aerial Photo Look-up System through https://fdotewp1.dot.state.fl.us/AerialPhotoLookUpSystem/.

FNAI, 2020. Database, Florida Natural Areas Inventory, updated April 2019. Accessed January 2020 from http://www.fnai.org.

FWC, 2008. *Bald Eagle Management Plan, Haliaeetus leucocephalus*. Florida Fish and Wildlife Conservation Commission. Adopted April 9, 2008.

FWC, 2020. Eagle Nest Locator website, Florida Fish and Wildlife Conservation Commission Database, Access January 2020 from https://public.myfwc.com/FWRI/EagleNests/nestlocator.aspx.

FWC, 2018. Florida Fish and Wildlife Conservation Commission pursuant to Rules 68A-27.003 through 68A-27.005, FAC (http://myfwc.com/wildlifehabitats/imperiled/), updated December 2018.

FWC, 2019. Florida Black Bear Management Plan. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida, 209 p. Revised 11 December 2019.

Hurt, 2007. *Hydric Soils of Florida Handbook*, 4^{th} Edition, Florida Association of Soil Scientists, March 2007.

LAL, 2020. Lakeland Linder International Airport Wildlife Hazard Management Plan, Class I Airport. Revised January 26, 2020.

NatureServe, 2020. Nature*Serve* Explorer maps and database. Accessed January 2020 from http://www.natureserve.org/explorer/.

NRCS, 2019. *Web Soil Survey of the Polk County, Florida.* United States Department of Agriculture and Soil Conservation Service, Washington, D.C. http://websoilsurvey.nrcs.usda.gov/

SWFWMD, 2017. Land Use/Land Cover GIS Database. Southwest Florida Water Management District.

USACE, 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0)*, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-20. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USFWS, 2020. Information, Planning, and Consultation (IPaC) System. Accessed January 31, 2020 from https://ecos.fws.gov/ipac/.

USFWS, 2019a. 50 Code of Federal Regulations (CFR) 17, U.S. Fish and Wildlife Service, from http://www.fws.gov/endangered/, updated 8 April 2019.

USFWS, 2019b. GIS wood stork data for active colonies. U.S. Department of Interior, Fish and Wildlife Service, updated 15 May 2019. Accessed from https://www.fws.gov/northflorida/WoodStorks/wood-storks.htm January 2020.

U.S. Geological Survey, 2018. U.S. Geological Survey 7.5 minute Topographical Quadrangle Map, Nichols, Florida.

APPENDIX A: AGENCY COORDINATION

AECOM
7650 West Courtney Campbell
Causeway
Tampa, FL 33607
www.aecom.com
813.675.6843 tel

May 4, 2020

Mr. Chris Stahl
Clearinghouse Coordinator
Florida State Clearinghouse
Department of Environmental Protection
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000

Re: State Clearinghouse Review for Phase II Air Cargo Development at Lakeland Linder International Airport (LAL), Polk County, Florida

Dear Mr. Stahl:

The City of Lakeland, Florida (City), through its Airports department, is proposing to implement Phase II of development of an air cargo facility at the Lakeland Linder International Airport (LAL), hereinafter referred to as the Proposed Project. The City, in coordination with the Federal Aviation Administration (FAA), is requesting review of the Proposed Project's early consistency with the Florida Coastal Management Program.

Additionally, the City and FAA are requesting early agency input on any environmental concerns and issues that should be considered in the environmental planning and permitting process for the Proposed Project. To accomplish this we would like to receive your comments relative to the proposed improvements as they relate to your specific area of expertise or regulatory jurisdiction, including permitting or mitigation requirements.

The enclosed **Figure 1** shows the extent of the Proposed Project, which is comprised of the following actions:

- Construct a 464,600 square foot (SF) expansion of the Phase I sort and office building;
- Construct approximately 69,000 square yards (SY) of paved truck court to accommodate 370 additional truck bays;
- Construct approximately 42,500 SY of paved vehicle parking lot to accommodate 1,120 additional parking spaces;
- Construct approximately 29,200 SY of concrete aircraft parking apron to accommodate three additional Boeing 767-300 aircraft parking positions.

- Construct approximately 19,350 SY of pavement for aircraft ground support equipment staging and periodic aircraft parking;
- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the airport's stormwater management system, including construction of swales and retention ponds.
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

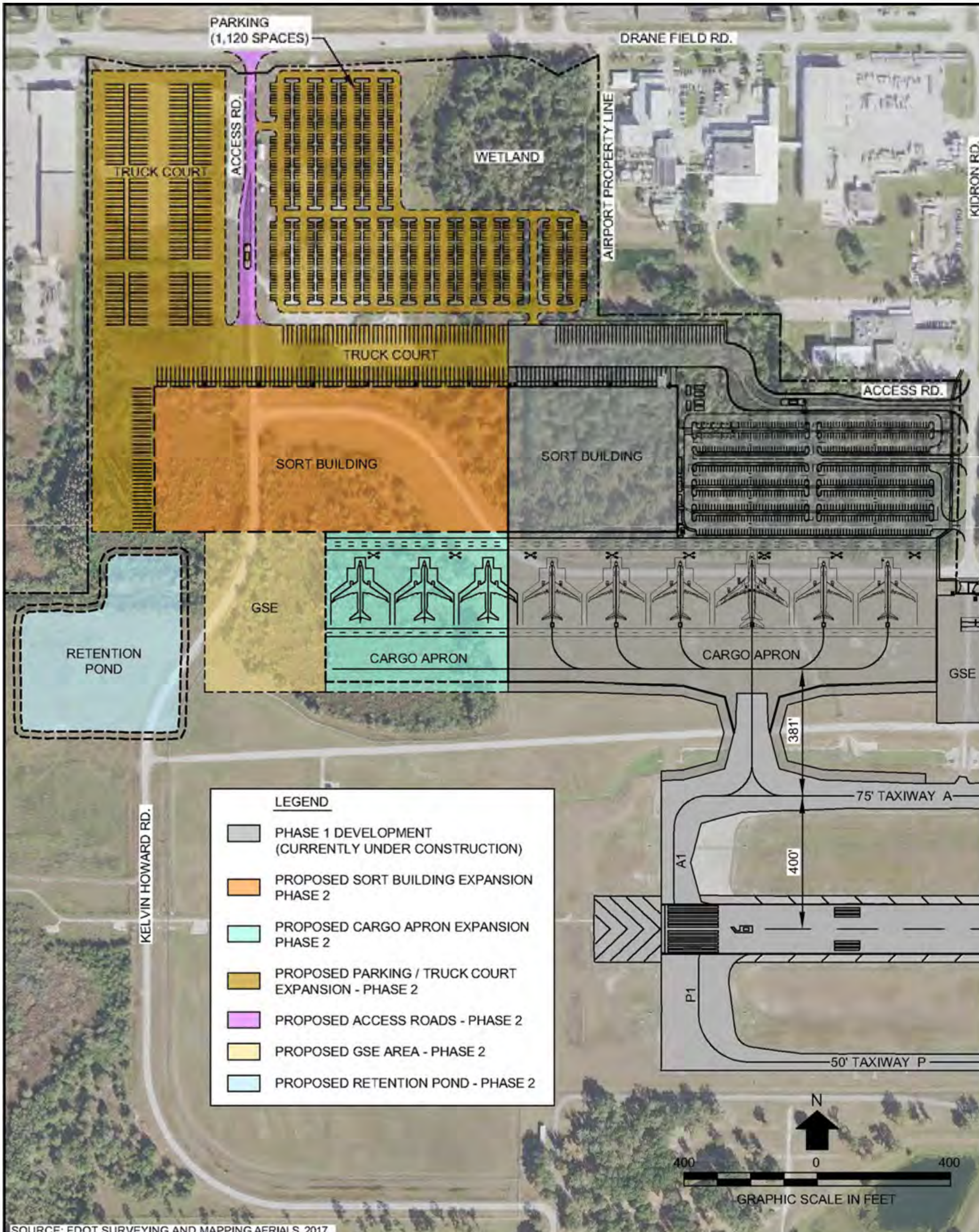
In order to sufficiently address any preliminary key project issues and maintain the project schedule, the City and FAA are requesting an expedited 30-day review of the Proposed Project. Please respond to me at the address provided below and feel free to contact me if you have any questions or concerns.

Sincerely,

Paul K. Sanford
AECOM Project Manager
7650 West Courtney Campbell Causeway
Tampa, FL 33607
813.675.6843
paul.sanford@aecom.com

Enclosure (1)

Copy: Gene Conrad, City of Lakeland
Peter Green, FAA
File



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EA PROPOSED PROJECT

FIGURE 1

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, FL 32960-3559
Phone: (772) 562-3909 Fax: (772) 562-4288
http://fws.gov/verobeach

In Reply Refer To: May 08, 2020
Consultation Code: 04EF2000-2020-SLI-0368
Event Code: 04EF2000-2020-E-02220
Project Name: Phase II Air Cargo Facility Development EA at LAL

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

South Florida Ecological Services Field Office
1339 20th Street
Vero Beach, FL 32960-3559
(772) 562-3909

Project Summary

Consultation Code: 04EF2000-2020-SLI-0368

Event Code: 04EF2000-2020-E-02220

Project Name: Phase II Air Cargo Facility Development EA at LAL

Project Type: TRANSPORTATION

Project Description: Phase II Air Cargo Facility Development EA at LAL

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/27.993463489938144N82.03855443416727W

Counties: Polk, FL

Endangered Species Act Species

There is a total of 33 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Florida Panther *Puma (=Felis) concolor coryi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1763 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/8/office/41420.pdf	Endangered
Puma (=mountain Lion) *Puma (=Felis) concolor (all subsp. except coryi)* Population: FL No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6049	Similarity of Appearance (Threatened)

Birds

NAME	STATUS
Audubon's Crested Caracara *Polyborus plancus audubonii* Population: FL pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8250	Threatened
Everglade Snail Kite *Rostrhamus sociabilis plumbeus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7713 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/1221/office/41420.pdf	Endangered
Florida Grasshopper Sparrow *Ammodramus savannarum floridanus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/32	Endangered
Florida Scrub-jay *Aphelocoma coerulescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6174	Threatened
Ivory-billed Woodpecker *Campephilus principalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8230	Endangered
Whooping Crane *Grus americana* Population: U.S.A. (CO, ID, FL, NM, UT, and the western half of Wyoming) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential
Wood Stork *Mycteria americana* Population: AL, FL, GA, MS, NC, SC No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8477 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/124/office/41420.pdf	Threatened

Reptiles

NAME	STATUS
American Alligator *Alligator mississippiensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/776	Similarity of Appearance (Threatened)
Bluetail Mole Skink *Eumeces egregius lividus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2203 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/178/office/41420.pdf	Threatened
Eastern Indigo Snake *Drymarchon corais couperi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/646	Threatened
Sand Skink *Neoseps reynoldsi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4094 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/179/office/41420.pdf	Threatened

Flowering Plants

NAME	STATUS
Avon Park Harebells *Crotalaria avonensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7093	Endangered
Britton's Beargrass *Nolina brittoniana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4460	Endangered
Carter's Mustard *Warea carteri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5583	Endangered
Florida Bonamia *Bonamia grandiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2230	Threatened
Florida Ziziphus *Ziziphus celata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2950	Endangered
Highlands Scrub Hypericum *Hypericum cumulicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2940	Endangered
Lewton's Polygala *Polygala lewtonii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6688	Endangered
Papery Whitlow-wort *Paronychia chartacea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1465	Threatened
Pigeon Wings *Clitoria fragrans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/991	Threatened
Pygmy Fringe-tree *Chionanthus pygmaeus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1084	Endangered
Sandlace *Polygonella myriophylla* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5745	Endangered
Scrub Blazingstar *Liatris ohlingerae* No critical habitat has been designated for this species.	Endangered

NAME	STATUS
Species profile: https://ecos.fws.gov/ecp/species/864	
Scrub Buckwheat *Eriogonum longifolium var. gnaphalifolium* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5940	Threatened
Scrub Lupine *Lupinus aridorum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/736	Endangered
Scrub Mint *Dicerandra frutescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/799	Endangered
Scrub Plum *Prunus geniculata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2238	Endangered
Short-leaved Rosemary *Conradina brevifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2929	Endangered
Wide-leaf Warea *Warea amplexifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/412	Endangered
Wireweed *Polygonella basiramia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1718	Endangered

Lichens

NAME	STATUS
Florida Perforate Cladonia *Cladonia perforata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7516	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX B: USFWS STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

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STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site without interference.
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate U.S. Fish and Wildlife Service (USFWS) office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

Killing, harming, or harassing indigo snakes is strictly prohibited and punishable under State and Federal Law.

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

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LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

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August 12, 2013

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

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- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate U.S. Fish and Wildlife Service (USFWS) office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A <u>DEAD</u> EASTERN INDIGO SNAKE ON THE SITE:

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LEGAL STATUS: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

August 12, 2013

ATTENTION:

THREATENED EASTERN INDIGO SNAKES MAY BE PRESENT ON THIS SITE!!!

Please read the following information provided by the U.S. Fish and Wildlife Service to become familiar with standard protection measures for the eastern indigo snake.

APPENDIX E
Hazardous Materials Documentation

E.1 Environmental Records Search Summary
E.2 Hazardous Materials Records Review

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APPENDIX E.1

Environmental Records Search Summary

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LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL RECORDS

Environmental Records Search Summary

Map ID	Site Name	Database(s)	Description
1	Green Tread Recycling, Inc WTPF *(3810 Drane Field Road, Suite 21)*	FL SWF/LF	Former waste tire processing facility. The site is inactive and has been closed since 2012-2013, with no groundwater monitoring occurring. Documentation that the warehouse (including processing equipment) was empty and all waste tires removed was received by the FDEP June 13, 2013.
	HD Builder Solutions Group Inc #FL0075 *(3810 Drane Field Road)*	RCRA NonGen / NLR	Registered as a non-generator of hazardous waste under the Resource Conservation and Recovery Act (RCRA) beginning in March 2001. No violations reported.
2	Brandis Aircraft Tom Miller Interior *(3925 Aero Place)*	RCRA NonGen / NLR, FINDS, ECHO	Registered as a non-generator of hazardous waste under the RCRA beginning December 23, 1999. Violations received at this facility have all been resolved.
3	FWCC Drainage Improvements *(3900 Drane Field Road)*	FINDS, ECHO	Facility issued a minor Generic Permit (GP) under National Pollutant Discharge Elimination System (NPDES) for stormwater construction that expires January 31, 2024. No violations have been reported.
4	International Paint LLC Lakeland Distribution Cent *(3919 Air Park Drive Ste 1-3)*	FL TIER 2	This facility participated in Tier 2 reporting from 2017 through 2018. The latest modification was submitted February 28, 2019.
5	Ferrera Tooling *(3960 Air Park Drive)*	FL NPDES	Construction Stormwater GP for an existing permitted facility/site for which effluent, reclaimed water or wastewater residual discharge into the environment and/or monitoring is taking place. Permit issued June 30, 2017 and expires June 29, 2022. No violations reported.
6	Industrial Brush Corp *(4000 Drane Field Road)*	FL LUST, FL TANKS, FINDS, ECHO, FL NPDES	Facility was subject to petroleum cleanup and rehabilitation for unleaded gasoline discharge on May 17, 2007. Site cleanup and a Site Rehabilitation Completion Report were completed and closed out with FDEP on May 28, 2008. The FDEP site manager ended oversite of the effort on June 10, 2008. The cleanup work status is considered complete and the site closed. Multi-Sector Stormwater GP issued to facility for stormwater construction that expires in July 2, 2022.
	Industrial Brush Corp *(4000 Drane Field Road)*	RCRA-VSQG[2]	Registered as a Conditionally-Exempt Very Small Quantity Generator (VSQG) under the RCRA beginning June 5, 2007. Specific wastes generated include ignitable waste (D001). Violations reported have been resolved.
7	Florida DMA National Guard Armory *(4140 Drane Field Road)*	RCRA-VSQG, FINDS, ECHO	Registered as a Conditionally-Exempt VSQG under the RCRA beginning October 18, 1996. Specific wastes generated include ignitable

Map ID	Site Name	Database(s)	Description
			waste (D001) and corrosive waste (D002). No violations reported.
	National Guard – Lakeland Armory *(4140 Drane Field Road)*	FL TIER 2	This facility participated in Tier 2 reporting during the period of 2013 through 2017. The latest modification was submitted February 28, 2018.
8	Protel Inc *(4150 Kidron Road)*	RCRA-VSQG, FINDS, ECHO	Registered as a Conditionally-Exempt VSQG under the RCRA beginning October 18, 1996 and ending November 3, 2011. Specific wastes generated include spent halogenated solvents used in degreasing (F001). No violations reported.
9	International Beverage *(3919 Kidron Road)*	RCRA-VSQG	Registered as a Conditionally-Exempt VSQG under the RCRA beginning May 25, 1999. Specific wastes generated not identified. No violations reported.
10	FL Refreshment Centers *(Kidron Road)*	FL UST, FL AST	This site was formerly occupied by a non-retail fuel user with three tanks that were removed at unknown dates. Tank 1 was a 2000-gallon UST containing leaded gasoline. Tank 2 was a 1000-gallon UST containing vehicular diesel. Tank 3 was a 1000-gallon AST containing vehicular diesel. No violations were reported. The facility closed at an unknown date.
11	Lakeland AAF *(Medulla, FL)*	FUDS	Site of former Lakeland AAF, consisting of 2,640.66 acres. This property is known or suspected to contain military munitions and explosives of concern (e.g., unexploded ordnance [UXO]) and, therefore, may present an explosive hazard. Between 1942 and 1944, the U.S. acquired 2,640.66 acres for an AAF. The Lakeland AAF was developed as a sub-base of MacDill Field and utilized for flight training. The facility was developed and named the Lakeland AAF. Improvements included approximately 320 structures, runways, taxiways, roads, underground fuel storage tanks, and utility systems. The Lakeland AAF remained active until 1945 when its functions were no longer required. The site was declared surplus in November 1945, and in January 1965 and September 1966, 608.60 acres and 701.4 acres were returned to the then current owners. Currently, these two parcels are owned by the one company, various business corporations, and private individuals. The utilization on this acreage consists of a major development for private residences, commercial establishments, and light industries. The remainder of the site was conveyed to the City for reactivation of the Lakeland Municipal Airport.

Map ID	Site Name	Database(s)	Description
			The USACE, Jacksonville District, prepared an Inventory Project Report to establish this site as a FUDS under the Defense Environmental Restoration Program. An Archives Search Report for this site was prepared by the USACE, St. Louis District, in September 1993 with a recommendation of no further action.
	CWM Areas *(Medulla, FL)*	UXO, FUDS	Former Lakeland AAF training and maneuver area. The USACE, Jacksonville District, prepared an Inventory Project Report to establish this site as a FUDS under the Defense Environmental Restoration Program. An Archives Search Report for this site was prepared by the USACE, St. Louis District, in September 1993 with a recommendation of no further action.
	Skeet Range and Firing In-Butt *(Medulla, FL)*	UXO, FUDS	Former Lakeland AAF small arms range. The USACE, Jacksonville District, prepared an Inventory Project Report to establish this site as a FUDS under the Defense Environmental Restoration Program. An Archives Search Report for this site was prepared by the USACE, St. Louis District, in September 1993 with a recommendation of no further action.
	Firmenich, Inc. *(4330 Drane Field Road)*	RCRA-LQG[3], US AIRS	Registered as an LQG under the RCRA beginning July 1, 2007. Specific wastes generated include ignitable waste (D001), corrosive waste (D002), spent halogenated solvents (F002), and spent nonhalogenated solvents (F003 and F005). The facility received several violations but all have been resolved and the facility is in compliance as of June 19, 2019. No air quality permits are associated with this facility. However, under the State Implementation Plan for national primary and secondary ambient air quality standards, compliance monitoring had been conducted on February 4, 2010, June 22, 2010, and June 2, 2014.
12	Trugreen Inc *(3939 Progress Drive)*	RCRA-VSQG, FINDS, ECHO	Registered as a Conditionally-Exempt VSQG under the RCRA. Facility activity dates and associated wastes are unknown. No violations reported.
13	GMF Industries, Inc *(4600 Drane Field Road)*	RCRA-VSQG, FINDS, ECHO	Registered as a Conditionally-Exempt VSQG under the RCRA beginning March 27, 1998. The site was historically registered as a small quantity generator (SQG) beginning January 6, 1992. Specific wastes generated include ignitable waste (D001) and spent nonhalogenated solvents (F003 and F005). Violations reported have since been resolved and the facility is considered in compliance since March 20, 1998.

Map ID	Site Name	Database(s)	Description
	GMF Industries, Inc *(4600 Drane Field Road)*	FL RESP PARTY, FL TIER 2, FL NPDES	This site is a closed Correct Action Plan (CAP)/Remedial Action Plan (RAP) site. The CAP/RAP was initiated September 15, 1997 and closed December 11, 2012. The facility participated in TIER 2 reporting at this address in 2010, 2015, and 2017. Specific chemicals reported were argon (liquified gas), nitrogen (liquified gas), carbon dioxide (liquified gas), and compressed oxygen (liquefied gas). The facility holds a multi-sector stormwater GP for an existing, permitted facility/site for which effluent, reclaimed water or wastewater residual discharge into the environment and/or monitoring is taking place. The permit was issued June 23, 2017 and expires June 22, 2022.
14	Interstate Chemical Inc (DC Drums) *(3903 Progress Road)*	RCRA-SQG[4]	Currently registered as a SQG under the RCRA beginning March 2, 2018. Facility RCRA generator registration began on November 1, 1999.The facility has historically been registered as a SQG (January 5, 2006), LQG (March 4, 2011), conditionally exempt SQG (March 28, 2012), and LQG (December 7, 2017). Specific wastes generated include ignitable waste (D001), corrosive waste (D002), and spent nonhalogenated solvents (F003 and F005). Several violations have been reported at this facility related to non-compliance. However, all violations have since been resolved.
	Interstate Chemical Inc (DC Drums) *(3903 Progress Road)*	FL AST, FL SPILLS, FL DRYCLEANERS, FL Financial Assurance, TIER 2	Facility has three tanks in service. Tanks 1 and 2 are 20,000-gallon ASTs containing an unspecified “hazardous substance” and installed August 1, 2006. Tank 3 is a 21,000-gallon AST containing an unspecified “miscellaneous petrol-based product” and was installed August 1, 2012. A 250-gallon sodium metasilicate (corrosive pollutant) spill was reported April 9, 2007. The incident is considered closed. The facility is registered as a wholesale supplier of dry cleaning chemicals. For financial assurance purposes the facility is registered for bulk chemical storage. The facility participated in Tier 2 reporting at this address between 2015 and 2018. Specific chemicals are not reported. The facility holds a Stormwater No Exposure Certification for a permitted facility/site for which effluent, reclaimed water or wastewater residual discharge into the environment and/or monitoring

Map ID	Site Name	Database(s)	Description
			is taking place. No treatment is currently required. The permit was issued February 10, 2017 and expires February 9, 2022.
15	Nations Rent #97 *(4710 Drane Field Road)*	FL AST	Facility was registered as a non-retail fuel user beginning on June1, 1999 and was closed on March 1, 2001. The site features a 3000-gallon vehicular diesel AST that is closed in place.
16	Connected Power Phosphate Services *(4783 Drane Field Road Ste 105)*	RCRA NonGen / NLR	Current operator is registered as a non-generator under the RCRA beginning November 20, 2014. The previous operator was registered as a non-generator beginning January 1, 2005, with no registered closing date. No violations reported.

Source: EDR, 2020;

AST = aboveground storage tank; ECHO = Enforcement and Compliance History Online; FINDS = Facility Index Data System; FUDS = Formerly Used Defense Sites; LQG = large quantity generator; LUST = Leaking Underground Storage Tanks; NLR = No Longer Regulated; RESP = Responsible Party; SWF/LF = Solid Waste and Landfilling Facilities; US AIRS = Aerometric Information Retrieval System; UST = Underground Storage Tanks.

[1] A non-generator status signifies that hazardous waste not currently generated by the facility.

[2] A VSQG generates 100 kilogram (kg) or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any and or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste.

[3] A LQG generates more than 1,000 kg of hazardous waste, more than 1 kg of acute hazardous waste, or more than 100 kg of acute spill residue or soil during any calendar month or accumulates more than 6,000 kg of hazardous waste.

[4] A SQG generates more than 100 and less than 1,000 kg of hazardous waste during any calendar month and accumulates less than 6,000 kg of hazardous waste at any time, or generates 100 kg or less of hazardous waste during any calendar month and accumulates more than 1,000 kg of hazardous waste at any time.

APPENDIX E.2

Hazardous Materials Records Review

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Lakeland Linder Intl Airport
3900 Don Emerson Dr
Lakeland, FL 33811

Inquiry Number: 5953258.2s
January 29, 2020

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

GEOCHECK ADDENDUM

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

3900 DON EMERSON DR
LAKELAND, FL 33811

COORDINATES

Latitude (North):	27.9945170 - 27° 59' 40.26''
Longitude (West):	82.0143140 - 82° 0' 51.53''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	400260.2
UTM Y (Meters):	3096837.8
Elevation:	136 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5676054 NICHOLS, FL
Version Date:	2012
Northeast Map:	5652798 LAKELAND, FL
Version Date:	2012
Southeast Map:	5653572 MULBERRY, FL
Version Date:	2012
Northwest Map:	5653826 PLANT CITY EAST, FL
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20150816
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
3900 DON EMERSON DR
LAKELAND, FL 33811

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	LAL N APRON REHABILI	3900 DON EMERSON DR	FINDS, ECHO		TP
A2	LAKELAND LINDER REGI	3900 DON EMERSON DR	FINDS, ECHO		TP
A3	REHABILITATE TAXIWAY	3900 DON EMERSON DR	FINDS, ECHO		TP
A4	PIEDMONT HAWTHORNE A	3900 DON EMERSON DR	FL AST		TP
A5	LAKELAND LINDER REG	3900 DON EMERSON DR	FL NPDES		TP
A6	LAKELAND LINDER REGI	3900 DON EMERSON DR	RCRA-SQG, FINDS, ECHO		TP
A7	RUNWAY 27 & TAXIWAY	3900 DON EMERSON DR	FINDS, ECHO		TP
A8	NEW FUEL FARM @ LAKE	3900 DON EMERSON DR	FINDS, ECHO		TP
A9	ENGLISH OAKS FORCE M	3900 DON EMERSON DR	FINDS, ECHO		TP
A10	LAKELAND LINDER REG	3900 DON EMERSON DR	FINDS		TP
A11	SW APRON RECONSTRUCT	3900 DON EMERSON DR	FINDS, ECHO		TP
A12	TAXIWAY B EXTENSION	3900 DON EMERSON DR	FINDS, ECHO		TP
A13		LAKELAND LENDER AIRP	FL SPILLS		TP
A14	LANDMARK AVIATION -	3900 DON EMERSON DRI	FL TIER 2		TP
A15		3900 DON EMERSON DRI	FL SPILLS		TP
A16	LAKELAND LINDER REGI	3900 DON EMERSON DR	FINDS, ECHO		TP
A17	KTTW HANGAR AT LAKEL	3900 DON EMERSON DR	FINDS, ECHO		TP
A18	LAKELAND LINDER REGI	3900 DON EMERSON DR	FL NPDES		TP
A19	LAKELAND LINDER INTE	3900 DON EMERSON DR	FL UST, FL AST, FL Financial Assurance, FL NPDES		TP
A20	SHELTAIR -LAKELAND J	3900 DON EMERSON DR	FL AST		TP
A21	LAKELAND LINDER INTE	3900 DON EMERSON DR,	FL AIRS		TP
A22	TSA AT LAKELAND LIND	3900 DON EMERSON DR	RCRA NonGen / NLR		TP
A23	LAKELAND LINDER REG	3900 DON EMERSON DR	FINDS, ECHO		TP
A24	FWCC DRAINAGE IMPROV	3900 DRANE FIELD RD	FL SPILLS, FL NPDES	Higher	70, 0.013, SW
25	COLUMBIA AIR -3320 A	3320 AIRFIELD DR E	FINDS, ECHO	Higher	316, 0.060, East
B26	STAYBRIDGE SUITES -	3855 DON EMERSON DR	FINDS, ECHO	Higher	569, 0.108, North
B27	STAYBRIDGE SUITES -	3855 DON EMERSON DR	FL NPDES	Higher	569, 0.108, North
C28	LAKELAND LINDER REGI	3450 DRANE FIELD RD	FL LUST, FL TANKS	Higher	885, 0.168, NNW
C29	LAKELAND ARMY AIRFIE	3450 DRANE FIELD RD	FL TANKS	Higher	885, 0.168, NNW
C30	LAKELAND ARMY AIRFIE	3450 DRANE FIELD RD	FL RGA LUST	Higher	885, 0.168, NNW
C31	LAKELAND ARMY AIRFIE	3450 DRANE FIELD RD	FL RGA LUST	Higher	885, 0.168, NNW
C32	LAKELAND ARMY AIRFIE	3450 DRANE FIELD RD	FL TANKS	Higher	885, 0.168, NNW
C33	LAKELAND LINDER REGI	3450 DRANE FIELD RD	FL RGA LUST	Higher	885, 0.168, NNW
C34	LAKELAND CITY-LINDER	3450 DRANE FIELD RD	FL LUST, FL UST, FL CLEANUP SITES, FL DWM CONTAM	Higher	885, 0.168, NNW
35	NO TORO AIRCRAFT INC	3240 AIRFIELD DR E #	RCRA NonGen / NLR, RAATS, FINDS, ECHO	Higher	979, 0.185, ENE
C36	LAKELAND CITY-HANGAR	3470 DRANE FIELD RD	FL LUST, FL UST	Lower	999, 0.189, NW
C37	LAKELAND MUNICIPAL A	3470 DRANE FIELD RD	FL LUST, FL UST, FL AST, FL CLEANUP SITES, FL DWM...	Lower	999, 0.189, NW
C38	LAKELAND CITY-HANGAR	3470 DRANE FIELD RD	FL RGA LUST	Lower	999, 0.189, NW
C39	LAKELAND MUNICIPAL A	3470 DRANE FIELD RD	FL RGA LUST	Lower	999, 0.189, NW

MAPPED SITES SUMMARY

Target Property Address:
3900 DON EMERSON DR
LAKELAND, FL 33811

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
C40	PUBLIX CORPORATE OFF	DRANE FIELD RD	FL LUST, FL TANKS	Higher	1089, 0.206, NNW
D41	FEDEX NATIONAL - AVI	3840 AIRFIELD COURT	FL TIER 2	Higher	1161, 0.220, East
D42	WATKINS MOTOR LINES	3840 AIRFIELD COURT	FINDS, ECHO	Higher	1161, 0.220, East
E43	RENNA ENTERPRISES	3231 DRANE FIELD RD	FL LUST, FL UST	Higher	1172, 0.222, NE
E44	RENNA ENTERPRISES	3231 DRANE FIELD RD	FL RGA LUST	Higher	1172, 0.222, NE
45	GLOBE AERO LIMITED I	3240 DRANE FIELD RD	FL CLEANUP SITES, FL RESP PARTY	Higher	1301, 0.246, NE
E46	KROON ENTERPRIES	3711 CENTURY BLVD	FINDS, ECHO	Higher	1377, 0.261, NE
F47	LAKELAND LINDER AIRP	3830 AIRFIELD CT W	FINDS, ECHO	Lower	1404, 0.266, WNW
G48	CIRCLE K #2707553	3730 AIRPORT RD	FL LUST, FL UST, FL Financial Assurance	Lower	1414, 0.268, NW
G49	CIRCLE K #2707553	3730 AIRPORT RD	FL RGA LUST	Lower	1414, 0.268, NW
G50	CIRCLE K STORES INC	3730 AIRPORT RD	EDR Hist Auto	Lower	1414, 0.268, NW
G51	A-1 DIESEL REPAIR IN	3718 DMG DR	FL AST	Lower	1441, 0.273, NW
F52	PUBLIX SUPER MARKETS	3795 AIRFIELD DRIVE	FL TIER 2	Lower	1449, 0.274, WNW
F53	PUBLIX CORPORATE AIR	3795 AIRFIELD DR W	FL AST	Lower	1449, 0.274, WNW
F54	PUBLIX CORPORATE AIR	3795 AIRFIELD DR W	FL Financial Assurance	Lower	1449, 0.274, WNW
F55	NATIONAL FLIGHT SERV	3480 AIRFIELD DR W	RCRA-VSQG, FINDS, ECHO	Lower	1475, 0.279, WNW
F56	9805363	3440 AIRFIELD DRIVE	FL TIER 2	Lower	1488, 0.282, WNW
F57	FLIGHT LEVEL AVIATIO	3440 AIRFIELD DR W	FL CLEANUP SITES, FL DWM CONTAM, FL TIER 2	Lower	1488, 0.282, WNW
F58	FLIGHT LEVEL AVIATIO	3440 AIRFIELD DR W	FL LUST, FL UST	Lower	1488, 0.282, WNW
F59	9046828	3440 AIRFIELD DRIVE	FL TIER 2	Lower	1488, 0.282, WNW
F60	FLIGHTLEVEL AVIATION	3440 AIRFIELD DRIVE	ECHO	Lower	1488, 0.282, WNW
F61	FLIGHTLEVEL AVIATION	3440 AIRFIELD DRIVE	FINDS	Lower	1488, 0.282, WNW
F62	LAKELAND LINDER REG	3400 AIRFIELD DRIVE	FINDS, ECHO	Lower	1500, 0.284, WNW
G63	SHELTAIR-LAKELAND JE	3600 DRANE FIELD RD	FL AST, FL Financial Assurance	Lower	1510, 0.286, WNW
G64	FLORIDA DMA FLARNG A	3600 DRANE FIELD RD	RCRA NonGen / NLR, FINDS, ECHO	Lower	1510, 0.286, WNW
G65	LAKELAND AIR SRVC IN	3600 DRANEFIELD RD	FL TANKS	Lower	1510, 0.286, WNW
H66	B & M CONSTRUCTION C	3706 DMG DR	RCRA-VSQG	Lower	1568, 0.297, NNW
H67	B & M CONSTRUCTION C	3706 DMG DR	FINDS, ECHO	Lower	1568, 0.297, NNW
I68		3633 CENTURY BLVD.	FL SPILLS	Higher	1576, 0.298, NE
J69	US ARMY-AIRFIELD	3610 DRANE FIELD RD	FL LUST, FL CLEANUP SITES, FL DWM CONTAM	Lower	1580, 0.299, WNW
J70	CHAD GUNTER	3610 DRANE FIELD RD	FINDS	Lower	1580, 0.299, WNW
J71	US ARMY-AIRFIELD	3610 DRANE FIELD RD	FL UST	Lower	1580, 0.299, WNW
J72	DENNIS TOWNSEL, JR	3610 DRANE FIELD RD	FINDS	Lower	1580, 0.299, WNW
J73	US ARMY-AIRFIELD	3610 DRANE FIELD RD	FL RGA LUST	Lower	1580, 0.299, WNW
J74	US ARMY-AIRFIELD	3610 DRANE FIELD RD	FL SPILLS 90	Lower	1580, 0.299, WNW
J75	IMPROVEMENTS TO SR 5	DRANE FIELD AND AIRP	FINDS, ECHO	Lower	1588, 0.301, WNW
K76	CITY OF LAKELAND- FI	3150 DRANE FIELD RD	FINDS, ECHO	Higher	1660, 0.314, ENE
I77	WILKERSON INSTRUMENT	3615 CENTURY BLVD	RCRA NonGen / NLR, FINDS, ECHO	Higher	1688, 0.320, NNE
K78	NEW CINGULAR WIRELES	3135 DRANE FIELD RD	FL TIER 2	Higher	1768, 0.335, ENE

MAPPED SITES SUMMARY

Target Property Address:
3900 DON EMERSON DR
LAKELAND, FL 33811

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
K79	NATURAL ADVANTAGE LL	3135 DRANE FIELD RD	RCRA-LQG, FINDS, ECHO	Higher	1768, 0.335, ENE
K80	TASTE ADVANTAGE - LA	3135 DRANE FIELD ROA	FL TIER 2	Higher	1768, 0.335, ENE
K81	NATURAL ADVANTAGE -	3135 DRANE FIELD ROA	FL TIER 2	Higher	1768, 0.335, ENE
K82	LAKELAND WAREHOUSE -	3135 DRANE FIELD RD	FL SPILLS, FL TIER 2, FL NPDES	Higher	1768, 0.335, ENE
K83		3135 DRANEFIELD ROAD	ERNS	Higher	1768, 0.335, ENE
K84	OMNIA INCORPORTATED	3125 DRANE FIELD ROA	FINDS	Higher	1801, 0.341, ENE
K85		3115 DRANE FIELD RD	ERNS	Higher	1841, 0.349, ENE
K86		3115 DRANE FIELD ROA	FL SPILLS	Higher	1841, 0.349, ENE
L87	FL AIRCRAFT TIRE	3604 E CENTURY BLVD	FL SWF/LF	Higher	1919, 0.363, NNE
L88	GOLD EAGLE ENTERPRIS	3604 CENTURY BLVD ST	RCRA NonGen / NLR	Higher	1919, 0.363, NNE
L89	GOLD EAGLE ENTERPRIS	3604 CENTURY BLVD ST	FINDS, ECHO	Higher	1919, 0.363, NNE
L90	CUSTOM CONTROLS & PU	3604 CENTURY BLVD. (	FINDS	Higher	1919, 0.363, NNE
M91	JC MACHINE INC	3620 AIRPORT RD	RCRA-SQG	Lower	1938, 0.367, NW
M92	QUALITY AEROSPACE CO	3620 AIRPORT ROAD	FINDS, ECHO	Lower	1938, 0.367, NW
N93	GMF IND INC	3517 CENTURY BLVD	RCRA-VSQG, FINDS, ECHO	Higher	1985, 0.376, NNE
N94	GMF IND INC	3517 CENTURY BLVD	RCRA NonGen / NLR	Higher	1985, 0.376, NNE
O95	CYPRESS AVIATION INC	3636 DRANE FIELD ROA	RCRA NonGen / NLR, RAATS, ICIS, FINDS, ECHO	Lower	2018, 0.382, WNW
O96	CYPRESS AVIATION INC	3636 DRANE FIELD ROA	FL RESP PARTY	Lower	2018, 0.382, WNW
M97	QUALITY AEROSPACE CO	3610 AIRPORT RD	RCRA-SQG	Lower	2020, 0.383, NW
M98	QUALITY AEROSPACE CO	3610 AIRPORT RD	FINDS, ECHO	Lower	2020, 0.383, NW
P99	QUALITY AEROSPACE CO	3536 DMG DRIVE	RCRA NonGen / NLR	Lower	2097, 0.397, NNW
P100		3536 DMG DRIVE	FL SPILLS	Lower	2097, 0.397, NNW
P101	QUALITY AEROSPACE CO	3536 DMG DRIVE	FINDS, ECHO	Lower	2097, 0.397, NNW
102	AIRPORT HANGER	DRANEFIELD ROAD WITH	FINDS, ECHO	Lower	2111, 0.400, West
N103	BELL CHEMICAL	3511 CENTURY BOULEVA	SEMS-ARCHIVE	Higher	2156, 0.408, NNE
N104	BELL CHEMICAL CO	3511 CENTURY BLVD	FINDS, ECHO	Higher	2156, 0.408, NNE
Q105	KINGS & QUEENS CABIN	3512 CENTURY BLVD	RCRA-VSQG, FINDS, ECHO	Higher	2251, 0.426, NNE
Q106	COMMON GROUND ENVIRO	3504 CENTURY BLVD #4	FL SWF/LF	Higher	2256, 0.427, NNE
107	CONE CONSTRUCTORS IN	3425 AIRPORT RD	FL AST	Lower	2312, 0.438, NW
R108	MAURICES AUTO BODY I	3025A DRANE FIELD RD	RCRA-VSQG, ICIS, FINDS, ECHO	Higher	2762, 0.523, ENE
R109	MAURICES AUTO BODY I	3025A DRANE FIELD RD	RCRA-VSQG	Higher	2762, 0.523, ENE
110	AIRPORT COMMERCE PAR	JONES INDUSTRIAL DR	FINDS, ECHO	Lower	2766, 0.524, WNW
S111	PHOSPHATE ENGINEERIN	2940 DRANE FIELD RD	FL RESP PARTY	Higher	2780, 0.527, ENE
S112	CONSERVE CHEMICALS	2940 DRANE FIELD RD	FINDS, ECHO	Higher	2780, 0.527, ENE
S113	PHOSPHATE ENGINEERIN	2940 DRANE FIELD RD	RCRA-SQG	Higher	2780, 0.527, ENE
S114	PHOSPHATE ENGINEERIN	2940 DRANE FIELD RD	RCRA-VSQG, FINDS, ECHO	Higher	2780, 0.527, ENE
S115	DIXIE SIGNS INC	2930 DRANE FIELD RD	RCRA-VSQG, FINDS, ECHO	Higher	2782, 0.527, East
T116	FABWELL	2934 PARKWAY ST	RCRA NonGen / NLR	Higher	2911, 0.551, East
T117	FABWELL	2934 PARKWAY ST	FINDS, ECHO	Higher	2911, 0.551, East

MAPPED SITES SUMMARY

Target Property Address:
3900 DON EMERSON DR
LAKELAND, FL 33811

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
T118	REESE CITRUS INSULAT	2940 PKWY CT	SSTS	Higher	2914, 0.552, East
T119	REESE CITRUS INSULAT	5888 LAKE VICTORIA P	SSTS	Higher	2914, 0.552, East
T120	NEW MANUFACTURING FA	2940 PARKWAY ST	FINDS, ECHO	Higher	2914, 0.552, East
T121	REESE CITRUS INSULAT	2940 PKY ST	SSTS	Higher	2914, 0.552, East
T122	REESE CITRUS INSULAT	2940 PARKWAY STREET	FINDS	Higher	2914, 0.552, East
T123	REESE CITRUS INSULAT	2940 PARKWAY ST	SSTS	Higher	2914, 0.552, East
T124	FLORIDA PROCESSING M	2920 PARKWAY ST	FINDS, ECHO	Higher	2969, 0.562, East
T125	FLORIDA PROCESSING M	2920 PARKWAY ST	RCRA NonGen / NLR	Higher	2969, 0.562, East
U126	POPS PAINTING INC	3805 DRANE FIELD RD	RCRA-LQG	Lower	2997, 0.568, WNW
U127	POP'S PAINTING, INC.	3805 DRANE FIELD RD	FINDS, ECHO	Lower	2997, 0.568, WNW
U128	POP'S PAINTING, INC.	3805 DRANE FIELD ROA	FL AIRS, FL Financial Assurance, FL TIER 2, FL...	Lower	2997, 0.568, WNW
U129	POP'S PAINTING, INC.	3805 DRANE FIELD ROA	FL TIER 2	Lower	2997, 0.568, WNW
U130	POPS PAINTING	3805 DRANE FIELD ROA	FL TIER 2	Lower	2997, 0.568, WNW
U131	POPS PAINTING INC	3805 DRANE FIELD RD	FL AST	Lower	2997, 0.568, WNW
132	PIPER AIRCRAFT CORPO	3000 MEDULLA RD	CORRACTS, RCRA NonGen / NLR, FINDS, ECHO	Lower	3003, 0.569, WSW
U133	TAMPA TANK & WELDING	5205 ADAMO DR	RCRA-SQG, ICIS, US AIRS	Lower	3019, 0.572, WNW
134	ROBERTS FLYING SERVI	LAKELAND MUNICIPAL A	FL UST	Lower	3026, 0.573, SW
V135	HD BUILDER SOLUTIONS	3810 DRANE FIELD RD	FINDS, ECHO	Lower	3143, 0.595, West
V136	GREEN TREAD RECYCLIN	3810 DRANE FIELD ROA	FL SWF/LF	Lower	3143, 0.595, West
V137	3810 DRANEFIELD ROAD	3810 DRANEFIELD ROAD	FINDS, ECHO	Lower	3143, 0.595, West
V138	HD BUILDER SOLUTIONS	3810 DRANE FIELD RD	RCRA NonGen / NLR	Lower	3143, 0.595, West
W139	TRI W RENTAL	2910 DRANE FIELD RD	FL AST	Higher	3214, 0.609, ENE
W140	RENTAL SERVICE CORPO	2910 DRANE FIELD RD	RCRA NonGen / NLR, FINDS, ECHO	Higher	3214, 0.609, ENE
X141	MGL ENGINEERING INC	2830 PKWY ST #2	RCRA-VSQG, FINDS, ECHO	Higher	3219, 0.610, East
X142	OES ENVIRONMENTAL	2830 PKWY ST SUITE 1	RCRA NonGen / NLR, FINDS, ECHO	Higher	3219, 0.610, East
Y143	ECLIPSE CONSTRUCTION	2930 PARKWAY ST	FINDS, ECHO	Higher	3249, 0.615, ESE
Y144	PARKWAY CENTER	2930 PARKWAY ST	FINDS, ECHO	Higher	3249, 0.615, ESE
Y145	ECLIPSE CONSTRUCTION	2930 PARKWAY ST	RCRA-VSQG	Higher	3249, 0.615, ESE
X146	SCHWAN'S HOME SERVIC	2905 PARKWAY STREET	FL TIER 2	Higher	3322, 0.629, East
X147	SCHWANS SALES ENTERP	2905 PARKWAY STREET	FL TIER 2	Higher	3322, 0.629, East
148	POPS' PAINTING, INC.	UNKNOWN	FINDS, ECHO	Lower	3395, 0.643, WNW
149	BRANDIS AIRCRAFT TOM	3925 AERO PL	RCRA NonGen / NLR, FINDS, ECHO	Lower	3427, 0.649, West
150	FWCC DRAINAGE IMPROV	3900 DRANE FIELD RD	FINDS, ECHO	Lower	3456, 0.655, WNW
Z151	PUBLIX SUPER MARKETS	3300 PUBLIX CORPORAT	RCRA NonGen / NLR	Higher	3512, 0.665, North
Z152	PUBLIX SUPER MARKETS	3300 PUBLIX CORPORAT	FINDS, ECHO	Higher	3512, 0.665, North
153	WALGREENS #13824	UNKNOWN	FINDS, ECHO	Higher	3562, 0.675, NE
AA154	MGL ENGINEERING INC	2818 PARKWAY ST	FINDS, ECHO	Higher	3613, 0.684, East
AB155	RUTHVEN PARKWAY CENT	2825 DRANE FIELD RD	FINDS, ECHO	Higher	3632, 0.688, ENE
AB156	RUTHVEN PARKWAY CENT	2825 DRANE FIELD RD	FL NPDES	Higher	3632, 0.688, ENE

MAPPED SITES SUMMARY

Target Property Address:
3900 DON EMERSON DR
LAKELAND, FL 33811

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
157	CARILLON PLACE	CARILLON BLVD	FINDS, ECHO	Lower	3713, 0.703, NNW
AA158	QUALITY AEROSPACE CO	2810 PARKWAY ST	FINDS, ECHO	Higher	3811, 0.722, East
AA159	QUALITY AEROSPACE CO	2810 PARKWAY ST	RCRA NonGen / NLR	Higher	3811, 0.722, East
AA160	QUALITY POT METAL WO	2810 PKWY ST #5	FINDS, ECHO	Higher	3811, 0.722, East
161	RUTHVEN REAL ESTATE	3965 AERO PLACE	FINDS, ECHO	Lower	3841, 0.727, West
162	SOUTHERN CROSS FIBER	2805 BABGER RD	RCRA NonGen / NLR, FINDS, ECHO	Higher	3920, 0.742, ESE
AC163	ROBINSON FANS FLORID	3955 DRANE FIELD ROA	FL TIER 2, FL NPDES	Lower	3921, 0.743, WNW
AC164	ROBINSON FANS, INC.	3955 DRANE FIELD ROA	FINDS	Lower	3921, 0.743, WNW
AC165	ROBINSON FANS INC	3955 DRANE FIELD RD	RCRA-VSQG	Lower	3921, 0.743, WNW
AC166	ROBINSON FANS INC	3955 DRANEFIELD RD	FINDS, ECHO	Lower	3921, 0.743, WNW
AC167	ROBINSON FANS 2008 W	3955 DRANE FIELD RD	FINDS, ECHO	Lower	3921, 0.743, WNW
168	REALIGNMENT OF TAXIW	UNKNOWN	FINDS, ECHO	Higher	4028, 0.763, ESE
AD169	VERIZON - WARING PAR	2721 PARKWAY STREET	FL TIER 2	Higher	4054, 0.768, East
AD170	VERIZON WARING PARK	2721 PARKWAY ST.	FL TIER 2	Higher	4054, 0.768, East
AD171	WARING PARK RSU (FTR	2721 PARKWAY ST.	FL TIER 2	Higher	4054, 0.768, East
AD172	FRONTIER WARING INDU	2721 PARKWAY ST	FL TIER 2	Higher	4054, 0.768, East
AE173	RUTHVEN REAL ESTATE	3910 AIR PARK DR	FINDS, ECHO	Lower	4080, 0.773, West
AD174	B H BUNN CO	2730 DRANE FIELD RD	RCRA-VSQG, FINDS, ECHO	Higher	4080, 0.773, East
AC175	LAKELAND PARK	DRANE FIELD RD. /AIR	FINDS, ECHO	Lower	4139, 0.784, West
AE176	INTERNATIONAL PAINT	3919 AIR PARK DRIVE	FL TIER 2	Lower	4164, 0.789, West
AF177	SPECIALTY MAINTENANC	4015 DRANE FIELD RD	RCRA-SQG	Lower	4219, 0.799, WNW
AF178	SPECIALTY FABRICATIO	4015 DRANE FIELD RD	FL AIRS, FL TIER 2, FL NPDES	Lower	4219, 0.799, WNW
AF179	SPECIALTY MAINT & CO	4015 DRANEFIELD RD	FINDS, ECHO	Lower	4219, 0.799, WNW
AF180	METAL-TEK, INC.	4015 DRANE FIELD RD.	FINDS	Lower	4219, 0.799, WNW
AG181	FERRERA TOOLING	3960 AIR PARK DR	FL NPDES	Lower	4234, 0.802, West
AG182	FERRERA TOOLING	3960 AIR PARK DR	FINDS, ECHO	Lower	4234, 0.802, West
AH183	GLOBE FIBERGLASS LTD	4033 HOLDEN RD	RCRA NonGen / NLR, FINDS, ECHO	Higher	4356, 0.825, East
AH184	GLOBE FIBERGLASS	4033 HOLDEN ROAD	FL TIER 2	Higher	4356, 0.825, East
185		3912 HOLDEN ROAD	FL SPILLS	Higher	4388, 0.831, East
AI186	INDUSTRIAL BRUSH COR	4000 DRANE FIELD RD	FL RGA LUST	Lower	4436, 0.840, West
AI187	INDUSTRIAL BRUSH COR	400 DRANE FIELD RD	FL LUST, FL TANKS, FINDS, ECHO, FL NPDES	Lower	4436, 0.840, West
AI188	INDUSTRIAL BRUSH COR	4000 DRANE FIELD RD	RCRA-VSQG	Lower	4436, 0.840, West
AI189	INDUSTRIAL BRUSH COR	4000 DRANE FIELD RD	FINDS, ECHO	Lower	4436, 0.840, West
190	CHEMSTATION OF FLORI	4410 HOLDEN RD	FL TIER 2	Lower	4486, 0.850, SE
AJ191	FLORIDA MODIFICATION	3430 FLIGHTLINE DR	RCRA-VSQG, FINDS, ECHO	Lower	4551, 0.862, South
AJ192	CYPRESS AVIATION INC	3450 FLIGHTLINE DR	RCRA-VSQG, FINDS, ECHO	Lower	4554, 0.863, South
AK193	MAX TORQUE LLC	3360 FLIGHTLINE DR	RCRA-SQG	Lower	4560, 0.864, South
AK194	MAX TORQUE LLC	3360 FLIGHTLINE DR	FINDS, ECHO	Lower	4560, 0.864, South
AK195	KIDRON INC	3330 FLIGHTLINE DR	RCRA NonGen / NLR	Lower	4618, 0.875, South

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
AK196	VT HACKNEY CORP	3330 FLIGHTLINE DRIV	FINDS, ECHO	Lower	4618, 0.875, South
AK197	KIDRON	3330 FLIGHT LINE DRI	FL TIER 2	Lower	4618, 0.875, South
198	PROTEL, INC	4705 AIRPARK DRIVE	FINDS, ECHO	Lower	4633, 0.877, West
AL199	TROPIC STAR SEAFOOD	3620 VENTURA DR E	FINDS	Lower	4658, 0.882, WNW
AL200	TROPIC STAR SEAFOOD,	3620 VENTURA DR E	FL NPDES	Lower	4658, 0.882, WNW
AM201	FLORIDA AERO SERVICE	3005 AIRSIDE CENTER	RCRA-VSQG, FINDS, ECHO	Lower	4687, 0.888, SSE
AK202	MODULAR SOLID SURFAC	3240 FLIGHTLINE DR	RCRA-VSQG	Lower	4688, 0.888, South
AK203	MODULAR SOLID SURFAC	3240 FLIGHTLINE DR.	FINDS, ECHO	Lower	4688, 0.888, South
AK204	MODULAR SOLID SURFAC	3240 FLIGHTLINE DRIV	FL TIER 2	Lower	4688, 0.888, South
AK205	SKY KING, INC./B737-	3200 FLIGHTLINE DRIV	ICIS, FINDS, ECHO	Lower	4715, 0.893, South
206	WARING INDUSTRIAL PA	4120 HOLDEN RD	FINDS, ECHO	Higher	4722, 0.894, ESE
AM207	CITY OF LAKELAND --	2949 AIRSIDE CENTER	FINDS, ECHO	Lower	4747, 0.899, SSE
AN208	METALTEK INTERNATION	4121 DRANE FIELD RD	US AIRS, FINDS, ECHO	Lower	4757, 0.901, WNW
AN209	METALTEK	4121 DRAIN FIELD ROA	FINDS	Lower	4757, 0.901, WNW
AN210	SPECIALTY MAINTENANC	4121 DRANE FIELD ROA	FL TIER 2	Lower	4757, 0.901, WNW
211		3607 VENTURA DRIVE E	FL SPILLS	Lower	4804, 0.910, WNW
212	FIREWOLF INDUSTRIES	3249 MEDULLA RD	RCRA NonGen / NLR, FINDS, ECHO	Lower	4922, 0.932, South
AO213	YARBOROUGH LANE		FINDS	Higher	5029, 0.952, ENE
AO214	LAKELAND, CITY OF -	GRIFFIN ROAD FROM US	FINDS	Higher	5029, 0.952, ENE
AO215		4100 SOUTH FRONTAGE	FL SPILLS	Higher	5029, 0.952, ENE
216	RUTHVEN REAL ESTATE	4020, 4030 AND 4040	FINDS	Lower	5061, 0.959, West
AP217	COMMON GROUND ENVIRO	4516 CLEMENTS RD	FINDS, ECHO	Lower	5088, 0.964, SE
AP218	COMMON GROUND ENVIRO	4516 CLEMENTS RD	RCRA NonGen / NLR	Lower	5088, 0.964, SE
AP219	C.D. BROWN CO, INC	4516 CLEMENTS RD.	SSTS	Lower	5088, 0.964, SE
AQ220	FLORIDA DMA NATIONAL	4140 DRANE FIELD RD	RCRA-VSQG, FINDS, ECHO	Lower	5186, 0.982, West
AQ221	NATIONAL GUARD - LAK	4140 DRANE FIELD ROA	FL TIER 2	Lower	5186, 0.982, West
222	RUTHVEN REAL ESTATE	4020, 4030 AND 4040	FINDS, ECHO	Lower	5240, 0.992, West
223	HERITAGE-CRYSTAL CLE	4302 HOLDEN RD	RCRA NonGen / NLR, FINDS	Higher	5339, 1.011, ESE
224	PROTEL INC	4150 KIDRON RD	RCRA-VSQG, FINDS, ECHO	Lower	5357, 1.015, West
225	DAY & NIGHT TIRE, LL	3703 VENTURA DRIVE,	FL SWF/LF	Lower	5379, 1.019, WNW
AR226	GLOBE FIBERGLASS LTD	3470 AIRCRAFT DR.	RCRA-VSQG, FINDS, ECHO	Lower	5499, 1.041, South
AR227	FOSTERS AIRCRAFT REF	3400B AIRCRAFT DR	RCRA-SQG	Lower	5503, 1.042, South
AR228	NATIONAL FLIGHT SERV	3400 AIRCRAFT DR	RCRA NonGen / NLR, FINDS, ECHO	Lower	5503, 1.042, South
AS229	INDUSTRIAL COMPOSITE	4225 DRANE FIELD RD	RCRA-SQG, TRIS, ICIS, US AIRS, FINDS, ECHO	Lower	5608, 1.062, West
AT230	SENIOR CARE PHARMACY	4175 S PIPKIN RD STE	RCRA-VSQG	Higher	5620, 1.064, ESE
AT231	CARTER LYNN P	4175 S PIPKIN RD	FL UST	Higher	5620, 1.064, ESE
AS232	HARDEE EQUIPMENT COM	4220 DRANE FIELD ROA	RCRA NonGen / NLR, FINDS, ECHO	Lower	5633, 1.067, West
AS233	KIDRON BODY CO	4220 DRANE FIELD RD	FL UST	Lower	5633, 1.067, West
234	WEST LAKELAND SOD	2915 AIRPORT RD	FL AST	Lower	5657, 1.071, North

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235	INTERNATIONAL BEVERA	3919 KIDRON RD	RCRA-VSQG	Lower	5691, 1.078, West
236	DARIAS ACOSTA BER 11	POLK PKWY FRONTAGE R	FL LUST, FL TANKS, FL CLEANUP SITES, FL DWM CONTAM	Higher	5941, 1.125, ENE
237	FL REFRESHMENT CENTE	KIDRON RD	FL UST, FL AST	Lower	5984, 1.133, West
238	CAROLINA LOGISTICS S	4150 S PIPKIN RD #5	RCRA NonGen / NLR	Higher	6016, 1.139, ESE
AU239	LAKELAND AAF		FUDS	Lower	6049, 1.146, West
AU240	CWM AREAS		UXO	Lower	6049, 1.146, West
AU241	SKEET RANGE & FIRING		UXO	Lower	6049, 1.146, West
AU242	FIRMENICH, INC.	4330 DRANE FIELD RD	RCRA-LQG, US AIRS	Lower	6104, 1.156, West
243	MORGAN J L	2646 MEDULLA RD	FL AST	Lower	6116, 1.158, SE
244	SUN 'N FUN FLY IN IN	4175 MEDULLA RD	FL AST	Lower	6157, 1.166, SW
245	PUBLIX SUPER MARKET	3525 AVIATION DR	FL AST, FL Financial Assurance	Lower	6356, 1.204, South
246	LUKES AMOCO INC	2716 MEDULLA RD	EDR Hist Auto	Lower	6383, 1.209, SE
247	SOUTHWEST STAINLESS	4355 DRANE FIELD RD	RCRA-SQG, PA MANIFEST	Lower	6590, 1.248, WNW
248	PIPER AIRCRAFT CORP-	2955 MEDULLA RD	FL LUST, FL UST	Lower	7018, 1.329, SSE
AV249	GOVERNMENT EMPLOYEE	3535 W PIPKIN RD	FL AST	Lower	7132, 1.351, South
AV250	GOVERNMENT EMPLOYEE	3535 W PIPKIN RD	FL LUST, FL Financial Assurance	Lower	7132, 1.351, South
AW251	IMPERIAL AMOCO INC	3230 W PIPKIN RD	EDR Hist Auto	Lower	7281, 1.379, South
AW252	QUALITY#154	3230 W PIPKIN RD	FL LUST, FL UST, FL CLEANUP SITES, FL DWM CONTAM,...	Lower	7281, 1.379, South
AW253	KELLERS CLEANERS	5004 YATES RD	EDR Hist Cleaner	Lower	7309, 1.384, South
254	LAKELAND CITY-ENGLIS	2121 DRANE FIELD RD	FL AST	Higher	7489, 1.418, East
255	LAKELAND, CITY OF (F	3249 MEDULLA RD	FL RESP PARTY	Lower	7842, 1.485, SW
AX256	CSX TRANSPORTATION 0	WINSTON RAIL YARD TR	FL LUST, FL TANKS	Higher	8234, 1.559, NE
AX257	CSX TRANSPORTATION 0	WINSTON RAIL YARD	FL LUST, FL TANKS	Higher	8234, 1.559, NE
AX258	CSX TRANSPORTATION 0	WINSTON YARD TRACKS	FL LUST, FL TANKS	Higher	8234, 1.559, NE
259	TRUGREEN INC	3939 PROGRESS DR	RCRA-VSQG, FINDS, ECHO	Lower	8443, 1.599, West
AY260	GMF INDUSTRIES, INC	4600 DRANE FIELD RD	RCRA-VSQG, FINDS, ECHO	Lower	8479, 1.606, West
AY261	GMF INDUSTRIES INC	4600 DRANE FIELD ROA	FL RESP PARTY, FL TIER 2, FL NPDES	Lower	8479, 1.606, West
AZ262	INTERSTATE CHEMICAL	3903 PROGRESS DR	RCRA-SQG	Lower	8671, 1.642, West
AZ263	INTERSTATE CHEMICAL	3903 PROGRESS DR	FL AST, FL SPILLS, FL DRYCLEANERS, FL Financial...	Lower	8671, 1.642, West
BA264	CITGO FOOD MART	1950 DRANE FIELD RD	RCRA-VSQG, FINDS	Higher	8713, 1.650, East
BA265	CITGO FOOD MART	1950 DRANE FIELD RD	FL LUST, FL UST, FL Financial Assurance	Higher	8713, 1.650, East
266	YAGER PROPERTIES	0 PIPKIN CREEK ROAD,	FL RESP PARTY	Lower	8887, 1.683, East
267	NATIONS RENT #97	4710 DRANEFIELD RD	FL AST	Lower	8941, 1.693, West
268	CONNECTED POWER PHOS	4783 DRANE FIELD RD	RCRA NonGen / NLR	Lower	9361, 1.773, West
269	PIPPING BLOCK	LAKE HENRY & LEAMEN	FL UST, FL AST	Lower	9777, 1.852, SE
BB270	FLORIDA RECYCLING SO	3210 WHITTEN ROAD	RCRA NonGen / NLR, FINDS, ECHO	Lower	9841, 1.864, WNW
BB271	AQUA CLEAN ENVIRONME	3210 WHITTEN RD	FL SWF/LF, FL SPILLS, FL Financial Assurance	Lower	9841, 1.864, WNW
BB272	AQUA CLEAN ENVIRONME	3210 WHITTEN RD	FL AST	Lower	9841, 1.864, WNW
BC273	COOK COMPOSITE & POL	4775 GATELAND DR	RCRA-VSQG	Higher	10455, 1.980, WNW

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
BC274	COMPOSITES ONE LLC	4775 GATELAND DR	RCRA-SQG	Higher	10455, 1.980, WNW
BC275	8381920 - VALSPAR -	4775 GATELAND DRIVE	RCRA NonGen / NLR	Higher	10455, 1.980, WNW
BC276	REICHOLD INC	4775 GATELAND DR	RCRA-VSQG	Higher	10455, 1.980, WNW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
LAL N APRON REHABILI 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110063607431 ECHO Registry ID: 110063607431	N/A
LAKELAND LINDER REGI 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110027962774 ECHO Registry ID: 110027962774	N/A
REHABILITATE TAXIWAY 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110070111544 ECHO Registry ID: 110070111544	N/A
PIEDMONT HAWTHORNE A 3900 DON EMERSON DR LAKELAND, FL 33811	FL AST Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9805314 Facility Status: CLOSED Facility Status: CLOSED	N/A
LAKELAND LINDER REG 3900 DON EMERSON DR LAKELAND, FL	FL NPDES Status: A Facility ID: FLR10JX50 Facility ID: FLR05A537 Facility ID: FLR10SF52 Facility ID: FLR10NI14	N/A
LAKELAND LINDER REGI 3900 DON EMERSON DR LAKELAND, FL 33811	RCRA-SQG EPA ID:: FLR000130518 FINDS Registry ID:: 110069485630 Registry ID:: 110056344273 ECHO Registry ID: 110069485630 Registry ID: 110056344273 Registry ID: 110070064129	FLR000130518
RUNWAY 27 & TAXIWAY 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS	N/A

	Registry ID:: 110064762332 Registry ID:: 110070263420 Registry ID:: 110044267762 ECHO Registry ID: 110070263420 Registry ID: 110064762332 Registry ID: 110044267762	
NEW FUEL FARM @ LAKE 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110062671755 ECHO Registry ID: 110062671755	N/A
ENGLISH OAKS FORCE M 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110037330796 ECHO Registry ID: 110037330796	N/A
LAKELAND LINDER REG 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110070064129	N/A
SW APRON RECONSTRUCT 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110063607422 ECHO Registry ID: 110063607422	N/A
TAXIWAY B EXTENSION 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110054134593 ECHO Registry ID: 110054134593	N/A
LAKELAND LENDER AIRP LAKELAND LENDER AIRP LAKELAND, FL	FL SPILLS OHMIT Incident Number: 24746 Incident Status: Closed	N/A
LANDMARK AVIATION - 3900 DON EMERSON DRI LAKELAND, FL 33801	FL TIER 2	N/A
3900 DON EMERSON DRI 3900 DON EMERSON DRI LAKELAND, FL	FL SPILLS OHMIT Incident Number: 44996 Incident Status: Closed	N/A
LAKELAND LINDER REGI 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS	N/A

	Registry ID:: 110020170679 ECHO Registry ID: 110020170679	
KTTW HANGAR AT LAKEL 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110070548451 ECHO Registry ID: 110070548451	N/A
LAKELAND LINDER REGI 3900 DON EMERSON DR LAKELAND, FL	FL NPDES Status: A Facility ID: FLR10QF20	N/A
LAKELAND LINDER INTE 3900 DON EMERSON DR LAKELAND, FL 33811	FL UST Database: UST, Date of Government Version: 10/30/2019 Tank Status: T Tank Status: B Facility-Site Id: 9046828 Facility Status: OPEN FL AST Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9046828 Facility Status: OPEN Facility Status: OPEN FL Financial Assurance Database: Financial Assurance 3, Date of Government Version: 10/29/2019 Facility Status: OPEN Facility Status: CLOSED Facility ID: 8943925 Facility ID: 9046828 Facility ID: 9805314 FL NPDES Status: A Facility ID: FLR20BP77 Facility ID: FLR10SN60 Facility ID: FLR20AE13 Facility ID: FLR20BC56 Facility ID: FLR20CK67 *Additional key fields are available in the Map Findings section	N/A
SHELTAIR -LAKELAND J 3900 DON EMERSON DR LAKELAND, FL 33811	FL AST Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 8943925 Facility Status: OPEN Facility Status: OPEN	N/A
LAKELAND LINDER INTE 3900 DON EMERSON DR, LAKELAND, FL 33811	FL AIRS	N/A

Facility Status: A
Facility Id: 1050470

TSA AT LAKELAND LIND 3900 DON EMERSON DR LAKELAND, FL 33811	RCRA NonGen / NLR EPA ID:: FLR000175927	FLR000175927
LAKELAND LINDER REG 3900 DON EMERSON DR LAKELAND, FL 33811	FINDS Registry ID:: 110070388526 ECHO Registry ID: 110070388526	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL.......................... National Priority List
Proposed NPL.............. Proposed National Priority List Sites
NPL LIENS.................. Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL............... National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY......... Federal Facility Site Information listing
SEMS....................... Superfund Enterprise Management System

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF.................. RCRA - Treatment, Storage and Disposal

Federal institutional controls / engineering controls registries

LUCIS....................... Land Use Control Information System
US ENG CONTROLS.......... Engineering Controls Sites List
US INST CONTROL.......... Sites with Institutional Controls

State- and tribal - equivalent CERCLIS

FL SHWS..................... Florida's State-Funded Action Sites

State and tribal leaking storage tank lists

FL LAST---------------------- Leaking Aboveground Storage Tank Listing
INDIAN LUST---------------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FL FF TANKS---------------- Federal Facilities Listing
FEMA UST------------------- Underground Storage Tank Listing
INDIAN UST----------------- Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

FL ENG CONTROLS---------- Institutional Controls Registry
FL INST CONTROL---------- Institutional Controls Registry

State and tribal voluntary cleanup sites

FL VCP---------------------- Voluntary Cleanup Sites
INDIAN VCP----------------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

FL BROWNFIELDS----------- Brownfields Sites Database

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS----------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

FL SWRCY------------------ Recycling Centers
INDIAN ODI----------------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI------------------------- Open Dump Inventory
IHS OPEN DUMPS---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL--------------- Delisted National Clandestine Laboratory Register
FL PRIORITYCLEANERS---- Priority Ranking List
FL FI Sites------------------ Sites List
US CDL--------------------- National Clandestine Laboratory Register
FL PFAS-------------------- PFOS and PFOA stand for perfluorooctane sulfonate and perfluorooctanoic acid

Local Land Records

LIENS 2-------------------- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS---------------------- Hazardous Materials Information Reporting System

FL SPILLS 80 .... SPILLS 80 data from FirstSearch

Other Ascertainable Records

DOD .... Department of Defense Sites
SCRD DRYCLEANERS .... State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR .... Financial Assurance Information
EPA WATCH LIST .... EPA WATCH LIST
2020 COR ACTION .... 2020 Corrective Action Program List
TSCA .... Toxic Substances Control Act
ROD .... Records Of Decision
RMP .... Risk Management Plans
PRP .... Potentially Responsible Parties
PADS .... PCB Activity Database System
FTTS .... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS .... Material Licensing Tracking System
COAL ASH DOE .... Steam-Electric Plant Operation Data
COAL ASH EPA .... Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER .... PCB Transformer Registration Database
RADINFO .... Radiation Information Database
HIST FTTS .... FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS .... Incident and Accident Data
CONSENT .... Superfund (CERCLA) Consent Decrees
INDIAN RESERV .... Indian Reservations
FUSRAP .... Formerly Utilized Sites Remedial Action Program
UMTRA .... Uranium Mill Tailings Sites
LEAD SMELTERS .... Lead Smelter Sites
US MINES .... Mines Master Index File
ABANDONED MINES .... Abandoned Mines
DOCKET HWC .... Hazardous Waste Compliance Docket Listing
FUELS PROGRAM .... EPA Fuels Program Registered Listing
FL ASBESTOS .... ASBESTOS
FL DEDB .... Ethylene Dibromide Database Results
FL Cattle Dip. Vats .... Cattle Dipping Vats
FL SITE INV SITES .... Site Investigation Section Sites Listing
FL UIC .... Underground Injection Wells Database Listing
MINES MRDS .... Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP .... EDR Proprietary Manufactured Gas Plants

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

FL RGA HWS .... Recovered Government Archive State Hazardous Waste Facilities List
FL RGA LF .... Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 10/25/2019 has revealed that there is 1 SEMS-ARCHIVE site within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BELL CHEMICAL Site ID: 0404953 EPA Id: FLD984167502	3511 CENTURY BOULEVA	NNE 1/4 - 1/2 (0.408 mi.)	N103	268

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 12/16/2019 has revealed that there is 1 CORRACTS site within approximately 2 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
PIPER AIRCRAFT CORPO EPA ID:: FLD049551864	***3000 MEDULLA RD***	***WSW 1/2 - 1 (0.569 mi.)***	***132***	***388***

Federal RCRA generators list

RCRA-LQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

A review of the RCRA-LQG list, as provided by EDR, and dated 12/16/2019 has revealed that there are 3 RCRA-LQG sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NATURAL ADVANTAGE LL EPA ID:: FLR000194407	***3135 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.335 mi.)***	***K79***	***183***

Lower Elevation	Address	Direction / Distance	Map ID	Page
POPS PAINTING INC EPA ID:: FLD984262535	3805 DRANE FIELD RD	WNW 1/2 - 1 (0.568 mi.)	U126	337
FIRMENICH, INC. EPA ID:: FLR000034512	***4330 DRANE FIELD RD***	***W 1 - 2 (1.156 mi.)***	***AU242***	***687***

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 12/16/2019 has revealed that there are 11 RCRA-SQG sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PHOSPHATE ENGINEERIN EPA ID:: FLD984262980	2940 DRANE FIELD RD	ENE 1/2 - 1 (0.527 mi.)	S113	280
COMPOSITES ONE LLC EPA ID:: FLR000120105	4775 GATELAND DR	WNW 1 - 2 (1.980 mi.)	BC274	835

Lower Elevation	Address	Direction / Distance	Map ID	Page
JC MACHINE INC EPA ID:: FLR000221549	3620 AIRPORT RD	NW 1/4 - 1/2 (0.367 mi.)	M91	224
QUALITY AEROSPACE CO EPA ID:: FLR000211375	3610 AIRPORT RD	NW 1/4 - 1/2 (0.383 mi.)	M97	256
TAMPA TANK & WELDING EPA ID:: FLD982088007	***5205 ADAMO DR***	***WNW 1/2 - 1 (0.572 mi.)***	***U133***	***394***
SPECIALTY MAINTENANC EPA ID:: FLD982148603	4015 DRANE FIELD RD	WNW 1/2 - 1 (0.799 mi.)	AF177	493
MAX TORQUE LLC EPA ID:: FLR000211706	3360 FLIGHTLINE DR	S 1/2 - 1 (0.864 mi.)	AK193	517
FOSTERS AIRCRAFT REF	3400B AIRCRAFT DR	S 1 - 2 (1.042 mi.)	AR227	597

EPA ID:: FLR000110403				
INDUSTRIAL COMPOSITE EPA ID:: FLD982107203	***4225 DRANE FIELD RD***	***W 1 - 2 (1.062 mi.)***	***AS229***	***633***
SOUTHWEST STAINLESS EPA ID:: FLD157571811	***4355 DRANE FIELD RD***	***WNW 1 - 2 (1.248 mi.)***	***247***	***705***
INTERSTATE CHEMICAL EPA ID:: FLR000124891	3903 PROGRESS DR	W 1 - 2 (1.642 mi.)	AZ262	757

RCRA-VSQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-VSQG list, as provided by EDR, and dated 12/16/2019 has revealed that there are 27 RCRA-VSQG sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GMF IND INC EPA ID:: FLTMP9002146	***3517 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.376 mi.)***	***N93***	***227***
KINGS & QUEENS CABIN EPA ID:: FL0000924894	***3512 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.426 mi.)***	***Q105***	***270***
MAURICES AUTO BODY I EPA ID:: FLR000056531	***3025A DRANE FIELD RD***	***ENE 1/2 - 1 (0.523 mi.)***	***R108***	***274***
MAURICES AUTO BODY I EPA ID:: FLR000056523	3025A DRANE FIELD RD	ENE 1/2 - 1 (0.523 mi.)	R109	276
PHOSPHATE ENGINEERIN EPA ID:: FLT950053413	***2940 DRANE FIELD RD***	***ENE 1/2 - 1 (0.527 mi.)***	***S114***	***304***
DIXIE SIGNS INC EPA ID:: FLR000056507	***2930 DRANE FIELD RD***	***E 1/2 - 1 (0.527 mi.)***	***S115***	***306***
MGL ENGINEERING INC EPA ID:: FLR000082859	***2830 PKWY ST #2***	***E 1/2 - 1 (0.610 mi.)***	***X141***	***416***
ECLIPSE CONSTRUCTION EPA ID:: FLR000122853	2930 PARKWAY ST	ESE 1/2 - 1 (0.615 mi.)	Y145	421
B H BUNN CO EPA ID:: FLD982121352	***2730 DRANE FIELD RD***	***E 1/2 - 1 (0.773 mi.)***	***AD174***	***483***
SENIOR CARE PHARMACY EPA ID:: FLR000221473	4175 S PIPKIN RD STE	ESE 1 - 2 (1.064 mi.)	AT230	665
CITGO FOOD MART EPA ID:: FLD984186304	***1950 DRANE FIELD RD***	***E 1 - 2 (1.650 mi.)***	***BA264***	***793***
COOK COMPOSITE & POL EPA ID:: FLT050074921	4775 GATELAND DR	WNW 1 - 2 (1.980 mi.)	BC273	834
REICHOLD INC EPA ID:: FLT060077930	4775 GATELAND DR	WNW 1 - 2 (1.980 mi.)	BC276	840

Lower Elevation	Address	Direction / Distance	Map ID	Page
NATIONAL FLIGHT SERV	***3480 AIRFIELD DR W***	***WNW 1/4 - 1/2 (0.279 mi.)***	***F55***	***136***

EPA ID:: FLR000061069				
B & M CONSTRUCTION C EPA ID:: FLT980059695	3706 DMG DR	NNW 1/4 - 1/2 (0.297 mi.)	H66	164
ROBINSON FANS INC EPA ID:: FLD984228189	3955 DRANE FIELD RD	WNW 1/2 - 1 (0.743 mi.)	AC165	463
INDUSTRIAL BRUSH COR EPA ID:: FLR000139386	4000 DRANE FIELD RD	W 1/2 - 1 (0.840 mi.)	AI188	508
FLORIDA MODIFICATION EPA ID:: FLR000204982	***3430 FLIGHTLINE DR***	***S 1/2 - 1 (0.862 mi.)***	***AJ191***	***512***
CYPRESS AVIATION INC EPA ID:: FLR000014092	***3450 FLIGHTLINE DR***	***S 1/2 - 1 (0.863 mi.)***	***AJ192***	***514***
FLORIDA AERO SERVICE EPA ID:: FLR000047381	***3005 AIRSIDE CENTER***	***SSE 1/2 - 1 (0.888 mi.)***	***AM201***	***538***
MODULAR SOLID SURFAC EPA ID:: FLR000045393	3240 FLIGHTLINE DR	S 1/2 - 1 (0.888 mi.)	AK202	541
FLORIDA DMA NATIONAL EPA ID:: FL0000360420	***4140 DRANE FIELD RD***	***W 1/2 - 1 (0.982 mi.)***	***AQ220***	***579***
PROTEL INC EPA ID:: FLD984227975	***4150 KIDRON RD***	***W 1 - 2 (1.015 mi.)***	***224***	***592***
GLOBE FIBERGLASS LTD EPA ID:: FLR000156505	***3470 AIRCRAFT DR.***	***S 1 - 2 (1.041 mi.)***	***AR226***	***596***
INTERNATIONAL BEVERA EPA ID:: FLT990063141	3919 KIDRON RD	W 1 - 2 (1.078 mi.)	235	674
TRUGREEN INC EPA ID:: FLT160086492	***3939 PROGRESS DR***	***W 1 - 2 (1.599 mi.)***	***259***	***746***
GMF INDUSTRIES, INC EPA ID:: FLD984178418	***4600 DRANE FIELD RD***	***W 1 - 2 (1.606 mi.)***	***AY260***	***748***

Federal ERNS list

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 09/09/2019 has revealed that there are 2 ERNS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported Incident Date Time: 2013-10-28 10:30:00 NRC Report #: 1064242	3135 DRANEFIELD ROAD	ENE 1/4 - 1/2 (0.335 mi.)	K83	211
Not reported Incident Date Time: 2015-07-17 10:38:00 NRC Report #: 1123111	3115 DRANE FIELD RD	ENE 1/4 - 1/2 (0.349 mi.)	K85	215

EXECUTIVE SUMMARY

State and tribal landfill and/or solid waste disposal site lists

FL SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Department of Environmental Protection's Facility Directory (Solid Waste Facilities).

A review of the FL SWF/LF list, as provided by EDR, has revealed that there are 5 FL SWF/LF sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FL AIRCRAFT TIRE	3604 E CENTURY BLVD	NNE 1/4 - 1/2 (0.363 mi.)	L87	221
Database: SWF/LF, Date of Government Version: 10/15/2019 Facility-Site Id: 95685 Class Status: INACTIVE (I)				
COMMON GROUND ENVIRO	3504 CENTURY BLVD #4	NNE 1/4 - 1/2 (0.427 mi.)	Q106	272
Database: SWF/LF, Date of Government Version: 10/15/2019 Facility-Site Id: 102143 Class Status: INACTIVE (I)				

Lower Elevation	Address	Direction / Distance	Map ID	Page
GREEN TREAD RECYCLIN	3810 DRANE FIELD ROA	W 1/2 - 1 (0.595 mi.)	V136	410
Database: SWF/LF, Date of Government Version: 10/15/2019 Facility-Site Id: 100389 Class Status: CLOSED, NO GW MONITORING (J) Class Status: INACTIVE (I)				
DAY & NIGHT TIRE, LL	3703 VENTURA DRIVE,	WNW 1 - 2 (1.019 mi.)	225	595
Database: SWF/LF, Date of Government Version: 10/15/2019 Facility-Site Id: 95954 Class Status: ACTIVE (A) Class Status: REGISTERED (R)				
AQUA CLEAN ENVIRONME	***3210 WHITTEN RD***	***WNW 1 - 2 (1.864 mi.)***	***BB271***	***826***
Database: SWF/LF, Date of Government Version: 10/15/2019 Facility-Site Id: 98770 Class Status: PROPOSED (P)				

State and tribal leaking storage tank lists

FL LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Protection's PCTO1--Petroleum Contamination Detail Report.

A review of the FL LUST list, as provided by EDR, and dated 10/28/2019 has revealed that there are 18 FL LUST sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND LINDER REGI	***3450 DRANE FIELD RD***	***NNW 1/8 - 1/4 (0.168 mi.)***	***C28***	***63***
Discharge Cleanup Status: NFA - NFA COMPLETE Facility Status: CLOSED Facility-Site Id: 9801687				
LAKELAND CITY-LINDER	***3450 DRANE FIELD RD***	***NNW 1/8 - 1/4 (0.168 mi.)***	***C34***	***68***

Discharge Cleanup Status: SA - SA ONGOING
Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9700527
Facility-Site Id: 9701079

PUBLIX CORPORATE OFF	*DRANE FIELD RD*	*NNW 1/8 - 1/4 (0.206 mi.)*	*C40*	*100*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9806933

RENNA ENTERPRISES	*3231 DRANE FIELD RD*	*NE 1/8 - 1/4 (0.222 mi.)*	*E43*	*106*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 8944950

DARIAS ACOSTA BER 11	*POLK PKWY FRONTAGE R*	*ENE 1 - 2 (1.125 mi.)*	*236*	*675*

Discharge Cleanup Status: SA - SA ONGOING
Facility Status: CLOSED
Facility-Site Id: 9813000

CSX TRANSPORTATION 0	*WINSTON RAIL YARD TR*	*NE 1 - 2 (1.559 mi.)*	*AX256*	*739*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9807740

CSX TRANSPORTATION 0	*WINSTON RAIL YARD*	*NE 1 - 2 (1.559 mi.)*	*AX257*	*742*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9806136

CSX TRANSPORTATION 0	*WINSTON YARD TRACKS*	*NE 1 - 2 (1.559 mi.)*	*AX258*	*744*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9807765

CITGO FOOD MART	*1950 DRANE FIELD RD*	*E 1 - 2 (1.650 mi.)*	*BA265*	*795*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: OPEN
Facility-Site Id: 8623420

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND CITY-HANGAR	*3470 DRANE FIELD RD*	*NW 1/8 - 1/4 (0.189 mi.)*	*C36*	*89*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9101671

LAKELAND MUNICIPAL A	*3470 DRANE FIELD RD*	*NW 1/8 - 1/4 (0.189 mi.)*	*C37*	*93*

Discharge Cleanup Status: RA - RA ONGOING
Facility Status: CLOSED
Facility-Site Id: 8628463

CIRCLE K #2707553	*3730 AIRPORT RD*	*NW 1/4 - 1/2 (0.268 mi.)*	*G48*	*113*

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: OPEN
Facility-Site Id: 9802234

FLIGHT LEVEL AVIATIO	*3440 AIRFIELD DR W*	*WNW 1/4 - 1/2 (0.282 mi.)*	*F58*	*148*

Discharge Cleanup Status: RA - RA ONGOING
Facility Status: CLOSED

Facility-Site Id: 9814943

US ARMY-AIRFIELD	***3610 DRANE FIELD RD***	***WNW 1/4 - 1/2 (0.299 mi.)***	***J69***	***166***

Discharge Cleanup Status: WDRW - WITHDRAWN FROM CLEANUP PROGRAM
Discharge Cleanup Status: SRCR - SRCR COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9101799

INDUSTRIAL BRUSH COR	***400 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI187***	***504***

Discharge Cleanup Status: SRCR - SRCR COMPLETE
Facility Status: CLOSED
Facility-Site Id: 9809351

PIPER AIRCRAFT CORP-	***2955 MEDULLA RD***	***SSE 1 - 2 (1.329 mi.)***	***248***	***709***

Discharge Cleanup Status: SRCR - SRCR COMPLETE
Facility Status: CLOSED
Facility-Site Id: 8623681

GOVERNMENT EMPLOYEE	***3535 W PIPKIN RD***	***S 1 - 2 (1.351 mi.)***	***AV250***	***716***

Discharge Cleanup Status: NFA - NFA COMPLETE
Facility Status: OPEN
Facility-Site Id: 9807101

QUALITY#154	***3230 W PIPKIN RD***	***S 1 - 2 (1.379 mi.)***	***AW252***	***722***

Discharge Cleanup Status: SA - SA ONGOING
Facility Status: OPEN
Facility-Site Id: 8624337

State and tribal registered storage tank lists

FL UST: The Underground Storage Tank database contains registered USTs. Shortly after the September 11 event, the DEP was instructed to remove the detail about some of the storage tank facilities in the state from their reports. Federal-owned facilities and bulk storage facilities are included in that set.

A review of the FL UST list, as provided by EDR, has revealed that there are 15 FL UST sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND CITY-LINDER	***3450 DRANE FIELD RD***	***NNW 1/8 - 1/4 (0.168 mi.)***	***C34***	***68***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 9202619
Facility Status: CLOSED

RENNA ENTERPRISES	***3231 DRANE FIELD RD***	***NE 1/8 - 1/4 (0.222 mi.)***	***E43***	***106***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8944950
Facility Status: CLOSED

CARTER LYNN P	4175 S PIPKIN RD	ESE 1 - 2 (1.064 mi.)	AT231	668

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8624261
Facility Status: CLOSED

CITGO FOOD MART	***1950 DRANE FIELD RD***	***E 1 - 2 (1.650 mi.)***	***BA265***	***795***

Database: UST, Date of Government Version: 10/30/2019

Tank Status: B
Tank Status: U
Facility-Site Id: 8623420
Facility Status: OPEN

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND CITY-HANGAR	***3470 DRANE FIELD RD***	***NW 1/8 - 1/4 (0.189 mi.)***	***C36***	***89***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 9101671
Facility Status: CLOSED

LAKELAND MUNICIPAL A	***3470 DRANE FIELD RD***	***NW 1/8 - 1/4 (0.189 mi.)***	***C37***	***93***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8628463
Facility Status: CLOSED

CIRCLE K #2707553	***3730 AIRPORT RD***	***NW 1/4 - 1/2 (0.268 mi.)***	***G48***	***113***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: U
Facility-Site Id: 9802234
Facility Status: OPEN

FLIGHT LEVEL AVIATIO	***3440 AIRFIELD DR W***	***WNW 1/4 - 1/2 (0.282 mi.)***	***F58***	***148***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 9814943
Facility Status: CLOSED

US ARMY-AIRFIELD	3610 DRANE FIELD RD	WNW 1/4 - 1/2 (0.299 mi.)	J71	171

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 9101799
Facility Status: CLOSED

ROBERTS FLYING SERVI	LAKELAND MUNICIPAL A	SW 1/2 - 1 (0.573 mi.)	134	408

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8624323
Facility Status: CLOSED

KIDRON BODY CO	4220 DRANE FIELD RD	W 1 - 2 (1.067 mi.)	AS233	673

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8624340
Facility Status: CLOSED

FL REFRESHMENT CENTE	***KIDRON RD***	***W 1 - 2 (1.133 mi.)***	***237***	***679***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8623581
Facility Status: CLOSED

PIPER AIRCRAFT CORP-	***2955 MEDULLA RD***	***SSE 1 - 2 (1.329 mi.)***	***248***	***709***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8623681
Facility Status: CLOSED

QUALITY#154	***3230 W PIPKIN RD***	***S 1 - 2 (1.379 mi.)***	***AW252***	***722***

Database: UST, Date of Government Version: 10/30/2019

Tank Status: B
Tank Status: U
Facility-Site Id: 8624337
Facility Status: OPEN

PIPPING BLOCK	***LAKE HENRY & LEAMEN***	***SE 1 - 2 (1.852 mi.)***	***269***	***808***

Database: UST, Date of Government Version: 10/30/2019
Tank Status: B
Facility-Site Id: 8735757
Facility Status: CLOSED

FL AST: Shortly after the Sept 11 event, the DEP was instructed to remove the detail about some of the storage tank facilities in the state from their reports. Federal-owned facilities and bulk storage facilities are included in that set.

A review of the FL AST list, as provided by EDR, has revealed that there are 18 FL AST sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
TRI W RENTAL	2910 DRANE FIELD RD	ENE 1/2 - 1 (0.609 mi.)	W139	413

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 8944932
Facility Status: CLOSED
Facility Status: CLOSED

LAKELAND CITY-ENGLIS	2121 DRANE FIELD RD	E 1 - 2 (1.418 mi.)	254	737

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 9811363
Facility Status: OPEN
Facility Status: OPEN

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND MUNICIPAL A	***3470 DRANE FIELD RD***	***NW 1/8 - 1/4 (0.189 mi.)***	***C37***	***93***

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 9101671
Facility Status: CLOSED
Facility Status: CLOSED

A-1 DIESEL REPAIR IN	3718 DMG DR	NW 1/4 - 1/2 (0.273 mi.)	G51	129

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 9815188
Facility Status: CLOSED
Facility Status: CLOSED

PUBLIX CORPORATE AIR	3795 AIRFIELD DR W	WNW 1/4 - 1/2 (0.274 mi.)	F53	134

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 9813646
Facility Status: OPEN
Facility Status: OPEN

SHELTAIR-LAKELAND JE	***3600 DRANE FIELD RD***	***WNW 1/4 - 1/2 (0.286 mi.)***	***G63***	***156***

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 9805363
Facility Status: OPEN
Facility Status: OPEN

CONE CONSTRUCTORS IN	3425 AIRPORT RD	NW 1/4 - 1/2 (0.438 mi.)	107	273

Database: AST, Date of Government Version: 10/30/2019

Facility-Site Id: 9601664 Facility Status: CLOSED Facility Status: CLOSED				
POPS PAINTING INC Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9502526 Facility Status: OPEN Facility Status: OPEN	3805 DRANE FIELD RD	WNW 1/2 - 1 (0.568 mi.)	U131	385
WEST LAKELAND SOD Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 8839375 Facility Status: CLOSED Facility Status: CLOSED	2915 AIRPORT RD	N 1 - 2 (1.071 mi.)	234	674
FL REFRESHMENT CENTE Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 8623581 Facility Status: CLOSED Facility Status: CLOSED	***KIDRON RD***	***W 1 - 2 (1.133 mi.)***	***237***	***679***
MORGAN J L Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 8838687 Facility Status: CLOSED Facility Status: CLOSED	2646 MEDULLA RD	SE 1 - 2 (1.158 mi.)	243	697
SUN 'N FUN FLY IN IN Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9806258 Facility Status: OPEN Facility Status: OPEN	4175 MEDULLA RD	SW 1 - 2 (1.166 mi.)	244	698
PUBLIX SUPER MARKET Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9809621 Facility Status: OPEN Facility Status: OPEN	***3525 AVIATION DR***	***S 1 - 2 (1.204 mi.)***	***245***	***699***
GOVERNMENT EMPLOYEE Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9807101 Facility Status: OPEN Facility Status: OPEN	3535 W PIPKIN RD	S 1 - 2 (1.351 mi.)	AV249	713
INTERSTATE CHEMICAL Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9808352 Facility Status: OPEN Facility Status: OPEN	***3903 PROGRESS DR***	***W 1 - 2 (1.642 mi.)***	***AZ263***	***781***
NATIONS RENT #97 Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 9803548 Facility Status: CLOSED Facility Status: CLOSED	4710 DRANEFIELD RD	W 1 - 2 (1.693 mi.)	267	806
PIPPING BLOCK Database: AST, Date of Government Version: 10/30/2019 Facility-Site Id: 8735757	***LAKE HENRY & LEAMEN***	***SE 1 - 2 (1.852 mi.)***	***269***	***808***

Facility Status: CLOSED
Facility Status: CLOSED

AQUA CLEAN ENVIRONME	3210 WHITTEN RD	WNW 1 - 2 (1.864 mi.)	BB272	831

Database: AST, Date of Government Version: 10/30/2019
Facility-Site Id: 9800103
Facility Status: OPEN
Facility Status: OPEN

FL TANKS: This listing includes storage tank facilities that do not have tank information. The tanks have either be closed or removed from the site, but the facilities were still registered at some point in history.

A review of the FL TANKS list, as provided by EDR, and dated 10/30/2019 has revealed that there are 10 FL TANKS sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND LINDER REGI	***3450 DRANE FIELD RD***	***NNW 1/8 - 1/4 (0.168 mi.)***	***C28***	***63***
Facility Status: CLOSED Facility ID: 9801687				
LAKELAND ARMY AIRFIE	3450 DRANE FIELD RD	NNW 1/8 - 1/4 (0.168 mi.)	C29	65
Facility Status: CLOSED Facility ID: 9700527				
LAKELAND ARMY AIRFIE	3450 DRANE FIELD RD	NNW 1/8 - 1/4 (0.168 mi.)	C32	67
Facility Status: CLOSED Facility ID: 9701079				
PUBLIX CORPORATE OFF	***DRANE FIELD RD***	***NNW 1/8 - 1/4 (0.206 mi.)***	***C40***	***100***
Facility Status: CLOSED Facility ID: 9806933				
DARIAS ACOSTA BER 11	***POLK PKWY FRONTAGE R***	***ENE 1 - 2 (1.125 mi.)***	***236***	***675***
Facility Status: CLOSED Facility ID: 9813000				
CSX TRANSPORTATION 0	***WINSTON RAIL YARD TR***	***NE 1 - 2 (1.559 mi.)***	***AX256***	***739***
Facility Status: CLOSED Facility ID: 9807740				
CSX TRANSPORTATION 0	***WINSTON RAIL YARD***	***NE 1 - 2 (1.559 mi.)***	***AX257***	***742***
Facility Status: CLOSED Facility ID: 9806136				
CSX TRANSPORTATION 0	***WINSTON YARD TRACKS***	***NE 1 - 2 (1.559 mi.)***	***AX258***	***744***
Facility Status: CLOSED Facility ID: 9807765				

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND AIR SRVC IN	3600 DRANEFIELD RD	WNW 1/4 - 1/2 (0.286 mi.)	G65	163
Facility Status: CLOSED Facility ID: 9805364				
INDUSTRIAL BRUSH COR	***400 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI187***	***504***
Facility Status: CLOSED Facility ID: 9809351				

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

FL SPILLS: Fuel Spill Cases from the Department of Environmental resource management

A review of the FL SPILLS list, as provided by EDR, and dated 10/03/2019 has revealed that there are 8 FL SPILLS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FWCC DRAINAGE IMPROV OHMIT Incident Number: 22460 Incident Status: Closed	***3900 DRANE FIELD RD***	***SW 0 - 1/8 (0.013 mi.)***	***A24***	***60***
Not reported OHMIT Incident Number: 63136 Incident Status: Pending-DM	3633 CENTURY BLVD.	NE 1/4 - 1/2 (0.298 mi.)	I68	165
LAKELAND WAREHOUSE - OHMIT Incident Number: 58909 OHMIT Incident Number: 58932 Incident Status: Pending-HQ Incident Status: Closed	***3135 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.335 mi.)***	***K82***	***205***
Not reported OHMIT Incident Number: 51287 OHMIT Incident Number: 53297 Incident Status: Closed	3115 DRANE FIELD ROA	ENE 1/4 - 1/2 (0.349 mi.)	K86	220
Not reported OHMIT Incident Number: 56675 Incident Status: Closed	3912 HOLDEN ROAD	E 1/2 - 1 (0.831 mi.)	185	503
Not reported OHMIT Incident Number: 51522 Incident Status: Closed	4100 SOUTH FRONTAGE	ENE 1/2 - 1 (0.952 mi.)	AO215	570

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported OHMIT Incident Number: 7025 Incident Status: Closed	3536 DMG DRIVE	NNW 1/4 - 1/2 (0.397 mi.)	P100	266
Not reported OHMIT Incident Number: 9176 Incident Status: Closed	3607 VENTURA DRIVE E	WNW 1/2 - 1 (0.910 mi.)	211	565

FL SPILLS 90: Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

A review of the FL SPILLS 90 list, as provided by EDR, and dated 12/10/2012 has revealed that there is 1 FL SPILLS 90 site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
US ARMY-AIRFIELD	3610 DRANE FIELD RD	WNW 1/4 - 1/2 (0.299 mi.)	J74	174

Status: CLOSED
Site Id: 539101799

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/16/2019 has revealed that there are 28 RCRA NonGen / NLR sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NO TORO AIRCRAFT INC EPA ID:: FLD085090421	***3240 AIRFIELD DR E #***	***ENE 1/8 - 1/4 (0.185 mi.)***	***35***	***73***
WILKERSON INSTRUMENT EPA ID:: FLD982097131	***3615 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.320 mi.)***	***I77***	***176***
GOLD EAGLE ENTERPRIS EPA ID:: FLR000081711	3604 CENTURY BLVD ST	NNE 1/4 - 1/2 (0.363 mi.)	L88	221
GMF IND INC EPA ID:: FLR000034538	3517 CENTURY BLVD	NNE 1/4 - 1/2 (0.376 mi.)	N94	228
FABWELL EPA ID:: FLD984229286	2934 PARKWAY ST	E 1/2 - 1 (0.551 mi.)	T116	324
FLORIDA PROCESSING M EPA ID:: FLD984246462	2920 PARKWAY ST	E 1/2 - 1 (0.562 mi.)	T125	335
RENTAL SERVICE CORPO EPA ID:: FLR000019570	***2910 DRANE FIELD RD***	***ENE 1/2 - 1 (0.609 mi.)***	***W140***	***414***
OES ENVIRONMENTAL EPA ID:: FLR000079525	***2830 PKWY ST SUITE 1***	***E 1/2 - 1 (0.610 mi.)***	***X142***	***418***
PUBLIX SUPER MARKETS EPA ID:: FLR000126102	3300 PUBLIX CORPORAT	N 1/2 - 1 (0.665 mi.)	Z151	443
QUALITY AEROSPACE CO EPA ID:: FLR000199398	2810 PARKWAY ST	E 1/2 - 1 (0.722 mi.)	AA159	449
SOUTHERN CROSS FIBER EPA ID:: FLD982098824	***2805 BABGER RD***	***ESE 1/2 - 1 (0.742 mi.)***	***162***	***451***
GLOBE FIBERGLASS LTD EPA ID:: FL0000071126	***4033 HOLDEN RD***	***E 1/2 - 1 (0.825 mi.)***	***AH183***	***500***
HERITAGE-CRYSTAL CLE EPA ID:: FLR000074971	***4302 HOLDEN RD***	***ESE 1 - 2 (1.011 mi.)***	***223***	***589***
CAROLINA LOGISTICS S EPA ID:: FLR000173781	4150 S PIPKIN RD #5	ESE 1 - 2 (1.139 mi.)	238	680
8381920 - VALSPAR - EPA ID:: FLT110083227	4775 GATELAND DRIVE	WNW 1 - 2 (1.980 mi.)	BC275	838

Lower Elevation	Address	Direction / Distance	Map ID	Page
FLORIDA DMA FLARNG A	***3600 DRANE FIELD RD***	***WNW 1/4 - 1/2 (0.286 mi.)***	***G64***	***161***

EPA ID:: FLD982088908				
CYPRESS AVIATION INC	***3636 DRANE FIELD ROA***	***WNW 1/4 - 1/2 (0.382 mi.)***	***O95***	***232***
EPA ID:: FLD094613346				
QUALITY AEROSPACE CO	3536 DMG DRIVE	NNW 1/4 - 1/2 (0.397 mi.)	P99	260
EPA ID:: FLR000178525				
PIPER AIRCRAFT CORPO	***3000 MEDULLA RD***	***WSW 1/2 - 1 (0.569 mi.)***	***132***	***388***
EPA ID:: FLD049551864				
HD BUILDER SOLUTIONS	3810 DRANE FIELD RD	W 1/2 - 1 (0.595 mi.)	V138	412
EPA ID:: FLR000126342				
BRANDIS AIRCRAFT TOM	***3925 AERO PL***	***W 1/2 - 1 (0.649 mi.)***	***149***	***441***
EPA ID:: FLD984183681				
KIDRON INC	3330 FLIGHTLINE DR	S 1/2 - 1 (0.875 mi.)	AK195	519
EPA ID:: FLR000036715				
FIREWOLF INDUSTRIES	***3249 MEDULLA RD***	***S 1/2 - 1 (0.932 mi.)***	***212***	***566***
EPA ID:: FLD984259952				
COMMON GROUND ENVIRO	4516 CLEMENTS RD	SE 1/2 - 1 (0.964 mi.)	AP218	571
EPA ID:: FLR000228791				
NATIONAL FLIGHT SERV	***3400 AIRCRAFT DR***	***S 1 - 2 (1.042 mi.)***	***AR228***	***616***
EPA ID:: FLR000047373				
HARDEE EQUIPMENT COM	***4220 DRANE FIELD ROA***	***W 1 - 2 (1.067 mi.)***	***AS232***	***669***
EPA ID:: FLD032419442				
CONNECTED POWER PHOS	4783 DRANE FIELD RD	W 1 - 2 (1.773 mi.)	268	807
EPA ID:: FLR000219626				
FLORIDA RECYCLING SO	***3210 WHITTEN ROAD***	***WNW 1 - 2 (1.864 mi.)***	***BB270***	***809***
EPA ID:: FLR000034033				

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 11/12/2019 has revealed that there is 1 FUDS site within approximately 2 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND AAF		W 1 - 2 (1.146 mi.)	AU239	684

SSTS: Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

A review of the SSTS list, as provided by EDR, and dated 05/01/2019 has revealed that there are 5 SSTS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
REESE CITRUS INSULAT	2940 PKWY CT	E 1/2 - 1 (0.552 mi.)	T118	326
Registration Number:: 045443FL 001				
REESE CITRUS INSULAT	5888 LAKE VICTORIA P	E 1/2 - 1 (0.552 mi.)	T119	329

Registration Number:: 045443FL 001				
REESE CITRUS INSULAT Registration Number:: 045443FL 001	2940 PKY ST	E 1/2 - 1 (0.552 mi.)	T121	331
REESE CITRUS INSULAT Registration Number:: 045443FL 001	2940 PARKWAY ST	E 1/2 - 1 (0.552 mi.)	T123	333

Lower Elevation	Address	Direction / Distance	Map ID	Page
C.D. BROWN CO, INC Registration Number:: 057611FL 001	4516 CLEMENTS RD.	SE 1/2 - 1 (0.964 mi.)	AP219	573

RAATS: The RCRA Administration Action Tracking System contains records based on enforcement actions issued under RCRA and pertaining to major violators. It includes administrative and civil actions brought by the United States Environmental Protection Agency. The source of this database is the U.S. EPA.

A review of the RAATS list, as provided by EDR, and dated 04/17/1995 has revealed that there are 2 RAATS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NO TORO AIRCRAFT INC Status: 01 Facility ID: FLD085090421	***3240 AIRFIELD DR E #***	***ENE 1/8 - 1/4 (0.185 mi.)***	***35***	***73***

Lower Elevation	Address	Direction / Distance	Map ID	Page
CYPRESS AVIATION INC Status: 03 Facility ID: FLD094613346	***3636 DRANE FIELD ROA***	***WNW 1/4 - 1/2 (0.382 mi.)***	***O95***	***232***

ICIS: The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

A review of the ICIS list, as provided by EDR, and dated 11/18/2016 has revealed that there are 4 ICIS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MAURICES AUTO BODY I FRS ID:: 110005656423	***3025A DRANE FIELD RD***	***ENE 1/2 - 1 (0.523 mi.)***	***R108***	***274***

Lower Elevation	Address	Direction / Distance	Map ID	Page
CYPRESS AVIATION INC FRS ID:: 110002538228	***3636 DRANE FIELD ROA***	***WNW 1/4 - 1/2 (0.382 mi.)***	***O95***	***232***
TAMPA TANK & WELDING FRS ID:: 110005626938	***5205 ADAMO DR***	***WNW 1/2 - 1 (0.572 mi.)***	***U133***	***394***
SKY KING, INC./B737- FRS ID:: 110055109582	***3200 FLIGHTLINE DRIV***	***S 1/2 - 1 (0.893 mi.)***	***AK205***	***559***

US AIRS: The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

A review of the US AIRS list, as provided by EDR, has revealed that there are 2 US AIRS sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
TAMPA TANK & WELDING	***5205 ADAMO DR***	***WNW 1/2 - 1 (0.572 mi.)***	***U133***	***394***
Database: US AIRS (AFS), Date of Government Version: 10/12/2016				
EPA plant ID:: 110005626938				
METALTEK INTERNATION	***4121 DRANE FIELD RD***	***WNW 1/2 - 1 (0.901 mi.)***	***AN208***	***562***
Database: US AIRS (AFS), Date of Government Version: 10/12/2016				

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 08/12/2019 has revealed that there are 91 FINDS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COLUMBIA AIR -3320 A	***3320 AIRFIELD DR E***	***E 0 - 1/8 (0.060 mi.)***	***25***	***61***
Registry ID:: 110032774987				
STAYBRIDGE SUITES -	***3855 DON EMERSON DR***	***N 0 - 1/8 (0.108 mi.)***	***B26***	***62***
Registry ID:: 110070016351				
NO TORO AIRCRAFT INC	***3240 AIRFIELD DR E #***	***ENE 1/8 - 1/4 (0.185 mi.)***	***35***	***73***
Registry ID:: 110002537256				
WATKINS MOTOR LINES	***3840 AIRFIELD COURT***	***E 1/8 - 1/4 (0.220 mi.)***	***D42***	***105***
Registry ID:: 110009074606				
KROON ENTERPRIES	***3711 CENTURY BLVD***	***NE 1/4 - 1/2 (0.261 mi.)***	***E46***	***112***
Registry ID:: 110037319924				
CITY OF LAKELAND- FI	***3150 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.314 mi.)***	***K76***	***176***
Registry ID:: 110056127846				
WILKERSON INSTRUMENT	***3615 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.320 mi.)***	***I77***	***176***
Registry ID:: 110002559874				
NATURAL ADVANTAGE LL	***3135 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.335 mi.)***	***K79***	***183***
Registry ID:: 110054830420				
OMNIA INCORPORTATED	3125 DRANE FIELD ROA	ENE 1/4 - 1/2 (0.341 mi.)	K84	215
Registry ID:: 110070329761				
GOLD EAGLE ENTERPRIS	***3604 CENTURY BLVD ST***	***NNE 1/4 - 1/2 (0.363 mi.)***	***L89***	***223***

Registry ID:: 110035569211				
CUSTOM CONTROLS & PU Registry ID:: 110011843210	3604 CENTURY BLVD. (	NNE 1/4 - 1/2 (0.363 mi.)	L90	224
GMF IND INC Registry ID:: 110005643759	***3517 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.376 mi.)***	***N93***	***227***
BELL CHEMICAL CO Registry ID:: 110002104366	***3511 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.408 mi.)***	***N104***	***269***
KINGS & QUEENS CABIN Registry ID:: 110002522182	***3512 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.426 mi.)***	***Q105***	***270***
MAURICES AUTO BODY I Registry ID:: 110005656423 Registry ID:: 110005656432	***3025A DRANE FIELD RD***	***ENE 1/2 - 1 (0.523 mi.)***	***R108***	***274***
CONSERVE CHEMICALS Registry ID:: 110035719951	***2940 DRANE FIELD RD***	***ENE 1/2 - 1 (0.527 mi.)***	***S112***	***279***
PHOSPHATE ENGINEERIN Registry ID:: 110005627161	***2940 DRANE FIELD RD***	***ENE 1/2 - 1 (0.527 mi.)***	***S114***	***304***
DIXIE SIGNS INC Registry ID:: 110005656405	***2930 DRANE FIELD RD***	***E 1/2 - 1 (0.527 mi.)***	***S115***	***306***
FABWELL Registry ID:: 110007458456	***2934 PARKWAY ST***	***E 1/2 - 1 (0.551 mi.)***	***T117***	***326***
NEW MANUFACTURING FA Registry ID:: 110032765620	***2940 PARKWAY ST***	***E 1/2 - 1 (0.552 mi.)***	***T120***	***330***
REESE CITRUS INSULAT Registry ID:: 110011852325	2940 PARKWAY STREET	E 1/2 - 1 (0.552 mi.)	T122	332
FLORIDA PROCESSING M Registry ID:: 110007461512 Registry ID:: 110039613371	***2920 PARKWAY ST***	***E 1/2 - 1 (0.562 mi.)***	***T124***	***335***
RENTAL SERVICE CORPO Registry ID:: 110005636204	***2910 DRANE FIELD RD***	***ENE 1/2 - 1 (0.609 mi.)***	***W140***	***414***
MGL ENGINEERING INC Registry ID:: 110012579290	***2830 PKWY ST #2***	***E 1/2 - 1 (0.610 mi.)***	***X141***	***416***
OES ENVIRONMENTAL Registry ID:: 110012549402	***2830 PKWY ST SUITE 1***	***E 1/2 - 1 (0.610 mi.)***	***X142***	***418***
ECLIPSE CONSTRUCTION Registry ID:: 110023095247	***2930 PARKWAY ST***	***ESE 1/2 - 1 (0.615 mi.)***	***Y143***	***420***
PARKWAY CENTER Registry ID:: 110037327283	***2930 PARKWAY ST***	***ESE 1/2 - 1 (0.615 mi.)***	***Y144***	***420***
PUBLIX SUPER MARKETS Registry ID:: 110031377560	***3300 PUBLIX CORPORAT***	***N 1/2 - 1 (0.665 mi.)***	***Z152***	***445***
WALGREENS #13824 Registry ID:: 110041938981	***UNKNOWN***	***NE 1/2 - 1 (0.675 mi.)***	***153***	***446***
MGL ENGINEERING INC Registry ID:: 110024577439	***2818 PARKWAY ST***	***E 1/2 - 1 (0.684 mi.)***	***AA154***	***446***
RUTHVEN PARKWAY CENT Registry ID:: 110063607486	***2825 DRANE FIELD RD***	***ENE 1/2 - 1 (0.688 mi.)***	***AB155***	***447***
QUALITY AEROSPACE CO Registry ID:: 110055433106	***2810 PARKWAY ST***	***E 1/2 - 1 (0.722 mi.)***	***AA158***	***448***
QUALITY POT METAL WO	***2810 PKWY ST #5***	***E 1/2 - 1 (0.722 mi.)***	***AA160***	***450***

Registry ID:: 110027224983				
SOUTHERN CROSS FIBER	***2805 BABGER RD***	***ESE 1/2 - 1 (0.742 mi.)***	***162***	***451***
Registry ID:: 110002560050				
REALIGNMENT OF TAXIW	***UNKNOWN***	***ESE 1/2 - 1 (0.763 mi.)***	***168***	***467***
Registry ID:: 110043165909				
B H BUNN CO	***2730 DRANE FIELD RD***	***E 1/2 - 1 (0.773 mi.)***	***AD174***	***483***
Registry ID:: 110011356567				
GLOBE FIBERGLASS LTD	***4033 HOLDEN RD***	***E 1/2 - 1 (0.825 mi.)***	***AH183***	***500***
Registry ID:: 110002516493				
WARING INDUSTRIAL PA	***4120 HOLDEN RD***	***ESE 1/2 - 1 (0.894 mi.)***	***206***	***561***
Registry ID:: 110024394323				
YARBOROUGH LANE		ENE 1/2 - 1 (0.952 mi.)	AO213	569
Registry ID:: 110035699447				
LAKELAND, CITY OF -	GRIFFIN ROAD FROM US	ENE 1/2 - 1 (0.952 mi.)	AO214	570
Registry ID:: 110035542311				

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND LINDER AIRP	***3830 AIRFIELD CT W***	***WNW 1/4 - 1/2 (0.266 mi.)***	***F47***	***112***
Registry ID:: 110046322537				
NATIONAL FLIGHT SERV	***3480 AIRFIELD DR W***	***WNW 1/4 - 1/2 (0.279 mi.)***	***F55***	***136***
Registry ID:: 110005659402				
FLIGHTLEVEL AVIATION	3440 AIRFIELD DRIVE	WNW 1/4 - 1/2 (0.282 mi.)	F61	155
Registry ID:: 110070231699				
LAKELAND LINDER REG	***3400 AIRFIELD DRIVE***	***WNW 1/4 - 1/2 (0.284 mi.)***	***F62***	***156***
Registry ID:: 110009070021				
FLORIDA DMA FLARNG A	***3600 DRANE FIELD RD***	***WNW 1/4 - 1/2 (0.286 mi.)***	***G64***	***161***
Registry ID:: 110007422360				
B & M CONSTRUCTION C	***3706 DMG DR***	***NNW 1/4 - 1/2 (0.297 mi.)***	***H67***	***165***
Registry ID:: 110035519178				
CHAD GUNTER	3610 DRANE FIELD RD	WNW 1/4 - 1/2 (0.299 mi.)	J70	171
Registry ID:: 110068690615				
DENNIS TOWNSEL, JR	3610 DRANE FIELD RD	WNW 1/4 - 1/2 (0.299 mi.)	J72	173
Registry ID:: 110068940846				
IMPROVEMENTS TO SR 5	***DRANE FIELD AND AIRP***	***WNW 1/4 - 1/2 (0.301 mi.)***	***J75***	***175***
Registry ID:: 110008982832				
QUALITY AEROSPACE CO	***3620 AIRPORT ROAD***	***NW 1/4 - 1/2 (0.367 mi.)***	***M92***	***226***
Registry ID:: 110070339667				
Registry ID:: 110059227670				
CYPRESS AVIATION INC	***3636 DRANE FIELD ROA***	***WNW 1/4 - 1/2 (0.382 mi.)***	***O95***	***232***
Registry ID:: 110002538228				
QUALITY AEROSPACE CO	***3610 AIRPORT RD***	***NW 1/4 - 1/2 (0.383 mi.)***	***M98***	***259***
Registry ID:: 110062926534				
QUALITY AEROSPACE CO	***3536 DMG DRIVE***	***NNW 1/4 - 1/2 (0.397 mi.)***	***P101***	***267***
Registry ID:: 110043986791				
AIRPORT HANGER	***DRANEFIELD ROAD WITH***	***W 1/4 - 1/2 (0.400 mi.)***	***102***	***268***
Registry ID:: 110020568385				
AIRPORT COMMERCE PAR	***JONES INDUSTRIAL DR***	***WNW 1/2 - 1 (0.524 mi.)***	***110***	***278***

Registry ID:: 110033636849				
POP'S PAINTING, INC.	***3805 DRANE FIELD RD***	***WNW 1/2 - 1 (0.568 mi.)***	***U127***	***369***
Registry ID:: 110005626938				
PIPER AIRCRAFT CORPO	***3000 MEDULLA RD***	***WSW 1/2 - 1 (0.569 mi.)***	***132***	***388***
Registry ID:: 110008325589				
HD BUILDER SOLUTIONS	***3810 DRANE FIELD RD***	***W 1/2 - 1 (0.595 mi.)***	***V135***	***410***
Registry ID:: 110027966716				
3810 DRANEFIELD ROAD	***3810 DRANEFIELD ROAD***	***W 1/2 - 1 (0.595 mi.)***	***V137***	***411***
Registry ID:: 110020521274				
POPS' PAINTING, INC.	***UNKNOWN***	***WNW 1/2 - 1 (0.643 mi.)***	***148***	***440***
Registry ID:: 110041940567				
BRANDIS AIRCRAFT TOM	***3925 AERO PL***	***W 1/2 - 1 (0.649 mi.)***	***149***	***441***
Registry ID:: 110005597666				
FWCC DRAINAGE IMPROV	***3900 DRANE FIELD RD***	***WNW 1/2 - 1 (0.655 mi.)***	***150***	***443***
Registry ID:: 110070548799				
CARILLON PLACE	***CARILLON BLVD***	***NNW 1/2 - 1 (0.703 mi.)***	***157***	***448***
Registry ID:: 110024577705				
RUTHVEN REAL ESTATE	***3965 AERO PLACE***	***W 1/2 - 1 (0.727 mi.)***	***161***	***450***
Registry ID:: 110020546756				
ROBINSON FANS, INC.	3955 DRANE FIELD ROA	WNW 1/2 - 1 (0.743 mi.)	AC164	463
Registry ID:: 110070330545				
ROBINSON FANS INC	***3955 DRANEFIELD RD***	***WNW 1/2 - 1 (0.743 mi.)***	***AC166***	***466***
Registry ID:: 110005613354				
ROBINSON FANS 2008 W	***3955 DRANE FIELD RD***	***WNW 1/2 - 1 (0.743 mi.)***	***AC167***	***466***
Registry ID:: 110037474346				
RUTHVEN REAL ESTATE	***3910 AIR PARK DR***	***W 1/2 - 1 (0.773 mi.)***	***AE173***	***482***
Registry ID:: 110024395910				
LAKELAND PARK	***DRANE FIELD RD. /AIR***	***W 1/2 - 1 (0.784 mi.)***	***AC175***	***491***
Registry ID:: 110020539568				
SPECIALTY MAINT & CO	***4015 DRANEFIELD RD***	***WNW 1/2 - 1 (0.799 mi.)***	***AF179***	***498***
Registry ID:: 110005587347				
METAL-TEK, INC.	4015 DRANE FIELD RD.	WNW 1/2 - 1 (0.799 mi.)	AF180	498
Registry ID:: 110070280595				
FERRERA TOOLING	***3960 AIR PARK DR***	***W 1/2 - 1 (0.802 mi.)***	***AG182***	***499***
Registry ID:: 110070097913				
INDUSTRIAL BRUSH COR	***400 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI187***	***504***
Registry ID:: 110009074456				
INDUSTRIAL BRUSH COR	***4000 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI189***	***510***
Registry ID:: 110027960543				
FLORIDA MODIFICATION	***3430 FLIGHTLINE DR***	***S 1/2 - 1 (0.862 mi.)***	***AJ191***	***512***
Registry ID:: 110056303147				
CYPRESS AVIATION INC	***3450 FLIGHTLINE DR***	***S 1/2 - 1 (0.863 mi.)***	***AJ192***	***514***
Registry ID:: 110005633948				
Registry ID:: 110045966558				
MAX TORQUE LLC	***3360 FLIGHTLINE DR***	***S 1/2 - 1 (0.864 mi.)***	***AK194***	***518***
Registry ID:: 110062926829				
VT HACKNEY CORP	***3330 FLIGHTLINE DRIV***	***S 1/2 - 1 (0.875 mi.)***	***AK196***	***523***

Registry ID:: 110000496758				
PROTEL, INC Registry ID:: 110020135021	***4705 AIRPARK DRIVE***	***W 1/2 - 1 (0.877 mi.)***	***198***	***537***
TROPIC STAR SEAFOOD Registry ID:: 110027971906	3620 VENTURA DR E	WNW 1/2 - 1 (0.882 mi.)	AL199	537
FLORIDA AERO SERVICE Registry ID:: 110005651400	***3005 AIRSIDE CENTER***	***SSE 1/2 - 1 (0.888 mi.)***	***AM201***	***538***
MODULAR SOLID SURFAC Registry ID:: 110015583395	***3240 FLIGHTLINE DR.***	***S 1/2 - 1 (0.888 mi.)***	***AK203***	***557***
SKY KING, INC./B737- Registry ID:: 110055109582	***3200 FLIGHTLINE DRIV***	***S 1/2 - 1 (0.893 mi.)***	***AK205***	***559***
CITY OF LAKELAND -- Registry ID:: 110063607869	***2949 AIRSIDE CENTER***	***SSE 1/2 - 1 (0.899 mi.)***	***AM207***	***561***
METALTEK INTERNATION Registry ID:: 110069428596	***4121 DRANE FIELD RD***	***WNW 1/2 - 1 (0.901 mi.)***	***AN208***	***562***
METALTEK Registry ID:: 110070290138	4121 DRAIN FIELD ROA	WNW 1/2 - 1 (0.901 mi.)	AN209	562
FIREWOLF INDUSTRIES Registry ID:: 110005625528	***3249 MEDULLA RD***	***S 1/2 - 1 (0.932 mi.)***	***212***	***566***
RUTHVEN REAL ESTATE Registry ID:: 110035486541	4020, 4030 AND 4040	W 1/2 - 1 (0.959 mi.)	216	571
COMMON GROUND ENVIRO Registry ID:: 110070431482	***4516 CLEMENTS RD***	***SE 1/2 - 1 (0.964 mi.)***	***AP217***	***571***
FLORIDA DMA NATIONAL Registry ID:: 110008314920	***4140 DRANE FIELD RD***	***W 1/2 - 1 (0.982 mi.)***	***AQ220***	***579***
RUTHVEN REAL ESTATE Registry ID:: 110020521265	***4020, 4030 AND 4040***	***W 1/2 - 1 (0.992 mi.)***	***222***	***589***

ECHO: ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

A review of the ECHO list, as provided by EDR, and dated 10/06/2019 has revealed that there are 79 ECHO sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
COLUMBIA AIR -3320 A Registry ID: 110032774987	***3320 AIRFIELD DR E***	***E 0 - 1/8 (0.060 mi.)***	***25***	***61***
STAYBRIDGE SUITES - Registry ID: 110070016351	***3855 DON EMERSON DR***	***N 0 - 1/8 (0.108 mi.)***	***B26***	***62***
NO TORO AIRCRAFT INC Registry ID: 110002537256	***3240 AIRFIELD DR E #***	***ENE 1/8 - 1/4 (0.185 mi.)***	***35***	***73***
WATKINS MOTOR LINES Registry ID: 110009074606	***3840 AIRFIELD COURT***	***E 1/8 - 1/4 (0.220 mi.)***	***D42***	***105***
KROON ENTERPRIES Registry ID: 110037319924	***3711 CENTURY BLVD***	***NE 1/4 - 1/2 (0.261 mi.)***	***E46***	***112***
CITY OF LAKELAND- FI	***3150 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.314 mi.)***	***K76***	***176***

Registry ID: 110056127846				
WILKERSON INSTRUMENT	***3615 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.320 mi.)***	***I77***	***176***
Registry ID: 110002559874				
NATURAL ADVANTAGE LL	***3135 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.335 mi.)***	***K79***	***183***
Registry ID: 110054830420				
GOLD EAGLE ENTERPRIS	***3604 CENTURY BLVD ST***	***NNE 1/4 - 1/2 (0.363 mi.)***	***L89***	***223***
Registry ID: 110035569211				
GMF IND INC	***3517 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.376 mi.)***	***N93***	***227***
Registry ID: 110005643759				
BELL CHEMICAL CO	***3511 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.408 mi.)***	***N104***	***269***
Registry ID: 110002104366				
KINGS & QUEENS CABIN	***3512 CENTURY BLVD***	***NNE 1/4 - 1/2 (0.426 mi.)***	***Q105***	***270***
Registry ID: 110002522182				
MAURICES AUTO BODY I	***3025A DRANE FIELD RD***	***ENE 1/2 - 1 (0.523 mi.)***	***R108***	***274***
Registry ID: 110005656423				
Registry ID: 110005656432				
CONSERVE CHEMICALS	***2940 DRANE FIELD RD***	***ENE 1/2 - 1 (0.527 mi.)***	***S112***	***279***
Registry ID: 110035719951				
PHOSPHATE ENGINEERIN	***2940 DRANE FIELD RD***	***ENE 1/2 - 1 (0.527 mi.)***	***S114***	***304***
Registry ID: 110005627161				
DIXIE SIGNS INC	***2930 DRANE FIELD RD***	***E 1/2 - 1 (0.527 mi.)***	***S115***	***306***
Registry ID: 110005656405				
FABWELL	***2934 PARKWAY ST***	***E 1/2 - 1 (0.551 mi.)***	***T117***	***326***
Registry ID: 110007458456				
NEW MANUFACTURING FA	***2940 PARKWAY ST***	***E 1/2 - 1 (0.552 mi.)***	***T120***	***330***
Registry ID: 110032765620				
FLORIDA PROCESSING M	***2920 PARKWAY ST***	***E 1/2 - 1 (0.562 mi.)***	***T124***	***335***
Registry ID: 110007461512				
Registry ID: 110039613371				
RENTAL SERVICE CORPO	***2910 DRANE FIELD RD***	***ENE 1/2 - 1 (0.609 mi.)***	***W140***	***414***
Registry ID: 110005636204				
MGL ENGINEERING INC	***2830 PKWY ST #2***	***E 1/2 - 1 (0.610 mi.)***	***X141***	***416***
Registry ID: 110012579290				
OES ENVIRONMENTAL	***2830 PKWY ST SUITE 1***	***E 1/2 - 1 (0.610 mi.)***	***X142***	***418***
Registry ID: 110012549402				
ECLIPSE CONSTRUCTION	***2930 PARKWAY ST***	***ESE 1/2 - 1 (0.615 mi.)***	***Y143***	***420***
Registry ID: 110023095247				
PARKWAY CENTER	***2930 PARKWAY ST***	***ESE 1/2 - 1 (0.615 mi.)***	***Y144***	***420***
Registry ID: 110037327283				
PUBLIX SUPER MARKETS	***3300 PUBLIX CORPORAT***	***N 1/2 - 1 (0.665 mi.)***	***Z152***	***445***
Registry ID: 110031377560				
WALGREENS #13824	***UNKNOWN***	***NE 1/2 - 1 (0.675 mi.)***	***153***	***446***
Registry ID: 110041938981				
MGL ENGINEERING INC	***2818 PARKWAY ST***	***E 1/2 - 1 (0.684 mi.)***	***AA154***	***446***
Registry ID: 110024577439				
RUTHVEN PARKWAY CENT	***2825 DRANE FIELD RD***	***ENE 1/2 - 1 (0.688 mi.)***	***AB155***	***447***
Registry ID: 110063607486				
QUALITY AEROSPACE CO	***2810 PARKWAY ST***	***E 1/2 - 1 (0.722 mi.)***	***AA158***	***448***

Registry ID: 110055433106				
QUALITY POT METAL WO	***2810 PKWY ST #5***	***E 1/2 - 1 (0.722 mi.)***	***AA160***	***450***
Registry ID: 110027224983				
SOUTHERN CROSS FIBER	***2805 BABGER RD***	***ESE 1/2 - 1 (0.742 mi.)***	***162***	***451***
Registry ID: 110002560050				
REALIGNMENT OF TAXIW	***UNKNOWN***	***ESE 1/2 - 1 (0.763 mi.)***	***168***	***467***
Registry ID: 110043165909				
B H BUNN CO	***2730 DRANE FIELD RD***	***E 1/2 - 1 (0.773 mi.)***	***AD174***	***483***
Registry ID: 110011356567				
GLOBE FIBERGLASS LTD	***4033 HOLDEN RD***	***E 1/2 - 1 (0.825 mi.)***	***AH183***	***500***
Registry ID: 110002516493				
WARING INDUSTRIAL PA	***4120 HOLDEN RD***	***ESE 1/2 - 1 (0.894 mi.)***	***206***	***561***
Registry ID: 110024394323				

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND LINDER AIRP	***3830 AIRFIELD CT W***	***WNW 1/4 - 1/2 (0.266 mi.)***	***F47***	***112***
Registry ID: 110046322537				
NATIONAL FLIGHT SERV	***3480 AIRFIELD DR W***	***WNW 1/4 - 1/2 (0.279 mi.)***	***F55***	***136***
Registry ID: 110005659402				
FLIGHTLEVEL AVIATION	3440 AIRFIELD DRIVE	WNW 1/4 - 1/2 (0.282 mi.)	F60	155
Registry ID: 110070231699				
LAKELAND LINDER REG	***3400 AIRFIELD DRIVE***	***WNW 1/4 - 1/2 (0.284 mi.)***	***F62***	***156***
Registry ID: 110009070021				
FLORIDA DMA FLARNG A	***3600 DRANE FIELD RD***	***WNW 1/4 - 1/2 (0.286 mi.)***	***G64***	***161***
Registry ID: 110007422360				
B & M CONSTRUCTION C	***3706 DMG DR***	***NNW 1/4 - 1/2 (0.297 mi.)***	***H67***	***165***
Registry ID: 110035519178				
IMPROVEMENTS TO SR 5	***DRANE FIELD AND AIRP***	***WNW 1/4 - 1/2 (0.301 mi.)***	***J75***	***175***
Registry ID: 110008982832				
QUALITY AEROSPACE CO	***3620 AIRPORT ROAD***	***NW 1/4 - 1/2 (0.367 mi.)***	***M92***	***226***
Registry ID: 110059227670				
CYPRESS AVIATION INC	***3636 DRANE FIELD ROA***	***WNW 1/4 - 1/2 (0.382 mi.)***	***O95***	***232***
Registry ID: 110002538228				
QUALITY AEROSPACE CO	***3610 AIRPORT RD***	***NW 1/4 - 1/2 (0.383 mi.)***	***M98***	***259***
Registry ID: 110062926534				
QUALITY AEROSPACE CO	***3536 DMG DRIVE***	***NNW 1/4 - 1/2 (0.397 mi.)***	***P101***	***267***
Registry ID: 110043986791				
AIRPORT HANGER	***DRANEFIELD ROAD WITH***	***W 1/4 - 1/2 (0.400 mi.)***	***102***	***268***
Registry ID: 110020568385				
AIRPORT COMMERCE PAR	***JONES INDUSTRIAL DR***	***WNW 1/2 - 1 (0.524 mi.)***	***110***	***278***
Registry ID: 110033636849				
POP'S PAINTING, INC.	***3805 DRANE FIELD RD***	***WNW 1/2 - 1 (0.568 mi.)***	***U127***	***369***
Registry ID: 110005626938				
PIPER AIRCRAFT CORPO	***3000 MEDULLA RD***	***WSW 1/2 - 1 (0.569 mi.)***	***132***	***388***
Registry ID: 110008325589				
HD BUILDER SOLUTIONS	***3810 DRANE FIELD RD***	***W 1/2 - 1 (0.595 mi.)***	***V135***	***410***

Registry ID: 110027966716				
3810 DRANEFIELD ROAD Registry ID: 110020521274	***3810 DRANEFIELD ROAD***	***W 1/2 - 1 (0.595 mi.)***	***V137***	***411***
POPS' PAINTING, INC. Registry ID: 110041940567	***UNKNOWN***	***WNW 1/2 - 1 (0.643 mi.)***	***148***	***440***
BRANDIS AIRCRAFT TOM Registry ID: 110005597666	***3925 AERO PL***	***W 1/2 - 1 (0.649 mi.)***	***149***	***441***
FWCC DRAINAGE IMPROV Registry ID: 110070548799	***3900 DRANE FIELD RD***	***WNW 1/2 - 1 (0.655 mi.)***	***150***	***443***
CARILLON PLACE Registry ID: 110024577705	***CARILLON BLVD***	***NNW 1/2 - 1 (0.703 mi.)***	***157***	***448***
RUTHVEN REAL ESTATE Registry ID: 110020546756	***3965 AERO PLACE***	***W 1/2 - 1 (0.727 mi.)***	***161***	***450***
ROBINSON FANS INC Registry ID: 110005613354	***3955 DRANEFIELD RD***	***WNW 1/2 - 1 (0.743 mi.)***	***AC166***	***466***
ROBINSON FANS 2008 W Registry ID: 110037474346	***3955 DRANE FIELD RD***	***WNW 1/2 - 1 (0.743 mi.)***	***AC167***	***466***
RUTHVEN REAL ESTATE Registry ID: 110024395910	***3910 AIR PARK DR***	***W 1/2 - 1 (0.773 mi.)***	***AE173***	***482***
LAKELAND PARK Registry ID: 110020539568	***DRANE FIELD RD. /AIR***	***W 1/2 - 1 (0.784 mi.)***	***AC175***	***491***
SPECIALTY MAINT & CO Registry ID: 110005587347	***4015 DRANEFIELD RD***	***WNW 1/2 - 1 (0.799 mi.)***	***AF179***	***498***
FERRERA TOOLING Registry ID: 110070097913	***3960 AIR PARK DR***	***W 1/2 - 1 (0.802 mi.)***	***AG182***	***499***
INDUSTRIAL BRUSH COR Registry ID: 110009074456	***400 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI187***	***504***
INDUSTRIAL BRUSH COR Registry ID: 110027960543	***4000 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI189***	***510***
FLORIDA MODIFICATION Registry ID: 110056303147	***3430 FLIGHTLINE DR***	***S 1/2 - 1 (0.862 mi.)***	***AJ191***	***512***
CYPRESS AVIATION INC Registry ID: 110045966558	***3450 FLIGHTLINE DR***	***S 1/2 - 1 (0.863 mi.)***	***AJ192***	***514***
MAX TORQUE LLC Registry ID: 110062926829	***3360 FLIGHTLINE DR***	***S 1/2 - 1 (0.864 mi.)***	***AK194***	***518***
VT HACKNEY CORP Registry ID: 110000496758	***3330 FLIGHTLINE DRIV***	***S 1/2 - 1 (0.875 mi.)***	***AK196***	***523***
PROTEL, INC Registry ID: 110020135021	***4705 AIRPARK DRIVE***	***W 1/2 - 1 (0.877 mi.)***	***198***	***537***
FLORIDA AERO SERVICE Registry ID: 110005651400	***3005 AIRSIDE CENTER***	***SSE 1/2 - 1 (0.888 mi.)***	***AM201***	***538***
MODULAR SOLID SURFAC Registry ID: 110015583395	***3240 FLIGHTLINE DR.***	***S 1/2 - 1 (0.888 mi.)***	***AK203***	***557***
SKY KING, INC./B737- Registry ID: 110055109582	***3200 FLIGHTLINE DRIV***	***S 1/2 - 1 (0.893 mi.)***	***AK205***	***559***
CITY OF LAKELAND --	***2949 AIRSIDE CENTER***	***SSE 1/2 - 1 (0.899 mi.)***	***AM207***	***561***

Registry ID: 110063607869				
METALTEK INTERNATION	***4121 DRANE FIELD RD***	***WNW 1/2 - 1 (0.901 mi.)***	***AN208***	***562***
Registry ID: 110069428596				
FIREWOLF INDUSTRIES	***3249 MEDULLA RD***	***S 1/2 - 1 (0.932 mi.)***	***212***	***566***
Registry ID: 110005625528				
COMMON GROUND ENVIRO	***4516 CLEMENTS RD***	***SE 1/2 - 1 (0.964 mi.)***	***AP217***	***571***
Registry ID: 110070431482				
FLORIDA DMA NATIONAL	***4140 DRANE FIELD RD***	***W 1/2 - 1 (0.982 mi.)***	***AQ220***	***579***
Registry ID: 110008314920				
RUTHVEN REAL ESTATE	***4020, 4030 AND 4040***	***W 1/2 - 1 (0.992 mi.)***	***222***	***589***
Registry ID: 110020521265				

UXO: A listing of unexploded ordnance site locations

A review of the UXO list, as provided by EDR, and dated 12/31/2017 has revealed that there are 2 UXO sites within approximately 2 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CWM AREAS		W 1 - 2 (1.146 mi.)	AU240	686
SKEET RANGE & FIRING		W 1 - 2 (1.146 mi.)	AU241	686

FL AIRS: A listing of Air Resources Management permits.

A review of the FL AIRS list, as provided by EDR, and dated 05/14/2019 has revealed that there are 2 FL AIRS sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
POP'S PAINTING, INC.	***3805 DRANE FIELD ROA***	***WNW 1/2 - 1 (0.568 mi.)***	***U128***	***370***
Facility Status: A Facility Id: 1050226				
SPECIALTY FABRICATIO	***4015 DRANE FIELD RD***	***WNW 1/2 - 1 (0.799 mi.)***	***AF178***	***494***
Facility Status: A Facility Id: 1050466				

FL CLEANUP SITES: This listing includes the locations of waste cleanup sites from various programs. The source of the cleanup site data includes Hazardous Waste programs, Site Investigation Section, Compliance and Enforcement Tracking, Drycleaning State Funded Cleanup Program (possibly other state funded cleanup), Storage Tank Contamination Monitoring.

A review of the FL CLEANUP SITES list, as provided by EDR, and dated 11/21/2019 has revealed that there are 5 FL CLEANUP SITES sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND CITY-LINDER	***3450 DRANE FIELD RD***	***NNW 1/8 - 1/4 (0.168 mi.)***	***C34***	***68***
DEP Cleanup Site Key: 60788728				
GLOBE AERO LIMITED I	***3240 DRANE FIELD RD***	***NE 1/8 - 1/4 (0.246 mi.)***	***45***	***109***

DEP Cleanup Site Key: 60778751

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND MUNICIPAL A DEP Cleanup Site Key: 60784828	*3470 DRANE FIELD RD*	*NW 1/8 - 1/4 (0.189 mi.)*	*C37*	*93*
FLIGHT LEVEL AVIATIO DEP Cleanup Site Key: 60786462	*3440 AIRFIELD DR W*	*WNW 1/4 - 1/2 (0.282 mi.)*	*F57*	*143*
US ARMY-AIRFIELD DEP Cleanup Site Key: 60788346	*3610 DRANE FIELD RD*	*WNW 1/4 - 1/2 (0.299 mi.)*	*J69*	*166*

Florida Drycleaners list comes from the Department of Environmental Protection.

A review of the FL DRYCLEANERS list, as provided by EDR, and dated 10/21/2019 has revealed that there is 1 FL DRYCLEANERS site within approximately 2 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
INTERSTATE CHEMICAL Facility Status: OPEN Facility-Site Id: 9812819	*3903 PROGRESS DR*	*W 1 - 2 (1.642 mi.)*	*AZ263*	*781*

FL DWM CONTAM: A listing of active or known sites. The listing includes sites that need cleanup but are not actively being working on because the agency currently does not have funding (primarily petroleum and drycleaning).

A review of the FL DWM CONTAM list, as provided by EDR, and dated 01/28/2019 has revealed that there are 6 FL DWM CONTAM sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND CITY-LINDER Program Site Id: 9700527	*3450 DRANE FIELD RD*	*NNW 1/8 - 1/4 (0.168 mi.)*	*C34*	*68*
DARIAS ACOSTA BER 11 Program Site Id: 9813000	*POLK PKWY FRONTAGE R*	*ENE 1 - 2 (1.125 mi.)*	*236*	*675*

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND MUNICIPAL A Program Site Id: 8628463	*3470 DRANE FIELD RD*	*NW 1/8 - 1/4 (0.189 mi.)*	*C37*	*93*
FLIGHT LEVEL AVIATIO Program Site Id: 9814943	*3440 AIRFIELD DR W*	*WNW 1/4 - 1/2 (0.282 mi.)*	*F57*	*143*
US ARMY-AIRFIELD Program Site Id: 9101799	*3610 DRANE FIELD RD*	*WNW 1/4 - 1/2 (0.299 mi.)*	*J69*	*166*
QUALITY#154 Program Site Id: 8624337	*3230 W PIPKIN RD*	*S 1 - 2 (1.379 mi.)*	*AW252*	*722*

EXECUTIVE SUMMARY

A list of hazardous waste facilities required to provide financial assurance under RCRA.

A review of the FL Financial Assurance list, as provided by EDR, has revealed that there are 4 FL Financial Assurance sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K #2707553	***3730 AIRPORT RD***	***NW 1/4 - 1/2 (0.268 mi.)***	***G48***	***113***
Database: Financial Assurance 3, Date of Government Version: 10/29/2019 Facility Status: OPEN Facility ID: 9802234				
PUBLIX CORPORATE AIR	3795 AIRFIELD DR W	WNW 1/4 - 1/2 (0.274 mi.)	F54	135
Database: Financial Assurance 3, Date of Government Version: 10/29/2019 Facility Status: OPEN Facility ID: 9813646				
SHELTAIR-LAKELAND JE	***3600 DRANE FIELD RD***	***WNW 1/4 - 1/2 (0.286 mi.)***	***G63***	***156***
Database: Financial Assurance 3, Date of Government Version: 10/29/2019 Facility Status: OPEN Facility ID: 9805363				
POP'S PAINTING, INC.	***3805 DRANE FIELD ROA***	***WNW 1/2 - 1 (0.568 mi.)***	***U128***	***370***
Database: Financial Assurance 3, Date of Government Version: 10/29/2019 Facility Status: OPEN Facility ID: 9502526				

FL RESP PARTY: Open, inactive and closed responsible party sites

A review of the FL RESP PARTY list, as provided by EDR, and dated 09/29/2019 has revealed that there are 6 FL RESP PARTY sites within approximately 2 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GLOBE AERO LIMITED I	***3240 DRANE FIELD RD***	***NE 1/8 - 1/4 (0.246 mi.)***	***45***	***109***
Site Status: OPEN Site Status: CLOSED				
PHOSPHATE ENGINEERIN	2940 DRANE FIELD RD	ENE 1/2 - 1 (0.527 mi.)	S111	279
Site Status: CLOSED				

Lower Elevation	Address	Direction / Distance	Map ID	Page
CYPRESS AVIATION INC	3636 DRANE FIELD ROA	WNW 1/4 - 1/2 (0.382 mi.)	O96	255
Site Status: CLOSED				
LAKELAND, CITY OF (F	3249 MEDULLA RD	SW 1 - 2 (1.485 mi.)	255	739
Site Status: CLOSED				
GMF INDUSTRIES INC	***4600 DRANE FIELD ROA***	***W 1 - 2 (1.606 mi.)***	***AY261***	***751***
Site Status: CLOSED				
YAGER PROPERTIES	0 PIPKIN CREEK ROAD,	E 1 - 2 (1.683 mi.)	266	805
Site Status: CLOSED				

EXECUTIVE SUMMARY

FL TIER 2: A listing of facilities which store or manufacture hazardous materials that submit a chemical inventory report.

A review of the FL TIER 2 list, as provided by EDR, and dated 12/31/2018 has revealed that there are 27 FL TIER 2 sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FEDEX NATIONAL - AVI	3840 AIRFIELD COURT	E 1/8 - 1/4 (0.220 mi.)	D41	102
NEW CINGULAR WIRELES Facility Id: 4030504 Facility Id: 4496266	3135 DRANE FIELD RD	ENE 1/4 - 1/2 (0.335 mi.)	K78	177
TASTE ADVANTAGE - LA Facility Id: 4550900 Facility Id: 4096081 Facility Id: 3989072 Facility Id: 5403634 Facility Id: 3988930 *Additional key fields are available in the Map Findings section*	3135 DRANE FIELD ROA	ENE 1/4 - 1/2 (0.335 mi.)	K80	189
NATURAL ADVANTAGE - Facility Id: 6396686 Facility Id: 5846674 Facility Id: 6142588	3135 DRANE FIELD ROA	ENE 1/4 - 1/2 (0.335 mi.)	K81	199
LAKELAND WAREHOUSE - Facility Id: 6073258 Facility Id: 6365027 Facility Id: 4983080 Facility Id: 5814063 Facility Id: 5377012	***3135 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.335 mi.)***	***K82***	***205***
SCHWAN'S HOME SERVIC Facility Id: 5372898 Facility Id: 6363030 Facility Id: 4032367 Facility Id: 6095735 Facility Id: 4514971 *Additional key fields are available in the Map Findings section*	2905 PARKWAY STREET	E 1/2 - 1 (0.629 mi.)	X146	425
SCHWANS SALES ENTERP Facility Id: 3988372	2905 PARKWAY STREET	E 1/2 - 1 (0.629 mi.)	X147	431
VERIZON - WARING PAR Facility Id: 3988203	2721 PARKWAY STREET	E 1/2 - 1 (0.768 mi.)	AD169	467
VERIZON WARING PARK Facility Id: 5383378 Facility Id: 4513047 Facility Id: 4039097 Facility Id: 4981353	2721 PARKWAY ST.	E 1/2 - 1 (0.768 mi.)	AD170	476
WARING PARK RSU (FTR Facility Id: 5835447	2721 PARKWAY ST.	E 1/2 - 1 (0.768 mi.)	AD171	480
FRONTIER WARING INDU Facility Id: 6382108 Facility Id: 6088743	2721 PARKWAY ST	E 1/2 - 1 (0.768 mi.)	AD172	481
GLOBE FIBERGLASS	4033 HOLDEN ROAD	E 1/2 - 1 (0.825 mi.)	AH184	502

Lower Elevation	Address	Direction / Distance	Map ID	Page
PUBLIX SUPER MARKETS	3795 AIRFIELD DRIVE	WNW 1/4 - 1/2 (0.274 mi.)	F52	130

Facility Id: 6404117				
Facility Id: 4990433				
Facility Id: 5380969				
Facility Id: 6090708				
Facility Id: 5814304				
9805363	3440 AIRFIELD DRIVE	WNW 1/4 - 1/2 (0.282 mi.)	F56	139
Facility Id: 5023201				
Facility Id: 6410085				
Facility Id: 5855203				
Facility Id: 6112248				
Facility Id: 5403718				
FLIGHT LEVEL AVIATIO	***3440 AIRFIELD DR W***	***WNW 1/4 - 1/2 (0.282 mi.)***	***F57***	***143***
Facility Id: 5022629				
Facility Id: 6410084				
Facility Id: 5855202				
Facility Id: 6112247				
Facility Id: 5403717				
9046828	3440 AIRFIELD DRIVE	WNW 1/4 - 1/2 (0.282 mi.)	F59	151
Facility Id: 5023229				
Facility Id: 6410086				
Facility Id: 5855204				
Facility Id: 6112249				
Facility Id: 5403719				
POP'S PAINTING, INC.	***3805 DRANE FIELD ROA***	***WNW 1/2 - 1 (0.568 mi.)***	***U128***	***370***
Facility Id: 4643685				
Facility Id: 5140044				
POP'S PAINTING, INC.	3805 DRANE FIELD ROA	WNW 1/2 - 1 (0.568 mi.)	U129	381
Facility Id: 6405425				
Facility Id: 5392683				
Facility Id: 6112620				
Facility Id: 5871908				
POPS PAINTING	3805 DRANE FIELD ROA	WNW 1/2 - 1 (0.568 mi.)	U130	384
ROBINSON FANS FLORID	***3955 DRANE FIELD ROA***	***WNW 1/2 - 1 (0.743 mi.)***	***AC163***	***452***
Facility Id: 5000620				
Facility Id: 6413545				
Facility Id: 3994959				
Facility Id: 4068153				
Facility Id: 5863753				
**Additional key fields are available in the Map Findings section*				
INTERNATIONAL PAINT	3919 AIR PARK DRIVE	W 1/2 - 1 (0.789 mi.)	AE176	491
Facility Id: 6409471				
Facility Id: 6111883				
SPECIALTY FABRICATIO	***4015 DRANE FIELD RD***	***WNW 1/2 - 1 (0.799 mi.)***	***AF178***	***494***
Facility Id: 4030027				
Facility Id: 4553431				
CHEMSTATION OF FLORI	4410 HOLDEN RD	SE 1/2 - 1 (0.850 mi.)	190	510
Facility Id: 6412568				
Facility Id: 6142616				
KIDRON	3330 FLIGHT LINE DRI	S 1/2 - 1 (0.875 mi.)	AK197	524
MODULAR SOLID SURFAC	3240 FLIGHTLINE DRIV	S 1/2 - 1 (0.888 mi.)	AK204	558
SPECIALTY MAINTENANC	4121 DRANE FIELD ROA	WNW 1/2 - 1 (0.901 mi.)	AN210	563

Facility Id: 5863110				
Facility Id: 5017845				
Facility Id: 5412757				
NATIONAL GUARD - LAK	4140 DRANE FIELD ROA	W 1/2 - 1 (0.982 mi.)	AQ221	581
Facility Id: 5015025				
Facility Id: 4042209				
Facility Id: 4546609				
Facility Id: 5848209				
Facility Id: 3992993				

**Additional key fields are available in the Map Findings section*

FL NPDES: Domestic and Industrial Wastewater Facilities

A review of the FL NPDES list, as provided by EDR, and dated 11/01/2019 has revealed that there are 10 FL NPDES sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FWCC DRAINAGE IMPROV	***3900 DRANE FIELD RD***	***SW 0 - 1/8 (0.013 mi.)***	***A24***	***60***
Status: A				
Facility ID: FLR10SM14				
STAYBRIDGE SUITES -	3855 DON EMERSON DR	N 0 - 1/8 (0.108 mi.)	B27	62
Status: A				
Facility ID: FLR20AS02				
LAKELAND WAREHOUSE -	***3135 DRANE FIELD RD***	***ENE 1/4 - 1/2 (0.335 mi.)***	***K82***	***205***
Status: A				
Facility ID: FLRNEF374				
RUTHVEN PARKWAY CENT	2825 DRANE FIELD RD	ENE 1/2 - 1 (0.688 mi.)	AB156	447
Status: A				
Facility ID: FLR10OS80				

Lower Elevation	Address	Direction / Distance	Map ID	Page
POP'S PAINTING, INC.	***3805 DRANE FIELD ROA***	***WNW 1/2 - 1 (0.568 mi.)***	***U128***	***370***
Status: A				
Facility ID: FLR10NX65				
Facility ID: FLR05H012				
ROBINSON FANS FLORID	***3955 DRANE FIELD ROA***	***WNW 1/2 - 1 (0.743 mi.)***	***AC163***	***452***
Status: A				
Facility ID: FLR05C386				
SPECIALTY FABRICATIO	***4015 DRANE FIELD RD***	***WNW 1/2 - 1 (0.799 mi.)***	***AF178***	***494***
Status: A				
Facility ID: FLR05H437				
FERRERA TOOLING	3960 AIR PARK DR	W 1/2 - 1 (0.802 mi.)	AG181	499
Status: A				
Facility ID: FLR10RC92				
INDUSTRIAL BRUSH COR	***400 DRANE FIELD RD***	***W 1/2 - 1 (0.840 mi.)***	***AI187***	***504***
Status: A				
Facility ID: FLR05B748				
TROPIC STAR SEAFOOD,	3620 VENTURA DR E	WNW 1/2 - 1 (0.882 mi.)	AL200	538

Status: A
Facility ID: FLA016917

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 3 EDR Hist Auto sites within approximately 2 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CIRCLE K STORES INC	3730 AIRPORT RD	NW 1/4 - 1/2 (0.268 mi.)	G50	129
LUKES AMOCO INC	2716 MEDULLA RD	SE 1 - 2 (1.209 mi.)	246	705
IMPERIAL AMOCO INC	3230 W PIPKIN RD	S 1 - 2 (1.379 mi.)	AW251	722

EDR Hist Cleaner: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Cleaner list, as provided by EDR, has revealed that there is 1 EDR Hist Cleaner site within approximately 2 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
KELLERS CLEANERS	5004 YATES RD	S 1 - 2 (1.384 mi.)	AW253	736

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

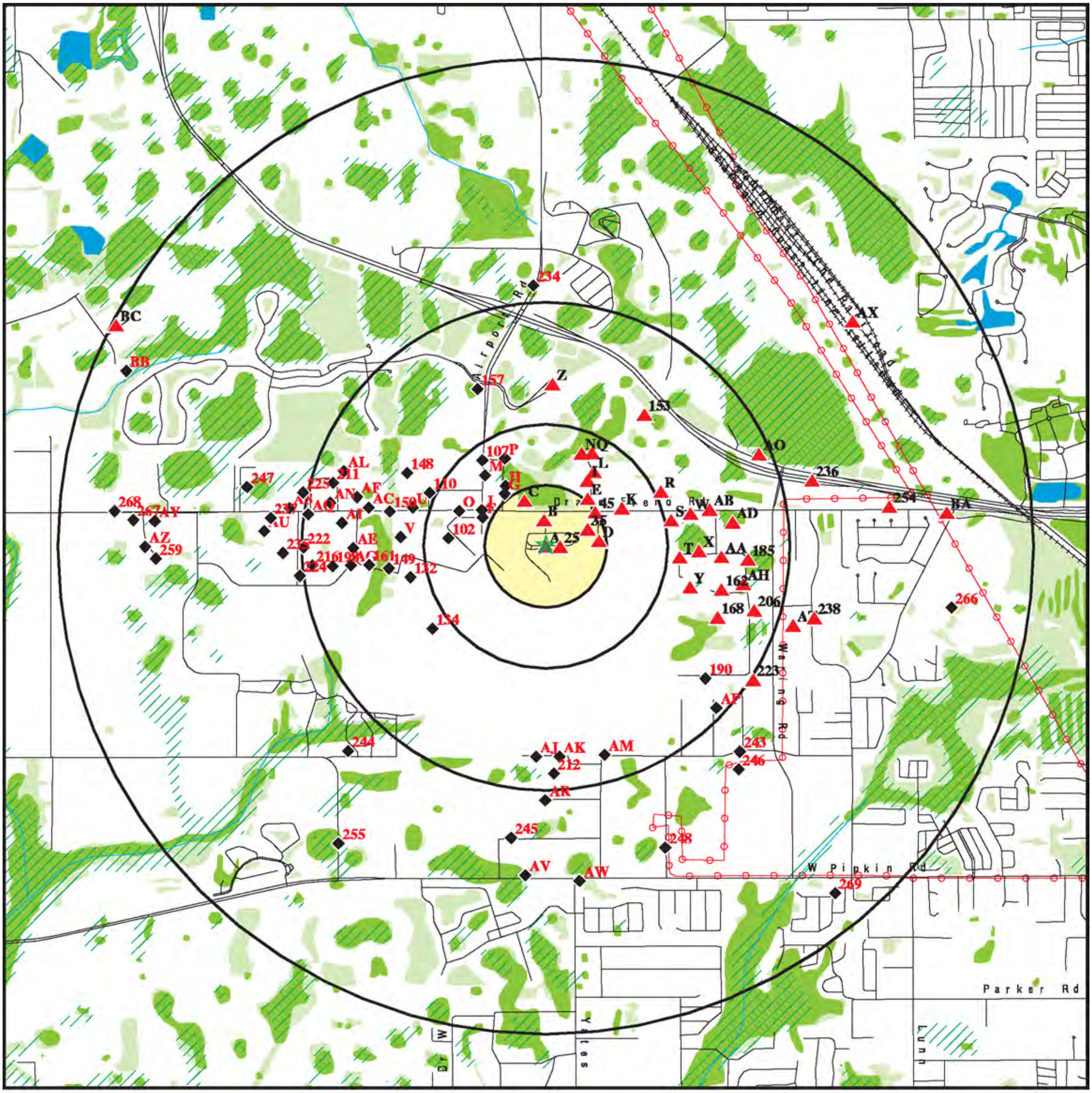
FL RGA LUST: The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environmental Protection in Floridia.

A review of the FL RGA LUST list, as provided by EDR, has revealed that there are 9 FL RGA LUST sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND ARMY AIRFIE Facility ID: 9700527	3450 DRANE FIELD RD	NNW 1/8 - 1/4 (0.168 mi.)	C30	66
LAKELAND ARMY AIRFIE Facility ID: 9701079	3450 DRANE FIELD RD	NNW 1/8 - 1/4 (0.168 mi.)	C31	66
LAKELAND LINDER REGI Facility ID: 9801687	3450 DRANE FIELD RD	NNW 1/8 - 1/4 (0.168 mi.)	C33	67
RENNA ENTERPRISES Facility ID: 8944950	3231 DRANE FIELD RD	NE 1/8 - 1/4 (0.222 mi.)	E44	109

Lower Elevation	Address	Direction / Distance	Map ID	Page
LAKELAND CITY-HANGAR Facility ID: 9101671	3470 DRANE FIELD RD	NW 1/8 - 1/4 (0.189 mi.)	C38	99
LAKELAND MUNICIPAL A Facility ID: 8628463	3470 DRANE FIELD RD	NW 1/8 - 1/4 (0.189 mi.)	C39	99
CIRCLE K #2707553 Facility ID: 9802234	3730 AIRPORT RD	NW 1/4 - 1/2 (0.268 mi.)	G49	128
US ARMY-AIRFIELD Facility ID: 9101799	3610 DRANE FIELD RD	WNW 1/4 - 1/2 (0.299 mi.)	J73	174
INDUSTRIAL BRUSH COR Facility ID: 9809351	4000 DRANE FIELD RD	W 1/2 - 1 (0.840 mi.)	AI186	504

OVERVIEW MAP - 5953258.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- FL Brownfield

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Lakeland Linder Intl Airport	CLIENT: AECOM
ADDRESS: 3900 Don Emerson Dr	CONTACT: Paul Sanford
Lakeland FL 33811	INQUIRY #: 5953258.2s
LAT/LONG: 27.994517 / 82.014314	DATE: January 29, 2020 7:12 pm

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APPENDIX F

Cultural Resources Assessment Survey

Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL)

Phase IB Cultural Resources Assessment Survey

Prepared for:

Federal Aviation Administration

Prepared by:

City of Lakeland, Florida and

AECOM

September 2020

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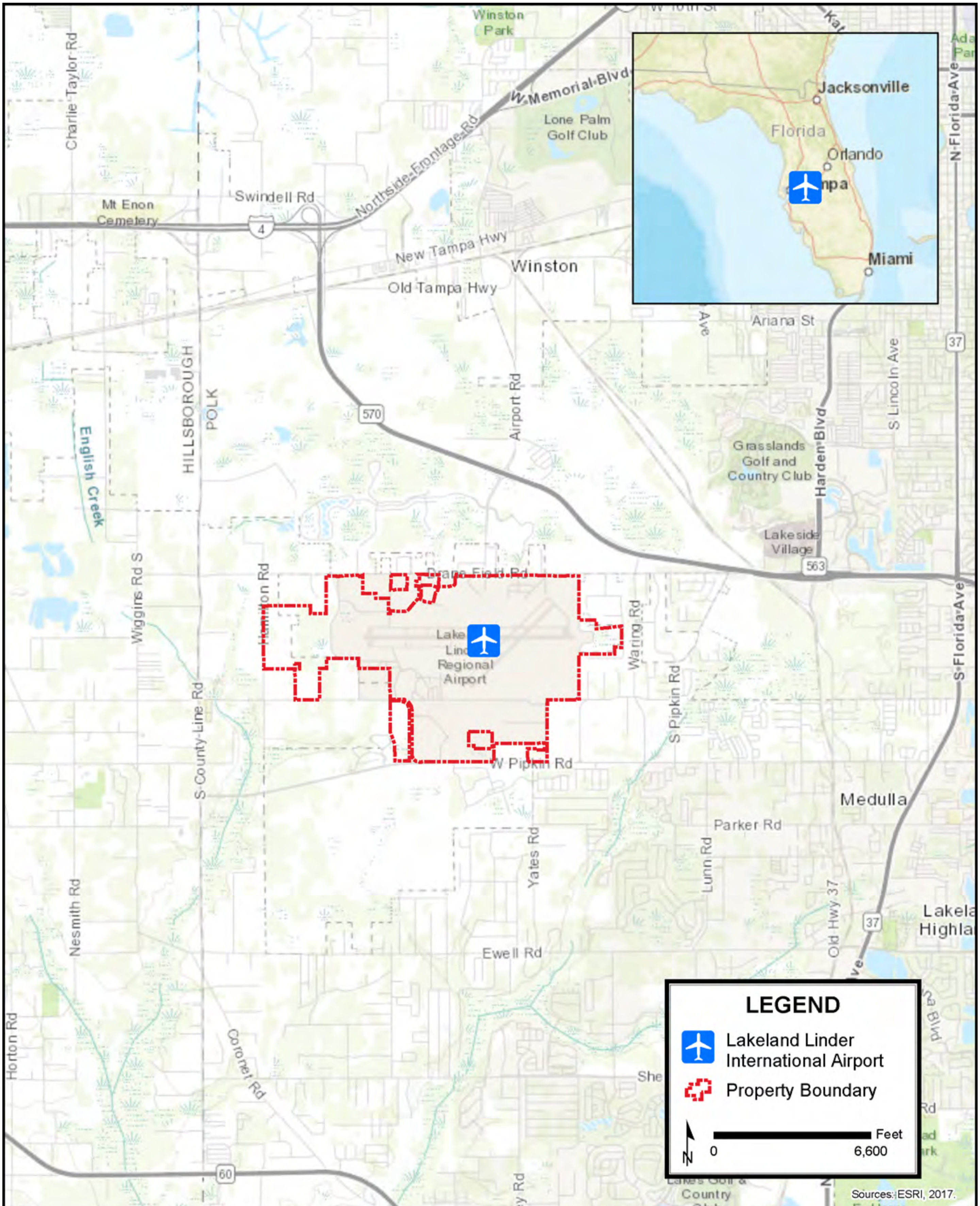
1. INTRODUCTION

AECOM Technical Services, Inc. (AECOM) has performed cultural assessment services to support Phase II of an air cargo facility at Lakeland Linder International Airport (LAL, or the Airport), hereinafter referred to as the Proposed Project. The Airport is located on approximately 1,710 acres in central Florida's Polk County, less than one mile east of the Hillsborough County Line, and approximately 3.5 miles south of Interstate Highway 4, five miles southwest of the City of Lakeland (City), and 27 miles east of Tampa International Airport (**Figure 1-1**).

The Proposed Project is an expansion of an air cargo facility already constructed (i.e., Phase I development). The Phase II expansion is being proposed to accommodate future flexibility for expanded operations, given the potential for network and customer demand to increase in the near future. A notional layout for the Proposed Project is shown on **Figure 1-2a** based on facility sizing needs. The Proposed Project would be developed on an approximate 68-acre site in the northwest quadrant of LAL, immediately west and adjacent to the completed Phase I development. Additionally, to accommodate the potential need for additional aviation fueling capacity at LAL, a fuel farm is being proposed in an area separate from the Proposed Project footprint, at the intersection of Aero Place and Taxiway H (**Figure 1-2b**). Current projections indicate need for additional aboveground storage tanks providing a total of 850,000 gallons of Jet-A fuel capacity. There is potential for a small portion of this capacity to be dedicated to off-road equipment fuel (e.g., gasoline, diesel or hydrogen) if usage needs dictate once the facility is operational.

AECOM conducted a Phase IB Cultural Resources Assessment Survey (CRAS) of the areas of potential effect (APE) for the Proposed Project. To identify potentially significant archaeological and/or historical resources within a project area, a Phase IB CRAS includes background research on the history and environment of the property followed by a subsurface survey and surface inspection of the project impact area which involves pedestrian inspections and shovel testing. Phase IB surveys also include recording any structures over 50 years in age within the vicinity of the project area. A Phase IB CRAS does not include formal excavations of identified cultural resources (Phase II), or data recovery/mitigation planning (Phase III). A Direct Effects Area of Potential Effect (APE) was delineated within which direct physical impacts of the Proposed Project (i.e., construction footprint) will be characterized and disclosed. and was used for the purposes of Section 106 coordination pursuant to the National Historic Preservation Act (NHPA).

An Indirect Effects APE was also delineated that corresponds to the area within the composite 65 decibel day-night average sound level (DNL 65 dB) and higher aircraft noise contour of the Proposed Project. The Indirect Effects APE was used to identify, disclose and evaluate potential impacts on eligible historic architectural resources protected by the NHPA. Refer to **Figure 1-3** for a graphical depiction of the Direct and Indirect Effects APEs delineated for the EA and this CRAS.



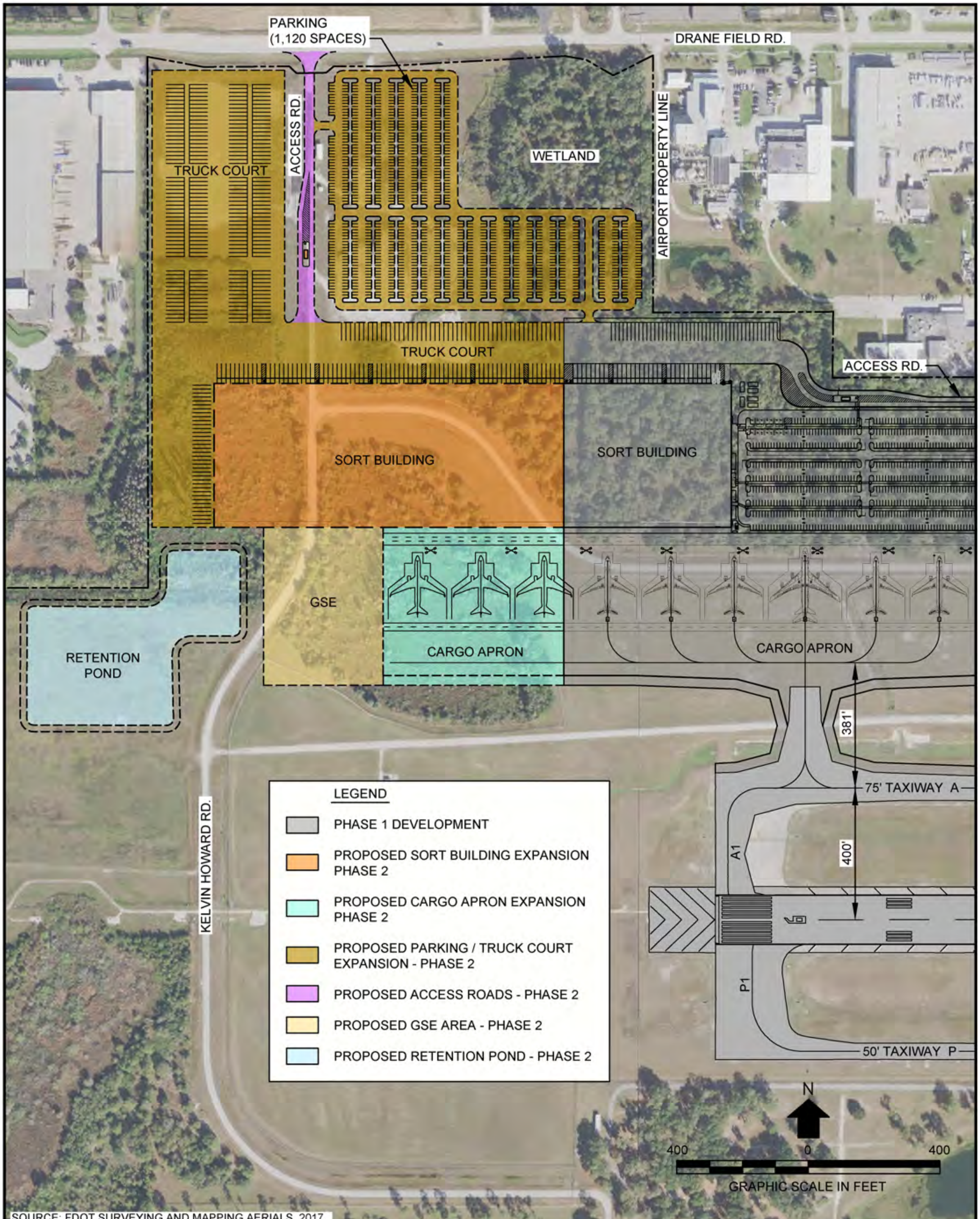
Path C:\Users\a.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 1-1 Project Location_rev0.mxd, Date Saved: 6/8/2020 9:52:52 AM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

PROJECT LOCATION

FIGURE 1-1



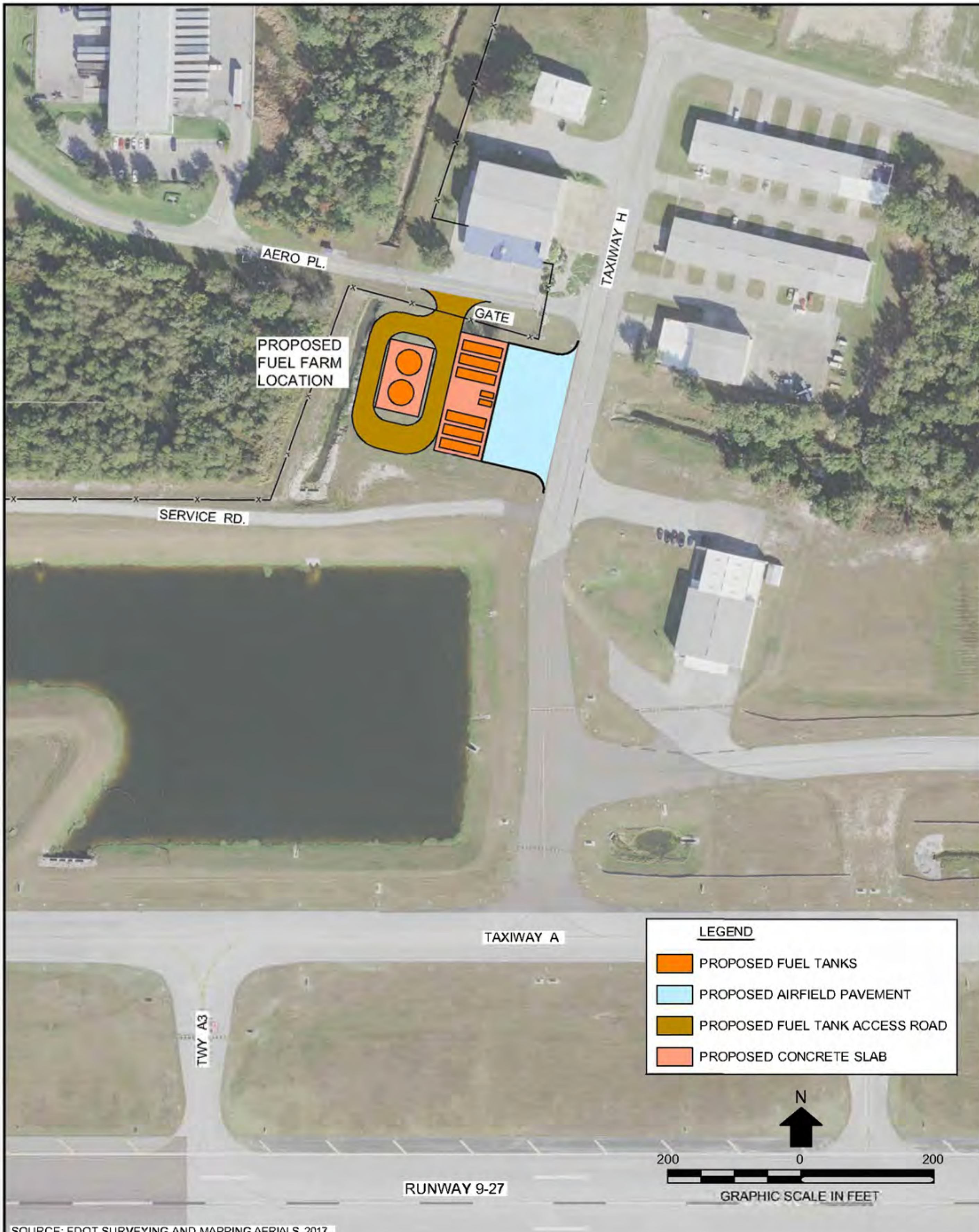
C:\Civil 3D Projects\Amazon\FIG 2.1-1-R-3.dwg 09/23/2020 14:20

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EA PROPOSED PROJECT

FIGURE 1-2a



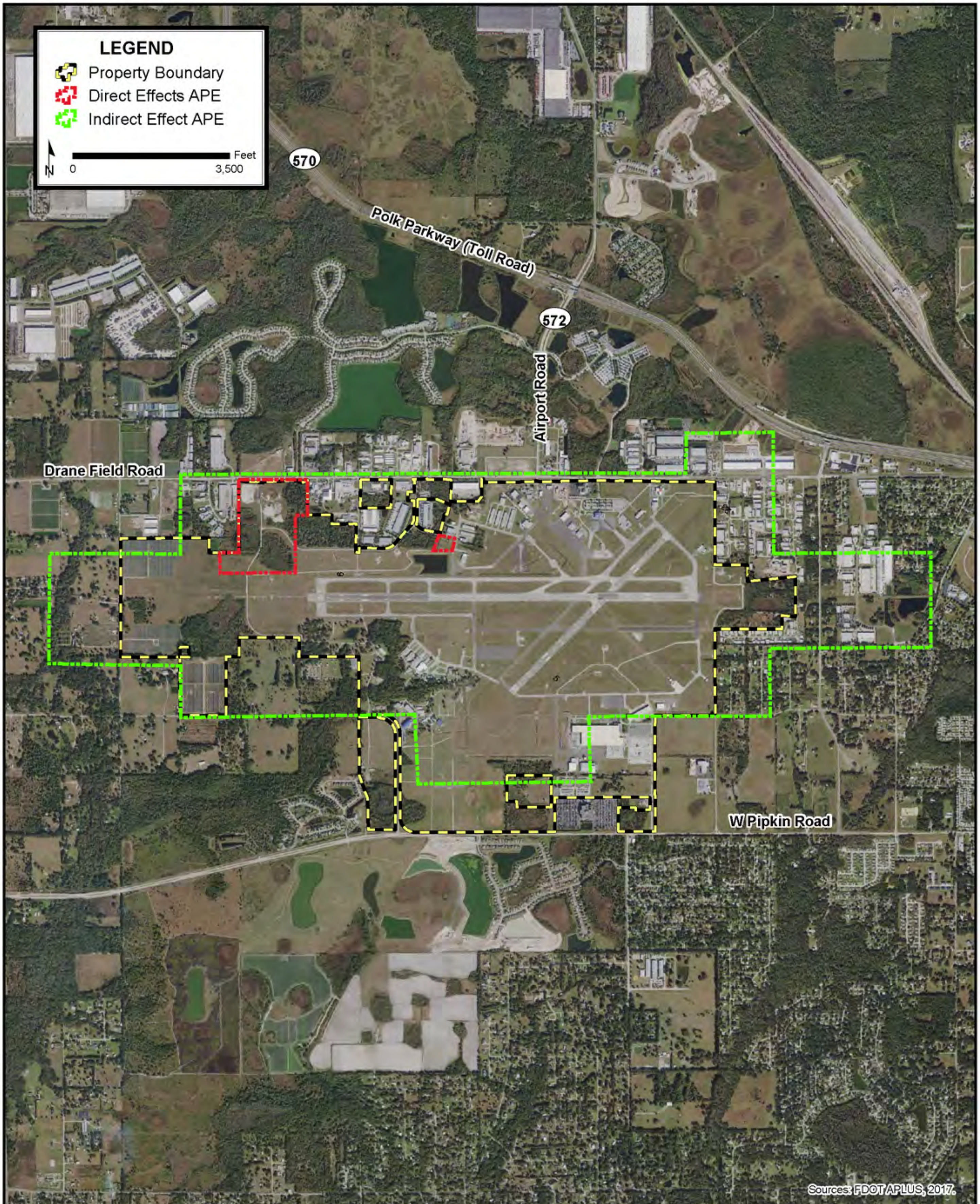
LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EA PROPOSED PROJECT FUEL FARM

FIGURE 1-2b

C:\Civil 3D Projects\Amazon\Draft EA Figures\FIG 1.2-1b.dwg 07/02/2020 10:36



Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 1-3 Areas of Potential Effect_rev2.mxd, Date Saved: 9/23/2020 1:34:04 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

AREAS OF POTENTIAL EFFECT

FIGURE 1-3

The Proposed Project requires Federal action and the Federal Aviation Administration (FAA) is the lead federal agency. This CRAS was prepared to facilitate consultation per Section 106 of the NHPA and 36 Code of Federal Regulation (CFR) 800. This work was conducted pursuant to Section 106 and conforms to the professional guidelines set forth in the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 CFR 44716, as amended and annotated). The work was also conducted pursuant to the following:

- Chapter 1A-46 of the Florida Administrative Code,
- Cultural Resource Management Standards and Operational Manual of the Florida Division of Historic Resources (FDHR, 2003), and
- Chapter 267, Florida Statutes (F.S.).

A background research conducted within one-mile of the Indirect Effects APE revealed that there are 17 historic structures, six archaeological sites, 26 cultural resource studies, and one resource group present within one mile of the Indirect Effects APE (**Appendix B**).

The current study, documented herein, constitutes a Phase IB CRAS and included a Florida Master Site File (FMSF) check, background research, and linear pedestrian and subsurface shovel testing survey within the APE. Mark Martinkovic served as Principal Investigator for the archaeological cultural resources survey on this project and authored this report, which adheres to the FDHR CRAS format. Archaeological fieldwork was conducted by Mark Martinkovic, Jeffrey Jones, Brooke Bayer, and Elizabeth Wilkins on July 6 and 7, 2020 and included the excavation of 12 shovel test pits (STPs) and photographic documentation. Based on the results of current survey, no further archaeological work is recommended for the APE. No Historic Properties will be affected by the Proposed Project.

2. ENVIRONMENTAL OVERVIEW

2.1 PHYSIOGRAPHY AND GEOLOGY

Regionally, the APEs are located in the Flatwoods province of Florida, approximately 25 miles (40 kilometers) east of Tampa Bay. This physiographic region is characterized by relatively low flat land encompassing large portions of south-central Florida. The altitude in this region ranges from sea level to 150 feet. This region is characterized by flatwoods and inland lakes between the Gulf of Mexico to the west and the Atlantic Coastal Ridge to the east. The topography of the region includes a series of poorly drained soil types and ranges in elevation from 140-144 feet (43 meters) above mean sea level.

2.2 HYDROLOGY

The western portion of Polk County consists of fairly level pine flatwoods containing numerous lakes and occasional swamps and marshes. The general area adjacent to LAL is drained by the Gaskin Branch which empties into the Peace Creek to the south which empties into the larger Peace River approximately three miles to the southwest. There are two hydrological characterizations within or adjacent to LAL: freshwater streams and stagnant flatland waters.

Much of the surrounding area is generally poorly drained with occasional drainage channels. The hydrology of the area surrounding LAL is consistent with hydric flatwoods and consists of poorly drained soils.

2.3 PALEOENVIRONMENT

During the late Pleistocene, sea levels were more than 70 meters lower than they are today, and the coastline of Florida extended many miles beyond its current location. From approximately 11,000 before present (B.P.) to 9000 B.P., sea levels rose dramatically as the continental ice sheets retreated and melted, bringing sea levels to within a few meters of current levels (**Figure 2-1**). Around 14,000 B.P., the vegetational community in the area of western Florida mostly consisted of oak, hickory, and southern pine forests, with mixed hardwood forests along major drainages from the Appalachian highlands toward the Gulf of Mexico. The oak, hickory, and southern pine forests persisted in the area until circa (ca.) 10,000 B.P., while communities from the Appalachians north from 33 degrees latitude and the Florida peninsula experienced a variety of changes as the climate warmed and sea levels rose. The Hypsithermal interval around 8000 to 4000 B.P. led to the emergence of southern pine communities in inter-riverine uplands and large riverine swamps in the lowlands (Anderson et al. 1996:3-7; Delcourt and Delcourt 1981, 1983, 1985, 1987).

2.4 SOILS

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) maps six distinct soil types in the Direct Effects APE (**Figure 2-2**). The soils within the APE are all poorly drained. The air cargo facility portion of the APE consists of Smyrna and Myakka fine sand; Pomona fine sand; Immokalee sand; Ona-Ona wet fine sand 0-2 percent slopes; and Basinger Mucky fine sand. The proposed fuel farm portion of the APE contains Pomona fine sand and Felda fine sand, frequently ponded 0-1 percent slopes (NRCS, 2019).

2.5 FLORA AND FAUNA

The traditional mesic flatwoods flora of the project area consists of longleaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*) (USDA, 1983), saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), dwarf live oak (*Quercus minima*), runner oak (*Quercus elliottii*), and wiregrass (*Astrida stricta*) (FNAI, 2010).

Tree-dwelling and larger mammals present on and around the project area include white tail deer (*Odocoileos virginianus*), river otter (*Lontra canadensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and squirrels (*Sciurus* ssp.). Avian species located in the area include local species, migratory species, and waterfowl. Reptiles are also present and include several species of snakes, turtles, lizards, and alligators. A wide variety of freshwater, fish are present in fresh water sources such a rivers, creeks, lakes, and ponds (FNAI 2010).

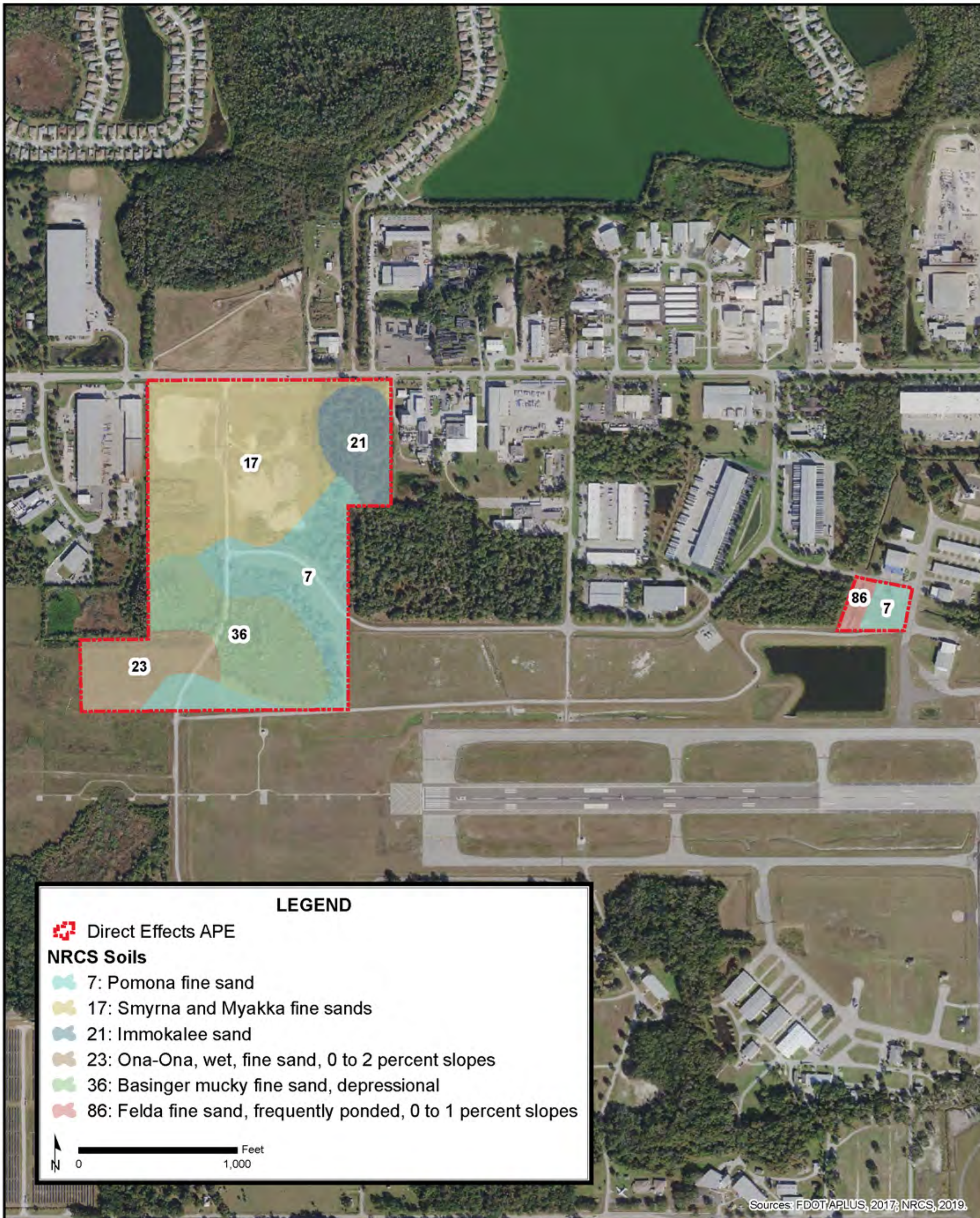
Path: C:\Users\lia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 2-1 Florida Shorelines_rev0.mxd, Date Saved: 8/27/2020 10:31:55 AM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

FLORIDA SHORELINES: PLEISTOCENE TO PRESENT

FIGURE 2-1



Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 2-2 Project Area Soils_rev1.mxd, Date Saved: 9/23/2020 2:01:39 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

SOILS

FIGURE 2-2

2.6 CURRENT CONDITIONS AND LAND USE

The Direct Effects APE is historically and is currently an actively maintained site where ground-disturbing operations are often conducted. Many of the ground disturbing activities include building construction and grading, and creation of retention ponds and drainage systems.

Areas of filled and disturbed soil were consistently encountered within the APE during current survey efforts.

The APEs are located in the northeastern portion of the U.S. Geological Survey (USGS) 7.5-minute Nichols, Florida topographic quadrangle map in an area labeled "Lakeland Linder Regional Airport" (**Figure 2-3**). The area immediately west of the Direct Effects APE is outside of the Airport property and consists of a series of light industrial and commercial businesses. North of the APE is Drane Field Road which is a heavily developed east/west road skirting the north boundary of the Airport property. South of the APE are a taxiway and the main runway for LAL.

3. CULTURAL CONTEXT

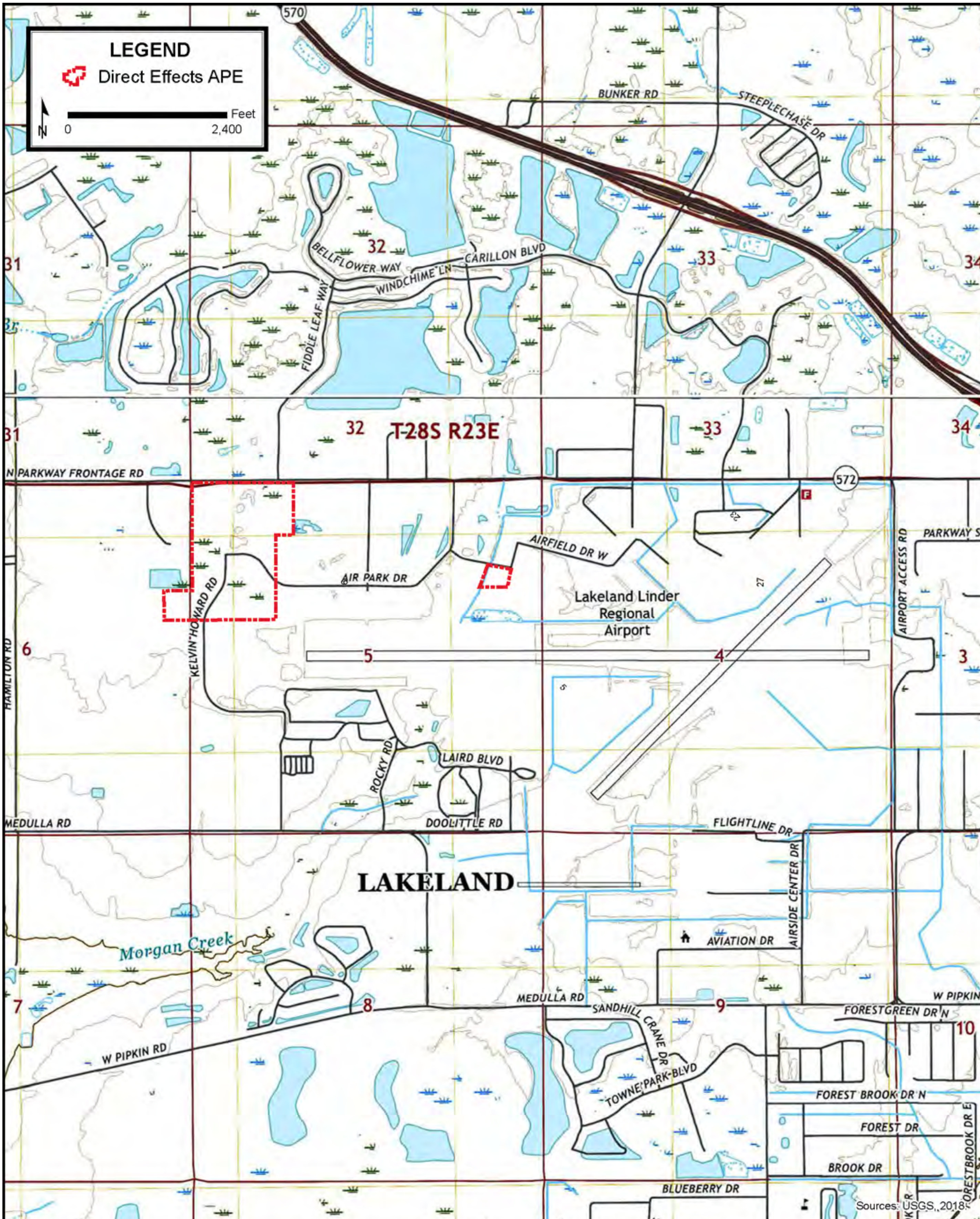
The FDHR has developed cultural contexts that provide a necessary framework for the description and analysis of known and anticipated cultural resources. The contexts are organized by geographic region, time/developmental period, and theme, and are the basis for evaluating the significance of resources within the APE. The sections that follow summarize the relevant information for each time period in the region. The FDHR divides the prehistory of the State of Florida into four general periods (Payne and Milanich, 1992):

- Paleoindian (12,000-7,900 Before Christ [B.C.]),
- Archaic (7,900-500 B.C.),
- Woodland (500 B.C.-Anno Domini [A.D.] 1500), and
- Mississippian (A.D. 1000-1500).

3.1 PALEOINDIAN PERIOD (12,000-7,900 B.C.)

The earliest human occupation in Florida dates to the Paleoindian period. These people were the descendants of populations that had previously crossed the Bering Strait from Asia into the New World during the Late Pleistocene. Although the timing of this migration is subject to considerable debate, by ca. 12,000 B.C. these early colonists had spread across most of North and South America (Adovasio and Pedler 2005; Milanich 1994).

The earliest human occupants in Florida occupied a landscape different from that which is present today. During the Ice Age at the end of the Pleistocene epoch (ca. 12,000 years ago), sea levels were approximately 60 to 100 m lower than today. As a result, large portions of the continental shelf to the east, west, and south of Florida would have been exposed and the Florida Peninsula was twice as large as it is today (Faught 2004; Milanich 1994).



Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 2-3 USGS Map_rev1.mxd, Date Saved: 9/23/2020 2:15:24 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

USGS 7.5-MINUTE QUADRANGLE MAP (1:24000 SCALE)

FIGURE 2-3

The subsequent inundation of these areas skews the available data on Paleoindian occupations in Florida, as sites that would have been located on the Coastal Plain are now under water (Borremans 1992; Faught 2004; Milanich 1994).

Paleoecological data suggest Florida was cooler and drier during the Paleoindian period compared to modern conditions (Borremans 1992). The now submerged Coastal Plain appears to have been crisscrossed by numerous river drainage systems, while the interior prairies were dotted by lakes and sinkholes created by upland springs.

These wetter environments would have provided more hospitable conditions for flora, fauna, and the earliest human occupants of interior Florida (Borremans 1992; Milanich 1994).

The majority of information related to the material culture of the Paleoindians of Florida comes from lithic assemblages. Paleoindian assemblages contain a mixture of formal and expedient stone tools (Borremans 1992). Formal tools include large, lanceolate projectile point/knives (PPKs), unifacial scrapers, gravers, and bifacial knives. Expedient tool types include flake knives, retouched flakes, and hammerstones used in tool manufacture. The majority of both formal and expedient Paleoindian tools were manufactured from high quality cherts (Borremans 1992; Milanich 1994). Ground stone tools were also manufactured, including adzes and egg-shaped weights interpreted as parts of bolas used in bird hunting (Milanich 1994).

Diagnostic stone tools dated to the first half of the Paleoindian period (i.e., Early and Middle Paleoindian periods [12,000-8,500 B.C.]) include the Suwannee, Simpson, and Clovis PPKs (Borremans 1992; Milanich 1994). Diagnostic stone tools dated to the latter part of the Paleoindian period (Late Paleoindian [8,500-8,000 B.C.]) include Dalton PPKs that represent a transitional form between the earlier Paleoindian and Early Archaic forms (Borremans 1992; Milanich 1994).

Although the Paleoindian occupants of Florida likely used a host of organic materials such as wood, bone, shell, and plant fibers to manufacture tools, shelters, ornaments, and clothing, the acidic soil conditions found across most of the state have resulted in the decomposition of most these organic artifacts (Borremans 1992). A small sample of non-lithic tools have been recovered across the state, including ivory spear foreshafts, bone and antler PPKs, bone needles, and worked fossil shark teeth (Dunbar and Webb 1996; Milanich 1994).

Paleoindians in Florida exploited a wide variety of animals and plants for food. Evidence for megafauna exploitation in Florida include a mammoth vertebra with visible butchering marks on its surface recovered from the Santa Fe River in north central Florida and the partial skeleton of an extinct species of bison (*Bison antiquus*) with a stone PPK still lodged in the skull found in the Wacissa River in northwest Florida (Milanich 1994). Faunal remains from the Little Salt Spring and sites on the Aucilla River demonstrate the wide breadth of species consumed by Paleoindian groups, including sloth, tapir, horse, camelids, mammoth, deer, fish, turtles, shellfish, opossum, rabbit, and muskrat. Evidence suggests that Paleoindian groups consumed plant foods as well. At the Little Salt Springs site, located just north of Charlotte Bay on the Gulf

Coast, archaeologists recovered botanical remains including berries, roots, seeds, and nuts (Borremans 1992; Milanich 1994).

Throughout the period, Paleoindian sites are interpreted as the remains of small, mobile bands of hunter-gatherer groups. The small size of most Paleoindian sites suggests these bands consisted of nuclear families or extended families, although larger group aggregations may have occurred at quarry sites (Milanich 1994). Sites located near fresh water sources are interpreted as seasonally reoccupied base camps; small lithic scatters are interpreted as short-term camps that represent brief stays for resource procurement (Milanich 1994). The location of high-quality chert for stone tool production also played a significant role in Paleoindian settlement systems. Quarry sites were likely visited on a regular basis to obtain raw materials for tool production and numerous sites have been found in association with chert outcrops. Cores, flakes, and other evidence of initial tool reduction are typically found at these sites (Borremans 1992).

Archaeological research conducted on the now submerged Coastal Plain suggests Paleoindian settlement was focused on riverine environments. Geological studies of inundated riverine, lagoon, and marsh deposits along the Florida coast suggest estuarine resources in these areas were utilized by Paleoindian groups (Borremans 1992). A survey conducted along the drowned channel of the Aucilla River in northwest Florida identified nine submerged Paleoindian sites. Diagnostic Paleoindian PPKs were recovered from these sites, including Suwannee PPKs as well as later Early and Middle Archaic PPKs (Faught 2004). These sites varied in size and artifact diversity suggesting the presence of base camps and short-term, resource procurement camps similar to those found in the interior.

3.2 ARCHAIC PERIOD (8,000-500 B.C.)

The Archaic period is typically divided into three subperiods based predominantly on the changes in PPK morphology through time: Early Archaic (8,000–5,000 B.C.); Middle Archaic (5,000–3,000 B.C.); and Late Archaic (3,000–500 B.C.). The general trend was toward increasing sedentism throughout the period, culminating in the appearance of the first fully sedentary villages during the Late Archaic period. Ceramic technology appeared during the Late Archaic. The end of the Archaic period is marked by the appearance of regional cultures in different parts of the peninsula. These regional cultures are primarily defined based on technological and stylistic differences in ceramic assemblages.

Sea-level rise and increasingly wetter climatic conditions constitute the largest changes to the environment along the Florida Peninsula during the Archaic period. Although the general climactic trend was towards increasingly wetter conditions, there were marked fluctuations in climate (Milanich 1994). The period from 8,000 to 6,000 B.C. was markedly wetter than the preceding Paleoindian period, while the period from 6,000 to 3,000 B.C. was drier than the previous 2,000 years. By 3,000 B.C., the climate of Florida was similar to that of today (Milanich 1994).

The wetter climate brought about changes in both the hydrology and flora on the Florida Peninsula. Pollen data suggest that during this period, mixed forests gradually replaced the xerophytic oak-pine forest that had dominated the landscape during the Paleoindian period (Pelletier *et al.* 2004). The moister climate also resulted in an increase in surface water across the state, expanding the number of pond, lake, marsh, and swamp environments across the peninsula.

Sea-level rise, which began during the Paleoindian period as the glaciers associated with the last glacial maximum began to melt, continued during the Archaic period. As a result of rising sea levels, a large number of Archaic period sites have been inundated. The inundation of these sites has created a bias in our understanding of Archaic period lifeways as the majority of the available data are from interior sites in upland settings.

3.2.1 EARLY ARCHAIC PERIOD (8,000-6,000 B.C.)

Diagnostic PPKs from the Early Archaic consist of a variety of side-notched and stemmed varieties including the Bolen, Dalton, Hamilton, Kirk Serrated, Nuckolls, Santa Fe, Suwannee, and Wacissa types (Milanich 1994; Russo 1992). PPKs with side notches and bifurcated bases, such as the Hamilton and Arredondo types, also date to this period (Milanich 1994; Russo 1992).

Early Archaic settlement and subsistence patterns appear to be similar to the preceding Paleoindian period. Early Archaic components are commonly found at sites with earlier Paleoindian occupations. This is most common at base camp sites (Milanich 1994). Types of Early Archaic sites include base camps, short-term camps, and quarry sites similar to those dated to the Paleoindian period (Russo 1992). The continuity in both site location and site types suggests Paleoindian lifeways generally continued into the Early Archaic period. Although the similarities in settlement pattern between the Early Archaic and Paleoindian periods are numerous, significant changes did occur. Early Archaic occupations are found in a more diverse set of locations and environments compared to early Paleoindian sites. The wetter conditions of the Early Archaic period resulted in an increase in available surface water, and Early Archaic populations appear to have expanded their occupation across the landscape as a result (Milanich 1994).

The second major development associated with Early Archaic populations was the appearance of a new type of site, the cemetery, which is not known for the preceding Paleoindian period. These sites are typically encountered in wet, marshy environments and shallow ponds, although later examples include internments in shell middens (Russo 1992). The practice of burying the dead in cemeteries located in low, wet, marshy environments persisted into the Middle Archaic period at sites such as Little Salt Spring in Sarasota County as well as sites in southern Florida (Milanich 1994; Russo 1992).

3.2.2 MIDDLE ARCHAIC PERIOD (6,000-3,000 B.C.)

Middle Archaic PPKs are typified by the stemmed PPK with a Christmas tree shaped blade such as the Levy, Marion, Newman, and Putnam types (Russo 1992). A hallmark of the Middle Archaic was the appearance and development of a blade industry (Milanich 1994). In addition to the PPKs, the Middle Archaic toolkit included a variety of specialized tools such as burins, microliths, and expedient forms.

While terrestrial animal and plant food resources continued to be exploited, the proliferation of shell middens in both riverine and coastal settings during the Middle through Late Archaic period demonstrate the importance of both freshwater and saltwater species of shellfish to these populations. At sites along the Gulf and Atlantic coasts, marine shellfish such as quahogs, whelks, conchs, oysters, and scallops were common food items. At riverine sites, mystery and apple snails, as well as freshwater mussels were harvested (Milanich 1994; Russo 1992). The focus on riverine and coastal resources helped to establish a more sedentary settlement pattern, with increasing population sizes at base camps (Milanich 1994; Russo 1992).

3.2.3 LATE ARCHAIC PERIOD (3,000-500 B.C.)

Late Archaic PPKs are typically smaller, stemmed and corner-notched forms that include the Clay, Culbreath, Destin, Lafayette, Marion, Putnam, and Savannah types (Campbell *et al.* 2012; Morehead *et al.* 2013). The Late Archaic tool kit also included a variety of temporally nondiagnostic formal and expedient stone tools such as scrapers, gravers, adzes, knives, drills, choppers, gouges, and hammerstones (Milanich 1994; Russo 1992).

One of the most significant technological developments of the Late Archaic period was the appearance of ceramic technology. The earliest ceramic ware found in Florida is fiber-tempered Orange ware ceramics, which appeared along the northeast coast of Florida ca. 2200 B.C. Shortly after the appearance of ceramic technology in northeast Florida, fiber-tempered ceramics appeared at sites in the southern portion of the state, as well as along the Gulf Coast and Florida Panhandle. Along the Gulf Coast, the earliest, fiber-tempered ceramics are defined as the Norwood series (Saunders and Hays 2004). Norwood series ceramics are similar in morphology and exterior surface decoration but have a greater amount of sand content in their paste compared to Orange wares (Russo 1992; Saunders and Hays 2004).

The increased exploitation of shellfish and coastal resources during the Late Archaic led to large shell midden sites covering several acres (Milanich 1994; Russo 1992). These shell midden sites consist of large, extensive sheet midden deposits or deep, ring-shaped mounds of shell arranged around open, circular areas. These interior spaces within shell-ring sites may have functioned as central plazas or living areas (Russo 1992; Sassaman 2005).

The variety of faunal and botanical remains at Late Archaic sites demonstrates continued reliance on a hunting and gathering subsistence strategy (Milanich 1994). Plant and animal resources available during different seasons have been recovered from sites, suggesting occupation year round. The larger size, increased depth, and evidence of year-round occupation based on faunal and botanical remains recovered from these sites indicates they represent occupations by semi-sedentary, and possibly even fully sedentary, hunter-gatherer groups (Russo 1992).

The larger sites appear to have been surrounded by a network of small, short-term resource procurement sites similar to those encountered during earlier periods. Russo (1992) has interpreted the relationship between large shell midden sites and these smaller, short-term camps as reflecting an integrated settlement system of large, centralized villages articulated with outlying habitation areas and resource processing stations.

3.3 WOODLAND PERIOD (500 B.C.-A.D. 1000)

The Woodland period in Florida is generally divided into three periods: the Early Woodland, represented by the Deptford culture (500 B.C.–A.D. 100); the Middle Woodland, represented by the Santa Rosa and Swift Creek cultures (A.D. 100–300); and the Late Woodland, represented by the Weeden Island culture (A.D. 300–900/1000). However, the Woodland Culture is poorly defined in the Central Florida Gulf Coast. Changes in pottery and technology beginning in the Late Archaic period are generally described as the Formative period. This culture gave rise to the later Weeden Island cultures.

Climactic conditions during the Woodland period were similar to those of today across the Southeast. Sea levels continued to rise, but at a slower rate than in earlier periods, with sea levels rising approximately 2 m over the last 2,000 years (Avery 1992).

3.3.1 WEEDEN ISLAND CULTURE (MANASOTA CULTURE) (500 B.C.-A.D. 1000)

Weeden Island cultures are generally distributed from Mobile Bay to the Atlantic Ocean and south through north and central Florida. Common Weeden Island cultural traits include distinctive decorated pottery, mound building and burial ceremonialism, and village sites. Gulf Coast sites are found as far south as Sarasota. There are several regional variations of the culture, based on regional adaptations to Florida’s varied environments. The southern manifestation of the Weeden Island culture is known as the Manasota Culture. Despite the distances between them, all Weeden Island cultures are thought to have shared a common belief system. The Manasota culture focused on fishing, hunting, and shell fish gathering. Burial practices include primary flexed mound burials. Dense shell middens (oysters, quahog, and scallops) are often found along the coast in elevated hammocks. Early Manasota pottery was sand-tempered and undecorated but later pottery was decorated with check and complicated stamping. This decorated pottery is often discovered in a funerary context within burial mounds (Milanich 1994).

3.4 MISSISSIPPIAN PERIOD (A.D. 1000-1500)

The Mississippian culture in southwest Florida is known as Safety Harbor and grew out of the earlier Manasota cultures. According to Willey (1949) and White (1982), the key aspects of the culture include large sites with a temple mound (or mounds); plazas along streams, coastal areas, inland lakes, and ponds; and typical Mississippian architecture (Lewis and Stout 1998; Payne 2002). Structural remains include daub, postholes/molds, wall trenches, hearths, and storage and refuse pits. There is little evidence of defensive constructions, such as palisades or embankments, around mound or other sites (Gardner 1971; Tesar 2006). Other features of these sites include cemeteries; an apparently reduced number of ceremonial sites as compared to the preceding periods; and a subsistence regime including evidence of maize agriculture, horticulture, and wild collected plants, as well as a wide range of fauna such as deer, small mammals, turtle, fish, and shellfish. Safety Harbor sites relied less on traditional Mississippian agriculture and focused on shellfish gathering (Milanich 1994).

3.5 HISTORIC CONTEXT

3.5.1 CONTACT PERIOD (A.D. 1500-1565)

Spain made several attempts to colonize Florida in the early sixteenth century. The North American continent was first sighted by Spanish explorer Juan Ponce de Leon in March of 1513. He claimed the land for the Spanish crown and named it *La Florida*, meaning "Land of Flowers." Spain launched multiple expeditions to settle their new discovery between 1513 and 1563, but Native Americans and the inhospitable wilderness prevented permanent settlement (Gannon 1996).

At the time that the first Spanish explorers, Juan Ponce de Leon, Panfilo de Narvaez, and Hernan de Soto, were making the first recorded European forays into Florida in the early 1500s, the northwestern portion of the State was occupied by the Apalachee chiefdoms, agricultural descendants of the Fort Walton Culture (Hann and Mcewan 1998). The Apalachee settlements included small farming hamlets, as well as larger villages and ceremonial mound centers. Alvar Nunez Cabeza de Vaca, a member of Narvaez's party, recorded fields of planted maize around the villages (Gannon 1996). Narvaez ventured into the Apalachee region in 1528 in an attempt to find treasure (Gannon 1996). After one month in the area, more than 60 of Narvaez's men were dead, and the party retreated to the Gulf Coast. There, they constructed small craft and set sail for Mexico, but a storm capsized the small boats off the coast of Texas, and all but eight of the men drowned. Of these survivors, only four reached Mexico (Gannon 1996).

A deadly hurricane prevented Tristan de Luna's efforts to establish a colony on Pensacola Bay in 1559 (Burns 2008). Florida became increasingly important to Spain because it was located along the return route followed by Spanish treasure fleets. The crown wanted to prevent foreign countries from establishing a base in Florida that would threaten Spain's communications with the Caribbean and Mexico (Johnson 1982).

The early contact with Spanish explorers, while brief, resulted in significant deleterious effects to the Native Americans. The influx of European trade goods, usually acquired via down-the-line exchange from other indigenous traders, brought about great changes in lifestyle as Native Americans incorporated new technologies and reoriented their economies to participate in the European goods trade networks (Holland Braund 1993). However, European diseases introduced by the explorers and traders decimated the local populations (Ramenofsky 1987).

By the time the Spanish Franciscans established missions in northwestern Florida during the mid-seventeenth century, the Apalachee were much reduced in population and social cohesion.

Florida became increasingly important to the European powers because of its location along the return route followed by Spanish treasure fleets. The first attempt to establish a permanent colony was in 1559, when Don Tristan de Luna y Arellano and 900 colonists from Mexico established a settlement in the Pensacola Bay area (Lyon 1996), but the colony was destroyed by a hurricane on September 19, 1559 (Lyon 1996). Later attempts at colonization by the French and Spanish were focused on the St. John's River area, near modern day St. Augustine, on the Atlantic coast (Johnson 1982). Conflicts between the French and Spanish in Florida resulted in the destruction of the French colonies in the 1560s and the establishment of a fixed Spanish foothold centered in the St. John's River area (Burns 2008). While Spain emerged victorious over the French in Florida, conflict with the English continued intermittently for the next 200 years.

3.5.2 First Spanish Period (A.D. 1559-1763)

The First Spanish period is defined by an era in which Spain first claimed ownership of Florida over the English and the French (Handly *et al.* 2012). The French presence in Florida threatened Spain's supply of gold and silver, which was carried in galleons along the coastline en route to Spain. King Phillip II named Pedro Menéndez de Avilés, a nobleman with extensive naval experience in Spain and the New World, as governor of Florida and instructed him to explore and further colonize the territory. St. Augustine was established as a permanent Spanish settlement in 1565 by Avilés.

Spanish settlement in northwestern Florida during this period appears to have been sparse. Fort Santa Maria de Galve was established by the Spanish in 1698 in Pensacola Bay in an attempt to thwart France's presence in the area. San Jose was a military outpost established in 1702 at St. Joseph's Bay (Handly *et al.* 2008). The French established Fort Crevecoeur at St. Joseph's Bay in 1717, which was abandoned by 1718. The Spanish erected their own fort in the same location, but it was also eventually abandoned. In 1754, there appears to have been a Spanish settlement located somewhere on St. Andrews Bay, although evidence is anecdotal (Handly *et al.* 2008).

Spanish colonial rule in Florida had a significant impact on the local Native American populations. The principal instrument of Spanish influence and control was the establishment of the mission system along the Atlantic coast from the St. Augustine north through coastal Georgia (Saunders 1992). Franciscan missions in Florida were established in pre-existing Native American village areas. While Spanish governors held supreme authority, local native officials were allowed to retain a degree of cultural and political influence (Hann 1996). The missions' primary goal was not of economic enterprise, as was the case in missions established in the Western U.S. While native peoples living at missions did work for the Spanish overlords, they often settled in the missions of their own accord for economic reasons (Hann 1996) and possibly to find refuge after their own homelands were devastated by disease and raiding (Ramenofsky 1987).

Missions among the Apalachee were established in the Tallahassee region in the 1630s and 1640s (Hann 1996). The mission on the Apalachicola River was the farthest west of the Franciscan churches in Florida prior to establishment of the Recollect Order's missions in the 1670s (Hann 1996). Groups like the Tama from central Georgia and the Chine and Chacato from northeastern Florida migrated to the Apalachee missions throughout the mid-1600s.

Estimates during the middle of the seventeenth century list 15,000 to 20,000 people living in the Apalachee area (Hann 1996). The local population of mixed Apalachee, Chacato, Chine, Amacano, Pacha, Tama-Yamasee, and others lived in 40 settlements, 11 of which were incorporated into the missions (Hann 1996). By the end of the seventeenth century, disease epidemics reduced local populations, and raids from native groups allied to the British in the Carolinas destroyed the mission settlements. Following the raids, the Spanish abandoned Apalachee in 1704. The remnant native population dispersed to Mobile, Pensacola, and St. Augustine (Hann 1996).

3.5.3 British Period (A.D. 1763-1781)

The Seven Years' War (1756–1763) broke out between England and France in North America and later spread to Europe. Spain remained neutral until 1762 (Johnson 1982). Spain was allied with France and feared that a British victory in North America would destroy the balance of power. The British captured Havana in 1762, and Spain ceded Florida to England in the Treaty of Paris in 1763 (Johnson 1982).

After England gained control of Florida, the territory was divided into West Florida and East Florida. East Florida included the Florida Peninsula and ended at the Apalachicola River. West Florida included the Florida Panhandle and portions of southern Alabama, Mississippi, and Louisiana. Apart from the capitals at St. Augustine and Pensacola, the province was almost devoid of European settlement (Burns 2008).

To attract European settlers, the governors of West Florida offered small tracts of land in exchange for service in the Seven Years War (Fabel 1996). However, poor soils, lack of the trade that was expected with Mexico, and frequent disease epidemics kept the province poor and largely undeveloped. In 1770, West Florida was home to 3,700 white and 12,000 black settlers, along with approximately 30,000 people belonging to the Chickasaw, Choctaw, and Creek nations (Fabel 1996:136). Most of the new settlers were concentrated in the Natchez Tract in Mississippi and around the towns of Mobile and Pensacola (Coker 1996; Fabel 1996). Small farmsteads were established in the rural areas of the Florida Panhandle, and the forests were harvested for lumber, but the area was mostly occupied by remnant Apalachee and Creek groups (Hudson 1976; Ramsey 1988).

Florida had become Britain's informal fourteenth colony, but the protectorate did not send a delegate to Philadelphia when the Declaration of Independence was signed (Boatner 1992;

Burns 2008). Florida was still a garrison colony and was dependent on English arms for protection (Johnson 1982). The majority of the European population consisted of soldiers and officers, officials, and dependents (Wright 1975). The region was also a haven for Loyalist refugees.

When France entered the American Revolutionary War, allied Spain also declared war on Britain. The Spanish Governor of Louisiana, Bernardo de Galvez, defeated the British garrisons at Baton Rouge, Natchez, and Mobile. Then, in 1781, he besieged and eventually occupied Pensacola (Fabel 1996). Florida was returned to Spain at the Second Treaty of Paris in 1783 in thanks for assisting America during the war for independence (Morris *et al.* 2002). The transfer of flags took place in St. Augustine in July of 1784.

3.5.4 SECOND SPANISH PERIOD (A.D. 1781-1821)

Spain retained the division of Florida's eastern and western provinces after formally taking over the territory in 1784 (Coker and Parker 1996). Most British residents departed for other parts of the British Empire or settled in the U.S. following the return of Florida to the Spanish. Those that remained were required to take an oath of allegiance to Spain. The population during the Second Spanish period included British, Minorcans, Italians, Greeks, refugee slaves from the former English colonies, and Spanish residents from the First Spanish period (Johnson 1982).

The poor Spanish colony was not economically vital to Spain, and pieces of the territory were gradually ceded to the U.S. In addition to lumber products, the Panhandle region saw increased trapping of deer for the skin-trade, particularly with British, and later American trading companies (Coker and Parker 1996; Pavao-Zuckerman 2007). The Creek Nation was the ethnic majority group in the northern Panhandle during this period (Coker and Parker 1996). Formerly enslaved Africans who had escaped from Alabama, Georgia, and eastern Florida cohabitated with the Creeks in the Panhandle region (Coker and Parker 1996:156).

Spanish Florida continually felt pressure from its neighbors to the north. The Spanish territory was considered by President James Madison to be "at all times a source of irritation and ill blood with the U.S." (Cusick 2003, quoted in Burns 2008:10). It was Madison's hope that it be occupied and absorbed into the U.S. The Spanish government in St. Augustine offered freedom to runaway slaves from nearby states and territories to reinforce their presence in Florida (Burns 2008; Griffin 1983).

Good trade relations did not quench the U.S.' desire to control Florida. The U.S. Army attempted to invade and occupy northeastern Florida between 1812 and 1813 in an effort to dominate the region. The Patriot War, as it is now known, resulted in no new land acquisitions for the U.S., but it did leave numerous plantations in ruin and intensified tensions between the U.S. and Spain (Burns 2008). During the War of 1812, the British, who were then allied with Spain, launched attacks on Mobile and New Orleans from Spanish-occupied Pensacola. After successfully defending both cities, American General Andrew Jackson attacked the British fortifications in Pensacola (Coker and Parker 1996:156).

The First Seminole War, which began when American troops attacked a Creek village in Georgia, was fought partly in northwestern Florida, specifically in areas of what is now Calhoun County. On December 13, 1817, a large force of Seminole and Creek attacked the Creek village, Blountstown, due to the political affiliation of its leader, Chief John Blount (Calhoun County Chamber of Commerce 2014). Later in December 1817, the same group attacked American supply boats on the Apalachicola near Ocheese Bluff, also in what is now northeastern Calhoun County (Missall and Missall 2004).

In 1818, Creek and African raiders from Negro Fort near the mouth of the Apalachicola River were attacking farmsteads in the region and up into southern Georgia and Alabama. General Jackson attacked the fort and then proceeded to attack Spanish troops in Pensacola on the pretext that they were collaborators with the Creek Nation (Coker and Parker 1996).

President James Monroe supported the acquisition of Florida during his 1821 inauguration speech by stating "it would provide neighboring states access to the ocean, its Gulf coast harbor could berth warships" (Waterbury 1983:151). Spain lost Florida when thousands of Americans settled there and made the country ungovernable. The U.S. Government seized the opportunity afforded by Spain's lack of control and negotiated the purchase of the territory. Spain officially ceded all of Florida to the U.S. with the signing of the Adams-Onis Treaty in February of 1821 (Franklin and Morris 1996:51; Morris *et al.* 2002).

3.5.5 TERRITORIAL PERIOD (1821-1845)

Tallahassee was chosen as the state capital in 1821 because of its central location, granting representatives from each part of the state equal access to a common meeting place (Schafer 1996). Florida's economy grew and diversified under American rule. Growth was spurred by the production of citrus fruit and sugar, which led to land speculation and the improvement of transportation facilities. Merchant vessel traffic increased as trade between the U.S. and the Caribbean region flourished. Goods from New York, New Orleans, and Charleston were imported to St. Augustine, while oak, cedar, timber, pine, cotton, bricks, oranges, and other items were exported (Burns 2008). American merchant ships, predominantly coastal schooners, were the key to the commercial expansion and economic viability of the new territory (Morris *et al.* 2002).

3.5.6 AMERICAN STATEHOOD AND CIVIL WAR PERIOD (A.D. 1845-1865)

Florida became the 27th State admitted to the Union in 1845. The northwestern portion of the State held 15 percent of the population, most of it rural. Pensacola was the largest city in the region, with 2,900 inhabitants (Brown 1996). The largely frontier-like conditions of northwestern (and eastern) Florida were the opposite of middle Florida's wealthy cotton and citrus plantations, which contained two-thirds of the State's enslaved population (Brown 1996). The disparate economies led to internal conflict on the subject of secession. As municipalities voted on slavery and secession, bands of armed regulators representing both sides of the issue rode about intimidating voters (Cox 2008). Despite abolitionist sympathizers in northwestern and parts of eastern Florida, the wealthy and politically connected land-owning class of middle

Florida pushed for secession, and Florida became the third State to secede from the Union in 1861 (Brown 1996).

The Civil War began in Florida two days after the shelling of Fort Sumter. Union troop buildup began at Fort Pickens on Santa Rosa Island in Pensacola Bay in early 1861. On April 13, 1861, Confederate troops began shelling the Union position but were quickly defeated by the Union navy (Brown 1996). The Confederate forces under General Braxton Bragg attempted several more times to dislodge the fortified Federal forces, but abandoned Pensacola by March of 1862 (Brown 1996). Port cities like Apalachicola and other southern coastal cities found themselves at the mercy of Union blockades by the spring of 1862 (Burns 2009). Skirmishing continued throughout the state, but no major battles took place. Nevertheless, the Union blockade and forced conscription of a large percentage of able-bodied men left Florida impoverished by 1864 (Brown 1996).

3.5.7 RECONSTRUCTION AND INDUSTRIALIZATION (A.D. 1865-1940)

Much of Florida struggled after the conclusion of the Civil War and the abolition of slavery. Freed slaves established homesteads or share-cropped much of the former plantation lands, leading to conflicts with former planters (Shofner 1996:250). On the other hand, migration of the wealthy planter class and northerners to peninsular Florida created a thriving citrus-growing and tourist economy (Burns 2008).

Things remained largely unchanged in the general region during the late 19th century. White yeoman and black farmers continued to grow cotton, corn, vegetables, sugar-cane, and tobacco as sharecroppers and tenant farmers (Proctor 1996). The timber industry also continued to operate.

Naval stores, also referred to as the turpentine industry, were a part of the timber industry in the southeastern U.S. Naval stores were produced through the industrial rendering of the sap or gum (oleoresin) gathered from pine trees, most notably the longleaf pine and slash pine. The naval stores industry, and its associated settlement patterns, were extractive systems closely linked with lumber and timber (Butler 1998). The naval stores industry supplied needed turpentine and rosin to the world market and provided employment for residents of Florida during the late 19th through middle 20th century. Turpentine and rosin were both used in many American household products including paints, medicines, hair spray, and cosmetics (Butler 1998).

Many of the families involved in the naval stores industry migrated to Florida in the decades following the Civil War from the Carolinas, as war and a long history of timbering negatively affected the industry in those states (Blount 1993). The influx of people from North and South Carolina helped exploit the vast timber resources of Florida. This business opportunity can be seen in contemporary advertisements proclaiming that ready fortunes were available in Florida for a hardy few. For example, in 1889 the New York Times described the timber and turpentine business in Florida as “A business that promises well for hardy men, money to be made in the cypress swamps and pine woods with honest, hard work" (New York Times 1889). The development of improved transportation systems during this period, such as improved roads, railroads, and narrow gauge tram railroads, allowed the naval stores industry to spread and utilize the resources farther from settled areas (Butler 1998). In 1850, Florida accounted for only 1.05 percent of naval stores production in the U.S. By 1900, Florida claimed 31.8 percent of the U.S. production, and became the national leader. Florida held the lead until 1924, when Georgia became the national leader and remained so until the demise of the industry after WWII (Martinkovic 2006).

3.5.8 1941-PRESENT DAY

A 1952 promotional publication summarized the immediate post-WWII history of Lakeland, founded in 1884 (Lakeland Chamber of Commerce 1952:5, 11). It noted that with a population of approximately 40,000, Lakeland was Polk County's principal city. The County grew a third of Florida's citrus crop, raised more cattle than any other Florida county, and produced 68 percent of the phosphate mined in the Country. Pebble phosphate was generally found in the County from 10 to 30 feet below the surface, requiring stripping of the land by giant shovels (**Photos 3-1** through **Photo 3-4**). This last item is most relevant to the history of LAL and its surroundings. Local resident Claude M. Harden, Jr. recalled that around 1940 or 1941, just prior to the Airport's construction, current Drane Field Road was dirt and the area was marked by "high and rugged" piles of spoil from phosphate mining (Cobb, Oldham and Harden n.d.) (**Photo 3-5**). Another contemporary account described the Airport site prior to construction differently (Lakeland Ledger 1945a):

> *Extensive installations, equipment, and buildings now on the [air] field present an interesting contrast to the barren expanse and swamps which confronted the original GI settlers here, who experienced hardships and privations sometimes not experienced by soldiers overseas. Mess was prepared and eaten out of doors, sanitary facilities were man-dug, and tents served as living quarters. All water was transported from Lakeland (quoted in* Cobb, Oldham and Harden *n.d.).*

A few pre-WWII residences likely built as farmhouses that stand west of the Airport, though, suggest that the area was not solely barren, swampy, or devoted to mining. It also supported agriculture. This would not be surprising, given the agricultural nature of Polk County and neighboring Hillsborough County to the west throughout much of the 20th century (Kerlin 2005).

Photo 3-1 (left): Polk County agricultural field, 1921[1]; **Photo 3-2** (right): view west over Davison Chemical Corporation phosphate mine with Drane Field Road and Edgewood Drive heading north, off the top of the aerial, toward the airport site, c1930-46.[2]

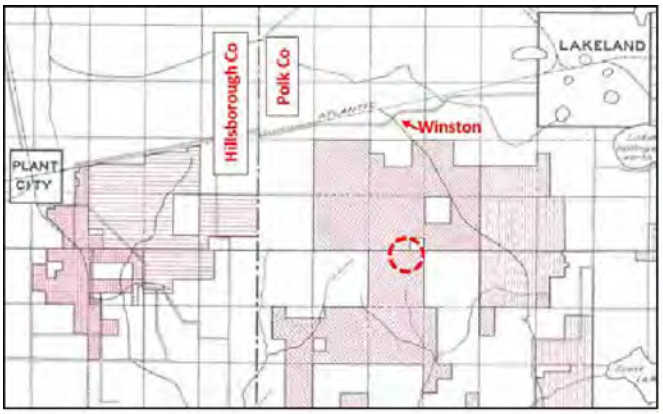


Photo 3-3 (left): 1940 US Geological Survey map with approximate airfield location circled, within property of International Minerals & Chemical Corporation;
Photo 3-4 (right): 1944 US Geological Survey Map with airfield at lower right.

Photo 3-5: Lakeland Army Air Base, late 1942 or early 1943 (source: McDill Field 1943:36).

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[1] Photo 3-1 accessed from https://ufdc.ufl.edu/UF00033854/00001/1x?search=polk+county).

[2] Photo 3-2 accessed from https://lakelandpubliclibrary.contentdm.oclc.org/digital/collection/p15809coll7/id/497/rec/25

In July 1941, the *Tampa Tribune* reported that Lakeland was in the midst of constructing a new airport five miles southwest of the city. The airport was initially called Lakeland Airport No. 2 to distinguish it from the city's Airport No. 1. (No. 1 was called Lodwick during WWII; its site is now occupied by Tiger Town, the Detroit Tigers spring training facility.) Lakeland Airport No. 2 was renamed Drane Field, for Rep. Herbert J. Drane, in May 1941 (*Tampa Times* 1941). Originally planned to cost about $380,000, the project was boosted in July to more than one million dollars. Lakeland was sponsoring the Federal Civil Aeronautics Act and Works Progress Administration (CAA-WPA) project. For the one-mile-square site and engineering services, the CAA-WPA provided two-thirds of the funding. The newspaper further noted that "Approximately a third of the cost of the project will be supplied by army engineers and the Federal bureau of public roads, giving rise to further speculation that the army plans to take over the development as a training field or as an air corps base."

In May 1942, with the Airport "being rushed to completion," Lakeland leased Drane Field to the War Department as a training center for U.S. Army fliers (*Tampa Tribune* 1942b; Air Force History Index at http://airforcehistoryindex.org/display.php?irisnum=174017&p=y). The Army renamed the facility Lakeland Army Air Field (*Tampa Tribune* 1947) (**Photo 3-6**).

Photo 3-6: Lakeland Army Air Field, 1943.[3]

When the field was built, current Drane Field Road was dirt (interview of Claude M. Harden, Jr. at Cobb, Oldham and Harden n.d.) and the area around it, as noted, was likely marked by a mix of piles of pebble-phosphate spoil, woods, swampy land, and citrus or other agricultural fields. An article in the May 1943 *Lakeland Ledger* described the many improvements to the field and its facilities:

[3] Photo 3-6 accessed from https://web.archive.org/web/20120608222530/http://www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm

Drane Field is one year old—and the post this morning, with its numerous buildings and extensive equipment, is a big contrast to the bare site which the first troops found when they arrived to begin clearing the woods and scratching redbugs. Long rows of identical army barracks have replaced the tents in which the first troops to come here were quartered. The paved streets, named for Army officers, are posted with neat signs identifying them as MacArthur Boulevard, Roosevelt Road, Voss Avenue, and similar designations. Speed limit signs are placed at regular intervals to control the heavy traffic and vigilant MPs check on violations.

A drive through the base shows further evidence of its growth—base headquarters, squadron areas, dayrooms, mess halls, hospital, officers' quarters, post exchange, theater, service club, chapel, and many other buildings. The base hospital is now fully equipped to care for the men at the field. It even has a maternity ward for wives of men stationed here and several births have been reported in the past few months. When the hospital was first set up its grounds were as barren as the rest of the field. Landscaping is underway, and grass, flowers, and shrubs have been planted to beautify the area. The base headquarters area is also being improved and landscaping is planned for other parts of the base later (quoted in Cobb, Oldham and Harden n.d.).

On November 2, 1945—two months after WWII ended—the War Department deactivated the training base (*Miami News* 1945). The *Lakeland Ledger* (1945a) summarized the field's activities during the war:

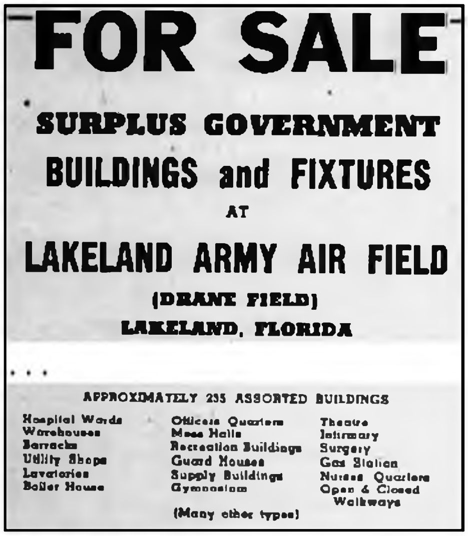
Of the 3,880 acres of land which comprise the reservation area, only 475 acres were purchased outright by the government. The remaining acres are leased from private individuals and firms. The cantonment area was constructed to accommodate 3,196 enlisted men and 958 officers, but housing and messing facilities were exhausted on several occasions by a sudden increase of personnel.

Air traffic at Lakeland Army Air Field has been fairly heavy, the average daily cycle of operations having been in excess of 100. Combat aircraft which have trained here have included B-17s, B-24s, B-26s, P-51s, P-40s, and A-20s, varying in weight from 8,500 pounds to 50,000 pounds. More than 15 groups ranging in type from heavy bombardment to specialized commando units and service groups of the old and new type have trained at Lakeland in the past 34 months.

Following the closure, Lakeland began to shift operations from its other city airfield—Lodwick Field on Lake Parker—to Drane. With its 5,000-foot long runways, Drane was more desirable than Lodwick, which had runways only 3,500 feet in length (*Lakeland Ledger* 1945b). In 1946, the City began flying locally grown strawberries from Drane to Detroit. In 1947, National Air Lines shifted its limited operations from Lodwick to Drane (*Tampa Tribune* 1946 and 1947).

In April 1947, the City recovered the title to Drane Field. It received from the War Assets Administration (WAA) not only the original 640-acre landing area, but an additional 320 acres of the training field, which included 13 buildings and many pieces of maintenance equipment (*Tampa Bay Times* 1947). The WAA retained approximately 235 buildings, which it put up for sale in May. The sale notice stated that the buildings and fixtures were "for removal and off-site use only." Among the buildings were barracks, warehouses, mess halls, hospital wards, and officers and nurses quarters. Most of the barracks, at least, were wooden (interview of Claude M. Harden, Jr. at Cobb, Oldham and Harden n.d.). In spite of fresh strawberry transportation and some National flights, from the end of the war until the mid-1950s, Drane Field was only partially in use. A 1953 aerial photograph depicts it with no evident planes and its WWII configuration intact (**Photos 3-7** and **3-8**).

In 1959-60 Drane Field added a new, one-story, Modernist terminal building and two new hangars (*Tampa Tribune* 1959a) (**Photos 3-9** through **3-11**). The cost of the new facilities, plus planned improved lighting and repair and extension of the runways, was to be covered by sale of the former Lodwick Airport property. Airport zoning regulations were also approved in 1959, "but not before residents in that section waged a successful fight to get the regulations relaxed to a minimum" (*Tampa Tribune* 1959b).



FOR SALE

SURPLUS GOVERNMENT

BUILDINGS and FIXTURES

AT

LAKELAND ARMY AIR FIELD

(DRANE FIELD)

LAKELAND, FLORIDA

. . .

APPROXIMATELY 235 ASSORTED BUILDINGS

Hospital Wards	Officers Quarters	Theatre
Warehouses	Mess Halls	Infirmary
Barracks	Recreation Buildings	Surgery
Utility Shops	Guard Houses	Gas Station
Lavatories	Supply Buildings	Nurses Quarters
Boiler House	Gymnasium	Open & Closed Walkways

(Many other types)

Photo 3-7 (left): Portions of WAA sales notice for Drane Field (Tampa Bay Times 1947); **Photo 3-8** (right): Aerial photo of field, 1953.[4]

Photo 3-9: Drane Field with municipal terminal and two hangars, c1960.[5]

Photo 3-10 (left): Lakeland Municipal Airport terminal under construction, December 1959 (source: Tampa Tribune 1959a); **Photo 3-11** (right): Terminal in 1967.[6]

[4] Photo 3-8 accessed from https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm

[5] Photo 3-9 accessed from *https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/43/rec/48*

[6] Photo 3-11 accessed from https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/66/rec/1.

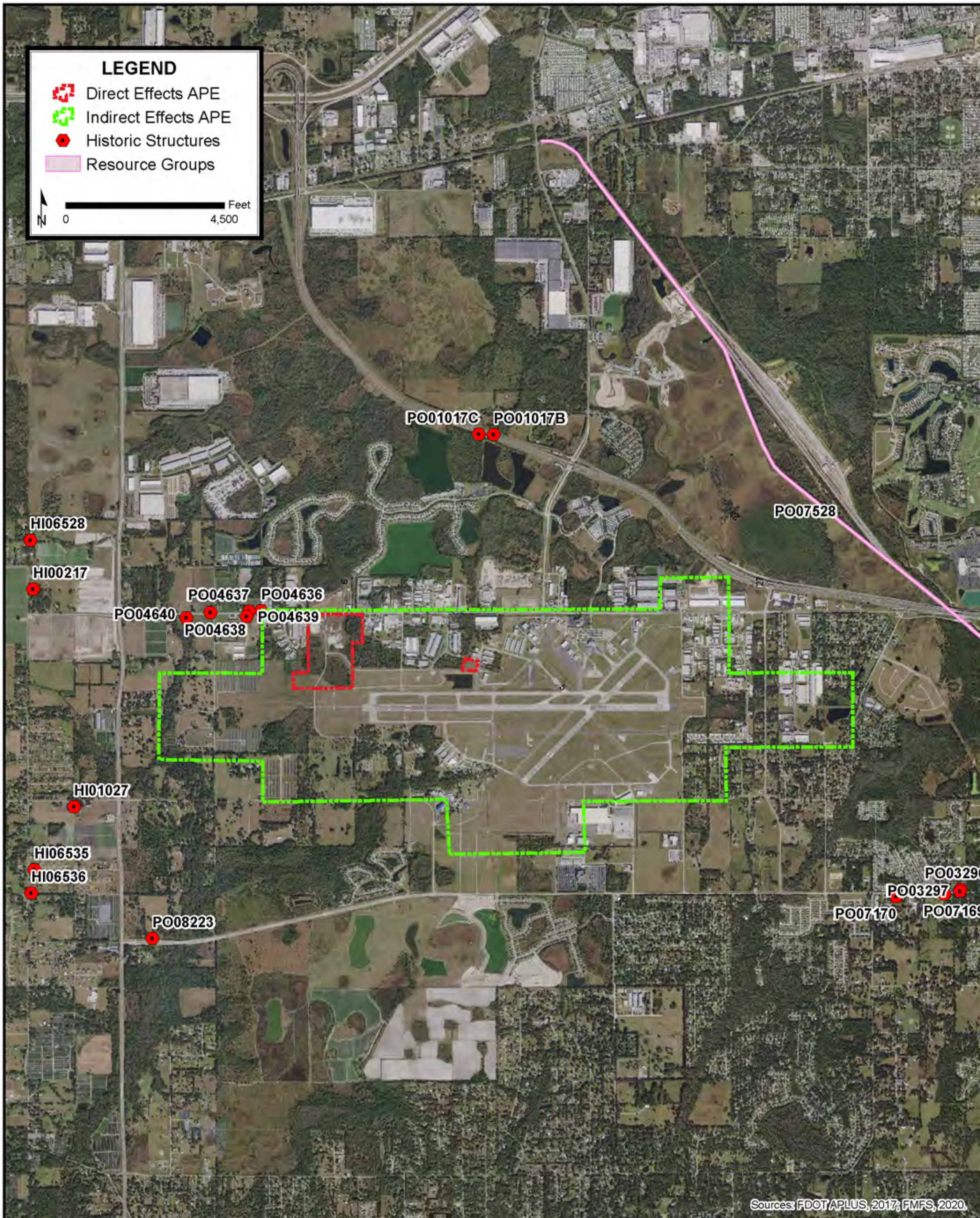
The Airport extended its east-west runway from 5,000 to 6,000 feet in 1967-68. By 1997 this runway had been extended further to 8,500 feet (*Tampa Tribune* 1967a, 1968 and 1997). In 2002 the Airport replaced the first terminal with a much larger two-story building at a cost of 6.7 million dollars (*Tampa Tribune* 2000b and 2002). This remains its current terminal.

The Airport's name changed with its buildings and runways. It reverted to Drane Field after the U.S. Army relinquished the field in the late 1940s. By January 1961, it was renamed the Lakeland Municipal Airport (*Tampa Tribune* 1961). By the early 1980s, it was the Lakeland Regional Airport, which in 1991 the City renamed the Lakeland Linder Regional Airport (*Tampa Tribune* 1961 and 1991). In 2017, the Airport took on its current name, Lakeland Linder International Airport (*Lakeland Ledger* 2017b).

3.6 LITERATURE SEARCH AND FLORIDA MASTER SITE FILE REVIEW

An archaeological and historical literature and background information search pertinent to the APEs was conducted to determine the types, chronology, and locations of previously recorded cultural resources and studies within the APEs. This included a search of the FMSF, NHRP nomination forms, and cultural resource management reports on file at the FDHR in Tallahassee.

Examination of the FMSF indicated that no National Register-listed sites are present within the Direct or Indirect Effects APEs or within a one-mile (0.8 kilometers [km]) radius of the APEs. The FMSF indicated that there are 17 historic structures, six archaeological sites, 26 cultural resource studies, and one resource group present within one mile of the Indirect Effects APE. These resources and studies are depicted in **Figure 3-1** and **Appendix B**.



Path: C:\Users\tia.norman\Desktop\LAL P2 EA\GIS\mxd\Cultural\REDACTED ARCH SITES_Figure 3-1 Previously Recorded Cultural Resources_rev3.mxd, Date Saved: 2/1/2021 2:06:27 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

PREVIOUSLY RECORDED CULTURAL RESOURCES

FIGURE 3-1

4. RESEARCH DESIGN AND METHODS

The objective of the Phase IB archaeological survey of the current Direct Effects APE was to identify cultural resources, if present, and assess them, if possible, for National Register of Historic Places (NRHP) significance.

4.1 RESEARCH

Prior to the start of the fieldwork, background research was conducted at a variety of institutions to characterize the general history of occupation and land use of the survey areas to identify previously documented archaeological sites and historic structures, and the potential locations of historic structures and occupations. Resources accessed included:

- FMSF,
- General Land Office Records of the Bureau of Land Management (http://www.glorecords.blm.gov/default.aspx),
- Land Boundary Information System of the Florida Department of Environmental Protection (http://www.labins.org/),
- Aerial Photography: Florida of the University of Florida Digital Collections at the George A. Smathers Libraries (http://ufdc.ufl.edu/aerials),
- Map and Imagery Collections of the University of Florida Digital Collections at the George A. Smathers Libraries (http://ufdcweb1.uflib.ufl.edu/maps), and
- USGS Historical Topographic Map Explorer (http://historicalmaps.arcgis.com/usgs/).

4.2 ARCHAEOLOGICAL FIELD METHODS

The property was investigated using a combination of visual surface inspection, photo documentation of existing field conditions, and subsurface shovel testing. The majority of the APE contained large portions of heavily disturbed soils and was subjected to visual surface inspection. Shovel testing was completed in areas where potential for intact deposits existed, and followed the proposed archaeological probability model. The archaeological probability model was adjusted based on field conditions.

4.3 ARCHAEOLOGICAL PROBABILITY MODEL

Prior to the field survey, a probability model was developed to aid in determining the shovel testing intensity to be applied within a particular portion of the Airport property, either at 25-meter, 50-meter, or 100-meter intervals. The standard testing model in Florida includes three probability levels (High, Medium, Low) that were primarily based on soils, proximity to water, and soil integrity. The Phase IB archaeological survey effort was comprised of linear transect survey involving systematic shovel testing along survey transects spaced a specified distance apart (as defined for each specific probability level). For the purposes of this project, there were no high probability levels based on the desktop review. Four moderate probability levels were identified (see **Figure 4-1**) and were assessed through the excavation of STPs at 50-meter intervals. Low probability levels were assessed through shovel testing transects spaced at 100-meter intervals (**Figure 4-1**). All mapped soils on the property were considered poorly-drained. The primary water source adjacent or within the Direct Effects APE consisted of hardwood forest wetland systems.

As areas of severe surface disturbances and construction along with standing water were encountered in the Direct Effects APE, the shovel testing intervals were increased to over 100 meters.

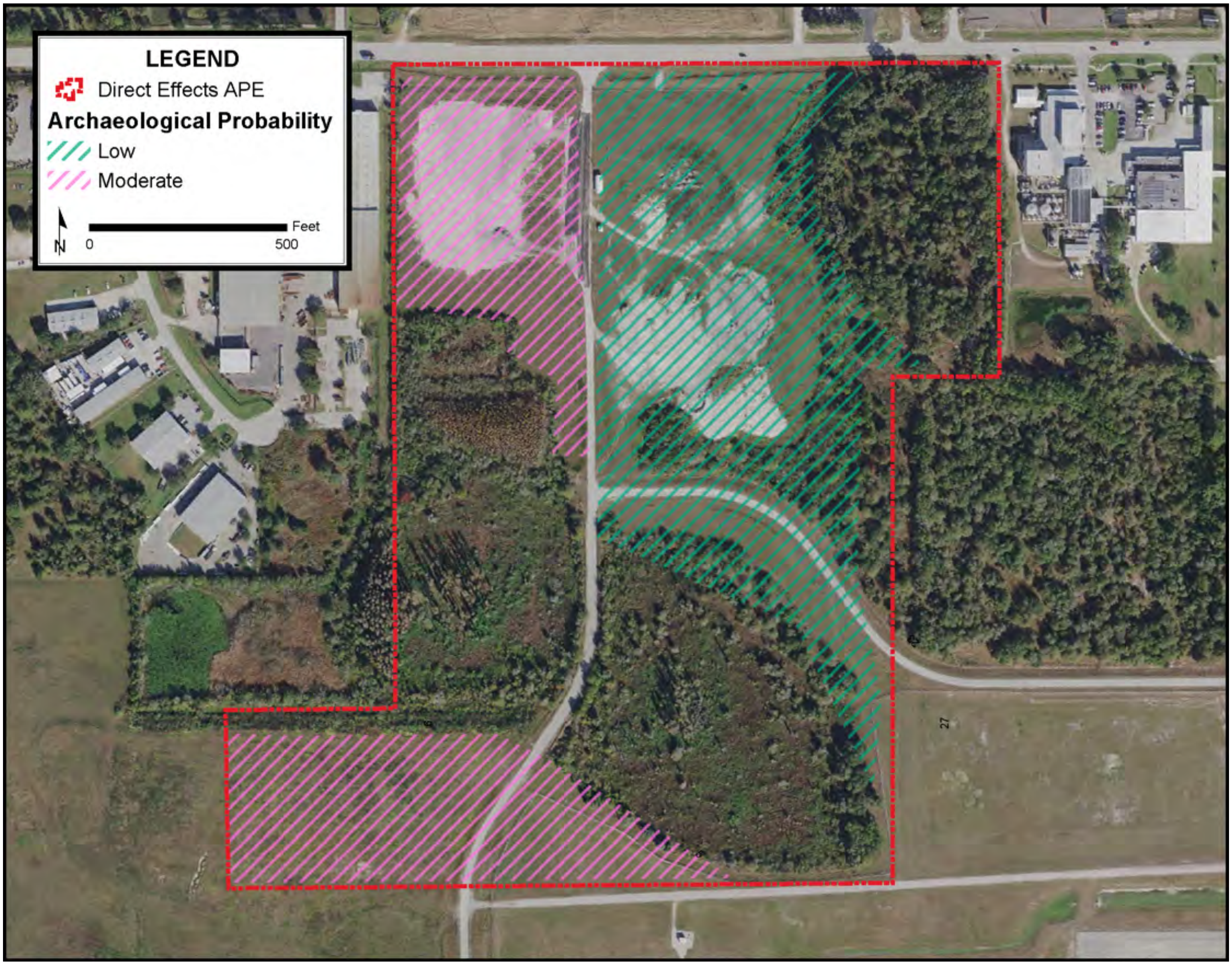
4.4 SHOVEL TESTING

STPs were 50 centimeters (cm) in diameter and excavated to subsoil or 100 cm below ground surface (bgs). STPs were excavated at 25-meter intervals for high probability areas, 50-meter intervals for moderate probability areas, and 100-meter intervals for low probability areas. STPs were excavated in 10-cm arbitrary levels, and soils were screened through a 0.635-millimeter (0.25-inch) mesh. When artifacts were encountered, the base of the STP excavation was extended to at least 20 cm beneath the last occurrence of cultural material. On thin upland and/or erosional landforms where compressed stratigraphy was encountered, excavation progressed at shallower intervals and/or followed the natural stratigraphic layers.

STP data were recorded on standardized forms, including information on depth of each individual STP, the number of artifacts, provenience, and soil conditions. Munsell soil charts were used to describe soil color. Standard soils nomenclature was used to describe soil textures. All of the STPs were backfilled. Flagging tape was used for marking STPs.

5. SURVEY AREA RESULTS

The following section presents the results within the Direct and Indirect APEs. There are two distinct parcels of land under study, western (i.e., air cargo facility) and eastern (i.e., fuel farm). **Section 5.1** describes the archaeology results and **Section 5.2** describes the historical architecture results.



Path C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 4-1 Archeo Prob Model_rev1.mxd, Date Saved: 9/23/2020 2:34:17 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

ARCHAEOLOGICAL PROBABILITY MODEL

FIGURE 4-1

5.1 ARCHAEOLOGICAL RESULTS

Large portions of the Direct Effects APE were subjected to a visual reconnaissance survey where significant disturbances were observed (**Photo 5-1**). There were large piles of construction rubble and material from grading present across the site. Subsurface testing was conducted in most areas to confirm the observable damage to the ground surface with the exception of inaccessible or newly paved areas. A total of 12 STPs were excavated in the Direct Effects APE (**Figure 5-1**). The only areas with relatively undisturbed soils are the wetlands (although construction materials were present in the A horizon in the wetland areas as well), and the majority of the shovel testing was attempted along the wetland edges. The following is a discussion of the western and eastern parcels.

Photo 5-1: Construction activities south of Drane Field Road, facing east.

5.1.1 WESTERN PARCEL

The western parcel measures approximately 67.2 acres (27.2 hectares) and was mostly an active construction site by the time of this study. The western parcel is partially bisected east-to-west by Air Park Drive and bisected north-to-south by Kelvin Howard Road. Both of these roads bisect in the center of the property. There are wetlands in the central and southern portion of the APE as well as the northeastern quadrant. There is recently completed air cargo facility immediately to the southeast of the APE, while the northern edge is bounded by Drane Field Road and the western edge is bounded by private property and wetlands. To the south is an unpaved access road.

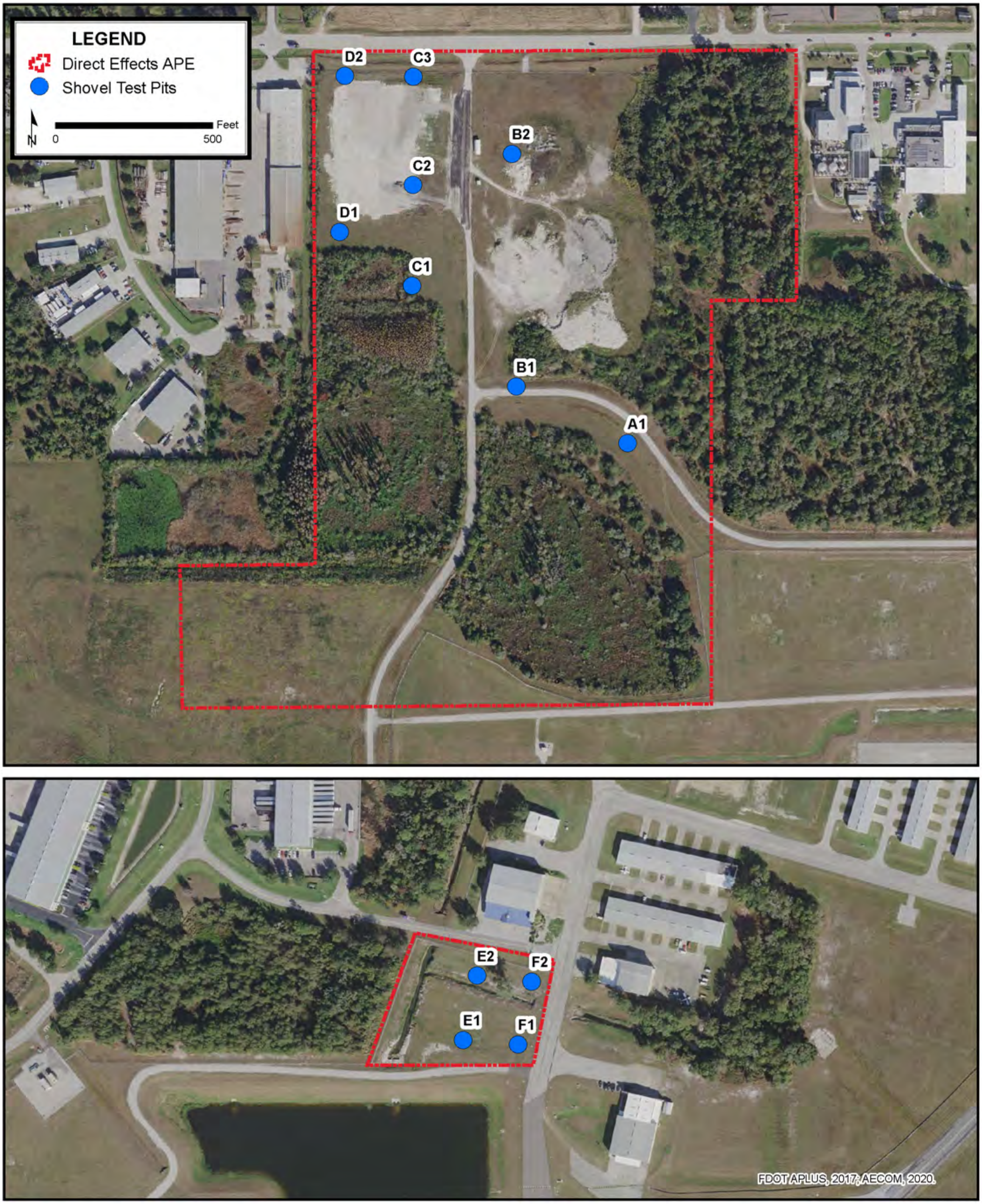
Shovel tests were planned but not excavated south of the wetland on the southern portion of the property on either side of Kelvin Howard Road. This area was paved to the east of Kelvin Howard Road and there was standing water on the western side of the road (**Photo 5-2**).

Photo 5-2: Paved area east of Kelvin Howard Road, facing west.

The northern portion of the APE closest to Drane Field Road was recently used as a staging area for the Phase I construction of the air cargo facility. Grading and mixing of gravel and clay had occurred over much of the prepared surfaces and there were large debris piles present (**Photo 5-3**).

Photo 5-3: Construction activities in the western parcel, Air Cargo warehouse visible in background, facing southeast.

Total of eight shovel tests were excavated in the western parcel. There was no observable natural soil stratigraphy observed in the western parcel as the construction activities have greatly impacted the area. A typical soil profile is exemplified in STP B1. This shovel test encountered disturbed soils. Stratum I was recorded from 0-42 cm bgs and consisted of very dark, grayish-brown, coarse sand containing concrete and asphalt. A concrete impasse was reached at 42 cm bgs. No historic cultural materials were recovered from this shovel test.



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

FIELD TESTING MAP

FIGURE 5-1

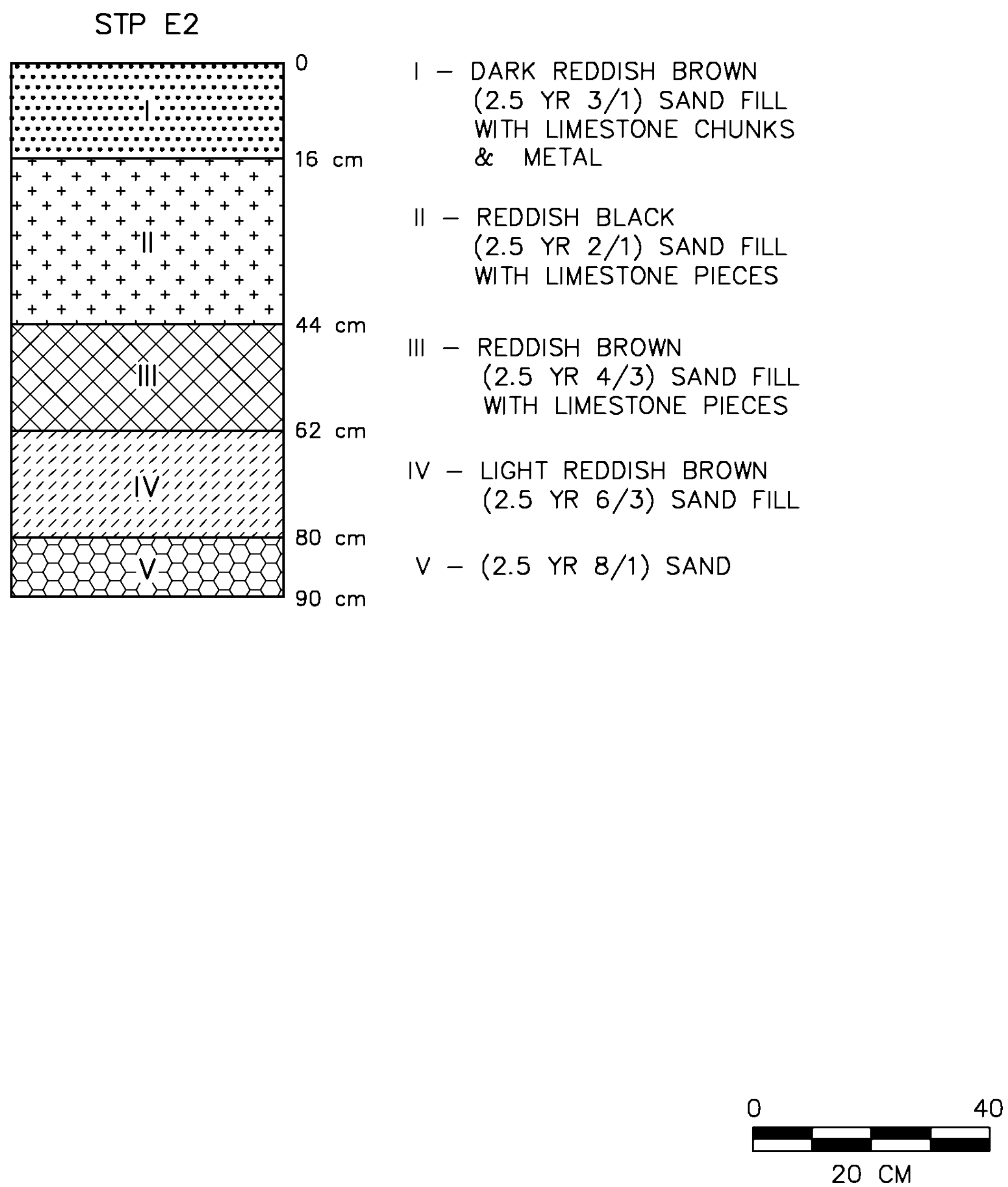
Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 5-1 Field Testing Map_rev3.mxd, Date Saved: 9/23/2020 2:46:03 PM

5.1.2 EASTERN PARCEL

The eastern parcel measures approximately 2.8 acres (1.1 hectares). The parcel is paralleled on the north side by Aero Place, the eastern and southern sides by unnamed airport access roads, and on the western side by dense hardwood wetlands. This parcel is bisected by two drainage ditches, one north-to-south and one east-to-west. The western edge of the property (west of the ditch) was comprised of rip-rap and was not testable. The primary vegetation in this area was manicured lawn (**Photo 5-4**).

Photo 5-4: Eastern Parcel setting, facing northwest

A total of four shovel tests were excavated in this location. All tests encountered disturbed soils, likely from the construction of the adjacent ditches, access roads, and the large man-made pond to the south (**Photo 5-5**). STP E2 is representative of the disturbed stratigraphy in this area (**Figure 5-2, Photo 5-6**). Stratum I consists of dark, reddish-brown (2.5YR 3/1) sand fill with limestone and metal from 0-16 cm bgs. Stratum II is characterized by reddish-black (2.5YR 2/1) sand fill with limestone from 16-44 cm bgs. Stratum III displayed reddish-brown (2.5YR 4/3) sand fill with limestone from 44-62 cm bgs. Stratum IV consists of light reddish brown (2.5YR 6/3) sand fill from 62-80 cm bgs. Stratum V contained white (2.5YR 8/1) sand from 80-90 cm bgs.



C:\Civil 3D Projects\Amazon\Draft EA Figures\FIG 5-2.dwg 08/26/2020 13:25

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

REPRESENTATIVE SHOVEL TEST SOIL PROFILE

FIGURE 5-2

Photo 5-5: Retention pond south of Eastern Parcel, facing southwest


Photo 5-6: STP E2 Profile, facing north.

5.2 ARCHITECTURAL HISTORY RESULTS

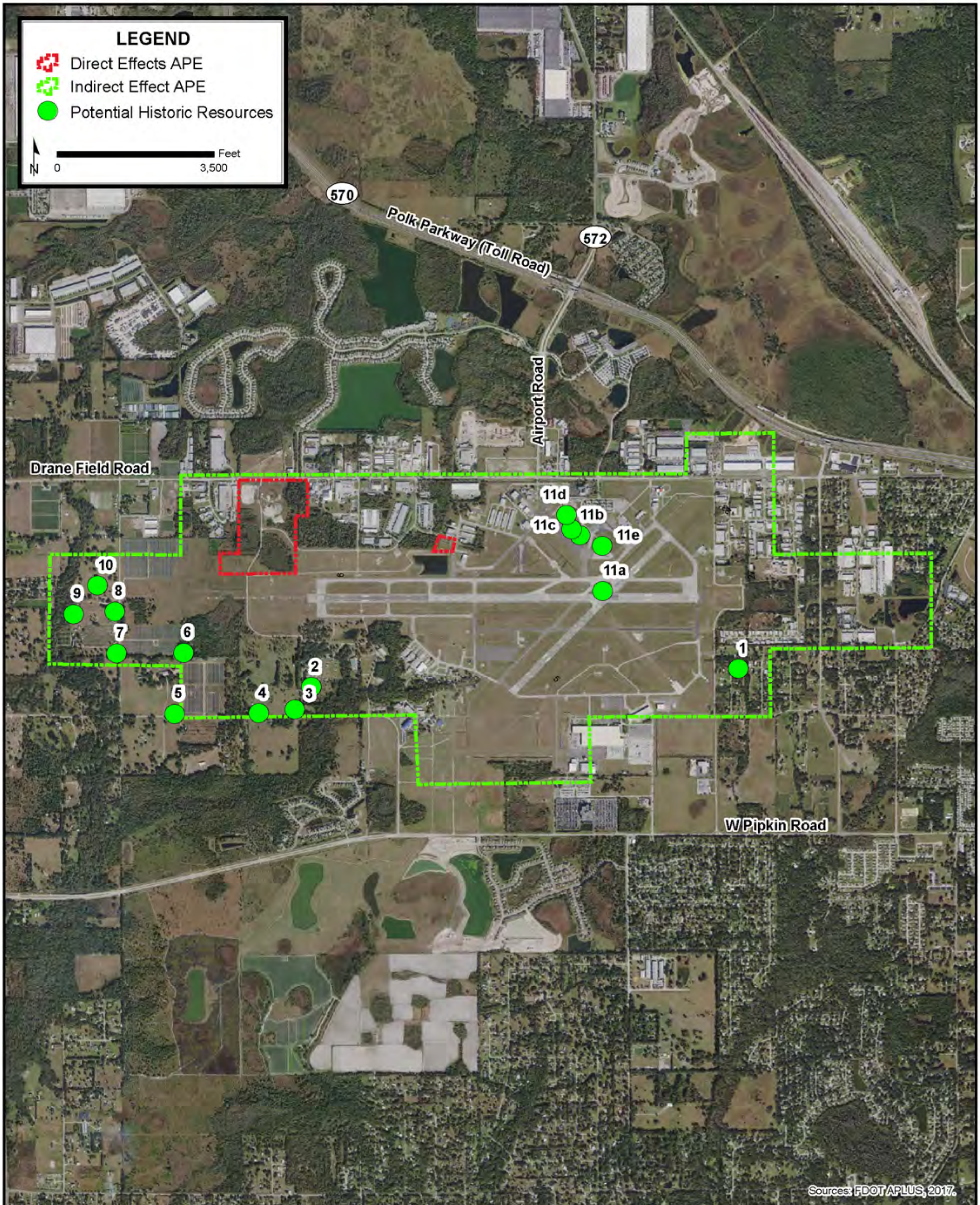
The architectural historic survey was performed on August 4 and 12, 2020. AECOM senior architectural historian Marvin Brown located, researched, and assessed the resources inventoried below, all of which were, or may have been, built 50 or more years ago. AECOM environmental planner Tia Norman took the photographs. Due to COVID-19 pandemic and access concerns and difficulties, and the insistence of several property owners and/or occupants prohibiting photographs to be taken of their property, the photographs accompanying the inventory have been supplemented with Google and Bing Maps, aerials, and online images from various sources. Ten houses located within the Indirect Effects APE, or upon parcels partially located within the APE, were inventoried and assessed for National Register (NR) eligibility. These are numbered by Map ID #1 through #10. An eleventh resource – LAL (former Lakeland Army Air Base/Drane Field/Lakeland Municipal Airport) – has been numbered #11a through #11e. The LAL airfield is identified as #11a. Four buildings on the airfield property that date from between about 1959 and 1971 are identified as #11b through #11e (**Figure 5-3**). Completed FMSF Historical Structure Forms for the resources described below are provided in **Appendix D**.

Robberson House – 4514 Windee Avenue (Map ID #1)

Tax records assign the house at 4514 Windee Avenue with a 1930 construction date. Google Maps photographs of it from 2011, which predate major alterations, suggest that it may well have been built in the 1930s. Currently, though, the house is almost unrecognizable as a dwelling from that time, as only its basic form remains intact. The house's owner, Kenneth L. Robberson, acquired it via a quitclaim deed from the estate of his brother, Jerry W. Robberson, in 2004 (Polk County Deed Book 5471/Page 0378). Jerry Robberson (1944-2003) was not its original owner, as the house predates his birth and he did not come to Lakeland until 1956 (*Lakeland Ledger* 2003).

In 2011, according to Google Maps photos taken that year, the house had a frame, one-story, gable-front, central block (**Photos 5-7** through **5-12**). This was crossed at the front (west) by a partially enclosed gable-roofed porch and at the rear (east) by a perpendicular, gable-end, frame block. The house had double-hung sash windows, a seam-metal roof, and aluminum siding. Since 2011, the porch has been removed and replaced by an open porch; bays have been covered or shifted and windows and doors have been replaced; new artificial siding has been added; and a gable-front rather than gable-end roof has been placed atop the rear ell. The house continues to stand on concrete blocks. The house's many significant alterations suggest that after the 2011 photographs were taken, it was essentially stripped down to its studs and rebuilt, resulting in its current appearance. Bing Maps photographs from 2014 depict the house as it is at present, dating its alterations to between 2011 and 2014.

The Robberson House is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. The house does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources. Additionally, due to its substantial alterations, the house is believed to have lost its integrity of design, materials, workmanship, feeling, and association. Its setting remains largely intact and it presumably stands at its original location.



Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Cultural\Figure 5-3 Architectural Hist Resources Locator_rev2.mxd, Date Saved: 9/23/2020 2:48:02 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVLEOPMENT ENVIRONMENTAL ASSESSMENT

POTENTIAL HISTORIC RESOURCES LOCATION MAP

FIGURE 5-3

Photo 5-7 (left): Robberson House in 2011, north side and west front elevations (source: https://www.google.com/maps); **Photo 5-8** (right): Robberson House in 2011, west front and south side elevations (source: https://www.google.com/maps).

Photo 5-9 (left): Robberson House in 2020, north side and west front elevations; **Photo 5-10** (right): Robberson House in 2020, west front and south side elevations.

Photo 5-11 (left): Robberson House in 2020, west front and south side elevations (source: https://www.bing.com/maps/); **Photo 5-12** (right): same elevations in 2014 (source: https://www.bing.com/maps/).

Aaron E. and Maude Morgan House – 4510 Aaron Morgan Road (Map ID #2)

Aaron Edward Morgan (1893-1974) and Maude Miranda Morgan (1897-1971) are likely the original owners of this house, which tax records assign a construction date of 1924. By 1917, (U.S. Selective Service System), when Aaron registered for the draft, they were already married and had a young child. Aaron was the son of Aaron Joseph Morgan, a citrus grower, cattleman, and state representative (*Tampa Times* 1917). In 1920, according to census records, the Morgans were living in the Medulla area – where the house is located – as was Aaron's father. They lived in the same area in 1930 and 1940. All three censuses, as well as Aaron's draft registration, identify him as a farmer (U.S. Bureau of the Census 1920, 1930, and 1940). His obituary noted that he was a lifelong Polk County resident who also drove a school bus (*Tampa Tribune* 1974).

In 1976, with both Morgans deceased, the Aaron E. Morgan Estate transferred this property to Ruth Morgan Bell (Polk County Deed Book 1678/Page 1221). Ruth was the Morgans' youngest child. She and her husband, Charles W. Bell, continue to own it (Polk County Deed Book 9864/Page 2248 (2016)).

The marital status and ages of the Morgans and the farmhouse's form and Craftsman-style features suggest that it was erected around 1924, the date tax records assign it (**Photos 5-13** through **5-17**). The frame house is one-story tall. Its west-facing front block has an asphalt-shingled gable-end roof and rests on brick piers. A door is centered at the front elevation, flanked by paired, double-hung, sash windows. The Craftsman-style four-vertical-light-over-one-light sash suggests the windows are original. The Craftsman-style glass-paned front door also appears to be original. Plain surrounds frame the door and windows. A hipped-roof porch supported by plain wooden posts and underpinned by exposed rafter tails – yet another Craftsman feature – extends across the facade's full length. Exposed rafter tails also mark the wide overhanging eaves of the block's roof and those of its small ventilated dormer, which is centered over the entry. A brick exterior-end chimney extends through the wide overhang on the block's south side elevation. The block is clad in original German siding that terminates at plain corner boards.

A gable-roofed ell extending from the northern portion of the block's rear elevation gives the house an L-shaped footprint. Within the legs of the ell, a formerly open porch has been enclosed. A small later addition extends to the rear of the ell and porch.

To the house's rear (east), thick round poles support the gabled sheet-metal roof of an open pole barn that is less than 50 years old (**Photos 5-18** through **5-22**). Shaded by the roof is an earlier building that appears to be largely built of slender, round, saddle-notched, unchinked logs. (Note: due to COVID-19 concerns and no-trespassing signs, access to the property and its resources was limited.) Log buildings were erected in Polk and other northern and central Florida counties into the late nineteenth century (Florida Association of the American Institute of Architecture 2017: 4, 23, 108). The extant English Family Log Cabin, now located in Homeland Heritage Park, was moved to Homeland from elsewhere in Polk County. Constructed of round saddle-notched logs, it dates from about 1890 (Hacking, Forbes, and Jones 2006). Whether this building was erected in the late nineteenth century could not be determined.)

The house and barn stand in the northwest corner of an approximately 16-acre rectangular parcel that fronts on Aaron Morgan Road. To their east and south is an inactive citrus grove that encompasses about half of the parcel. The eastern half of the parcel is wooded. The land to the parcel's east, south, and west remains largely rural, marked by open fields, woodland, and scattered houses. Only to the immediate north, where a trailer park was established in the early 2000s, has modern development encroached on the setting.

The Aaron E. and Maude Morgan House is recommended as eligible for NR listing under Criterion C for its architecture. It is a good, intact representative of an early-twentieth-century Polk County farmhouse. It retains its original form, German siding, plain surrounds, front porch, and corner boards, as well as its original Craftsman-style sash, doors, and overhanging eaves with exposed rafter tails. The only notable alterations appear to be the enclosure of a rear porch, which is clad in matching German siding, and the addition of a small room to the rear of the ell. Further, the house appears to stand on its original site. The Morgan House is therefore believed to retain its integrity of location, design, setting, materials, workmanship and, by extension, feeling and association. The house is not known to have any association with significant historic events or persons and is unlikely to yield important historical information not available from other sources. It is therefore recommended as not eligible for NR listing under NR Criteria A, B, or D.

The Morgan House's NR boundaries are recommended as the boundaries of its approximately 16-acre parcel (Polk County parcel 232905000000042030) on its north, east, and south (**Figure 5-4**). On its west, where the parcel reaches toward Aaron Morgan Road, its boundary is recommended as ending on the east side of the county-maintained shallow ditch and road right-of-way. (It is not clear from tax maps whether the parcel already terminates there.) Contained within this boundary are the house and barn, both of which are contributing buildings, the former citrus grove, and woodland, all of which were historically associated with the property.

Photo 5-13 (left): Aaron E. and Maude Morgan House in 2020, west front; **Photo 5-14** (right): Aaron E. and Maude Morgan House in 2020, south side elevations.

Photo 5-15: Aaron E. and Maude Morgan House, west front and south side elevations showing German siding and Craftsman-style windows, door, and exposed rafter tails, 2020.

Photo 5-16 (left): Aaron E. and Maude Morgan House, south side elevation at rear (north end) of house with front (west) elevation of barn at far right, 2020; **Photo 5-17** (right): Aaron E. and Maude Morgan House aerial depicting west front and south side elevations and roof lines, no date (source: https://www.google.com/maps).

Photo 5-18 (left): Aaron E. and Maude Morgan House, aerial depicting east rear and north side elevations, no date (source: https://www.google.com/maps); **Photo 5-19** (right): Aaron E. and Maude Morgan House, west front and south side elevations of barn to rear of house, 2020.

Photo 5-20: Aaron E. and Maude Morgan House, west front and south side elevations of pole barn and log building within it, 2020.

Photo 5-21 (left) and **Photo 5-22** (right): English Family Log Cabin, Homeland Heritage Park in Polk County, built c1890 (source: Polk County Government 2019).

Figure 5-4 Aaron E. and Maude Morgan House: Recommended NRHP Boundaries (Polk County parcel 232905000000042030)

Morgan Family House 1 – 4405 Medulla Road (Map ID #3)

This house stands at the intersection of Medulla and Aaron Morgan roads, in the southeastern corner of a 40-acre tract (Polk County parcel 232905000000044010) once owned by the estate of Aaron Joseph Morgan (1863-1941) and his wife, Dollie A. Morgan (1864-1957). In 1943, in association with the construction of Lakeland Army Air Base, A. Joseph Morgan's estate was awarded more than $15,000 as compensation for the taking of "homestead property of 160 acres." An additional 200 acres of the estate was valued at $8,500 (*Tampa Tribune* 1943). This parcel, not taken for the base, subsequently came into the hands of one of the Morgans' sons, Harley G. Morgan (1898-1977), and his wife, Thelma Futch Morgan (1910-2000). In 1976 they conveyed the land, which includes more than one house, to their daughter, Betty L. Howard, who still owns it (Polk County Deed Book 2883/Page 1542; *Tampa Tribune* 2000a). It is unlikely that the older Morgans lived in this small house, which carries a tax date of 1920. A. Joseph Morgan's obituary described him as a prominent two-term state legislator (1919 and 1921) who was a "successful citrus grower and cattleman" (*Tampa Tribune* 1941a). Harley G. Morgan, also a cattleman (*Tampa Bay Times* 1966), and his wife may have lived on the property; if so, it is not known which of the two houses they occupied. This house's modest size and form suggest it was a tenant house.

Photographs taken in 2011, before the house underwent a major renovation, depict a dwelling that may indeed have been built around 1920, the assigned tax date (**Photos 5-23** through **5-29**). In 2011 the small, gable-front, frame house – about 16 feet across and 24 feet deep according to tax records – was sided in heavily weathered vertical boards without battens and topped by a metal roof. Its two-bay-wide south-facing front facade was shaded by a plainly finished porch covered by a metal shed porch. To its rear (north) extended an ell faced with T111-type siding that had a double-pitched shed roof. Tax records identify much of the ell as a formerly open porch. Between 2011 and 2019, the old front porch was replaced by one with square posts and a balustrade. The front door was also replaced. A new metal roof was set atop the house and it received new artificial siding. Its two-over-two, double-hung, sash windows were cleaned or replaced in kind; the plain window surrounds were cleaned and painted. The rear ell was also re-sided.

Due to its many post-2011 alterations, the house is believed to have lost its integrity of design, materials, workmanship and, accordingly, feeling and association. Its setting appears to be largely intact and it likely continues to stand on the location upon which it was built, but overall it has lost its integrity. Additionally, the house is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. The house does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. Due to its loss of integrity and lack of significance, the house is recommended as not eligible for NR listing.


Photo 5-23 (left): Morgan Family House 1 south front elevation, c2014 (source: https://www.bing.com/maps/); **Photo 5-24** (right): Morgan Family House 1 west side and south front elevations in 2019 (source: https://www.google.com/maps).


Photo 5-25 (left): Morgan Family House 1 south front and east side elevations in 2011 (source: https://www.google.com/maps); **Photo 5-26** (right): Morgan Family House 1 in 2019 (source: https://www.google.com/maps).


Photo 5-27 (left): Morgan Family House 1 east side elevation in 2011 (source: https://www.google.com/maps); **Photo 5-28** (right): Morgan Family House 1 east side elevation in 2020 (source: https://www.google.com/maps).

Photo 5-29: Morgan Family House 1: east side and north rear elevations, 2011 (source: https://www.google.com/maps).

Morgan Family House 2 – 4415 Medulla Road (Map ID #4)

Morgan Family House 2 stands on the same 40-acre tract (Polk County parcel 232905000000044010) as Morgan Family House 1 does. It is located, however, near the southwest corner of the parcel facing Medulla Road. The known history of the two houses is nearly identical. The 40-acre parcel was once owned by the estate of Aaron Joseph Morgan (1863-1941) and his wife, Dollie A. Morgan (1864-1957). In 1943, in association with the construction of Lakeland Army Air Base, A. Joseph Morgan's estate was awarded more than $15,000 as compensation for the taking of "homestead property of 160 acres." An additional 200 acres of the estate was valued at $8,500 (*Tampa Tribune* 1943). This parcel, not taken for the base, subsequently came into the hands of one of the Morgans' sons, Harley G. Morgan (1898-1977), and his wife, Thelma Futch Morgan (1910-2000). It is unlikely that the older Morgans lived in this house, which carries a tax date of 1935. A. Joseph Morgan's obituary described him as a prominent two-term state legislator (1919 and 1921) who was a "successful citrus grower and cattleman" (*Tampa Tribune* 1941a). The house was more likely first occupied by Harley Morgan, who was also a cattleman (*Tampa Bay Times* 1966), and his wife.

In 1920 (U.S. Bureau of the Census), Harley Morgan was unmarried and still living with his parents. In that census he listed his occupation as a laborer on the "home farm." By 1930, he was married to Thelma and farming his own land. He was 32, she was 20, and their one child, Darwin, was two. In the order that the census was taken, four Morgan families lived one after the other: the elder Morgans were visited first, then Harley and Thelma, then brother and sister-in-law Aaron E. and Maude Morgan, and then another brother and his wife, G. Bascom and Eva Morgan.

In 1976, Harley and Thelma Morgan conveyed the 40 acres to their daughter, Betty L. Howard (Polk County Deed Book 2883/Page 1542; *Tampa Tribune* 2000a). She continues to own the property and occupies this house. On a field visit – due to COVID-19 and privacy concerns – it was forcefully requested that no photos of the house or outbuildings be taken from the property or the public right-of-way. One image was taken while driving away, but the other images below were taken by Google Earth and Maps in November 2019. Compared to views of the property driving by, the house appears unchanged since they were taken.

Tax records place the house's construction in 1935 (**Photos 5-30** through **5-41**). Its dimensions and L-plan footprint are nearly identical (according to tax records) to those of the Aaron Morgan House to the east, which has a tax date of 1924. Both houses are one-story tall, of frame construction, German sided, and edged with cornerboards. This house lacks Craftsman-style details, though. It does not have exposed rafter tails at the roof of its main block or porch and its windows appear to be one-over-one. This suggests the house may well have been built in the 1930s. A seam-metal hipped roof tops the main block and the full-facade porch to its front (south). The porch has plain square posts and a heavy infill of modern decorative metal grillwork. The windows on the east and west side elevations are covered by the same grillwork. An narrow, exterior-end, brick chimney stack rises along the west side elevation of the main block, which is extended to the rear by a one-story gable-end ell. The L-shaped porch that extended along the rear of main block and ell has been largely enclosed.

The house has seven associated outbuildings. To its east are two modern, taupe-colored, shed-roofed sheds that do not appear on Bing Maps aerials taken in December 2014. Between these sheds and the house's east side elevation stands a gable-front frame garage with sliding wooden doors that may be more than 50 years old. Three outbuildings are arrayed to the house's rear: a white shed-roofed shed and two taupe-colored gable-roofed sheds. The white shed may be more than 50 years old; the taupe sheds appear to have been built more recently. A long gable-roofed pole barn stands to the house's northwest. The varied pitches and conditions of its roof suggest it was built in three sections. Its first section rose at its south end, closest to the road. This may be the resource identified in tax records a "pole shed dirt [floor] erected in 1935. A second section added to its rear (north) may be the resource tax records identfy as a "pole shed concrete [floor]," erected in 1960. A more substantial and longer third section of the barn was subsequently appended to the barn's north end.

Morgan Family House 2 is not believed to retain the integrity necessary for NR eligibility. Its rural setting retains intact and it appears to stand upon the site where it was erected. However, the heavy intrusive grills that hide its porch and windows have negatively affected its integrity of design, materials, and workmanship, and thereby of feeling and association. Further, the house is not known to have any association with significant historic events or persons and is therefore recommended as not eligible for NR listing under NR Criteria A or B. It also does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources.


Photo 5-30 (left): Morgan Family House 2, south front and east side elevations; **Photo 5-31** (right): south front elevation, 2019 (source of both: https://www.google.com/maps).


Photo 5-32 (left): Morgan Family House 2, west side and south front elevations in 2019 (source: https://www.google.com/maps); **Photo 5-33** (right): same elevations in 2020.


Photo 5-34 (left): Morgan Family House 2, west side and south front elevations, 2019 (source: https://www.google.com/maps); **Photo 5-35** (right): Morgan Family House 2, aerial view of north rear elevation and roofs, 2018 (source: https://www.google.com/maps).


Photo 5-36 (left): Morgan Family House 2, looking north (with house at left) and two shed-roofed sheds at right (east), garage at center left, and two gable-roofed sheds at left distance, 2019 (source: https://www.google.com/maps); **Photo 5-37** (right): Morgan Family House 2, view of eastern shed-roofed sheds, 2019 (source: https://www.google.com/maps).


Photo 5-38 (left): Morgan Family House 2, looking northeast (house at left) at garage at left and eastern sheds at right, 2019 (source: https://www.google.com/maps); **Photo 5-39** (right): Morgan Famility House 2, looking northwest (house at left) at white shed-roofed shed and gabled sheds at left and garage at right, 2019 (source: https://www.google.com/maps).


Photo 5-40 (left): Morgan Family House 2, south front elevation of barn, 2019 (source: https://www.google.com/maps); **Photo 5-41** (right): Morgan Family House 2, aerial view of barn with south elevation at bottom, 2018 (source: https://www.google.com/maps).

English Family House – 4815 Medulla Road (Map ID #5)

This house was likely built for either James Jackson English (1872-1937) and Lula English (1869-1951) or their son and daughter-in-law, Clarence J. English, Sr. (1897-1970) and Lucy Peacock English (1897-1992). James or Jackson (he went by both names) lived in a house in the Medulla area in 1910 on property that was part of this tract. (Aaron Joseph Morgan of the Morgan Family houses lived a few doors down.) James and Lula may have lived on this property in 1900, although the surrounding names in the census of the year make this less clear (US Bureau of the Census 1900 and 1910). It is possible that they built the house around 1910, the assigned tax date. It is also possible that Clarence and Lucy erected it by 1920 on property he received from, or least farmed for, his parents. The form and finish of the house suggest it may indeed have been erected in the 1910s. The 1920 census places Clarence and Lucy living immediately next to his parents, again a few farms distant from A.J. Morgan. The census identifies him as living on a farm but working as a house carpenter, so if it was Clarence's house, he may well have built it himself.

In 1935 James and Lula continued to live in Polk County, but James died in 1937 in Plant City, west across the county line in Hillsborough County (Florida State Census 1935). His obituary noted that by 1937 Clarence and Lucy had also moved from the area, to Davenport in Polk County about 30 miles to the northeast (*Tampa Tribune* 1937). The property remained in English family hands, although likely not occupied by them for many years. Clarence J. English, Jr. and his wife, Irma, had moved back to the Springhead community (adjacent to Medulla) from Davenport about 1963 (*Tampa Tribune* 1967b). Whether to this house or another is not known. In 1974, though, when they acquired the property from Clarence's brother, John Henry English, a resident of Davenport, they were living in Lakeland (Polk County Deed Book 1605/Page1823). Clarence died in Lakeland in 2003 (*Lakeland Ledger*) and his and Irma's revocable trust sold the property out of the family to Eduardo and Shannon Morrell in 2005 (Polk County Deed Book 6559/Page 3). According to Shannon Morrell (personal communication), the house was built by the English family, possibly around 1908 or so.

The English Family House is one-story tall and of frame construction (**Photos 5-42** through **5-55**). Its main block has a T-shaped plan that is extended to the rear elevation by a one-story frame ell. The gable-front central part of the T-shaped block faces south toward Medulla Road. The legs of its T at its rear terminate in gables as well. The block retains original narrow corner boards, German siding, and plain surrounds with slightly crossetted lintels. The section facing the road is two bays wide; both of these bays hold original two-over-two, double-hung, sash windows. The rest of the house's window bays are finished in similar fashion. Entrances to the house are along either side of the projecting section. They are shaded and reached by a U-shaped porch that wraps around the front section. The porch retains turned posts and solid, floriated, jig-sawn brackets that appear to be original. The rear ell is original or early. An L-shaped porch that once crossed the rear of the main block and west side of the ell has been enclosed. Exterior-end brick chimney stacks rise along the rear gable of the ell and the east side gable of the main block.

After the English family sold the parcel to the Morrells, they quickly converted the property into its current use as the English Oaks Equestrian Center (**Photos 5-56** through **5-60**). (Its patrons include the Florida Southern University equestrian team, which Shannon Morrell coaches (*Lakeland Ledger* 2017b).) In 2007 they removed the citrus grove that extended to the north and west of the house and filled the southeastern third of the parcel. They also removed early outbuildings near the house, built a frame and a metal pole barn to the house's north, and added a large stable near the northern end of the property in 2013 accessed by a long new road. In 2017 the owners of the parcel abutting the east side of the English Family House parcel replaced a citrus grove with a solar farm, further altering the house's historic setting.

The English Family House 2 is recommended as eligible for NR listing under Criterion C for its architecture. It remains a good intact representative of an early-twentieth-century Polk County farmhouse. It retains its original T-shaped form, German siding, crossetted surrounds, two-over-two sash windows, corner boards, and front porch with turned posts and decorative brackets. Its only notable alteration appear to be the enclosure of the rear porch. The house appears to stand on its original site and is therefore believed to retain its integrity of location, design, materials, workmanship and, by extension, feeling and association. The removal of outbuildings and construction of modern ones, along with the removal of its citrus grove and the one that abutted its parcel to the east, have negatively affected its setting. The proposed NR boundaries for the house are not recommended to encompass all of its approximately 20-acre historic parcel (Polk County parcel 232906000000024010), which is now a horse farm with modern outbuildings. Rather, they are recommended as the approximately ½-acre portion at the parcel's southeastern corner that includes the house and its associated trees and intact setting (**Photo 5-61**). The proposed boundaries extend south to a fence near the right-of-way of Medulla Road and east and west to fence lines. On the north they terminate 25 feet north of the ell, before the modern metal and frame pole barns are reached. Lacking any known association with historic events or persons, and unlikely to yield important historical information not available from other sources, the house is not recommended as NR eligible under Criteria A, B, or D.


Photo 5-42 (left): English Family House, 2018 aerial with south at bottom of image (source: https://www.google.com/maps); **Photo 5-43** (right): English Family House, 2018 aerial with north at bottom of right image; T-shaped roofs of main block and linearly extended ell are topped by rusted roofs; porches and west gable end of main block are apparent from shiny appearance of reclad roofs (source: https://www.google.com/maps).


Photo 5-44 (left): English Family House, east side elevation in 2019 (source: https://www.google.com/maps); **Photo 5-45** (right): English Family House, east side elevation in 2020.


Photo 5-46 (left): English Family House, east side elevation in 2019 (source: https://www.google.com/maps); **Photo 5-47** (right): English Family House, east side elevation in 2020.


Photo 5-48 (left): English Family House, south front and west side elevation in 2019 (source: https://www.google.com/maps); **Photo 5-49** (right): English Family House, south front and west side elevation in 2020.


Photo 5-50 (left): English Family House, south front elevation in 2019 (source: https://www.google.com/maps); **Photo 5-51** (right): English Family House, south front elevation in 2020.


Photo 5-52 (left): English Family House, west side elevation in 2020; **Photo 5-53** (right): English Family House, west side elevation in 2020.


Photo 5-54 (left): English Family House, looking northeast at west side of house at right, metal pole barn at center, and wooden pole barn at far left, 2020; **Photo 5-55** (right): English Family House, metal pole barn in 2020.


Photo 5-56 (left): English Family House, west side and south rear elevation of modern stable in 2020; **Photo 5-57** (right): English Family House, interior of stable in 2019 (source: https://www.youtube.com/watch?v=CyRZU8S4zkU).

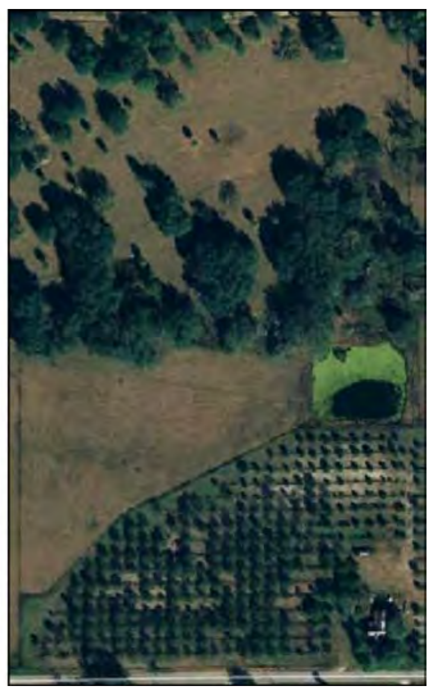



Photo 5-58 (left):English Family House parcel in December 2006 with house and outbuildings at lower right corner (source: https://www.google.com/maps); **Photo 5-59** (right): English Family House parcel in November 2007 with citrus grove and early outbuildings removed and modern outbuildings and access road added (source: https://www.google.com/maps).

Photo 5-60: February 2017 aerial of English parcel at left (west) and solar farm on site of former citrus grove at right (source: https://www.google.com/maps).

Photo 5-61: English Family House, proposed NR boundaries outlined in yellow.

House – 4404 Hamilton Road (Map ID #6)

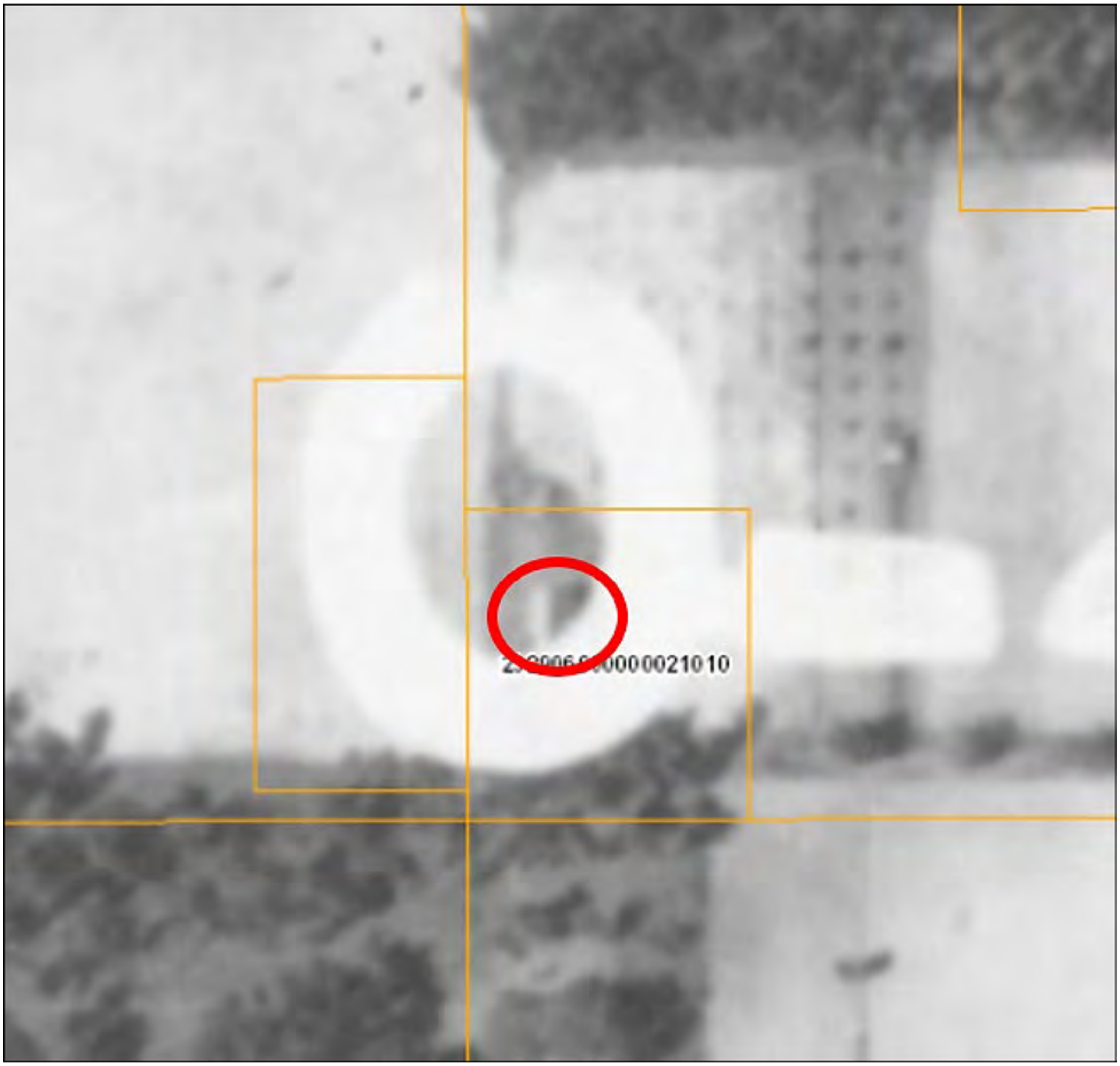
Deed and newspaper searches of this property did not unearth its history. It has changed hand numerous times over the past 25 years. Tax records put its date of construction at 1934. A 1941 aerial photograph shows it standing at the southwest corner of a citrus grove. The house and grove are visible in a 1964 aerial, along with the long entrance lane that extends east to it from

Hamilton Road. In a 1968 aerial, the house, one outbuilding to its (north) rear, and the grove are clearly visible (**Figures 5-5** through **5-8**). The former grove is now wooded and the house's diminished one-acre tract is abutted on its west and south by large expanses of solar panels. The property is gated off and the house could barely be viewed through the heavy growth of trees that largely surround it. It appeared to have its windows boarded up, but no further inspection could be made.

Tax records and aerial photographs indicate that the house has a one-story main block with a south-facing, metal, gable-front roof (**Photos 5-62** through **5-65**). It is built of frame with frame cladding. An unfinished open porch crosses most its front elevation. To its east is an additional section of unfinished porch that wraps partly around the east side elevation. A small gable peak in the roof above the side of this porch suggests that the porch shields a side entrance. To the west of the front porch another extended porch partly wraps the west elevation. It is enclosed but unfinished. The body of the house behind the porches is one-story tall. Rectangular, it encompasses just under 1,150 square feet. The outbuilding depicted on the aerials behind the house is now gone or hidden by overgrowth. From the edge of the parcel, the house and its grounds appear to be long abandoned and unmaintained. Bird-eye aerials from 2018 depict heavy overgrowth at the house's south front and east side elevation, further suggesting heavy deterioration.

The house at 4404 Hamilton Road is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. From the available evidence, it does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources. Additionally, the house's former citrus grove is now wooded and former groves to its west and south hold modern solar farms. It is therefore believed to have lost its integrity of setting. Its basic form and ca.1934 construction date, coupled with available information and apparent abandonment and deterioration, suggest it has also lost its integrity of design, materials, workmanship and, thereby, feeling and association. Due to its loss of integrity and lack of significance, the house is recommended as not eligible for NR listing.

Figure 5-5 House at 4404 Hamilton Road, March 10, 1941 Aerial

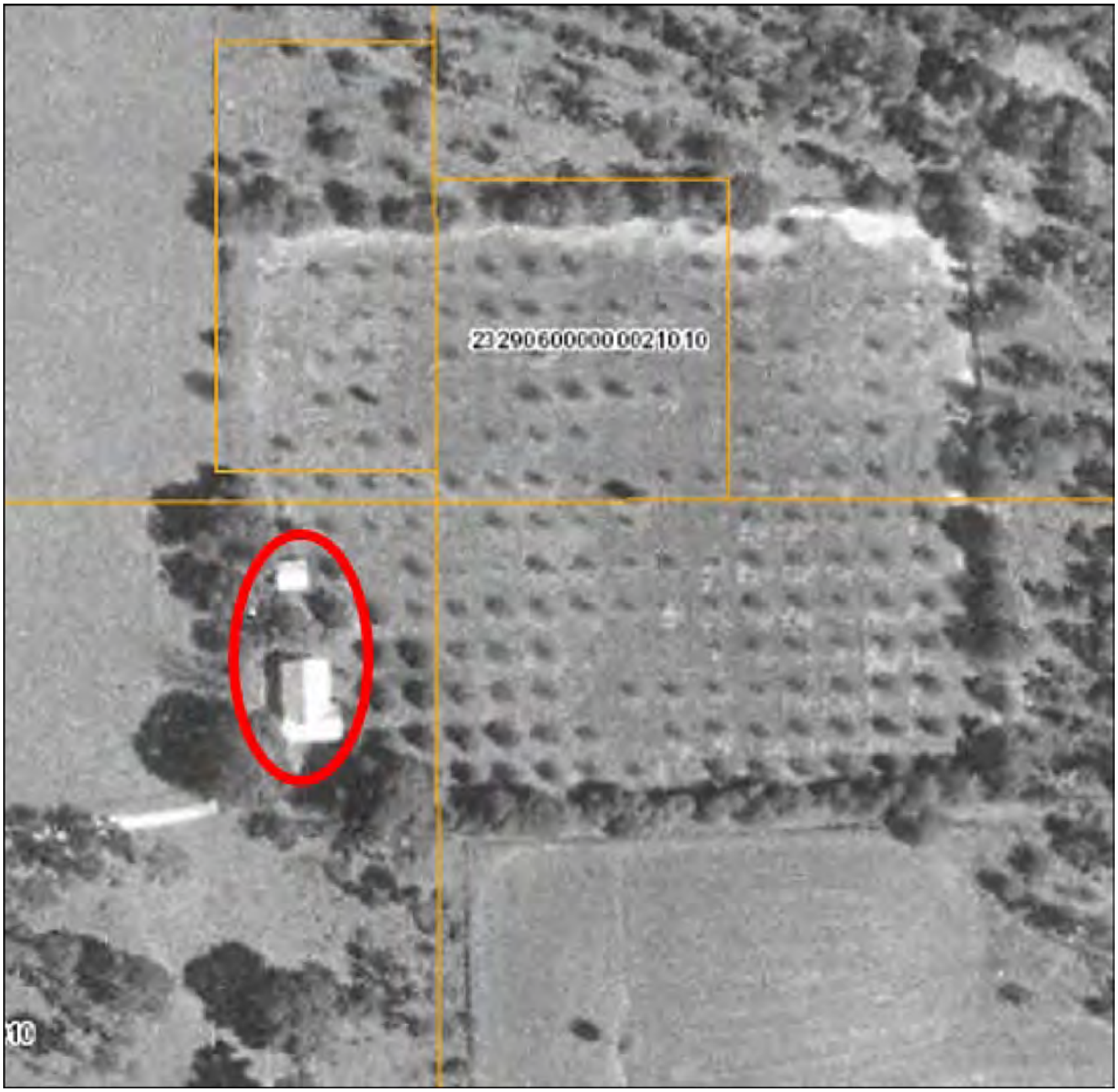


House partially obscured by date number (source: http://gisapps.polk-county.net/gisviewer).

Figure 5-6 House at 4404 Hamilton Road, 1964 Aerial

House at 4404 Hamilton Road with parcel boundaries mislocated to the left (west) (source: http://gisapps.polk-county.net/gisviewer).

Figure 5-7 House at 4404 Hamilton Road, 1964 Aerial



Parcel mislocated to the northeast of house (source: http://gisapps.polk-county.net/gisviewer).

Figure 5-8 House at 4404 Hamilton Road, 2010 Aerial

Former grove largely filled with trees and edged by solar farms (source of both: http://gisapps.polk-county.net/gisviewer).

Photo 5-62 (left): House at 4404 Hamilton Road, 2018 bird's-eye aerial view with south front of house at bottom (source: https://www.google.com/maps); **Photo 5-63** (right): House at 4404 Hamilton Road, 2018 bird's-eye aerial view with south front of house at left (source: https://www.google.com/maps).

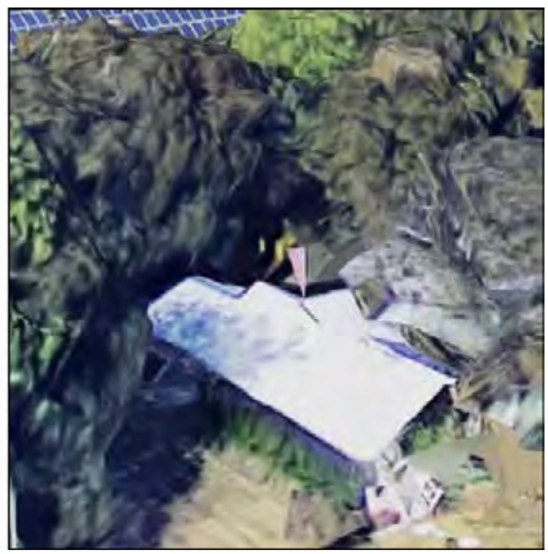


Photo 5-64 (left): House at 4404 Hamilton Road, 2018 bird's-eye aerial view with south front of house at top (source: https://www.google.com/maps); **Photo 5-65** (right) House at 4404 Hamilton Road, 2018 bird's-eye aerial view showing south front and east side of houses heavily encroached upon by tall green growth (source: https://www.google.com/maps).

House – 4333 Hamilton Road (Map ID #7)

This house stands on an approximately 0.6-acre parcel on the west side of Hamilton Road, 0.25 mile north of Medulla Road. The mostly modern houses to its north, south, and west occupy numerous small parcels of varying shapes that were likely cut off over time from a single larger agricultural property. This house has changed hands numerous times over the past 25 years and its early owners could not be determined. Tax records carry two dates for the house, a build date of 1920 and an estimated or apparent build date of 1991.

The house is built of frame with an overlay of brick veneer (**Photos 5-66** through **5-68**). It is one-story tall and has a gable-front roof pierced by a central brick chimney stack. Three bays cross its front (east) elevation, a central door flanked by paired windows with clip-in muntins. Windows with clip-in muntins mark the side elevations as well. A full-facade porch crosses its front elevation. A carport extends to the porch's north. An artificial-sided gable-front shed stands to the carport's north. The house's veneer, porch, and windows suggest a construction date within the past 30 or 40 years. If it was built in 1920, it is so heavily altered that this is not discernable.

This house is not known to have any association with significant historic events or persons and therefore is recommended as not eligible for NR listing under NR Criteria A or B. It does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources. If it is more than 50 years old, it has lost the integrity of design, materials, and workmanship – as well as setting, feeling, and association – that would express and represent that earlier period of construction. It is recommended as not eligible for NR listing under any of the Register's Criteria and Criteria Considerations.

Photo 5-66: House at 4333 Hamilton Road, east front elevation of house at left, carport at center, and modern shed at right in 2019 (source: https://www.google.com/maps).

Photo 5-67 (left): House at 4333 Hamilton Road, south side in 2020; **Photo 5-68** (right): House at 4333 Hamilton Road, east front elevations in 2020.

Photo 5-69 (left): House at 4333 Hamilton Road, north side and east front elevations in 2020; **Photo 5-70** (right): House at 4333 Hamilton Road, modern shed in 2020.

Futch-Dawson House – 4257 Hamilton Road (Map ID #8)

For much of the past 40 years at least, this house has been owned by either Mildred Ann Futch Dawson or her parents, Rev. Clyde A. and Florence Mary Futch (Polk County Deed Book 1941/Page 1835 (1980); Deed Book 3175/1925 (1992). Reverend Futch lived most of his life in eastern Hillsborough County (*Tampa Tribune* 1984), although he was living with his family and farming in the Medulla area of Polk County in 1940 (U.S. Bureau of the Census). The house carries a tax date of 1935, but its appearance strongly suggests that it is less than 50 years old.

The house has two blocks that are nearly equal in size (**Photos 5-71** through **5-75**). The gable-end block on the south is the principal one. Its east-facing front elevation is four bays wide. A door and a window are shaded by a hip-roofed screened front porch; a window is also placed to either side of the porch. These as the house's other windows are double-hung with two-horizontal-light-over-two-horizontal-light sash. The later-added north block holds a two-bay garage. Like the main block, it is topped by a gable-end roof and sided with asbestos shingles. It is flush with the main block at the front but extends a few feet farther back at the house's west-facing rear elevation. The window sash, their placement immediately under the eaves, the proportions of the main block, the asbestos shingles – all suggest a construction date within the past 50 years.

This house is not known to have any association with significant historic events or persons and therefore is recommended as not eligible for NR listing under NR Criteria A or B. It does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources. If it is more than 50 years old, it has lost the integrity of design, materials, and workmanship—as well as setting, feeling, and association—that would express and represent that earlier period of construction. It is recommended as not eligible for NR listing under any of the Register's Criteria and Criteria Considerations.


Photo 5-71 (left): Futch-Dawson House, east front and north side elevations; **Photo 5-72** (right): Futch-Dawson House, east front elevation.


Photo 5-73 (left): Futch-Dawson House, south side and east front elevations; **Photo 5-74** (right) Futch-Dawson House, north side and west rear elevations.

Photo 5-75: Futch-Dawson House, east front and north side elevations.

Dawson House – 4239 Hamilton Road (Map ID #9)

Like the house a short distance to its west at 4257 Hamilton Road, this house was long connected with Mildred Ann Futch Dawson, who owned it from at least the mid-1970s until her estate transferred it to another owner in 2017 (Polk County Deed Book 1679/Page 880 (1976); Probate Document 11052/Page 617 (2017). When Mildred Dawson and her husband, Willie Ray Dawson were divorced in 1980, she gave up the house at 4257 Hamilton Road, but retained and likely lived in this one. The house is assigned a tax date of 1940, but it appears to be less than 50 years old.

The house occupies a zig-zag-shaped parcel on the west side of Hamilton Road and is located down a lane about 300 yards from the road (**Photos 5-76** through **5-81**). Its distance from the road and the shape of its parcel indicate that its 5.54-acre parcel was cut out of a larger agricultural tract. The house is almost square with a notch out of the back of the northwestern corner of its rear (west) elevation. One-story tall, it encompasses approximately 1,600 square feet. The house is of stuccoed masonry construction. Its gable-end roof is asphalt-shingled. At its front (east) elevation it has a tripled one-over-one window grouping at the left, an entry shaded by a screened hip-roofed porch at the center, and paired one-over-windows at the right. The house's other windows are also one-over-one. A gabled roof extends to the house's rear. It is abutted by a fenced patio shaded by a modern metal-pole-supported roof. A modern outbuilding stands to the house's south. The window sash, the house's proportions and relatively large footprint, and its masonry construction suggest a construction date within the past 50 years.

This house is not known to have any association with significant historic events or persons and therefore is recommended as not eligible for NR listing under NR Criteria A or B. It does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources. If it is more than 50 years old, it has lost the integrity of design, materials, and workmanship—as well as setting, feeling, and association—that would express and represent that earlier period of construction. It is recommended as not eligible for NR listing under any of the Register's Criteria and Criteria Considerations.

Photo 5-76 (left): Dawson House, east front elevation in 2014 (source: https://www.bing.com/maps/); **Photo 5-77** (right): Dawson House, east front elevation in 2018 (source: https://www.google.com/maps).

Photo 5-78 (left): Futch-Dawson House, east front and north side elevations; **Photo 5-79** (right): Futch-Dawson House, north side and west rear elevations.

Photo 5-80 (left): Futch-Dawson House, west rear elevation; **Photo 5-81** (right): Futch-Dawson House, modern shed to house's south.

Opal and Oliver Phillips House – 4141 Hamilton Road (Map ID #10)

Tax records assign this house a date of 1935, but it may have been built a few years later. In 1937 George Hamilton, Jr. (1870-1942) and his wife, Florence B. Hamilton (1875-1965), transferred 24 acres to their daughter, Opal Phillips (1903-1983) (Polk County Deed Book 177/Page 145). She and her husband, Oliver W. Phillips (1892-1969), had married in 1927 (*Tampa Times*). They are believed to have built the house.

George Hamilton was a "stock breeder and orange grower" (*Tampa Tribune* 1906). The 1914 *Lakeland Ledger* described him as one of Polk County's "most substantial growers." He came from a local slaveholding family. In 1934 (*Tampa Tribune*) he gathered friends at his Medulla Road residence "to welcome Aunt Ella Robinson, 87, one-time slave, back to the old plantation." George's holdings of family property were apparently substantial in the early 20th century. The 1910 (US Bureau of the Census) census, taken when Opal was seven, identified his livelihood as "general farming." The farm inventoried immediately before his was that of James Jackson English of the English Family House at 4815 Medulla Road, located well southeast of this property.

Opal and Oliver Phillips likely erected this house in the late 1930s. Opal died in 1983. Two years later her estate kept the property in the family by transferring it to Billy J. Phillips. He continued to own but did not live in the house until it was foreclosed upon in 2019 (Polk County Deed Book 2324/Page 1045 (1985); Polk County Foreclosures).

The house's main block is one-story tall and two rooms deep (**Photos 5-82** through **5-89**). It is built of frame and topped by an asphalt-shingled gable-roof. A one-bay gable-front porch supported by square posts extends over its central front (south-facing) entry. The windows to either side of the facade are shaded by later-added metal hoods. An exterior-end brick chimney rises from the block's east gable. A hipped-roof wing wraps around much of the east side elevation of the house and part of the north rear elevation. The house has been vacant for a number of years and its windows are boarded over. It appears to be maintained, though, and its artificial siding is in good condition. When the house was artificially sided in recent years its original exposed rafter tails were boxed in. A frame two-car garage standing to the house's north rear appears to have been its contemporary, likely dating from the 1930s. A largely collapsed frame barn is overgrown by trees farther to the north. Its construction date is not known.

The Opal and Oliver Phillips House is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. The house does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. The house is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources. Additionally, due to its alterations—including boarded-over windows, artificial siding, and boxed-in eaves—the house is believed to have lost its integrity of design, materials, workmanship and, therefore, feeling and association. The loss of its the large citrus grove amidst which it stood has also negatively affected its integrity of setting.


Photo 5-82 (left): Opal and Oliver Phillips House, 2012 aerial with north at top showing ghost marks of a former grove (source: https://www.google.com/maps); **Photo 5-83** (right): Opal and Oliver Phillips House, 2012 aerial zoomed in

showing south front elevation of house with porch at bottom and garage at top (north) (source: https://www.google.com/maps).

Photo 5-84 (left): Opal and Oliver Phillips House, south front elevation with porch post visible at left center, 2020; **Photo 5-85** (right): Opal and Oliver Phillips House, detail of south elevation, 2020.

Photo 5-86 (left): Opal and Oliver Phillips House, south front and east elevations with porch at left in 2014 (source: https://www.bing.com/maps/); **Photo 5-87** (right): Opal and Oliver Phillips House, south front and east elevations with porch at left in 2020.

Photo 5-88 (left): Opal and Oliver Phillips House, south front and east side elevations with garage at far right, 2019 (source: https://www.google.com/maps); **Photo 5-89** (right): Opal and Oliver Phillips House, north rear of house with garage at left center and now collapsed barn at far left, no date (source: Connected Investors website).

Lakeland Linder International Airport (former Lakeland Army Air Base/Drane Field/Lakeland Municipal Airport) – 3900 Don Emerson Drive (Map ID #s11a through 11e)

Only the ghost of the original runway pattern of the former Lakeland Army Air Base is visible at the current Lakeland Linder International Airport (Map #11a) (**Photos 5-90** and **5-91**). Since the late 1980s, it has been transformed by the construction of extensions and new runways and the sodding over of old runways and pads (*Tampa Tribune* 1967b, 1968, 1997, 2000, and 2002). The runway and the airport grounds, therefore, are believed to have lost their integrity of design, setting, materials, workmanship and, thereby, feeling, and association. The airfield is accordingly not recommended as eligible for NR listing due to a loss of integrity. (The airfield does remain at its original location.)

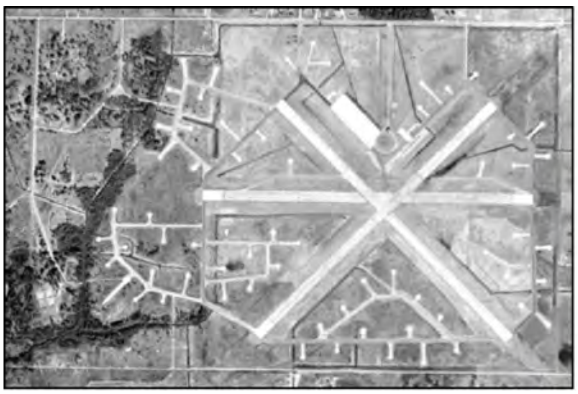


Photo 5-90 (left): Lakeland Army Air Field with Drane Field Road at north top, 1953 (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm; **Photo 5-91** (right): modern Google Maps aerial.

As noted at the historic context of this report, none of the Airport's scores of WWII-era buildings survived. Tax records and historic aerials, however, indicate that four of the its standing resources were erected between about 1959 and 1971. Three of these are hangars standing on the southwest side of Airfield Drive West about 400 feet southeast of the modern airport terminal. Matching steel hangars erected c.1960 (*Tampa Tribune* 1959a) now house the aircraft maintenance facilities of Sheltair Aviation (Map ID #11b) (**Photos 5-92** through **5-95**) and Aeromech Aviation (Map ID #11c) (**Photos 5-96** through **5-99**). These were joined by a nearly identical hangar (**Photos 5-100** through **5-103**) to their northwest – now home to the maintenance facilities of Double M Aviation (Map ID #11d) – between the taking of aerial photographs of the Airport in 1964 and 1968. (The 1964 aerial appears to show ground preparation for the hangar.) A second building was added to this hangar by 1971. (A series of historic aerials of the Airport and Polk County are available at the Polk County GIS Map Viewer site.) The three earliest hangars are essentially square, about 120 feet on each side. They are conventional hangar types with steel primary load-bearing trusses and framing and steel walls and roofs. Their doors are the standard horizontal telescoping type that slide, overlap, and open up access to the entire hangar space when fully pushed to either side. The hangar attached to the northeast side of the Double M Aviation hangar is of similar design and construction, but it only about half as wide. The two hangars are largely open to each other inside, forming a single work space.

The maintenance hangars are believed to retain their integrity of location, design, setting, materials, workmanship and, thereby, feeling, and association. However, they are not believed to be significant for any association with significant events or individuals or to embody the distinctive characteristics of a type, period, or method of construction. They are conventional steel hangar types with standard telescoping doors (Luke and Howson 2002; Iungerich 2018; Weitze 1999). The hangars have no known associations with the Cold War or other military activities. They are therefore not believed to be significant under NR Criteria A, B, or C and are recommended as not eligible for NR listing. The hangars are further recommended as not NR-eligible under Criterion D, for they are unlikely to yield important historical information not available from other sources.

Photo 5-92 (left): Sheltair Aviation maintenance hangar (Map ID #11b), airside elevation; **Photo 5-93** (right): Sheltair Aviation maintenance hangar (Map ID #11b), southwest airside and southeast elevations.


Photo 5-94 (left): Sheltair Aviation maintenance hangar (Map ID #11b), interior views. **Photo 5-95** (right): Sheltair Aviation maintenance hangar (Map ID #11b), interior views.

Photo 5-96 (left): Aeromech Aviation maintenance hangar (Map ID #11c), southwest airside elevation; **Photo 5-97** (right): Aeromech Aviation maintenance hangar (Map ID #11c), northwest side elevation.


Photo 5-98 (left): Aeromech Aviation maintenance hangar (Map ID #11c) interior view; **Photo 5-99** (right): Aeromech Aviation maintenance hangar (Map ID #11c) interior view.


Photo 5-100 (left): Double M Aviation maintenance hangars (Map ID #11d), southwest side and southeast airside elevations with first-built hangar at left; **Photo 5-101** (right): Double M Aviation maintenance hangars (Map ID #11d), southeast airside and northeast side elevations with second-built hangar at right.

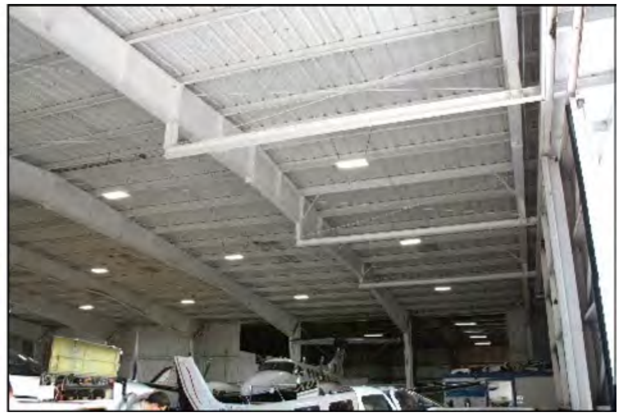


Photo 5-102 (left): Double M Aviation maintenance hangars (Map ID #11d), southwest side elevation of first-built hangar; **Photo 5-103** (right): Double M Aviation maintenance hangar (Map ID #11d), interior view looking from first-built hangar into darker second-built hangar space.

A portion of one additional building that is more than 50 years old survives at the Airport (**Photos 5-104** through **5-107**). In December 1959, the Airport was completing construction of its first purpose-built terminal. A basic Modernist building, the Lakeland Municipal Airport terminal was a one-story-tall rectangle of masonry construction topped by a flat roof. Exposed posts separated it into seven bays across its front. Three had three-part glass windows and paired doors that extended most of the way toward the roof; four were windowless. A flat-roofed portico supported by steel posts crossed the glassed bays. In the late 1980s or early 1990s, a control tower was built off the terminal's southeastern corner. Between 2002 and 2005, the western three-quarters of the building were lopped off, leaving only its eastern quarter. In the mid-2010s the control tower was removed as well.

The remaining quarter of the former terminal now houses the airport's U.S. Customs and Border Protection (CPB) facility (**Photos 5-108** through **5-110**). The one-story building retains some of the walls of the terminal and perhaps one of the original three-part windows. A shorter one-story addition has been wrapped around its south and east elevations. This addition includes three-part windows similar to the original ones.

Due its dramatic alterations—not least the removal of one-quarter of its original structure—the former Lakeland Municipal Airport terminal, now home to the airport's CPB facility, is believed to have lost its integrity of design, materials, workmanship and, accordingly, feeling and association. It remains in an airport setting on its original location, but it appears to have clearly lost its overall integrity. Additionally, the building is not known to have any association with significant historic events or persons and does not appear to embody the distinctive characteristics of a type, period, or method of construction. It is accordingly recommended as not NR-eligible under Criteria A, B, or C. The former terminal is further recommended as not NR-eligible under Criterion D, for it is unlikely to yield important historical information not available from other sources.

Photo 5-104 (left): Aerial view of former Lakeland Municipal Airport terminal (Map ID #11e) in 2002 (source: Polk County GIS Map Viewer site); **Photo 5-105** (right): Aerial view of former Lakeland Municipal Airport terminal (Map ID #11e) in 2005 (source: Polk County GIS Map Viewer site).

Photo 5-106 (left): Lakeland Municipal Airport terminal building (Map ID #11e), 1967 (source: https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/66/rec/1); **Photo 5-107** (right): Current U.S. Customs and Border Protection building (same number), south front and east side elevation.

Photo 5-108 (left): Current U.S. Customs and Border Protection building (Map ID #11e), south front elevation ; **Photo 5-109** (right): Current US Customs and Border Protection building (Map ID #11e), west side and south front elevations.

Photo 5-110: Current U.S. Customs and Border Protection building (Map ID #11e), north rear elevation.

6. EFFECTS RECOMMENDATIONS

6.1 ARCHAEOLOGICAL RESOURCES

Surface inspection, photo documentation of existing field conditions, and subsurface shovel testing performed within the Direct Effects APE (i.e., construction disturbance areas) revealed no existing or potential archaeological sites in the APE. There were no positive recoveries of potentially significant archaeological materials in the 12 STPs excavated for this study. Therefore, the recommendation of this study is that the Proposed Project will have *no effect* on archaeological resources in the APE.

6.2 HISTORIC ARCHITECTURAL RESOURCES

Examination of the FMSF indicated that no National Register-listed sites are present within the Direct or Indirect Effects APEs. The FMSF indicated that there are 17 historic structures, six archaeological sites, 26 cultural resource studies, and one resource group present within one mile of the Indirect Effects APE, although none of these are physically located in the APE.

As elaborated in **Section 5.2**, the Indirect Effects APE was further evaluated to determine the presence of buildings or structures 50 years of age or older that could be eligible for listing to the National Register. Fifteen structures at eleven locations on- and off-airport were identified for evaluation. All structures were appraised against NRHP Criteria A through D to recommend whether or not each location was potentially eligible for listing to the National Register. These results are summarized on **Table 6-1** and indicate that the Aaron E. and Maude Morgan House (Map ID #2) and the English Family House (Map ID #5) are each potentially eligible for listing to the National Register under Criterion C.

The Proposed Project would cause no direct physical effects to any of the fifteen locations within the APE described above, including the two that are potentially NRHP-eligible. To determine the potential for indirect effects, the noise and visual environment in the Indirect Effects APE was evaluated.

Table 6-1 Historic Evaluation Summary

Map ID	Name	NRHP Eligibility Criteria Recommendation				Predicted Sound Levels (DNL dB)				Effects Recommendation
		A	B	C	D	2022 No-Action	2022 Proposed Project	2027 No-Action	2027 Proposed Project	
1	Robberson House	N	N	N	N	61.13	62.32	61.68	62.75	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this agricultural/residential land use per FAA criteria. Property is 1.5 miles from project area with tree stands obstructing line of site, no viewshed changes expected.
2	Aaron E. and Maude Morgan House	N	N	Y	N	60.15	61.32	60.66	61.72	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this agricultural/residential land use per FAA criteria. Property is 0.6 mile from project area with multiple tree stands and a campground between property and project area, no viewshed changes expected.
3	Morgan Family House 1	N	N	N	N	57.8	58.89	58.34	59.32	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this agricultural/residential land use per FAA criteria. Property is 0.6 mile from project area with dense tree stands protecting viewshed, no viewshed changes expected.

Map ID	Name	NRHP Eligibility Criteria Recommendation				Predicted Sound Levels (DNL dB)				Effects Recommendation
		A	B	C	D	2022 No-Action	2022 Proposed Project	2027 No-Action	2027 Proposed Project	
4	Morgan Family House 2	N	N	N	N	56.93	57.91	57.54	58.4	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this agricultural/residential land use per FAA criteria. Property is 0.6 mile from project area with dense tree stands protecting viewshed, no viewshed changes expected.
5	English Family House	N	N	Y	N	55.08	55.99	55.82	56.59	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this agricultural/residential land use per FAA criteria. Property is 0.75 mile from project area with dense tree stands protecting viewshed, no viewshed changes expected.
6	House – 4404 Hamilton Road	N	N	N	N	57.99	58.88	58.77	59.53	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this residential land use per FAA criteria. Property is 0.6 mile from project area and set within a dense tree stand, no viewshed changes expected.

Map ID	Name	NRHP Eligibility Criteria Recommendation				Predicted Sound Levels (DNL dB)				Effects Recommendation
		A	B	C	D	2022 No-Action	2022 Proposed Project	2027 No-Action	2027 Proposed Project	
7	House – 4333 Hamilton Road	N	N	N	N	56.14	57.03	56.9	57.66	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this residential land use per FAA criteria. Property is 0.8 mile from project area with a dense tree stand partially obstructing line of site and a large solar farm between property and project area, no viewshed changes expected.
8	Futch-Dawson House	N	N	N	N	61.63	62.53	62.21	63.00	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this residential land use per FAA criteria. Property is 0.8 mile from project area with tree stands projecting viewshed, no viewshed changes expected.
9	Dawson House	N	N	N	N	60.00	60.89	60.56	61.35	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this residential land use per FAA criteria. Property is 1 mile from project area with small tree stands partially obstructing line of site, no viewshed changes expected.

Map ID	Name	NRHP Eligibility Criteria Recommendation				Predicted Sound Levels (DNL dB)				Effects Recommendation
		A	B	C	D	2022 No-Action	2022 Proposed Project	2027 No-Action	2027 Proposed Project	
10	Opal and Oliver Phillips House	N	N	N	N	61.79	62.72	62.31	63.15	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this agricultural/residential land use per FAA criteria. Property is 0.9 mile from project area with small tree stands and a large solar farm between property and project area, minimal viewshed changes expected.
11a	Aeromech Maintenance Hangar	N	N	N	N	78.70	79.10	79.40	79.75	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this governmental land use per FAA criteria. Property is 0.9 mile from project area and located on-airport with existing buildings and airport infrastructure between property and project area, no viewshed changes expected.
11b	Lakeland Linder International Airport	N	N	N	N	65.91	66.53	66.51	67.06	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this governmental land use per FAA criteria. Property is 1 mile from project area and located on-airport with existing buildings and airport infrastructure between property and project area, no viewshed changes expected.

Map ID	Name	NRHP Eligibility Criteria Recommendation				Predicted Sound Levels (DNL dB)				Effects Recommendation
		A	B	C	D	2022 No-Action	2022 Proposed Project	2027 No-Action	2027 Proposed Project	
11c	Sheltair Maintenance Hangar	N	N	N	N	64.69	65.37	65.35	65.94	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this governmental land use per FAA criteria. Property is 0.9 mile from project area and located on-airport with existing buildings and airport infrastructure between property and project area, no viewshed changes expected.
11d	Double M Maintenance Hangar	N	N	N	N	62.93	63.64	63.62	64.23	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this governmental land use per FAA criteria. Property is 0.9 mile from project area and located on-airport with existing buildings and airport infrastructure between property and project area, no viewshed changes expected.
11e	Former Lakeland Municipal Airport Terminal	N	N	N	N	73.31	73.48	73.5	73.66	*Direct:* No effect. *Indirect:* No adverse effects. Predicted sound levels remain noise-compatible for this governmental land use per FAA criteria. Property is 0.9 mile from project area and located on-airport with existing buildings and airport infrastructure between property and project area, no viewshed changes expected.

[1] Y = Recommended eligible under given criterion; N = Recommended ineligible under given criterion
Source: AEDT, 2020; AECOM, 2020.

For the evaluation of visual impacts, landscape character and visual/aesthetic attributes in the vicinity of these locations were qualitatively assessed in terms of the anticipated changes associated with the Proposed Project (see T**able 6-1**). Anticipated lighting sources are expected to be similar to existing structures at LAL and the adjacent land areas. The distance between the Proposed Project and the nearest property included in this study (Map ID #2) is approximately 0.6 mile, and the line of sight between the two is obscured by vegetation and other existing structures. Generally speaking, while the visual landscape would change as a result of the Proposed Project, it would be compatible with the Airport environs and not result in intrusive visual impacts.

For the evaluation of aircraft noise impacts, the FAA Aviation Environmental Design Tool (AEDT) was used to predict sound levels both with and without the Proposed Project. FAA considers a noise impact significant when the Proposed Project causes a predicted increase of a 1.5 decibels (dB) or more for a noise sensitive area that is exposed to noise at or above the Day-Night Average (DNL) 65 dB noise exposure level. This also applies when a noise-sensitive location is exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the No-Action Alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB.

The results of the noise analysis are documented on T**able 6-1** and show that none of the evaluated properties experience a 1.5 dB or greater increase due to the Proposed Project compared to the No-Action Alternative. Those already contained in the DNL 65 dB or higher contours (i.e., LAL airport buildings) remain noise-compatible per FAA regulation.

Based on the foregoing discussion, and the results listed on T**able 6-1**, the recommendation of this study is that the Proposed Project will have no adverse effects on potential historic resources in the APE.

7. SUMMARY

AECOM conducted a Phase IB CRAS of planned improvements at LAL in Polk County, Florida. These efforts included background research and field survey to study the archaeological and historic stand structures resources on the property. Background research identified no listed cultural resources within the Direct or Indirect Effects APEs.

The archaeological survey was performed from July 6-7, 2020. The archaeological investigations included ground surface reconnaissance and subsurface testing in all areas of proposed ground disturbance and resulted in the excavation of 12 STPs. During this time, no archaeological resources were encountered. Examination of the FMSF indicated that no National Register-listed sites are present within the Direct or Indirect Effects APEs. The FMSF indicated that there are 17 historic structures, six archaeological sites, 26 cultural resource studies, and one resource group present within one mile of the Indirect Effects APE. However, none of these resources will be affected by the Proposed Project.

The architectural historic survey was conducted on August 4 and 12, 2020. It identified 11 resources or groups of resources. Nine are recommended as not eligible for NRHP listing. Two are recommended as NRHP-eligible, the Aaron E. and Maude Morgan House (Map ID #2) and the English Family House (Map ID #5). Neither of these properties would be affected by project construction. Additionally, the properties are well outside of existing and future airport noise contours and are distant from the airport viewshed. Therefore, it is not anticipated that these properties would be adversely indirectly affected by facility operations once the facility is constructed.

Based on the results of current survey, no further archaeological work is recommended for the APE. No Historic Properties will be affected by the Proposed Project.

7.1 UNANTICIPATED FINDS

Should future construction activities uncover any archaeological remains, it is recommended that activity in the immediate area of the remains be stopped while a professional archaeologist evaluates the remains. In the event that human remains are found during construction or maintenance activities, the provisions of Chapter 872.05, F.S. will apply. Chapter 872.05, F.S. states that when human remains are encountered all activity that might disturb the remains shall cease and may not resume until authorized by the District Medical Examiner or the State Archaeologist. The District Medical Examiner has jurisdiction if the remains are less than 75 years old or if the remains are involved in a criminal investigation. The State Archaeologist has jurisdiction if the remains are over 75 years of age or more.

8. REFERENCES

Adovasio, James M. and David R. Pedler

2005 The Peopling of North America. In *North American Archaeology*. Edited by Timothy R. Pauketat and Diana DiPaolo Loren, pp. 30-55. Blackwell Publishing, Oxford.

Air Force History Index. Accessed July 2020 at http://airforcehistoryindex.org/search.php?q=LAKELAND+ARMY&c=u&h=100&F=1%2F1%2F1940&L=.

Almy, Marion, L. Hutchinson, J. Winkler, N. Rodrigues, M. Lumang

2009 *Cultural Resource Assessment Reevaluation U.S. 41 Business (S.R. 739) From Littleton Road (M.P. 4.162) to U.S. 41 (S.R. 45) (M.P. 5.400), Lee County, Florida*. Archaeological Consultants, Inc. Sarasota, Florida.

Anderson, David G., Lisa D. O'Steen, and Kenneth E. Sassaman

1996 Environmental and Chronological Considerations. In *The Paleoindian and Early Archaic Southeast,* edited by David G. Anderson and Kenneth E. Sassaman, pp. 3-15. The University of Alabama Press, Tuscaloosa.

Austin, Robert J.

1983 *A Cultural Resources Assessment Survey of the Proposed North Clear Springs Mining Area, Polk County, Florida*. ARMAC Engineers, Inc., Tampa, Florida.

Avery, George

1992 Northwest Florida, 2,500 B.P. to A.D. 1000. In *Florida's Cultural Heritage: A View of the Past (Draft)*, edited by Claudine Payne and Jerald T. Milanich, pp. 29-36. Division of Historical Resources, Florida Department of State, Tallahassee.

Blount, R.S.

1993 *Spirits of Turpentine: A History of Florida Naval Stores, 1528 to 1950*. Florida Agricultural Museum, Tallahassee, Florida.

Boatner, Mark M. III.

1992 *Landmarks of the American Revolution: People and Place Vital to the Quest for Independence*. Stackpole Book, Harrisburg, Pennsylvania.

Borremans, Nina T.

1992 The Paleoindian Period. In *Florida's Cultural Heritage: A View of the Past (Draft)*, edited by Claudine Payne and Jerald T. Milanich, pp. 14-21. Division of Historical Resources, Florida Department of State, Tallahassee.

Burns, Jason

2008 *Historical and Archaeological Resources Survey of Matanzas Harbor, St. Augustine, St. Johns County, Florida*. Submitted to the City of St. Augustine. Copies available from the Division of Historical Resources, Florida Department of State, Tallahassee.

2009 *Historic Assessment and Remote Sensing Survey of the St. Johns County Beach Erosion Control Project, St. Johns County, Florida*. Submitted to the U.S. Army Corps of Engineers Jacksonville District, Jacksonville, Florida. Copies available from the Division of Historical Resources, Florida Department of State, Tallahassee.

Butler, Carol B.
1998 *Treasures of the Longleaf Pine Naval Stores*. Tarkel Publishing, Shalimar, Florida.

Cobb, Alisa, Sybille Oldham, and Melanie Harden
n.d. "Lakeland's World War II History." Accessed July 2020 at https://www.polk-fl.net/staff/teachers/tah/documents/floridaflavor/lessons/E-7.pdf

Connected Investors website. Accessed August 2020
https://connectedinvestors.com/investment-property/4141-hamilton-rd/4869456.

Delcourt and Delcourt
1981 *Vegetation Maps for Eastern North America: 40,000 years B.P. to Present. In* Geobotany. *R. Romans (ed.). Plenum, New York. pp. 123-166.*

1983 *Late Quaternary Vegetational Dynamics and Community Stability Reconsidered.* Quaternary Research 19:265-271.

1985 *Quaternary Palynology and Vegetational History of the Southeastern United States.* In *Pollen Records of Late-Quaternary North American Sediments.* V. M. Bryant and R.G. Holloway (eds.). American Association of Stratigraphic Palynologists Foundation, College Station, Texas. pp. 1-37.

1987 *Long Term Forest Dynamics of the Temperate Zone: A Case Study of Late Quaternary Forests in Eastern North America.* Ecological Studies No. 63, Springer Verlag, New York.

Dunbar, James S. and S. David Webb
1996 *Bone and Ivory Tools from Submerged Paleoindian Sites in Florida.* In *The Paleoindian and Early Archaic Southeast,* edited by David G. Anderson and Kenneth E. Sassaman, pp. 331-353. The University of Alabama Press, Tuscaloosa.

Faught, Michael K.
2004 The Underwater Archaeology of Paleolandscapes, Apalachee Bay, Florida. *American Antiquity*. 69(2):275-289.

Florida Association of the American Institute of Architecture, editors
2017 *A Guide to Florida's Historic Architecture*. University of Florida Press, Gainesville. Accessed August 2020 at https://ufdcimages.uflib.ufl.edu/AA/00/06/13/81/00001/AA00061381_00001.pdf.

Florida Department of Environmental Protection (FDEP)

2017 Land Boundary Information System. Electronic document, http://www.labins.org/, accessed October 17, 2017.

Florida Division of Historic Resources (FDHR)

2002 *Cultural Resource Management Standards & Operational Manual*. Tallahassee.

2011 *Module Three: Guidelines for Use by Historic Preservation Professionals*. Tallahassee.

2017 Florida Master Site File. Tallahassee.

Franklin, Marianne and John W. Morris

1996 Southern Oceans Archaeological Research, Inc. *Survey Report No. 1: A Remote Sensing Survey of St. Augustine, Florida*. Southern Oceans Archaeological Research, Pensacola, Florida.

Gannon, Michael

1996 First European Contacts. In *The New History of Florida*. Edited by Michael Gannon, pp. 16-39. University Press of Florida, Gainesville, Florida.

Hacking, Gary, Jessica Forbes, and Robert O. Jones

2006 Homeland School National Register of Historic Places National Register registration form. Accessed August 2020 https://npgallery.nps.gov/NRHP/GetAsset/e6d07b1d-9531-46c8-9ad7-9de753772f06.

Iungerich, Justin M.

2018 "Comprehensive Comparison of Steel Frame Fabric and Conventionally Constructed Aircraft Hangars." Thesis, Air Force Institute of Technology. Accessed August 2020 at https://apps.dtic.mil/dtic/tr/fulltext/u2/1056499.pdf.

Kammerer, Laura A., P.M. Seabury, and J.R. Ballo

1985 *Cultural Resource Assessment Survey of the IMC Clear Springs Mine Extension Property, Polk County, Florida*. Piper Archaeological Research, Inc., St. Petersburg, Florida.

Kerlin, Mark W.

2005 "Plant City, Florida, 1885-1940: A Study in Southern Urban Development." M.A. thesis, University of Central Florida." Accessed July 2020 at http://etd.fcla.edu/CF/CFE0000617/Kerlin_Mark_W_20058_MA.pdf.

Lakeland Chamber of Commerce

1952 "The Lakelander." November 1952. Accessed July 2020 at https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll27/id/29/rec/20.

Lakeland Ledger

1943 "Drane Field One Year Old and Still Growing with Much Vigor." May 23, 1943. Quoted in Cobb, Oldham, and Harden.

1945a "Drane Field Closing to be Started Immediately." March 27, 1945. Quoted in Cobb, Oldham, and Harden.

1945b "Drane Field Expected to Close Nov. 1." October 19, 1945. Quoted in Cobb, Oldham, and Harden.

2003 C.J. "Jack" English obituary. November 25, 2003.

2017a "FSC Equestrian Team Jumps Into History." February 19, 2017.

2017b "Now It's an International Airport: US Customs Clears 1st Lakewood Linder Border Crossing." November 16, 2017.

Lakeland Public Library Photograph Collection. Accessed July and August 2020 https://cdm15809.contentdm.oclc.org/.

Luke, Stephen J., and W. Paul Howson
2002 "Modern Aircraft Hangars: A Review of the Design Trends." In The Structural Engineer (August 6, 2002), pp. 23-30. Accessed August 2020 at https://www.istructe.org/webtest/files/9d/9d0c56f1-286e-4e2b-ad88-95b6573980a7.pdf.

Martinkovic, Mark F.
2006 *Patterns in the Piney Woods: Naval Stores Site Catchment Analysis and Predictive Model, Washington County, Florida*. Master Thesis on File, University of West Florida Archaeology Institute, Pensacola, Florida. Copies also available from the Division of Historical Resources, Florida Department of State, Tallahassee.

Milanich, Jerald T.
1994 *Archaeology of Precolumbian Florida.* University Press of Florida, Gainesville.

McDill Field
1943 "Lakeland Army Air Base, Sub-Base Plays Important Role in Advanced Training." In *Thunderbird, McDill Field Quarterly*, Spring 1943:36, 46. Accessed July 2020 at http://aafcollection.info/items/documents/view.php?file=000214-01-00.pdf).

Miami News
1945 "Drain Field Closed as Training Base." November 2, 1945.

Morris, J. William, III, J.M. Burns and R.E. Moore
2002 *St. Johns County Submerged Cultural Resources Inventory and Management Plan 2001- 2002 Phase I (Volumes I and II)*. Submitted to the St. Augustine Lighthouse and Museum, Inc., St. Augustine. Copies available from the Division of Historical Resources, Florida Department of State, Tallahassee.

Morrell, Shannon
2020 Personal communication with the owner of the English Family House, July 2020.

National Park Service (NPS)
2002 *How to Apply the National Register Criteria for Evaluation.* Electronic document, http://www.nps.gov/nr/publications/bulletins/nrb15/, accessed February 2, 2015.

Natural Resource Conservation Service (NRCS)

2020a Web Soil Survey. Electronic resource, http://websoilsurvey.nrcs.usda.gov/app/, accessed May 18, 2020.

2020b Official Soils Series Descriptions. Electronic resource, http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/home/?cid=nrcs142p2_053587, accessed May 18, 2020.

New York Times
1889 *Lumbering in Florida: A Business that Promises Well for Hardy Men, Money to be Made in the Cypress Swamps and Pines Woods with Honest, Hard Work*. Advertisement. December 1, 1889.

Otvos, Ervin G.
1992 Quaternary evolution of the Apalachicola Coast, northeastern Gulf of Mexico. In Charles H. Fletcher, III, and John F. Wehmiller (editors), *Quaternary Coasts of the United States:* Marine and Lacustrine Systems. SEPM Special Publications No. 48, 221-232.

2005 Coastal Barriers, Gulf of Mexico: Holocene Evolution and Chronology. *Journal of Coastal Research Special Issue* 42:141-163.

Pelletier, Jean B., Samuel Turner, Martha R. Williams, Anthony Randolph, and Gregg Brooks
2004 *Historic Assessment and Remote Sensing Survey of the Duval County Shore Protection Sand Source, Duval County, Florida.* R. Christopher Goodwin and Associates, Inc., Frederick, Maryland. Submitted to the U.S. Army Corps of Engineers, Jacksonville District, Jacksonville, Florida. Copies available from the Division of Historical Resources, Florida Department of State, Tallahassee.

Polk County Foreclosures website. Accessed August 2020
https://www.polkcountyforeclosures.com/property-info/1845187/4141-hamilton-rd.

Polk County GIS Map Viewer site. Accessed July and August 2020
http://gisapps.polk-county.net/gisviewer.

Polk County Government and Florida Division of Historical Resource
2019 Homeland Heritage Park Walking Tour - English Log Cabin. Accessed August 2020 https://archive.org/details/Homeland_Heritage_Park_Walking_Tour_-_English_Log_Cabin.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

Tampa Bay Times
1947 "Lakeland Gets Drane Field Landing Area." April 10, 1947.

1966 "State Board Airs Complaints About Phosphate Plants." February 12, 1966.

Tampa Times

1917 "Salary System for County Officers." March 2, 1917.

1927 "Marriage Licenses." June 6, 1927.

1941 "Lakeland's New Airport Cost to Exceed $1,000,000." July 21, 1941.

Tampa Tribune
1906 "Personal Paragraphs." March 27, 1906.

1934 "Aunt Ella to Entertain." May 17, 1934.

1937 James Jackson English obituary. February 28, 1937.

1941a "A.J. Morgan, Pioneer of Polk County Dies, 77." April 18, 1941.

1941b "Drane Field." May 27, 1941.

1942 "Lakeland's New Field Leased by Army Air Corps." May 11, 1942.

1943 "U.S. Jury Fixes Price of Army Air Base Site." July 16, 1943.

1946 "Lakeland Opens Air Freight Line." February 22, 1946.

1947 "NAL to Move Lakeland Base." March 2, 1947.

1959a "New Airport Facility." December 10, 1959.

1959b "New Air Terminal Erected." December 27, 1959.

1967a "Airport Work Bids Below Airport Cost Estimates." August 3, 1967.

1967b "Party Line – Friends Invited on 50th." November 5, 1967.

1968 "Thousands Thrill to Navy Fliers' Exhibition at Lakewood." March 11, 1968.

1974 Aaron Edward Morgan obituary. April 8, 1974.

1991 "Lakeland Airport Named After Industrialist." January 24, 1991.

1994 Reverend Clyde A. Futch. October 16, 1994.

1997 "Airline Might Fly Out of Lakeland." June 22, 1997.

2000a Thelma Futch Morgan obituary. January 21, 2000.

2000b "Lakeland Airport to Get New Terminal." December 2, 2000.

2002 "Lakeland Airport Launches Terminal." April 9, 2002.

South, Stanley
1977 *Method and Theory in Historical Archaeology*. Academic Press, New York.

Stokes, Anne V.

2005 *An Inventory and Evaluation of The Eugene M. Bass National Guard Armory (Bartow Armory), Polk County, Florida*. Southeastern Archaeological Research, Inc., Jonesville, Florida.

University of Florida

2017 George A. Smathers Libraries Map and Imagery Collection. Electronic document, http://ufdcweb1.uflib.ufl.edu/maps, accessed October 16, 2017.

US Bureau of the Census

1900 *Fourteenth* Census of the United States. Accessed August 2020 https://search.ancestry.com/.

1910 *Fourteenth Census of the United States*. Accessed August 2020 https://search.ancestry.com/.

1920 *Fourteenth Census of the United States*. Accessed August 2020 https://search.ancestry.com/.

1930 *Fifteenth Census of the United States*. Accessed August 2020 https://search.ancestry.com/.

1940 *Sixteenth Census of the United States*. Accessed August 2020 https://search.ancestry.com/.

U.S. Department of Agriculture (USDA)

1983 Soil Survey of Manatee County, Florida. U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C.

U.S. Department of the Interior (USDI)

1979 The Archaeological Resources Protection Act. Electronic document, http://www.nps.gov/history/local-law/FHPL_ArchRsrcsProt.pdf, accessed October 17, 2017.

1990 The Native American Graves Protection and Repatriation Act. Electronic document, http://www.nps.gov/history/local-law/FHPL_NAGPRA.pdf, accessed October 17, 2017.

2004 Protection of Historic and Cultural Properties. Electronic document, http://www.achp.gov/regs-rev04.pdf, accessed October 17, 2017.

2012 36 CFR 60, National Register of Historic Places. Electronic document, http://www.gpo.gov/fdsys/granule/CFR-2012-title36-vol1/CFR-2012-title36-vol1-part60, accessed October 17, 2017.

US Geological Survey

1940 "Ownership Map, Pebble Phosphate Field in Hardee, Hillsborough, Manatee and Polk Counties, Florida." Washington, D.C. Accessed July 2020 at http://alabamamaps.ua.edu/historicalmaps/us_states/florida/index_1931-1940.htm.

1944 “Plant City, Fla.” Topographical map. Accessed July 2020 at https://catalog.data.gov/dataset/usgs-1-31680-scale-quadrangle-for-plant-city-fl-1944.

2020 USGS Historical Topographic map explorer. Electronic document, accessed May 18, 2020.

US Selective Service System
1917 World War I Selective Service System Draft Registration Cards, 1917-1918. Aaron Edward Morgan card accessed August 2020 at https://search.ancestry.com/.

Weitze, Karen J.
1999 “Cold War Infrastructure for Air Defense: The Fighter and Command Missions.” Prepared by KEA Environmental, Inc. for Headquarters Air Combat Command, Langley Air Force Base. Accessed August 2020 at http://www.mobileradar.org/Documents/1999-11-02132.pdf.

Appendix A: Qualifications of Investigators

Mark Martinkovic, M.A. is a Registered Professional Archaeologist with over 15 years of experience in the Cultural Resource Management (CRM) industry and exceeds the Secretary of the Interior's Professional Qualification Standards for Archaeology (36 CFR Part 61). Mr. Martinkovic is a Senior Archaeologist based in the Tallahassee, FL office. He has experience in the design, management, and technical execution of historic and archaeological investigations throughout the eastern US, primarily on the Gulf Coast. Since June 2006 he has been employed by AECOM and worked on Department of Transportation and private sector energy projects and also as a Historic Preservation Specialist (archaeologist) for FEMA in various roles on the Gulf Coast. Most recently he has successfully completed the Phase I investigation of 30 miles of proposed pipeline in South Carolina according to state and FERC guidelines. Mr. Martinkovic has also participated in surveys and studies of proposed energy corridors in Florida, primarily assessments of transmission line corridors and power station sites. He also has extensive experience in monitoring and overseeing the excavation of large-scale utility projects, including the installation of a sewer system on the Beauvoir Plantation in Biloxi, MS (2010) and the installation of a combined sewer and natural gas system in historic downtown Pensacola (2000).

Marvin Brown, M.A., has over 35 years of experience in historic and architectural studies, environmental compliance procedures, and project management. This experience includes performing historic architectural surveys in support of state and federal projects in compliance with Section 106 and other statutes and regulations; determination of effects and development of mitigation measures, including Memoranda of Agreement, Programmatic Agreements, Historic Preservation Plans, HABS/HAER-level recordation, and Section 4(f) documentation; environmental documentation including Environmental Impact Statements, Environmental Assessments, and Categorical Exclusions for airport, highway, and other projects; recordation of historic bridges; emergency and long-term response for FEMA projects; and drafting Multiple Property Documentation forms and National Register nominations for individual properties and historic districts. He has completed numerous projects in Florida associated with airports and other resources.

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Appendix B: Cultural Resources and Studies within One Mile of Area of Potential Effect

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Category	FMSF Site ID	Name	Description	Temporal Affiliation	NRHP Status
Archaeological Sites	PO01014	Early	Campsite	Prehistoric lacking pottery	Ineligible for NRHP
	PO01015	Hamilton Branch	Lithic scatter/quarry	Prehistoric lacking pottery	Not Evaluated by SHPO
	PO01016	Poley Creek	Lithic scatter/quarry	Prehistoric lacking pottery	Not Evaluated by SHPO
	PO03156	Bay Ridge	Campsite	Prehistoric lacking pottery	Ineligible for NRHP
	PO03858	Airport Road Foundation	Building remains	Twentieth century American, 1900-present	Ineligible for NRHP
	PO03859	Drane Field Road Foundation	Building remains	Twentieth century American, 1900-present	Not Evaluated by SHPO
Historic Structures	HI00217	Chumney House	Private residence (destroyed)	circa 1910	Ineligible for NRHP
	HI01027	Phagen-Getty-West House	Private residence (destroyed)	circa 1913	Ineligible for NRHP
	HI06528	1312 Lindsey Road	Frame vernacular	circa 1946	Ineligible for NRHP
	HI06535	3010 Wiggins Road	Bungalow	circa 1924	Ineligible for NRHP
	HI06536	3120 Wiggins Road	Frame vernacular	circa 1920	Ineligible for NRHP
	PO01017B	Drane Field Building 2	Military warehouse	1942	Ineligible for NRHP
	PO01017C	Drane Field Building 3	Military warehouse (destroyed)	1942	Ineligible for NRHP
	PO03296	1343 West Pipkin Road	Frame vernacular	1926	Ineligible for NRHP
	PO03297	1343 West Pipkin Road	Frame vernacular	1928	Ineligible for NRHP
	PO04636	4755 Drane Field Road	Frame vernacular	circa 1940	Ineligible for NRHP
	PO04637	4815 Drane Field Road	Frame vernacular	circa 1930	Ineligible for NRHP
	PO04638	5005 Drane Field Road	Frame vernacular	1955	Ineligible for NRHP
	PO04639	4830 Drane Field Road	Frame vernacular	circa 1940	Ineligible for NRHP
	PO04640	5110 Drane Field Road	Frame vernacular	circa 1940	Ineligible for NRHP
	PO07169	1360 West Pipkin Road	Frame vernacular	1954	Ineligible for NRHP
	PO07170	1610 West Pipkin Road	Frame vernacular	1955	Ineligible for NRHP
	PO08223	5140 County Line Road	Frame vernacular	circa 1968	Ineligible for NRHP
Resource Groups	PO07528	Winston & Bone Valley RR	Linear resource	American 1892-present	Eligible for NRHP

	FMSF Survey ID	Report Title	Author	Year
Cultural Resource Management Studies	1407	Cultural resource assessment survey of the proposed West Lakeland development site, Polk County, Florida	AUSTIN, ROBERT J.	1987
	1710	An Archaeological Survey of Segment 3, County Line Road, Polk/Hillsborough counties, Florida	WILLIAMS, J. RAYMOND	1988
	2132	Cultural resource assessment for the Oakbridge DRI, Drummond Properties, Lakeland, Polk Co., Florida	DICKINSON, MARTIN F.	1985
	3516	Archaeological / Historical Resource Evaluation for Polk Parkway (West Leg), Hillsborough and Polk Counties, Florida	HDR ENGINEERING, INC.	1993
	3776	A Cultural Resource Assessment Survey of the Drane Field Road/State Road 572 (Airport Road) Interchange Improvements Project, Polk County, Florida	BELLOMO, RANDY V.	1994
	4571	Drane Field Road Cultural Resources Survey and Assessment, Polk County, Florida	SOUTHARC, INC.	1995
	5409	Hillsborough County Historic Resources Survey Report	MAIO, TERESA	1998
	5828	Archaeological Site Location Predictive Model for the City of Lakeland	DEMING, JOAN	1999
	6733	Cultural Resource Assessment Survey of The Realignment of Medulla Road Between County Line Road and Existing Medulla Road Polk County, Florida	ALMY, MARION	2000
	7998	An Archaeological and Historical Survey of the Plant City/ Griffis Tower Site in Hillsborough County, Florida	AMBROSINO, JAMES N.	2001
	7458	An Archaeological and Historical Survey of the Proposed Medulla and Drainfield Tower Location in Hillsborough County, Florida	AMBROSINO, MEGHAN L.	2001
	8564	An Archaeological and Historical Survey of the Proposed Medulla & Drainfield Tower (Revised) Location in Hillsborough County, Florida	Sims, Cynthia L.	2001
	9136	AT&T Cellular Tower, French River Site, Polk County, Florida	WAYNE, LUCY B.	2003

	9804	Identification and Evaluation of Historic Properties Within the One Mile Area of Potential Effects of the Proposed Lakeland Electric Wireless Telecommunications Tower (Verizon Wireless 088096-6), Polk County, Florida (DEA Project Number 20401014)	Parker, Brian T.	2004
	10059	Assessment of Potential Effects Upon Historic Properties: Proposed 150-foot Old Medulla Road Wireless Telecommunications Tower (Verizon Wireless 088096-5), Polk County Florida	Florida Archaeological Consulting, Inc.	2004
	11647	An Inventory and Evaluation of the Lakeland National Guard Armory (Lakeland Armory), Polk County, Florida	Stokes, Anne V.	2005
	11918	An Archaeological and Historical Survey of the English Creek Project Area in Polk County, Florida	Driscoll, Kelly A	2005
	13061	A Phase 1 Cultural Resource Survey of the Lakeland Central Park DRI, Polk County, Florida	Stokes, Anne V.	2006
	14659	FCC Form 620: CSX Parkway Frontage Road Telecommunications Tower Site (Verizon Wireless Personal Communications LP 088307-1) Polk County, Florida	Parker, Brian T.	2007
	15860	An Archaeological and Historical Survey of the 10080881 - Scott Lake Tower in Polk County, Florida FCC Form 620	Bland and Associates, Inc.	2008
	16075	A Phase I Cultural Resources Assessment Survey Report West Pipkin Road Widening Project from Medulla Road to Old Highway 37	Cremer, David	2008
	17574	Administrative Action Environmental Assessment: State Road 563 (North/South Route) from State Road 37 (South Florida Avenue) to Drane Field Road, Polk County, Florida	Federal Highway Administration	1993
	18459	Cultural Resource Assessment Survey Wabash Avenue Extension PD&E Study Polk County, Florida	Brouwer, Kaitlyn T.	2011
	22724	Cultural Resource Assessment Survey of the Rice Road Commerce Center Property, Hillsborough County, Florida	ACI	2016
	24982	Cultural Resource Assessment Survey of the Lakeland-Linder Regional Airport Properties, Polk County, Florida	ACI	2018

	26804	A Cultural Resources Assessment Survey of the Publix Supermarket Development Project Parcel, 5140 County Line Road, Lakeland, Polk County, Florida	Mankowski, Joseph F.	2019

Appendix C: Shovel Test Log

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STP #	Strat	Depth (cm)	Munsell #	Munsell Color	Texture	Artifacts	Comments
A1	I	0-50	10YR 3/2	Very Dark Grayish Brown	FILL Sand	NCM	Limestone chunks; impasse
B1	I	0-42	10YR 3/2	Very Dark Grayish Brown	FILL Sand	NCM	Concrete & asphalt
C1	I	0-20	2.5Y 2.5/1	Black	Fine Sand	NCM	Larger area, heavily disturbed;
	II	20-35	2.5Y/2.5/1 & 4/1	Black & Dark Gray	Fine Sand	NCM	Spoil piles and concrete rubble; Water @ 20 cmbs
C2	I	0-15	2.5Y 2.5/1 & 4/1	Black	Fine Sand	NCM	Filled and graded -active construction site
	II	15-30	2.5Y 6/3	Light Yellowish Brown	Fine Sand	NCM	Water @ 30cmbs
C3	I	0-16	2.5Y 2.5/1	Black	Fine Sand	NCM	Filled and graded -active construction site
	II	16-40	2.5Y 6/3	Light Yellowish Brown	Fine Sand	NCM	Water @ 35cmbs
D1	I	0-18	2.5Y 2.5/1	Black	Fine Sand	NCM	Filled and graded -active construction site
	II	18-40	2.5Y 2.5/1 & 4/1	Black & Dark Gray	Fine Sand	NCM	Water @ 35cmbs
D2	I	0-20	2.5Y 2.5/1	Black	Fine Sand	NCM	Filled and graded -active construction site
	II	20-40	2.5Y 6/3	Light Yellowish Brown	Fine Sand	NCM	Water @30
E1	I	0-100	2.5Y 4/1	Dark Gray/Light Gray	FILL Sand	NCM	Smaller area; graded
E2	I	0-16	2.5Y 3/1	Very Dark Gray	Fine Sand	NCM	Fill sand with gravel
	II	16-44	2.5Y 2.5/1	Black	Fine Sand	NCM	
	III	44-62	2.5Y 4/3	Olive Brown	Fine Sand	NCM	
	IV	62-90	2.5Y 6/3	Light Yellowish Brown	Fine Sand	NCM	
	V	90-100	2.5Y 8/1	White	Fine Sand	NCM	
F1	I	0-68	2.5Y 3/2, 4/3	Dark Gray/Light Gray, Brown	FILL Sand	NCM	Limestone chunks
	II	68-100	2.5Y 3/2	Very Dark Grayish Brown	Fine Sand	NCM	
F2	I	0-23	2.5Y3/1	Very Dark Gray	Fine Sand	NCM	
	II	23-50	2.5Y/2.5/1	Black	Fine Sand	NCM	
	III	50-60	2.5Y 4/3	Olive Brown	Fine Sand	NCM	
	IV	60-87	2.5Y 6/3	Light Yellowish Brown	Fine Sand	NCM	
	V	87-95	2.5Y 8/1	White	Fine Sand	NCM	Water @ 90 cmbs

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Appendix D: FMSF Forms

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08452
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Robberson House
Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS
Survey # (DHR only) ______
National Register Category (please check one) ☒ building ☐ structure ☐ district ☐ site ☐ object
Ownership: ☐ private-profit ☐ private-nonprofit ☒ private-individual ☐ private-nonspecific ☐ city ☐ county ☐ state ☐ federal ☐ Native American ☐ foreign ☐ unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4514		Windee	Avenue	

Cross Streets (nearest / between) between Holden and Old Medulla roads
USGS 7.5 Map Name NICHOLS
USGS Date 1987
Plat or Other Map ______
City / Town (within 3 miles) Lakeland
In City Limits? ☒ yes ☐ no ☐ unknown
County ______
Township 29S
Range 23E
Section 3
¼ section: ☐ NW ☐ SW ☐ SE ☐ NE
Irregular-name: ______
Tax Parcel # 239030000000044040
Landgrant ______
Subdivision Name ______
Block ______
Lot ______
UTM Coordinates: Zone ☐ 16 ☐ 17
Easting ______
Northing ______
Other Coordinates: X: ______ Y: ______
Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1930 ☒ approximately ☐ year listed or earlier ☐ year listed or later

		From (year):	To (year):
Original Use	Residence, private		
Current Use	Residence, private		
Other Use			

Moves: ☐ yes ☒ no ☐ unknown Date: ______ Original address ______
Alterations: ☒ yes ☐ no ☐ unknown Date: ______ Nature see attachment
Additions: ☐ yes ☒ no ☐ unknown Date: ______ Nature ______
Architect (last name first): ______
Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)

see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐ yes ☐ no ☒ unknown Describe ______

DESCRIPTION

Style Craftsman
Exterior Plan Rectangular
Number of Stories 1
Exterior Fabric(s) 1. Aluminum 2. ______ 3. ______
Roof Type(s) 1. Gable 2. ______ 3. ______
Roof Material(s) 1. Asphalt shingles 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)

see attachment

Distinguishing Architectural Features (exterior or interior ornaments)

see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)

none

DHR USE ONLY — OFFICIAL EVALUATION — DHR USE ONLY

NR List Date ______
☐ Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐ yes ☐ no ☐ insufficient info Date ______ Init. ______
KEEPER – Determined eligible: ☐ yes ☐ no Date ______
NR Criteria for Evaluation: ☐ a ☐ b ☐ c ☐ d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08452

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Piers 2. ______
Foundation Material(s): 1. Concrete Block 2. ______

Main Entrance (stylistic details)
none

Porch Descriptions (types, locations, roof types, etc.)
modern

Condition (overall resource condition): ☐ excellent ☒ good ☐ fair ☐ deteriorated ☐ ruinous

Narrative Description of Resource
see attachment

Archaeological Remains ______ ☐ Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

- ☐ FMSF record search (sites/surveys)
- ☐ FL State Archives/photo collection
- ☐ property appraiser / tax records
- ☒ cultural resource survey (CRAS)
- ☐ library research
- ☐ city directory
- ☒ newspaper files
- ☐ historic photos
- ☒ building permits
- ☐ occupant/owner interview
- ☐ neighbor interview
- ☐ interior inspection
- ☐ Sanborn maps
- ☐ plat maps
- ☐ Public Lands Survey (DEP)
- ☐ HABS/HAER record search
- ☐ other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)
see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐ yes ☒ no ☐ insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐ yes ☒ no ☐ insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)
see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)
❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable). Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Robberson House – 4514 Windee Avenue (PO08452) (AECOM Resource #1)

Tax records assign the house at 4514 Windee Avenue a 1930 construction date. Google Maps photographs of it from 2011, which predate major alterations, suggest that it may well have been built in the 1930s. Currently, though, the house is almost unrecognizable as a dwelling from that time, as only its basic form remains intact. The house's owner, Kenneth L. Robberson, acquired it via a quitclaim deed from the estate of his brother, Jerry W. Robberson, in 2004 (Polk County Deed Book 5471/Page 0378). Jerry Robberson (1944-2003) was not its original owner, as the house predates his birth and he did not come to Lakeland until 1956 (*Lakeland Ledger* 2003).

In 2011, according to Google Maps photos taken that year, the house had a frame, one-story, gable-front, central block (Figure 2 through Figure 4). This was crossed at the front (west) by a partially enclosed gable-roofed porch and at the rear (east) by a perpendicular, gable-end, frame block. The house had double-hung sash windows, a seam-metal roof, and aluminum siding. Since 2011 the porch has been removed and replaced by an open porch; bays have been covered or shifted and windows and doors have been replaced; new artificial siding has been added; and a gable-front rather than gable-end roof has been placed atop the rear ell. The house continues to stand on concrete blocks. The house's many significant alterations suggest that after the 2011 photographs were taken, it was essentially stripped down to its studs and rebuilt, resulting in its current appearance. Bing Maps photographs from 2014 depict the house as it is at present, dating its alterations to between 2011 and 2014.

The Robberson House is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. The house does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. Additionally, due to its substantial alterations, the house is believed to have lost its integrity of design, materials, workmanship, feeling, and association. Its setting remains largely intact and it presumably stands at its original location.

Figure 1. Robberson House in 2011: left, north side and west front elevations; right, west front and south side elevations (source: https://www.google.com/maps).


Figure 2. Robberson House in 2020: left, north side and west front elevations; right, west front and south side elevations.


Figure 3. Robberson House: left, west front and south side elevations in 2020; right, same elevations in 2014 (source: https://www.bing.com/maps/).

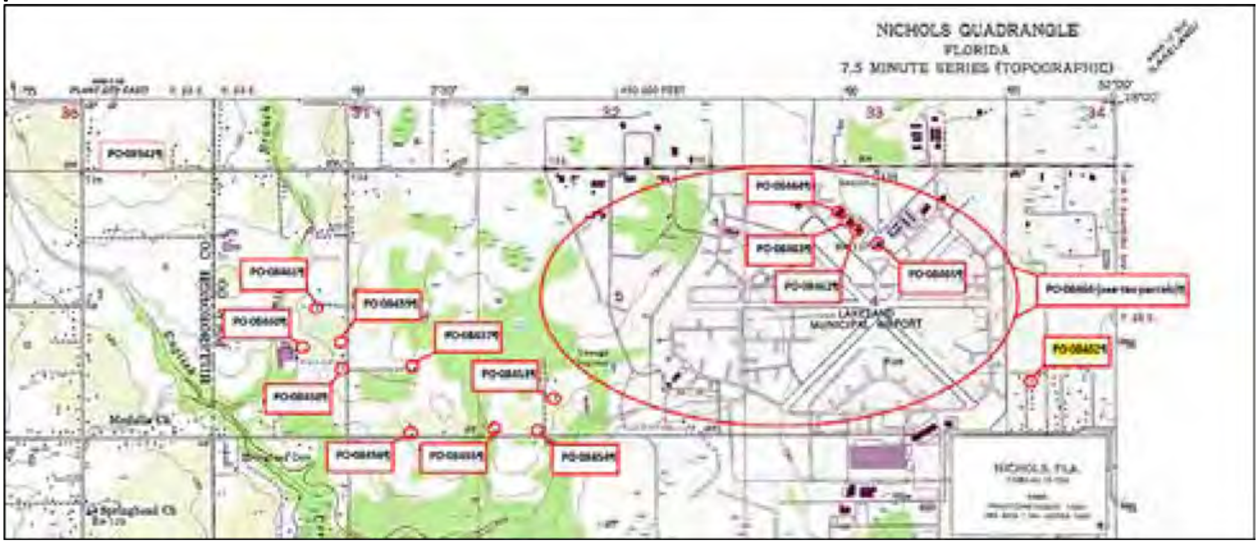
REFERENCES

Lakeland Ledger
2003 C.J. "Jack" English obituary. November 25, 2003.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 239030000000044040, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08453
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Aaron E. and Maude Morgan House
Multiple Listing (DHR only) ____
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS
Survey # (DHR only) ____
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4510		Aaron Morgan	Road	

Cross Streets (nearest / between) E side of Aaron Morgan Road north of Medulla road
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ____
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ____
Township 29S Range 23E Section 5 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ____
Tax Parcel # 232905000000042030 Landgrant ____
Subdivision Name ____ Block ____ Lot ____
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ____ Y: ____ Coordinate System & Datum ____
Name of Public Tract (e.g., park) ____

HISTORY

Construction Year: 1924 ☒approximately ☐year listed or earlier ☐year listed or later
Original Use Residence, private From (year): ____ To (year): ____
Current Use Residence, private From (year): ____ To (year): ____
Other Use ____ From (year): ____ To (year): ____
Moves: ☐yes ☒no ☐unknown Date: ____ Original address ____
Alterations: ☐yes ☒no ☐unknown Date: ____ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ____ Nature ____
Architect (last name first): ____ Builder (last name first): ____
Ownership History (especially original owner, dates, profession, etc.)

see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ____

DESCRIPTION

Style Frame Vernacular Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Siding-novelty 2. ____ 3. ____
Roof Type(s) 1. Gable 2. ____ 3. ____
Roof Material(s) 1. Asphalt shingles 2. ____ 3. ____
Roof secondary strucs. (dormers etc.) 1. ____ 2. ____
Windows (types, materials, etc.)

see attachment

Distinguishing Architectural Features (exterior or interior ornaments)

see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)

barn

DHR USE ONLY OFFICIAL EVALUATION DHR USE ONLY

NR List Date ____
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ____ Init. ____
KEEPER – Determined eligible: ☐yes ☐no Date ____
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

Florida Master Site File / Div. of Historical Resources / R. A. Gray Bldg / 500 S Bronough St., Tallahassee, FL 32399-0250
Phone 850.245.6440 / Fax 850.245.6439 / E-mail SiteFile@dos.myflorida.com

HISTORICAL STRUCTURE FORM

Site #8 PO08453

DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Piers 2. ______
Foundation Material(s): 1. Brick 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☒excellent ☐good ☐fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐FMSF record search (sites/surveys)
☐FL State Archives/photo collection
☐property appraiser / tax records
☒cultural resource survey (CRAS)
☐library research
☐city directory
☒newspaper files
☐historic photos
☒building permits
☐occupant/owner interview
☐neighbor interview
☐interior inspection
☐Sanborn maps
☐plat maps
☐Public Lands Survey (DEP)
☐HABS/HAER record search
☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☒yes ☐no ☐insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☒yes ☐no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Architecture
2. ______
3. ______
4. ______
5. ______
6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)
❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Aaron E. and Maude Morgan House – 4510 Aaron Morgan Road (PO08453) (AECOM Resource #2)

Aaron Edward Morgan (1893-1974) and Maude Miranda Morgan (1897-1971) are likely the original owners of this house, which tax records assign a construction date of 1924. By 1917 (US Selective Service System), when Aaron registered for the draft, they were already married and had a young child. Aaron was the son of Aaron Joseph Morgan, a citrus grower, cattleman, and state representative (*Tampa Times* 1917). In 1920, according to census records, the Morgans were living in the Medulla area—where the house is located—as was Aaron's father. They lived in the same area in 1930 and 1940. All three censuses, as well as Aaron's draft registration, identify him as a farmer (US Bureau of the Census 1920, 1930, and 1940). His obituary noted that he was a lifelong Polk County resident who also drove a school bus (*Tampa Tribune* 1974).

In 1976, with both Morgans deceased, the Aaron E. Morgan Estate transferred this property to Ruth Morgan Bell (Polk County Deed Book 1678/Page 1221). Ruth was the Morgans' youngest child. She and her husband, Charles W. Bell, continue to own it (Polk County Deed Book 9864/Page 2248 (2016)).

The marital status and ages of the Morgans and the farmhouse's form and Craftsman-style features suggest that it was erected around 1924, the date tax records assign it (Figure 1 through Figure 4). The frame house is one-story tall. Its west-facing front block has an asphalt-shingled gable-end roof and rests on brick piers. A door is centered at the front elevation, flanked by paired, double-hung, sash windows. The Craftsman-style four-vertical-light-over-one-light sash suggests the windows are original. The Craftsman-style glass-paned front door also appears to be original. Plain surrounds frame the door and windows. A hipped-roof porch supported by plain wooden posts and underpinned by exposed rafter tails—yet another Craftsman feature—extends across the facade's full length. Exposed rafter tails also mark the wide overhanging eaves of the block's roof and those of its small ventilated dormer, which is centered over the entry. A brick exterior-end chimney extends through the wide overhang on the block's south side elevation The block is clad in original German siding that terminates at plain cornerboards.

A gable-roofed ell extending from the northern portion of the block's rear elevation gives the house an L-shaped footprint. Within the legs of the ell, a formerly open porch has been enclosed. A small later addition extends to the rear of the ell and porch.

To the house's rear (east), thick round poles support the gabled sheet-metal roof of an open pole barn that is less than 50 years old (Figure 4 through Figure 6). Shaded by the roof is an earlier building that appears to be largely built of slender, round, saddle-notched, unchinked logs. (Due to Covid concerns and no-trespassing signs, access to the property and its resources was limited.) Log buildings were erected in Polk and other northern and central Florida counties into the late nineteenth century (Florida Association of the American Institute of Architecture 2017: 4, 23, 108). The extant English Family Log Cabin, now located in Homeland Heritage Park, was moved to Homeland from elsewhere in Polk County. Constructed of round saddle-notched logs, it dates from about 1890 (Hacking, Forbes, and Jones 2006). Whether this building was erected in the late nineteenth century could not be determined.)

The house and barn stand in the northwest corner of an approximately 16-acre rectangular parcel that fronts on Aaron Morgan Road. To their east and south is a no-longer-active citrus grove that encompasses about half of the parcel. The eastern half of the parcel is wooded. The land to the parcel's east, south, and west remains largely rural, marked by open fields, woodland, and scattered houses. Only to the immediate north, where a trailer park was established in the early 2000s, has modern development encroached on the setting.

The Aaron E. and Maude Morgan House is recommended as eligible for NR listing under Criterion C for its architecture. It is a good intact representative of an early-twentieth-century Polk County farmhouse. It retains its original form, German siding, plain surrounds, front porch, and cornerboards, as well as its original Craftsman-style sash, doors, and overhanging eaves with exposed rafter tails. The only notable alterations appear to be the enclosure of a rear porch, which is clad in matching German siding, and the addition of a small room to the rear of the ell. Further, the house appears to stand on its original site. The Morgan House is therefore believed to retain its integrity of location, design, setting, materials, workmanship and, by extension, feeling and association.

The Morgan House's NR boundaries are recommended as the boundaries of its approximately 16-acre parcel (Polk County parcel 232905000000042030) on its north, east, and south (Figure 7). On it west, where the parcel reaches toward Aaron Morgan Road, its boundary is recommended as ending on the east side of the county-maintained shallow ditch and road right-of-way. (It is not clear from tax maps whether the parcel already terminates there.) Contained within this boundary are the house and barn, both of which are contributing buildings, the former citrus grove, and woodland, all of which were historically associated with the property.

Figure 1. Aaron E. and Maude Morgan House: west front and south side elevations, 2020

Figure 2. Aaron E. and Maude Morgan House: west front and south side elevations showing German siding and Craftsman-style windows, door, and exposed rafter tails, 2020.

Figure 3. Aaron E. and Maude Morgan House: left, south side elevation at rear (north end) of house with front (west) elevation of barn at far right, 2020; right, aerial depicting west front and south side elevations and roof lines, no date (source: https://www.google.com/maps).

Figure 4. Aaron E. and Maude Morgan House: left, aerial depicting east rear and north side elevations, no date (source: https://www.google.com/maps); right, west front and south side elevations of barn to rear of house, 2020.

Figure 5. Aaron E. and Maude Morgan House: west front and south side elevations of pole barn and log building within it, 2020.

Figure 6. English Family Log Cabin, Homeland Heritage Park in Polk County, built c1890 (source: Polk County Government 2019).

Figure 7. Aaron E. and Maude Morgan House: recommended NR boundaries (Polk County parcel 232905000000042030).

REFERENCES

Florida Association of the American Institute of Architecture, editors
2017 *A Guide to Florida's Historic Architecture*. University of Florida Press, Gainesville. Accessed August 2020 at https://ufdcimages.uflib.ufl.edu/AA/00/06/13/81/00001/AA00061381_00001.pdf.

Hacking, Gary, Jessica Forbes, and Robert O. Jones
2006 Homeland School National Register of Historic Places National Register registration form. Accessed August 2020 at https://npgallery.nps.gov/NRHP/GetAsset/e6d07b1d-9531-46c8-9ad7-9de753772f06.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

Tampa Times
1917 "Salary System for County Officers." March 2, 1917.

Tampa Tribune
1974 Aaron Edward Morgan obituary. April 8, 1974.

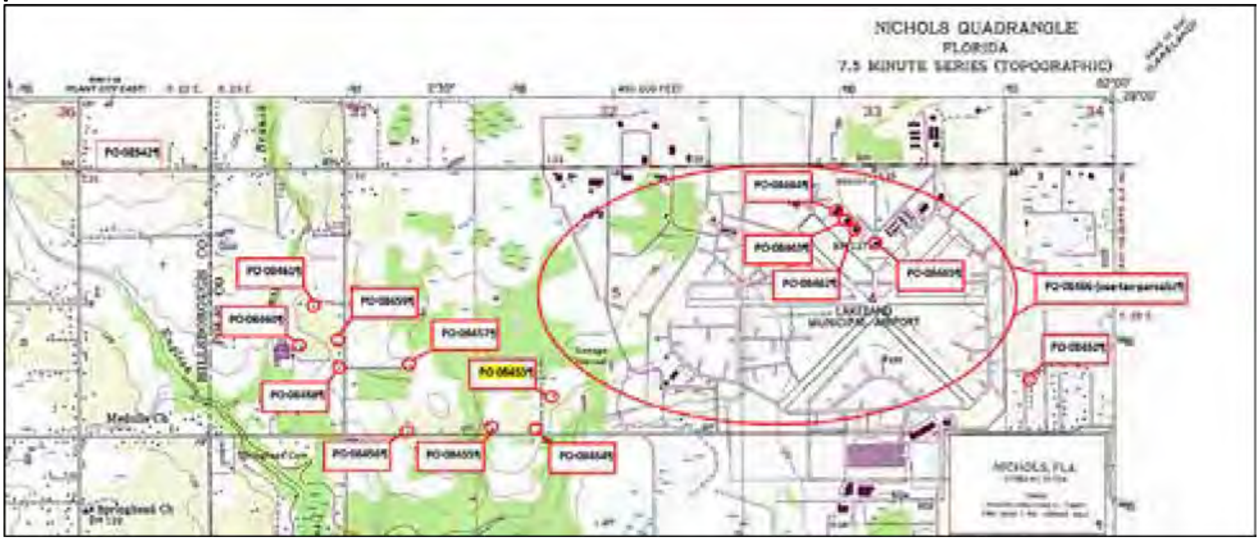
US Bureau of the Census
1920 *Fourteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

1930 *Fifteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

1940 Six*teenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

US Selective Service System
1917 World War I Selective Service System Draft Registration Cards, 1917-1918. Aaron Edward Morgan card accessed August 2020 at https://search.ancestry.com/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232905000000042030, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

[x] Original
[ ] Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site#8 PO08454
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Site Name(s) (address if none) Morgan Family House 1 Multiple Listing (DHR only) ________
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ________
National Register Category (please check one) [x] building [ ] structure [ ] district [ ] site [ ] object
Ownership: [ ] private-profit [ ] private-nonprofit [x] private-individual [ ] private-nonspecific [ ] city [ ] county [ ] state [ ] federal [ ] Native American [ ] foreign [ ] unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4405		Medulla	Avenue	

Cross Streets (nearest / between) NW corner of jct of Aaron Morgan & Medulla roads
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ________
City / Town (within 3 miles) Lakeland In City Limits? [x] yes [ ] no [ ] unknown County ________
Township 29S Range 23E Section 5 ¼ section: [ ] NW [ ] SW [ ] SE [ ] NE Irregular-name: ________
Tax Parcel # 232905000000044010 Landgrant ________
Subdivision Name ________ Block ________ Lot ________
UTM Coordinates: Zone [ ] 16 [ ] 17 Easting ________ Northing ________
Other Coordinates: X: ________ Y: ________ Coordinate System & Datum ________
Name of Public Tract (e.g., park) ________

HISTORY

Construction Year: 1920 [ ] approximately [ ] year listed or earlier [x] year listed or later
Original Use Residence, private From (year): ________ To (year): ________
Current Use Residence, private From (year): ________ To (year): ________
Other Use ________ From (year): ________ To (year): ________
Moves: [ ] yes [x] no [ ] unknown Date: ________ Original address ________
Alterations: [x] yes [ ] no [ ] unknown Date: ________ Nature see attachment
Additions: [ ] yes [x] no [ ] unknown Date: ________ Nature ________
Architect (last name first): ________ Builder (last name first): ________
Ownership History (especially original owner, dates, profession, etc.)

see attachment

Is the Resource Affected by a Local Preservation Ordinance? [ ] yes [ ] no [x] unknown Describe ________

DESCRIPTION

Style Frame Vernacular Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Aluminum 2. ________ 3. ________
Roof Type(s) 1. Gable 2. ________ 3. ________
Roof Material(s) 1. Sheet metal:3V crimp 2. ________ 3. ________
Roof secondary strucs. (dormers etc.) 1. ________ 2. ________
Windows (types, materials, etc.)

see attachment

Distinguishing Architectural Features (exterior or interior ornaments)

see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)

none

DHR USE ONLY OFFICIAL EVALUATION DHR USE ONLY

NR List Date ________
[ ] Owner Objection

SHPO – Appears to meet criteria for NR listing: [ ] yes [ ] no [ ] insufficient info Date ________ Init. ________
KEEPER – Determined eligible: [ ] yes [ ] no Date ________
NR Criteria for Evaluation: [ ] a [ ] b [ ] c [ ] d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08454

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Piers 2. ______
Foundation Material(s): 1. Concrete Block 2. ______

Main Entrance (stylistic details)

none

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐ excellent ☒ good ☐ fair ☐ deteriorated ☐ ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐ Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐ FMSF record search (sites/surveys)
☐ FL State Archives/photo collection
☐ property appraiser / tax records
☒ cultural resource survey (CRAS)
☐ library research
☐ city directory
☒ newspaper files
☐ historic photos
☒ building permits
☐ occupant/owner interview
☐ neighbor interview
☐ interior inspection
☐ Sanborn maps
☐ plat maps
☐ Public Lands Survey (DEP)
☐ HABS/HAER record search
☐ other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐ yes ☒ no ☐ insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐ yes ☒ no ☐ insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Morgan Family House 1– 4405 Medulla Road (PO08454) (AECOM Resource #3)

This house stands at the intersection of Medulla and Aaron Morgan roads, in the southeastern corner of a 40-acre tract (Polk County parcel 232905000000044010) once owned by the estate of Aaron Joseph Morgan (1863-1941) and his wife, Dollie A. Morgan (1864-1957). In 1943, in association with the construction of Lakeland Army Air Base, A. Joseph Morgan's estate was awarded more than $15,000 as compensation for the taking of "homestead property of 160 acres." An additional 200 acres of the estate was valued at $8,500 (*Tampa Tribune* 1943). This parcel, not taken for the base, subsequently came into the hands of one of the Morgans' sons, Harley G. Morgan (1898-1977), and his wife, Thelma Futch Morgan (1910-2000). In 1976 they conveyed the land, which includes more than one house, to their daughter, Betty L. Howard, who still owns it (Polk County Deed Book 2883/Page 1542; *Tampa Tribune* 2000a). It is unlikely that the olders Morgans lived in this small house, which carries a tax date of 1920. A. Joseph Morgan's obituary described him as a prominent two-term state legislator (1919 and 1921) who was a "successful citrus grower and cattleman" (*Tampa Tribune* 1941a). Harley G. Morgan, also a cattleman (*Tampa Bay Times* 1966), and his wife may have lived on the property; if so, it is not known which of the two houses they occupied. This house's modest size and form suggest it was a tenant house.

Photographs taken in 2011, before the house underwent a major renovation, depict a dwelling that may indeed have been built around 1920, the assigned tax date (Figure 1 through Figure 4). In 2011 the small, gable-front, frame house—about 16' across and 24' deep according to tax records—was sided in heavily weathered vertical boards without battens and topped by a metal roof. Its two-bay-wide south-facing front facade was shaded by a plainly finished porch covered by a metal shed porch. To its rear (north) extended an ell faced with T111-type siding that had a double-pitched shed roof. Tax records identify much of the ell as a formerly open porch. Between 2011 and 2019, the old front porch was replaced by one with square posts and a balustrade. The front door was also replaced. A new metal roof was set atop the house and it received new artificial siding. Its two-over-two, double-hung, sash windows were cleaned or replaced in kind; the plain window surrounds were cleaned and painted. The rear ell was also re-sided.

Due to its many post-2011 alterations, the house is believed to have lost its integrity of design, materials, workmanship and, accordingly, feeling and association. Its setting appears to be largely intact and it likely continues to stand on the location upon which it was built, but overall it has lost its integrity. Additionally, the house is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. The house does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. Due to its loss of integrity and lack of significance, the house is recommended as not eligible for NR listing.

Figure 1. Morgan Family House 1: left, south front elevation, c2014 (source: https://www.bing.com/maps/); right, west side and south front elevations in 2019 (source: https://www.google.com/maps).

Figure 2. Morgan Family House 1: left, south front and east side elevations in 2011 and, at right, in 2019 (source of both: https://www.google.com/maps).

Figure 3. Morgan Family House 1: left, east side elevation in 2011 (source: https://www.google.com/maps) and, at right, in 2020.

Figure 4. Morgan Family House 1: east side and north rear elevations, 2011 (source: https://www.google.com/maps).

REFERENCES

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

Tampa Bay Times
1966 "State Board Airs Complaints About Phosphate Plants." February 12, 1966.

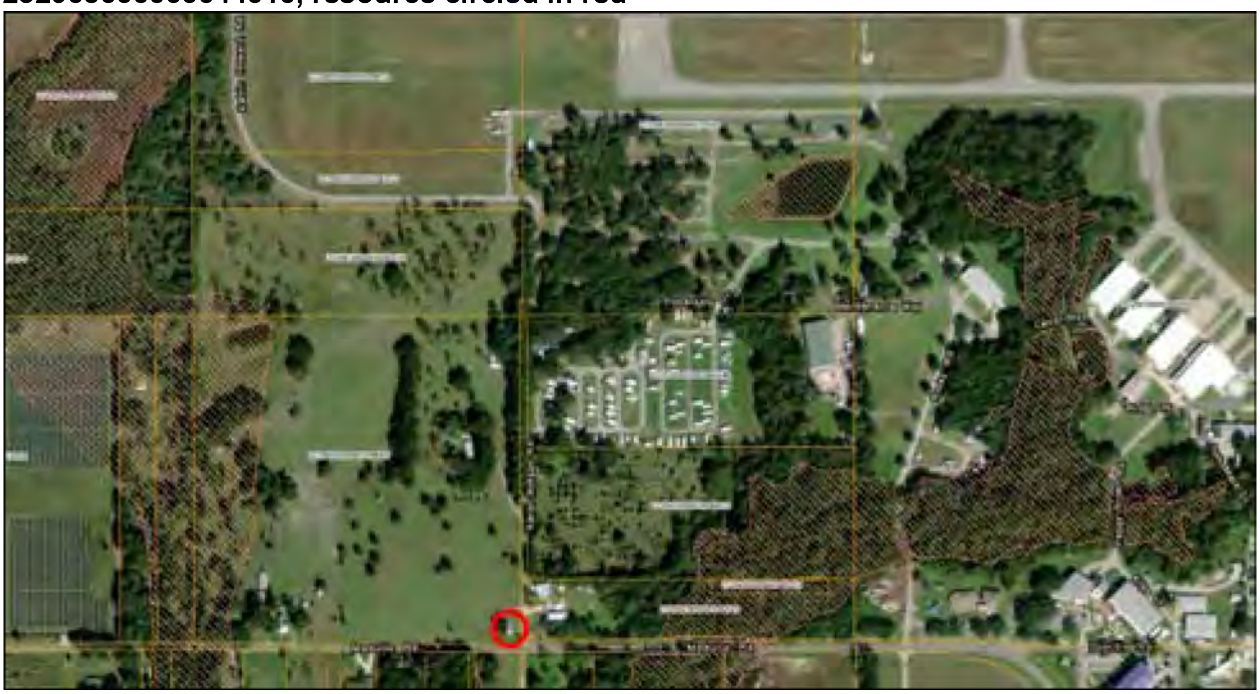
Tampa Tribune
1941a "A.J. Morgan, Pioneer of Polk County Dies, 77." April 18, 1941.

1943 "U.S. Jury Fixes Price of Army Air Base Site." July 16, 1943.

2000a Thelma Futch Morgan obituary. January 21, 2000.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised

Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232905000000044010, resource circled in red



Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08455
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Morgan Family House 2 Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ______
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

Street Number	Direction	Street Name	Street Type	Suffix Direction
Address: 4415		Medulla	Avenue	

Cross Streets (nearest / between) between Aaron Morgan & Hamilton rds
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ______
Township 29S Range 23E Section 5 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ______
Tax Parcel # 232905000000044010 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1935 ☐approximately ☐year listed or earlier ☒year listed or later
Original Use Residence, private From (year): ______ To (year): ______
Current Use Residence, private From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: ☐yes ☒no ☐unknown Date: ______ Original address ______
Alterations: ☒yes ☐no ☐unknown Date: ______ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ______

DESCRIPTION

Style Frame Vernacular Exterior Plan Square Number of Stories 1
Exterior Fabric(s) 1. Novelty siding 2. ______ 3. ______
Roof Type(s) 1. Hip 2. ______ 3. ______
Roof Material(s) 1. Sheet metal:3V crimp 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY OFFICIAL EVALUATION DHR USE ONLY

NR List Date ______
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ______ Init ______
KEEPER – Determined eligible: ☐yes ☐no Date ______
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08455

DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Piers 2. ______
Foundation Material(s): 1. Concrete Block 2. ______
Main Entrance (stylistic details)

none

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☒good ☐fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐FMSF record search (sites/surveys)
☐FL State Archives/photo collection
☐property appraiser / tax records
☒cultural resource survey (CRAS)
☐library research
☐city directory
☒newspaper files
☐historic photos
☒building permits
☐occupant/owner interview
☐neighbor interview
☐interior inspection
☐Sanborn maps
☐plat maps
☐Public Lands Survey (DEP)
☐HABS/HAER record search
☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Morgan Family House 2– 4415 Medulla Road (PO08455) (AECOM Resource #4)

Morgan Family House 2 stands on the same 40-acre tract (Polk County parcel 232905000000044010) as Morgan Family House 1 does. It is located, however, near the southwest corner of the parcel facing Medulla Road. The known history of the two houses is nearly identical. The 40-acre parcel was once owned by the estate of Aaron Joseph Morgan (1863-1941) and his wife, Dollie A. Morgan (1864-1957). In 1943, in association with the construction of Lakeland Army Air Base, A. Joseph Morgan's estate was awarded more than $15,000 as compensation for the taking of "homestead property of 160 acres." An additional 200 acres of the estate was valued at $8,500 (*Tampa Tribune* 1943). This parcel, not taken for the base, subsequently came into the hands of one of the Morgans' sons, Harley G. Morgan (1898-1977), and his wife, Thelma Futch Morgan (1910-2000). It is unlikely that the olders Morgans lived in this house, which carries a tax date of 1935. A. Joseph Morgan's obituary described him as a prominent two-term state legislator (1919 and 1921) who was a "successful citrus grower and cattleman" (*Tampa Tribune* 1941a). The house was more likely first occupied by Harley Morgan, who was also a cattleman (*Tampa Bay Times* 1966), and his wife.

In 1920 (US Bureau of the Census) Harley Morgan was unmarried and still living with his parents. In that census he listed his occupation as a laborer on the "home farm." By 1930 he was married to Thelma and farming his own land. He was 32, she was 20, and their one child, Darwin, was two. In the order that the census was taken, four Morgan families lived one after the other: the elder Morgans were visited first, then Harley and Thelma, then brother and sister-in-law Aaron E. and Maude Morgan, and then another brother and his wife, G. Bascom and Eva Morgan.

In 1976 Harley and Thelma Morgan conveyed the 40 acres to their daughter, Betty L. Howard (Polk County Deed Book 2883/Page 1542; *Tampa Tribune* 2000a). She continues to own the property and occupies this house. On a field visit—due to Covid and privacy concerns—it was forcefully requested that no photos of the house or outbuildings be taken from the property or the public right-of-way. One image was taken while driving away, but the other images below were taken by Google Earth and Maps in November 2019. Compared to views of the property driving by, the house appears unchanged since they were taken.

Tax records place the house's construction in 1935 (Figure 1 through Figure 6). Its dimensions and L-plan footprint are nearly identical (according to tax records) to those of the Aaron Morgan House to the east, which has a tax date of 1924. Both houses are one-story tall, of frame construction, German sided, and edged with cornerboards. This house lacks Craftsman-style details, though. It does not have exposed rafter tails at the roof of its main block or porch and its windows appear to be one-over-one. This suggests the house may well have been built in the 1930s. A seam-metal hipped roof tops the main block and the full-facade porch to its front (south). The porch has plain square posts and a heavy infill of modern decorative metal grillwork. The windows on the east and west side elevations are covered by the same grillwork. An narrow, exterior-end, brick chimney stack rises along the west side elevation of the main block, which is extended to the rear by a one-story gable-end ell. The L-shaped porch that extended along the rear of main block and ell has been largely enclosed.

The house has seven associated outbuildings. To its east are two modern, taupe-colored, shed-roofed sheds that do not appear on Bing Maps aerials taken in December 2014. Between these sheds and the house's east side elevation stands a gable-front frame garage with sliding wooden doors that may be more than 50 years old. Three outbuildings are arrayed to the house’s rear: a white shed-roofed shed and two taupe-colored gable-roofed sheds. The white shed may be more than 50 years old; the taupe sheds appear to have been built more recently. A long gable-roofed pole barn stands to the house’s northwest. The varied pitches and conditions of its roof suggest it was built in three sections. Its first section rose at its south end, closest to the road. This may be the resource identified in tax records a “pole shed dirt [floor] erected in 1935. A second section added to its rear (north) may be the resource tax records identfy as a “pole shed concrete [floor],” erected in 1960. A more substantial and longer third section of the barn was subsequently appended to barn’s north end.

Morgan Family House 2 is not believed to retain the integrity necessary for NR eligibility. Its rural setting retains intact and it appears to stand upon the site where it was erected. However, the heavy intrusive grills that hide its porch and windows have negatively affected its integrity of integrity design, materials, and workmanship, and thereby of feeling and association. Further, the house is not known to have any association with significant historic events or persons and is therefore recommended as not eligible for NR listing under NR Criteria A or B. It also does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C.

Figure 1. Morgan Family House 2: left, south front and east side elevations and, right, south front elevation, 2019 (source of both: https://www.google.com/maps).

Figure 2. Morgan Family House 2: left, west side and south front elevations in 2019 (source: https://www.google.com/maps) and, right, same elevations in 2020.

Figure 3. Morgan Family House 2: left, west side and south front elevations, 2019; right, aerial view of north rear elevation and roofs, 2018 (source of both: https://www.google.com/maps).

Figure 4. Morgan Family House 2: left, looking north (with house at left) at two shed-roofed sheds at right (east), garage at center left, and two gable-roofed sheds at left distance; right, view of eastern shed-roofed sheds, both 2019 (source of both: https://www.google.com/maps).

Figure 5. Morgan Family House 2: left, looking northeast (house at left) at garage at left and eastern sheds at right; right, looking northwest (house at left) at white shed-roofed shed and gabled sheds at left and garage at right, 2019 (source of both: https://www.google.com/maps).


Figure 6. Morgan Family House 2: left, south front elevation of barn, 2019; right, aerial view of barn with south elevation at bottom, 2018 (source of both: https://www.google.com/maps).

REFERENCES

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

Tampa Bay Times
1966 “State Board Airs Complaints About Phosphate Plants.” February 12, 1966.

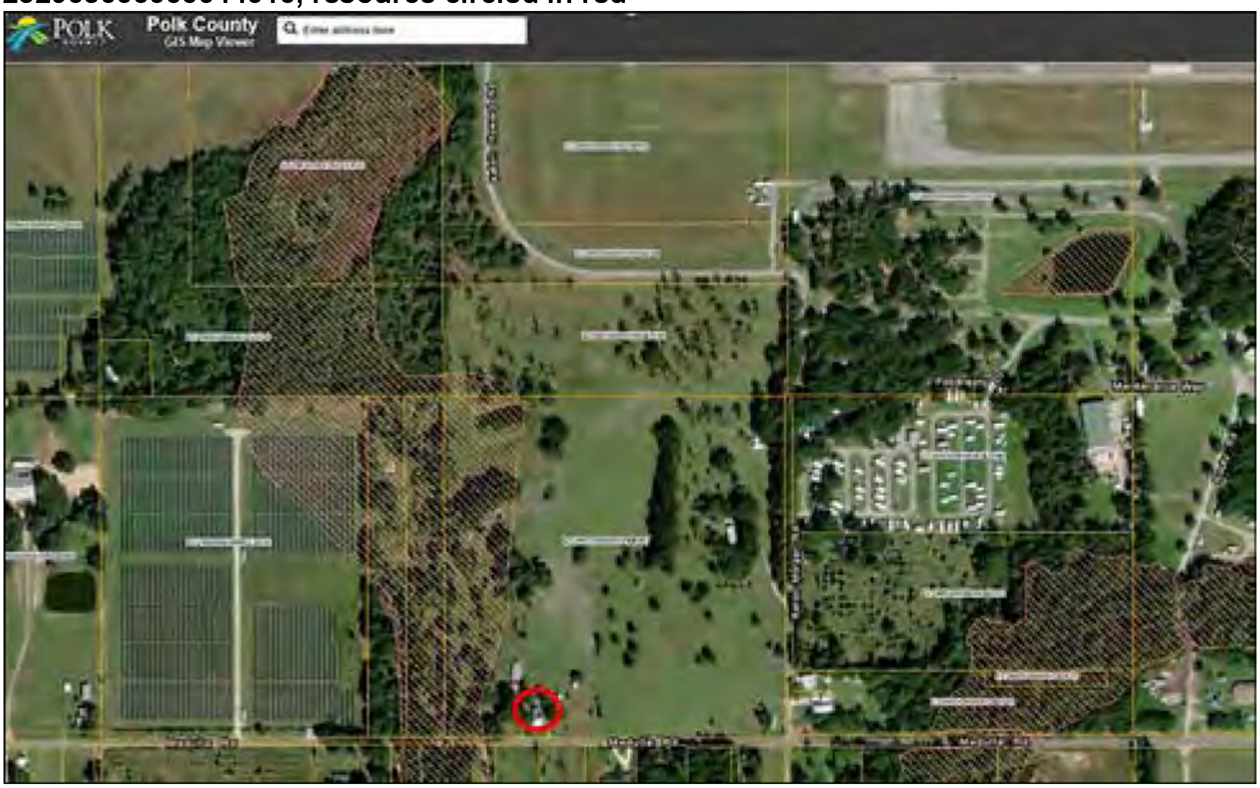
Tampa Tribune
1941a “A.J. Morgan, Pioneer of Polk County Dies, 77.” April 18, 1941.

1943 “U.S. Jury Fixes Price of Army Air Base Site.” July 16, 1943.

2000a Thelma Futch Morgan obituary. January 21, 2000.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised

Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232905000000044010, resource circled in red



Photographs included in above history attachment and submitted separately as pdfs

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08456
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) English Family House Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ______
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

Street Number	Direction	Street Name	Street Type	Suffix Direction
Address: 4815		Medulla	Avenue	

Cross Streets (nearest / between) between Aaron Morgan & Hamilton rds
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ______
Township 29S Range 23E Section 6 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ______
Tax Parcel # 232906000000024010 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1910 ☐approximately ☐year listed or earlier ☒year listed or later
Original Use Residence, private From (year): ______ To (year): ______
Current Use Residence, private From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: ☐yes ☒no ☐unknown Date: ______ Original address ______
Alterations: ☐yes ☒no ☐unknown Date: ______ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ______

DESCRIPTION

Style Frame Vernacular Exterior Plan Square Number of Stories 1
Exterior Fabric(s) 1. Novelty siding 2. ______ 3. ______
Roof Type(s) 1. Gable 2. ______ 3. ______
Roof Material(s) 1. Sheet metal:3V crimp 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY	OFFICIAL EVALUATION	DHR USE ONLY
NR List Date ______ ☐Owner Objection	SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ______ Init. ______ KEEPER – Determined eligible: ☐yes ☐no Date ______ NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)	

Florida Master Site File / Div. of Historical Resources / R. A. Gray Bldg / 500 S Bronough St., Tallahassee, FL 32399-0250
Phone 850.245.6440 / Fax 850.245.6439 / E-mail SiteFile@dos.myflorida.com

HISTORICAL STRUCTURE FORM

Site #8 PO08456

DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Piers 2. ______
Foundation Material(s): 1. Concrete Block 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☐good ☒fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐FMSF record search (sites/surveys) ☐library research ☒building permits ☐Sanborn maps
☐FL State Archives/photo collection ☐city directory ☒occupant/owner interview ☐plat maps
☐property appraiser / tax records ☒newspaper files ☐neighbor interview ☐Public Lands Survey (DEP)
☒cultural resource survey (CRAS) ☐historic photos ☐interior inspection ☐HABS/HAER record search
☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☒yes ☐no ☐insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☒yes ☐no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. Architecture 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)
❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

English Family House – 4815 Medulla Road (PO08455) (AECOM Resource #5)

This house was likely built for either James Jackson English (1872-1937) and Lula English (1869-1951) or their son and daughter-in-law, Clarence J. English, Sr. (1897-1970) and Lucy Peacock English (1897-1992). James or Jackson (he went by both names) lived in a house in the Medulla area in 1910 on property that was part of this tract. (Aaron Joseph Morgan of the Morgan Family houses lived a few doors down.) James and Lula may have lived on this property in 1900, although the surrounding names in the census of the year make this less clear (US Bureau of the Census 1900 and 1910). It is possible that they built the house around 1910, the assigned tax date. It is also possible that Clarence and Lucy erected it by 1920 on property he received from, or least farmed for, his parents. The form and finish of the house suggest it may indeed have been erected in the 1910s. The 1920 census places Clarence and Lucy living immediately next to his parents, again a few farms distant from A.J. Morgan. The census identifies him as living on a farm but working as a house carpenter, so if it was Clarence's house, he may well have built it himself.

In 1935 James and Lula continued to live in Polk County, but James died in 1937 in Plant City, west across the county line in Hillsborough County (Florida State Census 1935). His obituary noted that by 1937 Clarence and Lucy had also moved from the area, to Davenport in Polk County about 30 miles to the northeast (*Tampa Tribune* 1937). The property remained in English family hands, although likely not occupied by them for many years. Clarence J. English, Jr. and his wife, Irma, had moved back to the Springhead community (adjacent to Medulla) from Davenport about 1963 (*Tampa Tribune* 1967). Whether to this house or another is not known. In 1974, though, when they acquired the property from Clarence's brother, John Henry English, a resident of Davenport, they were living in Lakeland (Polk County Deed Book 1605/Page1823). Clarence died in Lakeland in 2003 (*Lakeland Ledger*) and his and Irma's revocable trust sold the property out of the family to Eduardo and Shannon Morrell in 2005 (Polk County Deed Book 6559/Page 3). According to Shannon Morrell (personal communication), the house was built by the English family, possibly around 1908 or so.

The English Family House is one-story tall and of frame construction (Figure 1 through Figure 6). Its main block has a T-shaped plan that is extended to the rear elevation by a one-story frame ell. The gable-front central part of the T-shaped block faces south toward Medulla Road. The legs of its T at its rear terminate in gables as well. The block retains original narrow cornerboards, German siding, and plain surrounds with slightly crossetted lintels. The section facing the road is two bays wide; both of these bays hold original two-over-two, double-hung, sash windows. The rest of the house's window bays are finished in similar fashion. Entrances to the house are along either side of the projecting section. They are shaded and reached by a U-shaped porch that wraps around the front section. The porch retains turned posts and solid, floriated, jig-sawn brackets that appear to be original. The rear ell is original or early. An L-shaped porch that once crossed the rear of the main block and west side of the ell has been enclosed. Exterior-end brick chimney stacks rise along the rear gable of the ell and the east side gable of the main block.

After the English family sold the parcel to the Morrells, they quickly converted the property into its current use as the English Oaks Equestrian Center (Figure 6 through Figure 9). (Its patrons include the Florida Southern University equestrian team, which Shannon Morrell coaches (*Lakeland Ledger* 2017).) In 2007 they removed the citrus grove that extended to the north and west of the house and filled the southeastern third of the parcel. They also removed early outbuildings near the house, built a frame and a metal pole barn to the house's north, and added a large stable near the northern end of the property in 2013 accessed by a long new road. In 2017 the owners of the parcel abutting the east side of the English Family House parcel replaced a citrus grove with a solar farm, further altering the house's historic setting.

The English Family House 2 is recommended as eligible for NR listing under Criterion C for its architecture. It remains a good intact representative of an early-twentieth-century Polk County farmhouse. It retains its original T-shaped form, German siding, crossetted surrounds, two-over-two sash windows, cornerboards, and front porch with turned posts and decorative brackets. Its only notable alteration appear to be the enclosure of the rear porch. The house appears to stand on its original site and is therefore believed to retain its integrity of location, design, materials, workmanship and, by extension, feeling and association. The removal of outbuildings and construction of modern ones, along with the removal of its citrus grove and the one that abutted its parcel to the east, have negatively affected its setting. The proposed NR boundaries for the house are not recommended to encompass all of its approximately 20-acre historic parcel (Polk County parcel 232906000000024010), which is now a horse farm with modern outbuildings. Rather, they are recommended as the approximately ½-acre portion at the parcel's southeastern corner that includes the house and its associated trees and intact setting (Figure 10). The proposed boundaries extend south to a fence near the right-of-way of Medulla Road and east and west to fence lines. On the north they terminate 25 feet north of the ell, before the modern metal and frame pole barns are reached. Lacking any known association with historic events or persons, the house is not recommended as NR eligible under Criteria A or B.

Figure 1. English Family House: 2018 aerials with south at bottom of left image and north at bottom of right image; T-shaped roofs of main block and linearly extended ell are topped by rusted roofs; porches and west gable end of main block are apparent from shiny appearance of reclad roofs.

Figure 2. English Family House: left, east side elevation in 2019 (source: https://www.google.com/maps); same elevation in 2020

Figure 3. English Family House: left, south front and west side elevation in 2019 (source: https://www.google.com/maps); same elevations in 2020.

Figure 4. English Family House: left, south front elevation in 2019 (source: https://www.google.com/maps); right, same elevation in 2020.

Figure 5. English Family House: west side elevation in 2020.

Figure 6. English Family House: left, looking northeast at west side of house at right, metal pole barn at center, and wooden pole barn at far left; right, metal pole barn, both in 2020.

Figure 7. English Family House: left, west side and south rear elevation of modern stable in 2020; interior of stable in 2019 (source: https://www.youtube.com/watch?v=CyRZU8S4zkU).

Figure 8. Left, parcel in December 2006 with house and outbuildings at lower right corner; right, parcel in November 2007 with citrus grove and early outbuildings removed and modern outbuildings and access road added (source of both: https://www.google.com/maps).

Figure 9. February 2017 aerial of English parcel at left (west) and solar farm on site of former citrus grove at right (source: https://www.google.com/maps).

Figure 10. English Family House: proposed NR boundaries outlined in yellow.

REFERENCES

Lakeland Ledger
2003 C.J. "Jack" English obituary. November 25, 2003.

2017 "FSC Equestrian Team Jumps Into History." February 19, 2017.

Morrell, Shannon
2020 Personal communication with the owner of the English Family House, July 2020.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

Tampa Tribune
1937 James Jackson English obituary. February 28, 1937.

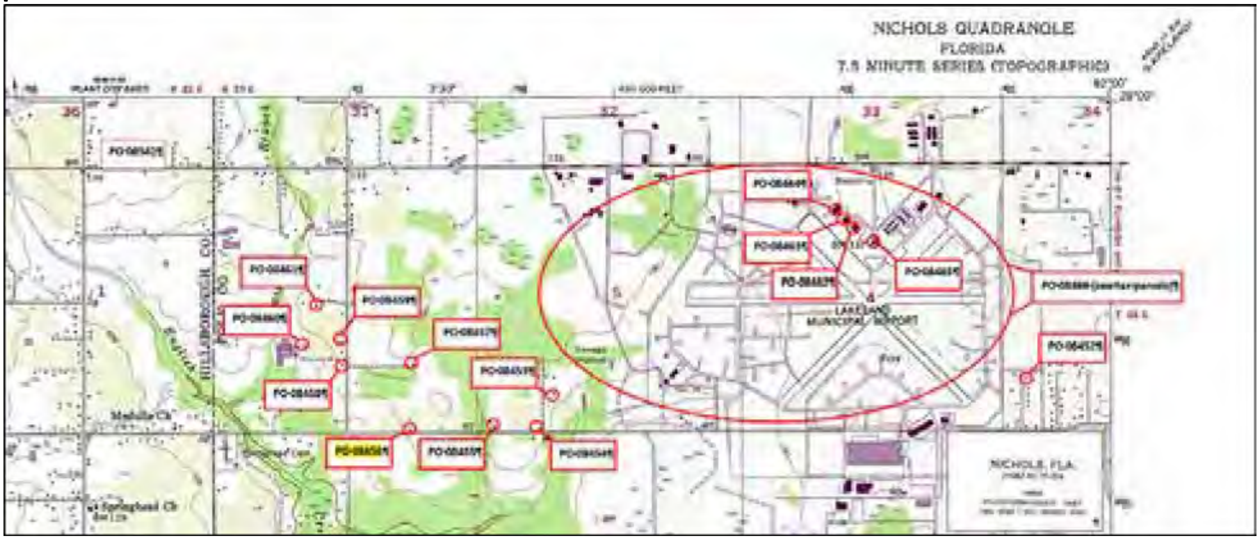
1967 "Party Line – Friends Invited on 50th." November 5, 1967.

US Bureau of the Census
1900 *Fourteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

1910 *Fourteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

1920 *Fourteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232906000000024010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08457
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) House
Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS
Survey # (DHR only) ______
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

Street Number	Direction	Street Name	Street Type	Suffix Direction
Address: 4404		Hamilton	Road	

Cross Streets (nearest / between) E side of Hamilton Rd N of Medulla Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ______
Township 29S Range 23E Section 6 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ______
Tax Parcel # 232906000000021010 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐☐
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1934 ☐approximately ☐year listed or earlier ☒year listed or later
Original Use Residence, private From (year): ______ To (year): ______
Current Use Residence, private From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: ☐yes ☒no ☐unknown Date: ______ Original address ______
Alterations: ☒yes ☐no ☐unknown Date: ______ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ______

DESCRIPTION

Style Frame Vernacular Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Unknown 2. ______ 3. ______
Roof Type(s) 1. Gable 2. ______ 3. ______
Roof Material(s) 1. Sheet metal:3V crimp 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY OFFICIAL EVALUATION DHR USE ONLY

NR List Date ______
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ______ Init. ______
KEEPER – Determined eligible: ☐yes ☐no Date ______
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08457

DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Unknown 2. ______
Foundation Material(s): 1. Obscured 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☐good ☐fair ☒deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

- ☐FMSF record search (sites/surveys)
- ☐FL State Archives/photo collection
- ☐property appraiser / tax records
- ☒cultural resource survey (CRAS)
- ☐library research
- ☐city directory
- ☐newspaper files
- ☐historic photos
- ☒building permits
- ☐occupant/owner interview
- ☐neighbor interview
- ☐interior inspection
- ☐Sanborn maps
- ☐plat maps
- ☐Public Lands Survey (DEP)
- ☐HABS/HAER record search
- ☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)
❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

House – 4404 Hamilton Road (FMSF PO08457) (AECOM Resource #6)

Deed and newspaper searches of this property did not unearth its history. It has changed hand numerous times over the past 25 years. Tax records put its date of construction at 1934. A 1941 aerial photograph shows it standing at the southwest corner of a citrus grove. The house and grove are visible in a 1964 aerial, along with the long entrance lane that extends east to it from Hamilton Road. In a 1968 aerial, the house, one outbuilding to its (north) rear, and the grove are clearly visible (Figure 1 and Figure 2). The former grove is now wooded and the house's diminished one-acre tract is abutted on its west and south by large expanses of solar panels. The property is gated off and the house could barely be viewed through the heavy growth of trees that largely surround it. It appeared to have its windows boarded up, but no further inspection could be made.

Tax records and aerial photographs indicate that the house has a one-story main block with a south-facing, metal, gable-front roof (Figure 3 and Figure 4). It is built of frame with frame cladding. An unfinished open porch crosses most its front elevation. To its east is an additional section of unfinished porch that wraps partly around the east side elevation. A small gable peak in the roof above the side of this porch suggests that the porch shields a side entrance. To the west of the front porch another extended porch partly wraps the west elevation. It is enclosed but unfinished. The body of the house behind the porches is one-story tall. Rectangular, it encompasses just under 1,150 square feet. The outbuilding depicted on the aerials behind the house is now gone or hidden by overgrowth. From the edge of the parcel, the house and its grounds appear to be long abandoned and unmaintained. Bird-eye aerials from 2018 depict heavy overgrowth at the house's south front and east side elevation, further suggesting heavy deterioration.

The house at 4404 Hamilton Road is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. From the available evidence, it does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. Additionally, its former citrus grove is now wooded and groves to its west and south hold modern solar farms. It is therefore believed to have lost its integrity of setting. Its basic form and c1934 construction date, coupled with available information and apparent abandonment and deterioration, suggest it has also lost its integrity of design, materials, workmanship and, thereby, feeling and association. Due to its loss of integrity and lack of significance, the house is recommended as not eligible for NR listing.

Figure 1. House at 4404 Hamilton Road: left, March 10, 1941 aerial with house partially obscured by date number; right, 1964 aerial with parcel boundaries mislocated to the left (west) (source of both: http://gisapps.polk-county.net/gisviewer).

Figure 2 . House at 4404 Hamilton Road: left, 1964 aerial with parcel mislocated to the northeast of house and, right, parcel in 2018 with former grove largely filled with trees and edged by solar farms (source of both: http://gisapps.polk-county.net/gisviewer).

Figure 3. House at 4404 Hamilton Road: left, 2018 bird's-eye aerial view with south front of house at bottom and, right with south front of house at left (source of both: https://www.google.com/maps).

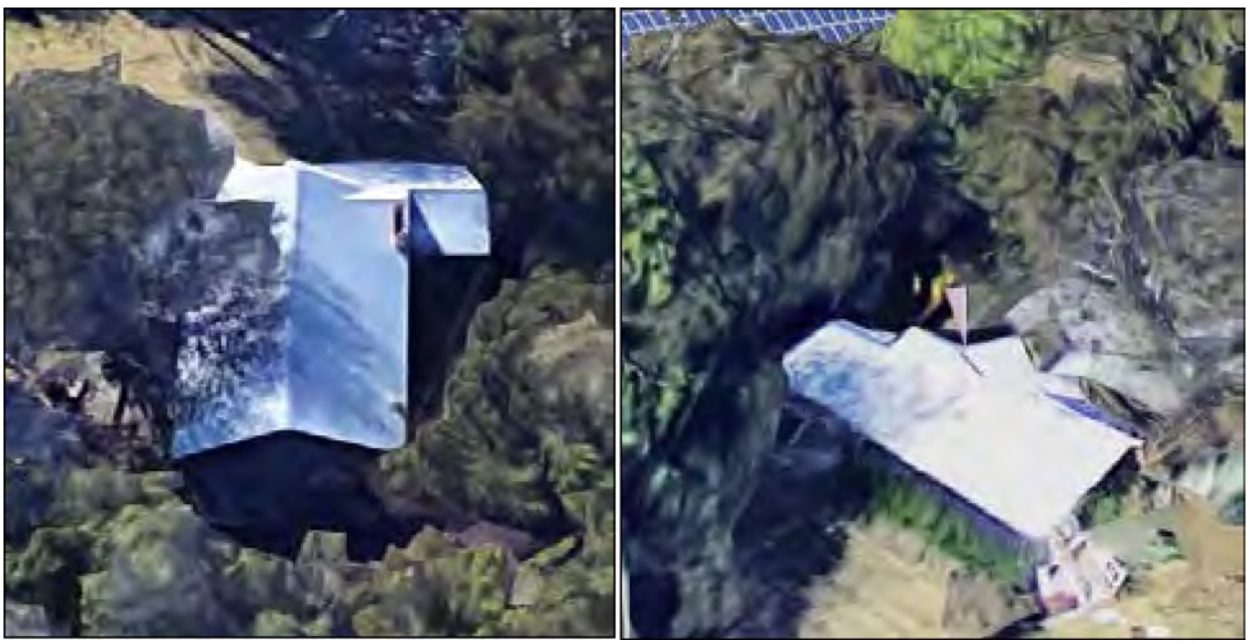


Figure 4. House at 4404 Hamilton Road: left, 2018 bird's-eye aerial view with south front of house at top and, right 2018 view showing south front and east side of houses heavily encroached upon by tall green growth (source of both: https://www.google.com/maps).

REFERENCES

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised

Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232906000000021010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08458
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) House Multiple Listing (DHR only) ____
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ____
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4333		Hamilton	Road	

Cross Streets (nearest / between) W side of Hamilton Rd N of Medulla Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ____
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ____
Township 29S Range 23E Section 6 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ____
Tax Parcel # 232906000000041090 Landgrant ____
Subdivision Name ____ Block ____ Lot ____
UTM Coordinates: Zone ☐16 ☐17 Easting ____ Northing ____
Other Coordinates: X: ____ Y: ____ Coordinate System & Datum ____
Name of Public Tract (e.g., park) ____

HISTORY

Construction Year: 1980 ☐approximately ☒year listed or earlier ☐year listed or later
Original Use Residence, private From (year): ____ To (year): ____
Current Use Residence, private From (year): ____ To (year): ____
Other Use ____ From (year): ____ To (year): ____
Moves: ☐yes ☒no ☐unknown Date: ____ Original address ____
Alterations: ☐yes ☒no ☐unknown Date: ____ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ____ Nature ____
Architect (last name first): ____ Builder (last name first): ____
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ____

DESCRIPTION

Style Other Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Brick 2. ____ 3. ____
Roof Type(s) 1. Gable 2. ____ 3. ____
Roof Material(s) 1. Composition shingles 2. ____ 3. ____
Roof secondary strucs. (dormers etc.) 1. ____ 2. ____
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY — OFFICIAL EVALUATION — DHR USE ONLY

NR List Date ____
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ____ Init. ____
KEEPER – Determined eligible: ☐yes ☐no Date ____
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08458

DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2. ____
Structural System(s): 1. Balloon wood frame 2. ____ 3. ____
Foundation Type(s): 1. Continuous 2. ____
Foundation Material(s): 1. Brick 2. ____

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐ excellent ☒ good ☐ fair ☐ deteriorated ☐ ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ____ ☐ Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

- ☐ FMSF record search (sites/surveys)
- ☐ FL State Archives/photo collection
- ☐ property appraiser / tax records
- ☒ cultural resource survey (CRAS)
- ☐ library research
- ☐ city directory
- ☐ newspaper files
- ☐ historic photos
- ☒ building permits
- ☐ occupant/owner interview
- ☐ neighbor interview
- ☐ interior inspection
- ☐ Sanborn maps
- ☐ plat maps
- ☐ Public Lands Survey (DEP)
- ☐ HABS/HAER record search
- ☐ other methods (describe) ____

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐ yes ☒ no ☐ insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐ yes ☒ no ☐ insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ____ 3. ____ 5. ____
2. ____ 4. ____ 6. ____

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ____ Maintaining organization ____
Document description ____ File or accession #'s ____

2) Document type ____ Maintaining organization ____
Document description ____ File or accession #'s ____

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

House – 4333 Hamilton Road (FMSF PO08458) (AECOM Resource #7)

This house stands on an approximately 0.6-acre parcel on the west side of Hamilton Road, 0.25 miles north of Medulla Road. The mostly modern houses to its north, south, and west occupy numerous small parcels of varying shapes that were likely cut off over time from a single larger agricultural property. This house has changed hands numerous times over the past 25 years and its early owners could not be determined. Tax records carry two dates for the house, a build date of 1920 and an estimated or apparent build date of 1991.

The house is built of frame with an overlay of brick veneer (Figure 1 through Figure 3). It is one-story tall and has a gable-front roof pierced by a central brick chimney stack. Three bays cross its front (east) elevation, a central door flanked by paired windows with clip-in muntins. Windows with clip-in muntins mark the side elevations as well. A full-facade porch crosses its front elevation. A carport extends to the porch's north. An artificial-sided gable-front shed stands to the carport's north. The house's veneer, porch, and windows suggest a construction date within the past 30 or 40 years. If it was built in 1920, it is so heavily altered that this is not discernable.

This house is not known to have any association with significant historic events or persons and therefore is recommended as not eligible for NR listing under NR Criteria A or B. It does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. If it is more than 50 years old, it has lost the integrity of design, materials, and workmanship—as well as setting, feeling, and association—that would express and represent that earlier period of construction. It is recommended as not eligible for NR listing under any of the Register's Criteria and Criteria Considerations.

Figure 1. House at 4333 Hamilton Road: east front elevation of house at left, carport at center, and modern shed at right in 2019 (source: https://www.google.com/maps).

Figure 2. House at 4333 Hamilton Road: south side and east front elevations, both 2020.

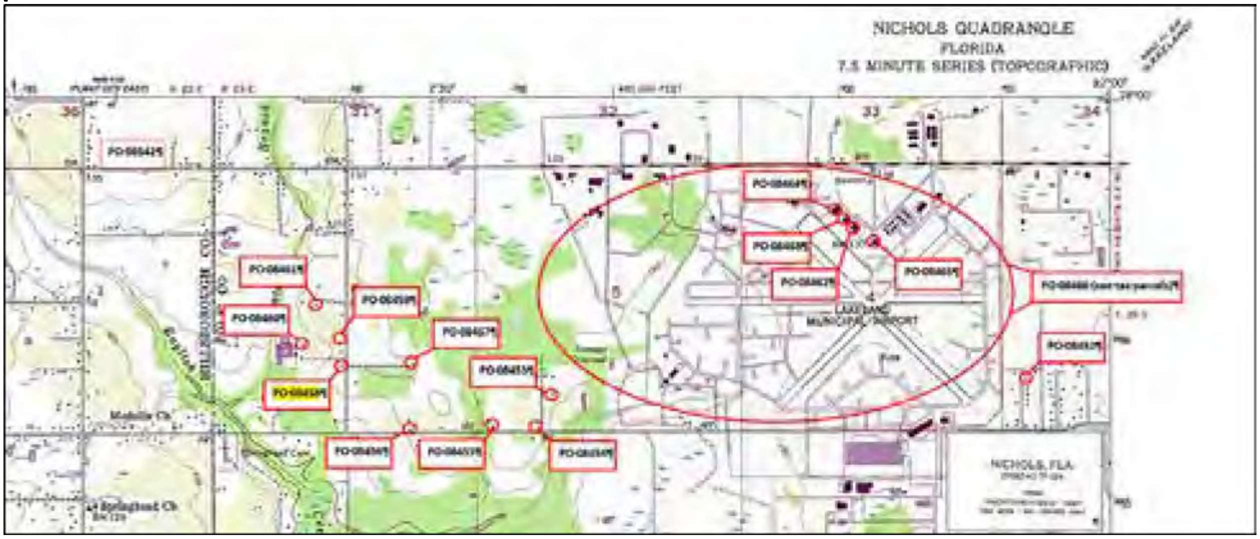
Figure 3. House at 4333 Hamilton Road: left, north side and east front elevations; right, modern shed, both 2020.

REFERENCES

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232906000000041090, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

[x] Original
[ ] Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08459
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Futch-Dawson House Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ______
National Register Category (please check one) [x] building [ ] structure [ ] district [ ] site [ ] object
Ownership: [ ] private-profit [ ] private-nonprofit [x] private-individual [ ] private-nonspecific [ ] city [ ] county [ ] state [ ] federal [ ] Native American [ ] foreign [ ] unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4257		Hamilton	Road	

Cross Streets (nearest / between) W side of Hamilton Rd N of Medulla Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? [x] yes [ ] no [ ] unknown County ______
Township 29S Range 23E Section 6 ¼ section: [ ] NW [ ] SW [ ] SE [ ] NE Irregular-name: ______
Tax Parcel # 232906000000041050 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone [ ] 16 [ ] 17 Easting ______ Northing ______
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1935 [ ] approximately [ ] year listed or earlier [x] year listed or later
Original Use Residence, private From (year): ______ To (year): ______
Current Use Residence, private From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: [ ] yes [x] no [ ] unknown Date: ______ Original address ______
Alterations: [ ] yes [x] no [ ] unknown Date: ______ Nature see attachment
Additions: [ ] yes [x] no [ ] unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? [ ] yes [ ] no [x] unknown Describe ______

DESCRIPTION

Style Other Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Asbestos 2. ______ 3. ______
Roof Type(s) 1. Gable 2. ______ 3. ______
Roof Material(s) 1. Sheet metal:3V crimp 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY OFFICIAL EVALUATION DHR USE ONLY

NR List Date ______
[ ] Owner Objection

SHPO – Appears to meet criteria for NR listing: [ ] yes [ ] no [ ] insufficient info Date ______ Init. ______
KEEPER – Determined eligible: [ ] yes [ ] no Date ______
NR Criteria for Evaluation: [ ] a [ ] b [ ] c [ ] d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08459

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______
Structural System(s): 1. Balloon wood frame 2. ______ 3. ______
Foundation Type(s): 1. Piers 2. ______
Foundation Material(s): 1. Concrete Block 2. ______
Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☐good ☒fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐FMSF record search (sites/surveys) ☐library research ☒building permits ☐Sanborn maps
☐FL State Archives/photo collection ☐city directory ☐occupant/owner interview ☐plat maps
☐property appraiser / tax records ☐newspaper files ☐neighbor interview ☐Public Lands Survey (DEP)
☒cultural resource survey (CRAS) ☐historic photos ☐interior inspection ☐HABS/HAER record search
☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)
❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Futch-Dawson House – 4257 Hamilton Road (FMSF PO08459) (AECOM Resource #8)

For much of the past 40 years at least, this house has been owned by either Mildred Ann Futch Dawson or her parents, Rev. Clyde A. and Florence Mary Futch (Polk County Deed Book 1941/Page 1835 (1980); Deed Book 3175/1925 (1992). Reverend Futch lived most of his life in eastern Hillsborough County (*Tampa Tribune* 1994), although he was living with his family and farming in the Medulla area of Polk County in 1940 (US Bureau of the Census). The house carries a tax date of 1935, but its appearance strongly suggests that it is less than 50 years old.

The house has two blocks that are nearly equal in size (Figure 1 through Figure 3). The gable-end block on the south is the principal one. Its east-facing front elevation is four bays wide. A door and a window are shaded by a hip-roofed screened front porch; a window is also placed to either side of the porch. These as the house's other windows are double-hung with two-horizontal-light-over-two-horizontal-light sash. The later-added north block holds a two-bay garage. Like the main block, it is topped by a gable-end roof and sided with asbestos shingles. It is flush with the main block at the front but extends a few feet farther back at the house's west-facing rear elevation. The window sash, their placement immediately under the eaves, the proportions of the main block, the asbestos shingles—all suggest a construction date within the past 50 years.

This house is not known to have any association with significant historic events or persons and therefore is recommended as not eligible for NR listing under NR Criteria A or B. It does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. If it is more than 50 years old, it has lost the integrity of design, materials, and workmanship—as well as setting, feeling, and association—that would express and represent that earlier period of construction. It is recommended as not eligible for NR listing under any of the Register's Criteria and Criteria Considerations.

Figure 1. Futch-Dawson House: left, east front and north side elevations; right, east front elevation.

Figure 2. Futch-Dawson House: left, south side and east front elevations; right, north side and west rear elevations.

Figure 3. Futch-Dawson House: east front and north side elevations.

REFERENCES

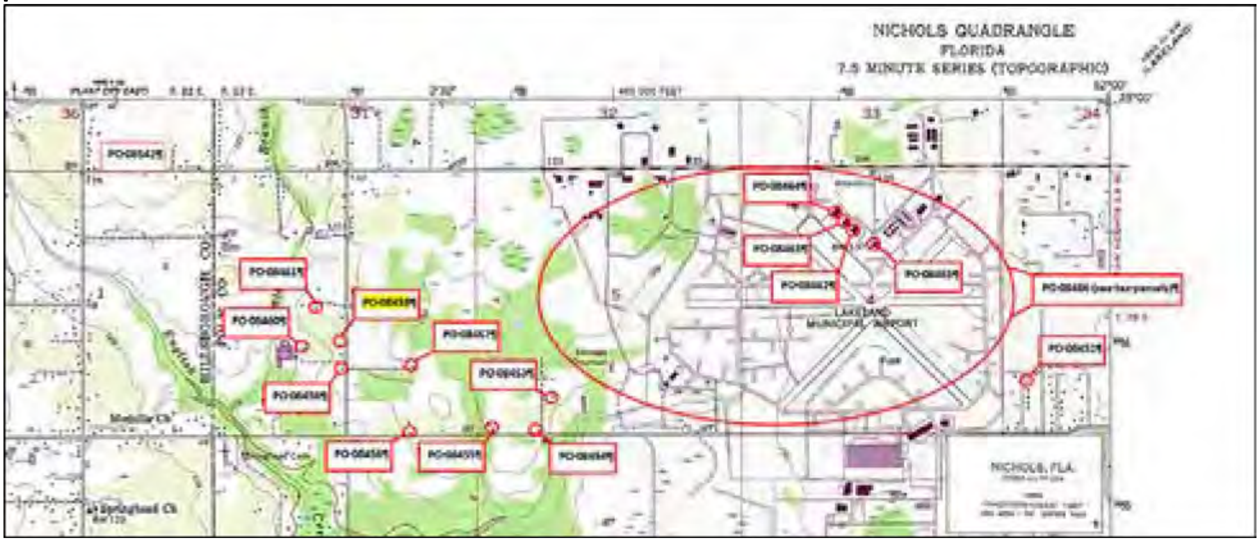
Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

Tampa Tribune
1994 Reverend Clyde A. Futch. October 16, 1994.

US Bureau of the Census
1940 *Sixteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232906000000041050, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08460
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Dawson House
Multiple Listing (DHR only) ____
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS
Survey # (DHR only) ____
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4239		Hamilton	Road	

Cross Streets (nearest / between) W side of Hamilton Rd N of Medulla Rd
USGS 7.5 Map Name NICHOLS
USGS Date 1987
Plat or Other Map ____
City / Town (within 3 miles) Lakeland
In City Limits? ☒yes ☐no ☐unknown
County ____
Township 29S Range 23E Section 6 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ____
Tax Parcel # 232906000000041130
Landgrant ____
Subdivision Name ____ Block ____ Lot ____
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ____ Y: ____ Coordinate System & Datum ____
Name of Public Tract (e.g., park) ____

HISTORY

Construction Year: 1940 ☐approximately ☐year listed or earlier ☒year listed or later
Original Use Residence, private From (year): ____ To (year): ____
Current Use Residence, private From (year): ____ To (year): ____
Other Use ____ From (year): ____ To (year): ____
Moves: ☐yes ☒no ☐unknown Date: ____ Original address ____
Alterations: ☐yes ☒no ☐unknown Date: ____ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ____ Nature ____
Architect (last name first): ____ Builder (last name first): ____
Ownership History (especially original owner, dates, profession, etc.)

see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ____

DESCRIPTION

Style Other
Exterior Plan Rectangular
Number of Stories 1
Exterior Fabric(s) 1. Stucco 2. ____ 3. ____
Roof Type(s) 1. Gable 2. ____ 3. ____
Roof Material(s) 1. Composition shingles 2. ____ 3. ____
Roof secondary strucs. (dormers etc.) 1. ____ 2. ____
Windows (types, materials, etc.)

see attachment

Distinguishing Architectural Features (exterior or interior ornaments)

see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)

see attachment

DHR USE ONLY — OFFICIAL EVALUATION — DHR USE ONLY

NR List Date ____
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ____ Init. ____
KEEPER – Determined eligible: ☐yes ☐no Date ____
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08460

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______

Structural System(s): 1. Masonry - General 2. ______ 3. ______

Foundation Type(s): 1. Continuous 2. ______

Foundation Material(s): 1. Obscured 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☒good ☐fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐FMSF record search (sites/surveys)
☐FL State Archives/photo collection
☐property appraiser / tax records
☒cultural resource survey (CRAS)
☐library research
☐city directory
☐newspaper files
☐historic photos
☒building permits
☐occupant/owner interview
☐neighbor interview
☐interior inspection
☐Sanborn maps
☐plat maps
☐Public Lands Survey (DEP)
☐HABS/HAER record search
☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information

Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM

Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ **USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED**
❷ **LARGE SCALE STREET, PLAT OR PARCEL MAP** (available from most property appraiser web sites)
❸ **PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE**
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Dawson House – 4239 Hamilton Road (FMSF PO08460) (AECOM Resource #9)

Like the house a short distance to its west at 4257 Hamilton Road, this house was long connected with Mildred Ann Futch Dawson, who owned it from at least the mid-1970s until her estate transferred it to another owner in 2017 (Polk County Deed Book 1679/Page 880 (1976); Probate Document 11052/Page 617 (2017). When Mildred Dawson and her husband, Willie Ray Dawson were divorced in 1980, she gave up the house at 4257 Hamilton Road, but retained and likely lived in this one. The house is assigned a tax date of 1940, but it appears to be less than 50 years old.

The house occupies a zig-zag-shaped parcel on the west side of Hamilton Road and is located down a lane about 300 yards from the road (Figure 1 through Figure 3). Its distance from the road and the shape of its parcel indicate that its 5.54-acre parcel was cut out of a larger agricultural tract. The house is almost square with a notch out of the back of the northwestern corner of its rear (west) elevation. One-story tall, it encompasses approximately 1,600 square feet. The house is of stuccoed masonry construction. Its gable-end roof is asphalt-shingled. At its front (east) elevation it has a tripled one-over-one window grouping at the left, an entry shaded by a screened hip-roofed porch at the center, and paired one-over-windows at the right. The house's other windows are also one-over-one. A gabled roof extends to the house's rear. It is abutted by a fenced patio shaded by a modern metal-pole-supported roof. A modern outbuilding stands to the house's south. The window sash, the house's proportions and relatively large footprint, and its masonry construction suggest a construction date within the past 50 years.

This house is not known to have any association with significant historic events or persons and therefore is recommended as not eligible for NR listing under NR Criteria A or B. It does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. If it is more than 50 years old, it has lost the integrity of design, materials, and workmanship—as well as setting, feeling, and association—that would express and represent that earlier period of construction. It is recommended as not eligible for NR listing under any of the Register's Criteria and Criteria Considerations.


Figure 1. Dawson House: Left, east front elevation in 2014 (source: https://www.bing.com/maps/) and, right, same elevation in 2018 (source: https://www.google.com/maps).

Figure 2. Dawson House: left, east front and north side elevations; right, north side and west rear elevations.

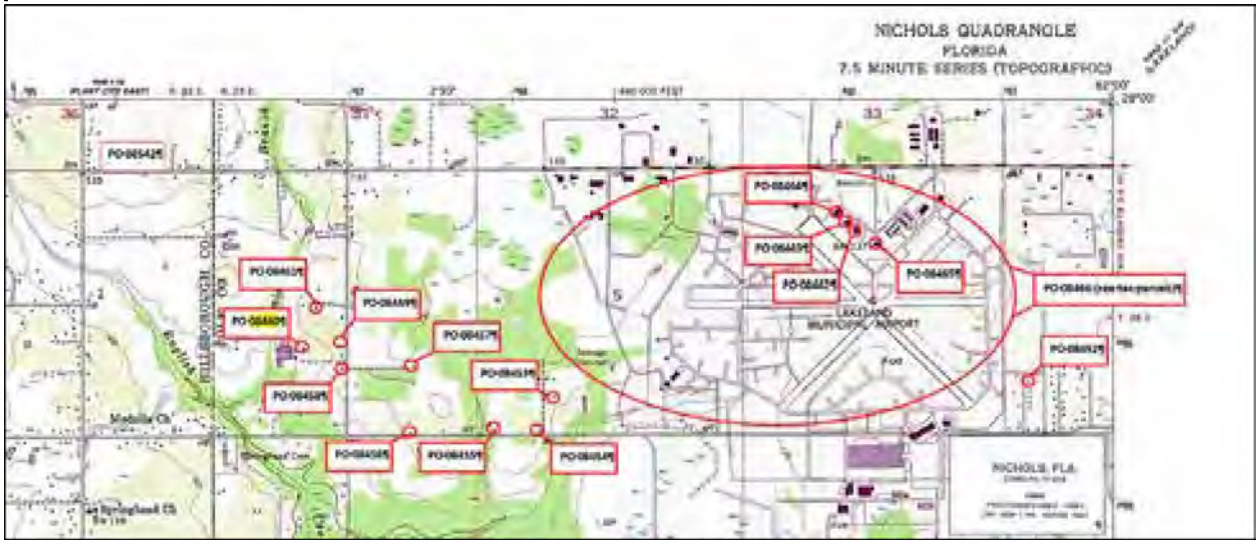
Figure 3. Dawson House: left, west rear elevation; right, modern shed to house's south.

REFERENCES

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232906000000041130, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08461
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Opal and Oliver Phillips House Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ______
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	4141		Hamilton	Road	

Cross Streets (nearest / between) W side of Hamilton Rd N of Medulla Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ______
Township 29S Range 23E Section 6 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ______
Tax Parcel # 232906000000032010 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone ☐16 ☐17 Easting ______ Northing ______
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1935 ☒approximately ☐year listed or earlier ☐year listed or later
Original Use Residence, private From (year): ______ To (year): ______
Current Use Residence, private From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: ☐yes ☒no ☐unknown Date: ______ Original address ______
Alterations: ☒yes ☐no ☐unknown Date: ______ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ______

DESCRIPTION

Style Frame Vernacular Exterior Plan Rectangular Number of Stories 1
Exterior Fabric(s) 1. Vinyl 2. ______ 3. ______
Roof Type(s) 1. Gable 2. ______ 3. ______
Roof Material(s) 1. Composition shingles 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY — OFFICIAL EVALUATION — DHR USE ONLY

NR List Date ______
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ______ Init. ______
KEEPER – Determined eligible: ☐yes ☐no Date ______
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

Florida Master Site File / Div. of Historical Resources / R. A. Gray Bldg / 500 S Bronough St., Tallahassee, FL 32399-0250
Phone 850.245.6440 / Fax 850.245.6439 / E-mail SiteFile@dos.myflorida.com

HISTORICAL STRUCTURE FORM

Site #8 PO08461

DESCRIPTION (continued)

Chimney: No. 1 Chimney Material(s): 1. Brick 2.
Structural System(s): 1. Balloon wood frame 2. 3.
Foundation Type(s): 1. Piers 2.
Foundation Material(s): 1. Concrete Block 2.

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☐good ☒fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ____ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

- ☐FMSF record search (sites/surveys)
- ☐FL State Archives/photo collection
- ☐property appraiser / tax records
- ☒cultural resource survey (CRAS)
- ☐library research
- ☐city directory
- ☐newspaper files
- ☐historic photos
- ☒building permits
- ☐occupant/owner interview
- ☐neighbor interview
- ☐interior inspection
- ☐Sanborn maps
- ☐plat maps
- ☐Public Lands Survey (DEP)
- ☐HABS/HAER record search
- ☐other methods (describe)

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information

Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. 3. 5.
2. 4. 6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ____ Maintaining organization ____
Document description ____ File or accession #'s ____

2) Document type ____ Maintaining organization ____
Document description ____ File or accession #'s ____

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM

Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED

❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)

❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Opal and Oliver Phillips House – 4141 Hamilton Road (FMSF PO08461) (AECOM Resource #10)

Tax records assign this house a date of 1935, but it may have been built a few years later. In 1937 George Hamilton, Jr. (1870-1942) and his wife, Florence B. Hamilton (1875-1965), transferred 24 acres to their daughter, Opal Phillips (1903-1983) (Polk County Deed Book 177/Page 145). She and her husband, Oliver W. Phillips (1892-1969), had married in 1927 (*Tampa Times*). They are believed to have built the house.

George Hamilton was a "stock breeder and orange grower" (*Tampa Tribune* 1906). The 1914 *Lakeland Ledger* described him as one of Polk County's "most substantial growers." He came from a local slaveholding family. In 1934 (*Tampa Tribune*) he gathered friends at his Medulla Road residence "to welcome Aunt Ella Robinson, 87, one-time slave, back to the old plantation." George's holdings of family property were apparently substantial in the early 20th century. The 1910 (US Bureau of the Census) census, taken when Opal was seven, identified his livelihood as "general farming." The farm inventoried immediately before his was that of James Jackson English of the English Family House at 4815 Medulla Road, located well southeast of this property.

Opal and Oliver Phillips likely erected this house in the late 1930s. Opal died in 1983. Two years later her estate kept the property in the family by transferring it to Billy J. Phillips. He continued to own but did not live in the house until it was foreclosed upon in 2019 (Polk County Deed Book 2324/Page 1045 (1985); Polk County Foreclosures).

The house's main block is one-story tall and two rooms deep (Figure 1 through Figure 4). It is built of frame and topped by an asphalt-shingled gable-roof. A one-bay gable-front porch supported by square posts extends over its central front (south-facing) entry. The windows to either side of the facade are shaded by later-added metal hoods. An exterior-end brick chimney rises from the block's east gable. A hipped-roof wing wraps around much of the east side elevation of the house and part of the north rear elevation. The house has been vacant for a number of years and its windows are boarded over. It appears to be maintained, though, and its artificial siding is in good condition. When the house was artificially sided in recent years its original exposed rafter tails were boxed in. A frame two-car garage standing to the house's north rear appears to have been its contemporary, likely dating from the 1930s. A largely collapsed frame barn is overgrown by trees farther to the north. Its construction date is not known.

The Opal and Oliver Phillips House is not known to have any association with significant historic events or persons. It is therefore recommended as not eligible for NR listing under NR Criteria A or B. The house does not appear to embody the distinctive characteristics of a type, period, or method of construction and accordingly is recommended as not NR-eligible under Criterion C. Additionally, due to its alterations—including boarded-over windows, artificial siding, and boxed-in eaves—the house is believed to have lost its integrity of design, materials, workmanship and, therefore, feeling and association. The loss of its the large citrus grove amidst which it stood has also negatively affected its integrity of setting.

Figure 1. Opal and Oliver Phillips House: left, 2012 aerial with north at top showing ghost marks of a former grove; right, same aerial zoomed in showing south front elevation of house with porch at bottom and garage at top (north) (source of both: https://www.google.com/maps).

Figure 2. Opal and Oliver Phillips House: left, south front elevation with porch post visible at left center; right, detail of south elevation, both 2020

Figure 3. Opal and Oliver Phillips House: left, south front and east elevations with porch at left in 2014 (source: https://www.bing.com/maps/); right, same view in 2020.

Figure 4. Opal and Oliver Phillips House: left, south front and east side elevations with garage at far right, 2019 (source: https://www.google.com/maps); right, north rear of house with garage at left center and now collapsed barn at far left, no date (source: Connected Investors website).

REFERENCES

Connected Investors website. Accessed August 2020 at https://connectedinvestors.com/investment-property/4141-hamilton-rd/4869456.

Polk County Foreclosures website. Accessed August 2020 at https://www.polkcountyforeclosures.com/property-info/1845187/4141-hamilton-rd.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Polk County Register of Deeds Office. Accessed August 2020 at https://apps.polkcountyclerk.net/browserviewor/.

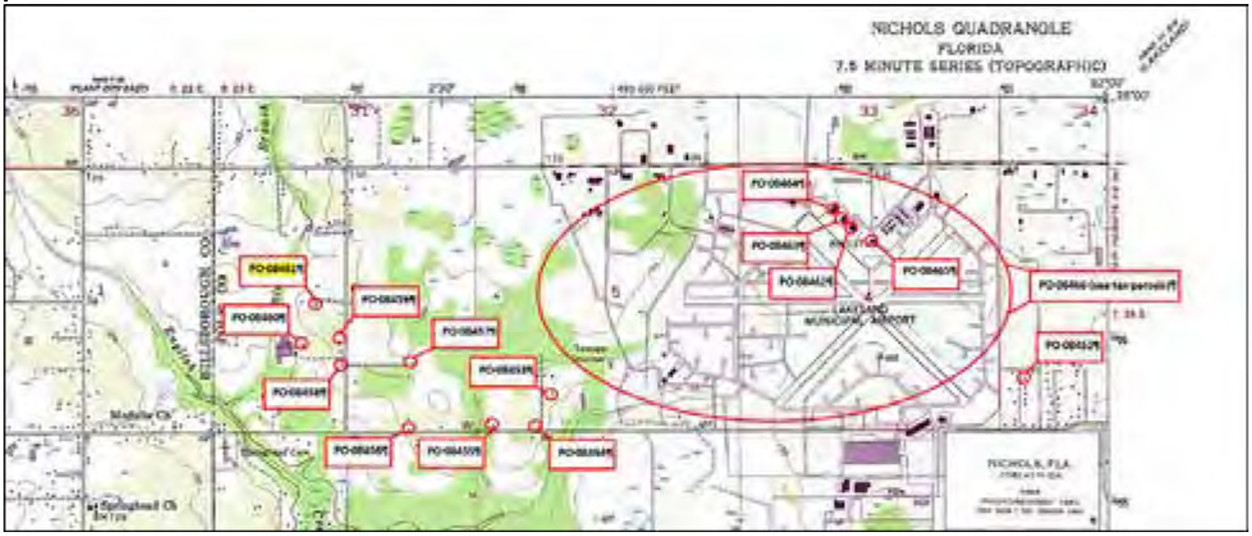
Tampa Times
1927 "Marriage Licenses." June 6, 1927.

Tampa Tribune
1906 "Personal Paragraphs." March 27, 1906.

1934 "Aunt Ella to Entertain." May 17, 1934.

US Bureau of the Census
1910 *Fourteenth Census of the United States.* Accessed August 2020 at https://search.ancestry.com/.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) Parcel 232906000000032010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08462
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Shelterair Maintenance Hangar   Multiple Listing (DHR only) ____
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS   Survey # (DHR only) ____
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	3900		Don Emerson	Drive	

Cross Streets (nearest / between) SE of Airfield Dr West and Drane Field Rd
USGS 7.5 Map Name NICHOLS   USGS Date 1987   Plat or Other Map ____
City / Town (within 3 miles) Lakeland   In City Limits? ☒yes ☐no ☐unknown   County ____
Township 29S   Range 23E   Section 4   ¼ section: ☐NW ☐SW ☐SE ☐NE   Irregular-name: ____
Tax Parcel # 232904000000011010   Landgrant ____
Subdivision Name ____   Block ____   Lot ____
UTM Coordinates: Zone ☐16 ☐17   Easting ____   Northing ____
Other Coordinates: X: ____   Y: ____   Coordinate System & Datum ____
Name of Public Tract (e.g., park) ____

HISTORY

Construction Year: 1960   ☒approximately   ☐year listed or earlier   ☐year listed or later
Original Use Hangar   From (year): ____   To (year): ____
Current Use Hangar   From (year): ____   To (year): ____
Other Use ____   From (year): ____   To (year): ____
Moves: ☐yes ☒no ☐unknown   Date: ____   Original address ____
Alterations: ☐yes ☒no ☐unknown   Date: ____   Nature see attachment
Additions: ☐yes ☒no ☐unknown   Date: ____   Nature ____
Architect (last name first): ____   Builder (last name first): ____
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown   Describe ____

DESCRIPTION

Style Industrial Vernacular   Exterior Plan Not applicable   Number of Stories 1
Exterior Fabric(s) 1. Metal   2. ____   3. ____
Roof Type(s) 1. Gable   2. ____   3. ____
Roof Material(s) 1. Sheet metal:3V crimp   2. ____   3. ____
Roof secondary strucs. (dormers etc.) 1. ____   2. ____
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY   OFFICIAL EVALUATION   DHR USE ONLY

NR List Date ____
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info   Date ____   Init. ____
KEEPER – Determined eligible: ☐yes ☐no   Date ____
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08462

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______

Structural System(s): 1. Steel skeleton 2. ______ 3. ______

Foundation Type(s): 1. Slab 2. ______

Foundation Material(s): 1. Concrete, Generic 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☒good ☐fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐FMSF record search (sites/surveys)
☐FL State Archives/photo collection
☐property appraiser / tax records
☒cultural resource survey (CRAS)
☐library research
☐city directory
☐newspaper files
☐historic photos
☒building permits
☐occupant/owner interview
☐neighbor interview
☐interior inspection
☐Sanborn maps
☐plat maps
☐Public Lands Survey (DEP)
☐HABS/HAER record search
☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information

Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM

Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Shelterair Maintenance Hangar – 3900 Don Emerson Drive (FMSF PO08462) (AECOM Resource #11b)

Only the ghost of the original runway pattern of the former Lakeland Army Air Base is visible at the current Lakeland Linder Airport (FMSF PO08466) (AECOM Resource 11a) (Figure 1). Since the late 1980s, it has been transformed by the construction of extensions and new runways and the sodding over of old runways and pads (*Tampa Tribune* 1967, 1968, 1997, 2000, and 2002). The runway and the airport grounds, therefore, are believed to have lost their integrity of design, setting, materials, workmanship and, thereby, feeling, and association. The airfield is accordingly not recommended as eligible for NR listing due to a loss of integrity. (The airfield does remain at its original location.)

As noted at the historic context of the accompanying report, none of the airport's scores of WWII-era buildings survive. Tax records and historic aerials, however, indicate that four of the its standing resources were erected between about 1959 and 1971. Three of these are hangars standing on the southwest side of Airfield Drive West about 400' southeast of the modern airport terminal. Matching steel hangars erected c1960 (*Tampa Tribune* 1959a) now house the aircraft maintenance facilities of Shelterair Aviation (FMSF PO08462) (AECOM Resource 11b) (Figure 2 and Figure 3) and Aeromech Aviation (FMSF PO08463) (AECOM Resource 11c). These were joined by a nearly identical hangar to their northwest—now home to the maintenance facilities of Double M Aviation (FMSF PO08464) (AECOM Resource 11d)—between the taking of aerial photographs of the airport in 1964 and 1968. (The 1964 aerial appears to show ground preparation for the hangar.) A second building was added to this hangar by 1971. (A series of historic aerials of the airport and Polk County are available at the Polk County GIS Map Viewer site.) The three earliest hangars are essentially square, about 120' on each side. They are conventional hangar types with steel primary load-bearing trusses and framing and steel walls and roofs. Their doors are the standard horizontal telescoping type that slide, overlap, and open up access to the entire hangar space when fully pushed to either side. The hangar attached to the northeast side of the Double M Aviation hangar is of similar design and construction, but it only about half as wide. The two hangars are largely open to each other inside, forming a single work space.

The maintenance hangars are believed to retain their integrity of location, design, setting, materials, workmanship and, thereby, feeling, and association. However, they are not believed to be significant for any association with significant events or individuals or to embody the distinctive characteristics of a type, period, or method of construction. They are conventional steel hangar types with standard telescoping doors (Luke and Howson 2002; Iungerich 2018; Weitze 1999). The hangars have no known associations with the Cold War or other military activities. They are therefore not believed to be significant under NR Criteria A, B, or C and are recommended as not eligible for NR listing.

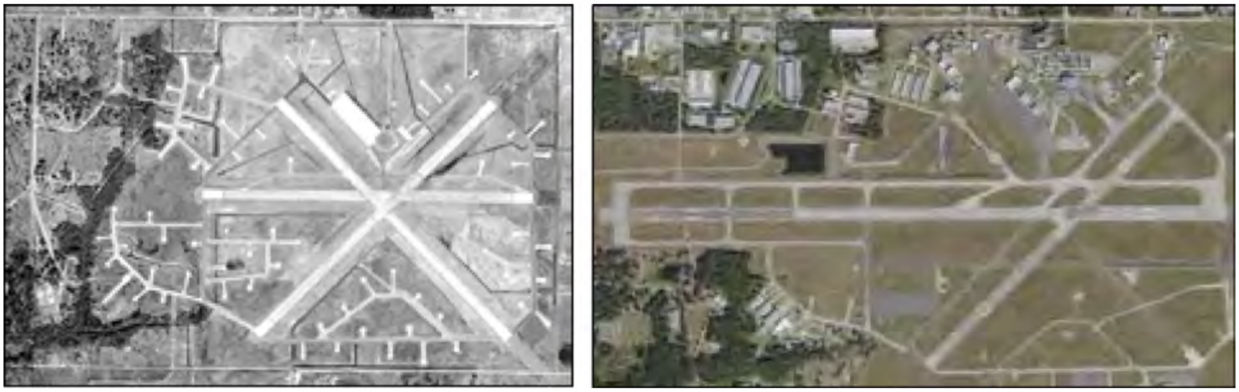


Figure 1. Left, Lakeland Army Air Field (FMSF PO08466) (AECOM Resource #11a) with Drane Field Road at north top, 1953: (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm; right, modern Google Maps aerial.

Figure 2. Shelterair Aviation maintenance hangar (FMSF PO08462) (AECOM Resource #11b): left, southwest airside elevation; right, southwest airside and southeast elevations.

Figure 3. Shelterair Aviation maintenance hangar (FMSF PO08462) (AECOM Resource #11b): interior views.

REFERENCES

Iungerich, Justin M.
2018 "Comprehensive Comparison of Steel Frame Fabric and Conventionally Constructed Aircraft Hangars." Thesis, Air Force Institute of Technology. Accessed August 2020 at https://apps.dtic.mil/dtic/tr/fulltext/u2/1056499.pdf

Luke, Stephen J., and W. Paul Howson
2002 "Modern Aircraft Hangars: A Review of the Design Trends." In *The Structural Engineer* (August 6, 2002), pp. 23-30. Accessed August 2020 at https://www.istructe.org/webtest/files/9d/9d0c56f1-286e-4e2b-ad88-95b6573980a7.pdf.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Tampa Bay Times
1947 "Lakeland Gets Drane Field Landing Area." April 10, 1947.

Tampa Tribune
1959a "New Airport Facility." December 10, 1959.

1967 "Airport Work Bids Below Airport Cost Estimates." August 3, 1967.

1968 "Thousands Thrill to Navy Fliers' Exhibition at Lakewood." March 11, 1968.

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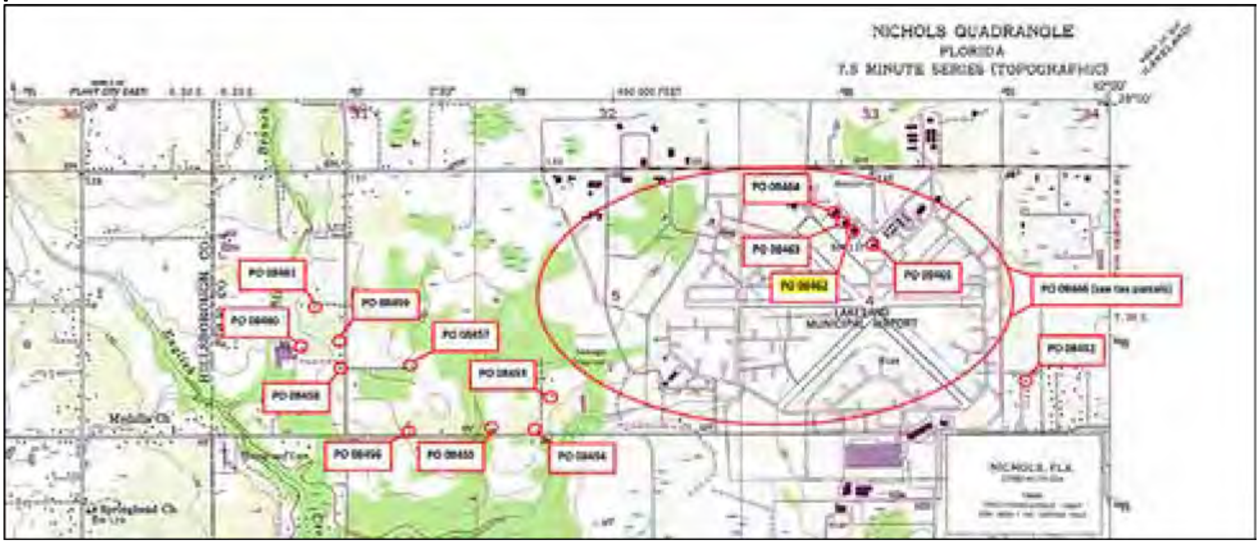
2000 "Lakeland Airport to Get New Terminal." December 2, 2000.

2002 "Lakeland Airport Launches Terminal." April 9, 2002.

Weitze, Karen J.
1999 "Cold War Infrastructure for Air Defense: The Fighter and Command Missions." Prepared by KEA Environmental, Inc. for Headquarters Air Combat Command, Langley Air Force Base. Accessed August 2020 at http://www.mobileradar.org/Documents/1999-11-02132.pdf.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) within Parcel 232904000000011010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08463
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Aeromech Maintenance Hangar Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ______
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	3900		Don Emerson	Drive	

Cross Streets (nearest / between) SE of Airfield Dr West and Drane Field Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ______
Township 29S Range 23E Section 4 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ______
Tax Parcel # 232904000000011010 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1960 ☒approximately ☐year listed or earlier ☐year listed or later
Original Use Hangar From (year): ______ To (year): ______
Current Use Hangar From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: ☐yes ☒no ☐unknown Date: ______ Original address ______
Alterations: ☐yes ☒no ☐unknown Date: ______ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ______

DESCRIPTION

Style Industrial Vernacular Exterior Plan Not applicable Number of Stories 1
Exterior Fabric(s) 1. Metal 2. ______ 3. ______
Roof Type(s) 1. Gable 2. ______ 3. ______
Roof Material(s) 1. Sheet metal:3V crimp 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY — OFFICIAL EVALUATION — DHR USE ONLY

NR List Date ______
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ______ Init. ______
KEEPER – Determined eligible: ☐yes ☐no Date ______
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______
Structural System(s): 1. Steel skeleton 2. ______ 3. ______
Foundation Type(s): 1. Slab 2. ______
Foundation Material(s): 1. Concrete, Generic 2. ______

Main Entrance (stylistic details)
see attachment

Porch Descriptions (types, locations, roof types, etc.)
see attachment

Condition (overall resource condition): ☐ excellent ☒ good ☐ fair ☐ deteriorated ☐ ruinous

Narrative Description of Resource
see attachment

Archaeological Remains ______ ☐ Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐ FMSF record search (sites/surveys) ☐ library research ☒ building permits ☐ Sanborn maps
☐ FL State Archives/photo collection ☐ city directory ☐ occupant/owner interview ☐ plat maps
☐ property appraiser / tax records ☐ newspaper files ☐ neighbor interview ☐ Public Lands Survey (DEP)
☒ cultural resource survey (CRAS) ☐ historic photos ☐ interior inspection ☐ HABS/HAER record search
☐ other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)
see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐ yes ☒ no ☐ insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐ yes ☒ no ☐ insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)
see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)
1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents
1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______
2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM
Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments
❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Aeromech Maintenance Hangar – 3900 Don Emerson Drive (FMSF PO08463) (AECOM Resource #11c)

Only the ghost of the original runway pattern of the former Lakeland Army Air Base is visible at the current Lakeland Linder Airport (FMSF PO08466) (AECOM Resource 11a) (Figure 1). Since the late 1980s, it has been transformed by the construction of extensions and new runways and the sodding over of old runways and pads (*Tampa Tribune* 1967, 1968, 1997, 2000, and 2002). The runway and the airport grounds, therefore, are believed to have lost their integrity of design, setting, materials, workmanship and, thereby, feeling, and association. The airfield is accordingly not recommended as eligible for NR listing due to a loss of integrity. (The airfield does remain at its original location.)

As noted at the historic context of the accompanying report, none of the airport's scores of WWII-era buildings survive. Tax records and historic aerials, however, indicate that four of the its standing resources were erected between about 1959 and 1971. Three of these are hangars standing on the southwest side of Airfield Drive West about 400' southeast of the modern airport terminal. Matching steel hangars erected c1960 (*Tampa Tribune* 1959a) now house the aircraft maintenance facilities of Shelterair Aviation (FMSF PO08462) (AECOM Resource 11b and Aeromech Aviation (FMSF PO08463) (AECOM Resource 11c) (Figure 2 through Figure 3). These were joined by a nearly identical hangar to their northwest—now home to the maintenance facilities of Double M Aviation (FMSF PO08464) (AECOM Resource 11d)—between the taking of aerial photographs of the airport in 1964 and 1968. (The 1964 aerial appears to show ground preparation for the hangar.) A second building was added to this hangar by 1971. (A series of historic aerials of the airport and Polk County are available at the Polk County GIS Map Viewer site.) The three earliest hangars are essentially square, about 120' on each side. They are conventional hangar types with steel primary load-bearing trusses and framing and steel walls and roofs. Their doors are the standard horizontal telescoping type that slide, overlap, and open up access to the entire hangar space when fully pushed to either side. The hangar attached to the northeast side of the Double M Aviation hangar is of similar design and construction, but it only about half as wide. The two hangars are largely open to each other inside, forming a single work space.

The maintenance hangars are believed to retain their integrity of location, design, setting, materials, workmanship and, thereby, feeling, and association. However, they are not believed to be significant for any association with significant events or individuals or to embody the distinctive characteristics of a type, period, or method of construction. They are conventional steel hangar types with standard telescoping doors (Luke and Howson 2002; Iungerich 2018; Weitze 1999). The hangars have no known associations with the Cold War or other military activities. They are therefore not believed to be significant under NR Criteria A, B, or C and are recommended as not eligible for NR listing.

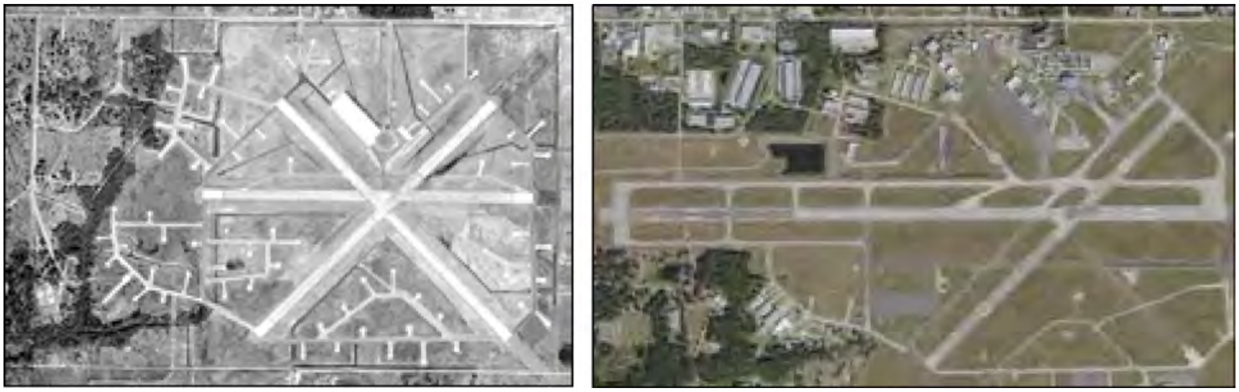


Figure 1. Left, Lakeland Army Air Field (FMSF PO08466) (AECOM Resource #11a) with Drane Field Road at north top, 1953: (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm; right, modern Google Maps aerial.

Figure 2. Aeromech Aviation maintenance hangar (AECOM Resource #11c): left, southwest airside elevation; right, northwest side elevation.

Figure 3. Aeromech Aviation maintenance hangar (AECOM Resource #11c): interior views.

REFERENCES

Iungerich, Justin M.
2018 "Comprehensive Comparison of Steel Frame Fabric and Conventionally Constructed Aircraft Hangars." Thesis, Air Force Institute of Technology. Accessed August 2020 at https://apps.dtic.mil/dtic/tr/fulltext/u2/1056499.pdf

Luke, Stephen J., and W. Paul Howson
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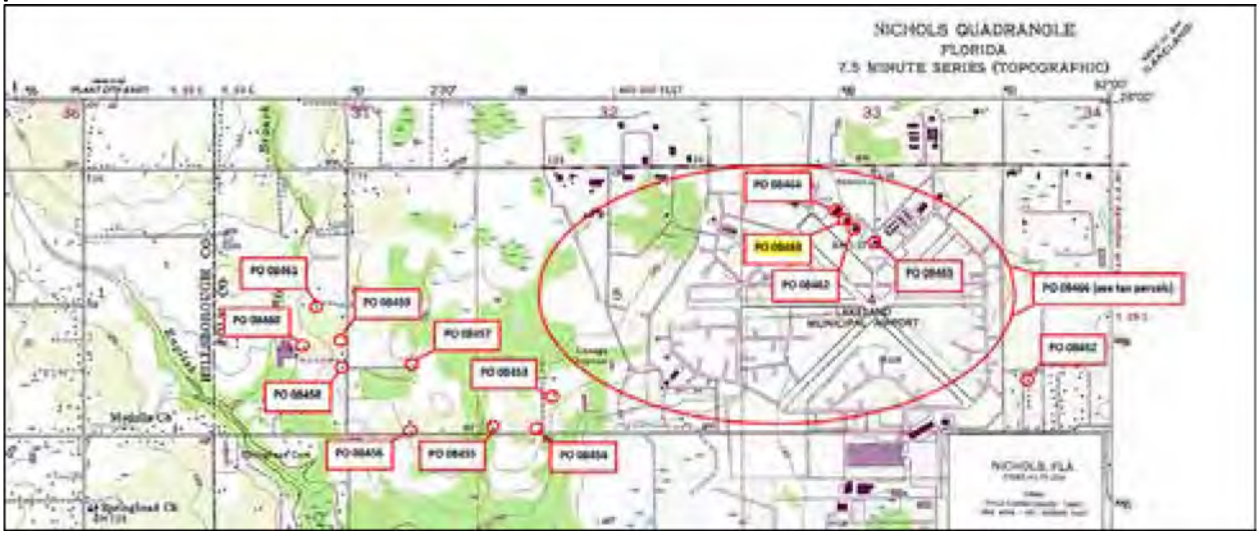
FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) within Parcel 232904000000011010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08464
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Double M Maintenance Hangar Multiple Listing (DHR only) ____
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ____
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	3900		Don Emerson	Drive	

Cross Streets (nearest / between) SE of Airfield Dr West and Drane Field Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ____
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ____
Township 29S Range 23E Section 4 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ____
Tax Parcel # 232904000000011010 Landgrant ____
Subdivision Name ____ Block ____ Lot ____
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ____ Y: ____ Coordinate System & Datum ____
Name of Public Tract (e.g., park) ____

HISTORY

Construction Year: 1965 ☒approximately ☐year listed or earlier ☐year listed or later
Original Use Hangar From (year): ____ To (year): ____
Current Use Hangar From (year): ____ To (year): ____
Other Use ____ From (year): ____ To (year): ____
Moves: ☐yes ☒no ☐unknown Date: ____ Original address ____
Alterations: ☐yes ☒no ☐unknown Date: ____ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ____ Nature ____
Architect (last name first): ____ Builder (last name first): ____
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ____

DESCRIPTION

Style Industrial Vernacular Exterior Plan Not applicable Number of Stories 1
Exterior Fabric(s) 1. Metal 2. ____ 3. ____
Roof Type(s) 1. Gable 2. ____ 3. ____
Roof Material(s) 1. Sheet metal:3V crimp 2. ____ 3. ____
Roof secondary strucs. (dormers etc.) 1. ____ 2. ____
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY — OFFICIAL EVALUATION — DHR USE ONLY

NR List Date ____
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ____ Init. ____
KEEPER – Determined eligible: ☐yes ☐no Date ____
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08464

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______
Structural System(s): 1. Steel skeleton 2. ______ 3. ______
Foundation Type(s): 1. Slab 2. ______
Foundation Material(s): 1. Concrete, Generic 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐excellent ☒good ☐fair ☐deteriorated ☐ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

- ☐FMSF record search (sites/surveys)
- ☐FL State Archives/photo collection
- ☐property appraiser / tax records
- ☒cultural resource survey (CRAS)
- ☐library research
- ☐city directory
- ☐newspaper files
- ☐historic photos
- ☒building permits
- ☐occupant/owner interview
- ☐neighbor interview
- ☐interior inspection
- ☐Sanborn maps
- ☐plat maps
- ☐Public Lands Survey (DEP)
- ☐HABS/HAER record search
- ☐other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐yes ☒no ☐insufficient information
Appears to meet the criteria for National Register listing as part of a district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM

Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Double M Maintenance Hangar – 3900 Don Emerson Drive (FMSF PO08464) (AECOM Resource #11d)

Only the ghost of the original runway pattern of the former Lakeland Army Air Base is visible at the current Lakeland Linder Airport (FMSF PO08466) (AECOM Resource 11a) (Figure 1). Since the late 1980s, it has been transformed by the construction of extensions and new runways and the sodding over of old runways and pads (*Tampa Tribune* 1967, 1968, 1997, 2000, and 2002). The runway and the airport grounds, therefore, are believed to have lost their integrity of design, setting, materials, workmanship and, thereby, feeling, and association. The airfield is accordingly not recommended as eligible for NR listing due to a loss of integrity. (The airfield does remain at its original location.)

As noted at the historic context of the accompanying report, none of the airport's scores of WWII-era buildings survive. Tax records and historic aerials, however, indicate that four of the its standing resources were erected between about 1959 and 1971. Three of these are hangars standing on the southwest side of Airfield Drive West about 400' southeast of the modern airport terminal. Matching steel hangars erected c1960 (*Tampa Tribune* 1959a) now house the aircraft maintenance facilities of Shelterair Aviation (FMSF PO08462) (AECOM Resource 11b and Aeromech Aviation (FMSF PO08463) (AECOM Resource 11c). These were joined by a nearly identical hangar to their northwest—now home to the maintenance facilities of Double M Aviation (FMSF PO08464) (AECOM Resource 11d)—between the taking of aerial photographs of the airport in 1964 and 1968 (Figure 2 through Figure 3). (The 1964 aerial appears to show ground preparation for the hangar.) A second building was added to this hangar by 1971. (A series of historic aerials of the airport and Polk County are available at the Polk County GIS Map Viewer site.) The three earliest hangars are essentially square, about 120' on each side. They are conventional hangar types with steel primary load-bearing trusses and framing and steel walls and roofs. Their doors are the standard horizontal telescoping type that slide, overlap, and open up access to the entire hangar space when fully pushed to either side. The hangar attached to the northeast side of the Double M Aviation hangar is of similar design and construction, but it only about half as wide. The two hangars are largely open to each other inside, forming a single work space.

The maintenance hangars are believed to retain their integrity of location, design, setting, materials, workmanship and, thereby, feeling, and association. However, they are not believed to be significant for any association with significant events or individuals or to embody the distinctive characteristics of a type, period, or method of construction. They are conventional steel hangar types with standard telescoping doors (Luke and Howson 2002; Iungerich 2018; Weitze 1999). The hangars have no known associations with the Cold War or other military activities. They are therefore not believed to be significant under NR Criteria A, B, or C and are recommended as not eligible for NR listing.

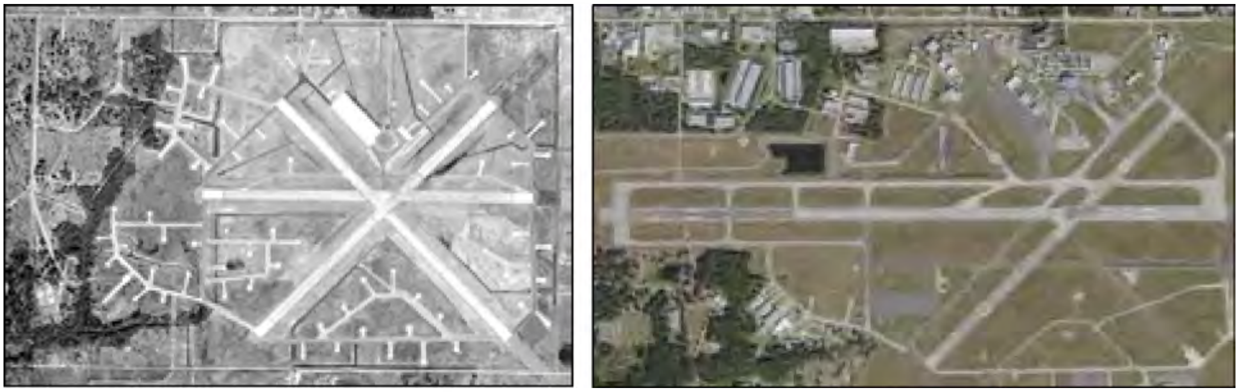


Figure 1. Left, Lakeland Army Air Field (FMSF PO08466) (AECOM Resource #11a) with Drane Field Road at north top, 1953: (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm; right, modern Google Maps aerial.

Figure 2. Double M Aviation maintenance hangars (AECOM Resource #11d): left, southwest side and southeast airside elevations with first-built hangar at left; right, southeast airside and northeast side elevations with second-built hangar at right.

Figure 3. Double M Aviation maintenance hangars (AECOM Resource #11d): left, southwest side elevation of first-built hangar; right, interior view looking from first-built hangar into darker second-built hangar space.

REFERENCES

Iungerich, Justin M.
2018 "Comprehensive Comparison of Steel Frame Fabric and Conventionally Constructed Aircraft Hangars." Thesis, Air Force Institute of Technology. Accessed August 2020 at https://apps.dtic.mil/dtic/tr/fulltext/u2/1056499.pdf

Luke, Stephen J., and W. Paul Howson
2002 "Modern Aircraft Hangars: A Review of the Design Trends." In *The Structural Engineer* (August 6, 2002), pp. 23-30. Accessed August 2020 at https://www.istructe.org/webtest/files/9d/9d0c56f1-286e-4e2b-ad88-95b6573980a7.pdf.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Tampa Bay Times
1947 "Lakeland Gets Drane Field Landing Area." April 10, 1947.

Tampa Tribune
1959a "New Airport Facility." December 10, 1959.

1967 "Airport Work Bids Below Airport Cost Estimates." August 3, 1967.

1968 "Thousands Thrill to Navy Fliers' Exhibition at Lakewood." March 11, 1968.

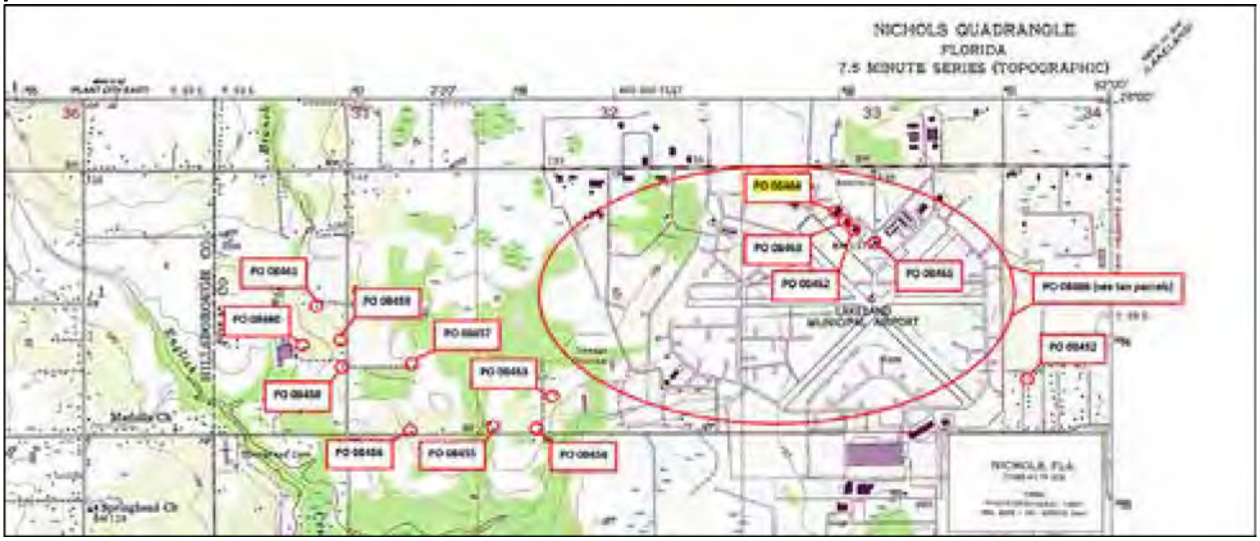
1997 "Airline Might Fly Out of Lakeland." June 22, 1997.

2000 "Lakeland Airport to Get New Terminal." December 2, 2000.

2002 "Lakeland Airport Launches Terminal." April 9, 2002.

Weitze, Karen J.
1999 "Cold War Infrastructure for Air Defense: The Fighter and Command Missions." Prepared by KEA Environmental, Inc. for Headquarters Air Combat Command, Langley Air Force Base. Accessed August 2020 at http://www.mobileradar.org/Documents/1999-11-02132.pdf.

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) within Parcel 232904000000011010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒ Original
☐ Update

HISTORICAL STRUCTURE FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site#8 PO08465
Field Date 8-12-2020
Form Date 8-25-2020
Recorder # Marvin Brown

Shaded Fields represent the minimum acceptable level of documentation.
Consult the *Guide to Historical Structure Forms* for detailed instructions.

Site Name(s) (address if none) Frmr Lakeland Municipal Airport Terminal Multiple Listing (DHR only) ______
Survey Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS Survey # (DHR only) ______
National Register Category (please check one) ☒building ☐structure ☐district ☐site ☐object
Ownership: ☐private-profit ☐private-nonprofit ☒private-individual ☐private-nonspecific ☐city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	3900		Don Emerson	Drive	

Cross Streets (nearest / between) SE of Airfield Dr West and Drane Field Rd
USGS 7.5 Map Name NICHOLS USGS Date 1987 Plat or Other Map ______
City / Town (within 3 miles) Lakeland In City Limits? ☒yes ☐no ☐unknown County ______
Township 29S Range 23E Section 4 ¼ section: ☐NW ☐SW ☐SE ☐NE Irregular-name: ______
Tax Parcel # 232904000000011010 Landgrant ______
Subdivision Name ______ Block ______ Lot ______
UTM Coordinates: Zone ☐16 ☐17 Easting ☐☐☐☐☐☐ Northing ☐☐☐☐☐☐☐
Other Coordinates: X: ______ Y: ______ Coordinate System & Datum ______
Name of Public Tract (e.g., park) ______

HISTORY

Construction Year: 1965 ☒approximately ☐year listed or earlier ☐year listed or later
Original Use Air/Bus/Rail terminal or depot From (year): ______ To (year): ______
Current Use Offices, government From (year): ______ To (year): ______
Other Use ______ From (year): ______ To (year): ______
Moves: ☐yes ☒no ☐unknown Date: ______ Original address ______
Alterations: ☒yes ☐no ☐unknown Date: ______ Nature see attachment
Additions: ☐yes ☒no ☐unknown Date: ______ Nature ______
Architect (last name first): ______ Builder (last name first): ______
Ownership History (especially original owner, dates, profession, etc.)
see attachment

Is the Resource Affected by a Local Preservation Ordinance? ☐yes ☐no ☒unknown Describe ______

DESCRIPTION

Style Modernistic Exterior Plan Not applicable Number of Stories 1
Exterior Fabric(s) 1. Brick 2. Concrete block 3. ______
Roof Type(s) 1. Flat 2. ______ 3. ______
Roof Material(s) 1. ______ 2. ______ 3. ______
Roof secondary strucs. (dormers etc.) 1. ______ 2. ______
Windows (types, materials, etc.)
see attachment

Distinguishing Architectural Features (exterior or interior ornaments)
see attachment

Ancillary Features / Outbuildings (record outbuildings, major landscape features; use continuation sheet if needed.)
see attachment

DHR USE ONLY OFFICIAL EVALUATION DHR USE ONLY

NR List Date ______
☐Owner Objection

SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ______ Init. ______
KEEPER – Determined eligible: ☐yes ☐no Date ______
NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)

HISTORICAL STRUCTURE FORM

Site #8 PO08465

DESCRIPTION (continued)

Chimney: No. 0 Chimney Material(s): 1. ______ 2. ______

Structural System(s): 1. Masonry - General 2. ______ 3. ______

Foundation Type(s): 1. Slab 2. ______

Foundation Material(s): 1. Concrete, Generic 2. ______

Main Entrance (stylistic details)

see attachment

Porch Descriptions (types, locations, roof types, etc.)

see attachment

Condition (overall resource condition): ☐ excellent ☒ good ☐ fair ☐ deteriorated ☐ ruinous

Narrative Description of Resource

see attachment

Archaeological Remains ______ ☐ Check if Archaeological Form Completed

RESEARCH METHODS (select all that apply)

☐ FMSF record search (sites/surveys)
☐ FL State Archives/photo collection
☐ property appraiser / tax records
☒ cultural resource survey (CRAS)
☐ library research
☐ city directory
☐ newspaper files
☐ historic photos
☒ building permits
☐ occupant/owner interview
☐ neighbor interview
☐ interior inspection
☐ Sanborn maps
☐ plat maps
☐ Public Lands Survey (DEP)
☐ HABS/HAER record search
☐ other methods (describe) ______

Bibliographic References (give FMSF manuscript # if relevant, use continuation sheet if needed)

see attachment

OPINION OF RESOURCE SIGNIFICANCE

Appears to meet the criteria for National Register listing individually? ☐ yes ☒ no ☐ insufficient information

Appears to meet the criteria for National Register listing as part of a district? ☐ yes ☒ no ☐ insufficient information

Explanation of Evaluation (**required**, whether significant or not; use separate sheet if needed)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. ______ 3. ______ 5. ______
2. ______ 4. ______ 6. ______

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

2) Document type ______ Maintaining organization ______
Document description ______ File or accession #'s ______

RECORDER INFORMATION

Recorder Name Marvin Brown Affiliation AECOM

Recorder Contact Information 701 Corporate Center Dr, Raleigh NC 2707/919-854-6203/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

❶ USGS 7.5' MAP WITH STRUCTURE LOCATION CLEARLY INDICATED
❷ LARGE SCALE STREET, PLAT OR PARCEL MAP (available from most property appraiser web sites)
❸ PHOTO OF MAIN FACADE, DIGITAL IMAGE FILE
When submitting an image, it must be included in digital AND hard copy format (plain paper grayscale acceptable).
Digital image must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Former Lakeland Municipal Airport Terminal (current US Customs and Border Protection building) – 3900 Don Emerson Drive (FMSF PO08465) (AECOM Resource #11e)

Only the ghost of the original runway pattern of the former Lakeland Army Air Base is visible at the current Lakeland Linder Airport (AECOM Resource 11a) (Figure 1). Since the late 1980s, it has been transformed by the construction of extensions and new runways and the sodding over of old runways and pads (*Tampa Tribune* 1967, 1968, 1997, 2000, and 2002). The runway and the airport grounds, therefore, are believed to have lost their integrity of design, setting, materials, workmanship and, thereby, feeling, and association. The airfield is accordingly not recommended as eligible for NR listing due to a loss of integrity. (The airfield does remain at its original location.)

As noted at the historic context of this report, none of the airport's scores of WWII-era buildings survive. Tax records and historic aerials, however, indicate that four of the its standing resources were erected between about 1959 and 1971. Three of these are hangars standing on the southwest side of Airfield Drive West about 400' southeast of the modern airport terminal. Matching steel hangars erected c1960 (*Tampa Tribune* 1959a) now house the aircraft maintenance facilities of Shelterair Aviation (AECOM Resource 11b) and Aeromech Aviation (AECOM resource 11c). These were joined by a nearly identical hangar to their northwest—now home to the maintenance facilities of Double M Aviation (AECOM Resource 11d)—between the taking of aerial photographs of the airport in 1964 and 1968. (The 1964 aerial appears to show ground preparation for the hangar.) A second building was added to this hangar by 1971. (A series of historic aerials of the airport and Polk County are available at the Polk County GIS Map Viewer site.) The three earliest hangars are essentially square, about 120 feet on each side. They are conventional hangar types with steel primary load-bearing trusses and framing and steel walls and roofs. Their doors are the standard horizontal telescoping type that slide, overlap, and open up access to the entire hangar space when fully pushed to either side. The hangar attached to the northeast side of the Double M Aviation hangar is of similar design and construction, but it only about half as wide. The two hangars are largely open to each other inside, forming a single work space.

A portion of one additional building that is more than 50 years old survives at the airport (Figure 2 through Figure 5). In December 1959 the airport was completing construction of its first purpose-built terminal. A basic Modernist building, the Lakeland Municipal Airport terminal was a one-story-tall rectangle of masonry construction topped by a flat roof. Exposed posts separated it into seven bays across its front. Three had three-part glass windows and paired doors that extended most of the way toward the roof; four were windowless. A flat-roofed portico supported by steel posts crossed the glassed bays. In the late 1980s or early 1990s, a control tower was built off the terminal's southeastern corner. Between 2002 and 2005, the western three-quarters of the building were lopped off, leaving only its eastern quarter. In the mid-2010s the control tower was removed as well.

The remaining quarter of the former terminal now houses the airport's US Customs and Border Protection (CPB) facility. The one-story building retains some of the walls of the terminal and perhaps one of the original three-part windows. A shorter one-story addition has been wrapped around its south and east elevations. This addition includes three-part windows similar to the original ones.

Due its dramatic alterations—not least the removal of one-quarter of its original structure—the former Lakeland Municipal Airport terminal, now home to the airport's CPB facility, is believed to have lost its integrity of design, materials, workmanship and, accordingly, feeling and association. It remains in an airport setting on its original location, but it appears to have clearly lost its overall integrity. Additionally, the building is not known to have any association with significant historic events or persons and does not appear to embody the distinctive characteristics of a type, period, or method of construction. It is accordingly recommended as not NR-eligible under Criteria A, B, or C.

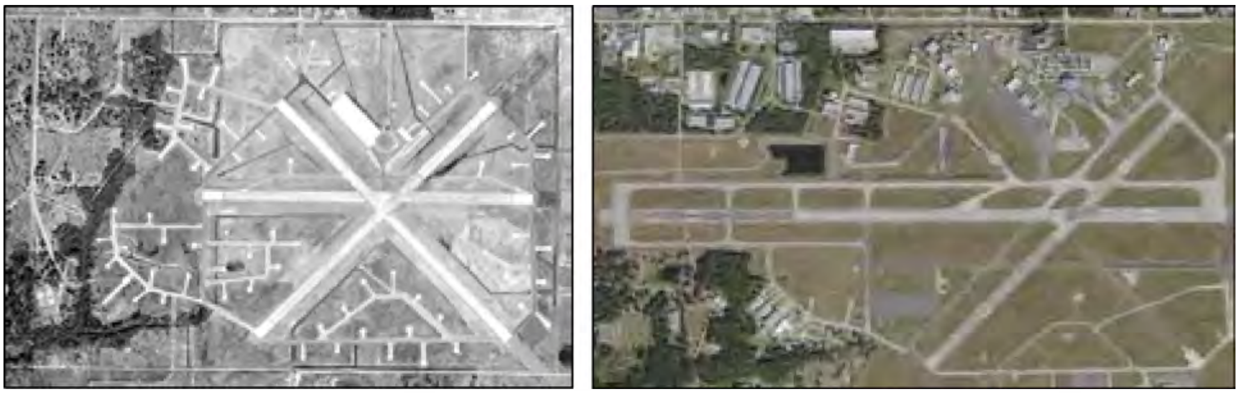


Figure 1. Left, Lakeland Army Air Field with Drane Field Road at north top, 1953 (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm; right, modern Google Maps aerial.

Figure 2. Left, aerial views of former Lakeland Municipal Airport terminal (FMSF PO08465) (AECOM Resource #11e) in 2002 and, right, in 2005 (source of both: Polk County GIS Map Viewer site)

Former Lakeland Municipal Airport Terminal (current US Customs and Border Protection building) – 3900 Don Emerson Drive (FMSF PO08465) attachment

Figure 3. Left, Lakeland Municipal Airport terminal building (FMSF PO08465) (AECOM #11e), 1967 (source: https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/66/rec/1); right, current US Customs and Border Protection building (same number), south front and east side elevation.

Figure 4. Left, current US Customs and Border Protection building (FMSF PO08465) (AECOM #11e), south front elevation and, right, west side and south front elevations.

Figure 5. Left, current US Customs and Border Protection building (FMSF PO08465) (AECOM #11e), north rear elevation.

REFERENCES

Iungerich, Justin M.
2018 "Comprehensive Comparison of Steel Frame Fabric and Conventionally Constructed Aircraft Hangars." Thesis, Air Force Institute of Technology. Accessed August 2020 at https://apps.dtic.mil/dtic/tr/fulltext/u2/1056499.pdf

Luke, Stephen J., and W. Paul Howson
2002 "Modern Aircraft Hangars: A Review of the Design Trends." In *The Structural Engineer* (August 6, 2002), pp. 23-30. Accessed August 2020 at https://www.istructe.org/webtest/files/9d/9d0c56f1-286e-4e2b-ad88-95b6573980a7.pdf.

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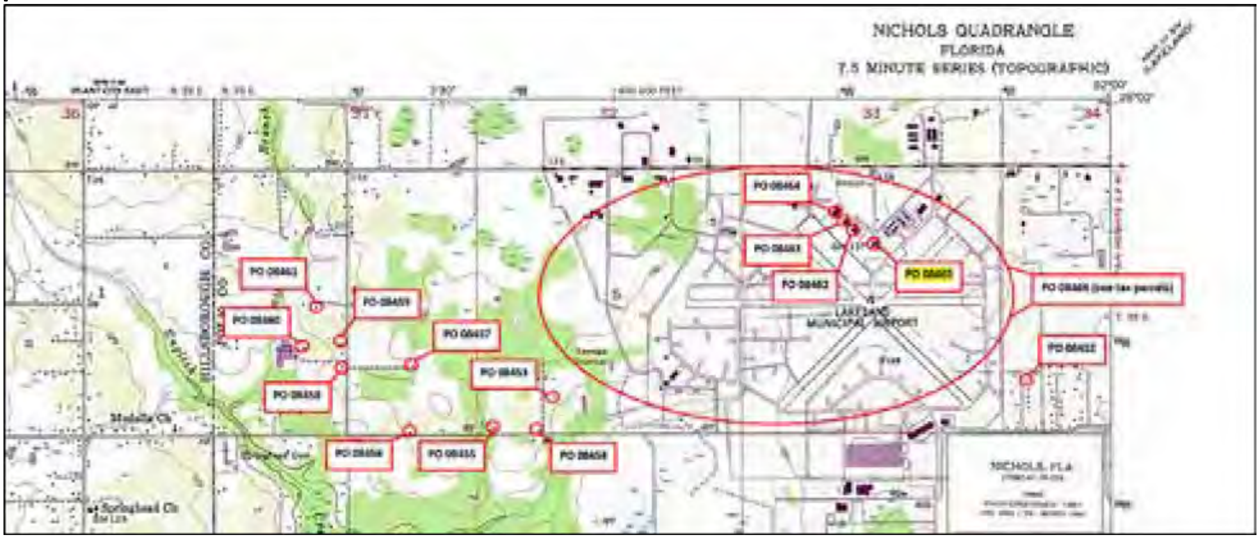
Former Lakeland Municipal Airport Terminal (current US Customs and Border Protection building) – 3900 Don Emerson Drive (FMSF PO08465) attachment

FMSF # highlighted in yellow and resource circled in red on Nichols Quad sheet, 1987 photorevised



Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) within Parcel 232904000000011010, resource circled in red

Photographs included in above history attachment and submitted separately as pdfs

Page 1

☒Original
☐Update

RESOURCE GROUP FORM
FLORIDA MASTER SITE FILE
Version 5.0 3/19

Site #8 PO08466
Field Date 8-12-2020
Form Date 8-24-2020
Recorder# Marvin Brown

Consult the *Guide to the Resource Group Form* for additional instructions

NOTE: Use this form to document districts, landscapes, building complexes and linear resources as described in the box below. Cultural resources contributing to the Resource Group should also be documented individually at the Site File. **Do not use this form for National Register multiple property submissions** (MPSs). National Register MPSs are treated as Site File manuscripts and are associated with the individual resources included under the MPS cover using the Site File manuscript number.

Check ONE box that best describes the Resource Group:

- ☐ **Historic district** (NR category "district"): buildings and NR structures only: NO archaeological sites
- ☐ **Archaeological district** (NR category "district"): archaeological sites only: NO buildings or NR structures
- ☐ **Mixed district** (NR category "district"): includes more than one type of cultural resource (example: archaeological sites and buildings)
- ☐ **Building complex** (NR category usually "building(s)"): multiple buildings in close spatial and functional association
- ☒ **Designed historic landscape** (NR category usually "district" or "site"): can include multiple resources (see *National Register Bulletin #18*, page 2 for more detailed definition and examples: e.g. parks, golf courses, campuses, resorts, etc.)
- ☐ **Rural historic landscape** (NR category usually "district" or "site"): can include multiple resources and resources not formally designed (see *National Register Bulletin #30, Guidelines for Evaluating and Documenting Rural Historic Landscapes* for more detailed

Resource Group Name Lakeland Linder Airport   Multiple Listing [DHR only] ____
Project Name EA for PhII Air Cargo Facility at LAL Ph IA CRAS   FMSF Survey # ____
National Register Category (please check one): ☐building(s) ☐structure ☒district ☐site ☐object
Linear Resource Type (if applicable): ☐canal ☐railway ☐road ☐other (describe): ____
Ownership: ☐private-profit ☐private-nonprofit ☐private-individual ☐private-nonspecific ☒city ☐county ☐state ☐federal ☐Native American ☐foreign ☐unknown

LOCATION & MAPPING

	Street Number	Direction	Street Name	Street Type	Suffix Direction
Address:	3900		Don Emerson	Drive	

City/Town (within 3 miles) Lakeland   In Current City Limits? ☒yes ☐no ☐unknown
County or Counties (do not abbreviate) Polk
Name of Public Tract (e.g., park) ____

	Township	Range	Section	¼ section	
1)	29S	23E	3	☐NW ☐SW ☐SE ☐NE	Irregular-name: ____
2)	29S	23E	4	☐NW ☐SW ☐SE ☐NE	
3)	29S	34E	5	☐NW ☐SW ☐SE ☐NE	
4)				☐NW ☐SW ☐SE ☐NE	

USGS 7.5' Map(s) 1) Name NICHOLS   USGS Date 1987
2) Name ____   USGS Date ____
Plat, Aerial, or Other Map (map's name, originating office with location) ____
Landgrant ____
Verbal Description of Boundaries (description does not replace required map)

Bounded by Drane Field Rd on the north; Airfield Perimeter Road E on the east; Airside Center Dr, Flightline Dr, James C Ray Dr and Medulla Rd on the south; and Aaron Morgan Rd and Kelvin Howard Rd on the west

DHR USE ONLY	OFFICIAL EVALUATION	DHR USE ONLY
NR List Date ____ ☐ Owner Objection	SHPO – Appears to meet criteria for NR listing: ☐yes ☐no ☐insufficient info Date ____ Init. ____ KEEPER – Determined eligible: ☐yes ☐no Date ____ NR Criteria for Evaluation: ☐a ☐b ☐c ☐d (see *National Register Bulletin 15*, p. 2)	

RESOURCE GROUP FORM

Site #8 PO08466

HISTORY & DESCRIPTION

Construction Year: 1941 ☐approximately ☐year listed or earlier ☐year listed or later

Architect/Designer: Builder:

Total number of individual resources included in this Resource Group: # of contributing 0 # of non-contributing 4

Time period(s) of significance (choose a period from the list or type in date range(s), e.g. *1895-1925*)

1. WW II & Aftermath 1941-1950
2. Modern (Post 1950)
3.
4.

Narrative Description (*National Register Bulletin 16A* pp. 33-34; attach supplementary sheets if needed)

see attachment

RESEARCH METHODS (check all that apply)

☒FMSF record search (sites/surveys) ☒library research ☐building permits ☐Sanborn maps
☒FL State Archives/photo collection ☐city directory ☐occupant/owner interview ☐plat maps
☐property appraiser / tax records ☒newspaper files ☐neighbor interview ☐Public Lands Survey (DEP)
☒cultural resource survey ☒historic photos ☐interior inspection ☐HABS/HAER record search
☒other methods (specify) online research

Bibliographic References (give FMSF Manuscript # if relevant)

Phase Ib CRAS for EA for Phase II Air Cargo Facility at Lakeland Linder Airport, Polk County, 2020

OPINION OF RESOURCE SIGNIFICANCE

Potentially eligible individually for National Register of Historic Places? ☐yes ☒no ☐insufficient information

Potentially eligible as contributor to a National Register district? ☐yes ☒no ☐insufficient information

Explanation of Evaluation (required, see *National Register Bulletin 16A* p. 48-49. Attach longer statement, if needed, on separate sheet.)

see attachment

Area(s) of Historical Significance (see *National Register Bulletin 15*, p. 8 for categories: e.g. "architecture", "ethnic heritage", "community planning & development", etc.)

1. Transportation
2.
3.
4.
5.
6.

DOCUMENTATION

Accessible Documentation Not Filed with the Site File - including field notes, analysis notes, photos, plans and other important documents

1) Document type Maintaining organization
Document description File or accession #'s

2) Document type Maintaining organization
Document description File or accession #'s

RECORDER INFORMATION

Recorder Name Marvin Brown, Sr Archit'al Historian Affiliation AECOM

Recorder Contact Information 701 Corporate Center Dr/Raleigh NC 27607 919-274-5374/marvin.brown@aecom.com
(address / phone / fax / e-mail)

Required Attachments

1. PHOTOCOPY OF USGS 7.5' MAP WITH DISTRICT BOUNDARY CLEARLY MARKED
2. LARGE SCALE STREET, PLAT OR PARCEL MAP WITH RESOURCES MAPPED & LABELED
3. TABULATION OF ALL INCLUDED RESOURCES - Include name, FMSF #, contributing? Y/N, resource category, street address or other location information if no address.
4. PHOTOS OF GENERAL STREETSCAPE OR VIEWS (Optional: aerial photos, views of typical resources) When submitting images, they must be included in digital AND hard copy format (plain paper grayscale acceptable). Digital images must be at least 1600 x 1200 pixels, 24-bit color, jpeg or tiff.

Lakeland Linder Airport history

A 1952 promotional publication summarized the immediate post-WWII history of Lakeland, founded in 1884 (Lakeland Chamber of Commerce 1952:5, 11). It noted that with a population of approximately 40,000, Lakeland was Polk County's principal city. The county grew a third of Florida's citrus crop, raised more cattle than any other Florida county, and produced 68% of the phosphate mined in the country. Pebble phosphate was generally found in the county from 10 to 30 feet below the surface, requiring stripping of the land by giant shovels (Figure 1 and Figure 2). This last item is most relevant to the history of Lakeland Linder Airport and its surroundings. Local resident Claude M. Harden, Jr. recalled that around 1940 or 1941, just prior to the airport's construction, current Drane Field Road was dirt and the area was marked by "high and rugged" piles of spoil from phosphate mining (Cobb, Oldham and Harden n.d.) (Figure 3). Another contemporary account described the airport site prior to construction differently (*Lakeland Ledger* 1945a):

> Extensive installations, equipment, and buildings now on the [air] field present an interesting contrast to the barren expanse and swamps which confronted the original GI settlers here, who experienced hardships and privations sometimes not experienced by soldiers overseas. Mess was prepared and eaten out of doors, sanitary facilities were man-dug, and tents served as living quarters. All water was transported from Lakeland (quoted in Cobb, Oldham and Harden n.d.).

A few pre-WWII residences likely built as farmhouses that stand west of the airport, though, suggest that the area was not solely barren, swampy, or devoted to mining. It also supported agriculture. This would not be surprising, given the agricultural nature of Polk and neighboring Hillsborough County to the west throughout much of the twentieth century (Kerlin 2005).

Figure 1. Left, Polk County agricultural field, 1921 (source: https://ufdc.ufl.edu/UF00033854/00001/1x?search=polk+county); right, view west over Davison Chemical Corporation phosphate mine with Drane Field Road and Edgewood Drive heading north, off the top of the aerial, toward the airport site, c1930-46 (source: https://lakelandpubliclibrary.contentdm.oclc.org/digital/collection/p15809coll7/id/497/rec/25).

Figure 2. Left, 1940 US Geological Survey map with approximate airfield location circled, within property of International Minerals & Chemical Corporation; right, 1944 US Geological Survey Map with airfield at lower right.

Figure 3. Lakeland Army Air Base, late 1942 or early 1943 (source: McDill Field 1943:36).

In July 1941 the *Tampa Tribune* reported that Lakeland was in the midst of constructing a new airport five miles southwest of the city. The airport was initially called Lakeland Airport No. 2 to distinguish it from the city's Airport No. 1. (No. 1 was called Lodwick during WWII; its site is now occupied by Tiger Town, the Detroit Tigers spring training facility.) Lakeland Airport No. 2 was renamed Drane Field, for Rep. Herbert J. Drane, in May 1941 (*Tampa Times* 1941). Originally planned to cost about $380,000, the project was boosted in July to more than one million dollars. Lakeland was sponsoring the federal Civil Aeronautics Act and Works Progress Administration (CAA-WPA) project. It provided the one-mile-square site and engineering services, the CAA-WPA provided two-thirds of the funding. The newspaper further noted that "Approximately a third of the cost of the project will be supplied by army engineers and the federal bureau of public roads, giving rise to further speculation that the army plans to take over the development as a training field or as an air corps base."

In May 1942, with the airport "being rushed to completion," Lakeland leased Drane Field to War the Department as a training center for US Army fliers (*Tampa Tribune* 1942b; Air Force History Index at http://airforcehistoryindex.org/display.php?irisnum=174017&p=y). The Army renamed the facility Lakeland Army Air Field (*Tampa Tribune* 1947) (Figure 4).

When the field was built, current Drane Field Road was dirt (interview of Claude M. Harden, Jr. at Cobb, Oldham and Harden n.d.) and the area around it, as noted, was likely marked by a mix of piles of pebble-phosphate spoil, woods, swampy land, and citrus or other agricultural fields. An article in the May 1943 *Lakeland Ledger* described the many improvements to the field and its facilities:

> Drane Field is one year old—and the post this morning, with its numerous buildings and extensive equipment, is a big contrast to the bare site which the first troops found when they arrived to begin clearing the woods and scratching redbugs. Long rows of identical army barracks have replaced the tents in which the first troops to come here were quartered. The paved streets, named for Army officers, are posted with neat signs identifying them as MacArthur Boulevard, Roosevelt Road, Voss Avenue, and similar designations. Speed limit signs are placed at regular intervals to control the heavy traffic and vigilant MPs check on violations.
>
> A drive through the base shows further evidence of its growth—base headquarters, squadron areas, dayrooms, mess halls, hospital, officers' quarters, post exchange, theater, service club, chapel, and many other buildings. The base hospital is now fully equipped to care for the men at the field. It even has a maternity ward for wives of men stationed here and several births have been reported in the past few months. When the hospital was first set up its grounds were as barren as the rest of the field. Landscaping is underway, and grass, flowers, and shrubs have been planted to beautify the area. The base headquarters area is also being improved and landscaping is planned for other parts of the base later (quoted in Cobb, Oldham and Harden n.d.).

Figure 4. Lakeland Army Air Field, 1943 (source: https://web.archive.org/web/20120608222530/http://www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm)

On November 2, 1945—two months after WWII ended—the War Department deactivated the training base (*Miami News* 1945). The *Lakeland Ledger* (1945a) summarized the field's activities during the war:

> Of the 3,880 acres of land which comprise the reservation area, only 475 acres were purchased outright by the government. The remaining acres are leased from private individuals and firms. The cantonment area was constructed to accommodate 3,196 enlisted men and 958 officers, but housing and messing facilities were exhausted on several occasions by a sudden increase of personnel.
>
> Air traffic at Lakeland Army Air Field has been fairly heavy, the average daily cycle of operations having been in excess of 100. Combat aircraft which have trained here have

> included B-17s, B-24s, B-26s, P-51s, P-40s, and A-20s, varying in weight from 8,500 pounds to 50,000 pounds. More than 15 groups ranging in type from heavy bombardment to specialized commando units and service groups of the old and new type have trained at Lakeland in the past 34 months.

Following the closure, Lakeland began to shift operations from its other city airfield—Lodwick Field on Lake Parker—to Drane. With its 5,000'-long runways, Drane was more desirable than Lodwick, which had runways only 3,500' in length (*Lakeland Ledger* 1945b). In 1946 the city began flying locally grown strawberries from Drane to Detroit. In 1947 National Air Lines shifted its limited operations from Lodwick to Drane (*Tampa Tribune* 1946 and 1947).

In April 1947, the city recovered title to Drane Field. It received from the War Assets Administration (WAA) not only the original 640-acre landing area, but an additional 320 acres of the training field, which included 13 buildings and many pieces of maintenance equipment (*Tampa Bay Times* 1947). The WAA retained approximately 235 buildings, which it put up for sale in May. The sale notice stated that the buildings and fixtures were "for removal and off-site use only." Among the buildings were barracks, warehouses, mess halls, hospital wards, and officers and nurses quarters. Most of the barracks, at least, were wooden (interview of Claude M. Harden, Jr. at Cobb, Oldham and Harden n.d.). In spite of fresh strawberry transportation and some National flights, from the end of the war until the mid-1950s Drane Field was only partially in use. A 1953 aerial photograph depicts it with no evident planes and its WWII configuration intact (Figure 5).


FOR SALE

SURPLUS GOVERNMENT BUILDINGS and FIXTURES AT LAKELAND ARMY AIR FIELD

(DRANE FIELD)

LAKELAND, FLORIDA

. . .

APPROXIMATELY 235 ASSORTED BUILDINGS

Hospital Wards	Officers Quarters	Theatre
Warehouses	Mess Halls	Infirmary
Barracks	Recreation Buildings	Surgery
Utility Shops	Guard Houses	Gas Station
Lavatories	Supply Buildings	Nurses Quarters
Boiler House	Gymnasium	Open & Closed Walkways

(Many other types)

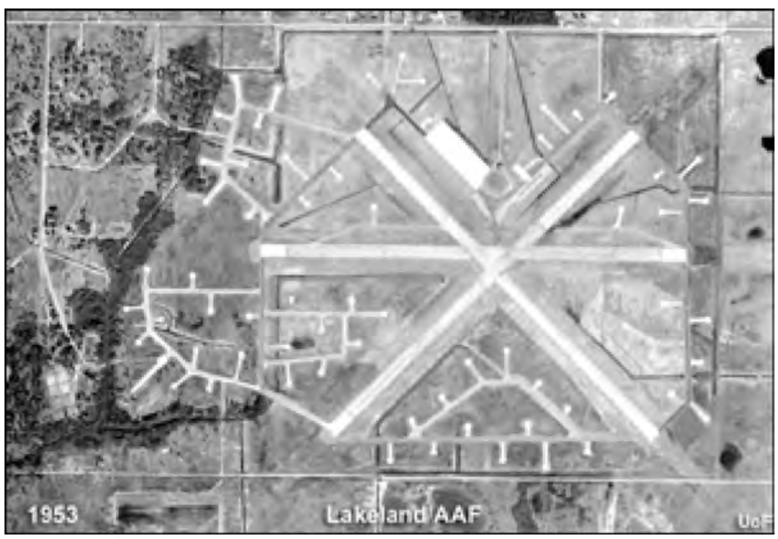


Figure 5. Left, portions of WAA sales notice for Drane Field (Tampa Bay Times 1947); right, aerial photo of field, 1953 (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm).

In 1959-60 Drane Field added a new, one-story, Modernist terminal building and two new hangars (*Tampa Tribune* 1959a) (Figure 6 and Figure 7). The cost of the new facilities, plus planned improved lighting and repair and extension of the runways, was to be covered by sale of the former Lodwick Airport property. Airport zoning regulations were also approved in 1959, "but not before residents in that section waged a successful fight to get the regulations relaxed to a minimum" (*Tampa Tribune* 1959b).

Figure 6. Left, Drane Field with municipal terminal and two hangars, c1960 (source: https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/43/rec/48).

Figure 7. Left, Lakeland Municipal Airport terminal under construction, December 1959 (source: Tampa Tribune 1959a); right, terminal in 1967 (source: https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/66/rec/1).

The airport extended its east-west runway from 5,000 to 6,000 feet in 1967-68. By 1997 this runway had been extended further to 8,500 feet (*Tampa Tribune* 1967, 1968 and 1997). In 2002 the airport replaced the first terminal with a much larger two-story building at a cost of 6.7 million dollars (*Tampa Tribune* 2000 and 2002). This remains its current terminal.

The airport's name changed with its buildings and runways. It reverted to Drain Field after the US Army relinquished the field in the late 1940s. By January 1961 it was renamed the Lakeland Municipal Airport (*Tampa Tribune* 1961). By the early 1980s it was the Lakeland Regional Airport, which in 1991 the city renamed the Lakeland Linder Regional Airport (*Tampa Tribune* 1961 and 1991). In 2017 the airport took on its current name, Lakeland Linder International Airport (*Lakeland Ledger* 2017).

Lakeland Linder Airport (former Lakeland Army Air Base/Drane Field/Lakeland Municipal Airport) – 3900 Don Emerson Drive (FMSF PO08466) (AECOM #11a)

Only the ghost of the original runway pattern of the former Lakeland Army Air Base is visible at the current Lakeland Linder Airport (FMSF PO08466) (AECOM resource 11a) (Figure 8). Since the late 1980s, it has been transformed by the construction of extensions and new runways and the sodding over of old runways and pads (*Tampa Tribune* 1967, 1968, 1997, 2000, and 2002). The runway and the airport grounds, therefore, are believed to have lost their integrity of design, setting, materials, workmanship and, thereby, feeling, and association. The airfield is accordingly not recommended as eligible for NR listing due to a loss of integrity. (The airfield does remain at its original location.)

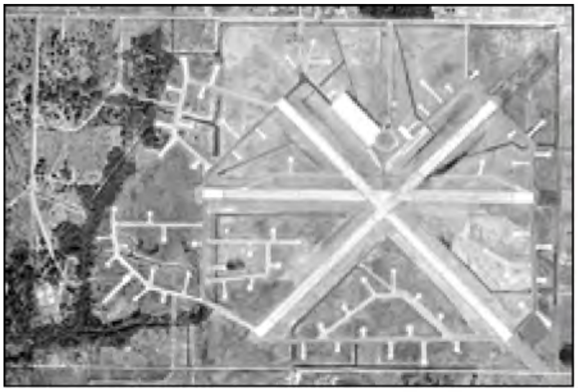



Figure 8. Left, Lakeland Army Air Field with Drane Field Road at north top, 1953 (source: https://web.archive.org/web/20120608222530/http:/www.airfieldsdatabase.com/WW2/WW2%20R27b%20CO-HA.htm; right, modern Google Maps aerial.

As noted at the historic context of this report, none of the airport's scores of WWII-era buildings survive. Tax records and historic aerials, however, indicate that four of the its standing resources were erected between about 1959 and 1971. Three of these are hangars standing on the southwest side of Airfield Drive West about 400' southeast of the modern airport terminal. Matching steel hangars erected c1960 (*Tampa Tribune* 1959a) now house the aircraft maintenance facilities of Shelterair Aviation (FMSF PO08462) (AECOM resource 11b) (Figure 9 and Figure 10) and Aeromech Aviation (FMSF PO08463) (AECOM resource 11c) (Figure 11 Figure 12). These were joined by a nearly identical hangar (Figure 13 and Figure 14) to their northwest—now home to the maintenance facilities of Double M Aviation (FMSF PO08464) (AECOM resource 11d)—between the taking of aerial photographs of the airport in 1964 and 1968. (The 1964 aerial appears to show ground preparation for the hangar.) A second building was added to this hangar by 1971. (A series of historic aerials of the airport and Polk County are available at the Polk County GIS Map Viewer site.) The three earliest hangars are essentially square, about 120' on each side. They are conventional hangar types with steel primary load-bearing trusses and framing and steel walls and roofs. Their doors are the standard horizontal telescoping type that slide, overlap, and open up access to the entire hangar space when fully pushed to either side. The hangar attached to the northeast side of the Double M Aviation hangar is of similar design and construction, but it only about half as wide. The two hangars are largely open to each other inside, forming a single work space.

The maintenance hangars are believed to retain their integrity of location, design, setting, materials, workmanship and, thereby, feeling, and association. However, they are not believed to be significant for any association with significant events or individuals or to embody the distinctive characteristics of a type, period, or method of construction. They are conventional steel hangar types with standard telescoping doors (Luke and Howson 2002; Iungerich 2018; Weitze 1999). The hangars have no known associations with the Cold War or other military activities. They are therefore not believed to be significant under NR Criteria A, B, or C and are recommended as not eligible for NR listing.

Figure 9. Shelterair Aviation maintenance hangar (FMSF PO08462) (AECOM Resource #11b): left, southwest airside elevation; right, southwest airside and southeast elevations.

Figure 10. Shelterair Aviation maintenance hangar (FMSF PO08462) (AECOM Resource #11b): interior views.

Figure 11. Aeromech Aviation maintenance hangar (FMSF PO08463) (AECOM Resource #11c): left, southwest airside elevation; right, northwest side elevation.

Figure 12. Aeromech Aviation maintenance hangar (FMSF PO08463) (AECOM Resource #11c): interior views.

Figure 13. Double M Aviation maintenance hangars (FMSF PO08464) (AECOM Resource #11d): left, southwest side and southeast airside elevations with first-built hangar at left; right, southeast airside and northeast side elevations with second-built hangar at right.

Figure 14. Double M Aviation maintenance hangars (FMSF PO08464) (AECOM Resource #11d): left, southwest side elevation of first-built hangar; right, interior view looking from first-built hangar into darker second-built hangar space.

A portion of one additional building that is more than 50 years old survives at the airport (Figure 15 and Figure 16). In December 1959 the airport was completing construction of its first purpose-built terminal (FMSF PO08465) (AECOM Resource #11e). A basic Modernist building, the Lakeland Municipal Airport terminal was a one-story-tall rectangle of masonry construction topped by a flat roof. Exposed posts separated it into seven bays across its front. Three had three-part glass windows and paired doors that extended most of the way toward the roof; four were windowless. A flat-roofed portico supported by steel posts crossed the glassed bays. In the late 1980s or early 1990s, a control tower was built off the terminal's southeastern corner. Between 2002 and 2005, the western three-quarters of the building were lopped off, leaving only its eastern quarter. In the mid-2010s the control tower was removed as well.

The remaining quarter of the former terminal now houses the airport's US Customs and Border Protection (CPB) facility (Figure 17 and Figure 18). The one-story building retains some of the walls of the terminal and perhaps one of the original three-part windows. A shorter one-story addition has been wrapped around its south and east elevations. This addition includes three-part windows similar to the original ones.

Due its dramatic alterations—not least the removal of one-quarter of its original structure—the former Lakeland Municipal Airport terminal, now home to the airport's CPB facility, is believed to have lost its integrity of design, materials, workmanship and, accordingly, feeling and association. It remains in an airport setting on its original location, but it appears to have clearly lost its overall integrity. Additionally, the building is not known to have any association with significant historic events or persons and does not appear to embody the distinctive characteristics of a type, period, or method of construction. It is accordingly recommended as not NR-eligible under Criteria A, B, or C.

Figure 15. Left, aerial views of former Lakeland Municipal Airport terminal (FMSF PO08465) (AECOM #11e) in 2002 and, right, in 2005 (source of both: Polk County GIS Map Viewer site)

Figure 16. Left, Lakeland Municipal Airport terminal building (FMSF PO08465) (AECOM #11e), 1967 (source: https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll7/id/66/rec/1); right, current US Customs and Border Protection building (same number), south front and east side elevation.


Figure 17. Left, current US Customs and Border Protection building (FMSF PO08465) (AECOM #11e), south front elevation and, right, west side and south front elevations.

Figure 18. Left, current US Customs and Border Protection building (FMSF PO08465) (AECOM #11e), north rear elevation.

REFERENCES

Air Force History Index. Accessed July 2020 at
http://airforcehistoryindex.org/search.php?q=LAKELAND+ARMY&c=u&h=100&F=1%2F1%2F1940&L=.

Cobb, Alisa, Sybille Oldham, and Melanie Harden
n.d. "Lakeland's World War II History." Accessed July 2020 at https://www.polk-fl.net/staff/teachers/tah/documents/floridaflavor/lessons/E-7.pdf

Iungerich, Justin M.
2018 "Comprehensive Comparison of Steel Frame Fabric and Conventionally Constructed Aircraft Hangars." Thesis, Air Force Institute of Technology. Accessed August 2020 at https://apps.dtic.mil/dtic/tr/fulltext/u2/1056499.pdf

Kerlin, Mark W.
2005 "Plant City, Florida, 1885-1940: A Study in Southern Urban Development." M.A. thesis, University of Central Florida." Accessed July 2020 at http://etd.fcla.edu/CF/CFE0000617/Kerlin_Mark_W_20058_MA.pdf.

Lakeland Chamber of Commerce
1952 "The Lakelander." November 1952. Accessed July 2020 at https://cdm15809.contentdm.oclc.org/digital/collection/p15809coll27/id/29/rec/20.

Lakeland Ledger
1943 "Drane Field One Year Old and Still Growing with Much Vigor." May 23, 1943. Quoted in Cobb, Oldham, and Harden.

1945a "Drane Field Closing to be Started Immediately." March 27, 1945. Quoted in Cobb, Oldham, and Harden.

1945b "Drane Field Expected to Close Nov. 1." October 19, 1945. Quoted in Cobb, Oldham, and Harden.

2017 "Now It's an International Airport: US Customs Clears 1st Lakewood Linder Border Crossing." November 16, 2017.

Lakeland Public Library Photograph Collection. Accessed July and August 2020 at https://cdm15809.contentdm.oclc.org/.

Luke, Stephen J., and W. Paul Howson
2002 "Modern Aircraft Hangars: A Review of the Design Trends." In *The Structural Engineer* (August 6, 2002), pp. 23-30. Accessed August 2020 at https://www.istructe.org/webtest/files/9d/9d0c56f1-286e-4e2b-ad88-95b6573980a7.pdf.

McDill Field
1943 "Lakeland Army Air Base, Sub-Base Plays Important Role in Advanced Training." In *Thunderbird, McDill Field Quarterly*, Spring 1943:36, 46. Accessed July 2020 at http://aafcollection.info/items/documents/view.php?file=000214-01-00.pdf).

Miami News
1945 "Drain Field Closed as Training Base." November 2, 1945.

Polk County GIS Map Viewer site. Accessed July and August 2020 at http://gisapps.polk-county.net/gisviewer.

Tampa Bay Times
1947 "Lakeland Gets Drane Field Landing Area." April 10, 1947.

Tampa Times
1941 "Lakeland's New Airport Cost to Exceed $1,000,000." July 21, 1941.

Tampa Tribune
1941 "Drane Field." May 27, 1941.

1942 "Lakeland's New Field Leased by Army Air Corps." May 11, 1942.

1946 "Lakeland Opens Air Freight Line." February 22, 1946.

1947 "NAL to Move Lakeland Base." March 2, 1947.

1959a "New Airport Facility." December 10, 1959.

1959b "New Air Terminal Erected." December 27, 1959.

1967 "Airport Work Bids Below Airport Cost Estimates." August 3, 1967.

1968 "Thousands Thrill to Navy Fliers' Exhibition at Lakewood." March 11, 1968.

1991 "Lakeland Airport Named After Industrialist." January 24, 1991.

1997 "Airline Might Fly Out of Lakeland." June 22, 1997.

2000 "Lakeland Airport to Get New Terminal." December 2, 2000.

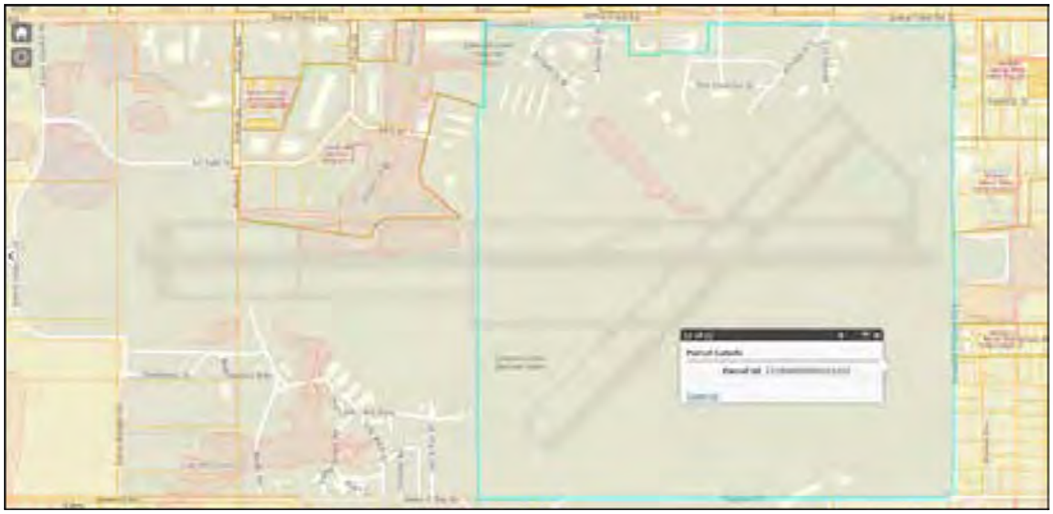
2002 "Lakeland Airport Launches Terminal." April 9, 2002.

US Geological Survey
1940 "Ownership Map, Pebble Phosphate Field in Hardee, Hillsborough, Manatee and Polk Counties, Florida." Washington, D.C. Accessed July 2020 at http://alabamamaps.ua.edu/historicalmaps/us_states/florida/index_1931-1940.htm.

1944 "Plant City, Fla." Topographical map. Accessed July 2020 at https://catalog.data.gov/dataset/usgs-1-31680-scale-quadrangle-for-plant-city-fl-1944

Weitze, Karen J.
1999 "Cold War Infrastructure for Air Defense: The Fighter and Command Missions." Prepared by KEA Environmental, Inc. for Headquarters Air Combat Command, Langley Air Force Base. Accessed August 2020 at http://www.mobileradar.org/Documents/1999-11-02132.pdf.

Airport tax parcels and street names



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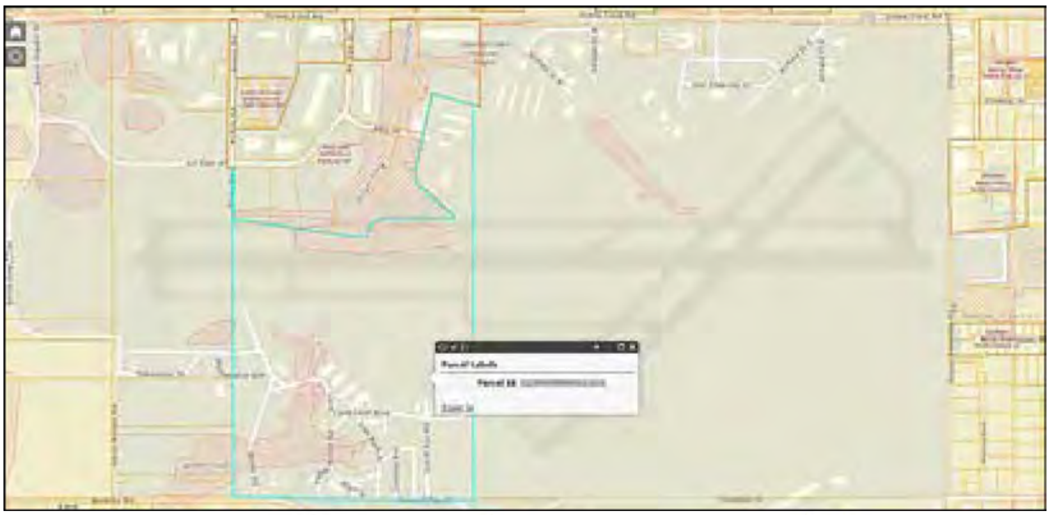

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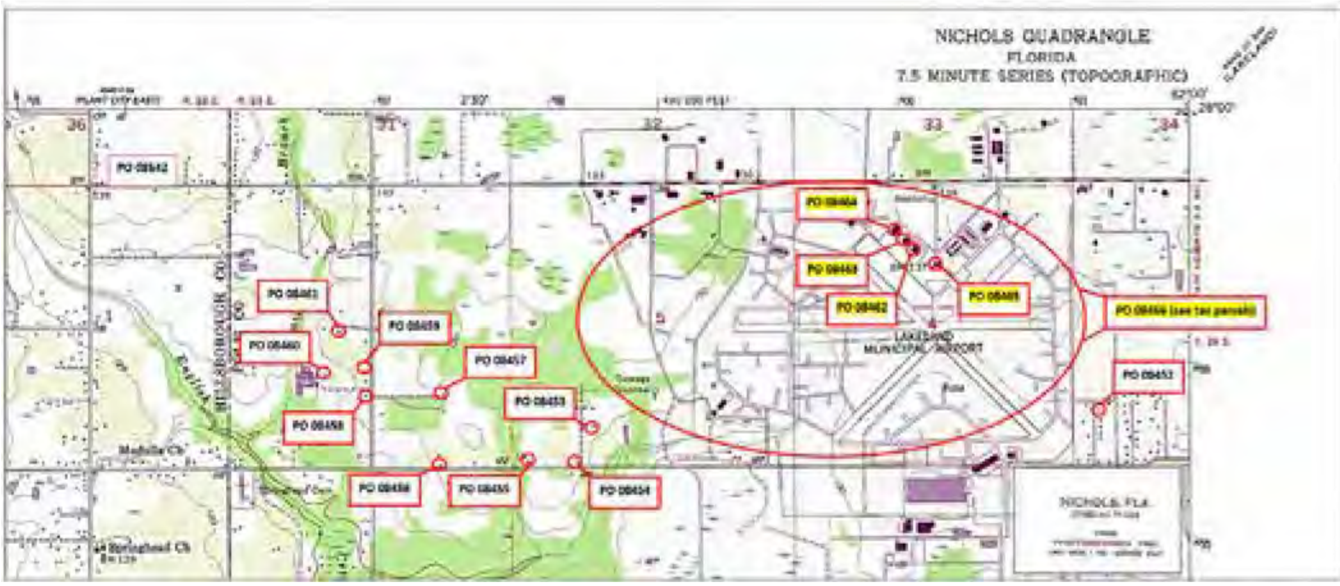
Polk County GIS Map Viewer (http://gisapps.polk-county.net/gisviewer) – Parcel 23905000000031010

FMSF numbers highlighted in yellow and resources circled in red



Photographs included in above history attachment and submitted separately as pdfs

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APPENDIX G

Noise Analysis Technical Report

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Environmental Assessment for Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL)

Noise Technical Report

Prepared for:

City of Lakeland, Florida
and
Federal Aviation Administration

Prepared by:

AECOM

October 2020

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ACRONYMS AND ABBREVIATIONS

AEDT	Aviation Environmental Design Tool
CFR	Code of Federal Regulation
CIP	Capital Improvement Program
dB	Decibel
dBA	A-Weighted Decibel
DNL	Day-Night Average Sound Level
FAA	Federal Aviation Administration
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
GA	General Aviation
HUD	Department of Housing and Urban Development
Hz	Hertz
INM	Integrated Noise Model
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
LAL	Lakeland Linder International Airport
NLR	Noise Level Reduction
SEL	Sound Exposure Level
SPL	Sound Pressure Level

CHAPTER 1 INTRODUCTION

This *Noise Technical Report* details the assessment scope, calculation methodology, input data and other technical information used in the analysis of noise impacts associated with the proposed Phase II Air Cargo Facility Development at the Lakeland Linder International Airport (i.e., LAL, or the Airport), hereinafter referred to as the Proposed Project.

1.1. AIRCRAFT NOISE DESCRIPTORS

A variety of noise metrics are used to assess airport noise impacts in different ways. Noise metrics are used to describe individual noise events (such as a single operation of an aircraft taking off overhead) or groups of events (such as the cumulative effect of numerous aircraft operations, the collection of which creates a general noise environment or overall exposure level). Both types of descriptors are helpful in explaining how people tend to respond to a given noise condition. Descriptions of these metrics are provided below.

Decibel, dB – Sound is a complex physical phenomenon consisting of complex minute vibrations traveling through a medium, such as air. These vibrations are sensed by the human ear as sound pressure. Because of the vast range of sound pressure or intensity detectable by the human ear, sound pressure level (SPL) is represented on a logarithmic scale known as decibels (dB). A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet (laboratory-type) listening conditions. A SPL of 120 dB begins to be felt inside the ear as discomfort and pain at approximately 140 dB. Most environmental sounds have SPLs ranging from 30 to 100 dB.

Because dB are logarithmic, they cannot be added or subtracted directly like other (linear) numbers. For example, if two sound sources each produce 100 dB, when they are operated together, they will produce 103 dB, not 200 dB. Four 100 dB sources operating together again double the sound energy, resulting in a total SPL of 106 dB, and so on. In addition, if one source is much louder than another, the two sources operating together will produce the same SPL as if the louder source were operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source masks the quieter one.

Two useful rules to remember when comparing SPLs are: (1) most people perceive a six to 10 dB increase in SPL between two noise events to be about a doubling of loudness, and (2) changes in SPL of less than about three dB between two events are not easily detected outside of a laboratory.

A-Weighted Decibel, dBA – Frequency, or pitch, is a basic physical characteristic of sound and is expressed in units of cycles per second or hertz (Hz). The normal frequency range of hearing for most people extends from about 20 to 15,000 Hz. Because the human ear is more sensitive to middle and high frequencies (i.e., 1000 to 4000 Hz), a frequency weighting called “A” weighting is applied to the measurement of sound. The internationally standardized "A" filter approximates the sensitivity of the human ear and helps in assessing the perceived loudness of various sounds. In this document all sound levels are A-weighted sound levels and the adjective "A-weighted" has been omitted.

Figure 1.1-1 charts common indoor and outdoor sound levels. A quiet rural area at nighttime may be 30 A-weighted decibels (dBA) or lower while the operator of a typical gas lawn mower may experience a level of 90 dBA. Similarly, the level in a library may be 30 dBA or lower while the listener at a rock band concert may experience levels near 110 dBA.

Maximum A-Weighted Noise Level, L_{max} – Sound levels vary with time. For example, the sound increases as an aircraft approaches, then falls and blends into the ambient or background as the aircraft recedes into the distance. Because of this variation, it is often convenient to describe a particular noise "event" by its highest or maximum sound level (L_{max}). Note L_{max} describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical L_{max} may produce very different total exposures. One may be of very short duration, while the other may be much longer.

Sound Exposure Level, SEL – The most common measure of noise exposure for a single aircraft flyover is the sound exposure level (SEL). SEL is a summation of the A-weighted sound energy at a particular location over the true duration of a noise event normalized to a fictional duration of one second. The true duration is defined as the amount of time the noise event exceeds background levels. For events lasting more than one second, SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event.

The normalization to the fictional duration of one second enables the comparison of noise events with differing true duration and/or maximum level. Because the SEL is normalized to one second, it will almost always be larger in magnitude than the L_{max} for the event. In fact, for most aircraft events, the SEL is about seven to 12 dB higher than the L_{max}. Additionally, since it is a cumulative measure, a higher SEL can result from either a louder or longer event, or some combination.

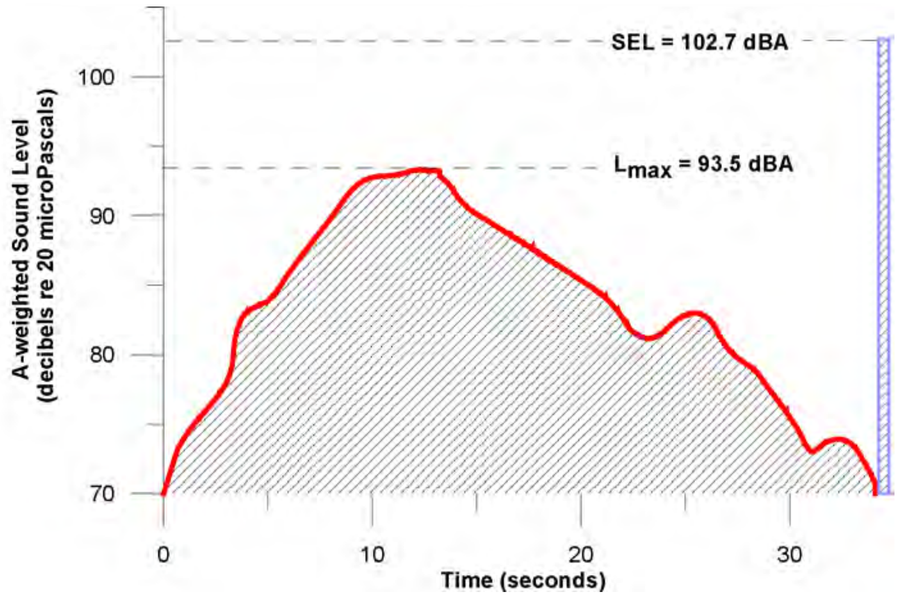
As SEL combines an event's overall sound level along with its duration, SEL provides a comprehensive way to describe noise events for use in modeling and comparing noise environments. Computer noise models, such as the one employed for this document, base their computations on these SELs.

Figure 1.1-2 shows an event's "time history," the variation of sound level with time. For typical sound events experienced by a fixed listener, like a person experiencing an aircraft flying by, the sound level rises as the source (or aircraft) approaches the listener, peaks and then diminishes as the aircraft flies away from the listener. The area under the time history curve represents the overall sound energy of the noise event. The L_{max} for the event shown in the figure was 93.5 dBA. Compressing the event's total sound energy into one second to compute its SEL yields 102.7 dBA.

Figure 1.1-1 Common Outdoor and Indoor Sound Levels

Source: URS Corporation, 2008

Figure 1.1-2 Comparison of Maximum Sound Level (L_{MAX}) and Sound Exposure Level (SEL)



Source: URS Corporation, 2007.

Equivalent Sound Level, L_{eq} – Equivalent sound level (L_{eq}) is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest (e.g., an hour, an 8-hour school day, nighttime, or a full 24-hour day). However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{eq(8)}$ or $L_{eq(24)}$.

Conceptually, L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal "peaks" and "dips." In the context of noise from typical aircraft flight events and as noted earlier for SEL, L_{eq} does not represent the sound level heard at any particular time, but rather represents the total sound exposure for the period of interest. Also, it should be noted that the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged," sound level. Thus, loud events tend to dominate the noise environment described by the L_{eq} metric.

Day-Night Average Sound Level, DNL - Time-averaged sound levels are measurements of sound levels averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period. For the evaluation of community noise effects, and particularly aircraft noise effects, the Day-Night Average Sound Level (DNL). This metrics are similar to the Leq except that it compensates for the widely assumed increase in people's sensitivity to noise during nighttime hours. Each aircraft operation occurring between 10:00 p.m. and 7:00 a.m. is treated as if it were 10 operations. Logarithmically, this multiplier is the equivalent of adding 10 dB to the noise level of each nighttime operation. These noise level penalties are intended to correspond to the drop in background noise level which studies have found takes place from daytime to nighttime in a typical community. The nighttime decrease in ambient sound levels—from both outdoor and indoor sources—is commonly considered to be the principal explanation for people's heightened sensitivity to noises during these periods.

DNL is the primary noise descriptor of this study. DNL is a 24-hour time-weighted-average noise metric expressed in dBA which accounts for the noise levels (in terms of SEL) of all individual aircraft events, the number of times those events occur, and the time of day at which they occur. Values of DNL can be measured with standard monitoring equipment or predicted with computer models. This document utilizes estimates of DNL with a Federal Aviation Administration (FAA)-approved computer-based noise model.

Typical DNL values for a variety of noise environments are shown in **Figure 1.1-3**. DNL values can be approximately 85 dBA outdoors under a flight path within a mile of a major airport and 40 dBA or less outdoors in a rural residential area.

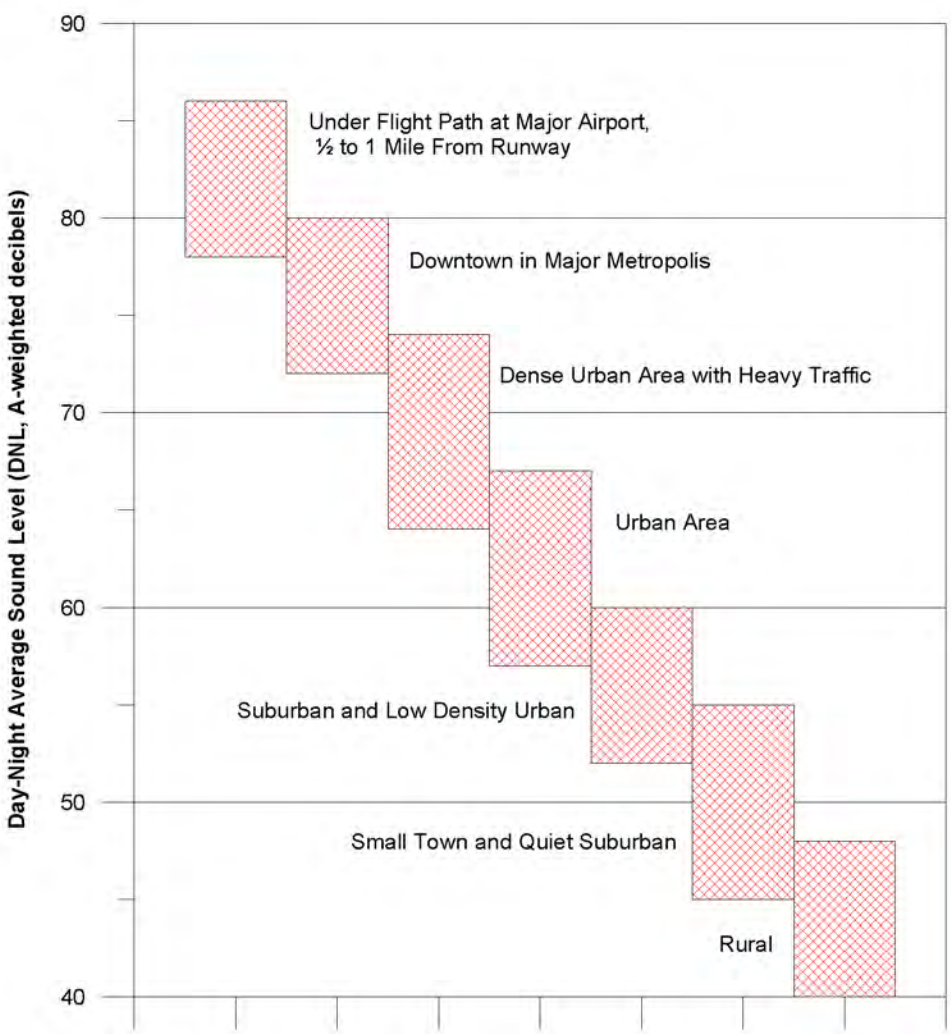
Due to the DNL descriptor's close correlation with the degree of community annoyance from aircraft noise, DNL have been formally adopted by most Federal agencies for measuring and evaluating aircraft noise for land use planning and noise impact assessment. Federal committees such as the Federal Interagency Committee on Urban Noise (FICUN) and the Federal Interagency Committee on Noise (FICON) which include the Environmental Protection Agency (EPA), FAA, Department of Defense, Department of Housing and Urban Development (HUD), and Veterans Administration, found DNL to be the best metric for land use planning. They also found no new cumulative sound descriptors or metrics of sufficient scientific standing to substitute for DNL. Other cumulative metrics could be used only to supplement, not replace DNL. Furthermore, FAA Order 1050.1F for environmental impact studies, requires DNL be used in describing cumulative noise exposure and in identifying aircraft noise/land use compatibility issues (EPA, 1974; FICUN, 1980; FICON, 1992; 14 CFR part 150, 2007; FAA, 2006).

1.2. EFFECTS OF AIRCRAFT NOISE ON PEOPLE

This section addresses three ways humans can be affected by aircraft noise: annoyance, speech interference and sleep disturbance.

Annoyance – The primary potential effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the Environmental Protection Agency as any negative subjective reaction on the part of an individual or group (EPA, 1974). Scientific studies and a large number of social/attitudinal surveys have been conducted to appraise people's annoyance to all types of environmental noise, especially aircraft events. These studies and surveys have found the DNL to be the best measure of this annoyance (EPA, 1974; FICUN, 1980; FICON, 1992; ANSI, 2007; ANSI, 2003; Schultz, 1978; Fidell, et. al., 1991).

Figure 1.1-3 Typical Range of Outdoor Community Day-Night Average Sound Levels



Source: FICON, 1992.

The relationship between annoyance and DNL determined by the scientific community and endorsed by many Federal agencies, including the FAA, is shown in F**igure 1.2-1**. For a DNL of 65 dBA, approximately 13 percent of the exposed population would be highly-annoyed. The figure also shows at very low values of DNL, such as 45 dB or less, one percent or less of the exposed population would be highly annoyed. At very high values of DNL, such as 90 dBA, more than 80 percent of the exposed population would be highly annoyed.

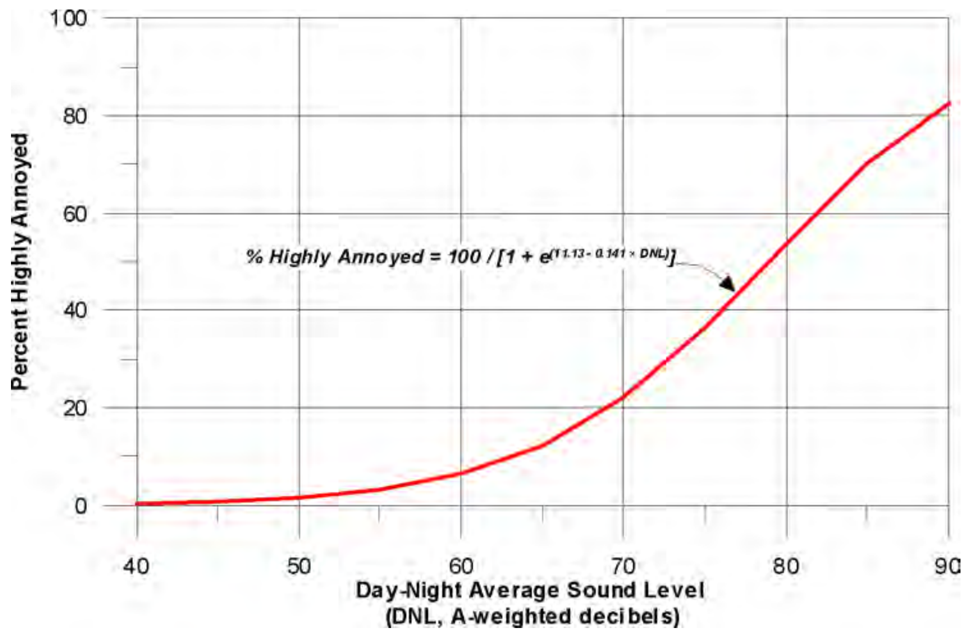
It is often suggested a lower DNL, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for FAA environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65 dB:

- Provides a valid basis for comparing and assessing community noise effects.
- Represents a noise exposure level normally dominated by aircraft noise and not other

community or nearby highway noise sources.

- Reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.
- HUD also established a DNL standard of 65 dBA for eligibility for federally-guaranteed home loans.

Figure 1.2-1 Relationship between Annoyance and Day-Night Average Sound Level



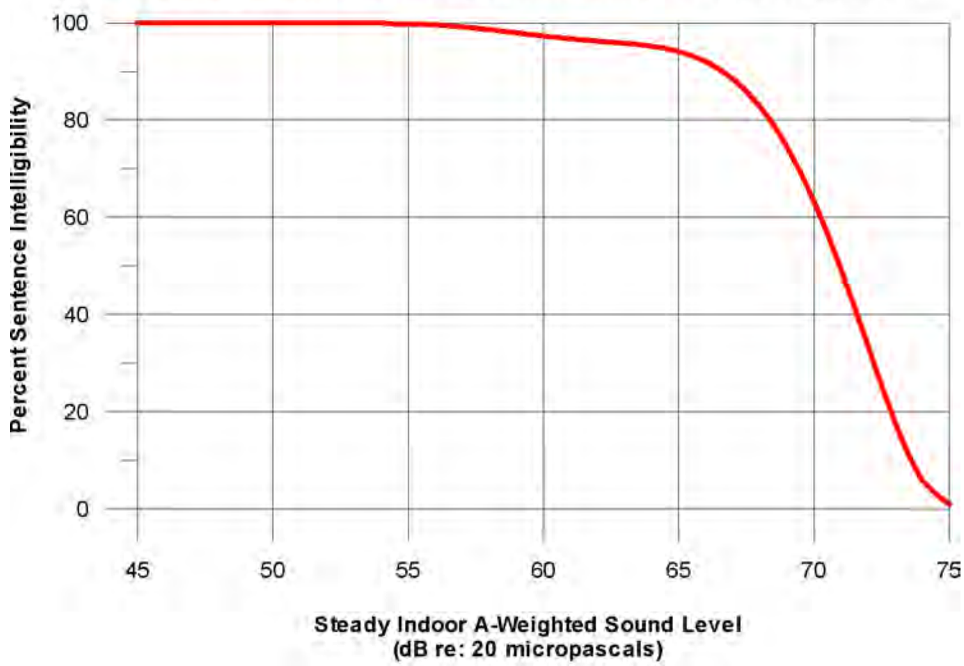
Source: FICON, 1992.

__Speech Interference__ – A primary effect of aircraft noise is its tendency to drown out or "mask" speech, making it difficult to carry on a normal conversation. As an aircraft approaches and its sound level increases, speech becomes harder to hear. As the ambient level increases, the talker must raise his/her voice, or the individuals must get closer together to continue talking.

For typical communication distances of three or four feet (one to 1.5 meters), acceptable outdoor conversations can be carried on in a normal voice as long as the ambient noise outdoors is less than about 65 dBA (FICON, 1992). If the noise exceeds this level, intelligibility would be lost unless vocal effort was increased or communication distance was decreased.

Indoor speech interference can be expressed as a percentage of sentence intelligibility between two average adults with normal hearing speaking fluently in relaxed conversation approximately one meter apart in a typical living room or bedroom (EPA, 1974). As shown in **Figure 1.2-2**, the percentage of sentence intelligibility is a non-linear function of the (steady) indoor ambient or background sound level (24-hour energy-average $L_{eq(24)}$). Steady ambient indoor sound levels of up to 45 dBA $L_{eq(24)}$ are expected to allow 100 percent intelligibility of sentences. The curve shows 99 percent sentence intelligibility for $L_{eq(24)}$ at or below 54 dBA and less than 10 percent intelligibility for $L_{eq(24)}$ greater than 73 dBA. In the same document from which F**igure 1.2-2** was taken, the EPA established an indoor criterion of 45 dBA DNL as requisite to protect against speech interference indoors (EPA, 1974).

Figure 1.2-2 Percent Sentence Intelligibility for Indoor Speech



Source: EPA, 1974

1.3. NOISE ANALYSIS

1.3.1. EXISTING CONDITION NOISE MODELING ASSUMPTIONS

<u>**Airport Environmental Design Tool (AEDT)**</u>

The FAA has required the use of the Aviation Environmental Design Tool (AEDT) since May 29, 2015 for determining the predicted noise impact in the vicinity of airports. Statutory requirements for AEDT use are defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*; and Title 14 CFR part 150, *Airport Noise Compatibility Planning*.

The AEDT incorporates the number of annual average daily daytime and nighttime flight and run-up operations, flight paths, and flight profiles of the aircraft along with its extensive internal database of aircraft noise and performance information, to calculate the DNL at many points on the ground around an airport. From a grid of points, the AEDT contouring program draws contours of equal DNL to be superimposed onto land use maps. For this document, DNL contours of 65, 70, and 75 dBA were developed. DNL contours are a graphical representation of how the noise from the airport's average annual daily aircraft operations is distributed over the surrounding area.

The AEDT can calculate sound levels at any specified point so that noise exposure at representative locations around an airport can be obtained.

The results of the AEDT analysis provide a relative measure of noise levels around airfield facilities. When the calculations are made in a consistent manner, the AEDT is most accurate for comparing before and after noise effects resulting from forecast changes or alternative noise control actions. It allows noise levels to be predicted for such Proposed Projects without the actual implementation and noise monitoring of those actions.

Title 14 CFR part 150, Appendix A, provides Federal compatible land use guidelines for several land uses as a function of DNL values. Compatible or non-compatible land use is determined by comparing the predicted or measured DNL values at a site to the established thresholds.

Examples of detailed local acoustical variables include:

- Temperature profiles;
- Wind gradients;
- Humidity effects;
- Ground absorption;
- Individual aircraft directivity patterns; and
- Sound diffraction caused by terrain, buildings, barriers, etc.

The results of the AEDT analysis provide a relative measure of noise levels around airfield facilities. When the calculations are made in a consistent manner, the AEDT is most accurate for comparing before and after noise effects resulting from forecast changes or alternative noise control actions. It allows noise levels to be predicted for such proposed projects without the actual implementation and noise monitoring of those actions.

Modeled Aircraft Operations

This section describes in detail the sources and derivation of the AEDT input data for the existing conditions including airport layout, weather, flight operations, runway use, flight tracks, track use, and flight profiles.

Airport Layout

LAL has three runways, designated as Runway 9-27, 5-23 and 8-26. Runway 9-27 is 8,499 feet long by 150 feet wide. Runway 5-23 is 5,005 feet long by 150 feet wide. Runway 8-26 is a turf surface runway and is 2,205 feet long by 60 feet wide. The field elevation at LAL is approximately 142 feet. Apron and hangar facilities are available for both based and transient aircraft.

Flight Operations

Tables 1.3-1 shows the AEDT-modeled average annual daily operations for the Existing Conditions by aircraft at LAL.

Runway Use

A summary of the modeled annual average daily utilization of LAL's runways is presented in **Table 1.3-2**. The percentages provided in **Table 1.3-2** are applicable to both day time and nighttime operations.

Flight Tracks

Flight tracks are the aircraft's actual path through the air projected vertically onto the ground. Modeled flight tracks reflect a reasonable representation of the actual flight track recognizing that pilot technique and weather conditions will affect the actual track of individual flights. **Figures 1.3-1a** through **1.3-1c** depict modeled arrival, departure, and touch and go tracks, respectively.

Track Use

Utilization percentages of the flight tracks are tabulated in **Table 1.3-3** for arrivals, departures, and touch-and-gos (TGOs).

Flight Profiles

Flight profiles model the vertical paths of aircraft during departure and arrival to determine the altitude, speed, and engine thrust or power of an aircraft at any point along a flight track. AEDT uses this information to calculate noise exposure on the ground. Profiles are unique to each aircraft type and vary with temperature, barometric pressure, headwind, and aircraft weight. Standard AEDT default profiles were used for all aircraft operations.

FAA Part 150 Compatible Land Use Criteria

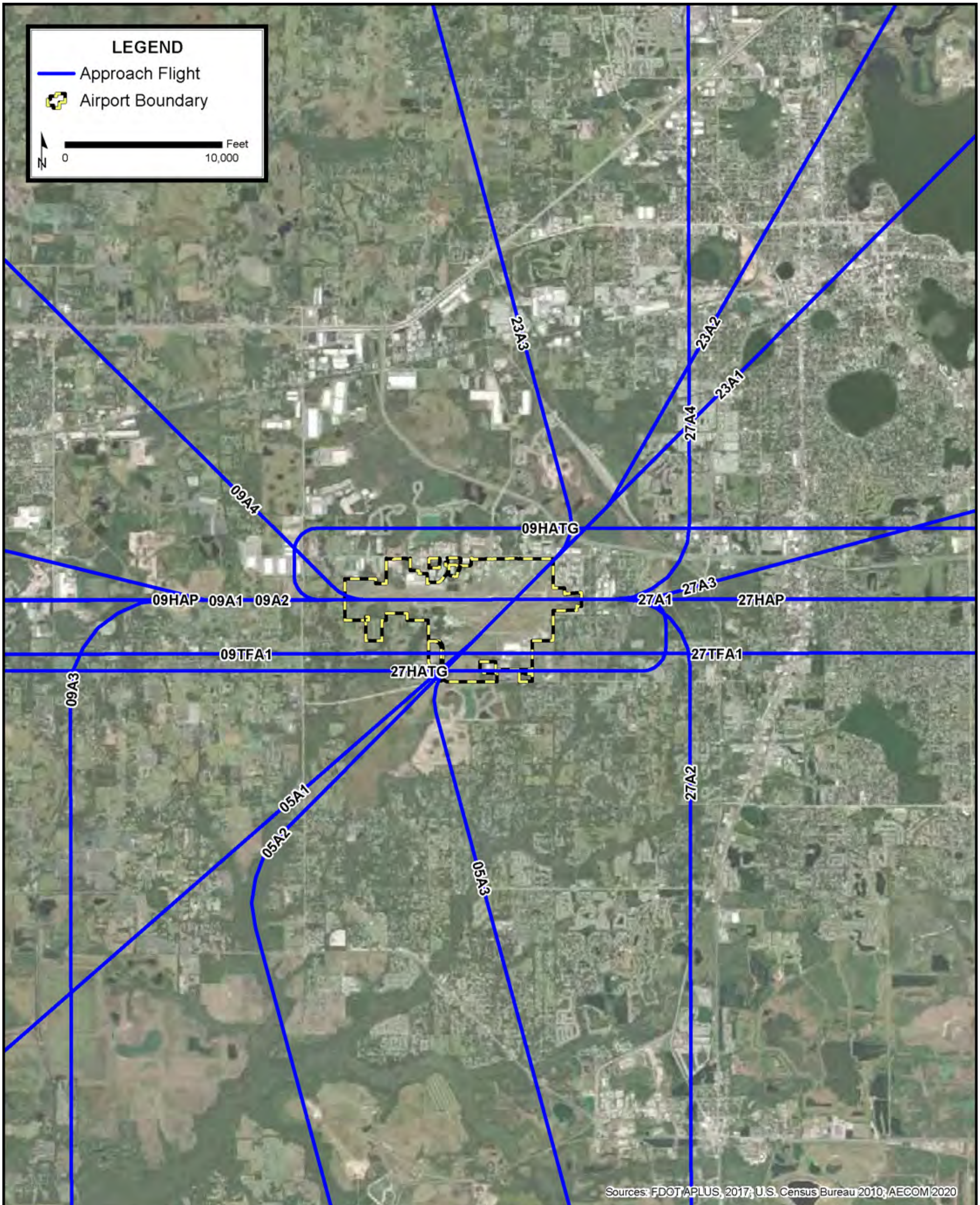
Title 14 CFR part 150, Appendix A, Table 1, provides Federal compatible land use guidelines for several land uses as a function of DNL values. Compatible or non-compatible land use is determined by comparing the predicted or measured DNL or Community Noise Equivalent Level (CNEL) values at a site to the values listed in Table 1. This table is provided as **Table 1.3-4**.

Table 1.3-1 Existing Condition Average Annual Daily Operations at LAL

Aircraft	2019 Existing Condition						
	Arrivals		Departures		TGO		Total
	Day	Night	Day	Night	Day	Night	
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	0.290	-	0.290	-	-	-	0.580
Agusta A-109 250B17 NONE	0.108	-	0.108	-	-	-	0.217
Airbus A320-200 Series 2CM018 NONE	0.004	0.001	0.004	0.001	-	-	0.010
BEC58P	12.908	0.824	12.908	0.824	2.686	0.298	30.447
Bell 206L-4T Long Ranger 250B17 NONE	0.037	-	0.037	-	-	-	0.073
Boeing 727-200 Series 1PW004 NONE	0.001	0.000	0.001	0.000	-	-	0.003
Boeing 737-800 Series 4CM039 NONE	0.011	0.004	0.013	0.002	-	-	0.029
Boeing 757-200 Series 4PW073 NONE	0.004	0.001	0.004	0.001	-	-	0.010
Boeing CH-46 Sea Knight T588F NONE	0.046	-	0.046	-	-	-	0.092
Boeing DC-10-10 Series 3GE076 NONE	0.001	0.000	0.001	0.000	-	-	0.003
Boeing F/A-18 Hornet F4044 NONE	0.065	-	0.065	-	-	-	0.131
Bombardier Challenger 600 5GE084 NONE	1.140	0.073	1.140	0.073	-	-	2.425
Bombardier Global 5000 Business 4BR009 NONE	0.177	0.011	0.177	0.011	-	-	0.376
Bombardier Learjet 35 1AS002 NONE	3.800	0.243	3.800	0.243	-	-	8.086
CASA CN-235-100 CT79B NONE	0.166	-	0.166	-	0.226	-	0.557
Cessna 150 Series O200 NONE	18.144	1.016	18.144	1.016	27.234	3.026	68.580
Cessna 172 Skyhawk IO360 NONE	1.270	0.081	1.270	0.081	-	-	2.702
Cessna 182 IO360 NONE	1.791	0.114	1.791	0.114	-	-	3.811
Cessna 206 TIO540 IO-540-AC	1.261	0.080	1.261	0.080	-	-	2.683
Cessna 208 Caravan PT6A14 NONE	2.081	0.133	2.081	0.133	-	-	4.428
Cessna 441 Conquest II TPE10A NONE	1.669	0.107	1.669	0.107	-	-	3.551
Cessna 500 Citation I 1PW038 NONE	1.451	0.093	1.451	0.093	-	-	3.087
Cessna 550 Citation II 1PW036 NONE	1.283	0.082	1.283	0.082	-	-	2.730
Cessna 650 Citation III 1AS001 NONE	0.113	0.007	0.113	0.007	-	-	0.240
Cessna 680 Citation Sovereign 7PW078 NONE	0.500	0.032	0.500	0.032	-	-	1.063
Cessna 750 Citation X 6AL024 NONE	0.201	0.013	0.201	0.013	-	-	0.427
COMSEP	5.254	0.335	5.254	0.335	1.705	0.189	13.074
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	10.259	0.655	10.259	0.655	-	-	21.827
Eclipse 500 / PW610F PW610F NONE	0.128	0.008	0.128	0.008	-	-	0.272
Embraer ERJ145 6AL008 NONE	0.002	0.001	0.003	0.000	-	-	0.006
Gulfstream G400 6RR042 NONE	0.674	0.043	0.674	0.043	-	-	1.433

Aircraft	2019 Existing Condition						
	Arrivals		Departures		TGO		Total
	Day	Night	Day	Night	Day	Night	
Gulfstream G500 4BR003 NONE	0.177	0.011	0.177	0.011	-	-	0.376
Hughes 500D 250B17 NONE	0.182	-	0.182	-	-	-	0.363
Israel IAI-1125 Astra 1AS002 NONE	0.195	0.012	0.195	0.012	-	-	0.415
Lockheed C-130 Hercules T56A14 NONE	0.951	-	0.951		2.629		4.530
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	0.986	-	0.986	-	-	-	1.971
McDonnell Douglas A-4 Skyhawk J52P4 NONE	0.083	-	0.083	-	-	-	0.166
Mitsubishi MU-300 Diamond 1PW037 NONE	0.317	0.020	0.317	0.020	-	-	0.674
Piper PA-24 Comanche TIO540 NONE	30.248	1.870	30.248	1.870	50.831	5.648	120.715
Piper PA-30 Twin Comanche IO320 NONE	1.638	0.105	1.638	0.105	-	-	3.486
Piper PA-42 Cheyenne Series PT6A41 NONE	0.422	0.027	0.422	0.027	-	-	0.898
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	0.435	-	0.435	-	-	-	0.869
Rockwell T-2 Buckeye J852 NONE	0.092	-	0.092	-	-	-	0.185
Saab 340-A CT7-5 NONE	0.700	0.045	0.700	0.045			1.490
Sikorsky SH-60 Sea Hawk T70041 NONE	0.674	-	0.674	-	-	-	1.347
T-38 Talon J855HA NONE	0.110	-	0.110	-	-	-	0.220
Grand Total	**102.045**	**6.047**	**102.049**	**6.043**	**85.312**	**9.162**	**310.658**

TGO = Touch and Go
Day = 7:00 a.m. to 9:59 p.m.; Night = 10:00 p.m. to 6:59 a.m.
Values reflect rounding.
Source: AECOM, 2020.



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

APPROACH FLIGHT TRACKS

FIGURE 1.3-1a

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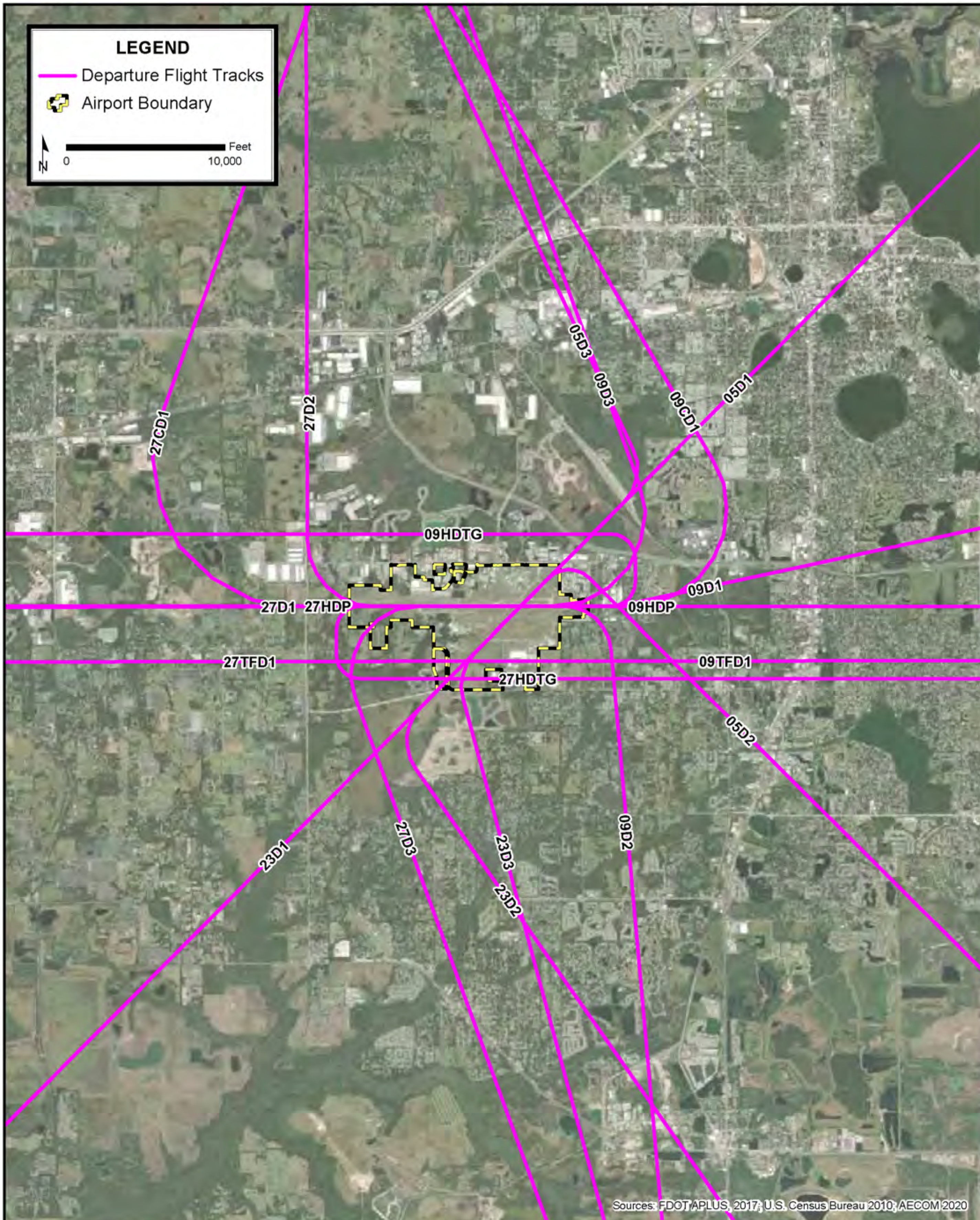

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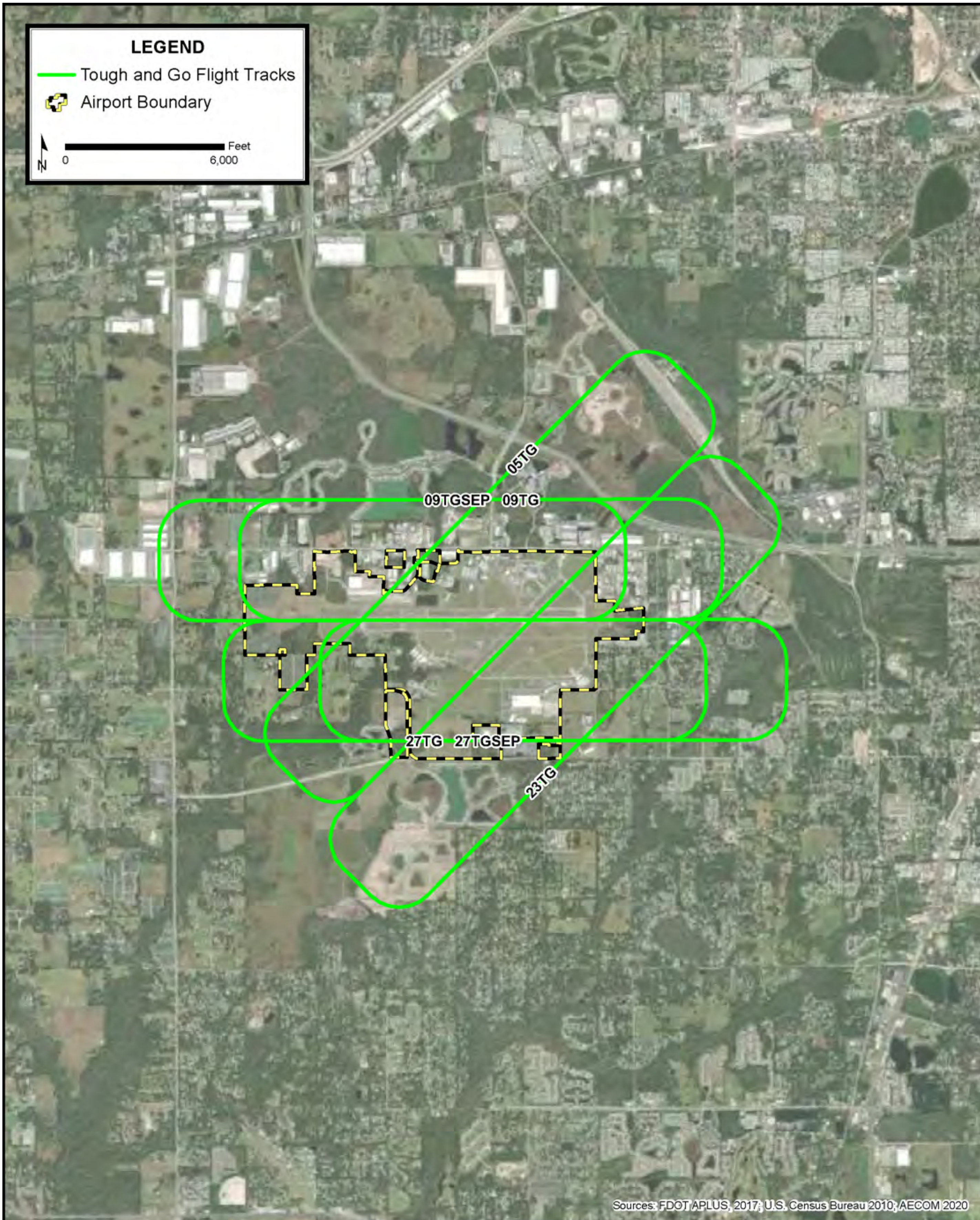
LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

DEPARTURE FLIGHT TRACKS

FIGURE 1.3-1b



Path: C:\Users\tia.norman\Desktop\Amazon\GIS\mxd\Draft EA\Figure 1-3-1c Flight Tracks TGO_rev01.mxd, Date Saved: 9/24/2020 3:11:57 PM

LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

TOUCH AND GO FLIGHT TRACKS

FIGURE 1.3-1c

Table 1.3-2 2019 Runway Utilization

Aircraft	Operation Type	Runway							
		5	9	23	27	09H	09TF	27H	27TF
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-
Agusta A-109 250B17 NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-
Airbus A320-200 Series 2CM018 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
BEC58P	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bell 206L-4T Long Ranger 250B17 NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-
Boeing 727-200 Series 1PW004 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Boeing 737-800 Series 4CM039 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Boeing 757-200 Series 4PW073 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Boeing CH-46 Sea Knight T588F NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-
Boeing DC-10-10 Series 3GE076 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Boeing F/A-18 Hornet F4044 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Bombardier Challenger 600 5GE084 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bombardier Global 5000 Business 4BR009 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bombardier Learjet 35 1AS002 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
CASA CN-235-100 CT79B NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
	TGO	-	60.00%	-	40.00%	-	-	-	-
Cessna 150 Series O200 NONE	Arrivals	17.67%	31.81%	12.37%	26.51%	-	6.40%	-	5.24%
	Departures	17.67%	31.81%	12.37%	26.51%	-	6.40%	-	5.24%

Aircraft	Operation Type	Runway							
		5	9	23	27	09H	09TF	27H	27TF
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 172 Skyhawk IO360 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 182 IO360 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 206 TIO540 IO-540-AC	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 208 Caravan PT6A14 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 441 Conquest II TPE10A NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 500 Citation I 1PW038 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 550 Citation II 1PW036 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 650 Citation III 1AS001 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 680 Citation Sovereign 7PW078 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 750 Citation X 6AL024 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
COMSEP	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Eclipse 500 / PW610F PW610F NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Embraer ERJ145 6AL008 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Gulfstream G400 6RR042 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Gulfstream G500 4BR003 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Hughes 500D 250B17 NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-

Aircraft	Operation Type	Runway							
		5	9	23	27	09H	09TF	27H	27TF
Israel IAI-1125 Astra 1AS002 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Lockheed C-130 Hercules T56A14 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
	TGO	-	60.00%	-	40.00%	-	-	-	-
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
McDonnell Douglas A-4 Skyhawk J52P4 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Mitsubishi MU-300 Diamond 1PW037 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-24 Comanche TIO540 NONE	Arrivals	19.41%	34.93%	13.58%	29.11%	-	1.64%	-	1.34%
	Departures	19.41%	34.93%	13.58%	29.11%	-	1.64%	-	1.34%
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-30 Twin Comanche IO320 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-42 Cheyenne Series PT6A41 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-
Rockwell T-2 Buckeye J852 NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-
Saab 340-A CT7-5 NONE	Arrivals	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departures	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Sikorsky SH-60 Sea Hawk T70041 NONE	Arrivals	-	-	-	-	60.00%	-	40.00%	-
	Departures	-	-	-	-	60.00%	-	40.00%	-
T-38 Talon J855HA NONE	Arrivals	-	55.00%	-	45.00%	-	-	-	-
	Departures	-	55.00%	-	45.00%	-	-	-	-

Table 1.3-3 2019 Existing Condition Flight Track Utilization

Arrival Track	Utilization	Departure Track	Utilization	TGO Track	Utilization
05A1	1.81%	05D1	2.79%	05TG	5.90%
05A2	0.91%	05D2	0.91%	09TG	0.55%
05A3	3.76%	05D3	2.79%	09TGSEP	10.62%
09A1	3.00%	09CD1	3.50%	23TG	4.13%
09A2	3.27%	09D1	2.30%	27TG	0.37%
09A3	1.40%	09D2	2.45%	27TGSEP	8.85%
09A4	4.43%	09D3	3.85%		
09HAP	0.27%	09HDP	0.27%		
09HATG	0.08%	09HDTG	0.08%		
09TFA1	0.56%	09TFD1	0.56%		
23A1	2.27%	23D1	0.91%		
23A2	1.36%	23D2	2.27%		
23A3	0.91%	23D3	1.36%		
27A1	3.27%	27CD1	1.68%		
27A2	1.46%	27D1	2.20%		
27A3	3.89%	27D2	3.75%		
27A4	1.46%	27D3	2.45%		
27HAP	0.18%	27HDP	0.18%		
27HATG	0.05%	27HDTG	0.05%		
27TFA1	0.46%	27TFD1	0.46%		
Subtotal	*34.79%*	*Subtotal*	*34.79%*	*Subtotal*	*30.41%*

Table 1.3-4 Land Use Compatibility with Yearly Day-Night Average Sound Levels

	Yearly Day-Night Average Sound Level (DNL)					
	Below 65 Decibels	**65-70 Decibels**	**70-75 Decibels**	**75-80 Decibels**	**80-85 Decibels**	**Over 85 Decibels**
Residential						
Residential (Other than mobile homes & transient lodges)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodging	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals, Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, Concert Halls	Y	25	30	N	N	N
Governmental Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, Business & Professional	Y	Y	25	30	N	N
Wholesale & Retail Building Materials, Hardware & Farm Equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail Trade - General	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communications	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing, General	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and Optical	Y	Y	25	30	N	N

	Yearly Day-Night Average Sound Level (DNL)					
	Below 65 Decibels	65-70 Decibels	70-75 Decibels	75-80 Decibels	80-85 Decibels	Over 85 Decibels
Agriculture (Except Livestock) & Forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock Farming & Breeding	Y	Y[6]	Y[7]	N	N	N
Mining & Fishing, Resource Production & Extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor Sports Arenas, Spectator Sports	Y	Y[5]	Y[5]	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Nature Exhibits & Zoos	Y	Y	N	N	N	N
Amusement, Parks, Resorts, Camps	Y	Y	Y	N	N	N
Golf Courses, Riding Stables, Water Recreation	Y	Y	25	30	N	N

NOTE: The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties remains with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land use for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

Y (Yes) Land Use and related structures are compatible without restrictions.
N (No) Land Use and related structures are not compatible and should be prohibited.
NLR Noise Level Reduction (outdoor to indoor) are to be achieved through incorporation of noise attenuation into the design and construction of structure.
25, 30, or 35 Land use and related structures are generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated in design and construction of structure.

[1] Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

[2] Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[3] Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[4] Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of the buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

[5] Land use compatibility provided special sound reinforcement systems are installed.

[6] Residential buildings require an NLR of 25 dB.

[7] Residential buildings require an NLR of 30 dB.

[8] Residential buildings not permitted.

Noncompatible land use

Source: Title 14 CFR part 150, 2007.

1.3.2. FUTURE CONDITIONS NOISE MODELING ASSUMPTIONS

Flight Operations

Table 1.3-5 shows the AEDT-modeled average annual daily operations for the 2022 No-Action Alternative and Proposed Project conditions by aircraft at LAL. **Table 1.3-6** shows the AEDT-modeled average annual daily operations for the 2027 No-Action Alternative and Proposed Project conditions.

Runway Use

Runway utilization for the 2022 and 2027 scenarios are provided in **Tables 1.3-7** and **1.3-8**. There is no change from the No-Action Alternative and the Proposed Project conditions.

Flight Tracks

Flight tracks remain unchanged from the Existing Condition.

Track Use

Utilization percentages of the flight tracks are summarized in **Table 1.3-9** for arrivals, departures, and TGO tracks for the 2022 No-Action Alternative, 2022 Proposed Project, 2027 No-Action Alternative, and 2027 Proposed Project scenarios.

Table 1.3-5 2022 Average Annual Daily Operations at LAL

Aircraft	2022 No-Action Alternative							2022 Proposed Project						
	Arrivals		Departures		TGO		Total	Arrivals		Departures		TGO		Total
	Day	Night	Day	Night	Day	Night		Day	Night	Day	Night	Day	Night	
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	1.055	-	1.055	-	-	-	2.110	1.055	-	1.055	-	-	-	2.110
Agusta A-109 250B17 NONE	0.396	-	0.396	-	-	-	0.791	0.396	-	0.396	-	-	-	0.791
Airbus A319-100 Series 7CM050 NONE	0.432	0.144	0.507	0.069	-	-	1.153	0.432	0.144	0.507	0.069	-	-	1.153
Airbus A320-200 Series 2CM018 NONE	0.185	0.062	0.217	0.030	-	-	0.494	0.185	0.062	0.217	0.030	-	-	0.494
BEC58P	7.499	0.479	7.499	0.479	16.034	1.782	33.771	7.499	0.479	7.499	0.479	16.034	1.782	33.771
Bell 206L-4T Long Ranger 250B17 NONE	0.132	-	0.132	-	-	-	0.264	0.132	-	0.132	-	-	-	0.264
Boeing 737-800 Series 4CM039 NONE	0.766	0.255	0.899	0.123	-	-	2.043	0.766	0.255	0.899	0.123	-	-	2.043
Boeing 737-800 Series 4CM039 NONE (CARGO)	4.000	2.000	4.000	2.000			12.000	7.000	7.000	7.000	6.000	-	-	27.000
Boeing 757-200 Series 4PW073 NONE	0.377	0.126	0.443	0.060	-	-	1.006	0.377	0.126	0.443	0.060	-	-	1.006
Boeing 767-300 ER Freighter 2GE054 NONE	2.000	2.000	3.000	1.000			8.000	2.000	2.000	3.000	2.000	-	-	9.000
Boeing F/A-18 Hornet F4044 NONE	0.071	-	0.071		-	-	0.142	0.071	-	0.071	-	-	-	0.142
Bombardier Challenger 600 5GE084 NONE	1.610	0.103	1.610	0.103	-	-	3.425	1.610	0.103	1.610	0.103	-	-	3.425
Bombardier Global 5000 Business 4BR009 NONE	0.250	0.016	0.250	0.016	-	-	0.531	0.250	0.016	0.250	0.016	-	-	0.531
Bombardier Learjet 35 1AS002 NONE	5.367	0.343	5.367	0.343	-	-	11.420	5.367	0.343	5.367	0.343	-	-	11.420
CASA CN-235-100 CT79B NONE	0.182	-	0.182	-	0.131	-	0.496	0.182		0.182		0.131	-	0.496
Cessna 150 Series O200 NONE	24.063	1.390	24.063	1.390	27.452	3.050	81.409	24.063	1.390	24.063	1.390	27.452	3.050	81.409
Cessna 172 Skyhawk IO360 NONE	1.690	0.108	1.690	0.108	-	-	3.595	1.690	0.108	1.690	0.108	-	-	3.595
Cessna 182 IO360 NONE	2.383	0.152	2.383	0.152	-	-	5.070	2.383	0.152	2.383	0.152	-	-	5.070
Cessna 206 TIO540 IO-540-AC	1.678	0.107	1.678	0.107	-	-	3.569	1.678	0.107	1.678	0.107	-	-	3.569
Cessna 208 Caravan PT6A14 NONE	1.212	0.077	1.212	0.077	-	-	2.579	1.212	0.077	1.212	0.077	-	-	2.579
Cessna 441 Conquest II TPE10A NONE	0.972	0.062	0.972	0.062	2.830	0.314	5.212	0.972	0.062	0.972	0.062	2.830	0.314	5.212
Cessna 500 Citation I 1PW038 NONE	2.049	0.131	2.049	0.131	-	-	4.359	2.049	0.131	2.049	0.131	-	-	4.359
Cessna 550 Citation II 1PW036 NONE	1.812	0.116	1.812	0.116	-	-	3.856	1.812	0.116	1.812	0.116	-	-	3.856
Cessna 650 Citation III 1AS001 NONE	0.159	0.010	0.159	0.010	-	-	0.339	0.159	0.010	0.159	0.010	-	-	0.339
Cessna 680 Citation Sovereign 7PW078 NONE	0.706	0.045	0.706	0.045	-	-	1.502	0.706	0.045	0.706	0.045	-	-	1.502
Cessna 750 Citation X 6AL024 NONE	0.284	0.018	0.284	0.018	-	-	0.604	0.284	0.018	0.284	0.018	-	-	0.604
COMSEP	6.990	0.446	6.990	0.446	1.718	0.191	16.782	6.990	0.446	6.990	0.446	1.718	0.191	16.782
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	5.975	0.381	5.975	0.381	-	-	12.713	5.975	0.381	5.975	0.381	-	-	12.713
Eclipse 500 / PW610F PW610F NONE	0.181	0.012	0.181	0.012	-	-	0.385	0.181	0.012	0.181	0.012	-	-	0.385
Gulfstream G400 6RR042 NONE	0.951	0.061	0.951	0.061	-	-	2.024	0.951	0.061	0.951	0.061	-	-	2.024
Gulfstream G500 4BR003 NONE	0.250	0.016	0.250	0.016	-	-	0.531	0.250	0.016	0.250	0.016	-	-	0.531
Hughes 500D 250B17 NONE	0.660	-	0.660	-	-	-	1.319	0.660	-	0.660	-	-	-	1.319
Israel IAI-1125 Astra 1AS002 NONE	0.275	0.018	0.275	0.018	-	-	0.586	0.275	0.018	0.275	0.018	-	-	0.586
Lockheed C-130 Hercules T56A14 NONE	1.044	-	1.044	-	1.523	-	3.611	1.044	-	1.044	-	1.523	-	3.611
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	1.085	-	1.085	-	-	-	2.169	1.085	-	1.085	-	-	-	2.169
Mitsubishi MU-300 Diamond 1PW037 NONE	0.448	0.029	0.448	0.029	-	-	0.952	0.448	0.029	0.448	0.029	-	-	0.952
Piper PA-24 Comanche TIO540 NONE	40.190	2.503	40.190	2.503	51.238	5.693	142.317	40.190	2.503	40.190	2.503	51.238	5.693	142.317
Piper PA-30 Twin Comanche IO320 NONE	0.954	0.061	0.954	0.061	-	-	2.029	0.954	0.061	0.954	0.061	-	-	2.029
Piper PA-42 Cheyenne Series PT6A41 NONE	0.246	0.016	0.246	0.016	-	-	0.523	0.246	0.016	0.246	0.016	-	-	0.523
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	4.519	-	4.519	-	-	-	9.037	4.519	-	4.519	-	-	-	9.037
Saab 340-A CT7-5 NONE	0.408	0.026	0.408	0.026	-	-	0.868	0.408	0.026	0.408	0.026	-	-	0.868
Sikorsky SH-60 Sea Hawk T70041 NONE	1.897	-	1.897	-	-	-	3.793	1.897	-	1.897	-	-	-	3.793
Grand Total	**127.401**	**11.310**	**128.706**	**10.005**	**100.926**	**11.030**	**389.378**	**130.401**	**16.310**	**131.706**	**15.005**	**100.926**	**11.030**	**405.378**

TGO = Touch and Go
Day = 7:00 a.m. to 9:59 p.m.; Night = 10:00 p.m. to 6:59 a.m.
Values reflect rounding
Source: AECOM, 2020

Table 1.3-6 2027 Average Annual Daily Operations at LAL

Aircraft	2027 No-Action Alternative							2027 Proposed Project						
	Arrivals		Departures		TGO		Total	Arrivals		Departures		TGO		Total
	Day	Night	Day	Night	Day	Night		Day	Night	Day	Night	Day	Night	
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	2.158		2.158				4.316	2.158		2.158				4.316
Agusta A-109 250B17 NONE	0.809		0.809				1.619	0.809		0.809				1.619
Airbus A319-100 Series 7CM050 NONE	0.500	0.167	0.587	0.080			1.335	0.500	0.167	0.587	0.080			1.335
Airbus A320-200 Series 2CM018 NONE	0.214	0.071	0.252	0.034			0.572	0.214	0.071	0.252	0.034			0.572
BEC58P	9.259	0.591	9.259	0.591	17.358	1.929	38.987	9.259	0.591	9.259	0.591	17.358	1.929	38.987
Bell 206L-4T Long Ranger 250B17 NONE	0.270		0.270				0.540	0.270		0.270				0.540
Boeing 737-800 Series 4CM039 NONE	0.887	0.296	1.040	0.142			2.364	0.887	0.296	1.040	0.142			2.364
Boeing 737-800 Series 4CM039 NONE (CARGO)	4.000	2.000	4.000	2.000			12.000	8.000	8.000	9.000	8.000			33.000
Boeing 757-200 Series 4PW073 NONE	0.437	0.146	0.512	0.070			1.164	0.437	0.146	0.512	0.070			1.164
Boeing 767-300 ER Freighter 2GE054 NONE	2.000	2.000	3.000	1.000			8.000	3.000	3.000	3.000	3.000			12.000
Boeing F/A-18 Hornet F4044 NONE	0.072		0.072				0.144	0.072		0.072				0.144
Bombardier Challenger 600 5GE084 NONE	2.453	0.157	2.453	0.157			5.220	2.453	0.157	2.453	0.157			5.220
Bombardier Global 5000 Business 4BR009 NONE	0.380	0.024	0.380	0.024			0.810	0.380	0.024	0.380	0.024			0.810
Bombardier Learjet 35 1AS002 NONE	8.180	0.522	8.180	0.522			17.404	8.180	0.522	8.180	0.522			17.404
CASA CN-235-100 CT79B NONE	0.186		0.186		0.289		0.660	0.186		0.186		0.289		0.660
Cessna 150 Series O200 NONE	27.251	1.587	27.251	1.587	35.188	3.910	96.774	27.251	1.587	27.251	1.587	35.188	3.910	96.774
Cessna 172 Skyhawk IO360 NONE	1.912	0.122	1.912	0.122			4.067	1.912	0.122	1.912	0.122			4.067
Cessna 182 IO360 NONE	2.696	0.172	2.696	0.172			5.735	2.696	0.172	2.696	0.172			5.735
Cessna 206 TIO540 IO-540-AC	1.898	0.121	1.898	0.121			4.038	1.898	0.121	1.898	0.121			4.038
Cessna 208 Caravan PT6A14 NONE	1.385	0.088	1.385	0.088			2.948	1.385	0.088	1.385	0.088			2.948
Cessna 441 Conquest II TPE10A NONE	1.111	0.071	1.111	0.071	2.959	0.329	5.651	1.111	0.071	1.111	0.071	2.959	0.329	5.651
Cessna 500 Citation I 1PW038 NONE	3.122	0.199	3.122	0.199			6.644	3.122	0.199	3.122	0.199			6.644
Cessna 550 Citation II 1PW036 NONE	2.762	0.176	2.762	0.176			5.876	2.762	0.176	2.762	0.176			5.876
Cessna 650 Citation III 1AS001 NONE	0.243	0.015	0.243	0.015			0.516	0.243	0.015	0.243	0.015			0.516
Cessna 680 Citation Sovereign 7PW078 NONE	1.076	0.069	1.076	0.069			2.289	1.076	0.069	1.076	0.069			2.289
Cessna 750 Citation X 6AL024 NONE	0.433	0.028	0.433	0.028			0.921	0.433	0.028	0.433	0.028			0.921
COMSEP	7.908	0.505	7.908	0.505	2.202	0.245	19.273	7.908	0.505	7.908	0.505	2.202	0.245	19.273
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	6.830	0.436	6.830	0.436			14.531	6.830	0.436	6.830	0.436			14.531
Eclipse 500 / PW610F PW610F NONE	0.276	0.018	0.276	0.018			0.586	0.276	0.018	0.276	0.018			0.586
Gulfstream G400 6RR042 NONE	1.450	0.093	1.450	0.093			3.084	1.450	0.093	1.450	0.093			3.084
Gulfstream G500 4BR003 NONE	0.380	0.024	0.380	0.024			0.810	0.380	0.024	0.380	0.024			0.810
Hughes 500D 250B17 NONE	1.349		1.349				2.698	1.349		1.349				2.698
Israel IAI-1125 Astra 1AS002 NONE	0.420	0.027	0.420	0.027			0.893	0.420	0.027	0.420	0.027			0.893
Lockheed C-130 Hercules T56A14 NONE	1.062		1.062		3.364		5.489	1.062		1.062		3.364		5.489
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	1.104		1.104				2.207	1.104		1.104				2.207
Mitsubishi MU-300 Diamond 1PW037 NONE	0.682	0.044	0.682	0.044			1.452	0.682	0.044	0.682	0.044			1.452
Piper PA-24 Comanche TIO540 NONE	45.502	2.839	45.502	2.839	65.677	7.297	169.657	45.502	2.839	45.502	2.839	65.677	7.297	169.657
Piper PA-30 Twin Comanche IO320 NONE	1.091	0.070	1.091	0.070			2.320	1.091	0.070	1.091	0.070			2.320
Piper PA-42 Cheyenne Series PT6A41 NONE	0.281	0.018	0.281	0.018			0.598	0.281	0.018	0.281	0.018			0.598
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	6.729		6.729				13.458	6.729		6.729				13.458
Saab 340-A CT7-5 NONE	0.466	0.030	0.466	0.030			0.992	0.466	0.030	0.466	0.030			0.992
Sikorsky SH-60 Sea Hawk T70041 NONE	2.200		2.200				4.400	2.200		2.200				4.400
Grand Total	**153.423**	**12.723**	**154.777**	**11.370**	**127.038**	**13.709**	**473.041**	**158.423**	**19.723**	**159.777**	**18.370**	**127.038**	**13.709**	**497.041**

TGO = Touch and Go
Day = 7:00 a.m. to 9:59 p.m.; Night = 10:00 p.m. to 6:59 a.m.
Values reflect rounding
Source: AECOM, 2020

Table 1.3-7 2022 Runway Utilization

Aircraft	Operation Type	2022 (No-Action Alternative and Proposed Project)							
		Runway							
		5	9	23	27	09H	09TF	27H	27TF
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Agusta A-109 250B17 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Airbus A319-100 Series 7CM050 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Airbus A320-200 Series 2CM018 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
BEC58P	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bell 206L-4T Long Ranger 250B17 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Boeing 737-800 Series 4CM039 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing 737-800 Series 4CM039 NONE (CARGO)	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing 757-200 Series 4PW073 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing 767-300 ER Freighter 2GE054 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing F/A-18 Hornet F4044 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Bombardier Challenger 600 5GE084 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bombardier Global 5000 Business 4BR009 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bombardier Learjet 35 1AS002 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
CASA CN-235-100 CT79B NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
	TGO	-	60.00%	-	40.00%	-	-	-	-
Cessna 150 Series O200 NONE	Arrival	18.20%	32.77%	12.74%	27.30%	-	4.94%	-	4.04%
	Departure	18.20%	32.77%	12.74%	27.30%	-	4.94%	-	4.04%
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 172 Skyhawk IO360 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 182 IO360 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 206 TIO540 IO-540-AC	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 208 Caravan PT6A14 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 441 Conquest II TPE10A NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	-	55.00%	-	45.00%	-	-	-	-
Cessna 500 Citation I 1PW038 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-

Aircraft	Operation Type	2022 (No-Action Alternative and Proposed Project)							
		Runway							
		5	9	23	27	09H	09TF	27H	27TF
Cessna 550 Citation II 1PW036 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 650 Citation III 1AS001 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 680 Citation Sovereign 7PW078 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 750 Citation X 6AL024 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
COMSEP	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Eclipse 500 / PW610F PW610F NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Gulfstream G400 6RR042 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Gulfstream G500 4BR003 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Hughes 500D 250B17 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Israel IAI-1125 Astra 1AS002 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Lockheed C-130 Hercules T56A14 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
	TGO	-	60.00%	-	40.00%	-	-	-	-
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Mitsubishi MU-300 Diamond 1PW037 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-24 Comanche TIO540 NONE	Arrival	19.54%	35.17%	13.68%	29.31%	-	1.26%	-	1.03%
	Departure	19.54%	35.17%	13.68%	29.31%	-	1.26%	-	1.03%
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-30 Twin Comanche IO320 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-42 Cheyenne Series PT6A41 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Saab 340-A CT7-5 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Sikorsky SH-60 Sea Hawk T70041 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-

Table 1.3-8 2027 Runway Utilization

Aircraft	Operation Type	2027 (No-Action Alternative and Proposed Project)							
		Runway							
		5	9	23	27	09H	09TF	27H	27TF
Aerospatiale SA-350D Astar (AS-350) TPE3 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Agusta A-109 250B17 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Airbus A319-100 Series 7CM050 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Airbus A320-200 Series 2CM018 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
BEC58P	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bell 206L-4T Long Ranger 250B17 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Boeing 737-800 Series 4CM039 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing 737-800 Series 4CM039 NONE (CARGO)	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing 757-200 Series 4PW073 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing 767-300 ER Freighter 2GE054 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Boeing F/A-18 Hornet F4044 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Bombardier Challenger 600 5GE084 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bombardier Global 5000 Business 4BR009 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Bombardier Learjet 35 1AS002 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
CASA CN-235-100 CT79B NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
	TGO	-	60.00%	-	40.00%	-	-	-	-
Cessna 150 Series O200 NONE	Arrival	18.20%	32.77%	12.74%	27.30%	-	4.94%	-	4.04%
	Departure	18.20%	32.77%	12.74%	27.30%	-	4.94%	-	4.04%
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 172 Skyhawk IO360 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 182 IO360 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 206 TIO540 IO-540-AC	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 208 Caravan PT6A14 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 441 Conquest II TPE10A NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	-	55.00%	-	45.00%	-	-	-	-
Cessna 500 Citation I 1PW038 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-

Aircraft	Operation Type	2027 (No-Action Alternative and Proposed Project)							
		Runway							
		5	9	23	27	09H	09TF	27H	27TF
Cessna 550 Citation II 1PW036 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 650 Citation III 1AS001 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 680 Citation Sovereign 7PW078 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Cessna 750 Citation X 6AL024 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
COMSEP	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
DeHavilland DHC-6-100 Twin Otter PT6A20 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Eclipse 500 / PW610F PW610F NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Gulfstream G400 6RR042 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Gulfstream G500 4BR003 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Hughes 500D 250B17 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Israel IAI-1125 Astra 1AS002 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Lockheed C-130 Hercules T56A14 NONE	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
	TGO	-	60.00%	-	40.00%	-	-	-	-
Lockheed P-3 Orion ANP:P3A T56A14 T56-A-14	Arrival	-	55.00%	-	45.00%	-	-	-	-
	Departure	-	55.00%	-	45.00%	-	-	-	-
Mitsubishi MU-300 Diamond 1PW037 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-24 Comanche TIO540 NONE	Arrival	19.58%	35.24%	13.70%	29.36%	0.00%	1.17%	0.00%	0.96%
	Departure	19.58%	35.24%	13.70%	29.36%	0.00%	1.17%	0.00%	0.96%
	TGO	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-30 Twin Comanche IO320 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Piper PA-42 Cheyenne Series PT6A41 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Robinson R44 Raven / Lycoming O-540-F1B5 TIO540 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-
Saab 340-A CT7-5 NONE	Arrival	20.00%	36.00%	14.00%	30.00%	-	-	-	-
	Departure	20.00%	36.00%	14.00%	30.00%	-	-	-	-
Sikorsky SH-60 Sea Hawk T70041 NONE	Arrival	-	-	-	-	60.00%	-	40.00%	-
	Departure	-	-	-	-	60.00%	-	40.00%	-

Table 1.3-9 2022 and 2027 Flight Track Utilization Summary

Flight Tracks	2022		2027	
	No-Action	Proposed Project	No-Action	Proposed Project
Arrival				
05A1	1.61%	1.55%	1.59%	1.51%
05A2	0.81%	0.77%	0.79%	0.76%
05A3	3.34%	3.21%	3.29%	3.13%
09A1	3.00%	3.12%	2.85%	3.01%
09A2	3.39%	3.56%	3.27%	3.48%
09A3	1.45%	1.53%	1.40%	1.49%
09A4	4.60%	4.83%	4.44%	4.73%
09HAP	0.64%	0.61%	1.03%	0.98%
09HATG	0.70%	0.67%	0.68%	0.65%
09TFA1	0.46%	0.44%	0.40%	0.38%
23A1	2.01%	1.93%	1.98%	1.89%
23A2	1.21%	1.16%	1.19%	1.13%
23A3	0.81%	0.77%	0.79%	0.76%
27A1	3.29%	3.43%	3.14%	3.32%
27A2	1.51%	1.58%	1.46%	1.55%
27A3	4.02%	4.22%	3.88%	4.13%
27A4	1.51%	1.58%	1.46%	1.55%
27HAP	0.42%	0.41%	0.69%	0.66%
27HATG	0.46%	0.45%	0.45%	0.43%
27TFA1	0.38%	0.36%	0.33%	0.31%
Subtotal Arrival	*35.62%*	*36.19%*	*35.12%*	*35.84%*
Departure				
05D1	2.47%	2.38%	2.44%	2.32%
05D2	0.81%	0.77%	0.79%	0.76%
05D3	2.47%	2.38%	2.44%	2.32%
09CD1	3.63%	3.81%	3.50%	3.73%
09D1	2.27%	2.36%	2.15%	2.26%
09D2	2.54%	2.67%	2.45%	2.61%
09D3	3.99%	4.19%	3.85%	4.11%
09HDP	0.64%	0.61%	1.03%	0.98%
09HDTG	0.70%	0.67%	0.68%	0.65%
09TFD1	0.46%	0.44%	0.40%	0.38%
23D1	0.81%	0.77%	0.79%	0.76%
23D2	2.01%	1.93%	1.98%	1.89%
23D3	1.21%	1.16%	1.19%	1.13%
27CD1	1.79%	1.90%	1.73%	1.87%
27D1	2.03%	2.04%	1.90%	1.92%
27D2	3.95%	4.18%	3.82%	4.11%
27D3	2.57%	2.71%	2.48%	2.66%
27HDP	0.42%	0.41%	0.69%	0.66%
27HDTG	0.46%	0.45%	0.45%	0.43%
27TFD1	0.38%	0.36%	0.33%	0.31%
Subtotal Departure	*35.62%*	*36.19%*	*35.12%*	*35.84%*
TGO				
05TG	5.50%	5.29%	5.66%	5.38%
09TG	0.70%	0.67%	0.85%	0.80%
09TGSEP	9.91%	9.52%	10.18%	9.69%
23TG	3.85%	3.70%	3.96%	3.77%

Flight Tracks	2022		2027	
	No-Action	Proposed Project	No-Action	Proposed Project
27TG	0.53%	0.51%	0.62%	0.59%
27TGSEP	8.26%	7.93%	8.49%	8.08%
Subtotal TGO	*28.75%*	*27.62%*	*29.75%*	*28.32%*
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

1.4. REFERENCES

American National Standards Institute, Inc. (ANSI), 2007. American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound - Part 5: Sound Level Descriptors for Determination of Compatible Land Use, ANSI/ASA S12.9-2007/Part 5, November 14, 2007.

ANSI, 2003. American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, Part 1, ANSI S12.9-1988 (R 2003).

Environmental Protection Agency (EPA), 1974. Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety, Report 550/9-74-004, March 1974.

FAA, 2015. Policies and Procedures for Considering Environmental Impacts, FAA Order 1050.1F, July 15, 2015.

Federal Interagency Committee on Noise (FICON), 1992. Federal Agency Review of Selected Airport Noise Analysis Issues, August 1992.

Federal Interagency Committee on Urban Noise (FICUN), 1980. Guidelines for Considering Noise in Land Use Planning and Control, June 1980.

Fidell et.al., 1991. Fidell, S., Barger, D.S., Schultz, T.J., Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise, Journal of the Acoustical Society of America, 89, pgs. 221-233, January 1991.

Schultz, 1978. Schultz, T.J., Synthesis of Social Surveys on Noise Annoyance, Journal of the Acoustical Society of America, 64, 377-405, August, 1978.

Title 14 CFR Part 150, 2007. Airport Noise Compatibility Planning, Doc. No. 18691, 49 FR 49269, Dec. 18, 1984; 50 FR 5063, Feb. 6, 1985; Amdt. 150–2, 54 FR 39295, Sept. 25, 1989; 69 FR 18803, Apr. 9, 2004; Amdt. 150–4, 69 FR 57626, Sept. 24, 2004; 72 FR 68475, Dec. 5, 2007.

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APPENDIX H

Traffic Study Technical Report

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Environmental Assessment
for
Phase II Air Cargo Facility Development at Lakeland Linder International Airport (LAL)

Traffic Study Technical Report

Prepared for:

City of Lakeland
Federal Aviation Administration

Prepared by:

AECOM

August 2020

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ACRONYMS AND ABBREVIATIONS

AADT	Average Annual Daily Traffic
AST	Aboveground Storage Tank
LAL	Lakeland Linder International Airport
D	Directional Factor
D1RPM	District 1 Regional Planning Model
DDHV	Daily Directional Hourly Volume
EA	Environmental Assessment
EB	Eastbound
FDOT	Florida Department of Transportation
FTI	Florida Traffic Information
GSE	Ground Service Equipment
HCM	Highway Capacity Manual
K	Scale Factor
LOS	Level of Service
LT	Left Turn
NB	Northbound
NCRHP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
RT	Right Turn
SB	Southbound
SF	Square Foot
SY	Square Yard
T	Truck Factor
TH	Through
TMC	Turning Movement Counts
WB	Westbound

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1.0 INTRODUCTION

The City of Lakeland (City), through their Airports Department, is undertaking an Environmental Assessment (EA) in accordance with the National Environmental Policy Act of 1969 (NEPA). The EA is being completed to support Phase II of air cargo facility development at Lakeland Linder International Airport (LAL or Airport), hereinafter referred to as the Proposed Project. The Proposed Project is an extension of development already completed to support air cargo service operations at LAL. The purpose of the EA is to identify and consider the potential environmental impacts associated with the Proposed Project and any reasonable alternatives.

This *Traffic Study Technical Report* details the assessment scope, input data and other technical information used in the analysis of traffic impacts associated with the Proposed Project.

In May 2019, the City completed a Major Traffic Study[1] for Phase I of the air cargo facility to determine the impacts a new air cargo facility will have on the adjacent transportation system and to recommend mitigation measures if necessary. The 2019 study determined how the intersections within the study area operate under existing AM and PM peak hour conditions. This additional traffic study was conducted to update the 2019 study and determine potential traffic impacts that would result from the Proposed Project. Conclusions from both the 2019 traffic study and the current study are summarized in the following sections.

1.1. PROPOSED PROJECT

The Proposed Project is a Phase II expansion of an air cargo facility already constructed. The Phase II expansion is being contemplated to accommodate future flexibility for expanded operations, given the potential for network and customer demand to increase in the near future. A notional layout for the Proposed Project is shown on **Figure 1.1-1a** based on facility sizing needs. The Proposed Project would be developed on an approximate 68-acre site in the northwest quadrant of LAL, immediately west and adjacent to the Phase I development already completed. All project components would be constructed on airport. Specific construction and operational activities included in the Proposed Project are listed below:

- Construct up to 464,600-square foot (SF) expansion of the Phase I sort and office building;
- Construct up to approximately 69,100 square yards (SY) of paved truck court to accommodate up to 370 additional truck bays;
- Construct up to approximately 42,500 SY of paved vehicle parking lot to accommodate up to 1,120 additional parking spaces;
- Construct up to approximately 29,200 SY of concrete aircraft parking apron accommodate three additional Boeing 767-300 aircraft parking positions;
- Construct up to approximately 19,400 SY of pavement for aircraft ground support equipment (GSE) staging and periodic aircraft parking;

[1] RK&K Engineers. *Lakeland Linder Airport – NW Quadrant Traffic Study – Major Traffic Study*. May 2019.

- Construct new airport access road to provide access to the Phase II facilities via Drane Field Road;
- Site clearing, grading, and landscaping;
- Modifications to the Airport's stormwater management system, including construction of swales and retention ponds;
- Installation of security fencing, gates and security checkpoints;
- Installation of airfield lighting and signage

The facility will be designed to approve Boeing 767 and 737 cargo aircraft. If approved, the Phase II Cargo Development project is expected to generate 8 additional bi-directional aircraft flights per day at LAL during the facility's first year of operation (2022) and 12 additional daily bi-directional flights in 2027. According to the forecast of project trips provided by the operator of Phase II Cargo Development, the project is expected to generate approximately 664 additional car and truck trips per day in 2022 (peak daily) and 1,242 additional car and truck trips per day in 2027.

Additionally, to accommodate the potential need for additional aviation fueling capacity at LAL, a fuel farm is being proposed in an area separate from the Proposed Project footprint, at the intersection of Aero Place and Taxiway H (**Figure 1.1-1b**). Current projections indicate need for additional aboveground storage tanks (ASTs) providing a total of 850,000 gallons of Jet-A fuel capacity. There is potential for a small portion of this capacity to be dedicated to off-road equipment fuel (e.g., gasoline, diesel or hydrogen) if usage needs dictate once the facility is operational.

2.0 EXISTING CONDITIONS

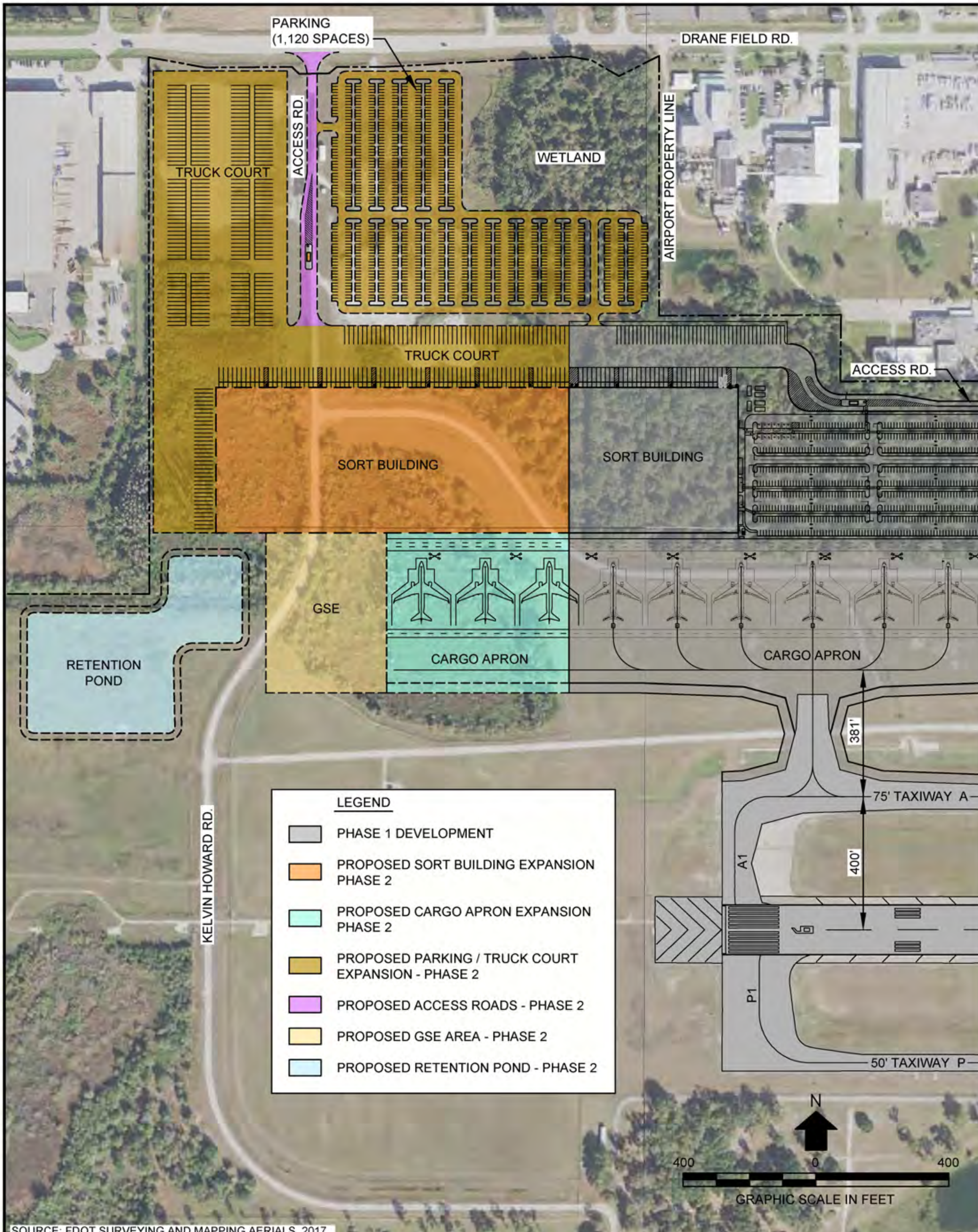
2.1. AREA TRANSPORTATION NETWORK CHARACTERISTICS

Table 2.1-1 presents the exiting conditions for the roadways adjacent to the Proposed Project including number of lanes, speed limit, and functional classification. The existing intersection controls are presented in **Table 2.1-2**. The existing roadway configurations are shown in **Figure 2.1-1**.

Table 2.1-1 Existing Roadway Characteristics

Roadway	Functional Classification	Facility Type	Speed Limit (mph)	Directionality	No. of Lanes
Drane Field Road	Major collector	Undivided	50	Two-way	2
County Line Road	Minor arterial	Divided	55	Two-way	4
Kidron Road	N/A	Undivided	25	Two-way	2
Airport Road	Major collector	Undivided	50	Two-way	2

Source: Lakeland Linder Airport – NW Quadrant Traffic Study: Major Traffic Study. May 2019.



LAKELAND LINDER INTERNATIONAL AIRPORT

PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT

EA PROPOSED PROJECT

FIGURE 1.1-1a

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SOURCE: FDOT SURVEYING AND MAPPING AERIALS, 2017.

C:\Civil 3D Projects\Amazon\Draft EA Figures\FIG 1.2-1b.dwg 07/02/2020 10:36

LAKELAND LINDER INTERNATIONAL AIRPORT PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT	EA PROPOSED PROJECT FUEL FARM	FIGURE 1.1-1b

Path: C:\Users\tia.norman\Desktop[redacted]GIS\mxd\Cultural\Figure 4-10-1 Traffic Configurations_rev1.mxd, Date Saved: 9/23/2020 3:51:10 PM

LAKELAND LINDER INTERNATIONAL AIRPORT PHASE II AIR CARGO DEVELOPMENT ENVIRONMENTAL ASSESSMENT	EXISTING ROADWAY CONFIGURATIONS	FIGURE 2.1-1

Table 2.1-2 Intersection and Control Type

Intersection	Control/Signal Type
County Line Road at Drane Field Road	Signal Controlled
Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized
Airport Road at Drane Field Road	Signal controlled

Source: Lakeland Linder Airport – NW Quadrant Traffic Study: Major Traffic Study. May 2019.

2.2. TRAFFIC COUNTS

As part of the 2019 study, turning movement traffic counts (TMC) were taken at the intersection of Drane Field Road and Kidron Road. The Florida Department of Transportation's (FDOT) Florida Traffic Information (FTI) seasonal factor (0.96) and axle factor (0.96) were applied to the counts to account for the time of year and the type of roadway where the counts were taken. A prior study collected volumes for the intersections of Airport Road at Drane Field Road on August 31, 2017 and May 12, 2017 and County Line Road at Drane Field Road on March 12, 2019.[2]

Additional traffic information was collected from the FTI database and from IdealSpot's 2019 Quarter One Average Annual Daily Traffic (AADT) report for the study year. The 2019 data from IdealSpot was used as the recommended AADT. The AADT developed from TMCs for Kidron Road was used where IdealSpot data was not available. The AADT collected from the 2019 study is summarized in **Table 2.2-1.**

2.3. TRAFFIC FACTORS AND EXISTING VOLUMES

The 2019 study used a directional factor (D) of 54.5 percent, which was identified from the 2018 FTI along Drane Field Road. The standard scale factor (K) of 9 percent and a truck factor (T) of 10.7 percent with an hourly truck factor of 5 percent was used. The seasonal and axle adjusted counts, calculated D factor and standard K factor were used to develop existing AADT volumes and Daily Directional Hourly Volumes (DDHV) on Drane Field Road and Kidron Road. Existing (2019) AADT volumes and DDHVs are shown in **Table 2.2-1.**

[2] RK&K Engineers. *Lakeland Linder Airport – NW Quadrant Traffic Study – Major Traffic Study.* May 2019.

Table 2.2-1 Existing AADT Volumes and Calculated DDHVs

Roadway	From	To	AADT				DDHV	
			Polk TPO	FTI	IdealSpot	TMC		
			2017	2018	2019	Various	Peak	Off Peak
Drane Field Road	County Line Road	Airport Road	7,600	7,100	7,900	9,300	387	324
Drane Field Road	Airport Road	Waring Road	10,700	15,400	13,400	10,000	657	549
County Line Road	Medulla Road	Drane Field Road	25,700	21,000	19,400	15,700	952	794
County Line Road	Drane Field Road	East Baker Street	25,700	20,500	19,600	18,700	961	803
Airport Road	Drane Field Road	Polk Parkway	10,400	10,600	10,600	8,700	520	434
Kidron Road	Airpark Drive	Drane Field Road	--	--	--	800	39	33

Notes: D-Factor = 54.5%; Standard K-Factor = 9%; T-Factor = 10.7%; DHT = 5% from FTI on Drane Field Road
Source: RK&K Engineers. *Lakeland Linder Airport – NW Quadrant Traffic Study – Major Traffic Study*. May 2019.

2.4. EXISTING LEVEL OF SERVICE CAPACITY ANALYSES

The 2019 study included an intersection capacity analysis for the existing intersections pursuant to methodologies prescribed by the *Highway Capacity Manual (HCM).*[3] A level of service (LOS) letter grade was assigned to each intersection for the peak hour of traffic based on the number of lanes, traffic volumes, and traffic existing controls. According to the HCM, LOS is a qualitative measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst.

The annual traffic volumes, average delay (seconds per vehicle), and LOS results for the existing peak hours are shown in **Table 2.4-1** for the existing roadway configurations (see **Figure 2.1-1**). These values are based on the existing lane configurations and lane usages. Existing turning movement volumes collected in the May 2019 traffic study were used to determine the existing LOS. Existing signal timings were not available for the intersection of Airfield Court West/Airport Road at Drane Field Road; therefore, they were developed based on Synchro optimizations for this intersection. The LOS calculations were performed by AECOM per the HCM using Synchro software. Traffic analysis results in HCM format were reported for intersections except for the intersection of Airfield Court/West Airport Road at Drane Field Road. Due to limitations of Synchro software, results in Synchro format were reported for the intersection instead. Based on the information provided in **Table 2.4-1**, all study intersections currently operate acceptably at LOS B or better during both AM and PM peak hours.

Table 2.4-2 provides a detailed summary of the existing conditions traffic operations including queue length, delays (seconds/vehicle), and LOS for each individual movement at each intersection shown on **Figure 2.1-1**.

[3] Transportation Research Board. *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis (HCM).* 2016

Table 2.4-1 Existing Conditions (2019) Traffic Volumes and Level of Service

Intersections	Control/Signal Type	Signal Type	Annual Volumes	AM		PM	
				LOS	Delay (Seconds/ Vehicle)	LOS	Delay (Seconds/ Vehicle)
County Line Road at Drane Field Road	Signal controlled	Signal	9,033,800	B	16.3	B	17.2
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	Signal	6,233,400	B	24.5	B	17.1
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	Unsignalized	2,883,500	A	0	A	0
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	Unsignalized	3,029,500	B	13	B	12.7

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 2.4-2 Existing Conditions (2019) Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	28.9	40	C	29.5	40
		EB TH	A	0.0	71	A	0.0	71
		EB RT	D	37.0	71	D	37.7	71
		WB LT	C	25.7	145	C	26.8	155
		WB TH	C	25.6	54	C	26.1	72
		WB RT	C	26.6	0	C	27.5	34
		NB LT	B	11.4	8	B	10.5	9
		NB TH	B	15.9	218	B	16.3	263
		NB RT	B	13.8	9	B	12.4	17
		SB LT	B	11.0	89	B	11.7	59
		SB TH	B	12.0	210	B	11.9	181
		SB RT	A	8.7	0	A	9.1	0
	Signal controlled	EB LT	F	94.6	#164	D	46.5	112

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
Airfield Court/West Airport Road at Drane Field Road		EB TH & RT	C	31.3	199	C	32.4	181
		WB LT	C	22.2	23	B	19.0	6
		WB TH	C	34.4	226	C	28.4	151
		WB RT	A	5.8	49	A	6.3	48
		NB LT, TH & RT	A	0.0	0.0	A	5.0	13
		SB TH & LT	B	14.7	262	A	8.6	109
		SB RT	A	2.1	22	A	1.8	28
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0	0	A	0	0
		EB RT	A	0	0	A	0	0
		WB LT	A	0	0	A	0	0
		WB TH	A	0	0	A	0	0
		NB LT	A	0	0	A	0	0
		NB RT	A	0	0	A	0	0
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH & RT	A	0	0	A	0	0
		WB LT	A	8.4	3	A	8.3	0
		WB TH	A	0	0	A	0	0
		NB LT & RT	B	12	8	B	12.7	8

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

3.0 FUTURE CONDITIONS

3.1 FORECAST TRAFFIC VOLUMES AND LEVEL OF SERVICE

3.1.1 NO-ACTION ALTERNATIVE

As part of the 2019 traffic study, future year (2023) traffic volumes on Drane Field Road were estimated using the District 1 Regional Planning Model (D1RPM) outputs. Model volumes for 2010 and 2040 from each leg of the study intersections were used to forecast 2019 volumes. The National Cooperative Highway Research Program (NCHRP) 765 adjustment procedure was utilized to develop 2040 AADT. The 2019 AADT and 2040 AADT were then used to linearly interpolate a “no-build” 2023 AADT (i.e., forecast traffic volumes that do not include traffic resulting from Phase I cargo development).

Traffic volumes for no-build conditions for years 2022 and 2027 were calculated via interpolation between years 2019 and 2040. Estimates of additional cargo truck and passenger vehicle traffic that would be generated by the Phase I air cargo development were added to the no-build traffic volumes for years 2022 and 2027 to represent the No-Action Alternative for EA. LOS for each study intersection was calculated for the 2022 and 2027 No-Action Alternative using methodologies previously described. T**ables 3.1-1** and **3.1-2** depict the forecasted No-Action Alternative annual traffic volumes and LOS for the 2022 and 2027 study years, respectively.

T**ables 3.1-3** and **3.1-4** provide a detailed summary of the No-Action traffic operations including queue length, delays (seconds/vehicle), and LOS for each individual movement at each intersection for the 2022 and 2027 study years, respectively.

Table 3.1-1 2022 No-Action Alternative Traffic Volumes and Level of Service

Intersections	Control/Signal Type	Annual Volumes	AM		PM	
			LOS	Delay (Seconds/ Vehicle)	LOS	Delay (Seconds/ Vehicle)
County Line Road at Drane Field Road	Signal Controlled	10,128,800	B	17.8	B	18.8
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	6,872,100	C	24	B	17.7
Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized	3,605,400	C	18.9	C	18.3
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized	4,365,800	C	24.2	C	22.5

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 3.1-2 2027 No-Action Alternative Traffic Volumes and Level of Service

Intersections	Control/Signal Type	Annual Volumes	AM		PM	
			LOS	Delay (Seconds/ Vehicle)	LOS	Delay (Seconds/ Vehicle)
County Line Road at Drane Field Road	Signal Controlled	11,112,200	B	19.7	B	21.4
Airfield Court/West Airport Road at Drane Field Road[1]	Signal controlled	7,486,600	C	24.2	B	17.8
Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized	3,917,700	C	20.8	C	20
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized	4,690,300	D	29.7	D	26.7

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 3.1-3 2022 No-Action Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.6	41	C	29.7	40
		EB TH	A	0.0	69	A	0.0	69
		EB RT	D	37.8	69	D	37.9	69
		WB LT	C	34.7	#200	C	34.6	#213
		WB TH	C	27.2	64	C	27.0	84
		WB RT	C	28.7	1	C	29.1	23
		NB LT	B	11.7	8	B	10.7	10
		NB TH	B	17.1	239	B	17.8	293
		NB RT	B	15.3	39	B	13.5	18
		SB LT	B	12.9	117	B	13.7	83
		SB TH	B	11.7	216	B	11.9	191
		SB RT	A	8.3	0	A	8.8	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	95.6	#207	D	49.6	127
		EB TH & RT	C	26.1	234	C	29.0	197
		WB LT	B	17.2	20	B	16.0	6
		WB TH	C	27.1	246	C	24.8	160
		WB RT	A	4.3	42	A	5.2	43
		NB LT, TH & RT	A	0.0	0	A	6.3	15
		SB TH & LT	B	19.3	258	B	10.1	105
		SB RT	A	2.1	22	A	1.8	28
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	10.6	0	B	10.0	0
		WB TH	A	0.0	0	A	0.0	0
		NB LT	C	24.0	5	C	23.9	5
		NB RT	B	13.8	2.5	B	12.7	3
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH & RT	A	0.0	0	A	0.0	0
		WB LT	A	9.2	13	A	8.7	5
		WB TH	A	0.0	0	A	0.0	0

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
		NB LT & RT	C	24.2	65	C	22.5	70

Notes:
#: 95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

Table 3.1-4 2027 No-Action Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.5	44	C	30.3	44
		EB TH	A	0.0	75	A	0.0	75
		EB RT	D	38.0	75	D	39.0	75
		WB LT	D	41.4	#233	E	56.7	#197
		WB TH	C	27.4	68	C	29.1	91
		WB RT	C	29.1	7	C	32.2	42
		NB LT	B	12.3	9	B	10.4	10
		NB TH	B	18.9	275	B	18.1	320
		NB RT	B	16.5	41	B	13.2	33
		SB LT	B	16.2	161	B	16.5	132[2]
		SB TH	B	12.6	248	B	11.7	212
		SB RT	A	8.6	0	A	8.4	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	95.2	#229	D	54.3	139
		EB TH & RT	C	24.5	249	C	27.9	208
		WB LT	B	16.3	20	B	15.0	6
		WB TH	C	25.5	267	C	24.0	169
		WB RT	A	4.0	43	A	4.9	43
		NB LT, TH & RT	A	0.1	0	A	7.1	18
		SB TH & LT	C	24.6	303	B	11.7	126
		SB RT	A	2.8	35	A	2.5	35
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
		WB LT	B	10.9	0	B	10.3	0
		WB TH	A	0.0	0	A	0.0	0
		NB LT	D	27.0	5	D	26.9	5
		NB RT	B	14.5	2.5	B	13.2	3
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH & RT	A	0.0	0	A	0.0	0
		WB LT	A	9.5	13	A	8.8	8
		WB TH	A	0.0	0	A	0.0	0
		NB LT & RT	D	29.7	83	D	26.7	85

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

3.1.2 PROPOSED PROJECT

For the purpose of this study, additional estimates of increased daily cargo truck and passenger vehicle traffic that would result from the operations of the Proposed Project were added to the forecasted No-Action Alternative traffic volumes for each study year to develop total traffic volumes and calculate intersection LOS that would result from the Proposed Project. **Tables 3.1-5** and **3.1-6** depict the forecasted Proposed Project annual traffic volumes and LOS for the 2022 and 2027 study years, respectively. **Tables 3.1-7** and **3.1-8** summarize changes to annual traffic volumes, LOS, and average delay that would result from the Proposed Project in 2022 and 2027, respectively. **Tables 3.1-9** and **3.1-10** provide a detailed summary of the Proposed Project traffic operations including queue length, delays (seconds/vehicle), and LOS for each individual movement at each intersection for the 2022 and 2027 study years, respectively.

Traffic impacts that would result from operation of the Proposed Project incur no unacceptable decrease in LOS at three of the four studied intersections. While impacts would be evident in the 2022 study year, the increased average intersection delay and the resulting impacts to LOS would generally be greatest in the 2027 study year. The County Line Road and Drane Field Road intersection would experience average delay increases of less than three seconds per vehicle, resulting in LOS change from B to C in 2027. The intersection of Airfield Court West/Airport Road and Drane Field Road would experience the least impact, with less than one second increase in average delay per vehicle, and no resulting change to LOS in 2027. At Kelvin Howard Road and Drane Field Road, the 2027 increase in average intersection delay would be 6.3 seconds during the AM peak hour and 5.8 seconds during the PM Peak hour. Both peak hours would experience a reduced LOS from C to D, as compared to the No-Action Alternative.

The intersection of Kidron Road and Drane Field Road would experience an unacceptable decrease to LOS as a result of the Proposed Project. This intersection currently is controlled only by stop signs on Kidron Road, and there are no dedicated turn lanes at the intersection, either on Kidron Road or Drane Field Road. Under the No-Action Alternative, this intersection would have a LOS of C in 2022 and LOS of D in 2027. With operation of the Proposed project, the LOS would decrease to LOS E in 2022 and LOS F in 2027. Without mitigation, this would constitute a significant impact to surface transportation. Mitigation alternatives considered are presented in **Section 4.0**.

Table 3.1-5 2022 Proposed Project Traffic Volumes and Level of Service

Intersections	Control/Signal Type	Annual Volumes	AM		PM	
			LOS	Delay (Seconds/ Vehicle)	LOS	Delay (Seconds/ Vehicle)
County Line Road at Drane Field Road	Signal Controlled	10,333,600	B	18.6	B	19.4
Airfield Court/West Airport Road at Drane Field Road[1]	Signal controlled	7,170,200	C	24.1	B	17.8
Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized	3,879,100	C	22.1	C	21.2
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized	4,809,900	E	38.7	E	36.6

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 3.1-6 2027 Proposed Project Traffic Volumes and Level of Service

Intersections	Control/Signal Type	Annual Volumes	AM		PM	
			LOS	Delay (Seconds/ Vehicle)	LOS	Delay (Seconds/ Vehicle)
County Line Road at Drane Field Road	Signal Controlled	11,481,300	C	22	C	23.8
Airfield Court/West Airport Road at Drane Field Road[1]	Signal controlled	8,046,200	C	25	C	17.8
Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized	4,382,000	D	27.1	D	25.8
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized	5,537,900	F	126	F	114.5

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 3.1-7 2022 Traffic Volume, Level of Service, and Delay Changes Resulting from Proposed Project

Intersections	Control/Signal Type	Annual Volume Difference	LOS Difference		Average Delay Difference (Seconds/Vehicle)	
			AM	PM	AM	PM
County Line Road at Drane Field Road	Signal Controlled	204,800	None	None	0.8	0.6
Airfield Court/West Airport Road at Drane Field Road[1]	Signal controlled	298,100	None	None	0.1	0.1
Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized	273,700	None	None	3.2	2.9
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized	444,100	C to E	C to E	14.5	14.1

Notes: Difference = Difference between No-Action Alternative and Proposed Project
Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition: A Guide for Multimodal Mobility Analysis (HCM). 2016; except as noted with "*"
[1] Calculations performed with Synchro software

Table 3.1-8 2027 Traffic Volume, Level of Service, and Delay Changes Resulting from Proposed Project

Intersections	Control/Signal Type	Annual Volume Difference	LOS Difference		Average Delay Difference (Seconds/Vehicle)	
			AM	PM	AM	PM
County Line Road at Drane Field Road	Signal Controlled	369,100	B to C	B to C	2.3	2.4
Airfield Court/West Airport Road at Drane Field Road[1]	Signal controlled	559,600	None	None	0.8	0

Kelvin Howard Road at Drane Field Road	Stop sign controlled/Unsignalized	464,300	C to D	C to D	6.3	5.8
Kidron Road at Drane Field Road	Stop sign controlled/Unsignalized	847,600	D to F	D to F	96.3	87.8

Notes: Difference = Difference between No-Action Alternative and Proposed Project
Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition: A Guide for Multimodal Mobility Analysis (HCM). 2016; except as noted with "*"
[1] Calculations performed with Synchro software

Table 3.1-9 2022 Proposed Project Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.6	41	C	29.7	41
		EB TH	A	0.0	69	A	0.0	69
		EB RT	D	37.8	69	D	37.9	69
		WB LT	C	34.4	#208	D	39.0	#239
		WB TH	C	26.7	66	C	27.3	87
		WB RT	C	28.2	3	C	29.6	26
		NB LT	B	12.5	8	B	10.8	10
		NB TH	B	18.3	247	B	18.0	299
		NB RT	B	16.8	42	B	14.0	25
		SB LT	B	14.4	142	B	14.3	97
		SB TH	B	12.1	220	B	11.7	190
		SB RT	A	8.6	0	A	8.7	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	88.4	#239	D	50.2	138
		EB TH & RT	C	27.3	274	C	28.1	212
		WB LT	B	19.0	22	B	14.7	6
		WB TH	C	27.5	280	C	23.2	164
		WB RT	A	4.2	46	A	4.7	41
		NB LT, TH & RT	A	0.1	0	A	7.0	17
		SB TH & LT	C	20.2	236	B	11.3	112
		SB RT	A	3.0	37	A	2.5	35

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	10.9	3	B	10.3	3
		WB TH	A	0.0	0	A	0.0	0
		NB LT	D	29.1	10	D	28.8	10
		NB RT	C	15.0	5	B	13.5	3
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH & RT	A	0.0	0	A	0.0	0
		WB LT	A	9.6	15	A	8.9	8
		WB TH	A	0.0	0	A	0.0	0
		NB LT & RT	E	38.7	13	E	36.6	140

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

Table 3.1-10 2027 Proposed Project Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.5	44	C	30.2	44
		EB TH	A	0.0	75	A	0	75
		EB RT	D	38.0	75	D	38.8	75
		WB LT	E	60.7	#211	E	71.3	#227
		WB TH	C	28.3	74	C	29.2	96
		WB RT	C	30.5	12	C	32.6	37
		NB LT	B	12.3	9	B	10.8	10
		NB TH	B	19.1	273	B	19.1	329
		NB RT	B	17.4	43	B	14.3	36
		SB LT	B	19.1	#215	B	19.2	#167
		SB TH	B	12.0	243	B	11.7	212
		SB RT	A	8.2	0	A	8.4	0
	Signal controlled	EB LT	F	91.3	#269	D	53.6	158

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
Airfield Court/West Airport Road at Drane Field Road		EB TH & RT	C	24.3	296	C	25.8	232
		WB LT	B	16.5	21	B	12.7	5
		WB TH	C	24.4	297	C	20.8	172
		WB RT	A	3.7	43	A	4.1	38
		NB LT, TH & RT	A	0.1	0	A	8.9	20
		SB TH & LT	C	28.6	299	B	14.6	147
		SB RT	A	4.8	57	A	3.0	41
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	11.5	3	B	10.7	3
		WB TH	A	0.0	0	A	0.0	0
		NB LT	E	37.7	15	E	36.9	15
		NB RT	C	16.5	5	B	14.6	5
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH & RT	A	0.0	0	A	0.0	0
		WB LT	B	10.2	20	A	9.3	13
		WB TH	A	0.0	0	A	0.0	0
		NB LT & RT	F	126.0	298	F	114.5	325

Notes:
#: 95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

4.0 SUMMARY AND RECOMMENDATIONS

4.1 SUMMARY OF FINDINGS

The Proposed Project has the potential to impact vehicle delays and LOS at four intersections. Compared to the No-Action Alternative, the Proposed Project would incur additional delays in the 2022 and 2027 study years at all four intersections, either during AM peak hour, PM peak hour, or both. The greatest impacts would generally occur in the 2027 study year. Three of the four impacted intersections would not experience significant or unacceptable increased average delay or LOS in either study year.

However, the intersection of Kidron Road at Drane Field Road would experience substantial average vehicle delays and decreases in LOS by 2022. With operation of the Proposed Project, in the 2022 study year, the intersection would experience an average vehicle delay of as much as 14.5 seconds more than the No-Action Alternative, resulting in a LOS decrease from C to E. In the 2027 study year, the intersection would experience an average vehicle delay of as much as 96.3 seconds more than the No-Action Alternative, resulting in a LOS decrease from D to F.

4.2 TRAFFIC IMPACTS MITIGATION

Two alternative methods were developed to mitigate the impacts to LOS by reducing the increased average vehicle delay that would be incurred by the Proposed Project at the intersection of Kidron Road at Drane Field Road. Mitigation Alternative 1 includes adding dedicated turning lanes at the intersection. Mitigation Alternative 2 includes the addition of turn lanes and replacing the existing stop sign with a traffic signal. The resulting average delay and LOS for 2022 and 2027 are depicted in **Tables 4.2-1** and **4.2-2**, respectively.

Table 4.2-1 2022 Kidron Road at Drane Field Road Traffic Mitigation Scenarios

Scenario	Control Type	AM		PM	
		LOS	Delay (Seconds/ Vehicle)	LOS	Delay (Seconds/ Vehicle)
No-Action	Stop Sign	C	24.2	C	22.5
Proposed Project, No Mitigation	Stop Sign	E	38.7	E	36.6
Proposed Project, Mitigation Alternative 1	Stop Sign with Dedicated Turn Lanes	C	21.2	C	19.5
Proposed Project, Mitigation Alternative 2	Signal with Dedicated Turn Lanes	B	11.0	B	10.2

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 4.2-2 2027 Kidron Road and Drane Field Road Traffic Mitigation Scenarios

Scenario	Control Type	AM		PM	
		LOS	Delay (Seconds/	LOS	Delay (Seconds/

			Vehicle)		Vehicle)
No-Action	Stop Sign	D	29.7	D	26.7
Proposed Project, No Mitigation	Stop Sign	F	126.0	F	114.5
Proposed Project, Mitigation Alternative 1	Stop Sign with Dedicated Turn Lanes	D	32.0	D	28.4
Proposed Project, Mitigation Alternative 2	Signal with Dedicated Turn Lanes	B	13.0	B	12.0

Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Tables 4.2-3 and **4.2-4** summarize the average delay and LOS impacts of the Proposed Project with no mitigation, with Mitigation Alternative 1, and with Mitigation Alternative 2, as compared to the No-Action Alternative.

Table 4.2-3 2022 Kidron Road and Drane Field Road Traffic Mitigation Comparisons

Scenario	AM		PM	
	LOS Difference	Average Delay Difference (Seconds/Vehicle)	LOS Difference	Average Delay Difference (Seconds/Vehicle)
No-Action Vs Proposed Project, No Mitigation	C to E	14.5	C to E	14.1
No-Action Vs Proposed Project, Alternative 1	No Change	-3.0	No Change	-3.0
No-Action Vs Proposed Project, Alternative 2	C to B	-13.2	C to B	-13.2

Notes: Difference = Difference between No-Action Alternative and Proposed Project
Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

Table 4.2-4 2027 Kidron Road and Drane Field Road Traffic Mitigation Comparisons

Scenario	AM		PM	
	LOS Difference	Average Delay Difference (Seconds/Vehicle)	LOS Difference	Average Delay Difference (Seconds/Vehicle)
No-Action Vs Proposed Project, No Mitigation	D to F	96.3	D to F	87.8
No-Action Vs Proposed Project, Alternative 1	No Change	2.3	No Change	1.7
No-Action Vs Proposed Project, Alternative 2	D to B	-16.7	D to B	-14.7

Notes: Difference = Difference between No-Action Alternative and Proposed Project
Sources: AECOM, 2020; Transportation Research Board. *Highway Capacity Manual*, 6th Edition

As previously stated, constructing the Proposed Project with no mitigation at the Kidron Road and Drane Field Road intersection would result in significant impacts to surface road traffic. Therefore, implementing mitigation would be required to avoid significant impacts.

By implementing Mitigation Alternative 1 (construct designated turn lanes), the majority of traffic impacts potentially incurred by the Proposed Project at this intersection would be mitigated, and LOS would be preserved at the No-Action Alternative of LOS C, with a slight average delay time decrease in 2022 and a slight increase average delay time increase in 2027. In both study years, the intersection would remain at an acceptable LOS with this mitigation scenario. The Proposed Project would therefore result in no significant impact to surface road traffic.

If Mitigation Alternative 2 (construct designated turn lanes and a traffic signal) is implemented, all potential traffic impacts incurred by the Proposed Project at this intersection would be mitigated, and average delay and LOS would improve relative to the No-Action Alternative. With the No-Action Alternative, traffic volumes at this intersection would continue to increase over time, and the average delay would be expected to increase, with a resulting LOS decrease from C in 2022 to D 2027. However, with the implementation of Mitigation Alternative 2, the intersection would experience a marked decrease in average delay, resulting in an improvement of LOS compared to the No-Action Alternative LOS. The LOS resulting from Mitigation Alternative 2 would improve to LOS B, compared to the No-Action Alternative LOS C and D in 2022 and 2027, respectively. Therefore, the intersection would remain at an acceptable LOS with this mitigation scenario and there would be no significant impact to surface road traffic.

Further details summarizing the traffic operations, including queue length, delays (seconds/vehicle), and LOS for each individual movement, for the 2022 and 2027 Proposed Project conditions with each mitigation alternative are provided in T**ables 4.2-5** through **4.2-6** below. Attached to this Report are the detailed Synchro outputs utilized in the analysis contained herein.

Table 4.2-5 2022 Proposed Project Mitigation Alternative 1 Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.6	41	C	29.7	41
		EB TH	A	0.0	69	A	0.0	69
		EB RT	D	37.8	69	D	37.9	69
		WB LT	C	34.4	#208	D	39.0	#239
		WB TH	C	26.7	66	C	27.3	87
		WB RT	C	28.2	3	C	29.6	26
		NB LT	B	12.5	8	B	10.8	10
		NB TH	B	18.3	247	B	18.0	299
		NB RT	B	16.8	42	B	14.0	25
		SB LT	B	14.4	142	B	14.3	97
		SB TH	B	12.1	220	B	11.7	190
		SB RT	A	8.6	0	A	8.7	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	88.4	#239	D	50.2	138
		EB TH & RT	C	27.3	274	C	28.1	212
		WB LT	B	19.0	22	B	14.7	6
		WB TH	C	27.5	280	C	23.2	164
		WB RT	A	4.2	46	A	4.7	41
		NB LT, TH & RT	A	0.1	0	A	7.0	17
		SB TH & LT	C	20.2	236	B	11.3	112
		SB RT	A	3.0	37	A	2.5	35
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	10.9	3	B	10.3	3
		WB TH	A	0.0	0	A	0.0	0
		NB LT	D	29.1	10	D	28.8	10
		NB RT	C	15.0	5	B	13.5	3
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	EBTH&RT	A	0	0	A	0	0
		WBLT	A	9.6	15	A	8.9	8
		WBTH	A	0	0	A	0	0
		NBLT	E	39.7	38	D	34.8	40
		NBRT	C	15.3	35	B	14.2	38

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

Table 4.2-6 2027 Proposed Project Mitigation Alternative 1 Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.5	44	C	30.2	44
		EB TH	A	0.0	75	A	0.0	75
		EB RT	D	38.0	75	D	38.8	75
		WB LT	E	60.7	#211	E	71.3	#227
		WB TH	C	28.3	74	C	29.2	96
		WB RT	C	30.5	12	C	32.6	37
		NB LT	B	12.3	9	B	10.8	10
		NB TH	B	19.1	273	B	19.1	329
		NB RT	B	17.4	43	B	14.3	36
		SB LT	B	19.1	#215	B	19.2	#167
		SB TH	B	12.0	243	B	11.7	212
		SB RT	A	8.2	0	A	8.4	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	91.3	#269	D	53.6	158
		EB TH & RT	C	24.3	296	C	25.8	232
		WB LT	B	16.5	21	B	12.7	5
		WB TH	C	24.4	297	C	20.8	172
		WB RT	A	3.7	43	A	4.1	38
		NB LT, TH & RT	A	0.1	0	A	8.9	20
		SB TH & LT	C	28.6	299	B	14.6	147
		SB RT	A	4.8	57	A	3.0	41
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	11.5	3	B	10.7	3
		WB TH	A	0.0	0	A	0.0	0
		NB LT	E	37.7	15	E	36.9	15
		NB RT	C	16.5	5	B	14.6	5
		EBTH&RT	A	0	0	A	0	0

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
Kidron Road at Drane Field Road	Stop sign controlled/unsignalized	WBLT	B	10.2	20	A	9.3	13
		WBTH	A	0	0	A	0	0
		NBLT	F	74.5	73	F	60.9	78
		NBRT	C	18.4	58	C	16.9	58

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

Table 4.2-7 2022 Proposed Project Mitigation Alternative 2 Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.6	41	C	29.7	41
		EB TH	A	0.0	69	A	0.0	69
		EB RT	D	37.8	69	D	37.9	69
		WB LT	C	34.4	#208	D	39.0	#239
		WB TH	C	26.7	66	C	27.3	87
		WB RT	C	28.2	3	C	29.6	26
		NB LT	B	12.5	8	B	10.8	10
		NB TH	B	18.3	247	B	18.0	299
		NB RT	B	16.8	42	B	14.0	25
		SB LT	B	14.4	142	B	14.3	97
		SB TH	B	12.1	220	B	11.7	190
		SB RT	A	8.6	0	A	8.7	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	88.4	#239	D	50.2	138
		EB TH & RT	C	27.3	274	C	28.1	212
		WB LT	B	19	22	B	14.7	6
		WB TH	C	27.5	280	C	23.2	164
		WB RT	A	4.2	46	A	4.7	41
		NB LT, TH & RT	A	0.1	0	A	7.0	17
		SB TH & LT	C	20.2	236	B	11.3	112

		SB RT	A	3.0	37	A	2.5	35
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	10.9	3	B	10.3	3
		WB TH	A	0.0	0	A	0.0	0
		NB LT	D	29.1	10	D	28.8	10
		NB RT	C	15.0	5	B	13.5	3
Kidron Road at Drane Field Road	Signal controlled	EB TH	A	0	264	A	0	198
		EBRT	B	12.8	264	B	12.5	198
		WBLT	A	8.2	31	A	7.2	23
		WBTH	A	3.9	73	A	5	103
		NBLT	B	16.4	51	B	13.9	51
		NBRT	C	20.8	44	B	17.7	42

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

Table 4.2-8 2027 Proposed Project Mitigation Alternative 2 Traffic Operations

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
County Line Road at Drane Field Road	Signal controlled	EB LT	C	29.5	44	C	30.2	44
		EB TH	A	0.0	75	A	0.0	75
		EB RT	D	38.0	75	D	38.8	75
		WB LT	E	60.7	#211	E	71.3	#227
		WB TH	C	28.3	74	C	29.2	96
		WB RT	C	30.5	12	C	32.6	37
		NB LT	B	12.3	9	B	10.8	10
		NB TH	B	19.1	273	B	19.1	329
		NB RT	B	17.4	43	B	14.3	36
		SB LT	B	19.1	#215	B	19.2	#167
		SB TH	B	12.0	243	B	11.7	212
		SB RT	A	8.2	0	A	8.4	0
Airfield Court/West Airport Road at Drane Field Road	Signal controlled	EB LT	F	91.3	#269	D	53.6	158
		EB TH & RT	C	24.3	296	C	25.8	232
		WB LT	B	16.5	21	B	12.7	5

Intersections	Control/Signal Type	Movement	AM			PM		
			LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)	LOS	Delay (Seconds/ Vehicle)	Queue Length (feet)
		WB TH	C	24.4	297	C	20.8	172
		WB RT	A	3.7	43	A	4.1	38
		NB LT, TH & RT	A	0.1	0	A	8.9	20
		SB TH & LT	C	28.6	299	B	14.6	147
		SB RT	A	4.8	57	A	3	41
Kelvin Howard Road at Drane Field Road	Stop sign controlled/unsignalized	EB TH	A	0.0	0	A	0.0	0
		EB RT	A	0.0	0	A	0.0	0
		WB LT	B	11.5	3	B	10.7	3
		WB TH	A	0.0	0	A	0.0	0
		NB LT	E	37.7	15	E	36.9	15
		NB RT	C	16.5	5	B	14.6	5
Kidron Road at Drane Field Road	Signal controlled	EBTH	A	0	333	A	0	252
		EBRT	B	14.6	333	B	14.3	252
		WBLT	B	11.1	38	A	8.9	29
		WBTH	A	4.4	84	A	5.8	127
		NBLT	B	18.7	66	B	15.6	68
		NBRT	C	24.6	51	C	20.7	49

Notes:
#:95th percentile volume exceeds capacity and queue may be longer. Queue shown is maximum after two cycles.
SB = southbound; EB = eastbound; WB = westbound; NB = northbound; TH = through; LT = left turn; RT = right turn

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ATTACHMENT A SYNCHRO OUTPUTS

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	53	22	196	51	76	8	643	143	192	731	38
Future Volume (veh/h)	43	53	22	196	51	76	8	643	143	192	731	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	50	62	26	228	59	88	9	748	166	223	850	44
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	273	98	41	384	323	274	340	1507	672	433	1800	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.04	0.08	0.08	0.14	0.18	0.18	0.01	0.43	0.43	0.10	0.52	0.52
Unsig. Movement Delay												
Ln Grp Delay, s/veh	28.9	0.0	37.0	25.7	25.6	26.6	11.4	15.9	13.8	11.0	12.0	8.7
Ln Grp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		138			375			923			1117	
Approach Delay, s/veh		34.1			25.9			15.5			11.6	
Approach LOS		C			C			B			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	3.0	1.1	4.0	1.1	3.0	1.1	3.0
Phs Duration (G+Y+Rc), s	11.4	35.9	14.7	10.3	5.3	42.0	7.7	17.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green (Gmax), s	13.5	29.0	11.5	18.0	5.0	37.5	5.1	24.4
Max Allow Headway (MAH), s	3.7	4.6	3.7	4.9	3.7	4.7	3.7	4.3
Max Q Clear (g_c+I1), s	6.7	13.2	10.2	5.6	2.2	13.3	3.9	5.6
Green Ext Time (g_e), s	0.3	4.5	0.1	0.2	0.0	5.5	0.0	0.4
Prob of Phs Call (p_c)	0.99	1.00	0.99	1.00	0.17	1.00	0.63	1.00
Prob of Max Out (p_x)	0.09	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1739		1739		1739		1739	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3469		1221		3469		1826
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		1547		512		1547		1547
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	223	0	228	0	9	0	50	0
Grp Sat Flow (s), veh/h/ln	1739	0	1739	0	1739	0	1739	0
Q Serve Time (g_s), s	4.7	0.0	8.2	0.0	0.2	0.0	1.9	0.0
Cycle Q Clear Time (g_c), s	4.7	0.0	8.2	0.0	0.2	0.0	1.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	596	0	1278	0	608	0	1211	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	33.4	0.0	7.8	0.0	31.4	0.0	5.8	0.0
Perm LT Serve Time (g_u), s	20.1	0.0	2.2	0.0	26.2	0.0	5.8	0.0
Perm LT Q Serve Time (g_ps), s	7.9	0.0	1.2	0.0	0.1	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	433	0	384	0	340	0	273	0
V/C Ratio (X)	0.52	0.00	0.59	0.00	0.03	0.00	0.18	0.00
Avail Cap (c_a), veh/h	591	0	415	0	440	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	10.0	0.0	23.8	0.0	11.3	0.0	28.6	0.0
Incr Delay (d2), s/veh	1.0	0.0	2.0	0.0	0.0	0.0	0.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	11.0	0.0	25.7	0.0	11.4	0.0	28.9	0.0
1st-Term Q (Q1), veh/ln	1.2	0.0	3.0	0.0	0.1	0.0	0.7	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.4	0.0	3.2	0.0	0.1	0.0	0.7	0.0
%ile Storage Ratio (RQ%)	0.10	0.00	0.41	0.00	0.01	0.00	0.10	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		T
Lanes in Grp	0	2	0	0	0	2	0	1
Grp Vol (v), veh/h	0	748	0	0	0	850	0	59
Grp Sat Flow (s), veh/h/ln	0	1735	0	0	0	1735	0	1826
Q Serve Time (g_s), s	0.0	11.2	0.0	0.0	0.0	11.3	0.0	2.0
Cycle Q Clear Time (g_c), s	0.0	11.2	0.0	0.0	0.0	11.3	0.0	2.0
Lane Grp Cap (c), veh/h	0	1507	0	0	0	1800	0	323
V/C Ratio (X)	0.00	0.50	0.00	0.00	0.00	0.47	0.00	0.18
Avail Cap (c_a), veh/h	0	1507	0	0	0	1800	0	616
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	14.7	0.0	0.0	0.0	11.1	0.0	25.3
Incr Delay (d2), s/veh	0.0	1.2	0.0	0.0	0.0	0.9	0.0	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	15.9	0.0	0.0	0.0	12.0	0.0	25.6
1st-Term Q (Q1), veh/ln	0.0	3.5	0.0	0.0	0.0	3.2	0.0	0.8
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.7	0.0	0.0	0.0	3.4	0.0	0.8
%ile Storage Ratio (RQ%)	0.00	0.07	0.00	0.00	0.00	0.05	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		R		R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	166	0	88	0	44	0	88
Grp Sat Flow (s), veh/h/ln	0	1547	0	1734	0	1547	0	1547
Q Serve Time (g_s), s	0.0	4.9	0.0	3.6	0.0	1.0	0.0	3.6
Cycle Q Clear Time (g_c), s	0.0	4.9	0.0	3.6	0.0	1.0	0.0	3.6
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.30	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	672	0	138	0	803	0	274
V/C Ratio (X)	0.00	0.25	0.00	0.64	0.00	0.05	0.00	0.32
Avail Cap (c_a), veh/h	0	672	0	432	0	803	0	522
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	13.0	0.0	32.2	0.0	8.6	0.0	26.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	4.8	0.0	0.1	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	13.8	0.0	37.0	0.0	8.7	0.0	26.6
1st-Term Q (Q1), veh/ln	0.0	1.4	0.0	1.4	0.0	0.3	0.0	1.2
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.6	0.0	1.5	0.0	0.3	0.0	1.2
%ile Storage Ratio (RQ%)	0.00	0.16	0.00	0.02	0.00	0.03	0.00	0.16
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	387	0	0	324	0	0
Future Vol, veh/h	387	0	0	324	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	450	0	0	377	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	450	0	827	450
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	377	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1095	-	337	603
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1095	-	337	603
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	687	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1095	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Intersection						
Int Delay, s/veh	1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	386	1	36	287	8	25
Future Vol, veh/h	386	1	36	287	8	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	449	1	42	334	9	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	450	0	868	450
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	418	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1095	-	319	603
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1095	-	304	603
Mov Cap-2 Maneuver	-	-	-	-	304	-
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	627	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	487	-	-	1095	-
HCM Lane V/C Ratio	0.079	-	-	0.038	-
HCM Control Delay (s)	13	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	88	228	59	88	9	748	166	223	850	44
v/c Ratio	0.21	0.41	0.63	0.15	0.19	0.03	0.55	0.22	0.52	0.43	0.05
Control Delay	22.0	32.1	29.9	26.8	0.9	9.1	21.3	1.6	13.1	12.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	32.1	29.9	26.8	0.9	9.1	21.3	1.6	13.1	12.0	0.1
Queue Length 50th (ft)	17	30	86	24	0	2	147	0	49	113	0
Queue Length 95th (ft)	40	71	145	54	0	8	218	9	89	210	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	242	438	381	600	631	354	1354	749	491	1955	953
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.60	0.10	0.14	0.03	0.55	0.22	0.45	0.43	0.05

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	148	306	20	344	399	29	463	142
v/c Ratio	0.96	0.63	0.11	0.70	0.56	0.03	0.58	0.14
Control Delay	94.6	31.3	22.2	34.4	5.8	0.0	14.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.6	31.3	22.2	34.4	5.8	0.0	14.7	2.1
Queue Length 50th (ft)	73	134	8	155	0	0	124	0
Queue Length 95th (ft)	#164	199	23	226	49	0	262	22
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	223	710	266	711	846	1097	795	1003
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.43	0.08	0.48	0.47	0.03	0.58	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	53	22	211	73	103	10	818	123	124	647	32
Future Volume (veh/h)	43	53	22	211	73	103	10	818	123	124	647	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	50	62	26	245	85	120	12	951	143	144	752	37
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	265	97	41	395	337	286	377	1601	714	342	1779	793
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.04	0.08	0.08	0.15	0.18	0.18	0.01	0.46	0.46	0.07	0.51	0.51
Unsig. Movement Delay												
Ln Grp Delay, s/veh	29.5	0.0	37.7	26.8	26.1	27.5	10.5	16.3	12.4	11.7	11.9	9.1
Ln Grp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		138			450			1106			933	
Approach Delay, s/veh		34.8			26.8			15.8			11.8	
Approach LOS		C			C			B			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	3.0	1.1	4.0	1.1	3.0	1.1	3.0
Phs Duration (G+Y+Rc), s	9.4	38.5	15.5	10.4	5.6	42.3	7.7	18.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green (Gmax), s	8.5	34.0	11.5	18.0	5.0	37.5	5.1	24.4
Max Allow Headway (MAH), s	3.7	4.6	3.7	4.9	3.7	4.7	3.7	4.3
Max Q Clear (g_c+I1), s	5.0	17.0	11.0	5.6	2.3	11.9	3.9	7.0
Green Ext Time (g_e), s	0.1	5.9	0.0	0.2	0.0	4.8	0.0	0.6
Prob of Phs Call (p_c)	0.95	1.00	0.99	1.00	0.22	1.00	0.64	1.00
Prob of Max Out (p_x)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1739		1739		1739		1739	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3469		1221		3469		1826
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		1547		512		1547		1547
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	144	0	245	0	12	0	50	0
Grp Sat Flow (s), veh/h/ln	1739	0	1739	0	1739	0	1739	0
Q Serve Time (g_s), s	3.0	0.0	9.0	0.0	0.3	0.0	1.9	0.0
Cycle Q Clear Time (g_c), s	3.0	0.0	9.0	0.0	0.3	0.0	1.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	503	0	1278	0	670	0	1149	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	35.3	0.0	7.9	0.0	34.0	0.0	5.9	0.0
Perm LT Serve Time (g_u), s	19.0	0.0	2.2	0.0	27.8	0.0	5.9	0.0
Perm LT Q Serve Time (g_ps), s	6.5	0.0	1.3	0.0	0.1	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	342	0	395	0	377	0	265	0
V/C Ratio (X)	0.42	0.00	0.62	0.00	0.03	0.00	0.19	0.00
Avail Cap (c_a), veh/h	428	0	408	0	469	0	309	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	10.8	0.0	24.0	0.0	10.4	0.0	29.2	0.0
Incr Delay (d2), s/veh	0.8	0.0	2.7	0.0	0.0	0.0	0.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	11.7	0.0	26.8	0.0	10.5	0.0	29.5	0.0
1st-Term Q (Q1), veh/ln	0.8	0.0	3.3	0.0	0.1	0.0	0.7	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.9	0.0	3.6	0.0	0.1	0.0	0.8	0.0
%ile Storage Ratio (RQ%)	0.07	0.00	0.46	0.00	0.01	0.00	0.10	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		T
Lanes in Grp	0	2	0	0	0	2	0	1
Grp Vol (v), veh/h	0	951	0	0	0	752	0	85
Grp Sat Flow (s), veh/h/ln	0	1735	0	0	0	1735	0	1826
Q Serve Time (g_s), s	0.0	15.0	0.0	0.0	0.0	9.9	0.0	2.9
Cycle Q Clear Time (g_c), s	0.0	15.0	0.0	0.0	0.0	9.9	0.0	2.9
Lane Grp Cap (c), veh/h	0	1601	0	0	0	1779	0	337
V/C Ratio (X)	0.00	0.59	0.00	0.00	0.00	0.42	0.00	0.25
Avail Cap (c_a), veh/h	0	1601	0	0	0	1779	0	605
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	14.7	0.0	0.0	0.0	11.2	0.0	25.7
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.0	0.0	0.7	0.0	0.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	16.3	0.0	0.0	0.0	11.9	0.0	26.1
1st-Term Q (Q1), veh/ln	0.0	4.6	0.0	0.0	0.0	2.9	0.0	1.1
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.0	0.0	0.2	0.0	0.0

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.9	0.0	0.0	0.0	3.0	0.0	1.2
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.00	0.00	0.05	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		T+R		R		R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	143	0	88	0	37	0	120
Grp Sat Flow (s), veh/h/ln	0	1547	0	1734	0	1547	0	1547
Q Serve Time (g_s), s	0.0	4.0	0.0	3.6	0.0	0.9	0.0	5.0
Cycle Q Clear Time (g_c), s	0.0	4.0	0.0	3.6	0.0	0.9	0.0	5.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	0.30	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	714	0	138	0	793	0	286
V/C Ratio (X)	0.00	0.20	0.00	0.64	0.00	0.05	0.00	0.42
Avail Cap (c_a), veh/h	0	714	0	424	0	793	0	512
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	11.8	0.0	32.9	0.0	9.0	0.0	26.5
Incr Delay (d2), s/veh	0.0	0.6	0.0	4.8	0.0	0.1	0.0	1.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	12.4	0.0	37.7	0.0	9.1	0.0	27.5
1st-Term Q (Q1), veh/ln	0.0	1.1	0.0	1.4	0.0	0.2	0.0	1.7
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	1.3	0.0	1.6	0.0	0.3	0.0	1.8
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.02	0.00	0.03	0.00	0.23
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 6th Ctrl Delay		17.2						
HCM 6th LOS		B						

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	324	0	0	387	0	0
Future Vol, veh/h	324	0	0	387	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	377	0	0	450	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	377	0	827	377
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	450	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1165	-	337	663
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1165	-	337	663
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	1165	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Intersection						
Int Delay, s/veh	0.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	379	9	8	316	9	30
Future Vol, veh/h	379	9	8	316	9	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	441	10	9	367	10	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	451	0	831	446
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	385	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1094	-	336	606
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1094	-	333	606
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	510	-	-	1094	-
HCM Lane V/C Ratio	0.089	-	-	0.009	-
HCM Control Delay (s)	12.7	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	88	245	85	120	12	951	143	144	752	37
v/c Ratio	0.22	0.42	0.69	0.22	0.28	0.03	0.62	0.18	0.43	0.38	0.04
Control Delay	22.8	33.1	33.6	28.4	7.0	8.5	20.2	1.9	12.3	11.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	33.1	33.6	28.4	7.0	8.5	20.2	1.9	12.3	11.2	0.1
Queue Length 50th (ft)	18	32	99	37	0	2	194	0	30	96	0
Queue Length 95th (ft)	40	71	155	72	34	9	263	17	59	181	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	232	422	369	575	575	405	1524	783	348	1993	968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.21	0.66	0.15	0.21	0.03	0.62	0.18	0.41	0.38	0.04

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	148	303	3	253	381	29	267	337
v/c Ratio	0.74	0.69	0.02	0.58	0.58	0.03	0.33	0.31
Control Delay	46.5	32.4	19.0	28.4	6.3	5.0	8.6	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	32.4	19.0	28.4	6.3	5.0	8.6	1.8
Queue Length 50th (ft)	58	118	1	95	0	2	46	0
Queue Length 95th (ft)	112	181	6	151	48	13	109	28
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	446	978	356	978	1006	1019	801	1090
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.31	0.01	0.26	0.38	0.03	0.33	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	232	61	90	9	696	191	251	782	40
Future Volume (veh/h)	42	52	22	232	61	90	9	696	191	251	782	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	270	71	105	10	809	222	292	909	47
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	265	95	41	360	300	254	332	1490	665	441	1860	829
Arrive On Green	0.04	0.08	0.08	0.13	0.16	0.16	0.01	0.43	0.43	0.12	0.54	0.54
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	270	71	105	10	809	222	292	909	47
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.5	9.5	2.5	4.5	0.2	12.8	7.0	6.3	12.1	1.1
Cycle Q Clear(g_c), s	1.9	0.0	3.5	9.5	2.5	4.5	0.2	12.8	7.0	6.3	12.1	1.1
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	265	0	136	360	300	254	332	1490	665	441	1860	829
V/C Ratio(X)	0.19	0.00	0.63	0.75	0.24	0.41	0.03	0.54	0.33	0.66	0.49	0.06
Avail Cap(c_a), veh/h	310	0	423	360	555	470	429	1490	665	603	1860	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	32.9	26.3	26.8	27.6	11.7	15.6	14.0	11.2	10.7	8.2
Incr Delay (d2), s/veh	0.3	0.0	4.8	8.4	0.4	1.1	0.0	1.4	1.4	1.7	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.5	4.6	1.0	1.6	0.1	4.4	2.3	1.8	3.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	0.0	37.8	34.7	27.2	28.7	11.7	17.1	15.3	12.9	11.7	8.3
LnGrp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			446			1041			1248	
Approach Delay, s/veh		34.8			32.1			16.6			11.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	36.2	14.0	10.3	5.4	44.0	7.7	16.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.6	28.9	9.5	18.0	5.0	39.5	5.1	22.4
Max Q Clear Time (g_c+I1), s	8.3	14.8	11.5	5.5	2.2	14.1	3.9	6.5
Green Ext Time (p_c), s	0.5	4.8	0.0	0.2	0.0	6.1	0.0	0.5

Intersection Summary		
HCM 6th Ctrl Delay		17.8
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	488	6	6	373	9	9
Future Vol, veh/h	488	6	6	373	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	67	67
Mvmt Flow	567	7	7	434	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	574	0	1015	567
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	448	-
Critical Hdwy	-	-	5.1	-	7.07	6.87
Critical Hdwy Stg 1	-	-	-	-	6.07	-
Critical Hdwy Stg 2	-	-	-	-	6.07	-
Follow-up Hdwy	-	-	3.1	-	4.103	3.903
Pot Cap-1 Maneuver	-	-	653	-	202	418
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	526	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	653	-	200	418
Mov Cap-2 Maneuver	-	-	-	-	200	-
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	520	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	200	418	-	-	653	-
HCM Lane V/C Ratio	0.052	0.025	-	-	0.011	-
HCM Control Delay (s)	24	13.8	-	-	10.6	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	422	75	112	313	37	118
Future Vol, veh/h	422	75	112	313	37	118
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	491	87	130	364	43	137

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	578	0	1159	535
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	624	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	981	-	213	540
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	528	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	981	-	178	540
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	440	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	24.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	364	-	-	981	-
HCM Lane V/C Ratio	0.495	-	-	0.133	-
HCM Control Delay (s)	24.2	-	-	9.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.6	-	-	0.5	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	86	270	71	105	10	809	222	292	909	47
v/c Ratio	0.21	0.41	0.82	0.20	0.24	0.03	0.61	0.30	0.65	0.45	0.05
Control Delay	23.5	31.9	45.8	29.4	1.7	8.6	22.5	4.2	15.9	11.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	31.9	45.8	29.4	1.7	8.6	22.5	4.2	15.9	11.0	0.1
Queue Length 50th (ft)	17	29	110	30	0	2	165	0	62	114	0
Queue Length 95th (ft)	41	69	#200	64	1	8	239	39	117	216	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	237	435	331	545	590	336	1337	733	513	2028	959
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.82	0.13	0.18	0.03	0.61	0.30	0.57	0.45	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	194	402	20	420	409	29	405	250
v/c Ratio	1.01	0.64	0.10	0.67	0.51	0.03	0.58	0.27
Control Delay	95.6	26.1	17.2	27.1	4.3	0.0	19.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.6	26.1	17.2	27.1	4.3	0.0	19.3	2.7
Queue Length 50th (ft)	94	163	7	173	0	0	135	0
Queue Length 95th (ft)	#207	234	20	246	42	0	258	33
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	270	881	289	883	959	991	695	943
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.46	0.07	0.48	0.43	0.03	0.58	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	251	86	123	11	884	165	166	692	33
Future Volume (veh/h)	42	52	22	251	86	123	11	884	165	166	692	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	292	100	143	13	1028	192	193	805	38
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	259	95	41	383	324	274	364	1575	703	341	1806	805
Arrive On Green	0.04	0.08	0.08	0.14	0.18	0.18	0.02	0.45	0.45	0.08	0.52	0.52
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	292	100	143	13	1028	192	193	805	38
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.6	10.5	3.5	6.2	0.3	17.0	5.7	4.0	10.7	0.9
Cycle Q Clear(g_c), s	1.9	0.0	3.6	10.5	3.5	6.2	0.3	17.0	5.7	4.0	10.7	0.9
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	259	0	136	383	324	274	364	1575	703	341	1806	805
V/C Ratio(X)	0.19	0.00	0.63	0.76	0.31	0.52	0.04	0.65	0.27	0.57	0.45	0.05
Avail Cap(c_a), veh/h	304	0	421	383	578	490	454	1575	703	433	1806	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	33.1	25.8	26.5	27.6	10.7	15.7	12.6	12.2	11.1	8.7
Incr Delay (d2), s/veh	0.4	0.0	4.8	8.8	0.5	1.5	0.0	2.1	1.0	1.5	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.6	5.0	1.4	2.2	0.1	5.7	1.8	1.2	3.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	37.9	34.6	27.0	29.1	10.7	17.8	13.5	13.7	11.9	8.8
LnGrp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			535			1233			1036	
Approach Delay, s/veh		34.9			31.7			17.0			12.1	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	38.1	15.0	10.3	5.7	43.0	7.7	17.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.0	33.5	10.5	18.0	5.0	38.5	5.1	23.4				
Max Q Clear Time (g_c+I1), s	6.0	19.0	12.5	5.6	2.3	12.7	3.9	8.2				
Green Ext Time (p_c), s	0.2	6.0	0.0	0.2	0.0	5.2	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			18.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	405	6	6	452	9	9
Future Vol, veh/h	405	6	6	452	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	67	67
Mvmt Flow	471	7	7	526	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	478	0	1011	471
Stage 1	-	-	-	-	471	-
Stage 2	-	-	-	-	540	-
Critical Hdwy	-	-	5.1	-	7.07	6.87
Critical Hdwy Stg 1	-	-	-	-	6.07	-
Critical Hdwy Stg 2	-	-	-	-	6.07	-
Follow-up Hdwy	-	-	3.1	-	4.103	3.903
Pot Cap-1 Maneuver	-	-	720	-	203	479
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	473	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	720	-	201	479
Mov Cap-2 Maneuver	-	-	-	-	201	-
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	468	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	201	479	-	-	720	-
HCM Lane V/C Ratio	0.052	0.022	-	-	0.01	-
HCM Control Delay (s)	23.9	12.7	-	-	10	-
HCM Lane LOS	C	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	4.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	353	61	69	414	46	133
Future Vol, veh/h	353	61	69	414	46	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	410	71	80	481	53	155

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	481	0	1087	446
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1066	-	236	606
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	519	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1066	-	212	606
Mov Cap-2 Maneuver	-	-	-	-	212	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	466	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	22.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	410	-	-	1066	-
HCM Lane V/C Ratio	0.508	-	-	0.075	-
HCM Control Delay (s)	22.5	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.8	-	-	0.2	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	86	292	100	143	13	1028	192	193	805	38
v/c Ratio	0.21	0.42	0.85	0.27	0.31	0.03	0.69	0.24	0.58	0.40	0.04
Control Delay	23.4	32.6	48.5	29.9	4.3	8.2	21.9	2.0	16.3	10.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	32.6	48.5	29.9	4.3	8.2	21.9	2.0	16.3	10.9	0.1
Queue Length 50th (ft)	18	30	125	45	0	2	219	0	40	101	0
Queue Length 95th (ft)	40	69	#213	84	23	10	293	18	83	191	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	228	420	344	550	594	386	1496	802	352	2022	979
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.85	0.18	0.24	0.03	0.69	0.24	0.55	0.40	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	177	364	3	300	391	29	224	324
v/c Ratio	0.81	0.71	0.02	0.58	0.54	0.03	0.30	0.32
Control Delay	49.6	29.0	16.0	24.8	5.2	6.3	10.1	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	29.0	16.0	24.8	5.2	6.3	10.1	2.2
Queue Length 50th (ft)	66	131	1	104	0	3	40	0
Queue Length 95th (ft)	127	197	6	160	43	15	105	32
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	490	1157	378	1157	1124	945	743	1027
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.31	0.01	0.26	0.35	0.03	0.30	0.32

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	253	66	99	10	767	207	272	862	44
Future Volume (veh/h)	46	57	24	253	66	99	10	767	207	272	862	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	294	77	115	12	892	241	316	1002	51
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	271	101	43	358	303	257	302	1451	647	426	1846	823
Arrive On Green	0.04	0.08	0.08	0.13	0.17	0.17	0.01	0.42	0.42	0.13	0.53	0.53
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	294	77	115	12	892	241	316	1002	51
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.0	0.0	3.9	9.5	2.7	5.0	0.3	15.0	8.0	7.0	14.1	1.2
Cycle Q Clear(g_c), s	2.0	0.0	3.9	9.5	2.7	5.0	0.3	15.0	8.0	7.0	14.1	1.2
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	271	0	144	358	303	257	302	1451	647	426	1846	823
V/C Ratio(X)	0.20	0.00	0.65	0.82	0.25	0.45	0.04	0.61	0.37	0.74	0.54	0.06
Avail Cap(c_a), veh/h	313	0	420	358	551	467	393	1451	647	584	1846	823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	33.0	27.2	27.0	27.9	12.2	16.9	14.9	12.9	11.4	8.4
Incr Delay (d2), s/veh	0.3	0.0	5.0	14.2	0.4	1.2	0.1	2.0	1.6	3.3	1.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	5.6	1.1	1.7	0.1	5.2	2.6	2.2	4.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	38.0	41.4	27.4	29.1	12.3	18.9	16.5	16.2	12.6	8.6
LnGrp LOS	C	A	D	D	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			486			1145			1369	
Approach Delay, s/veh		34.9			36.3			18.3			13.3	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	35.5	14.0	10.7	5.6	44.0	7.8	16.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.3	28.2	9.5	18.0	5.0	39.5	5.1	22.4
Max Q Clear Time (g_c+I1), s	9.0	17.0	11.5	5.9	2.3	16.1	4.0	7.0
Green Ext Time (p_c), s	0.5	4.7	0.0	0.3	0.0	6.7	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	530	6	6	408	9	9
Future Vol, veh/h	530	6	6	408	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	67	67
Mvmt Flow	616	7	7	474	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	623	0	1104	616
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	-	-	5.1	-	7.07	6.87
Critical Hdwy Stg 1	-	-	-	-	6.07	-
Critical Hdwy Stg 2	-	-	-	-	6.07	-
Follow-up Hdwy	-	-	3.1	-	4.103	3.903
Pot Cap-1 Maneuver	-	-	621	-	176	390
Stage 1	-	-	-	-	432	-
Stage 2	-	-	-	-	502	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	621	-	174	390
Mov Cap-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	432	-
Stage 2	-	-	-	-	496	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	20.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	174	390	-	-	621	-
HCM Lane V/C Ratio	0.06	0.027	-	-	0.011	-
HCM Control Delay (s)	27	14.5	-	-	10.9	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	5					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	464	75	116	344	38	121
Future Vol, veh/h	464	75	116	344	38	121
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	540	87	135	400	44	141

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	627	0	1254	584
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	670	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	940	-	187	506
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	503	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	940	-	152	506
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	410	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	29.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	325	-	-	940	-
HCM Lane V/C Ratio	0.569	-	-	0.143	-
HCM Control Delay (s)	29.7	-	-	9.5	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.3	-	-	0.5	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	94	294	77	115	12	892	241	316	1002	51
v/c Ratio	0.22	0.44	0.89	0.22	0.26	0.04	0.69	0.33	0.72	0.49	0.05
Control Delay	23.8	33.5	56.0	29.7	2.5	9.0	25.5	4.4	22.2	11.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	33.5	56.0	29.7	2.5	9.0	25.5	4.4	22.2	11.7	0.1
Queue Length 50th (ft)	20	35	128	34	0	2	204	0	73	133	0
Queue Length 95th (ft)	44	75	#233	68	7	9	275	41	161	248	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	238	428	330	538	584	307	1286	726	491	2033	961
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.22	0.89	0.14	0.20	0.04	0.69	0.33	0.64	0.49	0.05

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	210	433	21	457	451	31	445	271
v/c Ratio	1.02	0.63	0.09	0.66	0.52	0.03	0.68	0.30
Control Delay	95.2	24.5	16.3	25.5	4.0	0.1	24.6	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	24.5	16.3	25.5	4.0	0.1	24.6	2.8
Queue Length 50th (ft)	106	175	7	189	0	0	192	0
Queue Length 95th (ft)	#229	249	20	267	43	0	303	35
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	259	871	282	873	975	940	652	913
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.50	0.07	0.52	0.46	0.03	0.68	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	274	94	134	12	974	179	180	762	37
Future Volume (veh/h)	46	57	24	274	94	134	12	974	179	180	762	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	319	109	156	14	1133	208	209	886	43
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	261	100	42	349	297	252	348	1640	732	327	1873	835
Arrive On Green	0.04	0.08	0.08	0.12	0.16	0.16	0.02	0.47	0.47	0.08	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	319	109	156	14	1133	208	209	886	43
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.1	0.0	4.0	9.5	4.0	7.1	0.3	19.5	6.2	4.3	12.0	1.0
Cycle Q Clear(g_c), s	2.1	0.0	4.0	9.5	4.0	7.1	0.3	19.5	6.2	4.3	12.0	1.0
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	0	142	349	297	252	348	1640	732	327	1873	835
V/C Ratio(X)	0.20	0.00	0.66	0.91	0.37	0.62	0.04	0.69	0.28	0.64	0.47	0.05
Avail Cap(c_a), veh/h	300	0	410	349	537	455	433	1640	732	375	1873	835
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	0.0	33.9	29.1	28.4	29.7	10.3	15.7	12.2	13.6	10.8	8.3
Incr Delay (d2), s/veh	0.4	0.0	5.1	27.6	0.8	2.5	0.0	2.4	1.0	2.9	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.8	3.6	1.7	2.6	0.1	6.6	2.0	1.4	3.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	0.0	39.0	56.7	29.1	32.2	10.4	18.1	13.2	16.5	11.7	8.4
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			584			1355			1138	
Approach Delay, s/veh		35.9			45.0			17.3			12.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	40.5	14.0	10.8	5.8	45.6	7.9	16.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.5	36.0	9.5	18.0	5.0	39.5	5.1	22.4
Max Q Clear Time (g_c+I1), s	6.3	21.5	11.5	6.0	2.3	14.0	4.1	9.1
Green Ext Time (p_c), s	0.1	6.7	0.0	0.3	0.0	5.9	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	0.4					
Movement	**EBT**	**EBR**	**WBL**	**WBT**	**NBL**	**NBR**
Lane Configurations						
Traffic Vol, veh/h	440	6	6	494	9	9
Future Vol, veh/h	440	6	6	494	9	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	67	67
Mvmt Flow	512	7	7	574	10	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	519	0	1100	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	588	-
Critical Hdwy	-	-	5.1	-	7.07	6.87
Critical Hdwy Stg 1	-	-	-	-	6.07	-
Critical Hdwy Stg 2	-	-	-	-	6.07	-
Follow-up Hdwy	-	-	3.1	-	4.103	3.903
Pot Cap-1 Maneuver	-	-	690	-	177	452
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	447	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	690	-	175	452
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	443	-
Approach	**EB**		**WB**		**NB**	
HCM Control Delay, s	0		0.1		20	
HCM LOS					C	

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	175	452	-	-	690	-
HCM Lane V/C Ratio	0.06	0.023	-	-	0.01	-
HCM Control Delay (s)	26.9	13.2	-	-	10.3	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	4.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	388	61	69	455	47	135
Future Vol, veh/h	388	61	69	455	47	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	451	71	80	529	55	157

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	522	0	1176	487
Stage 1	-	-	-	-	487	-
Stage 2	-	-	-	-	689	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1029	-	208	574
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1029	-	185	574
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	439	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	26.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	372	-	-	1029	-
HCM Lane V/C Ratio	0.569	-	-	0.078	-
HCM Control Delay (s)	26.7	-	-	8.8	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.4	-	-	0.3	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	94	319	109	156	14	1133	208	209	886	43
v/c Ratio	0.23	0.45	0.99	0.32	0.37	0.04	0.72	0.25	0.69	0.43	0.04
Control Delay	24.2	33.9	78.2	31.4	8.1	7.8	21.5	3.2	24.6	10.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	33.9	78.2	31.4	8.1	7.8	21.5	3.2	24.6	10.9	0.1
Queue Length 50th (ft)	20	35	142	50	0	3	240	0	43	112	0
Queue Length 95th (ft)	44	75	#197	91	42	10	320	33	#132	212	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	230	413	321	517	551	371	1579	818	304	2070	976
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23	0.99	0.21	0.28	0.04	0.72	0.25	0.69	0.43	0.04

Intersection Summary

#	95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	190	392	3	326	430	32	247	353
v/c Ratio	0.85	0.71	0.02	0.59	0.56	0.03	0.35	0.35
Control Delay	54.3	27.9	15.0	24.0	4.9	7.1	11.7	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	27.9	15.0	24.0	4.9	7.1	11.7	2.5
Queue Length 50th (ft)	72	141	1	112	0	3	49	0
Queue Length 95th (ft)	139	208	6	169	43	18	126	35
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	474	1175	365	1175	1149	915	713	1016
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.33	0.01	0.28	0.37	0.03	0.35	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	243	64	94	9	696	206	270	782	40
Future Volume (veh/h)	42	52	22	243	64	94	9	696	206	270	782	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	283	74	109	10	809	240	314	909	47
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	264	95	41	375	315	267	326	1425	636	445	1831	817
Arrive On Green	0.04	0.08	0.08	0.14	0.17	0.17	0.01	0.41	0.41	0.13	0.53	0.53
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	283	74	109	10	809	240	314	909	47
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.5	10.1	2.6	4.6	0.2	13.2	8.0	7.0	12.4	1.1
Cycle Q Clear(g_c), s	1.9	0.0	3.5	10.1	2.6	4.6	0.2	13.2	8.0	7.0	12.4	1.1
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	0	136	375	315	267	326	1425	636	445	1831	817
V/C Ratio(X)	0.19	0.00	0.63	0.76	0.24	0.41	0.03	0.57	0.38	0.71	0.50	0.06
Avail Cap(c_a), veh/h	310	0	423	375	570	483	422	1425	636	613	1831	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	32.9	25.9	26.3	27.2	12.4	16.7	15.1	12.2	11.1	8.5
Incr Delay (d2), s/veh	0.3	0.0	4.8	8.5	0.4	1.0	0.0	1.6	1.7	2.2	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.5	4.8	1.0	1.6	0.1	4.6	2.6	2.1	3.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	0.0	37.8	34.4	26.7	28.2	12.5	18.3	16.8	14.4	12.1	8.6
LnGrp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			466			1059			1270	
Approach Delay, s/veh		34.8			31.7			17.9			12.5	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	34.8	14.6	10.3	5.4	43.4	7.7	17.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.7	27.2	10.1	18.0	5.0	38.9	5.1	23.0
Max Q Clear Time (g_c+I1), s	9.0	15.2	12.1	5.5	2.2	14.4	3.9	6.6
Green Ext Time (p_c), s	0.5	4.5	0.0	0.2	0.0	6.0	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	0.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	514	14	14	384	17	17
Future Vol, veh/h	514	14	14	384	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	82	82
Mvmt Flow	598	16	16	447	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1077	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	479	-
Critical Hdwy	-	-	5.1	-	7.22	7.02
Critical Hdwy Stg 1	-	-	-	-	6.22	-
Critical Hdwy Stg 2	-	-	-	-	6.22	-
Follow-up Hdwy	-	-	3.1	-	4.238	4.038
Pot Cap-1 Maneuver	-	-	627	-	173	381
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	627	-	169	381
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	473	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	22.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	169	381	-	-	627	-
HCM Lane V/C Ratio	0.117	0.052	-	-	0.026	-
HCM Control Delay (s)	29.1	15	-	-	10.9	-
HCM Lane LOS	D	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	430	101	136	321	48	149
Future Vol, veh/h	430	101	136	321	48	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	500	117	158	373	56	173

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	617	0	1248	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	689	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	949	-	189	523
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	949	-	149	523
Mov Cap-2 Maneuver	-	-	-	-	149	-
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	389	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	38.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	325	-	-	949	-
HCM Lane V/C Ratio	0.705	-	-	0.167	-
HCM Control Delay (s)	38.7	-	-	9.6	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	5	-	-	0.6	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	86	283	74	109	10	809	240	314	909	47
v/c Ratio	0.21	0.41	0.82	0.20	0.24	0.03	0.64	0.34	0.68	0.45	0.05
Control Delay	23.2	31.9	45.4	29.0	2.0	9.1	24.5	4.5	18.3	11.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	31.9	45.4	29.0	2.0	9.1	24.5	4.5	18.3	11.4	0.1
Queue Length 50th (ft)	17	30	117	32	0	2	176	0	69	117	0
Queue Length 95th (ft)	41	69	#208	66	3	8	247	42	142	220	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	236	435	345	559	601	323	1257	714	522	2004	972
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.82	0.13	0.18	0.03	0.64	0.34	0.60	0.45	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	209	432	20	438	409	29	405	269
v/c Ratio	0.98	0.63	0.09	0.64	0.49	0.03	0.61	0.29
Control Delay	88.4	27.3	19.0	27.5	4.2	0.1	20.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	27.3	19.0	27.5	4.2	0.1	20.2	3.0
Queue Length 50th (ft)	114	193	7	197	0	0	155	5
Queue Length 95th (ft)	#239	274	22	280	46	0	236	37
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	220	709	224	710	852	939	669	918
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.61	0.09	0.62	0.48	0.03	0.61	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	263	90	128	11	884	179	180	692	33
Future Volume (veh/h)	42	52	22	263	90	128	11	884	179	180	692	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	306	105	149	13	1028	208	209	805	38
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	258	95	41	378	319	270	367	1565	698	347	1815	810
Arrive On Green	0.04	0.08	0.08	0.14	0.17	0.17	0.02	0.45	0.45	0.09	0.52	0.52
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	306	105	149	13	1028	208	209	805	38
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.6	10.3	3.7	6.5	0.3	17.1	6.3	4.4	10.7	0.9
Cycle Q Clear(g_c), s	1.9	0.0	3.6	10.3	3.7	6.5	0.3	17.1	6.3	4.4	10.7	0.9
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	0	136	378	319	270	367	1565	698	347	1815	810
V/C Ratio(X)	0.19	0.00	0.63	0.81	0.33	0.55	0.04	0.66	0.30	0.60	0.44	0.05
Avail Cap(c_a), veh/h	303	0	421	378	573	485	457	1565	698	455	1815	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	33.1	26.6	26.7	27.9	10.8	15.8	12.9	12.6	10.9	8.6
Incr Delay (d2), s/veh	0.4	0.0	4.8	12.4	0.6	1.8	0.0	2.2	1.1	1.7	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.6	5.7	1.5	2.3	0.1	5.8	2.0	1.3	3.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	37.9	39.0	27.3	29.6	10.8	18.0	14.0	14.3	11.7	8.7
LnGrp LOS	C	A	D	D	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			560			1249			1052	
Approach Delay, s/veh		34.9			34.3			17.3			12.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	37.9	14.8	10.3	5.7	43.2	7.7	17.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.1	32.6	10.3	18.0	5.0	38.7	5.1	23.2
Max Q Clear Time (g_c+I1), s	6.4	19.1	12.3	5.6	2.3	12.7	3.9	8.5
Green Ext Time (p_c), s	0.2	5.9	0.0	0.2	0.0	5.2	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	425	14	14	466	17	17
Future Vol, veh/h	425	14	14	466	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	82	82
Mvmt Flow	494	16	16	542	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	1068	494
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	5.1	-	7.22	7.02
Critical Hdwy Stg 1	-	-	-	-	6.22	-
Critical Hdwy Stg 2	-	-	-	-	6.22	-
Follow-up Hdwy	-	-	3.1	-	4.238	4.038
Pot Cap-1 Maneuver	-	-	697	-	175	443
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	433	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	697	-	171	443
Mov Cap-2 Maneuver	-	-	-	-	171	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	423	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	171	443	-	-	697	-
HCM Lane V/C Ratio	0.116	0.045	-	-	0.023	-
HCM Control Delay (s)	28.8	13.5	-	-	10.3	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-

Intersection						
Int Delay, s/veh	7.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	361	81	91	422	60	172
Future Vol, veh/h	361	81	91	422	60	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	420	94	106	491	70	200

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	514	0	1170	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	703	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1036	-	210	590
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1036	-	180	590
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	417	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	36.6
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	371	-	-	1036	-
HCM Lane V/C Ratio	0.727	-	-	0.102	-
HCM Control Delay (s)	36.6	-	-	8.9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	5.6	-	-	0.3	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	86	306	105	149	13	1028	208	209	805	38
v/c Ratio	0.21	0.42	0.89	0.29	0.33	0.03	0.70	0.26	0.61	0.40	0.04
Control Delay	23.5	32.4	55.5	30.3	5.0	8.3	22.7	2.7	17.6	10.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	32.4	55.5	30.3	5.0	8.3	22.7	2.7	17.6	10.8	0.1
Queue Length 50th (ft)	18	30	132	47	0	2	222	0	43	101	0
Queue Length 95th (ft)	41	69	#239	87	26	10	299	25	97	190	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	228	423	342	549	593	380	1465	790	371	2024	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.89	0.19	0.25	0.03	0.70	0.26	0.56	0.40	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	194	400	3	317	391	29	224	342
v/c Ratio	0.83	0.72	0.02	0.57	0.53	0.03	0.31	0.34
Control Delay	50.2	28.1	14.7	23.2	4.7	7.0	11.3	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	28.1	14.7	23.2	4.7	7.0	11.3	2.5
Queue Length 50th (ft)	73	143	1	107	0	3	44	0
Queue Length 95th (ft)	138	212	6	164	41	17	112	35
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	499	1192	361	1192	1146	909	712	1007
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.34	0.01	0.27	0.34	0.03	0.31	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	272	71	106	10	767	234	306	862	44
Future Volume (veh/h)	46	57	24	272	71	106	10	767	234	306	862	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	316	83	123	12	892	272	356	1002	51
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	270	101	43	339	284	240	309	1443	643	444	1883	840
Arrive On Green	0.04	0.08	0.08	0.12	0.16	0.16	0.01	0.42	0.42	0.14	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	316	83	123	12	892	272	356	1002	51
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.0	0.0	3.9	8.7	3.0	5.4	0.3	15.0	9.3	7.9	13.8	1.2
Cycle Q Clear(g_c), s	2.0	0.0	3.9	8.7	3.0	5.4	0.3	15.0	9.3	7.9	13.8	1.2
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	0	144	339	284	240	309	1443	643	444	1883	840
V/C Ratio(X)	0.20	0.00	0.65	0.93	0.29	0.51	0.04	0.62	0.42	0.80	0.53	0.06
Avail Cap(c_a), veh/h	312	0	420	339	531	450	401	1443	643	584	1883	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	33.0	28.9	27.8	28.8	12.3	17.1	15.4	13.1	10.9	8.0
Incr Delay (d2), s/veh	0.4	0.0	5.0	31.7	0.6	1.7	0.1	2.0	2.0	6.0	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	4.1	1.2	1.9	0.1	5.2	3.1	2.8	4.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	38.0	60.7	28.3	30.5	12.3	19.1	17.4	19.1	12.0	8.2
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			522			1176			1409	
Approach Delay, s/veh		34.9			48.4			18.6			13.6	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	35.4	13.2	10.7	5.6	44.8	7.8	16.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	28.8	8.7	18.0	5.0	40.3	5.1	21.6
Max Q Clear Time (g_c+I1), s	9.9	17.0	10.7	5.9	2.3	15.8	4.0	7.4
Green Ext Time (p_c), s	0.6	4.9	0.0	0.3	0.0	6.8	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	581	17	17	429	20	20
Future Vol, veh/h	581	17	17	429	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	85	85
Mvmt Flow	676	20	20	499	23	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	696	0	1215	676
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	5.1	-	7.25	7.05
Critical Hdwy Stg 1	-	-	-	-	6.25	-
Critical Hdwy Stg 2	-	-	-	-	6.25	-
Follow-up Hdwy	-	-	3.1	-	4.265	4.065
Pot Cap-1 Maneuver	-	-	576	-	138	337
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	448	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	576	-	133	337
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	27.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	133	337	-	-	576	-
HCM Lane V/C Ratio	0.175	0.069	-	-	0.034	-
HCM Control Delay (s)	37.7	16.5	-	-	11.5	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-

Intersection						
Int Delay, s/veh	23.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	126	165	355	59	184
Future Vol, veh/h	475	126	165	355	59	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	552	147	192	413	69	214

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	699	0	1423	626
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	797	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	884	-	147	479
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	439	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	884	-	106	479
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	315	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	126
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	-	-	884	-
HCM Lane V/C Ratio	1.095	-	-	0.217	-
HCM Control Delay (s)	126	-	-	10.2	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	11.9	-	-	0.8	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	94	316	83	123	12	892	272	356	1002	51
v/c Ratio	0.23	0.44	1.04	0.25	0.29	0.04	0.69	0.36	0.76	0.48	0.05
Control Delay	24.6	33.9	93.4	31.1	3.3	8.7	25.4	4.3	25.3	11.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	33.9	93.4	31.1	3.3	8.7	25.4	4.3	25.3	11.1	0.1
Queue Length 50th (ft)	20	35	~146	38	0	2	202	0	94	129	0
Queue Length 95th (ft)	44	75	#211	74	12	9	273	43	#215	243	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	235	421	303	509	563	306	1289	746	494	2089	984
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.22	1.04	0.16	0.22	0.04	0.69	0.36	0.72	0.48	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	238	491	21	492	451	31	445	306
v/c Ratio	1.01	0.63	0.09	0.63	0.49	0.04	0.74	0.36
Control Delay	91.3	24.3	16.5	24.4	3.7	0.1	28.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	24.3	16.5	24.4	3.7	0.1	28.6	4.8
Queue Length 50th (ft)	~135	211	7	212	0	0	198	18
Queue Length 95th (ft)	#269	296	21	297	43	0	299	57
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	235	781	235	782	920	865	602	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.63	0.09	0.63	0.49	0.04	0.74	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	295	101	144	12	974	205	206	762	37
Future Volume (veh/h)	46	57	24	295	101	144	12	974	205	206	762	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	343	117	167	14	1133	238	240	886	43
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	260	100	43	351	298	253	347	1594	711	337	1865	832
Arrive On Green	0.04	0.08	0.08	0.13	0.16	0.16	0.02	0.46	0.46	0.10	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	343	117	167	14	1133	238	240	886	43
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.1	0.0	4.0	9.5	4.3	7.7	0.3	19.9	7.4	5.1	12.0	1.0
Cycle Q Clear(g_c), s	2.1	0.0	4.0	9.5	4.3	7.7	0.3	19.9	7.4	5.1	12.0	1.0
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	0	143	351	298	253	347	1594	711	337	1865	832
V/C Ratio(X)	0.20	0.00	0.66	0.98	0.39	0.66	0.04	0.71	0.33	0.71	0.47	0.05
Avail Cap(c_a), veh/h	300	0	412	351	540	458	433	1594	711	394	1865	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	33.7	29.5	28.3	29.7	10.7	16.4	13.1	14.3	10.9	8.3
Incr Delay (d2), s/veh	0.4	0.0	5.1	41.8	0.8	2.9	0.0	2.7	1.3	4.9	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	5.4	1.8	2.8	0.1	6.8	2.4	1.8	3.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	0.0	38.8	71.3	29.2	32.6	10.8	19.1	14.3	19.2	11.7	8.4
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			627			1385			1169	
Approach Delay, s/veh		35.7			53.1			18.2			13.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	39.3	14.0	10.7	5.8	45.2	7.9	16.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	34.8	9.5	18.0	5.0	39.5	5.1	22.4
Max Q Clear Time (g_c+I1), s	7.1	21.9	11.5	6.0	2.3	14.0	4.1	9.7
Green Ext Time (p_c), s	0.2	6.4	0.0	0.3	0.0	5.9	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	1.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	481	17	17	522	20	20
Future Vol, veh/h	481	17	17	522	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	85	85
Mvmt Flow	559	20	20	607	23	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	579	0	1206	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	5.1	-	7.25	7.05
Critical Hdwy Stg 1	-	-	-	-	6.25	-
Critical Hdwy Stg 2	-	-	-	-	6.25	-
Follow-up Hdwy	-	-	3.1	-	4.265	4.065
Pot Cap-1 Maneuver	-	-	649	-	140	400
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	393	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	649	-	136	400
Mov Cap-2 Maneuver	-	-	-	-	136	-
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	25.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	136	400	-	-	649	-
HCM Lane V/C Ratio	0.171	0.058	-	-	0.03	-
HCM Control Delay (s)	36.9	14.6	-	-	10.7	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	24.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	399	102	113	466	75	212
Future Vol, veh/h	399	102	113	466	75	212
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	464	119	131	542	87	247

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	583	0	1328	524
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	804	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	977	-	169	547
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	435	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	977	-	137	547
Mov Cap-2 Maneuver	-	-	-	-	137	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	351	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	114.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	307	-	-	977	-
HCM Lane V/C Ratio	1.087	-	-	0.134	-
HCM Control Delay (s)	114.5	-	-	9.3	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	13	-	-	0.5	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	94	343	117	167	14	1133	238	240	886	43
v/c Ratio	0.23	0.45	1.07	0.34	0.38	0.04	0.74	0.29	0.75	0.43	0.04
Control Delay	24.2	33.9	98.4	31.7	6.8	7.9	23.0	3.4	30.0	10.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	33.9	98.4	31.7	6.8	7.9	23.0	3.4	30.0	10.9	0.1
Queue Length 50th (ft)	20	35	~160	54	0	3	247	0	57	112	0
Queue Length 95th (ft)	44	75	#227	96	37	10	329	36	#167	212	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	229	413	321	517	569	367	1526	815	321	2070	976
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23	1.07	0.23	0.29	0.04	0.74	0.29	0.75	0.43	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	222	460	3	358	430	32	247	385
v/c Ratio	0.88	0.73	0.02	0.57	0.53	0.04	0.38	0.39
Control Delay	53.6	25.8	12.7	20.8	4.1	8.9	14.6	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	25.8	12.7	20.8	4.1	8.9	14.6	3.0
Queue Length 50th (ft)	84	161	1	116	0	3	54	0
Queue Length 95th (ft)	158	232	5	172	38	20	147	41
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	501	1257	346	1257	1199	842	656	978
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.37	0.01	0.28	0.36	0.04	0.38	0.39

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	243	64	94	9	696	206	270	782	40
Future Volume (veh/h)	42	52	22	243	64	94	9	696	206	270	782	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	283	74	109	10	809	240	314	909	47
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	264	95	41	375	315	267	326	1425	636	445	1831	817
Arrive On Green	0.04	0.08	0.08	0.14	0.17	0.17	0.01	0.41	0.41	0.13	0.53	0.53
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	283	74	109	10	809	240	314	909	47
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.5	10.1	2.6	4.6	0.2	13.2	8.0	7.0	12.4	1.1
Cycle Q Clear(g_c), s	1.9	0.0	3.5	10.1	2.6	4.6	0.2	13.2	8.0	7.0	12.4	1.1
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	0	136	375	315	267	326	1425	636	445	1831	817
V/C Ratio(X)	0.19	0.00	0.63	0.76	0.24	0.41	0.03	0.57	0.38	0.71	0.50	0.06
Avail Cap(c_a), veh/h	310	0	423	375	570	483	422	1425	636	613	1831	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	32.9	25.9	26.3	27.2	12.4	16.7	15.1	12.2	11.1	8.5
Incr Delay (d2), s/veh	0.3	0.0	4.8	8.5	0.4	1.0	0.0	1.6	1.7	2.2	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.5	4.8	1.0	1.6	0.1	4.6	2.6	2.1	3.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	0.0	37.8	34.4	26.7	28.2	12.5	18.3	16.8	14.4	12.1	8.6
LnGrp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			466			1059			1270	
Approach Delay, s/veh		34.8			31.7			17.9			12.5	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	34.8	14.6	10.3	5.4	43.4	7.7	17.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	16.7	27.2	10.1	18.0	5.0	38.9	5.1	23.0				
Max Q Clear Time (g_c+I1), s	9.0	15.2	12.1	5.5	2.2	14.4	3.9	6.6				
Green Ext Time (p_c), s	0.5	4.5	0.0	0.2	0.0	6.0	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	514	14	14	384	17	17
Future Vol, veh/h	514	14	14	384	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	82	82
Mvmt Flow	598	16	16	447	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1077	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	479	-
Critical Hdwy	-	-	5.1	-	7.22	7.02
Critical Hdwy Stg 1	-	-	-	-	6.22	-
Critical Hdwy Stg 2	-	-	-	-	6.22	-
Follow-up Hdwy	-	-	3.1	-	4.238	4.038
Pot Cap-1 Maneuver	-	-	627	-	173	381
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	627	-	169	381
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	473	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	22.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	169	381	-	-	627	-
HCM Lane V/C Ratio	0.117	0.052	-	-	0.026	-
HCM Control Delay (s)	29.1	15	-	-	10.9	-
HCM Lane LOS	D	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	430	101	136	321	48	149
Future Vol, veh/h	430	101	136	321	48	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	350	-	350	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	500	117	158	373	56	173

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	617	0	1248	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	689	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	949	-	189	523
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	949	-	158	523
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	411	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.8	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	158	523	-	-	949	-
HCM Lane V/C Ratio	0.353	0.331	-	-	0.167	-
HCM Control Delay (s)	39.7	15.3	-	-	9.6	-
HCM Lane LOS	E	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	1.4	-	-	0.6	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	263	90	128	11	884	179	180	692	33
Future Volume (veh/h)	42	52	22	263	90	128	11	884	179	180	692	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	306	105	149	13	1028	208	209	805	38
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	258	95	41	378	319	270	367	1565	698	347	1815	810
Arrive On Green	0.04	0.08	0.08	0.14	0.17	0.17	0.02	0.45	0.45	0.09	0.52	0.52
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	306	105	149	13	1028	208	209	805	38
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.6	10.3	3.7	6.5	0.3	17.1	6.3	4.4	10.7	0.9
Cycle Q Clear(g_c), s	1.9	0.0	3.6	10.3	3.7	6.5	0.3	17.1	6.3	4.4	10.7	0.9
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	0	136	378	319	270	367	1565	698	347	1815	810
V/C Ratio(X)	0.19	0.00	0.63	0.81	0.33	0.55	0.04	0.66	0.30	0.60	0.44	0.05
Avail Cap(c_a), veh/h	303	0	421	378	573	485	457	1565	698	455	1815	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	33.1	26.6	26.7	27.9	10.8	15.8	12.9	12.6	10.9	8.6
Incr Delay (d2), s/veh	0.4	0.0	4.8	12.4	0.6	1.8	0.0	2.2	1.1	1.7	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.6	5.7	1.5	2.3	0.1	5.8	2.0	1.3	3.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	37.9	39.0	27.3	29.6	10.8	18.0	14.0	14.3	11.7	8.7
LnGrp LOS	C	A	D	D	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			560			1249			1052	
Approach Delay, s/veh		34.9			34.3			17.3			12.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	37.9	14.8	10.3	5.7	43.2	7.7	17.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.1	32.6	10.3	18.0	5.0	38.7	5.1	23.2
Max Q Clear Time (g_c+I1), s	6.4	19.1	12.3	5.6	2.3	12.7	3.9	8.5
Green Ext Time (p_c), s	0.2	5.9	0.0	0.2	0.0	5.2	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	425	14	14	466	17	17
Future Vol, veh/h	425	14	14	466	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	82	82
Mvmt Flow	494	16	16	542	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	1068	494
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	5.1	-	7.22	7.02
Critical Hdwy Stg 1	-	-	-	-	6.22	-
Critical Hdwy Stg 2	-	-	-	-	6.22	-
Follow-up Hdwy	-	-	3.1	-	4.238	4.038
Pot Cap-1 Maneuver	-	-	697	-	175	443
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	433	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	697	-	171	443
Mov Cap-2 Maneuver	-	-	-	-	171	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	423	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	171	443	-	-	697	-
HCM Lane V/C Ratio	0.116	0.045	-	-	0.023	-
HCM Control Delay (s)	28.8	13.5	-	-	10.3	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-

Intersection						
Int Delay, s/veh	4.5					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	361	81	91	422	60	172
Future Vol, veh/h	361	81	91	422	60	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	350	-	350	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	420	94	106	491	70	200

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	514	0	1170	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	703	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1036	-	210	590
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1036	-	189	590
Mov Cap-2 Maneuver	-	-	-	-	189	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	436	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	189	590	-	-	1036	-
HCM Lane V/C Ratio	0.369	0.339	-	-	0.102	-
HCM Control Delay (s)	34.8	14.2	-	-	8.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.6	1.5	-	-	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	272	71	106	10	767	234	306	862	44
Future Volume (veh/h)	46	57	24	272	71	106	10	767	234	306	862	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	316	83	123	12	892	272	356	1002	51
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	270	101	43	339	284	240	309	1443	643	444	1883	840
Arrive On Green	0.04	0.08	0.08	0.12	0.16	0.16	0.01	0.42	0.42	0.14	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	316	83	123	12	892	272	356	1002	51
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.0	0.0	3.9	8.7	3.0	5.4	0.3	15.0	9.3	7.9	13.8	1.2
Cycle Q Clear(g_c), s	2.0	0.0	3.9	8.7	3.0	5.4	0.3	15.0	9.3	7.9	13.8	1.2
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	0	144	339	284	240	309	1443	643	444	1883	840
V/C Ratio(X)	0.20	0.00	0.65	0.93	0.29	0.51	0.04	0.62	0.42	0.80	0.53	0.06
Avail Cap(c_a), veh/h	312	0	420	339	531	450	401	1443	643	584	1883	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	33.0	28.9	27.8	28.8	12.3	17.1	15.4	13.1	10.9	8.0
Incr Delay (d2), s/veh	0.4	0.0	5.0	31.7	0.6	1.7	0.1	2.0	2.0	6.0	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	4.1	1.2	1.9	0.1	5.2	3.1	2.8	4.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	38.0	60.7	28.3	30.5	12.3	19.1	17.4	19.1	12.0	8.2
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			522			1176			1409	
Approach Delay, s/veh		34.9			48.4			18.6			13.6	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	35.4	13.2	10.7	5.6	44.8	7.8	16.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	28.8	8.7	18.0	5.0	40.3	5.1	21.6
Max Q Clear Time (g_c+I1), s	9.9	17.0	10.7	5.9	2.3	15.8	4.0	7.4
Green Ext Time (p_c), s	0.6	4.9	0.0	0.3	0.0	6.8	0.0	0.6

Intersection Summary			
HCM 6th Ctrl Delay			22.0
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	581	17	17	429	20	20
Future Vol, veh/h	581	17	17	429	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	85	85
Mvmt Flow	676	20	20	499	23	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	696	0	1215	676
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	5.1	-	7.25	7.05
Critical Hdwy Stg 1	-	-	-	-	6.25	-
Critical Hdwy Stg 2	-	-	-	-	6.25	-
Follow-up Hdwy	-	-	3.1	-	4.265	4.065
Pot Cap-1 Maneuver	-	-	576	-	138	337
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	448	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	576	-	133	337
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	27.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	133	337	-	-	576	-
HCM Lane V/C Ratio	0.175	0.069	-	-	0.034	-
HCM Control Delay (s)	37.7	16.5	-	-	11.5	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	126	165	355	59	184
Future Vol, veh/h	475	126	165	355	59	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	350	-	350	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	552	147	192	413	69	214

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	699	0	1423	626
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	797	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	884	-	147	479
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	439	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	884	-	115	479
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	344	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	32
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	115	479	-	-	884	-
HCM Lane V/C Ratio	0.597	0.447	-	-	0.217	-
HCM Control Delay (s)	74.5	18.4	-	-	10.2	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	2.9	2.3	-	-	0.8	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	295	101	144	12	974	205	206	762	37
Future Volume (veh/h)	46	57	24	295	101	144	12	974	205	206	762	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	343	117	167	14	1133	238	240	886	43
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	260	100	43	351	298	253	347	1594	711	337	1865	832
Arrive On Green	0.04	0.08	0.08	0.13	0.16	0.16	0.02	0.46	0.46	0.10	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	343	117	167	14	1133	238	240	886	43
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.1	0.0	4.0	9.5	4.3	7.7	0.3	19.9	7.4	5.1	12.0	1.0
Cycle Q Clear(g_c), s	2.1	0.0	4.0	9.5	4.3	7.7	0.3	19.9	7.4	5.1	12.0	1.0
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	0	143	351	298	253	347	1594	711	337	1865	832
V/C Ratio(X)	0.20	0.00	0.66	0.98	0.39	0.66	0.04	0.71	0.33	0.71	0.47	0.05
Avail Cap(c_a), veh/h	300	0	412	351	540	458	433	1594	711	394	1865	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	33.7	29.5	28.3	29.7	10.7	16.4	13.1	14.3	10.9	8.3
Incr Delay (d2), s/veh	0.4	0.0	5.1	41.8	0.8	2.9	0.0	2.7	1.3	4.9	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	5.4	1.8	2.8	0.1	6.8	2.4	1.8	3.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	0.0	38.8	71.3	29.2	32.6	10.8	19.1	14.3	19.2	11.7	8.4
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			627			1385			1169	
Approach Delay, s/veh		35.7			53.1			18.2			13.2	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	39.3	14.0	10.7	5.8	45.2	7.9	16.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.7	34.8	9.5	18.0	5.0	39.5	5.1	22.4
Max Q Clear Time (g_c+I1), s	7.1	21.9	11.5	6.0	2.3	14.0	4.1	9.7
Green Ext Time (p_c), s	0.2	6.4	0.0	0.3	0.0	5.9	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	481	17	17	522	20	20
Future Vol, veh/h	481	17	17	522	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	85	85
Mvmt Flow	559	20	20	607	23	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	579	0	1206	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	5.1	-	7.25	7.05
Critical Hdwy Stg 1	-	-	-	-	6.25	-
Critical Hdwy Stg 2	-	-	-	-	6.25	-
Follow-up Hdwy	-	-	3.1	-	4.265	4.065
Pot Cap-1 Maneuver	-	-	649	-	140	400
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	393	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	649	-	136	400
Mov Cap-2 Maneuver	-	-	-	-	136	-
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	25.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	136	400	-	-	649	-
HCM Lane V/C Ratio	0.171	0.058	-	-	0.03	-
HCM Control Delay (s)	36.9	14.6	-	-	10.7	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-

Intersection						
Int Delay, s/veh	6.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	399	102	113	466	75	212
Future Vol, veh/h	399	102	113	466	75	212
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	350	-	350	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	464	119	131	542	87	247

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	583	0	1328	524
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	804	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	977	-	169	547
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	435	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	977	-	146	547
Mov Cap-2 Maneuver	-	-	-	-	146	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	377	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	28.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	146	547	-	-	977	-
HCM Lane V/C Ratio	0.597	0.451	-	-	0.134	-
HCM Control Delay (s)	60.9	16.9	-	-	9.3	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	3.1	2.3	-	-	0.5	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	243	64	94	9	696	206	270	782	40
Future Volume (veh/h)	42	52	22	243	64	94	9	696	206	270	782	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	283	74	109	10	809	240	314	909	47
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	264	95	41	375	315	267	326	1425	636	445	1831	817
Arrive On Green	0.04	0.08	0.08	0.14	0.17	0.17	0.01	0.41	0.41	0.13	0.53	0.53
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	283	74	109	10	809	240	314	909	47
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.5	10.1	2.6	4.6	0.2	13.2	8.0	7.0	12.4	1.1
Cycle Q Clear(g_c), s	1.9	0.0	3.5	10.1	2.6	4.6	0.2	13.2	8.0	7.0	12.4	1.1
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	0	136	375	315	267	326	1425	636	445	1831	817
V/C Ratio(X)	0.19	0.00	0.63	0.76	0.24	0.41	0.03	0.57	0.38	0.71	0.50	0.06
Avail Cap(c_a), veh/h	310	0	423	375	570	483	422	1425	636	613	1831	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	32.9	25.9	26.3	27.2	12.4	16.7	15.1	12.2	11.1	8.5
Incr Delay (d2), s/veh	0.3	0.0	4.8	8.5	0.4	1.0	0.0	1.6	1.7	2.2	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.5	4.8	1.0	1.6	0.1	4.6	2.6	2.1	3.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	0.0	37.8	34.4	26.7	28.2	12.5	18.3	16.8	14.4	12.1	8.6
LnGrp LOS	C	A	D	C	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			466			1059			1270	
Approach Delay, s/veh		34.8			31.7			17.9			12.5	
Approach LOS		C			C			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	34.8	14.6	10.3	5.4	43.4	7.7	17.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	16.7	27.2	10.1	18.0	5.0	38.9	5.1	23.0				
Max Q Clear Time (g_c+I1), s	9.0	15.2	12.1	5.5	2.2	14.4	3.9	6.6				
Green Ext Time (p_c), s	0.5	4.5	0.0	0.2	0.0	6.0	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	430	101	136	321	48	149
Future Volume (veh/h)	430	101	136	321	48	149
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	500	117	158	373	56	173
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	625	146	435	1158	285	253
Arrive On Green	0.44	0.44	0.10	0.63	0.16	0.16
Sat Flow, veh/h	1431	335	1739	1826	1739	1547
Grp Volume(v), veh/h	0	617	158	373	56	173
Grp Sat Flow(s),veh/h/ln	0	1766	1739	1826	1739	1547
Q Serve(g_s), s	0.0	13.5	1.9	4.2	1.2	4.7
Cycle Q Clear(g_c), s	0.0	13.5	1.9	4.2	1.2	4.7
Prop In Lane		0.19	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	771	435	1158	285	253
V/C Ratio(X)	0.00	0.80	0.36	0.32	0.20	0.68
Avail Cap(c_a), veh/h	0	1805	677	2481	801	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	10.9	7.7	3.7	16.1	17.5
Incr Delay (d2), s/veh	0.0	2.0	0.5	0.2	0.3	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.4	0.3	0.4	0.5	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.8	8.2	3.9	16.4	20.8
LnGrp LOS	A	B	A	A	B	C
Approach Vol, veh/h	617			531	229	
Approach Delay, s/veh	12.8			5.2	19.7	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		11.8	8.8	23.9				32.7
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		20.5	10.5	45.5				60.5
Max Q Clear Time (g_c+I1), s		6.7	3.9	15.5				6.2
Green Ext Time (p_c), s		0.6	0.2	4.0				2.1

Intersection Summary			
HCM 6th Ctrl Delay			11.0
HCM 6th LOS			B

Intersection						
Int Delay, s/veh	0.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	514	14	14	384	17	17
Future Vol, veh/h	514	14	14	384	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	82	82
Mvmt Flow	598	16	16	447	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1077	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	479	-
Critical Hdwy	-	-	5.1	-	7.22	7.02
Critical Hdwy Stg 1	-	-	-	-	6.22	-
Critical Hdwy Stg 2	-	-	-	-	6.22	-
Follow-up Hdwy	-	-	3.1	-	4.238	4.038
Pot Cap-1 Maneuver	-	-	627	-	173	381
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	627	-	169	381
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	473	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	22.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	169	381	-	-	627	-
HCM Lane V/C Ratio	0.117	0.052	-	-	0.026	-
HCM Control Delay (s)	29.1	15	-	-	10.9	-
HCM Lane LOS	D	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	86	283	74	109	10	809	240	314	909	47
v/c Ratio	0.21	0.41	0.82	0.20	0.24	0.03	0.64	0.34	0.68	0.45	0.05
Control Delay	23.2	31.9	45.4	29.0	2.0	9.1	24.5	4.5	18.3	11.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	31.9	45.4	29.0	2.0	9.1	24.5	4.5	18.3	11.4	0.1
Queue Length 50th (ft)	17	30	117	32	0	2	176	0	69	117	0
Queue Length 95th (ft)	41	69	#208	66	3	8	247	42	142	220	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	236	435	345	559	601	323	1257	714	522	2004	972
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.82	0.13	0.18	0.03	0.64	0.34	0.60	0.45	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	617	158	373	56	173
v/c Ratio	0.74	0.35	0.32	0.21	0.45
Control Delay	17.5	5.2	4.4	25.1	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	5.2	4.4	25.1	9.2
Queue Length 50th (ft)	139	12	34	15	0
Queue Length 95th (ft)	264	31	73	51	44
Internal Link Dist (ft)	2130		3893	1523	
Turn Bay Length (ft)		350		350	
Base Capacity (vph)	1526	556	1750	771	785
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.28	0.21	0.07	0.22

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	209	432	20	438	409	29	405	269
v/c Ratio	0.98	0.63	0.09	0.64	0.49	0.03	0.61	0.29
Control Delay	88.4	27.3	19.0	27.5	4.2	0.1	20.2	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	27.3	19.0	27.5	4.2	0.1	20.2	3.0
Queue Length 50th (ft)	114	193	7	197	0	0	155	5
Queue Length 95th (ft)	#239	274	22	280	46	0	236	37
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	220	709	224	710	852	939	669	918
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.61	0.09	0.62	0.48	0.03	0.61	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	52	22	263	90	128	11	884	179	180	692	33
Future Volume (veh/h)	42	52	22	263	90	128	11	884	179	180	692	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	49	60	26	306	105	149	13	1028	208	209	805	38
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	258	95	41	378	319	270	367	1565	698	347	1815	810
Arrive On Green	0.04	0.08	0.08	0.14	0.17	0.17	0.02	0.45	0.45	0.09	0.52	0.52
Sat Flow, veh/h	1739	1208	524	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	49	0	86	306	105	149	13	1028	208	209	805	38
Grp Sat Flow(s),veh/h/ln	1739	0	1732	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	1.9	0.0	3.6	10.3	3.7	6.5	0.3	17.1	6.3	4.4	10.7	0.9
Cycle Q Clear(g_c), s	1.9	0.0	3.6	10.3	3.7	6.5	0.3	17.1	6.3	4.4	10.7	0.9
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	0	136	378	319	270	367	1565	698	347	1815	810
V/C Ratio(X)	0.19	0.00	0.63	0.81	0.33	0.55	0.04	0.66	0.30	0.60	0.44	0.05
Avail Cap(c_a), veh/h	303	0	421	378	573	485	457	1565	698	455	1815	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	33.1	26.6	26.7	27.9	10.8	15.8	12.9	12.6	10.9	8.6
Incr Delay (d2), s/veh	0.4	0.0	4.8	12.4	0.6	1.8	0.0	2.2	1.1	1.7	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.6	5.7	1.5	2.3	0.1	5.8	2.0	1.3	3.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	0.0	37.9	39.0	27.3	29.6	10.8	18.0	14.0	14.3	11.7	8.7
LnGrp LOS	C	A	D	D	C	C	B	B	B	B	B	A
Approach Vol, veh/h		135			560			1249			1052	
Approach Delay, s/veh		34.9			34.3			17.3			12.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	37.9	14.8	10.3	5.7	43.2	7.7	17.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	11.1	32.6	10.3	18.0	5.0	38.7	5.1	23.2
Max Q Clear Time (g_c+I1), s	6.4	19.1	12.3	5.6	2.3	12.7	3.9	8.5
Green Ext Time (p_c), s	0.2	5.9	0.0	0.2	0.0	5.2	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	361	81	91	422	60	172
Future Volume (veh/h)	361	81	91	422	60	172
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	420	94	106	491	70	200
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	553	124	445	1064	331	295
Arrive On Green	0.38	0.38	0.09	0.58	0.19	0.19
Sat Flow, veh/h	1444	323	1739	1826	1739	1547
Grp Volume(v), veh/h	0	514	106	491	70	200
Grp Sat Flow(s),veh/h/ln	0	1768	1739	1826	1739	1547
Q Serve(g_s), s	0.0	10.0	1.2	6.1	1.3	4.8
Cycle Q Clear(g_c), s	0.0	10.0	1.2	6.1	1.3	4.8
Prop In Lane		0.18	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	677	445	1064	331	295
V/C Ratio(X)	0.00	0.76	0.24	0.46	0.21	0.68
Avail Cap(c_a), veh/h	0	2026	622	2644	1029	916
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	10.7	7.0	4.7	13.6	14.9
Incr Delay (d2), s/veh	0.0	1.8	0.3	0.3	0.3	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.2	0.6	0.5	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.5	7.2	5.0	13.9	17.7
LnGrp LOS	A	B	A	A	B	B
Approach Vol, veh/h	514			597	270	
Approach Delay, s/veh	12.5			5.4	16.7	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	12.1	7.9	19.7	27.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.5	7.5	45.5	57.5
Max Q Clear Time (g_c+I1), s	6.8	3.2	12.0	8.1
Green Ext Time (p_c), s	0.8	0.1	3.1	3.0

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	0.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	425	14	14	466	17	17
Future Vol, veh/h	425	14	14	466	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	82	82
Mvmt Flow	494	16	16	542	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	1068	494
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	574	-
Critical Hdwy	-	-	5.1	-	7.22	7.02
Critical Hdwy Stg 1	-	-	-	-	6.22	-
Critical Hdwy Stg 2	-	-	-	-	6.22	-
Follow-up Hdwy	-	-	3.1	-	4.238	4.038
Pot Cap-1 Maneuver	-	-	697	-	175	443
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	433	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	697	-	171	443
Mov Cap-2 Maneuver	-	-	-	-	171	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	423	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	21.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	171	443	-	-	697	-
HCM Lane V/C Ratio	0.116	0.045	-	-	0.023	-
HCM Control Delay (s)	28.8	13.5	-	-	10.3	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	86	306	105	149	13	1028	208	209	805	38
v/c Ratio	0.21	0.42	0.89	0.29	0.33	0.03	0.70	0.26	0.61	0.40	0.04
Control Delay	23.5	32.4	55.5	30.3	5.0	8.3	22.7	2.7	17.6	10.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	32.4	55.5	30.3	5.0	8.3	22.7	2.7	17.6	10.8	0.1
Queue Length 50th (ft)	18	30	132	47	0	2	222	0	43	101	0
Queue Length 95th (ft)	41	69	#239	87	26	10	299	25	97	190	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	228	423	342	549	593	380	1465	790	371	2024	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.20	0.89	0.19	0.25	0.03	0.70	0.26	0.56	0.40	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	514	106	491	70	200
v/c Ratio	0.70	0.22	0.46	0.23	0.45
Control Delay	17.0	4.5	6.0	21.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	4.5	6.0	21.3	7.8
Queue Length 50th (ft)	103	8	49	16	0
Queue Length 95th (ft)	198	23	103	51	42
Internal Link Dist (ft)	2130		3893	1523	
Turn Bay Length (ft)		350		350	
Base Capacity (vph)	1635	509	1789	1007	984
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.31	0.21	0.27	0.07	0.20

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	194	400	3	317	391	29	224	342
v/c Ratio	0.83	0.72	0.02	0.57	0.53	0.03	0.31	0.34
Control Delay	50.2	28.1	14.7	23.2	4.7	7.0	11.3	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	28.1	14.7	23.2	4.7	7.0	11.3	2.5
Queue Length 50th (ft)	73	143	1	107	0	3	44	0
Queue Length 95th (ft)	138	212	6	164	41	17	112	35
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	499	1192	361	1192	1146	909	712	1007
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.34	0.01	0.27	0.34	0.03	0.31	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	272	71	106	10	767	234	306	862	44
Future Volume (veh/h)	46	57	24	272	71	106	10	767	234	306	862	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	316	83	123	12	892	272	356	1002	51
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	270	101	43	339	284	240	309	1443	643	444	1883	840
Arrive On Green	0.04	0.08	0.08	0.12	0.16	0.16	0.01	0.42	0.42	0.14	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	316	83	123	12	892	272	356	1002	51
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.0	0.0	3.9	8.7	3.0	5.4	0.3	15.0	9.3	7.9	13.8	1.2
Cycle Q Clear(g_c), s	2.0	0.0	3.9	8.7	3.0	5.4	0.3	15.0	9.3	7.9	13.8	1.2
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	270	0	144	339	284	240	309	1443	643	444	1883	840
V/C Ratio(X)	0.20	0.00	0.65	0.93	0.29	0.51	0.04	0.62	0.42	0.80	0.53	0.06
Avail Cap(c_a), veh/h	312	0	420	339	531	450	401	1443	643	584	1883	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.1	0.0	33.0	28.9	27.8	28.8	12.3	17.1	15.4	13.1	10.9	8.0
Incr Delay (d2), s/veh	0.4	0.0	5.0	31.7	0.6	1.7	0.1	2.0	2.0	6.0	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	4.1	1.2	1.9	0.1	5.2	3.1	2.8	4.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.5	0.0	38.0	60.7	28.3	30.5	12.3	19.1	17.4	19.1	12.0	8.2
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			522			1176			1409	
Approach Delay, s/veh		34.9			48.4			18.6			13.6	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	35.4	13.2	10.7	5.6	44.8	7.8	16.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	28.8	8.7	18.0	5.0	40.3	5.1	21.6
Max Q Clear Time (g_c+I1), s	9.9	17.0	10.7	5.9	2.3	15.8	4.0	7.4
Green Ext Time (p_c), s	0.6	4.9	0.0	0.3	0.0	6.8	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	475	126	165	355	59	184
Future Volume (veh/h)	475	126	165	355	59	184
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	552	147	192	413	69	214
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	657	175	382	1181	318	283
Arrive On Green	0.47	0.47	0.09	0.65	0.18	0.18
Sat Flow, veh/h	1389	370	1739	1826	1739	1547
Grp Volume(v), veh/h	0	699	192	413	69	214
Grp Sat Flow(s),veh/h/ln	0	1759	1739	1826	1739	1547
Q Serve(g_s), s	0.0	18.4	2.6	5.4	1.8	6.9
Cycle Q Clear(g_c), s	0.0	18.4	2.6	5.4	1.8	6.9
Prop In Lane		0.21	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	831	382	1181	318	283
V/C Ratio(X)	0.00	0.84	0.50	0.35	0.22	0.76
Avail Cap(c_a), veh/h	0	1516	573	2092	675	601
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.2	10.1	4.3	18.4	20.5
Incr Delay (d2), s/veh	0.0	2.4	1.0	0.2	0.3	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	0.6	0.8	0.7	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.6	11.1	4.4	18.7	24.6
LnGrp LOS	A	B	B	A	B	C
Approach Vol, veh/h	699			605	283	
Approach Delay, s/veh	14.6			6.5	23.2	
Approach LOS	B			A	C	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.1	9.2	29.4				38.6
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5
Max Green Setting (Gmax), s		20.5	10.5	45.5				60.5
Max Q Clear Time (g_c+I1), s		8.9	4.6	20.4				7.4
Green Ext Time (p_c), s		0.7	0.2	4.6				2.4

Intersection Summary			
HCM 6th Ctrl Delay			13.0
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	581	17	17	429	20	20
Future Vol, veh/h	581	17	17	429	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	85	85
Mvmt Flow	676	20	20	499	23	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	696	0	1215	676
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	539	-
Critical Hdwy	-	-	5.1	-	7.25	7.05
Critical Hdwy Stg 1	-	-	-	-	6.25	-
Critical Hdwy Stg 2	-	-	-	-	6.25	-
Follow-up Hdwy	-	-	3.1	-	4.265	4.065
Pot Cap-1 Maneuver	-	-	576	-	138	337
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	448	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	576	-	133	337
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	432	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	27.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	133	337	-	-	576	-
HCM Lane V/C Ratio	0.175	0.069	-	-	0.034	-
HCM Control Delay (s)	37.7	16.5	-	-	11.5	-
HCM Lane LOS	E	C	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	94	316	83	123	12	892	272	356	1002	51
v/c Ratio	0.23	0.44	1.04	0.25	0.29	0.04	0.69	0.36	0.76	0.48	0.05
Control Delay	24.6	33.9	93.4	31.1	3.3	8.7	25.4	4.3	25.3	11.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	33.9	93.4	31.1	3.3	8.7	25.4	4.3	25.3	11.1	0.1
Queue Length 50th (ft)	20	35	~146	38	0	2	202	0	94	129	0
Queue Length 95th (ft)	44	75	#211	74	12	9	273	43	#215	243	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	235	421	303	509	563	306	1289	746	494	2089	984
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.22	1.04	0.16	0.22	0.04	0.69	0.36	0.72	0.48	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	699	192	413	69	214
v/c Ratio	0.82	0.47	0.33	0.28	0.53
Control Delay	21.4	7.1	4.3	29.6	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	7.1	4.3	29.6	10.4
Queue Length 50th (ft)	179	17	41	21	0
Queue Length 95th (ft)	333	38	84	66	51
Internal Link Dist (ft)	2130		3893	1523	
Turn Bay Length (ft)		350		350	
Base Capacity (vph)	1402	480	1685	632	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.50	0.40	0.25	0.11	0.31

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	238	491	21	492	451	31	445	306
v/c Ratio	1.01	0.63	0.09	0.63	0.49	0.04	0.74	0.36
Control Delay	91.3	24.3	16.5	24.4	3.7	0.1	28.6	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.3	24.3	16.5	24.4	3.7	0.1	28.6	4.8
Queue Length 50th (ft)	~135	211	7	212	0	0	198	18
Queue Length 95th (ft)	#269	296	21	297	43	0	299	57
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	235	781	235	782	920	865	602	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.63	0.09	0.63	0.49	0.04	0.74	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	57	24	295	101	144	12	974	205	206	762	37
Future Volume (veh/h)	46	57	24	295	101	144	12	974	205	206	762	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	66	28	343	117	167	14	1133	238	240	886	43
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	260	100	43	351	298	253	347	1594	711	337	1865	832
Arrive On Green	0.04	0.08	0.08	0.13	0.16	0.16	0.02	0.46	0.46	0.10	0.54	0.54
Sat Flow, veh/h	1739	1217	516	1739	1826	1547	1739	3469	1547	1739	3469	1547
Grp Volume(v), veh/h	53	0	94	343	117	167	14	1133	238	240	886	43
Grp Sat Flow(s),veh/h/ln	1739	0	1733	1739	1826	1547	1739	1735	1547	1739	1735	1547
Q Serve(g_s), s	2.1	0.0	4.0	9.5	4.3	7.7	0.3	19.9	7.4	5.1	12.0	1.0
Cycle Q Clear(g_c), s	2.1	0.0	4.0	9.5	4.3	7.7	0.3	19.9	7.4	5.1	12.0	1.0
Prop In Lane	1.00		0.30	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	0	143	351	298	253	347	1594	711	337	1865	832
V/C Ratio(X)	0.20	0.00	0.66	0.98	0.39	0.66	0.04	0.71	0.33	0.71	0.47	0.05
Avail Cap(c_a), veh/h	300	0	412	351	540	458	433	1594	711	394	1865	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	33.7	29.5	28.3	29.7	10.7	16.4	13.1	14.3	10.9	8.3
Incr Delay (d2), s/veh	0.4	0.0	5.1	41.8	0.8	2.9	0.0	2.7	1.3	4.9	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.7	5.4	1.8	2.8	0.1	6.8	2.4	1.8	3.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.2	0.0	38.8	71.3	29.2	32.6	10.8	19.1	14.3	19.2	11.7	8.4
LnGrp LOS	C	A	D	E	C	C	B	B	B	B	B	A
Approach Vol, veh/h		147			627			1385			1169	
Approach Delay, s/veh		35.7			53.1			18.2			13.2	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	39.3	14.0	10.7	5.8	45.2	7.9	16.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.7	34.8	9.5	18.0	5.0	39.5	5.1	22.4				
Max Q Clear Time (g_c+I1), s	7.1	21.9	11.5	6.0	2.3	14.0	4.1	9.7				
Green Ext Time (p_c), s	0.2	6.4	0.0	0.3	0.0	5.9	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			23.8									
HCM 6th LOS			C									

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	399	102	113	466	75	212
Future Volume (veh/h)	399	102	113	466	75	212
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	464	119	131	542	87	247
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	577	148	404	1087	370	329
Arrive On Green	0.41	0.41	0.09	0.60	0.21	0.21
Sat Flow, veh/h	1402	359	1739	1826	1739	1547
Grp Volume(v), veh/h	0	583	131	542	87	247
Grp Sat Flow(s),veh/h/ln	0	1761	1739	1826	1739	1547
Q Serve(g_s), s	0.0	13.6	1.7	8.0	1.9	7.0
Cycle Q Clear(g_c), s	0.0	13.6	1.7	8.0	1.9	7.0
Prop In Lane		0.20	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	725	404	1087	370	329
V/C Ratio(X)	0.00	0.80	0.32	0.50	0.24	0.75
Avail Cap(c_a), veh/h	0	1672	567	2240	872	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	8.4	5.5	15.3	17.3
Incr Delay (d2), s/veh	0.0	2.1	0.5	0.4	0.3	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	0.4	1.2	0.7	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.3	8.9	5.8	15.6	20.7
LnGrp LOS	A	B	A	A	B	C
Approach Vol, veh/h	583			673	334	
Approach Delay, s/veh	14.3			6.4	19.4	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	14.5	8.6	23.8	32.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.5	8.5	44.5	57.5
Max Q Clear Time (g_c+I1), s	9.0	3.7	15.6	10.0
Green Ext Time (p_c), s	1.0	0.1	3.7	3.4

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	1.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↱	↰	↑	↰	↱
Traffic Vol, veh/h	481	17	17	522	20	20
Future Vol, veh/h	481	17	17	522	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	275	200	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	5	100	100	5	85	85
Mvmt Flow	559	20	20	607	23	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	579	0	1206	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	647	-
Critical Hdwy	-	-	5.1	-	7.25	7.05
Critical Hdwy Stg 1	-	-	-	-	6.25	-
Critical Hdwy Stg 2	-	-	-	-	6.25	-
Follow-up Hdwy	-	-	3.1	-	4.265	4.065
Pot Cap-1 Maneuver	-	-	649	-	140	400
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	393	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	649	-	136	400
Mov Cap-2 Maneuver	-	-	-	-	136	-
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	25.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	136	400	-	-	649	-
HCM Lane V/C Ratio	0.171	0.058	-	-	0.03	-
HCM Control Delay (s)	36.9	14.6	-	-	10.7	-
HCM Lane LOS	E	B	-	-	B	-
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	94	343	117	167	14	1133	238	240	886	43
v/c Ratio	0.23	0.45	1.07	0.34	0.38	0.04	0.74	0.29	0.75	0.43	0.04
Control Delay	24.2	33.9	98.4	31.7	6.8	7.9	23.0	3.4	30.0	10.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.2	33.9	98.4	31.7	6.8	7.9	23.0	3.4	30.0	10.9	0.1
Queue Length 50th (ft)	20	35	~160	54	0	3	247	0	57	112	0
Queue Length 95th (ft)	44	75	#227	96	37	10	329	36	#167	212	0
Internal Link Dist (ft)		1862		5754			1432			1594	
Turn Bay Length (ft)	200		200		200	275		250	350		250
Base Capacity (vph)	229	413	321	517	569	367	1526	815	321	2070	976
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23	1.07	0.23	0.29	0.04	0.74	0.29	0.75	0.43	0.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	583	131	542	87	247
v/c Ratio	0.72	0.29	0.48	0.29	0.52
Control Delay	17.6	5.1	6.2	24.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	5.1	6.2	24.7	8.5
Queue Length 50th (ft)	131	11	60	23	0
Queue Length 95th (ft)	252	29	127	68	49
Internal Link Dist (ft)	2130		3893	1523	
Turn Bay Length (ft)		350		350	
Base Capacity (vph)	1509	503	1739	890	916
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.39	0.26	0.31	0.10	0.27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	222	460	3	358	430	32	247	385
v/c Ratio	0.88	0.73	0.02	0.57	0.53	0.04	0.38	0.39
Control Delay	53.6	25.8	12.7	20.8	4.1	8.9	14.6	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	25.8	12.7	20.8	4.1	8.9	14.6	3.0
Queue Length 50th (ft)	84	161	1	116	0	3	54	0
Queue Length 95th (ft)	158	232	5	172	38	20	147	41
Internal Link Dist (ft)		3893		1270		729	1301	
Turn Bay Length (ft)	400		150		300			350
Base Capacity (vph)	501	1257	346	1257	1199	842	656	978
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.37	0.01	0.28	0.36	0.04	0.38	0.39

Intersection Summary

APPENDIX I

Wetland Documentation

I.1 Wetland and Other Surface Water Descriptions

I.2 UMAM Worksheets

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APPENDIX I.1

Wetland and Other Surface Water Descriptions

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Wetlands and Other Surface Waters within the BSA

ID	FLUCFCS Code and Description[1]	USFWS Classification[2]	Acres in BSA
Wetlands			
WL 1	630 – Wetland Forested Mixed	PFO1/3C	5.6
WL 2	621 – Cypress / 631 – Wetland Scrub	PFO2C / PFO1/2C	11.5
WL 6	631 – Wetland Scrub	PFO1/2C	11.2
		TOTAL WETLANDS:	**28.3**
Other Surface Waters			
Ditch 1	510 – Streams and waterways	PUBx	0.3
		TOTAL OTHER SURFACE WATERS:	**0.3**

[1] FDOT, *Florida Land Use, Cover and Forms Classification System (FLUCFCS) Handbook*, 1999.
[2] Cowardin, Lewis M., *et.al. U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States*. 1979.

<u>Wetland 1 (WL 1)</u>
FLUCFCS: 630 – Wetland Forested Mixed
USFWS: PFO1/3C – Palustrine, Forested, Broad-leaved Deciduous/Needle-leaved Evergreen, Seasonally Flooded

WL 1 is comprised of a forested wetland that predominantly consists of water oak (*Quercus nigra*), laurel oak (*Q. laurifolia*), red maple (*Acer rubrum*), Caroline willow (*Salix caroliniana*), slash pine (*Pinus elliottii*), Virginia chain fern (*Woodwardia virginica*), and primrose willow (*Ludwigia peruviana*). WL 1 is located directly south of Drane Field Road on the east side of Kelvin Howard Road. An upland-cut drainage ditch within WL 1 flows north to south underneath Drane Field Road. To facilitate drainage of this poorly drained site with high groundwater levels, the USACE constructed a series of relatively deep drainage ditches between 1941 and 1945, including the one that runs through the eastern portion of WL 1. The ditches served to lower groundwater levels at the site, and to provide more efficient conveyance for flows from off-site areas north of Drane Field Road. WL 1 comprises approximately 5.6 acres of the BSA.

<u>WL 2</u>
FLUCFCS: 621 – Cypress / 631 – Wetland Scrub
USFWS: PFO2C / PFO1/2C – Palustrine, Forested, Needle-leaved Deciduous, Seasonally Flooded / Palustrine, Forested, Broad-leaved/Needle-leaved Deciduous, Seasonally Flooded

Historically a forested wetland, WL 2 has been cleared of canopy species in the past and is currently identified as a scrub wetland. However, during the April 2020 field review, WL 2 appeared to be succeeding back into a forested wetland with a cypress dome near the center. WL 2 is an isolated system located on the west side of Kelvin Howard Road and is adjacent to a stormwater management facility to the west outside of the BSA. Dominant vegetation within WL 2 includes bald cypress (*Taxodium distichum*), red maple, sweet bay (*Magnolia virginiana*), saltbush (*Baccharis halimifolia*), elderberry (*Sambucus canadensis*), and Virginia chain fern. The fringe of WL 2 consists predominantly of Brazilian pepper (*Schinus terebinthifolia*), peppervine (*Nekemias arborea*), cogon grass (*Imperata cylindrica*), and wax myrtle (*Morella cerifera*). During the wet season, water flows through a shallow drainage ditch in the southern portion of the wetland that flows from east to west and consists of primrose willow, alligatorweed (*Alternanthera philoxeroides*), Carolina willow, and soft rush (*Juncus effusus*). WL 2 comprises approximately 11.5 acres of the BSA.

WL 6

FLUCFCS: 631 – Wetland Scrub

USFWS: PFO1/2C – Palustrine, Forested, Broad-leaved/Needle-leaved Deciduous, Seasonally Flooded

Similar to WL 2, WL 6 historically was a forested wetland but is now a scrub wetland due to historic clearing of canopy species. However, during the April 2020 field review, WL 6 appeared to be succeeding back into a forested wetland. WL 6 is an isolated system located on the east side of Kelvin Howard Road south of Air Park Drive. Dominant vegetation within WL 6 includes bald cypress, red maple, sweet bay, saltbush, elderberry, primrose willow, and Virginia chain fern. WL 6 comprises approximately 11.2 acres of the BSA.

Ditch 1

FLUCFCS: 510 – Streams and Waterways

USFWS: PUBx – Palustrine, Unconsolidated Bottom, Excavated

Ditch 1 is an upland-cut drainage ditch that is seasonally inundated by surface water during the wet season and intermittently flooded after rainfall events in the dry season. This ditch is located in the proposed fuel area and consists of steep slopes and a sandy bottom. Vegetation within the ditch consists of primrose willow, camphorweed (*Pluchea rosea*), elderberry, pennywort (*Hydrocotyle* spp.), and dogfennel (*Eupatorium capillifolium*). Ditch 1 is part of a stormwater management system that directs water into the stormwater pond directly south of the ditch. It is under the jurisdiction of the SWFWMD through Environmental Resource Permit (ERP) Number 49002237.068 issued in October 2010. This ditch comprises approximately 0.3 acre of the BSA. During the April 29, 2020 field review, the ditch was inundated with approximately 12 inches of water and various fish species were observed.

APPENDIX I.2
UMAM Worksheets

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PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 1

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
630: Wetland Forested Mixed	PFO1/3C – Palustrine, Forested, Broad-leaved Deciduous/Needle-leaved Evergreen, Seasonally Flooded	Direct Impact	1.2 acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importa
Alafia River	Class III	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

WL 1 is located on Airport property directly south of Drane Field Rd on the east side of Kelvin Howard Rd. An upland-cut drainage ditch within WL 1 flows north to south underneath Drane Field Rd. WL 1 is bounded by Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the west, Phase I development of the air cargo facility to the south, and a manufacturing facility to the east.

Assessment area description

WL 1 is comprised of a forested wetland that predominantly consists of water oak, laurel oak, red maple, Caroline willow, slash pine, Virginia chain fern, and primrose willow

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lakeland Linder International Airport	The assessment area is not considered unique, as surrounding areas consists of depressional wetlands.

Functions	Mitigation for previous permit/other historic use
Functions include water quality improvement, groundwater recharge, plant habitat, and wildlife foraging habitat.	None known

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Snakes, small mammals, song birds, frogs.	Eastern indigo snake (T, foraging, breeding, resting); various listed wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Evidence of wildlife was not observed during the April 2020 field review.

Additional relevant factors:

Hydrology has been impacted by large ditch and industrial build up to east and south.

Assessment conducted by:	Assessment date(s):
Tia Norman, AECOM	29-Apr-20

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 1
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Direct Impact	Tia Norman	29-Apr-20

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	3	0	WL 1 is located on Airport property directly south of Drane Field Rd on the east side of Kelvin Howard Rd. WL 1 is bounded by Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the west, Phase I development of the air cargo facility to the south, and a manufacturing facility to the east. Surrounding development, airport perimeter fencing, and active airfield operations at LAL limit wildlife movement to and from the assessment area.
.500(6)(b)Water Environment (n/a for uplands)	4	0	The hydrology and water environment within WL 1 supports the functions and provides benefits to wildlife at a marginal capacity. However, a large upland-cut ditch bisects the wetland and it appears to have had an adverse effect on the hydrology as a whole in the feature. There is standing water present in the ditch feature; however, none was observed within the forested area of the wetland. The soils observed within this feature were hydric with dark surface, sandy redox and stripped matrix. Water level indicators are not distinct or consistent with the expected hydrologic conditions of the wetland feature.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	5	0	Beneficial wetland vegetation present include red maple and Virginia chain fern. However, because of the hydrology issues a number of successional canopy and shrub species were present including water oak, laurel oak, slash pine, and Carolina willow. There was minor nuisance and exotic vegetation within this wetland which consisted of Peruvian primrose willow. However, this species was primarily limited to the ditch feature within the wetland.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.400	0.000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres (1.2) = 0.48

Delta = [with-current]
-0.400

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 1

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
630: Wetland Forested Mixed	PFO1/3C – Palustrine, Forested, Broad-leaved Deciduous/Needle-leaved Evergreen, Seasonally Flooded	Secondary Impact	0.3 acre

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importa
Alafia River	Class III	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

WL 1 is located on Airport property directly south of Drane Field Rd on the east side of Kelvin Howard Rd. An upland-cut drainage ditch within WL 1 flows north to south underneath Drane Field Rd. WL 1 is bounded by Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the west, Phase I development of the air cargo facility to the south, and a manufacturing facility to the east.

Assessment area description

WL 1 is comprised of a forested wetland that predominantly consists of water oak, laurel oak, red maple, Caroline willow, slash pine, Virginia chain fern, and primrose willow

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lakeland Linder International Airport	The assessment area is not considered unique, as surrounding areas consists of depressional wetlands.

Functions	Mitigation for previous permit/other historic use
Functions include water quality improvement, groundwater recharge, plant habitat, and wildlife foraging habitat.	None known

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Snakes, small mammals, song birds, frogs.	Eastern indigo snake (T, foraging, breeding, resting); various listed wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Evidence of wildlife was not observed during the April 2020 field review.

Additional relevant factors:

Hydrology has been impacted by large ditch and industrial build up to east and south.

Assessment conducted by:	Assessment date(s):
Tia Norman, AECOM	29-Apr-20

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 1
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Secondary Impact	Tia Norman	29-Apr-20

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	3	2	WL 1 is located on Airport property directly south of Drane Field Rd on the east side of Kelvin Howard Rd. WL 1 is bounded by Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the west, Phase I development of the air cargo facility to the south, and a manufacturing facility to the east. Surrounding development, airport perimeter fencing, and active airfield operations at LAL limit wildlife movement to and from the assessment area.
.500(6)(b)Water Environment (n/a for uplands)	4	4	The hydrology and water environment within WL 1 supports the functions and provides benefits to wildlife at a marginal capacity. However, a large upland-cut ditch bisects the wetland and it appears to have had an adverse effect on the hydrology as a whole in the feature. There is standing water present in the ditch feature; however, none was observed within the forested area of the wetland. The soils observed within this feature were hydric with dark surface, sandy redox and stripped matrix. Water level indicators are not distinct or consistent with the expected hydrologic conditions of the wetland feature.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	5	4	Beneficial wetland vegetation present include red maple and Virginia chain fern. However, because of the hydrology issues a number of successional canopy and shrub species were present including water oak, laurel oak, slash pine, and Carolina willow. There was minor nuisance and exotic vegetation within this wetland which consisted of Peruvian primrose willow. However, this species was primarily limited to the ditch feature within the wetland.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.400	0.333

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres (0.3) = 0.02

Delta = [with-current]
-0.067

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 2

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
621: Cypress	PFO2C – Palustrine, Forested, Needle-leaved Deciduous, Seasonally Flooded	Direct Impact	1.4 acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Alafia River	Class III	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

WL 2 is an isolated system located on Airport property on the west side of Kelvin Howard Rd and is adjacent to a stormwater management facility to the west outside of the project area. WL 2 is bounded by disturbed land and Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the east, manufacturing facilities and an artificial pond to the west, and LAL airfield to the south.

Assessment area description

The assessment area comprises the central portion of WL 2 and consists of a cypress dome dominated by bald cypress.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lakeland Linder International Airport	The assessment area is not considered unique, as surrounding areas consists of depressional wetlands.

Functions	Mitigation for previous permit/other historic use
Functions include water quality improvement, groundwater recharge, plant habitat, and wildlife foraging habitat.	None known

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Snakes, small mammals, song birds, frogs.	Eastern indigo snake (T, foraging, breeding, resting); various listed wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Evidence of wildlife was not observed during the April 2020 field review.

Additional relevant factors:

The assessment area has been affected by historic clearing and surrounding development activities.

Assessment conducted by:	Assessment date(s):
Tia Norman, AECOM	29-Apr-20

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 2
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Direct Impact	Tia Norman	29-Apr-20

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	4	0	WL 2 is an isolated system located on Airport property on the west side of Kelvin Howard Rd and adjacent to a stormwater management facility to the west outside of the project area. WL 2 is bounded by disturbed land and Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the east, manufacturing facilities and an artificial pond to the west, and LAL airfield to the south. Surrounding development, airport perimeter fencing, and active airfield operations at LAL limit wildlife movement to and from the assessment area.
.500(6)(b)Water Environment (n/a for uplands)	7	0	The hydrology and water environment within WL 2 supports the functions and provides benefits to wildlife at a marginal capacity. Water level indicators are not distinct or consistent with the expected hydrologic conditions of the wetland feature.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	7	0	The assessment area is dominated by bald cypress with little to no exotic/invasive species present.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.600	0.000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres (1.4) = 0.86

Delta = [with-current]
-0.600

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 2

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
631: Wetland Scrub	PFO1/2C – Palustrine, Forested, Broad-leaved/Needle-leaved Deciduous, Seasonally Flooded	Direct Impact	10.1 acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Alafia River	Class III	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

WL 2 is an isolated system located on Airport property on the west side of Kelvin Howard Rd and is adjacent to a stormwater management facility to the west outside of the project area. WL 2 is bounded by disturbed land and Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the east, manufacturing facilities and an artificial pond to the west, and LAL airfield to the south.

Assessment area description

WL 2 has been cleared of canopy species in the past and is currently identified as a scrub wetland. As of April 2020, WL 2 appears to be succeeding back into a forested wetland. Dominant vegetation includes bald cypress, red maple, sweet bay, saltbush, elderberry, and Virginia chain fern. The fringe consists of Brazilian pepper, peppervine, cogon grass, and wax myrtle. A shallow drainage ditch present in the southern portion of the wetland flows from east to west and consists of primrose willow, alligatorweed, Carolina willow, and soft rush.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lakeland Linder International Airport	The assessment area is not considered unique, as surrounding areas consists of depressional wetlands.

Functions	Mitigation for previous permit/other historic use
Functions include water quality improvement, groundwater recharge, plant habitat, and wildlife foraging habitat.	None known

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Snakes, small mammals, song birds, frogs.	Eastern indigo snake (T, foraging, breeding, resting); various listed wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Evidence of wildlife was not observed during the April 2020 field review.

Additional relevant factors:

Hydrology has been impacted by large ditch in southern portion of wetland that flows into artifical pond west of the wetland.

Assessment conducted by:	Assessment date(s):
Tia Norman, AECOM	29-Apr-20

Form 62-345.900(1), F.A.C.

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 2
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Impact	Tia Norman	29-Apr-20

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	3	0	WL 2 is located on Airport property on the west side of Kelvin Howard Rd and extends westward outside of the project area. WL 2 is bounded by disturbed land and Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the east, manufacturing facilities and an artificial pond to the west, and LAL airfield to the south. Surrounding development, airport perimeter fencing, and active airfield operations at LAL limit wildlife movement to and from the assessment area.
.500(6)(b)Water Environment (n/a for uplands)	5	0	The hydrology and water environment within WL 2 supports the functions and provides benefits to wildlife at a marginal capacity. However, a large cut ditch bisects the southern portion of the wetland and it appears to have had an adverse effect on the hydrology as a whole in the feature. There is standing water present in the ditch feature; however, none was observed within the forested area of the wetland. The soils observed within this feature were hydric with dark surface. Water level indicators are not distinct or consistent with the expected hydrologic conditions of the wetland feature.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	5	0	Beneficial wetland vegetation present include red maple, bald cypress, sweet bay, saltbush, elderberry, and Virginia chain fern. However, because of the hydrology issues a number of successional canopy and shrub species are present. There was nuisance and exotic vegetation within this wetland on the fringes which consisted of Brazilian pepper, peppervine, and cogon grass. The ditch consisted of nuisance and exotic vegetation consisting of Peruvian primrose willow and alligatorweed.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.433	0.000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres (10.1) = 4.8

Delta = [with-current]
-0.433

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 2

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
631: Wetland Scrub	PFO1/2C – Palustrine, Forested, Broad-leaved/Needle-leaved Deciduous, Seasonally Flooded	Secondary Impact	0.7 acre

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
Alafia River	Class III	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

WL 2 is an isolated system located on Airport property on the west side of Kelvin Howard Rd and is adjacent to a stormwater management facility to the west outside of the project area. WL 2 is bounded by disturbed land and Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the east, manufacturing facilities and an artificial pond to the west, and LAL airfield to the south.

Assessment area description

WL 2 has been cleared of canopy species in the past and is currently identified as a scrub wetland. As of April 2020, WL 2 appears to be succeeding back into a forested wetland. Dominant vegetation includes bald cypress, red maple, sweet bay, saltbush, elderberry, and Virginia chain fern. The fringe consists of Brazilian pepper, peppervine, cogon grass, and wax myrtle. A shallow drainage ditch present in the southern portion of the wetland flows from east to west and consists of primrose willow, alligatorweed, Carolina willow, and soft rush.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lakeland Linder International Airport	The assessment area is not considered unique, as surrounding areas consists of depressional wetlands.

Functions	Mitigation for previous permit/other historic use
Functions include water quality improvement, groundwater recharge, plant habitat, and wildlife foraging habitat.	None known

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Snakes, small mammals, song birds, frogs.	Eastern indigo snake (T, foraging, breeding, resting); various listed wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Evidence of wildlife was not observed during the April 2020 field review.

Additional relevant factors:

Hydrology has been impacted by large ditch in southern portion of wetland that flows into artifical pond west of the wetland.

Assessment conducted by:	Assessment date(s):
Tia Norman, AECOM	29-Apr-20

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 2
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
Secondary Impact	Tia Norman	29-Apr-20

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	4	3	WL 2 is located on Airport property on the east side of Kelvin Howard Rd and extends westward outside of the project area. WL 2 is bounded by disturbed land and Drane Field Rd to the north, disturbed land and Kelvin Howard Rd to the east, manufacturing facilities and an artificial pond to the west, and LAL airfield to the south. Surrounding development, airport perimeter fencing, and active airfield operations at LAL limit wildlife movement to and from the assessment area.
.500(6)(b)Water Environment (n/a for uplands)	5	5	The hydrology and water environment within WL 2 supports the functions and provides benefits to wildlife at a marginal capacity. However, a large cut ditch bisects the southern portion of the wetland and it appears to have had an adverse effect on the hydrology as a whole in the feature. There is standing water present in the ditch feature; however, none was observed within the forested area of the wetland. The soils observed within this feature were hydric with dark surface. Water level indicators are not distinct or consistent with the expected hydrologic conditions of the wetland feature.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	6	5	Beneficial wetland vegetation present include red maple, bald cypress, sweet bay, saltbush, elderberry, and Virginia chain fern. However, because of the hydrology issues a number of successional canopy and shrub species are present. There was nuisance and exotic vegetation within this wetland on the fringes which consisted of Brazilian pepper, peppervine, and cogon grass. The ditch consisted of nuisance and exotic vegetation consisting of Peruvian primrose willow and alligatorweed.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.500	0.433

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres (0.7) = 0.05

Delta = [with-current]
-0.067

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 6

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
631: Wetland Scrub	PFO1/2C – Palustrine, Forested, Broad-leaved/Needle-leaved Deciduous, Seasonally Flooded	Direct Impact	11.2 acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importa
Alafia River	Class III	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

WL 6 is an isolated system located on Airport property on the east side of Kelvin Howard Rd south of Air Park Dr and is bounded by Phase I development of the air cargo facility to the east, disturbed land and Air Park Dr to the north, Kelvin Howard Rd to the west, and LAL airfield to the south.

Assessment area description

WL 6 has been cleared of canopy species in the past and is currently identified as a scrub wetland. As of April 2020, WL 2 appears to be succeeding back into a forested wetland. Dominant vegetation includes bald cypress, red maple, sweet bay, saltbush, elderberry, primrose willow, and Virginia chain fern.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Lakeland Linder International Airport	The assessment area is not considered unique, as surrounding areas consists of depressional wetlands.

Functions	Mitigation for previous permit/other historic use
Functions include water quality improvement, groundwater recharge, plant habitat, and wildlife foraging habitat.	None known

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Snakes, small mammals, song birds, frogs.	Eastern indigo snake (T, foraging, breeding, resting); various listed wading birds

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Evidence of wildlife was not observed during the April 2020 field review.

Additional relevant factors:

Hydrology has been impacted by surrounding development.

Assessment conducted by:	Assessment date(s):
Tia Norman, AECOM	29-Apr-20

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
Phase II Air Cargo Facility Development at LAL		WL 6
Impact or Mitigation	Assessment conducted by:	Assessment date:
Direct Impact	Tia Norman	29-Apr-20

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	3	0	WL 6 is located on Airport property on the east side of Kelvin Howard Rd south of Air Park Dr and is bounded by Phase I development of the air cargo facility to the east, disturbed land and Air Park Dr to the north, Kelvin Howard Rd to the west, and LAL airfield to the south. Surrounding development, airport perimeter fencing, and active airfield operations at LAL limit wildlife movement to and from the assessment area.
.500(6)(b)Water Environment (n/a for uplands)	5	0	The hydrology and water environment within WL 6 supports the functions and provides benefits to wildlife at a marginal capacity. However, surrounding development and adjacent disturbance appears to have had an adverse effect on the hydrology as a whole in the feature. The soils observed within this feature were hydric with organic bodies and redox concentrations. Water level indicators are not distinct or consistent with the expected hydrologic conditions of the wetland feature.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	6	0	Beneficial wetland vegetation present include red maple, bald cypress, sweet bay, saltbush, elderberry, and Virginia chain fern. However, because of the hydrology issues a number of successional canopy and shrub species are present. There was nuisance and exotic vegetation within this wetland which consisted of Peruvian primrose willow.

Score = sum of above scores/30 (if uplands, divide by 20)	
current or w/o pres	with
0.467	0.000

If preservation as mitigation,
Preservation adjustment factor =
Adjusted mitigation delta =

For impact assessment areas
FL = delta x acres (11.2) = 5.25

Delta = [with-current]
-0.467

If mitigation
Time lag (t-factor) =
Risk factor =

For mitigation assessment areas
RFG = delta/(t-factor x risk) =

APPENDIX J

Draft EA Public Involvement

(to be provided at Preliminary Final EA)

J.1 Notice of Availability of Draft EA and Notice of Combined Public Hearing/Public Information Workshop

J.2 Draft EA Agency Transmittal Letters and Distribution List

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APPENDIX J.1

Notice of Availability of Draft EA and Notice of Combined Public Hearing/Public Information Workshop

(to be provided at Preliminary Final EA)

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APPENDIX J.2

Draft EA Agency Transmittal Letters and Distribution List

(To be provided at Preliminary Final EA)

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APPENDIX K

Acronyms and Abbreviations

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ACRONYMS AND ABBREVIATIONS

§	Section
100LL	100 Octane Low Lead Aviation Gasoline
AC	Advisory Circular
ACS	American Community Survey
AEDT	Aviation Environmental Design Tool
AID	Airport Impact District
AIP	Airport Improvement Program
ALP	Airport Layout Plan
APE	Area of Potential Effect
APU	Auxiliary Power Units
ARMB	Alafia River Mitigation Bank
AST	Aboveground Storage Tank
AvGas	Aviation Gasoline
BA	Biological Assessment
BMP	Best Management Practice
BSA	Biological Study Area
CAA	Clean Air Act
CBRS	Coastal Barrier Resources System
CEQ	Council on Environmental Quality
CFH	Cubic Feet Per Hour
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO2e	Carbon Dioxide Equivalent
CRAS	Cultural Resources Assessment Survey
CY	Cubic Yards
dB	Decibel
dBA	A-weighted Decibels
DNL	Day-Night Average Sound Level
DOT	Department of Transportation
DSA	Direct Study Area
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
F.A.C.	Florida Administrative Code
FBO	Fixed Based Operator
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FMSF	Florida Master Site File
FONSI	Finding of No Significant Impact
FWC	Florida Fish and Wildlife Conservation Commission
GA	General Aviation
GHG	Greenhouse Gas

GIS	Geographic Information System
GSE	Ground Support Equipment
HCM	Highway Capacity Manual
IPaC	Information for Planning and Consultation
ISA	Indirect Study Area
LAL	Lakeland Linder International Airport
LF	Linear Foot/Feet
LOS	Level of Service
mgd	Million Gallons Per Day
MSA	Metropolitan Statistical Areas
msl	Mean Sea Level
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NO_x	Nitrogen Oxides
NRHP	National Register of Historic Places
NSS	Noise Sensitive Site
O_3	Ozone
PFC	Passenger Facility Charge
PFO1/2C	Palustrine, Forested, Broad-Leaved Deciduous/Needle-Leaved Evergreen, Seasonally Flooded
PFO1/3C	Palustrine, Forested, Broad-Leaved Deciduous/Needle-Leaved Evergreen, Seasonally Flooded
PFO2C	Palustrine, Forested, Needle-Leaved Deciduous, Seasonally Flooded
PM_{10}	Particulate Matter Equal to or Less than 10 Micrometers in Diameter
$PM_{2.5}$	Particulate Matter Equal to or Less than 2.5 Micrometers in Diameter
POWx	Palustrine, Open Water, Excavated
PUBx	Palustrine, Unconsolidated Bottom, Excavated
PUD	Planned Unit Development
RAI	Request for Additional Information
RCRA	Resource Conservation and Recovery Act
SF	Square Foot/Feet
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SO_x	Sulfur Oxides
SPCC	Spill Prevention Control and Countermeasures Plan
SSA	Socioeconomic Study Area
SWFWMD	Southwest Florida Water Management District
SWPPP	Stormwater Pollution Prevention Plan
SY	Square Yards
U.S.	United States
U.S.C.	U.S. Code
UMAM	Uniform Mitigation Assessment Methodology
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compounds
WHMP	Wildlife Hazard Management Plan
WWRF	Wastewater Reclamation Facility