Geotechnical and Environmental Consultants, Inc.

**TECHNICAL MEMORANDUM**

August 13, 2024
Revised May 28, 2025
Revised June 17, 2025
Revised June 25, 2025

From: Erin Hemmy, Richard P. McCormick, P.G., and Daniel C. Stanfill, P.E.

To: Ms. Amanda Ashby, AICP
Project Manager
Ardurra Group, Inc.

Subject: Existing Contamination Conditions Technical Memorandum
**SR 417 SANFORD AIRPORT CONNECTOR PD&E STUDY**
Seminole County, Florida
CFX Project No. 417-246A
GEC Project No. 5603E

Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to present this Existing Contamination Conditions Technical Memorandum for the SR 417 Sanford Airport Connector PD&E Study. This study is being performed for Ardurra Group, Inc. and the Central Florida Expressway Authority (CFX).

**Contamination Screening**

GEC conducted this evaluation using limited elements of Chapter 20 of the FDOT PD&E Manual dated July 31, 2024. The study area is shown on the attached **Figure 1**.

GEC reviewed relevant information from the following sources of information:

- USGS Quadrangle Maps of Oviedo, Osteen, Sanford, and Casselberry, Florida (**Figure 2**),
- National Resource Conservation Service (NRCS) Soil Survey (**Figure 3**), and
- Limited Florida Department of Environmental Protection (FDEP) Map Direct and Nexus Information Portal file research was performed for the sites of concern identified within the Evaluation Area.

Based on the results of the contamination screening activities, GEC assigned Contamination Risk Ratings (CRRs) to potential contamination sites in the Evaluation Area. The CRR system was developed by FDOT and incorporates four levels of risk: **No, Low, Medium and High**. For a description of the four risk levels please refer to **Appendix A.**

Varying buffer areas are identified on a 2022 aerial photograph with site locations shown in attached **Figures 4A** and **4B.**

**Table 1** – Potential Contamination Site Summary, presents the results of our evaluation. The information obtained from each source of information listed above is summarized for the Evaluation Area and potential contamination sites, along with the corresponding CRRs. Public file excerpts for potential contamination sites are attached as **Appendix C**.

**Table 2** – Pond Potential Risk Ratings, presents the CRRs assigned to the 10 pond site options.

**Contamination Review Summary**

The potential contamination site locations are shown on **Figures 4A-4B**. File review summaries are presented in the two tables below. Note that the site numbers correlate to the earlier Existing Conditions Technical Memorandum.

**Table 1**
**Potential Contamination Site Summary**

| Site No. | Facility Name and Address | Facility ID | Concerns | Risk Rating |
|---|---|---|---|---|
| 1 | Seminole County Main Expressway Plaza 875 Oakway Avenue | 9400810 | This site maintains a 500-gallon aboveground emergency generator diesel tank. No complaints, violations, or discharges have been recorded at this site. | Low |
| 20 | Marquette Shores Borrow Pit C&D Marquette Avenue and Ohio Avenue | 27164 | This site was a construction demolition debris disposal site, that received a No Further Action status. Debris may remain on-site. | Medium |
| 21 | Sanford Airport FUDS Site | FL49799F467500 | This site is a former Naval Air Station with the potential for soil and groundwater impacts. | Medium |

| Site No. | Facility Name and Address | Facility ID | Concerns | Risk Rating |
|---|---|---|---|---|
| 22 | Brisson Road/Avenue Landfill/Dump<br>2861 East Lake Mary Boulevard | ERIC_8881; ERIC_5591; ERIC_5562; 83721 | This site is an abandoned landfill. An April 2015 Supplemental Site Assessment Report found high methane soil exceedances, metal groundwater exceedances, and remaining solid waste debris on-site. An October 2015 Addendum recommends a No Further Action status for the groundwater due to low levels of exceedances. Landfill debris remains on-site. Additional areas of contamination impacts could exist. | High |
| 25 | Historical Citrus Groves and Row Crops | N/A | Typical concerns associated with citrus groves and row crops include pesticide/herbicide storage and usage, grove heating during cooler winter months (smudge pots and other grove heating equipment), tractor and equipment maintenance and fueling, underground and aboveground fuel storage tanks, irrigation pumps and maintenance, and asbestos irrigation lines. | Medium |
| 27 | Sunland Park Debris Staging Area<br>180 Collins Drive | 98048 | This is an inactive disaster debris management area with no recorded contamination impacts. | Low |

## Table 2
## Pond Potential Risk Rating

| Pond Name | Location | Concerns | Risk Rating |
|---|---|---|---|
| Pond 417-1A | Northeast corner of the Mellonville Avenue and Oakway intersection | Historically Pond 417-1A consisted of row crop farming prior to 1986, when the site was developed with a horse pasture. In 2023, a pile of brush and tree debris is visible in the southeast corner. The potential for agricultural impacts may remain on site. | Medium |
| Pond 417-1B | Northeast corner of the Mellonville Avenue and Oakway intersection | Historically Pond 417-1B consisted of row crop farming and a residence. The row crops became fallow by 1986. The potential for agricultural impacts may remain on site. | Medium |
| Pond 417-1C1 | West Side of SR 417 and Sanford Airport Connector intersection | Historically Pond 417-1C1 consisted of row crop farming between 1940 and about 1990. | Medium |
| Pond 417-1C2 | East Side of SR 417 and Sanford Airport Connector intersection | Historically Pond 417-1C2 consisted of row crop farming between 1940 and about 1990. | Medium |

| Pond Name | Location | Concerns | Risk Rating |
|---|---|---|---|
| Pond 417-2A | Northwest corner of the Palm Way and Bloom Lane intersection | Historically undeveloped wooded land. Currently the site contains a residence with a covered car port and a garage building. | Low |
| Pond 417-2B | Northeast corner of the Palm Way and Bloom Lane intersection | Historically Pond 417-2B consisted of row crop farming until developed with six large horticulture grow houses. The potential for agricultural impacts may remain on site. | Medium |
| Pond 417-3A | Around 300 feet southeast of the corner of Botanical Way and Hidden Palm Drive | Historically undeveloped wooded land located on a natural conservation area. | Low |
| Pond 417-3B | Around 470 feet northwest of the Swinstead Drive and Tudor Rose Drive intersection | Historically undeveloped wooded land is located on a natural conservation area. | Low |
| Pond 417-Existing 1 | North corner of the East Lake Mary Boulevard and Red Cleveland Boulevard intersection | Historically undeveloped wooded land until developed with the existing pond location. | Low |
| Pond 417-4B | East corner of the East Lake Mary Boulevard and Red Cleveland Boulevard intersection | Historically undeveloped wooded land. This site is adjacent to a closed landfill with known soil contamination impacts and residual landfill debris (**Site No. 22**). | High |

**Level II Impact to Construction Impact Assessments and Recommendations**

Due to the preliminary nature of this Technical Memorandum, Level II Impact to Construction Assessments (ICAs) are not required at this time.

Level II ICAs will be recommended for the High Risk pond site (**Pond 417-4B**) adjacent to **Site No. 22**, and the Medium Risk pond sites (**Ponds 417-1A, 1B, 1C1, 1C2, and 2B**) with historical agricultural concerns. A Contamination Screening Evaluation Report will be prepared for the selected roadway alignment and include Level II ICA recommendations.

**Limitations**

The findings, opinions, conclusions, and recommendations presented herein are based in part on reasonably ascertainable information contained in the public record. GEC does not warrant or guarantee the accuracy or completeness of this information. Some of this public record information may be dated and not representative of conditions at the time this report was

prepared (June through August 2024 and May through June 2025), or in the future. Additional limitations are as follows:

- Not discussed in this report are properties that have been historically undeveloped land, are associated with residential use and do not appear to pose a contamination risk, or are professional/commercial establishments that are not associated with hazardous materials or petroleum products.

- This study also does not include surveys of wetlands, endangered species, asbestos containing materials, lead-based paints, or other potential hazardous building materials.

**Use of This Memorandum**

GEC has prepared this memorandum for the exclusive use of our client, Ardurra Group, Inc. and CFX, for application to our client's project. GEC will not be held responsible for any other party's interpretation or use of this report's data or recommendations without our written authorization.

GEC has performed the services described in this report in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in Central Florida. No other representation is made or implied in this document.

The conclusions and recommendations should be disregarded if the final project design differs from the project description in this report. If such changes are contemplated, GEC should be retained to review the new plans to assess the applicability of this report in light of proposed changes.

We appreciate the opportunity to work with Ardurra Group, Inc. and CFX on this project. If you have any questions concerning this report, or if we may be of further assistance, please contact us.

# FIGURES

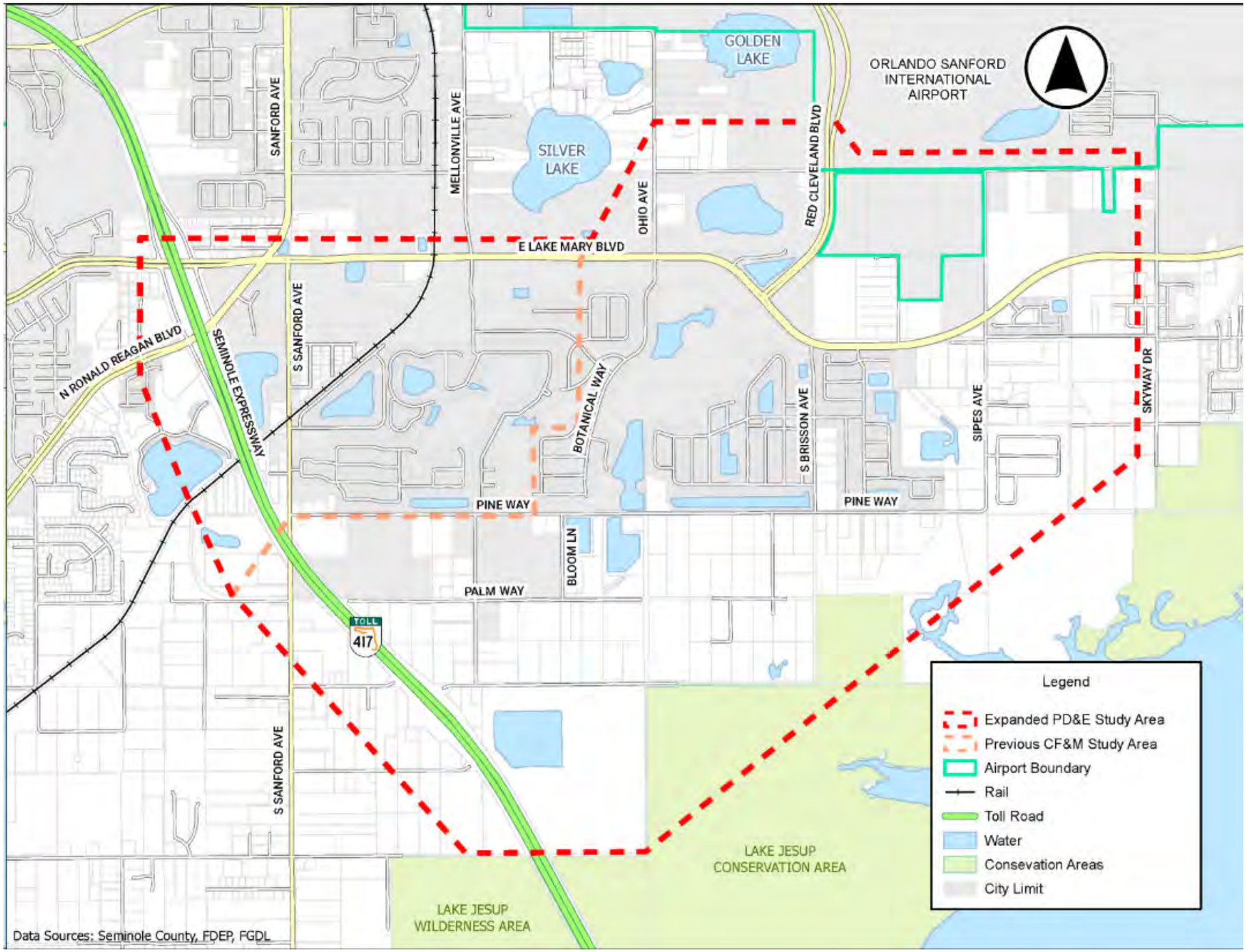
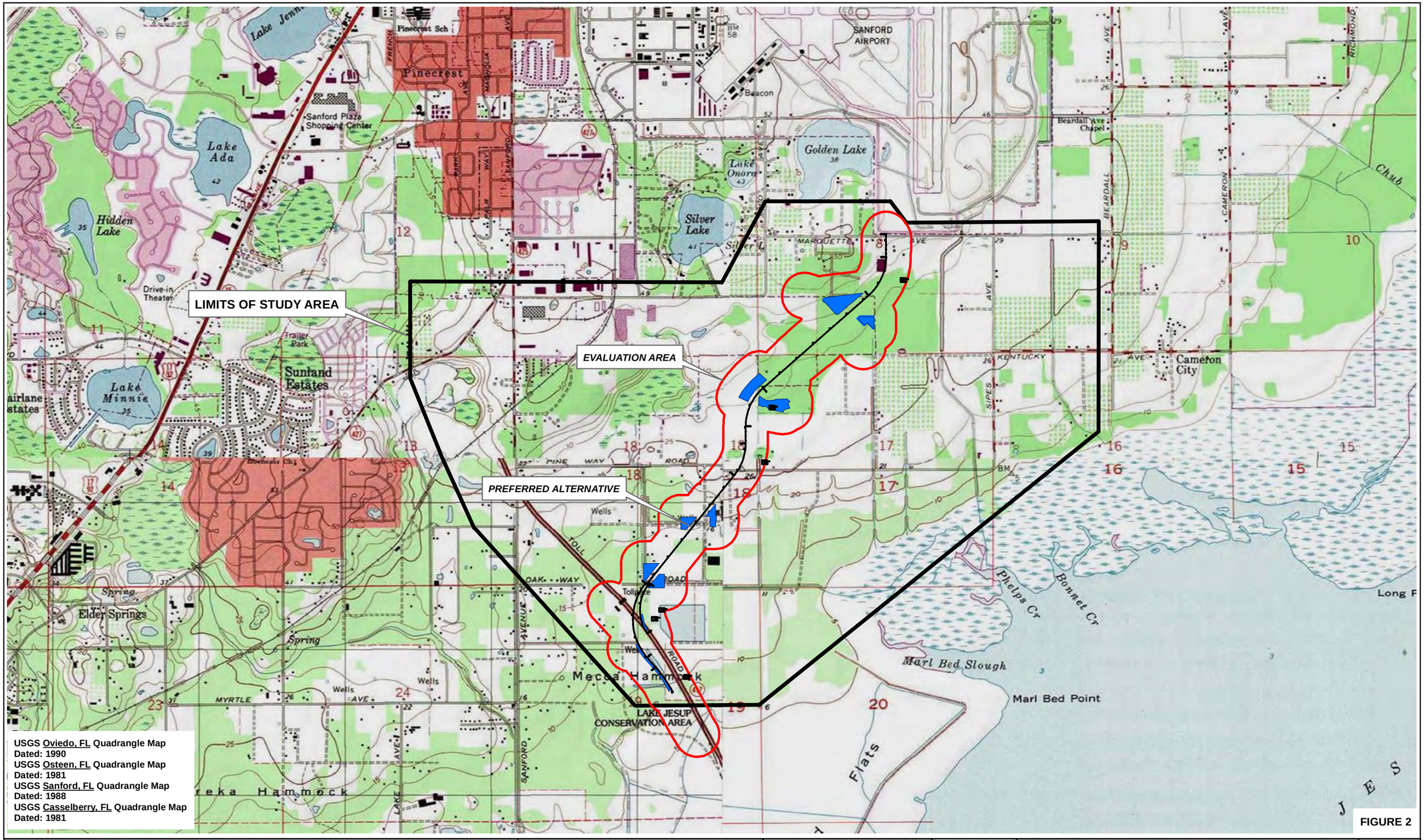



**FIGURE 1**

| | | | | | |
|---|---|---|---|---|---|
| | RICHARD P. McCORMICK, P.G.<br>P.G. LICENSE NUMBER 2096<br>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.<br>919 LAKE BALDWIN LANE<br>ORLANDO, FL. 32814 | SR 417 SANFORD AIRPORT CONNECTOR PD&E STUDY<br>ROAD NO. -- / PROJECT NO. 417-246A | CENTRAL FLORIDA EXPRESSWAY AUTHORITY | STUDY LIMITS MAP | SHEET NO. |

T:\J5603GE SR 417 Sanford Airport Connector\7 CADD Files\Environmental\ArcGIS\5603E STUDY LIMITS.mxd 6/25/2025




USGS Oviedo, FL Quadrangle Map
Dated: 1990
USGS Osteen, FL Quadrangle Map
Dated: 1981
USGS Sanford, FL Quadrangle Map
Dated: 1988
USGS Casselberry, FL Quadrangle Map
Dated: 1981

**FIGURE 2**

N

0 1,000 2,000
Feet


RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.
919 LAKE BALDWIN LANE
ORLANDO, FL. 32814


| SR 417 SANFORD AIRPORT CONNECTOR PD&E STUDY | |
|---|---|
| ROAD NO. | PROJECT NO. |
| -- | 417-246A |

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

# USGS QUADRANGLE MAP

SHEET NO.

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LIMITS OF STUDY AREA

EVALUATION AREA

PREFERRED ALTERNATIVE

**SEMINOLE COUNTY SOIL SURVEY INDEX**

- 2 - Adamsville-Sparr fine sands
- 6 - Astatula-Apopka fine sands, 0 to 5 percent slopes
- 9 - Basinger and Delray fine sands
- 10 - Basinger, Samsula, and Hontoon soils, depressional
- 11 - Basinger and Smyrna fine sands, depressional
- 13 - EauGallie and Immokalee fine sands
- 15 - Felda and Manatee mucky fine sands, depressional
- 17 - Brighton, Samsula, and Sanibel mucks
- 19 - Manatee, Floridana, and Holopaw soils, frequently flooded
- 20 - Myakka and EauGallie fine sands
- 22 - Nittaw muck, occasionally flooded
- 23 - Nittaw, Okeelanta, and Basinger soils, frequently flooded
- 24 - Paola-St. Lucie sands, 0 to 5 percent slopes
- 25 - Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes
- 26 - Udorthents, excavated
- 27 - Pomello fine sand, 0 to 5 percent slopes
- 29 - St. Johns and EauGallie fine sands
- 31 - Tavares-Millhopper complex, 0 to 5 percent slopes
- 34 - Urban land, 0 to 2 percent slopes
- 35 - Wabasso fine sand, 0 to 2 percent slopes
- 99 - Water

**FIGURE 3**

N

0 1,000 2,000

Feet

RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS, INC.
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ORLANDO, FL. 32814

SR 417 SANFORD
AIRPORT CONNECTOR
PD&E STUDY

| ROAD NO. | PROJECT NO. |
|---|---|
| -- | 417-246A |

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

# NRCS SOIL SURVEY MAP

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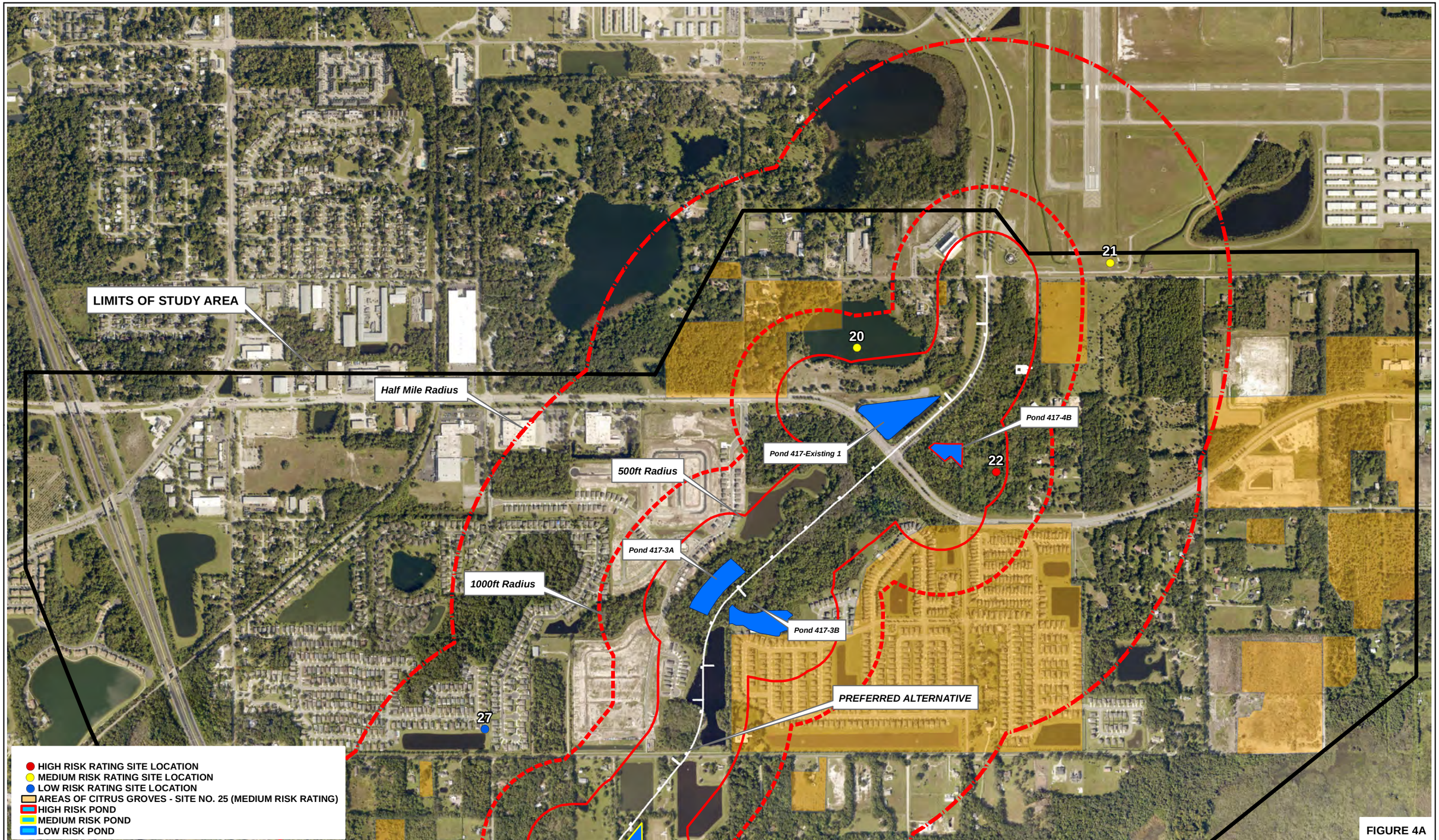


FIGURE 4A

N

0 500 1,000

Feet

RICHARD P. McCORMICK, P.G.
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CONSULTANTS, INC.
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ORLANDO, FL. 32814

SR 417 SANFORD
AIRPORT CONNECTOR
PD&E STUDY

| ROAD NO. | PROJECT NO. |
|---|---|
| -- | 417-246A |

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

# POTENTIAL CONTAMINATION AND POND SITE LOCATION MAP

SHEET NO.

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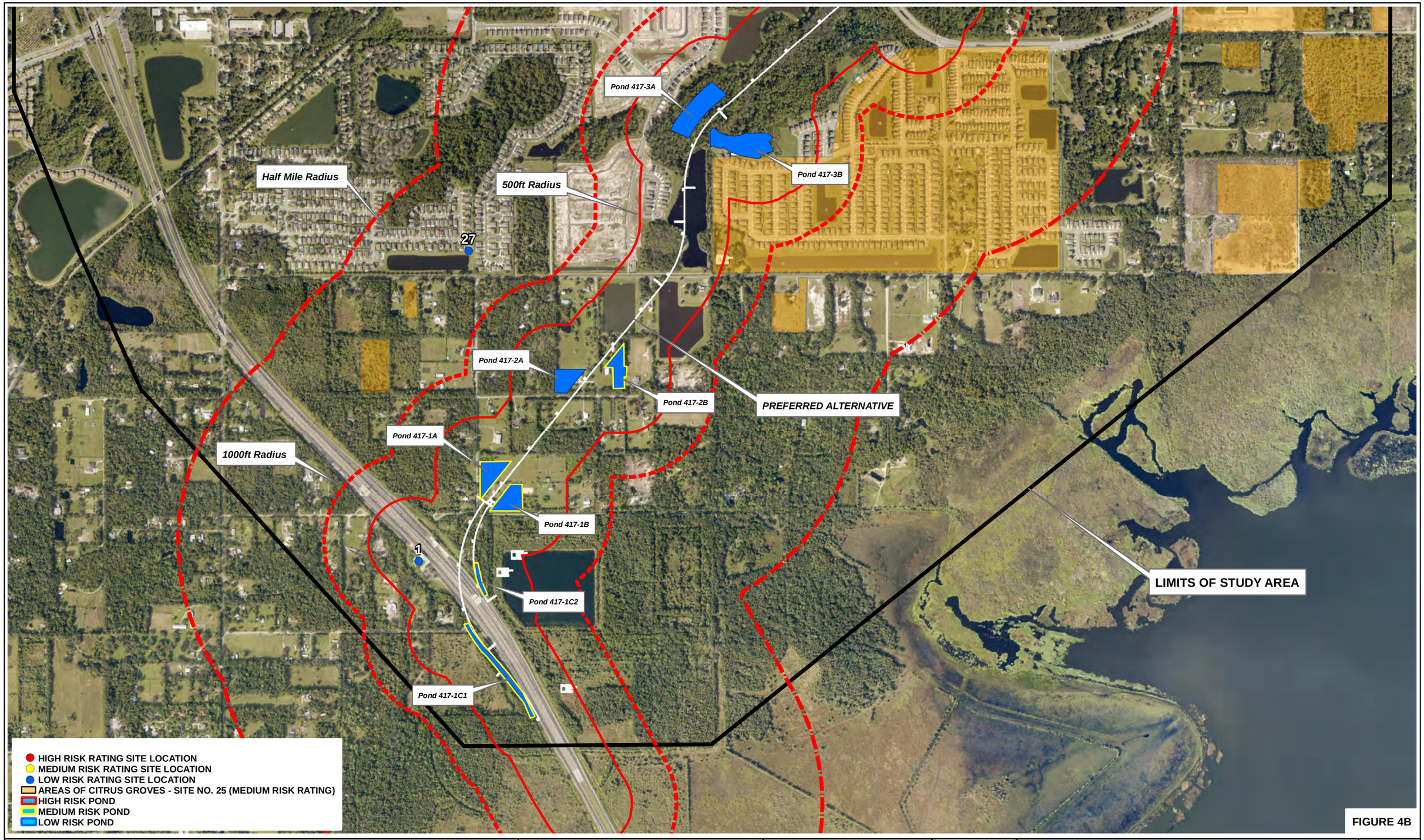


FIGURE 4B

N

0 500 1,000

Feet

RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
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CONSULTANTS, INC.
919 LAKE BALDWIN LANE
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SR 417 SANFORD
AIRPORT CONNECTOR
PD&E STUDY

| ROAD NO. | PROJECT NO. |
|---|---|
| -- | 417-246A |

CENTRAL FLORIDA EXPRESSWAY AUTHORITY

# POTENTIAL CONTAMINATION AND POND SITE LOCATION MAP

SHEET NO.

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# APPENDIX A

# Contamination Risk Rating Descriptions

The contamination potential risk rating system was developed by FOOT and is included in Part 2, Chapter 20 of the PD&E Manual, dated July 31, 2024. The rating system incorporates four levels of risk:

1. **No -** A review of available information on the property and a review of the conceptual or design plans indicates there is no potential contamination impact to the project. It is possible that contaminants have been handled on the property. However, findings from the Level I evaluation indicate that contamination impacts are not expected.

2. **Low -** A review of available information indicates that past or current activities on the property have an ongoing contamination issue; the site has a hazardous waste generator identification (ID) number, or the site stores, handles, or manufactures hazardous materials. However, based on the review of conceptual or design plans and/or findings from the Level I evaluation, it is not likely that there would be any contamination impacts to the project.

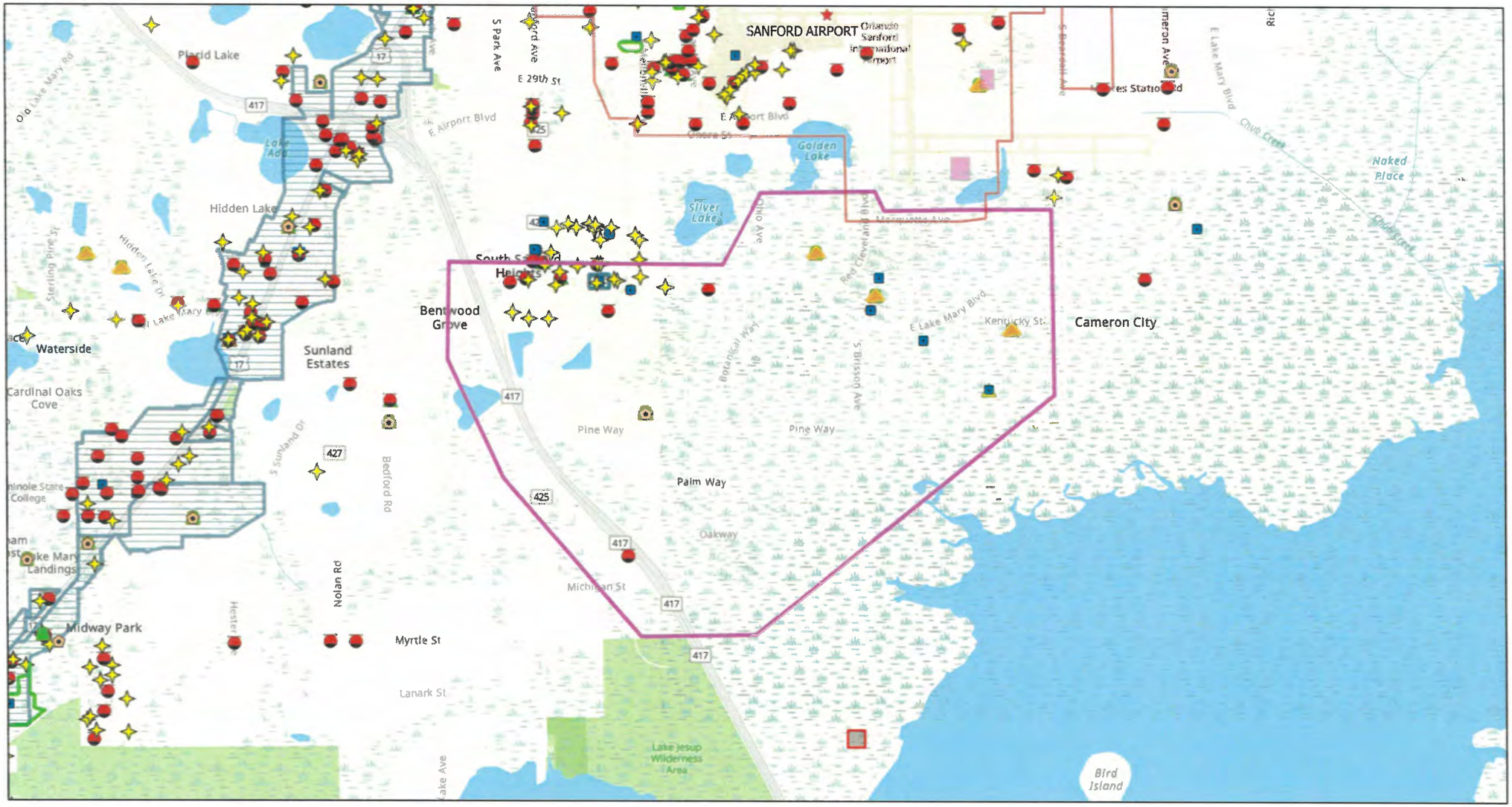
3. **Medium -** After a review of conceptual or design plans and findings from a Level I evaluation, a potential contamination impact to the project has been identified. If there is insufficient information (such as regulatory records or site historical documents) to make a determination as to the potential for contamination impact, and there is reasonable suspicion that contamination may exist, the property should be rated at least as a "Medium." Properties used historically as gasoline stations and which have not been evaluated or assessed by regulatory agencies, sites with abandoned in place underground petroleum storage tanks or currently operating gasoline stations should receive this rating.

4. **High -** After a review of all available information and conceptual or design plans, there is appropriate analytical data that shows contamination will substantially impact construction activities, have implications to ROW acquisition or have other potential transfer of contamination related liability to the FDOT.

# APPENDIX B

# Map Direct Maps

# Standard Map




August 13, 2024

1:33,310

0 0.35 0.7 1.4 mi

0 0.5 1 2 km

ERIC PFAS Sites
- Drycleaning Solvent Cleanup Program,Cleanup Underway
- Drycleaning Solvent Program Cleanup Sites
- Florida Institutional Controls Registry
- Site Investigation Section Sites
- ERIC Waste Cleanup

ERIC PFAS Sites
- Drycleaning Solvent Cleanup Program,Cleanup Underway
- ERIC Waste Cleanup

DEP Cleanup Sites
- OTHER WASTE CLEANUP
- PETROLEUM
- PFAS SITES

- ERIC Waste Cleanup
- Brownfield Sites
- Brownfield Areas
- Storage Tank Contamination Monitoring (STCM)
- Compliance & Enforcement Tracking-Hazardous Waste Facilities

Solid Waste Facilities
- Facility

- General Disposal Area
- Waste Processing Area

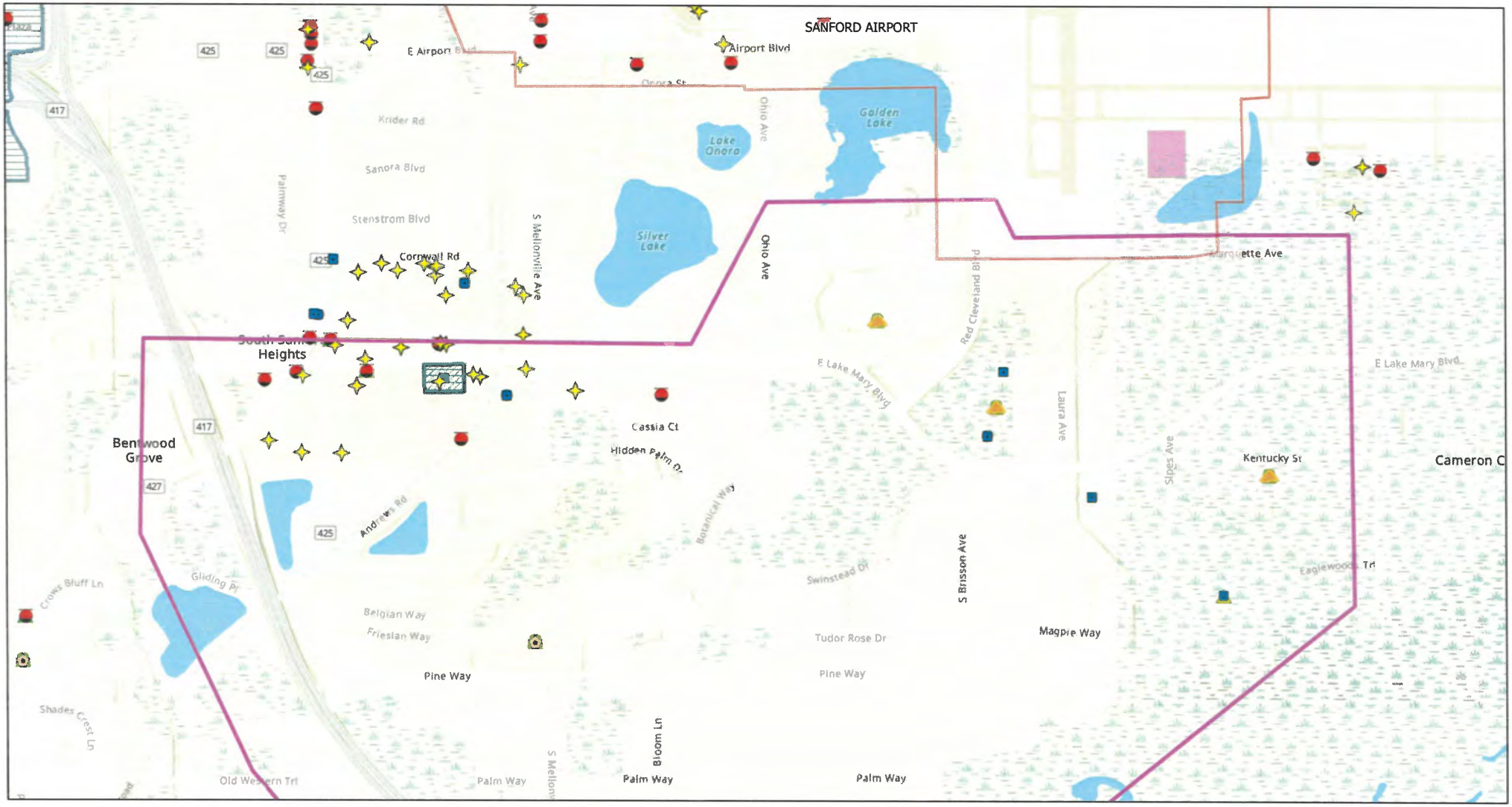
Formerly Used Defense Sites (FUDS) Points
- Properties with projects

- Formerly Used Defense Sites (FUDS) Polygons
- FUDS Munitions Response Sites
- Florida Institutional Controls Registry

Seminole County GIS, FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, FDEP, DWM, FDEP,DWM, Esri, NASA, NGA, USGS, FEMA, FDEP/MMP, FDEP/DWM/BWC, WRM

Map created by Map Direct, powered by ESRI.

# Standard Map




August 13, 2024

1:16,655

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

- Site Investigation Section Sites
- ERIC Waste Cleanup
- ERIC Waste Cleanup
- ERIC Waste Cleanup
- Brownfield Sites
- Brownfield Areas
- Storage Tank Contamination Monitoring (STCM)
- Compliance & Enforcement Tracking-Hazardous Waste Facilities

DEP Cleanup Sites

- OTHER WASTE CLEANUP
- PETROLEUM

Solid Waste Facilities

- Facility
- General Disposal Area
- Waste Processing Area
- Formerly Used Defense Sites (FUDS) Polygons
- FUDS Munitions Response Sites

FDEP, DWM, Esri Community Maps Contributors, Seminole County GIS, FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, FDEP,DWM, Esri, NASA, NGA, USGS, FEMA, FDEP/

Map created by Map Direct, powered by ESRI.

# APPENDIX C

# Public File Excerpts

# Site No. 1

# Seminole County Main Expressway Plaza

**Florida Department of Environmental Protection**

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Storage Tanks & Contamination Monitoring Information

# Cover Page Report

Report Run Date: 05/01/2025 Last Data Refresh: 04/30/2025 Report Generated from DOPPLER

| | | | |
|---|---|---|---|
| **District** | Central | **Type** | State Government |
| **County** | Seminole | **Status** | OPEN |
| **ID** | 9400810 | **Latitude** | 28° 44' 25.973 |
| **Name** | SEMINOLE CNTY MAIN EXPRESSWAY PLAZA<br>875 OAKWAY AVE<br>SANFORD, FL 32772 | **Longitude** | 81° 15' 27.0265 |
| | | **LL Method** | DPHO |
| **Contact** | HARLES WEGMAD | **LL Status** | REVIEWED |
| **Phone** | | **Status Date** | 10/28/2003 |

## Account Owner Information

| | | | |
|---|---|---|---|
| **Name** | FLORIDAS TURNPIKE ENTERPRISE<br>PO BOX 9828<br>FORT LAUDERDALE, FL 33310-9828 | **Effective Date** | 04/15/1994 |
| **Contact** | SANTIAGO ALVAREZ | | |
| **Phone** | (954) 934-1261 | | |
| **Email** | SANTIAGO.ALVAREZ@DOT.STATE.FL.US | **Placard # / Date** | |

**No Property Owner Information Found**

| Tank | Tank Size | Content | Installed | Placement | Status |
|---|---|---|---|---|---|
| 1 | 500 | Emerg Generator Diesel (G) | 08/01/1993 | ABOVEGROUND | In Service (U) |

**Constructions**
(C) Steel
(I) Double wall
(M) Spill containment bucket
(P) Level gauges/alarms

**Pipings**
(A) Abv, no soil contact
(B) Steel/galvanized metal
(I) Suction piping system

**Monitorings**
(F) Monitor dbl wall tank space
(H) Mechanical line leak detector

**No Insurance Documents Found**

**No Legacy Data Found**

**No Compliance Activity Data Found**

**No Open AOCs Found**

**No Open Violations Found**

**No Discharges Found**

DATA ENTERED

APR 15 1994

By KO

*Florida Department of Environmental Regulation*

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form # 17-761.900(2)
Form Title Storage Tank Registration Form
Effective Date December 10, 1990
DER Application No _____ (Filled in by DER)

# Storage Tank Registration Form

**Please Print or Type - Review Instructions Before Completing Form**

1. DER Facility ID Number: 59-9400810
2. Facility Type: G
3. New Registration [X] New Owner Data [ ] Facility Revision [ ] Tank(s) Revision [ ]
4. County and Code of tank(s) location: SEMINOLE / 59

5. Facility Name: SEMINOLE COUNTY MAIN EXPRESSWAY PLAZA
   Tank(s) Address: 875 OAKWAY AV.
   City/State/Zip: SANFORD FL 32772
   Contact Person: CHARLES WEGMAN Telephone: (____)
6. Financial Responsibility Type: C

7a. Tank(s) Owner: F.D.O.T. TURNPIKE
   Owner Mailing Address: P.O. BOX 17870
   City/State/Zip: PLANTATION FL 33318
   Contact Person: CHARLES WEGMAN Telephone: (____)

7b. New Owner Signature/Change Date: ____/____/____

8. Location (optional) Latitude: ___°___'___" Longitude: ___°___'___" Section____ Township____ Range____

**Complete One Line For Each Tank At This Facility (Use Codes - See Instructions)**

Complete 9 - 16 for tanks in use; 9 - 19 for tanks out of use

| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 500 | G | 8/93 | A | C, M, P, I | B, A, I | F, H | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

20. BLAKE W. BAMMER — Certified Contractor*
DPR# PCC 0516681 — Department of Professional Regulation License Number*

*For new tank installation or tank removal

To the best of my knowledge and belief all information submitted on this form is true, accurate and complete.

BLAKE BAMMER PROJECT MANAGER — Print name & title of owner or authorized person
B. Bammer — Signature
9/8/93 — Date

Northwest District | Northeast District | Central District | Southwest District | South District | Southeast District

# Site No. 20

# Marquette Shores Borrow Pit C&D


Florida Department of Environmental Protection
Water Assurance Compliance System
Solid Waste Facility Inventory Report
05/01/2025

Generate Excel Spreadsheet of Current Results

No guarantee as to the accuracy of the information in this database is implied or expressed.
While additional information may have been submitted to the Department, manpower and resources
are not always available to ensure updates of this information to the database are made in a timely manner.
Any specific information missing from the database may be obtained by a file review for the particular facility at the appropriate District office.

*For Testsite Data Links:*
**I**: TestSite Inventory Report
**R**: TestSite Result Report
**C**: Regulatory Comparison Report

*For Detail Links:*
**A**: Facility Activities
**M**: GIS Map on this Facility [*New and Improved]
**D**: Documents in OCULUS
**P**: PA Permits
**E**: Sending Feedback to Address Data Errors

| TestSite Data | Detail Links | Facility ID | Facility Name | City | Address | County | District | Class | Class Type | Class Status |
|---|---|---|---|---|---|---|---|---|---|---|
| I R C | A M D P E | 27164 | MARQUETTE SHORES BORROW PIT C&D | SANFORD | MARQUETTE AVENUE AND OHIO AVE. | SEMINOLE | CD | CONSTRUCTION/DEMOLITION DEBRIS DISPOSAL | 540 | NFA,NO FURTHER ACTI |

CD - General Permit
Seminole County

# Department of Environmental Protection

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

27164

Marquette Shores Borrow Pit
200 North Park Avenue, Suite 200
Sanford, Florida 32771

OCD-SW-95-0297

Attention: Sid Vihlen, Jr.

3059P-75153

Seminole County - SW
Marquette Shores Borrow Pit
Notification of Use of General Permit for a
Construction and Demolition Debris Disposal Facility
Permit No. SO59-275153

Dear Mr. Vihlen:

In response to your request, this letter is to advise you that the Department has received your notice of intent of use a general permit as provided in Rules 62-4 and 62-701, Florida Administrative Code, (F.A.C.), for a Construction and Demolition Debris Disposal Facility and does not object to your use of such general permit. Please be advised that you are required to abide by all conditions in Rules 62-4.510 through 62-4.540, F.A.C., the general requirements for general permits; and Rule 62-701.803, F.A.C.

Sincerely,

W. M. Bostwick, Jr., P.E.
Program Administrator
Waste Managment

DATE: 8/28/95

WMB/gc/ewb

Enclosure

Copies furnished to:

Mary Jean Yon - DEP - Tallahassee ✓
Lt. Don McMillen - Florida Game and Fresh Water Fish Commission
Seminole County Department of Environmental Services
Fred Blakeley, Manager - Seminole County Solid Waste Division
Devo Seereeram, Ph.D., P.E. - Orlando
Steven C. Helle, P.E. - Orlando

REV. 4/91

# Site No. 21

# Sanford Airport FUDS Site

US Army Corps of Engineers
BUILDING STRONG®

# NAVAL AIR STATION SANFORD

## Formerly Used Defense Sites Program Management Action Plan

Published by: U.S. Army Corps of Engineers, Environmental Programs
Data as of 2022 Annual Report to Congress

# Table of Contents

# I. Statement of Purpose

## A. Management Action Plan

The Management Action Plan (MAP) is to outline the total multi-year environmental cleanup program for a Formerly Used Defense Site (FUDS) property. The plan will define the cleanup program requirements and propose a comprehensive approach and associated costs to conduct future investigations and response action at each cleanup site.

## B. Formerly Used Defense Sites Program

During the past two centuries, the Department of Defense (DOD) has used land throughout the United States to both train Soldiers, Airmen, Sailors and Marines, and test new weapons to ensure the nation's military readiness. As training and testing needs changed, DOD obtained property or returned it to private or public uses. When no longer needed, many of these properties were cleaned up according to the best practices available at the time and then transferred to other owners such as private individuals or federal, state, tribal, or local government entities.

Today, DOD is responsible for the environmental restoration (cleanup) of properties that were formerly owned by, leased to or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense prior to October 1986.Such properties are known as Formerly Used Defense Sites or FUDS. The U.S. Army is DOD's lead agent for the FUDS Program. The U.S. Army Corps of Engineers executes the FUDS Program on behalf of the U.S. Army and DOD. The U.S. Army and DOD are dedicated to protecting human health and the environment by investigating and, if required, cleaning up potential contamination or munitions that may remain on these properties from past DOD activities.

The scope and magnitude of the FUDS Program are significant, with more than 10, 000 properties identified for potential inclusion in the program. Information about the origin and extent of contamination or munitions, land transfer issues, past and present property ownership, applicable laws and DOD policies must be evaluated before DOD considers a property eligible for Defense Environment Restoration Account funding under the FUDS Program. Environmental cleanup at FUDS properties is conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

## C. Installation Restoration Program (IRP)

Installation Restoration Program (IRP) category projects include sites that require response actions to address releases of: (a) Hazardous substances and pollutants or contaminants; (b) Petroleum, Oil, and Lubricants (POLs); (c) Hazardous wastes or hazardous waste constituents; and (d) Explosive compounds released to soil, surface water, sediment, or groundwater as a result of ammunition or explosives production or manufacturing at ammunition plants.

The relative risk site evaluation (RRSE) framework is a methodology used by all DoD Components to evaluate the relative risk posed by a site in relation to other sites. It is a tool used across all of DoD to group sites into high, medium, and low categories based on an evaluation of site information using three factors: the contaminant hazard factor (CHF), the migration pathway factor (MPF), and the receptor factor (RF).Factors are based on a quantitative evaluation of Comprehensive Environmental Response, Compensation and Liability Act(CERCLA) hazardous substances, pollutants, or contaminants and a qualitative evaluation of pathways and human and ecological receptors in the four media most likely to result in significant exposure groundwater, surface water, sediment, and surface soils.

## D. Military Munitions Response Program (MMRP)

In 2001, DoD established the Military Munitions Response Program (MMRP). The MMRP addresses munitions response sites (MRSs) at Formerly Used Defense Site locations. MRSs are sites that are known or suspected to contain unexploded ordnance, discarded military munitions, or munitions constituents (MC). Through the MMRP, DoD complies with environmental cleanup laws, such as the Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund.

To prioritize funding and cleanup of MRSs that pose the greatest threat to safety, human health, and the environment, DoD uses the Munitions Response Site Prioritization Protocol (MRSPP). The MRSPP consists of three separate modules to evaluate hazards associated with explosives, chemical warfare materiel, MC, and other incidental environmental contaminants. The MRSPP scores affect how DoD sequences MRSs for cleanup. In addition to relative risk, DoD considers other factors such as economic, programmatic, and stakeholder concerns, as well as reuse and redevelopment plans, when prioritizing sites for cleanup.

# II: Acronyms

| | |
|---|---|
| **BD/DR** | Building Demolition and Debris Removal |
| **CERCLA** | Comprehensive Environmental Response, Compensation, and Liability Act |
| **CHE** | Chemical Warfare Material Hazard Evaluation |
| **COMM/REL** | Community Relations |
| **CON/HTRW** | Containerized/Hazardous, Toxic and Radioactive Waste |
| **CTC** | Cost to complete |
| **CWM** | Chemical Warfare Material |
| **DD** | Decision Document |
| **DERP** | Defense Environmental Restoration Program |
| **DOD** | Department of Defense |
| **EE/CA** | Engineer Evaluation/Cost Analysis |
| **EHE** | Explosive Hazard Factor |
| **EP** | Evaluation Pending |
| **FFA** | Federal Facilities Agreement |
| **FUDS** | Formerly Used Defense Sites |
| **FUDSMIS** | Formerly Used Defense Sites Management Information System |
| **FS** | Feasibility Study |
| **HQDA** | Headquarters, Department of the Army |
| **HHE** | Health Hazard Evaluation |
| **IAG** | Interagency Agreement |
| **IRA** | Interim remedial action |
| **IRP** | Installation Restoration Program |
| **LTM** | Long Term Management |
| **MAP** | Management Action Plan |
| **MMRP** | Military Munitions Response Program |
| **MMRP/CWM** | Military Munitions Response Program/Chemical Warfare Materials |
| **MRSPP** | Military Munitions Site Prioritization Protocol |
| **NKSH** | No Known or suspected Hazard |
| **NLR** | No Longer Required |
| **NPL** | National Priorities List |
| **PA** | Preliminary Assessment |
| **PA/INPR** | Preliminary Assessment/Inventory Project Report |
| **PCO** | Project Closeout |
| **PN** | Preliminary Negotiations |
| **QA** | Quality Assurance |
| **RA** | Remedial Action |
| **RA-C** | Remedial Action-Construction |
| **RA-O** | Remedial Action-Operations |
| **RAB** | Restoration Advisory Board |
| **RC** | Response Complete |

| | |
|---|---|
| **RCRA** | Resource Conservation and Recovery Act |
| **RD** | Remedial Design |
| **RmA-C** | Removal Action-Construction |
| **RmD** | Removal Design |
| **RI/FS** | Remedial Investigation/Feasibility Study |
| **RIP** | Remedy in Place |
| **ROD** | Record of Decision |
| **RRSE** | Relative Risk Site Evaluation |
| **SI** | Site Investigation |
| **TAPP** | Technical Assistance for Public Participation |
| **TRC** | Technical Review Committee |

# III. Property Information

**FUDS Number:** I04FL0864
**FFID:** FL49799F467500
**Name:** NAVAL AIR STATION SANFORD

## A. Property Description

The 1,813.64 acre site is located in Seminole County and is the Orlando Sanford International Airport.

## B. Locale

**City:** SANFORD
**State:** FL
**Latitude:** 28.77833333
**Longitude:** -81.24138889
**Congressional District:** 07
**Size (Acreage):** 1182

## C. Organization

**Division:** South Atlantic Division
**District:** Jacksonville District
**Phone:** 904-232-2235

**Current Owners:**

| Type | Name |
|---|---|
| Local | CITY HOSPITAL, AIRPORT, INDUSTRIAL PARK. ; City of Sanford |
| Private | Numerous Private Owners |

## D. National Priorities List Status

The National Priorities List (NPL) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.

**National Priorities List (NPL) Status:** Not on the NPL

## E. Project Summaries

The below table outlines all projects that have been identified on this FUDS property. The table provides information on the category of project, the legal driver, the RRSE or MRSPP score that is used for prioritization, the total funding for the project, the status of work on the project, and the actual or anticipated remedy in place and response complete dates.

| Project Number | Category | Name | Legal Driver | RRSE | MRSPP | Status | RIP | RC |
|---|---|---|---|---|---|---|---|---|
| 0 | PA/INPR | PA/INPR Funding | | | | Complete | | |
| 01 | CON/HTRW | 01 | State | | | Complete | 09/2000 Actual | 09/2000 Actual |
| 02 | MMRP | Debris Disposal Areas | CERCLA | | 05 | Underway | 09/2048 Scheduled | 09/2048 Scheduled |
| 03 | HTRW | POL Contamination | State | Not Required | | Complete | 12/2010 Actual | 08/2017 Actual |
| 04 | HTRW | Chlorinated Solvents Vicinity of Site 2 | CERCLA | Not Required | | Complete | 09/2015 Actual | 09/2015 Actual |
| 05 | MMRP | Small Arms Ranges | CERCLA | | NKSH | Complete | 05/2014 Actual | 05/2014 Actual |

# IV. Cleanup Program Summary

## A. Historic Activity

During World War II, the U.S. acquired the City of Sanford's airfield as well as other properties to establish Naval Air Station Sanford to use for dive bomber and fighter training. The Navy constructed approximately 66 buildings and structures along with other miscellaneous improvements (such as runways, taxiways, aprons, water, sewage, and electrical distribution systems, fuel storage tanks, etc.) on the site. It was utilized as a fully operational Naval Air Station until being decommissioned in 1946. By 1948, the government had disposed of all the land comprising the former Naval Air Station Sanford, but by 1954, the government had reacquired all the land as well as additional property, eventually bringing the total to 1,813.64. The reacquired site was reactivated and utilized as a fully operational Naval Air Station until it was decommissioned in 1967.

The government deeded the entire 1,813.64 acres to the City of Sanford in 1969. The property is now the Orlando Sanford International Airport.

# V. Installation Restoration Program (IRP)

## A. IRP Summary

**Inception of IRP:** 07/1994
**Projects Identified:** 3
**Projects at Response Complete:** 3
**Remedy-in-Place (RIP):** 09/2015
**Response Complete (RC):** 08/2017
**IRP completion (including LTM):** 05/2020

## B. IRP Schedule

**Project Schedule**

| Project No | Category | Site Type | Status | Response Complete |
|---|---|---|---|---|
| 01 | CON/HTRW | Underground Storage Tanks | Complete | 09/2000 Actual |
| 03 | HTRW | POL (Petroleum/Oil/Lubricants) Lines | Complete | 08/2017 Actual |
| 04 | HTRW | Maintenance Yard | Complete | 09/2015 Actual |

**Phase Schedule**

| Project No | Phase | Phase Type | Status | Start | End |
|---|---|---|---|---|---|
| 01 | RD | Remedial Response | Complete | 07/1994 | 09/1996 |
| 01 | RA-C | Remedial Action | Complete | 07/1995 | 09/2000 |
| 03 | RI/FS | Remedial Response | Complete | 07/2000 | 09/2010 |
| 03 | RD | Remedial Response | Complete | 01/2010 | 03/2010 |
| 03 | RA-C | Remedial Action | Complete | 01/2010 | 12/2010 |
| 03 | RA-O | Remedial Action | Complete | 10/2010 | 08/2017 |
| 03 | LTM | Remedial Response | Complete | 10/2018 | 05/2020 |
| 04 | RI/FS | Remedial Response | Complete | 01/2011 | 09/2015 |

**Five-Year Review**
**Status:** No Reviews Planned

## C. Project Descriptions

Please see **Appendix I** for detailed IRP project descriptions

## D. Costs

**Funding To Date* ($K):** 6346
**2022 Funding ($K):** 0
**CTC ($K):** 0

| Project No | Phase | Status | < 2022 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 + |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | RD | Complete | | | | | | | | |
| 01 | RA-C | Complete | | | | | | | | |
| 03 | RI/FS | Complete | | | | | | | | |
| 03 | RD | Complete | | | | | | | | |
| 03 | RA-C | Complete | | | | | | | | |
| 03 | RA-O | Complete | | | | | | | | |
| 03 | LTM | Complete | | | | | | | | |
| 04 | RI/FS | Complete | | | | | | | | |

*Past costs are approximate and not inflated to reflect current year fiscal dollars.
= phase funded

# VI. Military Munitions Response Program (MMRP)

## A. MMRP Summary

**Inception of MMRP:** 07/1994
**Projects Identified:** 2
**Projects at Response Complete:** 1
**Remedy-in-Place (RIP):** 09/2048
**Response Complete (RC):** 09/2048
**MMRP completion (including LTM):** 09/2077

## B. MMRP Schedule

**Project Schedule**

| Project No | Category | Site Type | Status | Response Complete |
|---|---|---|---|---|
| 02 | MMRP | Munitions Burial | Underway | 09/2048 Scheduled |
| 05 | MMRP | Small Arms Range | Complete | 05/2014 Actual |

**Phase Schedule**

| Project No | Phase | Phase Type | Status | Start | End |
|---|---|---|---|---|---|
| 02 | SI | Remedial Response | Complete | 07/1997 | 06/2010 |
| 02 | RI/FS | Remedial Response | Future | 10/2028 | 09/2029 |
| 02 | RA-C | Remedial Action | Future | 10/2047 | 09/2048 |
| 02 | LTM | Remedial Response | Future | 10/2051 | 09/2077 |

**Five-Year Review**
**Status:** No Reviews Planned

## C. Project Descriptions

Please see **Appendix II** for detailed MMRP project descriptions

## D. Costs

**Funding To Date* ($K):** 232
**2022 Funding ($K):** 0
**CTC ($K):** 1369

| Project No | Phase | Status | < 2022 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 + |
|---|---|---|---|---|---|---|---|---|---|---|
| 02 | SI | Complete | | | | | | | | |
| 02 | RI/FS | Future | | | | | | | | |
| 02 | RA-C | Future | | | | | | | | |
| 02 | LTM | Future | | | | | | | | |

*Past costs are approximate and not inflated to reflect current year fiscal dollars.
= phase funded

# VII. Community Involvement

Since 1993, the Department of Defense (DOD) has supported the development, implementation, and maintenance of the Restoration Advisory Board (RAB) program. Through the RAB program, communities provide input into the decision - making process of DOD's environmental cleanup program. A RAB is a group, equally co - chaired by a DOD representative and a community member, that serves as a forum for exchange of information between government officials and members of the local community on property cleanup issues. In addition to regular RAB meetings, a combination of activities may be conducted to enhance this process. Such activities may include coordinating installation site tours or providing interactive presentations with the use of cleanup technology models. Members of a RAB may include local citizens and representatives of the U.S. Environmental Protection Agency (EPA) and state, local, and tribal governments. The RAB team should reflect the diverse interests of the community and help identify possible issues associated with an installation's environmental cleanup program. RABs provide a link between the community and cleanup decision makers, and should complement other community involvement activities, such as holding public meetings, distributing informative mailings to the public on installation cleanup activities, and establishing local information repositories.

In fiscal year 1998 (FY98), DOD continued to build trust with local communities surrounding military installations by strengthening the RAB program and making new resources available; including the implementation of the Technical Assistance for Public Participation (TAPP) program. The TAPP program was designed to help community members of RABs and TRCs better understand the scientific and engineering issues underlying their properties' environmental cleanup activities. Under TAPP, the installation may contract for an independent technical consultant to advise the RAB on a specific project, which must be identified in the TAPP application. Typical projects may involve reviewing proposed remedial technologies, interpreting health and environmental effects data, or reviewing cleanup documents.

**Reason RAB not Established:** The community has expressed no sufficient, sustained interest in a RAB

# APPENDIX I
# IRP Project Descriptions

## 1. Identification

**Project ID:** 01
**Project Name:** 01
**Legal Driver:** State
**Closeout**
**RIP Date:** 09/2000 Actual
**RC Date:** 09/2000 Actual

## 2. Project Description

No description reported.

## 3. Restoration History

The Presence of the Underground Tanks and Debris from the Former DOD Installation is not compatible with the present use and impedes full and
safe use of the area.

Tanks were beneficially used by airport. Information of this beneficial use was not known when tanks were removed. No further remediation at this site is required. Project will go NDAI.

2/4/2016: PCO complete

## 4. Cleanup/Exit Strategy

No cleanup/exit strategy reported.

## 5. Status

**RRSE:** RC- 09/2000

**Phases**

| Phase | Status |
|---|---|
| RD | Complete |
| RA-C | Complete |

## 1. Identification

**Project ID:** 03
**Project Name:** POL Contamination
**Legal Driver:** State
**Closeout**
**RIP Date:** 12/2010 Actual
**RC Date:** 08/2017 Actual

## 2. Project Description

The POL (non-CERCLA) project site is located within the Orlando Sanford International Airport's runway area. The Navy operated an underground fuel storage area at the project site.

## 3. Restoration History

Project 03, POL Contamination, was approved on 07 April 2000. Site assessment for former Tanks 62, 63, 002 completed in 1998. Supplemental site assessment completed in 2002. Twelve shallow monitoring wells, 11 deep monitoring wells and 4 vertical profile borings were installed in 2005. The Revised INPR in 2011 separated Project 03 into a POL project and a HTRW project (Project 04).

Regulator has agreed Response Complete and Site Closeout have been achieved. Wells have been properly closed. Project is complete in FY20.

## 4. Cleanup/Exit Strategy

POL HTRW project. Regulator concurred that RC was achieved; claimed RC in 2017. Site closeout activities were delayed due to property owner (Sanford Airport) not signing ROE to allow monitoring well closure. ROE was later signed and wells properly closed in FY20. Regulator agreed Response Complete and Site Closeout was achieved.

## 5. Status

**RRSE:** RC- 08/2017

**Phases**

| Phase | Status |
|---|---|
| RI/FS | Complete |
| RD | Complete |
| RA-C | Complete |
| RA-O | Complete |
| LTM | Complete |

## 1. Identification

**Project ID:** 04
**Project Name:** Chlorinated Solvents Vicinity of Site 2
**Legal Driver:** CERCLA
**Closeout**
**RIP Date:** 09/2015 Actual
**RC Date:** 09/2015 Actual

## 2. Project Description

The site is located in Seminole County, about two miles southeast of the city of Sanford, Florida. The site was originally developed and named the Sanford Naval Air Station.

## 3. Restoration History

This Project has achieved Project Close Out (PCO) 9/28/15 (although the date in FUDSMIS recorded a day earlier due to a glitch)

Project Approved 21 Jan 2011. Project is to address Chlorinated Solvents in Vicinity of Site 2 from Project 03. Supplemental Site Assessment completed Aug 2011 RI completed and final report published. RI report identified that no DoD source of chlorinated solvents/petroleum impacts were identified therefore the project is no longer eligible under DERP-FUDS.

9/4/2015: received FDEP concurrence for Response Complete.

## 4. Cleanup/Exit Strategy

This Project has achieved Project Close Out (PCO)

## 5. Status

**RRSE:** RC- 09/2015

**Phases**

| Phase | Status |
|---|---|
| RI/FS | Complete |

# APPENDIX II
# MMRP Project Descriptions

## 1. Identification

**Project ID:** 02
**Project Name:** Debris Disposal Areas
**Legal Driver:** CERCLA
**Closeout**
**RIP Date:** 09/2048 Scheduled
**RC Date:** 09/2048 Scheduled

## 2. Project Description

The 11-acre Debris Disposal Areas MRS is located in within the Orlando Sanford International Airport in Seminole County in Sanford, Florida, approximately 18 miles northeast of Orlando. It is comprised of two separate areas - the former bomb casing disposal area (4 acres) and the former metallic debris disposal area (7 acres).

## 3. Restoration History

MMRP-SI Final Report completed in 30-Jun-10. Recommend RI/FS.

## 4. Cleanup/Exit Strategy

A Remedial Investigation/Feasibility Study will be awarded when funding becomes available, and USACE will coordinate with the regulator to achieve concurrence on future actions leading to RIP/RC.

## 5. Status

### MRSPP

| | | | |
|---|---|---|---|
| MRSPP: 05 | EHE: 6 | CHE: No Known or Suspected Hazard | HHE: 5 |

### MRSPP Army Quality Assurance (QA) Panel Review

| | |
|---|---|
| Result: Approved | Date: 9/25/2006 |

### Media

| |
|---|
| Surface Water - Human Endpoint, Sediment - Human Endpoint, Surface Water - Ecological Endpoint, Sediment - Ecological Endpoint, Surface Soil |

**Munitions**

| |
|---|
| Type: Practice |
| Source of Hazard: Former burial pit or other disposal area |
| Location: Suspected (physical evidence) |

**CWM**

| |
|---|
| Type: Evidence of no CWM |

**Phases**

| Phase | Status |
|---|---|
| SI | Complete |
| RI/FS | Future |
| RA-C | Future |
| LTM | Future |

## 1. Identification

**Project ID:** 05
**Project Name:** Small Arms Ranges
**Legal Driver:** CERCLA
**Closeout**
**RIP Date:** 05/2014 Actual
**RC Date:** 05/2014 Actual

## 2. Project Description

The 1,023-acre Small Arms Ranges project is located in Seminole County in Sanford, Florida approximately 18 miles northeast of Orlando. It was used by the Navy between 1942 and 1968 for small arms training and to zero, service, and maintain aircraft weapon systems. The munitions used on the MRS include small arms ammunition. The city of Sanford, Florida owns the portion of the land that operates as the Orlando Sanford International Airport. Areas outside of the airport are privately-owned and used for residential, commercial, and industrial developments.

## 3. Restoration History

MMRP Proj 05 _ Created due to re-alignment of MMRP project 02 under MRA Area I04FL086402R03.
NDAI assigned 2 MAY 2014.

## 4. Cleanup/Exit Strategy

MMRP Proj 05 _ NDAI assigned 2 MAY 2014. Completed PCO phase requirements and updated FUDSMIS.

## 5. Status

### MRSPP

| | | | |
|---|---|---|---|
| MRSPP: 10 | EHE: No Known or Suspected Hazard | CHE: No Known or Suspected Hazard | HHE: No Longer Required |

### MRSPP Army Quality Assurance (QA) Panel Review

| | |
|---|---|
| Result: Approved | Date: 7/2/2014 |

**Media**

| |
|---|
| NLR, RC- 05/2014 |

**Munitions**

| |
|---|
| Type: Small arms |
| Source of Hazard: Former small arms range |
| Location: Small arms (regardless of location) |

**CWM**

| |
|---|
| Type: Evidence of no CWM |

**Phases**

# Site No. 22

# Brisson Road/Avenue Landfill/Dump


Florida Department of Environmental Protection
Water Assurance Compliance System
Solid Waste Facility Inventory Report
05/01/2025

Generate Excel Spreadsheet of Current Results

No guarantee as to the accuracy of the information in this database is implied or expressed.
While additional information may have been submitted to the Department, manpower and resources
are not always available to ensure updates of this information to the database are made in a timely manner.
Any specific information missing from the database may be obtained by a file review for the particular facility at the appropriate District office.

*For Testsite Data Links:*
**I**: TestSite Inventory Report
**R**: TestSite Result Report
**C**: Regulatory Comparison Report

*For Detail Links:*
**A**: Facility Activities
**M**: GIS Map on this Facility [*New and Improved]
**D**: Documents in OCULUS
**P**: PA Permits
**E**: Sending Feedback to Address Data Errors

| TestSite Data | Detail Links | Facility ID | Facility Name | City | Address | County | District | Class | Class Type | Class Status |
|---|---|---|---|---|---|---|---|---|---|---|
| I R C | A M D P E | 83721 | BRISSON ROAD DUMP | SANFORD | BRISSON ROAD AND KENTUCKY STREET | SEMINOLE | CD | OLD DUMP | 520 | CLOSED, NO GW MONITORING |

# SUPPLEMENTAL SITE ASSESSMENT REPORT

## BRISSON AVENUE LANDFILL

*Sanford, Seminole County, Florida*

**Conducted for Carolyn Hughey (Trustee) Under**
**USEPA State Response Program Cooperative Agreement No.: RP-00D13513**

**Solid Waste Facility ID# 83721**

**Contract No.: HW559**

**AMEC Project No.: 6090140035.1000**

*Prepared for:*

**Florida Department of Environmental Protection**
**Bureau of Waste Cleanup, State Brownfields Program**
**2600 Blair Stone Road**
**Tallahassee, Florida 32301**

*Prepared by:*

**AMEC**
**Environment & Infrastructure, Inc.**
**2533 Greer Road, Suite 6**
**Tallahassee, Florida 32308**

**APRIL 2015**

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## PROFESSIONAL REVIEW CERTIFICATION

The investigation activities described in this report was conducted and the document prepared in accordance with commonly accepted procedures consistent with the applied standards of practice under the direction of the undersigned professional geologist.

This report is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned should be notified to evaluate the effects of any additional information on the report findings.

The Supplemental Site Assessment was conducted at the Brisson Avenue Landfill in Sanford, Seminole County, Florida in accordance with Florida Department of Environmental Protection directives and U.S. Environmental Protection Agency protocol, and the report should not be construed to apply for any other purpose or to any other site.

Ronald D. White
Professional Geologist
Florida License No.: 0002068
Expires July 31, 2016

Date

# 1.0 INTRODUCTION

The Florida Department of Environmental Protection (FDEP) tasked AMEC Environment & Infrastructure (AMEC) to conduct a Supplemental Site Assessment (SSA) at the Brisson Avenue Landfill site in Sanford, Seminole County, Florida. The SSA was conducted and this report has been prepared in response to FDEP's USEPA State Response Program Cooperative Agreement No. RP-00D13513, issued to AMEC under FDEP Contract No. HW559.

This SSA was conducted at the site to evaluate *Recognized Environmental Conditions* (RECs) identified by AMEC and FDEP during the site reconnaissance that was conducted on August 18, 2014 and to conduct assessment activities based on the observations made and the known site history. FDEP is conducting this project with Brownfields State Response Program grant funding to assist the property owner with evaluating site conditions prior to redevelopment of the property. The scope of work was developed based on a records review, meetings conducted with FDEP State Brownfields Section personnel, Central District personnel, the property owner and AMEC and the observations and findings of the site reconnaissance and previous assessments conducted at the site. FDEP file material is available in its Oculus records management system under Solid Waste Facility ID Number 83721 and Waste Cleanup Facility ID Number 35-1.

The objective of the SSA was to determine the presence and extent of trash or solid waste and groundwater contamination at the site. The site RECs primarily include the presence of both surface and subsurface trash and solid waste, including but not limited to tires, appliances and drums of various undetermined contents.

This SSA report summarizes the results of assessment activities conducted at the Brisson Avenue Landfill site (Figure 1). AMEC conducted the SSA field investigation during the week of December 1, 2014. The scope of work included collecting soil samples for visual observation to assess the presence and extent of solid waste and screening for methane with a Flame Ionization Detector (FID) unit. Micro-wells were installed with a direct-push technology (DPT) rig and groundwater samples were collected for offsite laboratory analysis. The locations of initial soil and groundwater samples were selected based on the observations made during the site reconnaissance review of historical aerial photographs. Once the approximate limits of the past dumping activities were determined, a 150-foot x 150-foot grid pattern was applied to sufficiently cover the landfill area. Additional locations were added as necessary based on the observations made in the field.

This SSA report presents the site background, the number of samples that were collected and their locations, describes the screening, sampling and analytical methodologies and presents the findings and results of the assessment activities.

The SSA was conducted in accordance with the approved October 2014 work plan that was submitted by AMEC to the FDEP's State Brownfields Section. The work plan outlined a scope of work in accordance with the FDEP Standard Operating Procedures (SOPs) and prescribed guidance documents set forth by the United States Environmental Protection Agency (USEPA) Region IV, including the USEPA Science and Ecosystem Support Division (SESD) Region IV Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM). The scope of work is specifically applied to sampling locations, sample types, sampling procedures, use of data, data types and field quality assurance/quality control (QA/QC) samples.

# 2.0 SITE BACKGROUND

## 2.1 Site Description

The Brisson Avenue Landfill is located on the north side of E. Lake Mary Boulevard (Parcel # 08-20-31-501-0000-0010) approximately 1,750 feet east of Red Cleveland Boulevard, which is the road that leads to the Orlando-Sanford International Airport in Sanford, Seminole County, Florida. The site was previously bounded on the south by Kentucky Street, where it connected with Brisson Avenue. Lake Mary Boulevard was constructed after the landfill was closed sometime after 2001 and was directed around the southern boundary of the site. Kentucky Street was removed from this area when Lake Mary Boulevard was constructed but a portion of Kentucky Street still exists approximately 2,000 feet to the east of the site, off of Sipes Avenue. The geographical coordinates are Latitude $28^0$ 45' 29" North and Longitude $81^0$ 14' 16" West in Section 8 of Township 20 South and Range 31 East (Figure 1). The site is an approximately 20-acre unfenced former landfill owned by Ms. Carolyn Hughey (Trustee) of Osteen, Florida. The property was previously owned by her husband, Mr. L.I. Hughey, who purchased the property in an auction from Seminole County in 1980. The site is presently densely overgrown with palmetto, palm, scrub oaks, large trees, pine vegetation and heavy undergrowth. The landfill reportedly accepted old appliances, machinery and construction debris. It was also reported that 55-gallon drums of unknown contents were disposed onsite. The western side of the property is low and swampy. The eastern portion is bounded by a stream, which separates the site from a sparsely populated neighborhood with homes on acreage (Seminole Gardens Subdivision). All homes in the area are believed to be on private wells and septic tanks. The northern side is bounded by the Orlando-Sanford International Airport. The southern side is bounded by E. Lake Mary Boulevard and then undeveloped land, much of which was formerly used as agricultural land (Figure 2). There are no structures on the property. According to Mr. Hughey in an interview conducted by FDEP in approximately 2000 – 2001, and based on reviews of historical aerial photographs, burial activities mainly took place in two long trenches oriented in a north-south direction, along the eastern edge of the landfill.

## 2.2 Site History and Operations

Again based on an interview conducted numerous years ago with Mr. Hughey, Seminole County operated the landfill until sometime between 1973 and 1980 under the name Cameron City Landfill. However, a newspaper article dated February 10, 1080 noted that the property has not been used as a dump since the 1960s. Mr. Hughey bought that property at auction in 1980 to graze cattle on the property. He also reportedly considered building a home on the property but was later informed that he could never build on the property.

## 2.3 Previous Assessment History

In September 1985, FDEP's Central District Office received several complaints from local residents. On October 1, 1985, 12 groundwater samples were collected from private wells located 200 feet to 1,500 feet from the landfill. Results indicated that the samples contained less than the minimum detectable levels of pesticides, polychlorinated biphenyls (PCBs), acid extractable and base/neutral extractable organic. Several samples contained trace quantities of cadmium, iron, lead and zinc. Levels of methylene chloride and acetone detected from one residential well sample and methylene chloride detected from two other private wells were determined by FDEP to be attributable to laboratory contamination.

In April 1986, eight onsite shallow monitoring wells were installed by FDEP at depths of ranging between 4 feet below land surface (bls) to 35 feet bls. Two surface water samples were also

collected from the stream adjoining the site on the east. However, laboratory analytical problems resulted in only partial analysis. Re-sampling was conducted in March 1987. Samples collected from the shallow monitoring wells contained concentrations of arsenic (2.1 micrograms per liter [µg/l], 2.7 µg/l and 3.1 µg/l), iron (1,841 µg/l to 60,200 µg/l), methylene chloride (12 µg/l, 13 µg/l, 16 µg/l and 23 µg/l) and benzene (6.6 µg/l). Surface water samples contained iron (7,650 µg/l and 2,950 µg/l) and methylene chloride (14 µg/l and 11 µg/l).

In 1995, a portion of the landfill was being considered as part of a right-of-way (ROW) for the Silver Lake Drive extension. As part of the engineering study, an electromagnetic (EM) conductivity survey was conducted in April 1995 by Environmental Management Systems, Inc., to determine the suitability for road construction. Observed on the surface in the planned ROW were car parts, tires, household trash, 5-gallon tar buckets, glass, furniture, scrap metal, white goods and 55-gallon drums. An oily sheen was also observed in the stream located adjacent to the ROW. Results of the EM study suggested areas of anomalous terrain representing buried metal. In June 1995, trenches were dug along the proposed ROW. Several 55-gallon drums containing fiberglass resins, as well as trash, demolition debris, bottles, tires, automobile parts, and large metal objects were noted in the excavations. Also, chemical odors were detected and an oily sheen was observed on the surface of water in the excavated trenches. Samples collected from standing water in the excavated trenches contained chromium (498 µg/l) and lead (334 µg/l).

In January 1996, 45 soil borings were installed along the proposed ROW corridor to an average depth of 10 feet bls, with the deepest boring at 26 feet bls. The borings were used to determine the location of the abandoned landfill trenches. Soil headspace readings using an organic vapor analyzer (OVA) were also collected from representative borings. Eight temporary monitoring wells were also installed and sampled in the area of the ROW. Laboratory results reported arsenic (2 µg/l to 8.8 µg/l), barium (56 µg/l to 560 µg/l), chromium (4 µg/l to 8.2 µg/l) and selenium (3.8 µg/l to 7.2 µg/l). Additionally, toluene (2.1 µg/l and 2.3 µg/l), ethyl benzene (6.6 µg/l), chlorobenzene (2.9 µg/l and 3.3 µg/l), chloroethane (3.5 µg/l and 18 µg/l), chloromethane (3.7 µg/l to 6.2 µg/l), and dichlorodifluoromethane (7.0 µg/l to 16 µg/l) were detected in groundwater samples. OVA readings exceeded 50 parts per million (ppm) at one location where elevated concentrations of chloromethane were detected. Further sampling of nearby private wells was conducted in March 1996. Twelve private potable wells were sampled. The samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals. No compounds were detected above detection limits. The proposed ROW was subsequently relocated from the site.

In June, 2001, Harding ESE (currently AMEC), conducted a CERCLA Site Inspection (SI) at the former Brisson Avenue Landfill site. The SI field program included collection of groundwater, surface soil and sediment samples to evaluate the presence of contamination at the site. Six micro-wells were installed and groundwater samples were collected for laboratory analysis. Five surface soil samples, and three sediment samples were collected for laboratory analysis. Each of the samples was analyzed for Target Compound List (TCL) VOCs, SVOCs, pesticides, PCBs and Target Analyte List (TAL) inorganics (including cyanide). Analytical results indicated that four groundwater samples contained one or more of the following inorganics (aluminum, boron, iron and manganese) at concentrations that exceeded the State and Federal Secondary maximum contaminant levels (MCLs) and one groundwater sample contained benzene at a concentration that exceeded the State's Primary MCLs. The results of the soil samples confirmed the presence of arsenic in one soil sample at a concentration above the residential exposure levels contained in Chapter 62-777, FAC. One sediment sample contained benzo(a)pyrene, DDD-p,p', DDE-p,p' and mercury at concentrations that exceeded the Florida Sediment Quality Assessment Guidelines (SQAGs) Toxic Effect Level and/or Probable Effect Level.

On July 1, 2014, the Seminole County Department of Health (DOH) collected a water sample from the private potable well at the residence located at 3750 Laura Avenue, located in the Seminole Gardens Subdivision adjacent to the eastern side of the Brisson Avenue Landfill. The sample was analyzed for Organic Priority Pollutants using EPA Methods 8260C and 8270D and select metals using EPA Methods 200.8, sodium using EPA Method 200.7 and mercury using EPA Method 245.1. Sodium (262 mg/l), barium (17 µg/l) and chromium (0.61 µg/l) were the only analytes detected in this sample. No other metals or organic analytes were reported at concentrations above their respective laboratory method detection limit. Reportedly, this was the only residence that would give the Seminole County DOH permission to collect samples from their wells.

On August 18, 2014, a site reconnaissance was conducted by AMEC and FDEP staff for the following purposes: establish site conditions, select possible sampling locations, assess site accessibility and surrounding properties, and meet with the property owner. Due to the excessive overgrowth on the site, only the southern perimeter of the site was observed.

# 3.0 SITE ENVIRONMENTAL SETTING

## 3.1 Site Physiography and Surface Water

The Brisson Avenue Landfill site is located in the Osceola Plains Physiographic region of the Coastal Lowlands Geomorphologic province. The site lies within the northern portion of Seminole County, which is drained by the St. Johns River. Land surface in the vicinity of the site is approximately 25 to 30 feet above mean sea level (msl). Seminole County is located in an area characterized by karst terrain. Numerous surface geomorphic features (sinkholes, springs, lakes) characteristic of karst terrain are present in the area. A mixture of cover-subsidence and cover-collapse sinkholes predominates in northern Seminole County. Recharge of the underlying drinking water aquifer (Floridan aquifer) probably occurs via sinkhole lakes and other karst features.

The site is located outside the 500-year flood zone. Surface water runoff from the site is expected to flow into the adjacent drainage ditch on the eastern border of the site and into the low lying area in the northwest portion of the site. The drainage ditch flows to the south towards Lake Jessup, which is approximately 1-mile to the south. Surface water flow direction from Lake Jessup is towards the north into Lake Monroe, which then are connected by and then discharges into the St. Johns River. The numerous surface water bodies are used extensively for recreational fishing, boating and swimming.

## 3.2 Regional Geology/Hydrogeology

Three hydrostratigraphic units exist in Seminole County. These include the surficial aquifer system, intermediate aquifer system/confining unit and the Floridan aquifer system.

The surficial aquifer system is composed of Pleistocene to Recent age fine to medium grained quartz sands with varying amounts of clay, silt and shell. In the area near Lake Monroe, these quartz sand units may be interbedded with occasional shell and clay layers. The surficial aquifer system is an unconfined aquifer that typically ranges between 10 and 75 feet in thickness in Seminole County. The surficial aquifer system is primarily recharged by rainfall. The water table is usually found less than 10 feet bls throughout the County. Yields from the surficial aquifer system are generally less than 20 gallons/minute. High iron concentrations limit the use of this aquifer to primarily lawn irrigation and, less frequently, livestock applications.

The surficial aquifer system is underlain by the intermediate aquifer system/confining unit, which consists of tacky blue clay and shell beds of undifferentiated Pliocene to Miocene age deposits and the blue to gray, calcareous clays and interbedded cream to gray, sandy limestones of the Miocene-age Hawthorn Group. The Hawthorn Group is undifferentiated in northwestern Seminole County. The Peace River and Arcadia Formations comprise the Hawthorn Group in extreme southern Seminole County. Locally, the sandy limestone units within the intermediate system may be capable of yielding significant quantities of water. However, the low-permeability clay units within the intermediate system predominate and separate the surficial and Floridan aquifer systems, thus confining groundwater within the underlying Floridan aquifer system. The intermediate aquifer system is present throughout most of Seminole County at a thickness of between 50 to 100 feet. However, in the northern part of the county, along the St. Johns River and Lake Monroe, the Hawthorn Group deposits have been eroded away.

The intermediate aquifer system/confining unit is underlain by the Eocene-age carbonate units of the karstic Floridan aquifer system. The Floridan aquifer system is the major source of potable water in the area. The Floridan aquifer system in Seminole County includes, in descending order, the Ocala Limestone and the Avon Park Formation. The Ocala Limestone consists of a cream to

tan-gray, soft to hard, granular, porous, marine limestone. The Ocala Limestone may be absent in the northern part of Seminole County. The Avon Park Formation consists of fossiliferous limestone, interbedded with vuggy dolostone. In Seminole County, the Floridan aquifer may also include sand and shell beds in the lower part of the Pliocene and Miocene age deposits and permeable portions of the Hawthorn Group in hydrologic contact with the Eocene age units. The depth to the Floridan aquifer ranges from 50 to 200 feet bls in Seminole County. The top of the Floridan aquifer system reportedly occurs at a depth of approximately 50 feet below msl throughout most of north-central Seminole County. However, two buried faults are located in the Sanford area. These faults are oriented west-northwest/east-southeast. Lake Monroe occupies the graben structure located between the two faults. The faults reportedly displace strata of the Floridan aquifer system causing the depth to the top of the Floridan aquifer to vary within the Sanford area. Sanford and Lake Mary are located on the southern most upthrown block. The public supply wells for the cities of Sanford, Lake Mary, Casselberry, Winter Springs and Longwood are completed into the Floridan aquifer system. Regional groundwater flow in the upper Floridan aquifer system is to the northeast in northern Seminole County. Recharge to the Floridan aquifer in northern Seminole County varies from no recharge in the extreme northern section of the County (Lake Monroe-St Johns River) to moderate recharge in the Casselberry area.

Water levels were measured in the six micro-wells installed at the site during the 2001 SI field activities. Depth to groundwater was approximately 8 feet bls. Groundwater flow at the site was to the southeast. The shallow lithology encountered while advancing soil borings consisted of very fine silty sand ranging in color from light brown to dark brown to medium gray.

# 4.0 FIELD METHODOLOGY

## 4.1 Sampling Locations and Rationale

To assess the presence and extent of solid waste disposed at the subject site, soil borings were advanced to collect soil samples to visually inspect for evidence of solid waste and to also screen for methane. Additionally, micro-wells were installed and groundwater samples were collected for laboratory analysis to evaluate groundwater conditions at the site. The objective of the SSA was to determine the presence and extent of buried solid wastes in the soil and to determine if groundwater contamination exists and is migrating offsite.

The environmental soil sampling locations focused on the entirety of the subject property with an exception to the northwest corner, as historical documentation suggested that area was not used in landfill activities. Also access to that portion of the property was limited due to a ravine that transverses the property from the western edge to the northeast corner (Figure 3) and also by flooded areas to the west and north of this ravine.

Prior to beginning the assessment work, AMEC personnel determined and marked the locations of the planned borings based on historical aerial photographs and measurements taken from property boundaries and roadways locations shown on the aerial photographs.

Nine micro-wells were installed around the perimeter of the buried solid waste to collect groundwater samples for laboratory analysis to assess the extent of groundwater contamination as well as determine the groundwater flow direction.

The soil boring locations and monitoring well locations were identified and recorded using a hand-held GPS unit equipped with wide area augmentation system (WAAS) which can have a real-time accuracy of 3 meters. The sampling locations are shown on Figures 3 through 6.

## 4.2 Soil Investigation

To assess the extent of buried solid waste and screen soils for methane gas, soil samples were collected from a total of 43 locations (38 pre-designated and five step-out) for FID screening and visual inspection for landfill debris. Some soil borings were added as step-out delineation points at some locations where solid waste was observed in an attempt to delineate the extent of the landfill.

This entire property was covered with very dense vegetation and was cleared with an industrial-sized bush-hog by a third party company hired by the property owner prior to AMEC arriving onsite so that access to the site was possible. A grid sampling pattern was set up to collect the soil samples within the site. Additional step out soil boring locations were necessary to assess the extent of buried debris and to collect additional screening samples.

The soil samples were collected using a DPT rig with a macro-core sampler. The macro-core sampler consists of a 1.5-inch diameter, 5-foot long stainless steel core tube with a polyethylene inner liner that is advanced on the end of the DPT rig's rods to the desired sample depth.

Soil borings were advanced to 10 feet bls, which extended below the water table at every location. Soil screening for methane was then performed by applying the microFID probe into the borehole annulus at the land surface once the DPT rods were removed. The initial OVA reading was recorded, followed by recording a filtered reading, which corresponds with the methane concentration.

## 4.3 Groundwater Investigation

### 4.3.1 *Micro-Well Installation*

Nine micro-wells (MW-1 through MW-9) were installed at locations which are located along the edges of the property, outside of former landfill areas, to monitor groundwater conditions downgradient of the former landfill to assess if any contamination was migrating offsite and also along the ravine in the north-central portion of the property to serve as upgradient sample locations (Figure 3). A boring was advanced at each location to visually inspect for visible trash to make sure that the wells were not installed through buried debris. The micro-wells were installed with a DPT rig through a 3-inch diameter steel casing and constructed of 1-inch diameter schedule 40 PVC.

The shallow micro-wells were installed to a depth of approximately 11 feet bls with 10 feet of pre-packed screen (consisting of a pre-packed 20/30-grade silica sand filter). The screen/borehole annulus was filled with clean silica sand (30/65 grade) to a height of approximately 0.5 feet above the top of the screen interval. A 0.25-foot thick layer of fine sand was placed above the sand pack to act as a seal. The remaining annular space was filled with grout and concrete for the pad. All micro-wells were constructed as above-ground wells, with approximately 3 feet of riser above-ground, and a steel locking stick-up vault to protect the wells and assure sample integrity. A summary of the depths and screen intervals for each micro-well is provided in Table 2.

The micro-wells were developed with a peristaltic pump until they produced sediment free water to the satisfaction of the onsite AMEC representatives. Micro-well construction logs are provided in Appendix B.

After construction of the micro-wells was completed, the top of casing elevation of each new micro-well was surveyed relative to an arbitrary elevation with the exception of MW-3, which was accidentally locked, not allowing the crew (different personnel than crew who conducted the assessment) who surveyed the well to access it.

### 4.3.2 *Groundwater Sampling*

Prior to the groundwater sampling event, depth to groundwater measurements were collected from each micro-well associated with the site to determine the groundwater flow direction at the site at the time of the investigation. Groundwater elevation data and micro-well construction details are summarized in Table 4.

Groundwater samples were collected from the nine newly installed micro-wells for analysis by a fixed-base laboratory. Prior to sampling, each well was purged using low flow purging techniques with a peristaltic pump and new HDPE tubing. Field parameters (including temperature, pH, specific conductance, turbidity, dissolved oxygen and oxygen reduction potential) were measured following removal of each well volume (Table 5).

A minimum of three well volumes were purged from each micro-well. After the field parameters stabilized (i.e., two consecutive measurements within 5%) and the turbidity was less than 20 nephelometric turbidity units (NTU) after at least three well volumes, the groundwater sample was collected. If turbidity below 20 NTU could not be attained, attempts were made to purge the well until the turbidity measurements became stable, at which time the groundwater sample was collected. This occurred in two samples collected from micro-wells MW-3 (62.6 NTUs) and MW-4 (35.7 NTUs) where a minimum of 5 volumes was purged before sampling. Also, turbidity below 20 NTU also could not be attained at micro-well MW-7, and in that case the turbidity did not stabilize, but began to gradually increase. All samples with turbidity readings above 20 NTUs

were collected after more than 5 well volumes were purged with approval from FDEP's site manager.

The sample parameters were collected directly through the peristaltic pump using new silicone tubing. In addition, field observations, such as color, odor and sheen, were documented.

The groundwater samples were analyzed for Appendix I Parameters which included VOCs using USEPA Method 8260, Metals using USEPA Method 6010/7470, Cyanide using SM 4500-CN-E, Ammonia using USEPA Method 350.1, Chloride, Nitrate, and Sulfate using USEPA Method 300.0, and Total Dissolved Solids (TDS) by the SM 2540 C method. The micro-well groundwater samples were placed in a cooler with wet ice and sent under standard chain-of-custody protocol to the AEL Orlando, Florida laboratory for analysis. The AEL laboratory reports for the groundwater samples are provided in Appendix A.

## 4.4 Quality Assurance/Quality Control

Pre-cleaned sample bottles were provided by the analytical laboratory and the sampling equipment was cleaned in accordance with the FDEP Comprehensive Quality Assurance Plan (CompQAP). One duplicate groundwater sample (GW-Dup) was collected from micro-well MW-2. Also, a groundwater equipment rinsate blank (GW-Rinsate) was collected. The samples were collected, packaged, preserved and transported in accordance with standard CompQAP protocol to the AEL laboratory in Orlando, Florida the day of sampling. A standard chain-of-custody sheet for all of the samples was maintained. Sampling field notes were recorded in a bound field book.

## 4.5 Investigation-Derived Waste

Investigation derived waste from the sampling effort (soil, purge water, and decontamination fluids) were disposed of in accordance with FDEP and USEPA guidelines. The soil cuttings were returned to the borehole from where they were generated and purge water was disposed of on the ground next to the micro-well from where it was pumped, since the depth to water was less than 5 feet bls.

# 5.0 INVESTIGATION RESULTS

## 5.1 Soil Investigation Results

The soil screening results for methane and the presence of solid waste for the SSA field investigation are summarized in Table 1. Bolded results denote boring locations where garbage, trash, vegetative waste, commercial waste or construction and demolition (C&D) materials (collectively referred to as solid waste for this report) were observed, either on the land surface or in the soil samples collected with the DPT macro-core, which was advanced to a depth of 10 feet bls.

### 5.1.1 *Lithologic Characterization*

Prior to collecting soil samples, a soil boring was advanced to 15 feet bls at the BL001/MW-1 location to collect soil samples for lithologic description. Soil types that can influence the movement of contaminants of concern were of particular interest to be identified for sampling. In that initial boring, the predominant lithology was silty sand from land surface to the terminus of the boring at 15 feet bls. The sandy lithology does not present a confining layer that could inhibit the downward movement of potential contaminants of concern. Water was encountered at approximately 3 feet bls.

### 5.1.2 *Solid Waste and Landfill Debris Delineation*

Forty-three soil samples were collected from across the Brisson Avenue Landfill site for visual observation to delineate the presence of solid waste across the site area. Twenty-five of the 43 samples contained solid waste either in the borehole or at land surface at that location. Solid waste observed included scrap metal, appliances, tires, drums, plastics, vegetative waste and other various items.

It should be noted that the boreholes represented a 2-inch diameter core, and occurrence of surface and subsurface solid waste was observed at some locations in the immediate vicinity but not necessarily in the DPT sample sleeve. Therefore, this data should only be used as a screening tool to indicate the presence and approximated bounds of the landfill debris within the property.

The occurrence of solid waste ranged from obvious wastes at the surface, to borehole sample cores that contained solid waste or encountered refusal or contained no sample recovery, presumably due to subsurface trash and debris. Two adjacent boring locations in particular (BL013 and BL014) both met refusal due to subsurface debris at 7 feet bls, which suggests that landfill wastes are buried at this region of the property. Furthermore, the methane readings obtained from that region of the site were elevated.

The visual determination of solid waste was successful in delineating the observed landfill areas to both the southern and eastern property boundaries. No solid waste was found on the surface or in the DPT sleeves of the boreholes situated on the southernmost or easternmost gridlines. The two northernmost borings (BL037 and BL036) were also clear of observable solid waste, however, delineation of the northern property line was not completed to the western boundary as a ravine transects the property, limiting access to the northwest corner. Solid waste was observed in the majority of boreholes along the western gridline and each borehole situated along the ravine that transverses the site to the northeast. The ravine appeared to be approximately 8 to 10 feet wide, and likely inhibited landfill machinery from performing landfill activities to the west of its path. This corresponds closely to the estimated limits of landfilling operations based on historical aerial photography that was established prior to this field assessment event. With the

exception of micro-well MW-7, in which a temporary land-bridge was utilized to traverse the ravine to a limited patch of dry land, no access west of the ravine was available as the area appeared to be heavily flooded.

The visual solid waste observations are detailed in Table 1 and shown on Figure 4.

### 5.1.3 *Soil Methane Screening Results*

Forty-three soil screening borings (which include five step-out borings) were advanced at the Brisson Avenue Landfill site during the SSA field investigation. All 43 boreholes were screened for methane directly from the open borehole, as were eight of the nine monitoring wells. The methane results show that of the 51 total screening locations, 24 exhibited a methane reading higher than 100 parts per million (ppm). At three locations (BL007, BL008 and BL014) the concentrations of methane detected by the microFID unit exceeded the maximum result of 50,000 ppm, as both the filtered and unfiltered measurements exceeded the maximum microFID unit measurements. This region of the property with elevated methane readings corresponds to the same areas where visual observations indicated historical landfilling activities occurred. Soil screening locations and microFID results are shown on Figure 4.

## 5.2 Groundwater Investigation Results

The groundwater sample analytical results were compared to Florida's Groundwater Cleanup Target Levels (GCTLs) contained in Chapter 62-777, FAC and State groundwater standards in Chapter 62-550, FAC. Please note that the criteria contained in Chapter 62-777, FAC, only apply as standards to the cleanup of contaminated sites governed by this statute and the standards in Chapter 62-550, FAC, are only applicable to specific groundwater classifications.

Tables 4 & 5 summarize the analytical results for groundwater samples collected at the Brisson Avenue Landfill site. Analytical results are also shown on Figure 6. Bolded results in the table and figures are used to denote target analytes that were detected at concentrations above their applicable GCTLs.

### 5.2.1 *Groundwater Field Parameters*

Final groundwater field parameter measurements including pH, specific conductance, temperature, dissolved oxygen (DO), turbidity and oxygen reduction potential (ORP) are summarized in Table 3. The pH values for the samples ranged from 4.38 to 6.84 standard units (SUs). Seven of the nine groundwater samples collected from the newly installed micro-wells exhibited pH values that were below the acceptable range of the Florida secondary drinking water standard (SDWS) of 6.5 to 8.5 SUs. Specific conductance measurements for the samples ranged from 141 micromhos per centimeter (µmhos/cm) to 1,235 µmhos/cm. The temperature measurements ranged from 20.48 degrees Celsius (°C) to 25.77 °C. Dissolved oxygen measurements ranged from 0.49 milligrams per liter (mg/l) to 2.27 mg/l. The turbidity values were above 20 nephelometric turbidity units (NTUs) in three of the nine micro-wells wells that were sampled. Turbidity below 20 NTUs could not be attained in the groundwater samples collected from MW-3 (62.6 NTUs), MW-4 (35.7 NTUs) and MW-7 (230 NTUs).

### 5.2.2 *Groundwater Analytical Results*

Groundwater samples were collected and submitted for laboratory analysis from nine newly installed micro-wells (MW-1 through MW-9) for fixed-base laboratory analysis.

***Volatile Organic Compounds (VOCs)*** were not detected in any of the groundwater samples collected from the site at concentrations above their respective laboratory method detection limits

except in the groundwater sample collected from MW-3 for chlorobenzene (5.3 µg/l) (Table 4 and Figure 6). The concentration of chlorobenzene detected in this sample is below the FDEP's GCTL of 100 µg/l.

***Indicator Parameters*** that were analyzed for include chloride, nitrate, sulfate, ammonia, cyanide and total dissolved solids (TDS). Of those parameters, only chloride, ammonia and TDS were detected in any of the groundwater samples collected from the newly installed micro-wells at concentrations above the method detection limit for the given parameter. Of the detections above MDL, only one sample reported a concentration above the GCTL for an indicator parameter. The groundwater sample collected from micro-well MW-3 contained ammonia (7,800 µg/l) at a concentration that exceeded the GCTL of 2,800 µg/l (Figure 6). Micro-well MW-3 is along the southern property boundary, adjacent to the right-of-way of East Lake Mary Boulevard. Micro-well MW-3 is situated downgradient of an area of interest as determined in the soil screening portion of the assessment, comprised of boring locations BL007, BL008 and BL014. No groundwater samples were collected south of the property line.

***Metals*** were detected in each of the groundwater samples collected from the nine newly installed micro-wells at the Brisson Avenue Landfill site. Of the detections above the MDLs, only one sample reported a concentration above the GCTL for a metal. The groundwater sample collected from micro-well MW-9 contained lead (30 µg/l) at a concentration that exceeded the GCTL of 15 µg/l (Figure 6). Micro-well MW-9 is located onsite, north of the ravine, and is hydraulically upgradient of the former landfill. It should be noted that lead was detected at a lower concentration just above the laboratory MDLs (8.0 I µg/l) in the groundwater equipment rinsate blank.

## 5.3 Quality Assurance/Quality Control

One duplicate groundwater sample was collected in conjunction with the groundwater sampling activities conducted at the Brisson Avenue Landfill site. The analytical results of the duplicate sample (GW-DUP) were comparable to the results of the original sample collected from micro-well MW-2 (Tables 4 and 5).

A groundwater rinsate blank (GW-rinsate) was collected from new HDPE sampling equipment prior to sampling. Ten metals and two indicator parameters were detected in the rinsate sample, at concentrations just above the laboratory method detection limits.

## 5.4 Site Hydrogeology

Preliminary groundwater flow direction prior to the assessment activities was based entirely on previous assessment data, which showed groundwater flow direction to the southeast. During the activities conducted onsite during this field event, this preliminary flow direction was confirmed.

Depth to groundwater measurements were made in nine micro-wells on December 4, 2014 (Table 2). The depth to water in the shallow aquifer zone wells ranged from approximately 4.93 to 9.21 feet below top of casing (btoc). Each micro-well has a stick-up riser which is approximately 3.5 feet above land surface. Interpretation of the groundwater elevation data indicates that the groundwater flow at the Brisson Avenue Landfill site was generally towards the southeast which is consistent with historical groundwater flow directions (Figure 5).

# 6.0 SUMMARY AND CONCLUSIONS

Based on the data collected from the soil screening and groundwater samples for this SSA, the following conclusions can be made.

## 6.1 Soil Summary

Solid waste was observed on either the surface or in the soil boring locations across a large majority of the subject property. The southern and eastern borders of the property appeared to be clear of solid waste, both visually on the surface, and no observed debris in the soil borings at the locations which make up those borders. It is also unlikely that landfilling occurred in the northwestern portion of the site based on historical aerial photos and observations made in the field. The soil boring locations where solid waste was observed at the site are shown on Figure 4.

Methane screening readings exceeded 100 ppm in 24 of the 52 soil screening locations. Of those, three (BL007, BL008 and BL014) exceeded 50,000 ppm in the filtered reading, representing a strong presence of methane.

Observations of refusal for the DPT rig at approximately 7 feet bls as well as exponentially higher methane readings in the boring locations BL007, BL008 and BL014, may indicate the presence of buried wastes, the total depth of which is unknown.

Based on the historical information (aerial photos, file documents) and observations made during the soil boring assessment, the waste disposal area is situated south, southeast and east of the ravine shown on Figure 4. Vertical profiling of solid waste at the site during this assessment only included land surface to 10 feet bls. Therefore, it is unknown if landfilling activities have impacted the soils below that vertical limit.

## 6.2 Groundwater Summary

Groundwater samples were collected and submitted for laboratory analysis from nine newly installed micro-wells (MW-1 through MW-9) for fixed-base laboratory analysis. The samples were analyzed for the Appendix I parameters.

Samples collected from the nine micro-wells did not contain VOCs above the respective GCTLs for each of the analytes. Only one detection of chlorobenzene in micro-well MW-3 exceeded the MDL, but was below the GCTL for chlorobenzene.

Of the six indicator parameters, only chloride, ammonia and TDS were detected in any of the groundwater samples collected from the newly installed micro-wells at concentrations above the MDL for the given parameter. The only exceedence above GCTLs occurred in the sample collected from micro-well MW-3 where the reported concentration for ammonia (7,800 µg/l) exceeded the GCTL for ammonia of 2,800 µg/l per Chapter 62-777, FAC. This well is located along the southern border of the property.

However, on December 3, 2012, FDEP's Director of the Division of Waste Management (DWM) issued a memorandum regarding monitoring and evaluation of ammonia in groundwater at solid waste management facilities. The memorandum notes that the Minimal Risk Level (MRL) oral reference dose used to calculate the GCTL is no longer supported by the Agency for Toxic Substances and Disease Registry's Toxicological Profile for ammonia. As a result of the toxicological profile changes, FDEP's DWM issued new guidelines regarding the detection of ammonia above GCTLs. The new guidelines state that ammonia is a minimum criteria contaminant for groundwater at permitted and non-permitted solid waste facilities only if there is sufficient scientific reasons to believe that ammonia in groundwater is discharging to surface

water bodies and likely to cause a violation of surface water standards. Based on the location of MW-3, the groundwater flow direction and the 2012 guidelines issued by the DWM, the ammonia detected in groundwater is not likely to cause a violation of surface water standards and is therefore, not considered to be a contaminant of concern at the site.

Only one sample reported a concentration above the GCTL for a metal. The exceedence occurred in the sample collected from micro-well MW-9 where the reported concentration for lead (30 µg/l) exceeded the GCTL of 15 µg/l. However, the detection of lead in micro-well MW-9 is not believed to be attributable to past landfilling operations because the well is located hydraulically upgradient of the former landfill, and lead was not detected above GCTLs in any of the downgradient wells. It should also be noted that lead was detected at a lower concentration just above the laboratory MDLs (8 I µg/l) in the groundwater equipment rinsate blank. It should also be noted that the northwest corner of the property, upgradient of MW-9, was not accessible at the time of the assessment activities.

Depth to groundwater measurements ranged from approximately 4.93 to 9.21 feet below top of casing (btoc). Interpretation of the groundwater elevation data indicates that the groundwater flow at the Brisson Avenue Landfill site was generally towards the southeast, which is consistent with historical flow directions.

## 7.0 REMEDIAL ALTERNATIVES EVALUATION

AMEC is providing a review and analysis of available technologies to determine the most viable and cost effective remedial alternative. The goal of the active remediation is to reduce site concentrations of contaminants of concern below SCTLs and GCTLs as defined in Chapter 62-770, FAC.

Several remedial technologies were considered to address soil and groundwater contamination at the subject site. A number of factors including potential effectiveness, cleanup time, property access issues and cost of implementation were considered before choosing the remedial technologies for this site. Future land use will also be a key factor when choosing a cleanup remedy.

### 7.1 Remedial Alternatives for Soil

The following options were considered to address the remediate soils at the site and address landfill closure options:

#### 7.1.1 No Further Action (NFA)

No Further Action (NFA) is the most cost effective option if land use does not change. However, this remedy option may not be a viable option if local ordinances require the removal of solid waste or debris at land surface.

#### 7.1.2 Landfill Surficial Trash Removal

Significant quantities of surficial trash, debris and solid waste was observed across the majority of the site. The surficial solid waste included refrigerators, washer, dryers, auto metal parts, tires and general trash. Also, four dirt piles covered with trash was observed. Surficial trash and debris removal could be an interim measure to ensure the surficial trash is not a continuing source. It is estimated that approximately 20 to 25 roll-offs bins would be required to clear the site. The trash and debris would need to be disposed of at an approved landfill. Upon, clearing the surficial trash, AMEC recommends posting signs to prevent any further dumping on the subject site.

**Estimated Cost - $100,000**

#### 7.1.3 Surficial Trash and Solid Waste Removal (Landfill Closure)

Significant quantities of surficial trash, debris and solid waste was observed across the majority of the site. The surficial solid waste included refrigerators, washer, dryers, auto metal parts, tires and general trash. Also, four dirt piles covered with trash was observed. Surficial trash and debris removal could be an interim measure to ensure the surficial trash is not a continuing source. It is estimated that approximately 15 to 20 roll-offs bins would be required to clear the site. The trash and debris would need to be disposed of at an approved landfill. A protective soil layer at least 24 inches thick shall be placed on top of the geomembrane. Material specifications, installation methods, and compaction specifications, which may include a drainage layer between the geomembrane and the protective soil layer, shall be adequate to protect the barrier layer from root penetration, resist erosion and remain stable on the final design slopes of the landfill. This soil layer should include topsoil or soils that will sustain vegetative growth.

**Estimated Cost - $6,000,000**

### 7.1.4 Excavation and Disposal (Landfill Redevelopment)

Excavation is a highly effective method to remediate the contamination source in areas where buildings or other structures do not obstruct the removal of affected soils. Soils can be removed with conventional earth-moving equipment such as a backhoe and front-end loader. Where necessary, soils can be removed with shovels and rakes to prevent damage to any nearby structures or monitoring wells. Once removed, the soils are disposed of in a permitted landfill and replaced with clean fill. Soil excavation and disposal will enhance the cleanup time; however this remedy is not cost effective.

It is estimated that approximately 871,200 square feet of the landfill material will need to be excavated to 10 feet below land surface. Approximately 322,667 cubic yards (484,000 tons) of soil mixed with trash and debris would need to excavated and disposed to the nearest approved landfill. The excavated area would be backfilled and compacted with approximately 300,000 cubic yards of clean A-3 soil. Please refer to the FDEP guidance on the development of old landfills at the following link: (http://dep.state.fl.us/waste/quick_topics/_publications/shw/solidwaste/Dump-Guidance-03Feb11.pdf). In the guidance, Section 4.3.1 discusses how to prepare an Excavation and Disposal Plan (EDP).

**Estimated cost - $24,000,000.**

## 7.2 Remedial Alternatives for Groundwater

The following options were considered to address the groundwater at the site:

### 7.2.1 No Further Action (NFA)

There are a total of nine micro-wells that were sampled during the 2014 site assessment. The groundwater analytical results from MW-3 indicated that ammonia exceeded the groundwater cleanup target level (GCTL) of 2.8 mg/L per Chapter 62-777, FAC. However, on December 3, 2012, FDEP's Division of Waste Management issued a guidance memorandum regarding ammonia in groundwater at permitted and non-permitted solid waste facilities. The guidelines noted that ammonia detected in groundwater is not considered a chemical of concern if it does not impact a surface water body. Based on the location of MW-3, the groundwater flow direction and DEP policies, the ammonia detected in groundwater at the site is not likely to impact surface water. For this reason, the ammonia is not considered to be a contaminant of concern. The FDEP's December 3, 2012 policy memorandum can be found at the following link: http://www.dep.state.fl.us/waste/quick_topics/publications/shw/solid_waste/policymemos/SWM-13-10.pdf).

The 2014 groundwater sampling results also reported a concentration of lead above the GCTL in one micro-well (MW-9). The lead exceedence occurred in the sample collected from micro-well MW-9, where the reported concentration for lead (30 µg/l) exceeded the GCTL of 15 µg/l. However, the detection of lead in micro-well MW-9 is not believed to be attributable to past landfilling operations because the well is located hydraulically upgradient of the former landfill, and lead was not detected above GCTLs in any of the downgradient wells.

Based on the 2014 groundwater sampling results, it appears that past landfill operations have had minimal impacts to the groundwater. However, it is recommended that one more round of groundwater data should be collected from micro-wells MW-6, MW-7, MW-8 and MW-9. If similar results are reported compared to the current data, then no further action would be appropriate with regards to groundwater at the site.

### 7.2.2 Groundwater Monitoring

If the follow up groundwater sampling recommended above shows elevated lead concentrations in downgradient wells, implementation of a semi-annual or annual groundwater monitoring plan may be required.

## 7.3 Remedial Alternatives for Landfill Gas

The following options were considered to address the landfill gas (LFG) abatement options:

### 7.3.1 No Further Action (NFA)

Based on discussions with FDEP, LFG is not a concern at this site if land use does not change. However, LFG should be evaluated further if the site is redeveloped. AMEC recommends including a discussion about addressing LFG in the Health and Safety Plan prior to conducting any future construction/development activities at the site.

## 8.0 RECOMMENDATIONS

As part of FDEP's task assignment, AMEC was tasked to complete a Remedial Alternative Evaluation (RAE) to evaluate cleanup options costs estimates to implement the remedial alternatives. The RAE is presented in Appendix A and considers potential remedial alternative options to address soil and groundwater impacts as well as methane abatement. The remedial options evaluated ranged from no further action to removal of all wastes at the site. Costs to implement the corrective measures will vary considerably based on future land use (i.e. agricultural, commercial or residential) and/or future redevelopment plans.

Based on the SSA and RAE findings, AMEC believes that the most cost effective option is no further action if the follow up groundwater sampling recommended below verifies that the lead detected in the upgradient well is not related to an onsite source of contamination. However, this option may not be viable to meet local ordinances or if land use changes. The most viable cleanup and cost effective option to address soils at the site would be to implement a removal of solid waste and debris at the land surface. Other remedial actions options considered include implementation of a landfill closure action that would involve the removal of debris and trash at land surface, and placement of 2 feet of clean fill or an impermeable surface (i.e. pavement, parking lot, buildings, etc.) over the buried wastes; and removal of all surface and buried waste at the site. It should be noted that remedies that include the placement of landfill cover (clean fill, Impermeable surface) could be implemented in conjunction with future redevelopment plans to be more cost effective.

Although groundwater sampling results showed ammonia and lead above their respective GCTLs in one sample each, the ammonia impact appears to be minimal and are not impacting any surface water bodies, and the detection of lead in the upgradient well is not believed to be related to past landfill activities. For these reasons, groundwater qualify at the site does not appear to be a concern. However, AMEC recommends that monitoring wells MW-6, MW-7, MW-8 and MW-9 be re-sampled for metals to verify the conclusion that the lead detected in the upgradient well is not related to past landfilling operations. If similar results are reported compared to the current data, then no further action would likely be appropriate in regards to groundwater at the site.

Landfill gas may be an issue at the site in the future if the property is developed. However, no additional assessment is needed at this time to address the methane gas detected at the site if land use does not change. If the site is developed, a structural engineering evaluation should be completed to evaluate potential unstable subsurface conditions and landfill gas issues before constructing any buildings, structures or impermeable surfaces at the site.

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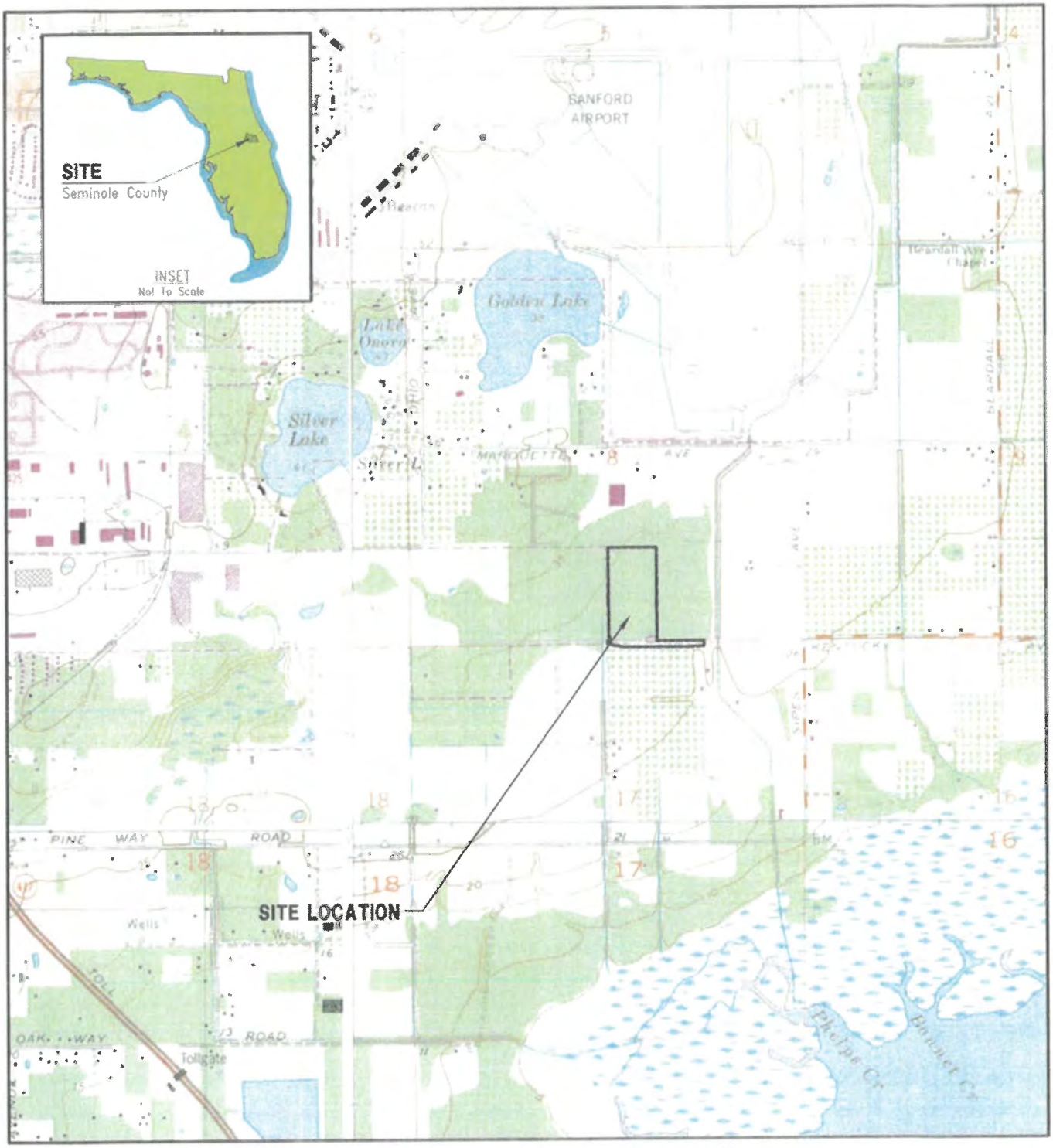
# FIGURES




**SOURCE:**
USGS Quadrangles:
SANFORD, FLA., 1965, Photorevised 1988
OSTEEN, FLA., 1965, Photorevised 1980
OVIEDO, FLA., 1956, Photorevised 1980, Photoinspected 1984
CASSELBERRY, FL., 1994


APPROXIMATE SITE LOCATION
Section 8,
Township 20 South, Range 31 East
Latitude: 28° 45' 32.52" North
Longitude: 81° 14' 15.53" West

**LEGEND**
Approximate site boundary

0 1,000 2,000
SCALE: 1 INCH = 2,000 FEET

## SITE VICINITY MAP

PLOTTED: January 20, 2015 - 9:47 AM, BY: Burton, George A.

| NO. | DATE | REVISIONS |
|---|---|---|
| 0 | Jan-15 | Initial Submittal |

| DESIGNED | DRAWN | CHECKED | DATE |
|---|---|---|---|
| CV | GB | | |

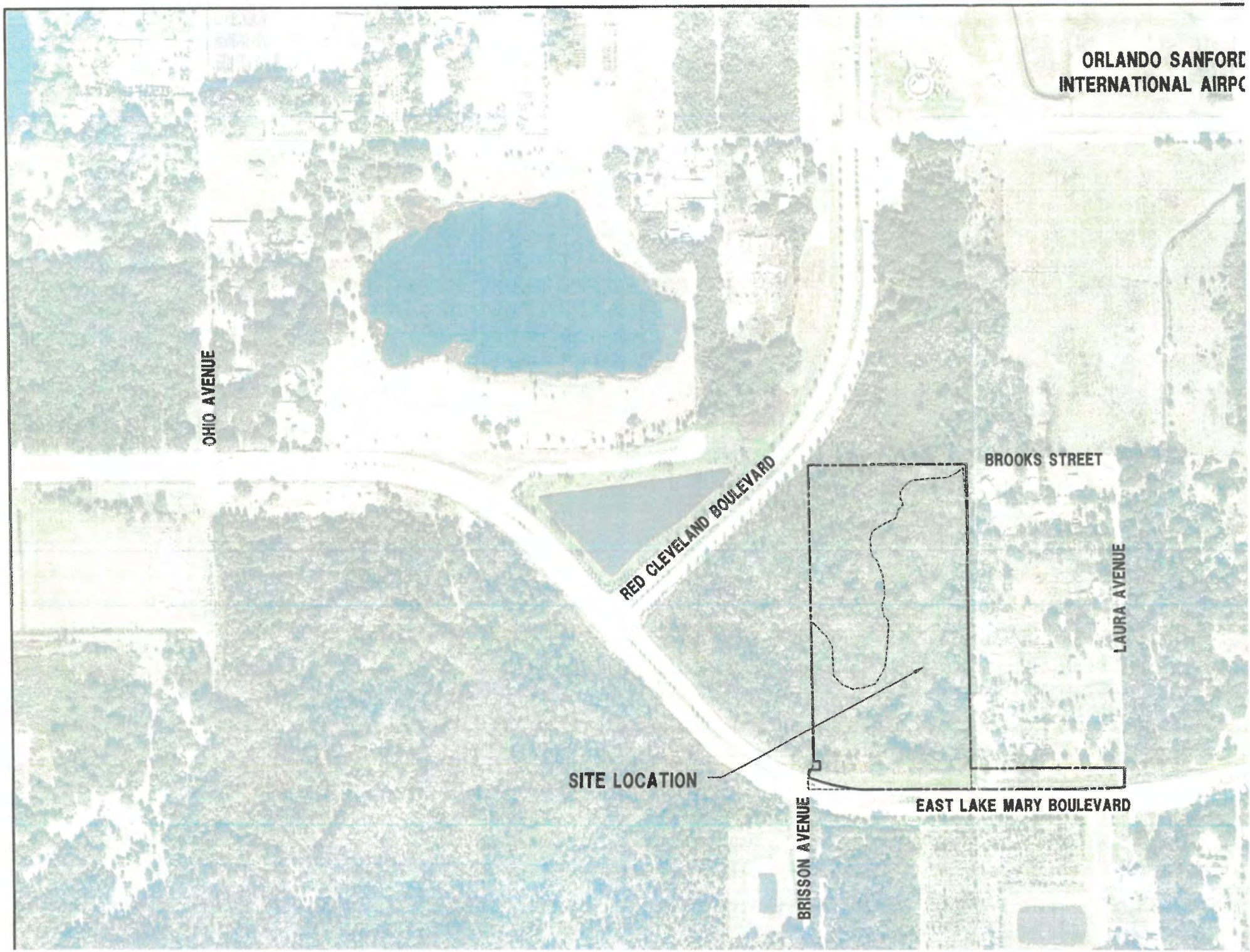
P:\CAD\GEORGIA\Brisson Landfill\SR\FIG-1.dwg

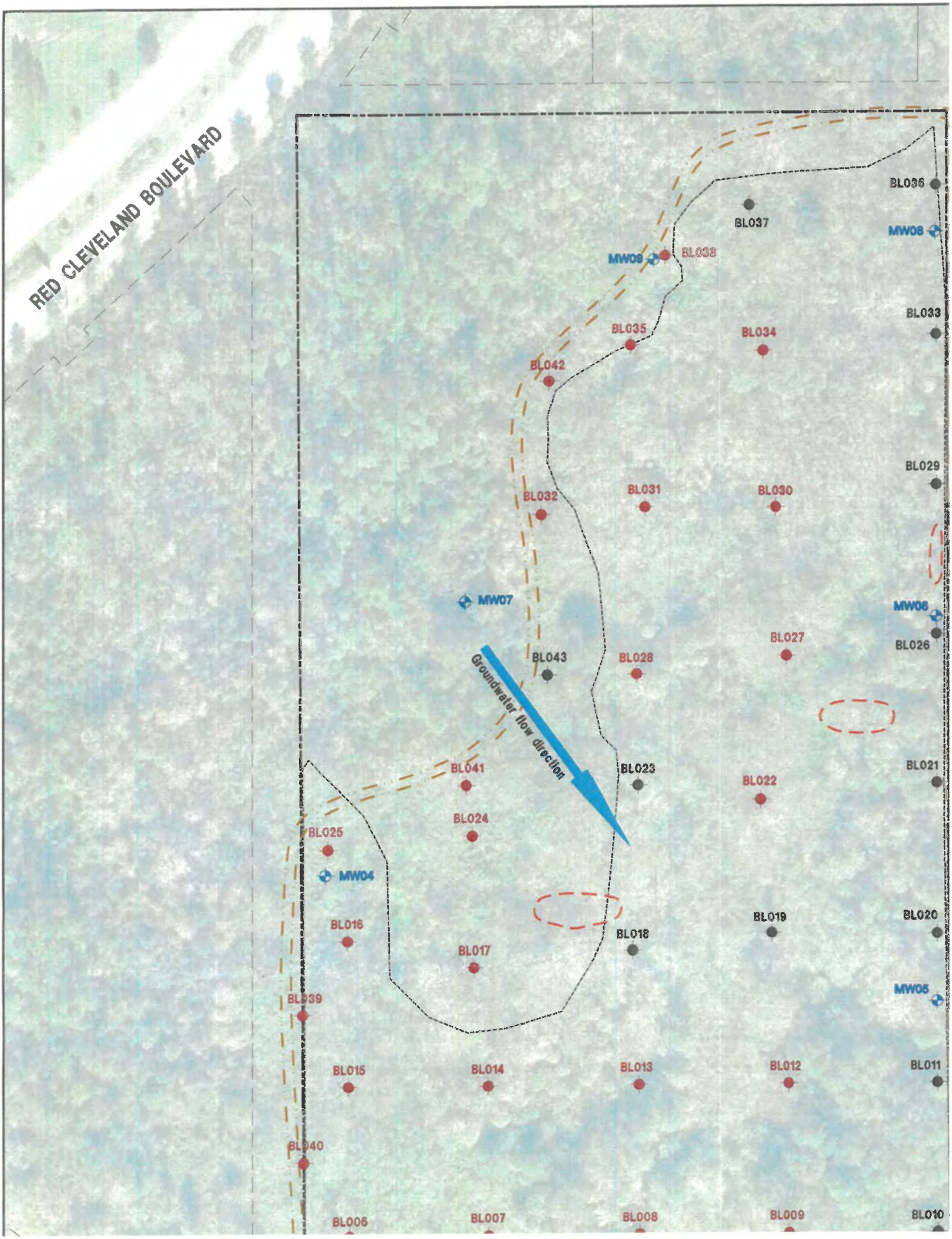
amec
Environment & Infrastructure, Inc.
Tallahassee, Florida
850-656-1293

**BRISSON AVENUE LANDFILL**
SUPPLEMENTAL SITE ASSESSMENT REPORT
SANFORD
SEMINOLE COUNTY, FLORIDA

**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION**

FIGURE: 1


ORLANDO SANFORD
INTERNATIONAL AIRPO
OHIO AVENUE
RED CLEVELAND BOULEVARD
BROOKS STREET
LAURA AVENUE
SITE LOCATION
EAST LAKE MARY BOULEVARD
BRISSON AVENUE


RED CLEVELAND BOULEVARD
BL036
BL037
MW08
MW08
BL038
BL033
BL035
BL034
BL042
BL029
BL032
BL031
BL030
MW07
MW06
BL027
BL026
BL043
BL028
Groundwater flow direction
BL041
BL023
BL021
BL022
BL024
BL025
MW04
BL016
BL019
BL020
BL018
BL017
MW05
BL039
BL015
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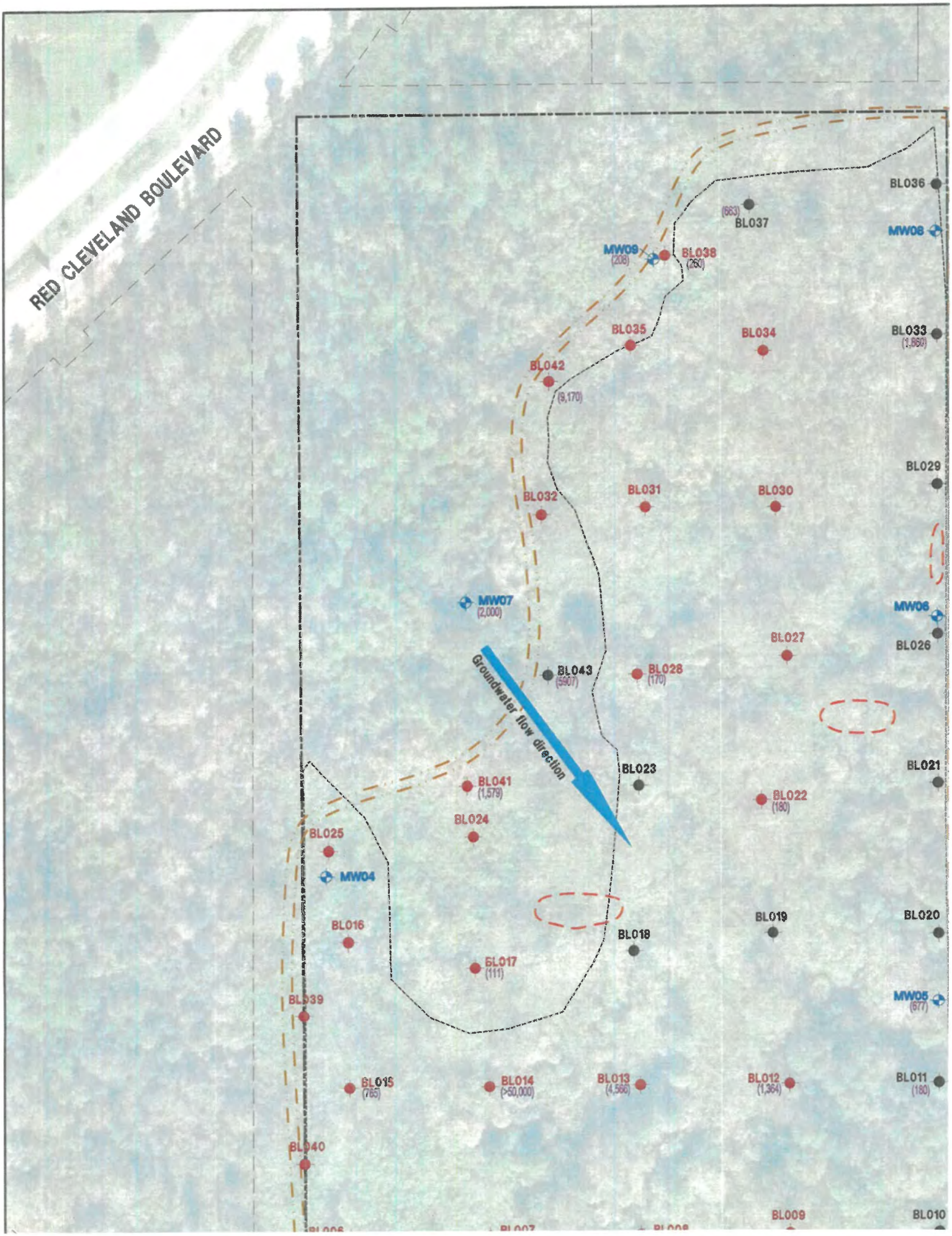
BL009
BL010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BL037
MW08
MW09
(208)
BL038
(260)
BL035
BL034
BL033
(1,860)
BL042
(9,170)
BL029
BL032
BL031
BL030
MW07
(2,000)
MW06
BL027
BL026
Groundwater flow direction
BL043
(5907)
BL028
(170)
BL023
BL021
BL041
(1,579)
BL022
(180)
BL024
BL025
MW04
BL016
BL019
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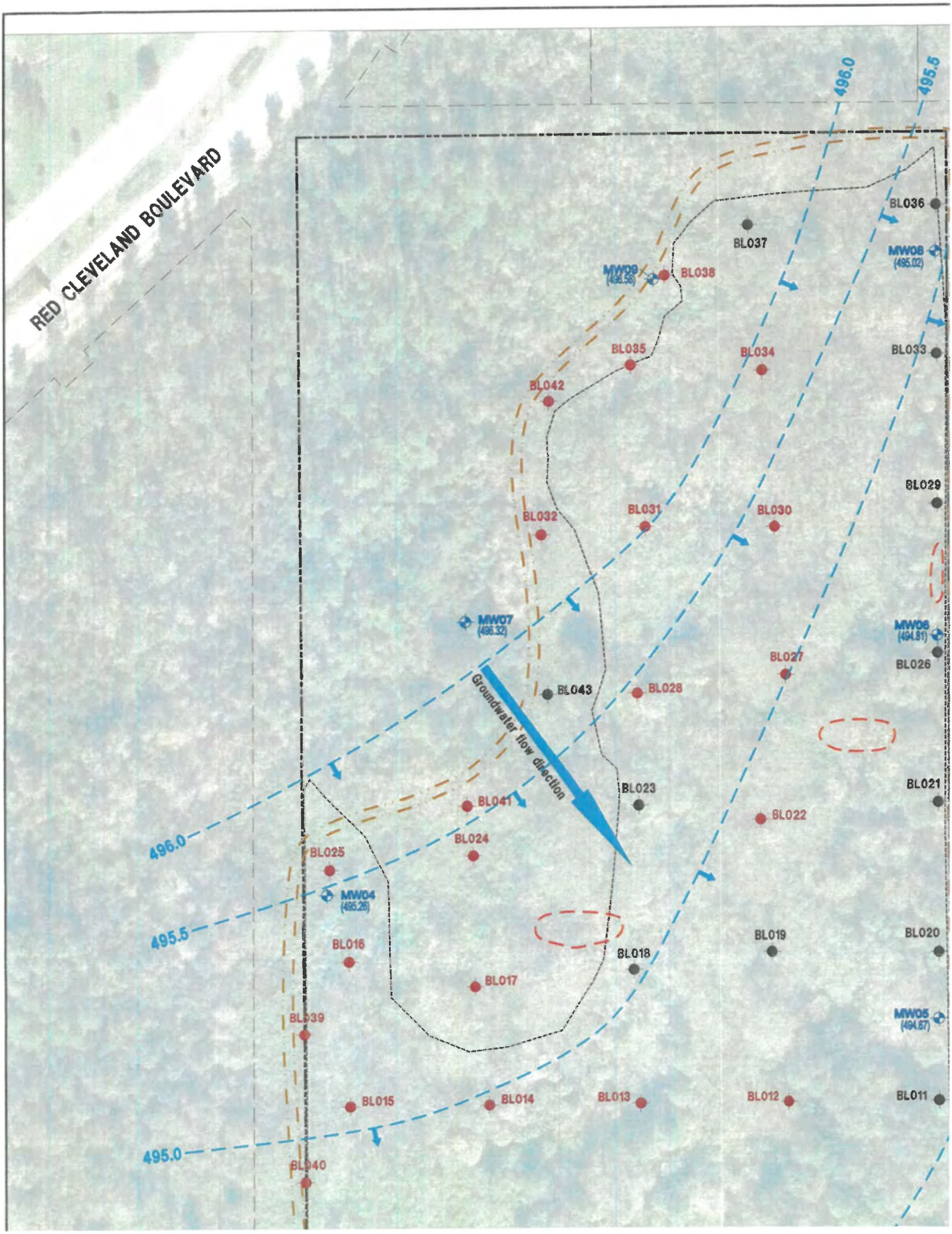
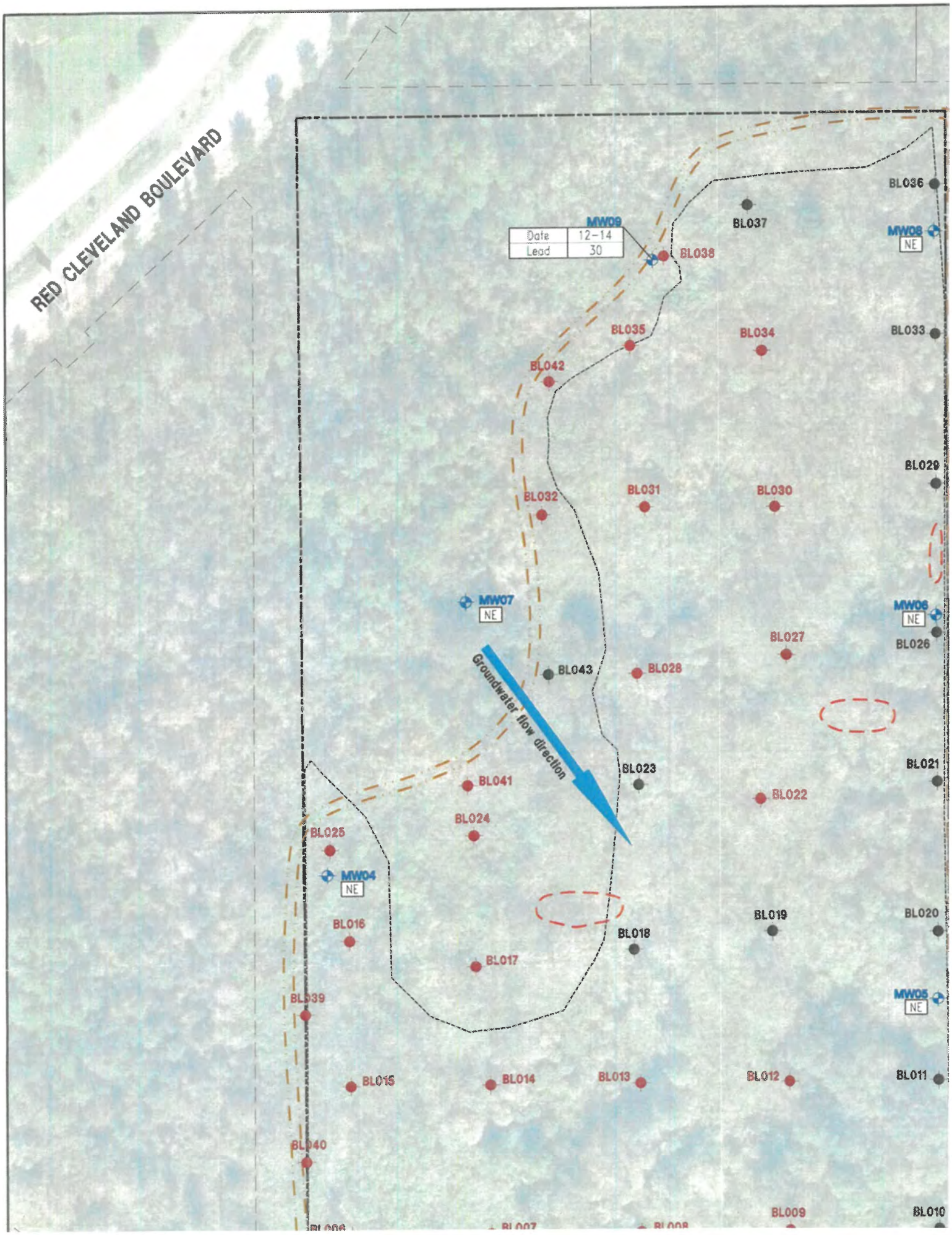
(677)
BL015
(65)
BL014
(>50,000)
BL013
(4,566)
BL012
(1,364)
BL011
(180)
BL040
BL009
BL010


RED CLEVELAND BOULEVARD
496.0
495.5
BL036
BL037
MW08
(495.02)
MW09
(495.58)
BL038
BL035
BL034
BL033
BL042
BL029
BL032
BL031
BL030
MW07
(496.32)
MW06
(494.81)
BL027
BL026
BL043
BL028
Groundwater flow direction
BL023
BL021
BL041
BL022
BL024
BL025
MW04
(495.26)
BL019
BL020
BL016
BL018
BL017
MW05
(494.67)
BL039
BL015
BL014
BL013
BL012
BL011
BL040


RED CLEVELAND BOULEVARD
MW09
Date 12-14
Lead 30
BL038
BL036
BL037
MW08
NE
BL035
BL034
BL033
BL042
BL029
BL032
BL031
BL030
MW07
NE
MW06
NE
BL027
BL026
BL043
BL028
Groundwater flow direction
BL023
BL021
BL041
BL022
BL024
BL025
MW04
NE
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BL019
BL020
BL018
BL017
BL039
MW05
NE
BL015
BL014
BL013
BL012
BL011
BL040
BL009
BL010

# TABLES

## Table 1
## Solid Waste Observations and Methane Screening for Soil Borings

Supplemental Site Assessment Report
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Sample ID | Total OVA | With Filter (Methane) | Net OVA | Notes | Sample ID | Total OVA | With Filter (Methane) | Net OVA | Notes |
|---|---|---|---|---|---|---|---|---|---|
| BL001 | 28 | 4 | 24 | @ MW-1 | BL027 | 0 | 0 | 0 | Trash in auger |
| BL002 | 60 | 22 | 38 | | BL028 | 305 | 170 | 135 | Refusal @ 4' |
| BL003 | 1,025 | 652 | 373 | | BL029 | 20 | 2 | 18 | |
| BL004 | 7,264 | 2,600 | 4,664 | | BL030 | 0 | 0 | 0 | Surface trash |
| BL005 | 32 | 0 | 32 | | BL031 | 5 | 0 | 5 | Minimal trash |
| BL006 | 14,781 | 4,700 | 10,171 | | BL032 | 60 | 50 | 10 | |
| BL007 | >50,000 | >50,000 | 0 | No recovery | BL033 | 1,919 | 1,860 | 59 | |
| BL008 | >50,000 | >50,000 | 0 | Trash in sleeve | BL034 | 0 | 0 | 0 | Diesel Drum nearby |
| BL009 | 30 | 20 | 10 | Little trash | BL035 | 28 | 76 | - | |
| BL010 | 10 | 4 | 6 | | BL036 | 0 | - | 0 | |
| BL011 | 190 | 150 | 40 | | BL037 | 777 | 663 | 114 | |
| BL012 | 1,587 | 1,364 | 223 | Trash in sleeve | BL038 | 332 | 260 | 72 | |
| BL013 | 7,077 | 4,566 | 2,511 | Refusal @ 7' | BL039 | 10 | 0 | 10 | |
| BL014 | >50,000 | >50,000 | 0 | Refusal @ 7' | BL040 | 165 | 88 | 77 | |
| BL015 | 1,158 | 765 | 393 | | BL041 | 1,824 | 1,579 | 245 | N step out, tires |
| BL016 | 0 | - | 0 | | BL042 | 7,650 | 9,170 | - | W step out, surface |
| BL017 | 111 | 111 | 0 | | BL043 | 1,065 | 590 | 475 | W step out |
| BL018 | 6 | 6 | 0 | | MW01 | 28 | 4 | 24 | @ BL001 |
| BL019 | 65 | 48 | 17 | | MW02 | 878 | 878 | 0 | |
| BL020 | 0 | 0 | 0 | | MW03 | 229 | 115 | 114 | |
| BL021 | 95 | 77 | 18 | | MW04 | - | - | - | |
| BL022 | 405 | 180 | 225 | Trash in auger | MW05 | 2,016 | 677 | 1,339 | |
| BL023 | 2 | 0 | 2 | | MW06 | 17 | 22 | - | |
| BL024 | 67 | 60 | 7 | | MW07 | 1,700 | 2,000 | - | |
| BL025 | 2 | 0 | 2 | | MW08 | 42 | 20 | 22 | |
| BL026 | 2 | 0 | 2 | | MW09 | 305 | 208 | 97 | |

Notes: All results reported in parts per million (ppm).
**Bold Red** = Garbage, trash, vegetative waste, commercial waste or C&D material (solid waste) was observed at the boring location either in the hand auger (0-5 ft bls) or in the DPT sleeve (5 to10 feet bls).
Shaded columns = Targeted methane response achieved with filtered reading

## Table 2
## Micro-Well Completion Summary and Depths to Groundwater
## (December 4, 2014)

Supplemental Site Assessment Report
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Micro-well | Total Depth (feet bls) | Screen Interval (feet bls) | Top of Casing Elevation | Depth To Groundwater (feet btoc) | Groundwater Elevation (feet btoc) |
|---|---|---|---|---|---|
| MW-1 | 12.41 | 2.41 – 12.41 | 500.49 | 6.44 | 494.05 |
| MW-2 | 11.60 | 1.60 – 11.60 | 500.00 | 5.15 | 494.85 |
| MW-3 | 11.30 | 1.30 – 11.30 | ** | 4.93 | ** |
| MW-4 | 11.90 | 1.90 – 11.90 | 504.47 | 9.21 | 495.26 |
| MW-5 | 11.00 | 1 - 11 | 500.78 | 6.11 | 494.67 |
| MW-6 | 11.80 | 1.80 – 11.80 | 500.30 | 5.49 | 494.81 |
| MW-7 | 10.90 | 0.90 – 10.90 | 501.72 | 5.40 | 496.32 |
| MW-8 | 11.10 | 1.10 – 11.10 | 501.71 | 6.69 | 495.02 |
| MW-9 | 10.95 | 0.95 – 10.95 | 501.51 | 4.93 | 496.58 |

Notes: Top of casing elevations are set to an arbitrary elevation of 500 feet (see MW-2)
bls = below land surface.
btoc = below top of casing
** = top of casing elevation was not determined at the time of the survey

## Table 3
## Final Field Parameter Measurements

Supplemental Site Assessment Report
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Sample ID | Micro-well | pH (standard units) | Specific Conductance (µmhos/cm) | Temperature (° C) | Turbidity (NTU) | Dissolved Oxygen (mg/l) | ORP (milliVolts) |
|---|---|---|---|---|---|---|---|
| MW-1 | MW-1 | 6.33 | 645 | 22.60 | 9.75 | 0.99 | 29.41 |
| MW-2 | MW-2 | 6.84 | 1235 | 23.61 | 9.50 | 0.59 | -74.3 |
| MW-3 | MW-3 | 6.25 | 600 | 25.77 | 62.6 | 0.49 | -35.0 |
| MW-4 | MW-4 | 6.19 | 1031 | 22.29 | 35.7 | 1.09 | 17.3 |
| MW-5 | MW-5 | 6.51 | 1130 | 22.34 | 7.67 | 1.07 | -60.3 |
| MW-6 | MW-6 | 5.78 | 284 | 20.48 | 4.32 | 2.27 | 90.2 |
| MW-7 | MW-7 | 4.38 | 141 | 22.15 | 230 | 1.21 | 156.3 |
| MW-8 | MW-8 | 6.15 | 590 | 21.10 | 9.93 | 1.72 | 41.0 |
| MW-9 | MW-9 | 6.28 | 439 | 21.23 | 9.65 | 0.98 | -32.0 |

Notes: Reported parameters are the final readings recorded after all of the parameters had stabilized within their respective criteria.
Micro-well MW-7 never achieved turbidity under 10 NTU. Sampling was approved by AMEC project manager after more than 16 volumes had been purged.
µmhos/cm = micromhos per centimeter.
°C = Degrees Celsius
NTU = nephelometric turbidity units.
mg/l = milligrams per liter.
ORP = Oxygen Reduction Potential

## Table 4
## Summary of Laboratory Analytical Results for Groundwater Samples for VOCs and Indicator Parameters

Supplemental Site Assessment Report
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Analyte (µg/l) | MW-1 | MW-2 | MW-3 | MW-4 | MW-5 | MW-6 | MW-7 | MW-8 | MW-9 | GW-Rinsate | GW-DUP | GCTL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Volatile Organic Aromatics** | | | | | | | | | | | | |
| Benzene | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | **1** |
| Chlorobenzene | 0.69 U | 0.69 U | 5.3 | 0.69 U | 0.69 U | 0.69 U | 0.69 U | 0.69 U | 0.69 U | 0.69 U | 0.69 U | **100** |
| cis-1,2-Dichloroethene | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | **70** |
| trans-1,2-Dichloroethene | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | 0.59 U | **100** |
| Ethyl Benzene | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | 0.38 U | **30** |
| Tetrachloroethene (PCE) | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | 0.48 U | **3** |
| Toluene | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | 0.49 U | **40** |
| Trichloroethene (TCE) | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | 0.74 U | **3** |
| Vinyl Chloride | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | 0.45 U | **1** |
| Xylenes, total | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | **20** |
| **Indicator Parameters** | | | | | | | | | | | | |
| Chloride (as Cl) | 54000 | 18000 | 29000 | 51000 | 53000 | 23000 | 26000 | 54000 | 30000 | 780 U | 17000 | **250000** |
| Ammonia (as N) | 800 | 2000 | **7800** | 2400 | 13000 | 1700 | 250 | 870 | 1200 | 20 | 2200 | **2800** |
| Total Diss. Solids (TDS) | 450000 | 800000 | 410000 | 690000 | 630000 | 200000 | 190000 | 450000 | 290000 | 16000 | 790000 | **n/a** |

Notes: GCTL = Florida Groundwater Cleanup Target Level per Chapter 62-777, FAC and Chapter 62-550 FAC
U = Indicates that the compound was analyzed for but not detected.
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
**Bold** = Concentration meets or exceeds Florida GCTL.

## Table 5
## Summary of Laboratory Analytical Results for Groundwater Samples for Metals

Supplemental Site Assessment Report
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Analyte (µg/l) | MW-1 | MW-2 | MW-3 | MW-4 | MW-5 | MW-6 | MW-7 | MW-8 | MW-9 | GW-Rinsate | GW-DUP | GCTL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.7 I | 2.1 I | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 4.0 I | 2.9 I | **10** |
| Barium | 44 | 190 | 61 | 78 | 77 | 29 | 18 | 67 | 49 | 1.3 I | 180 | **2000** |
| Beryllium | 0.11 U | 0.11 U | 0.11 U | 0.11 U | 0.11 U | 0.12 I | 0.30 I | 0.16 I | 0.11 U | 1.6 | 0.29 I | **4** |
| Cadmium | 0.26 I | 0.82 I | 2.0 | 0.24 U | 0.97 | 0.24 U | 0.36 I | 0.26 I | 0.91 | 1.2 | 0.98 | **5** |
| Chromium | 1.3 I | 0.96 I | 3.1 | 0.30 U | 0.30 U | 0.82 I | 19 | 2.3 | 0.30 U | 1.7 I | 1.9 I | **100** |
| Cobalt | 0.35 I | 2.0 I | 3.8 | 0.25 U | 1.8 I | 0.25 U | 0.62 I | 1.4 I | 1.8 I | 0.70 I | 2.1 | **140** |
| Copper | 4.2 I | 3.0 I | 1.4 I | 3.5 I | 2.6 I | 2.8 I | 0.84 U | 6.7 I | 4.8 I | 0.86 I | 3.4 I | **1000** |
| Lead | 3.2 U | 3.2 U | 4.0 I | 3.2 U | 3.2 U | 3.2 U | 3.2 U | 9.0 I | **30** | 8.0 I | 3.2 U | **15** |
| Thallium | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 6.1 I | **2** |
| Tin | 0.73 U | 0.73 U | 0.73 U | 0.73 U | 0.73 U | 0.73 U | 0.74 I | 0.73 U | 0.73 U | 8.5 I | 0.73 U | **4200** |
| Vanadium | 2.8 | 3.1 | 8.6 | 1.4 | 1.9 | 4.2 | 11 | 4.0 | 1.6 | 0.21 U | 3.0 | **49** |
| Zinc | 10 | 13 | 19 | 6.9 I | 7.6 I | 9.2 I | 19 | 49 | 25 | 16 | 11 | **5000** |

Notes: GCTL = Florida Groundwater Cleanup Target Level per Chapter 62-777, Florida Administrative Code (FAC) and Chapter 62-550 FAC
U = Indicates that the compound was analyzed for but not detected.
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
**Bold** = Concentration meets or exceeds Florida GCTL.

## Table 6
## Sample Location Coordinates

Supplemental Site Assessment Report
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Sample ID | Latitude | Longitude | Sample ID | Latitude | Longitude |
|---|---|---|---|---|---|
| BL002 | 28.75694 | -81.2374 | BL030 | 28.75926 | -81.2376 |
| BL003 | 28.75693 | -81.2379 | BL031 | 28.75927 | -81.2379 |
| BL004 | 28.7569 | -81.2384 | BL032 | 28.7593 | -81.2383 |
| BL005 | 28.75693 | -81.2389 | BL033 | 28.75981 | -81.2372 |
| BL006 | 28.75726 | -81.2389 | BL034 | 28.75971 | -81.2377 |
| BL007 | 28.75733 | -81.2384 | BL035 | 28.75977 | -81.238 |
| BL008 | 28.75731 | -81.238 | BL036 | 28.76015 | -81.2372 |
| BL009 | 28.75731 | -81.2378 | BL037 | 28.7601 | -81.2378 |
| BL010 | 28.75746 | -81.237 | BL038 | 28.76 | -81.2379 |
| BL011 | 28.75801 | -81.2371 | BL039 | 28.75782 | -81.2391 |
| BL012 | 28.75774 | -81.237 | BL040 | 28.75749 | -81.2391 |
| BL013 | 28.7577 | -81.2379 | BL041 | 28.75858 | -81.2385 |
| BL014 | 28.75783 | -81.2384 | BL042 | 28.75967 | -81.2383 |
| BL015 | 28.75767 | -81.2389 | BL043 | 28.75899 | -81.2383 |
| BL016 | 28.75804 | -81.2389 | BL-DP-1 | 28.75908 | -81.2372 |
| BL017 | 28.75797 | -81.2385 | BL-DP-2 | 28.75873 | -81.2373 |
| BL018 | 28.75806 | -81.238 | BL-DP-3 | 28.75726 | -81.2372 |
| BL019 | 28.75815 | -81.2376 | BL-DP-4-H | 28.75819 | -81.2382 |
| BL020 | 28.75805 | -81.237 | BL-MW-01 | 28.75688 | BL-MW-01 |
| BL021 | 28.75857 | -81.2372 | BL-MW-02 | 28.75688 | BL-MW-02 |
| BL022 | 28.75851 | -81.2376 | BL-MW-03 | 28.75688 | BL-MW-03 |
| BL023 | 28.75841 | -81.2379 | BL-MW-04 | 28.75831 | BL-MW-04 |
| BL024 | 28.75842 | -81.2385 | BL-MW-05 | 28.75797 | BL-MW-05 |
| BL025 | 28.75834 | -81.239 | BL-MW-06 | 28.75902 | BL-MW-06 |
| BL026 | 28.75905 | -81.237 | BL-MW-07 | 28.75906 | BL-MW-07 |
| BL027 | 28.75891 | -81.2375 | BL-MW-08 | 28.76012 | BL-MW-08 |
| BL028 | 28.75886 | -81.238 | BL-MW-09 | 28.76 | BL-MW-09 |
| BL029 | 28.75942 | -81.2371 | | | |

Notes: Longitude and latitude obtained from a GPS unit equipped with wide area augmentation system
Coordinates are listed in decibel degrees

October 7, 2015

Mr. Joe McGarrity
Florida Department of Environmental Protection
State Brownfields Program
2600 Blair Stone Road
Tallahassee, FL 32399-2400

**SUBJECT: Supplemental Site Assessment Report Addendum**
**Brisson Avenue Landfill Site**
**Sanford, Seminole County, Florida**
**Solid Waste Facility ID# 83721**
**Task Assignment No.: BF-006C**
**AMEC Project No.: 6090140035.1000**

Dear Joe:

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) is pleased to submit to the Florida Department of Environmental Protection (FDEP) State Brownfields Program this Supplemental Site Assessment Report Addendum detailing the follow-up groundwater sampling event at the Brisson Avenue Landfill site in Sanford, Seminole County, Florida. These supplemental activities were conducted at the request of FDEP in response to the FDEP Task Assignment No. BF-001-B, Cooperative Agreement number RP-00D13513, issued to AMEC under FDEP Contract No. HW559. The initial Supplemental Site Assessment (SSA) was conducted at the site to evaluate *Recognized Environmental Conditions* (RECs) identified by AMEC and FDEP during the site reconnaissance that was conducted on August 18, 2014 and to conduct assessment activities based on the observations made and the known site history. FDEP is conducting this project with Brownfields State Response Program grant funding to assist the property owner with evaluating site conditions prior to redevelopment of the property. The scope of work was developed based on a records review, meetings conducted with FDEP State Brownfields Section personnel, Central District personnel, the property owner and AMEC and the observations and findings of the site reconnaissance and previous assessments conducted at the site. The objective of the SSA was to determine the presence and extent of trash or solid waste and groundwater contamination at the site. The site RECs primarily include the presence of both surface and subsurface trash and solid waste, including but not limited to tires, appliances and drums of various undetermined contents.

The initial SSA activities took place the week of December 1, 2014 and included the following:

- Advanced 43 soil borings to 10 feet below land surface (bls) to collect soil samples for FID screening and visual inspection for landfill debris.
- Installed nine micro-wells (MW-1 through MW-9) at locations which were located along the edges of the property, outside of former landfill areas, to monitor groundwater conditions downgradient of the former landfill to assess if any contamination was migrating offsite and also along the ravine in the north-central portion of the property to serve as upgradient sample locations (Figure 6).

- Collected groundwater samples from the nine newly installed micro-wells for analysis by a fixed-base laboratory for Appendix I Parameters which included VOCs using USEPA Method 8260, Metals using USEPA Method 6010/7470, Cyanide using SM 4500-CN-E, Ammonia using USEPA Method 350.1, Chloride, Nitrate, and Sulfate using USEPA Method 300.0, and Total Dissolved Solids (TDS) by the SM 2540C method.
- Measured depth to groundwater from each micro-well to determine the groundwater flow direction at the site at the time of the investigation.

The groundwater analytical results indicated that samples collected from the nine micro-wells did not contain VOCs above the respective Groundwater Cleanup Target Levels (GCTLs). Metals were detected in each of the groundwater samples collected from the nine micro-wells. Of the detections above the MDLs, only one sample reported a concentration above the GCTL for a metal. The groundwater sample collected from micro-well MW-9 contained lead (30 micrograms per liter [µg/l]) at a concentration that exceeded the GCTL of 15 µg/l (Figure 6). It should also be noted that lead was detected at a lower concentration just above the laboratory MDLs (8 I µg/l) in the groundwater equipment rinsate blank. Indicator Parameters that were analyzed for include chloride, nitrate, sulfate, ammonia, cyanide and total dissolved solids (TDS). Of those parameters, only chloride, ammonia and TDS were detected in any of the groundwater samples collected from the newly installed micro-wells at concentrations above the method detection limit for the given parameter. Of the detections above MDL, only one sample reported a concentration above the GCTL for an indicator parameter. The groundwater sample collected from micro-well MW-3 contained ammonia (7,800 µg/l) at a concentration that exceeded the GCTL of 2,800 µg/l.

Based on the results of the SSA, it was recommended that additional groundwater samples be collected from select micro-wells including MW-6, MW-7, MW-8 and MW-9 to be analyzed for lead only to confirm the initial results. On August 28, 2015, FDEP tasked Amec Foster Wheeler to conduct supplemental sampling activities at the site.

## SCOPE OF WORK

The scope of work conducted during the supplemental groundwater sampling included collecting water levels and groundwater samples from micro-wells MW-6, MW-7, MW-8 and MW-9 to be analyzed for lead.

On September 10, 2015, Amec Foster Wheeler mobilized to the site to conduct the supplemental groundwater sampling activities. When Amec Foster Wheeler personnel arrived onsite, the site was overgrown with heavy vegetation again. Amec Foster Wheeler spent approximately 3 hours bush whacking through heavy vegetation while using a hand held GPS unit (and coordinates of the wells) to locate the four micro-wells. All of the wells were located and sampled with the exception of MW-7 which could not be located due to excessively overgrown vegetation.

### Groundwater Analytical Results

Based on the groundwater analytical results from the supplemental groundwater sampling activities, lead was only detected in the groundwater sample collected from MW-9 (1.5 I µg/l) which is below the GCTL of 15 µg/l. No other samples contained lead at a concentration above the laboratory method detection limit. Updated tables and figures with the recent analytical data are included with this report.

Depth to groundwater elevations were collected from the three micro-wells prior to sampling. The measured depths to water in micro-wells MW-6 and MW-9 were similar to the December 2014 measurements while the depth to water in MW-8 was approximately 0.72 feet deeper. The groundwater flow direction on September 10, 2015 was to the east which is a little inconsistent with what was observed in December 2014, which was to the southeast. However, that is to be expected with only using a few of the wells and does not represent an accurate depiction of actual groundwater flow at the site.

## CONCLUSIONS AND RECOMMENDATIONS

Amec Foster Wheeler has prepared this report addendum for the Brisson Avenue Landfill Supplemental Site Assessment Report site dated April 2015. Although initial groundwater sampling results from December 2014 showed ammonia and lead above their respective GCTLs in one sample each. The ammonia detection appeared to be localized and not impacting any surface water bodies, and the detection of lead in the upgradient well (MW-9) was not believed to be related to past landfill activities. As stated in the original SSA Report, groundwater quality at the site does not appear to be a concern. However, to confirm groundwater quality at the site, additional groundwater samples were collected during this assessment from micro-wells MW-6, MW-8 and MW-9 and analyzed for lead to verify the original conclusion that the lead detected in the upgradient well is not related to past landfilling operations.

The analytical results from September 2015 indicated that lead was not detected at concentrations above its GCTL in any of the samples. Lead was previously detected at 30 µg/l in MW-9 in December 2014 and was detected at 1.5 l µg/l during this supplemental groundwater sampling event in September 2015 which is comparable to the detected concentrations from the other groundwater samples collected in December 2014.

Based on the groundwater analytical results obtained from each sampling event, it appears that past landfill operations have had minimal impacts to the groundwater and no further action is recommended for groundwater at the site.

If you have questions concerning this report, please contact either of the undersigned at 850-656-1293.

Sincerely,

**Amec Foster Wheeler**
**Environment & Infrastructure, Inc.**

Ron White, PG
Senior Scientist
Project Manager

Eric Blomberg, PG
Principal Hydrogeologist

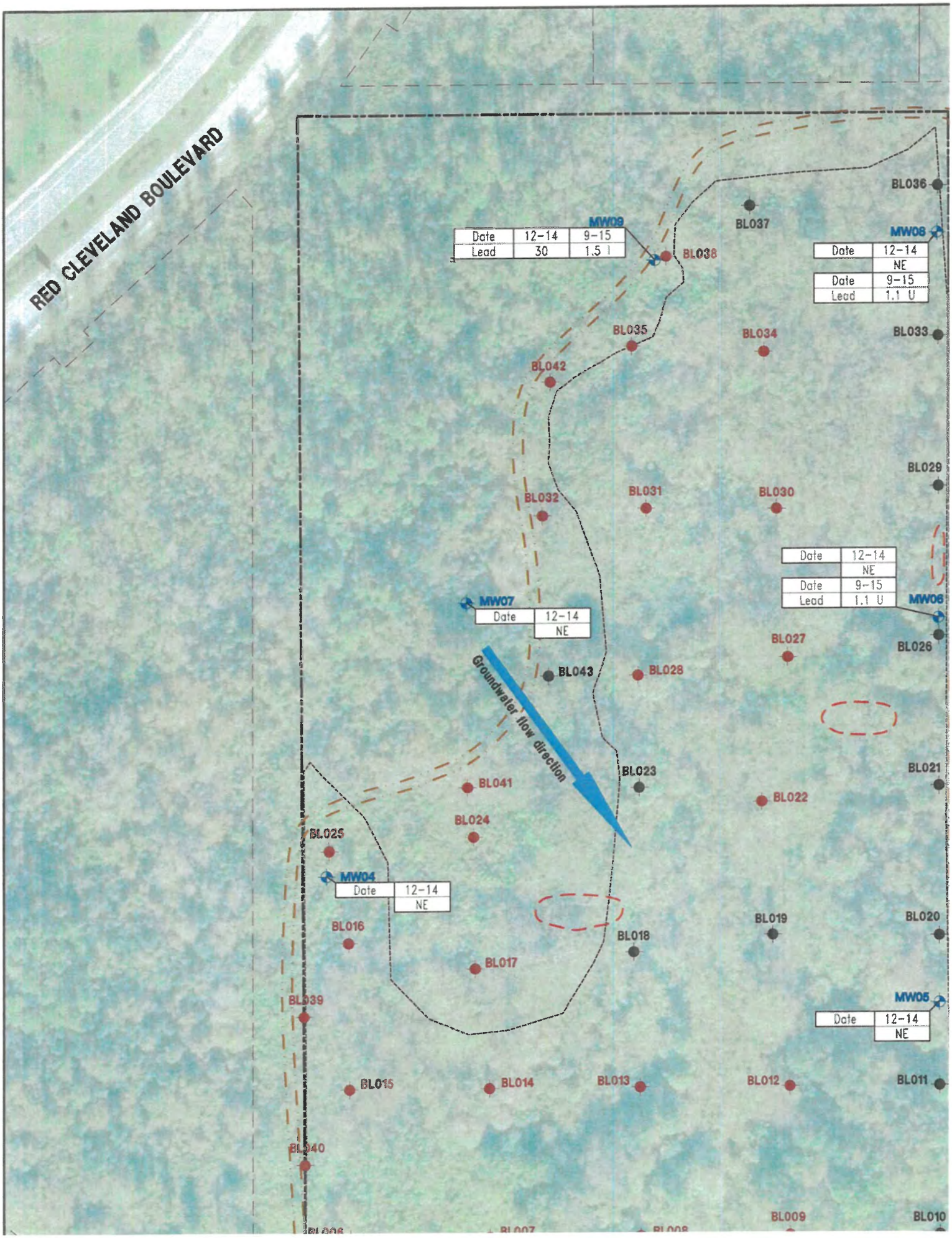
## PROFESSIONAL REVIEW CERTIFICATION

The work described in this Supplemental Site Assessment Addendum Report for the Brisson Avenue Landfill in Sanford, Seminole County, Florida, was performed in accordance with commonly accepted procedures consistent with the applied standards of practice under the direction of the undersigned professional geologist. The professional opinions rendered are based on the associated information detailed in the text and appended to this report or referenced in public literature. Recommendations are based upon interpretations of the applicable regulatory requirements, guidelines, and relevant issues discussed with regulatory personnel. If conditions that differ from those described are determined to exist, the undersigned should be notified to evaluate the effects of any additional information on the assessment or recommendations made in this report. These Supplemental Site Assessment were conducted at the Brisson Avenue Landfill in Sanford, Seminole County, Florida in accordance with Florida Department of Environmental Protection directives and U.S. Environmental Protection Agency protocol, and the report should not be construed to apply for any other purpose or to any other site.

AMEC E&I, Inc. **(License Number NBR: GB514)** is authorized under the provisions of Chapter 492 Florida Statues, to offer geology services to the public through a Professional Geologist.

Ronald D. White
Professional Geologist
Florida License No.: 0002068
Expires July 31, 2016

10/7/15
Date


RED CLEVELAND BOULEVARD
BL036
BL037
MW09
Date 12-14 9-15
Lead 30 1.5 I
BL038
MW08
Date 12-14
NE
Date 9-15
Lead 1.1 U
BL035
BL034
BL033
BL042
BL029
BL032
BL031
BL030
Date 12-14
NE
Date 9-15
Lead 1.1 U
MW07
Date 12-14
NE
MW06
BL027
BL026
Groundwater flow direction
BL043
BL028
BL023
BL021
BL041
BL022
BL024
BL025
MW04
Date 12-14
NE
BL016
BL019
BL020
BL018
BL017
MW05
Date 12-14
NE
BL039
BL015
BL014
BL013
BL012
BL011
BL040
BL009
BL010

## Table 2
## Micro-Well Completion Summary and Depths to Groundwater

Supplemental Site Assessment Report Addendum
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Micro-well | Total Depth (feet bls) | Screen Interval (feet bls) | Top of Casing Elevation | Depth To Groundwater (feet btoc) | Groundwater Elevation (feet btoc) |
|---|---|---|---|---|---|
| **December 4, 2014** | | | | | |
| MW-1 | 12.41 | 2.41 – 12.41 | 500.49 | 6.44 | 494.05 |
| MW-2 | 11.60 | 1.60 – 11.60 | 500.00 | 5.15 | 494.85 |
| MW-3 | 11.30 | 1.30 – 11.30 | ** | 4.93 | ** |
| MW-4 | 11.90 | 1.90 – 11.90 | 504.47 | 9.21 | 495.26 |
| MW-5 | 11.00 | 1 - 11 | 500.78 | 6.11 | 494.67 |
| MW-6 | 11.80 | 1.80 – 11.80 | 500.30 | 5.49 | 494.81 |
| MW-7 | 10.90 | 0.90 – 10.90 | 501.72 | 5.40 | 496.32 |
| MW-8 | 11.10 | 1.10 – 11.10 | 501.71 | 6.69 | 495.02 |
| MW-9 | 10.95 | 0.95 – 10.95 | 501.51 | 4.93 | 496.58 |
| **September 10, 2015** | | | | | |
| MW-6 | 11.80 | 1.80 – 11.80 | 500.30 | 5.89 | 494.41 |
| MW-8 | 11.10 | 1.10 – 11.10 | 501.71 | 7.41 | 494.30 |
| MW-9 | 10.95 | 0.95 – 10.95 | 501.51 | 4.92 | 496.59 |

Notes: Top of casing elevations are set to an arbitrary elevation of 500 feet (see MW-2)
bls = below land surface.
btoc = below top of casing
** = top of casing elevation was not determined at the time of the survey

## Table 3
## Final Field Parameter Measurements

Supplemental Site Assessment Report Addendum
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Sample ID | Micro-well | pH (standard units) | Specific Conductance (µmhos/cm) | Temperature (° C) | Turbidity (NTU) | Dissolved Oxygen (mg/l) | ORP (milliVolts) |
|---|---|---|---|---|---|---|---|
| **December 3-4, 2014** | | | | | | | |
| MW-1 | MW-1 | 6.33 | 645 | 22.60 | 9.75 | 0.99 | 29.41 |
| MW-2 | MW-2 | 6.84 | 1235 | 23.61 | 9.50 | 0.59 | -74.3 |
| MW-3 | MW-3 | 6.25 | 600 | 25.77 | 62.6 | 0.49 | -35.0 |
| MW-4 | MW-4 | 6.19 | 1031 | 22.29 | 35.7 | 1.09 | 17.3 |
| MW-5 | MW-5 | 6.51 | 1130 | 22.34 | 7.67 | 1.07 | -60.3 |
| MW-6 | MW-6 | 5.78 | 284 | 20.48 | 4.32 | 2.27 | 90.2 |
| MW-7 | MW-7 | 4.38 | 141 | 22.15 | 230 | 1.21 | 156.3 |
| MW-8 | MW-8 | 6.15 | 590 | 21.10 | 9.93 | 1.72 | 41.0 |
| MW-9 | MW-9 | 6.28 | 439 | 21.23 | 9.65 | 0.98 | -32.0 |
| **September 10, 2015** | | | | | | | |
| MW-6 | MW-6 | 4.86 | 330 | 25.93 | 5.04 | 1.44 | 52 |
| MW-8 | MW-8 | 5.27 | 400 | 26.02 | 7.73 | 1.39 | -60.9 |
| MW-9 | MW-9 | 5.94 | 346 | 26.23 | 10.0 | 1.42 | 55.3 |

Notes: Reported parameters are the final readings recorded after all of the parameters had stabilized within their respective criteria.
Micro-well MW-7 never achieved turbidity under 10 NTU. Sampling was approved by AMEC project manager after more than 16 volumes had been purged.
µmhos/cm = micromhos per centimeter.
°C = Degrees Celsius
NTU = nephelometric turbidity units.
mg/l = milligrams per liter.
ORP = Oxygen Reduction Potential

## Table 5
## Summary of Laboratory Analytical Results for Groundwater Samples for Metals

Supplemental Site Assessment Report Addendum
Brisson Avenue Landfill
Sanford, Seminole County, Florida

| Analyte (µg/l) | MW-1 | MW-2 | MW-3 | MW-4 | MW-5 | MW-6 | MW-7 | MW-8 | MW-9 | GW-Rinsate | GW-DUP | GCTL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **December 3-4, 2015** | | | | | | | | | | | | |
| Arsenic | 1.7 I | 2.1 I | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 1.6 U | 4.0 I | 2.9 I | **10** |
| Barium | 44 | 190 | 61 | 78 | 77 | 29 | 18 | 67 | 49 | 1.3 I | 180 | **2000** |
| Beryllium | 0.11 U | 0.11 U | 0.11 U | 0.11 U | 0.11 U | 0.12 I | 0.30 I | 0.16 I | 0.11 U | 1.6 | 0.29 I | **4** |
| Cadmium | 0.26 I | 0.82 I | 2.0 | 0.24 U | 0.97 | 0.24 U | 0.36 I | 0.26 I | 0.91 | 1.2 | 0.98 | **5** |
| Chromium | 1.3 I | 0.96 I | 3.1 | 0.30 U | 0.30 U | 0.82 I | 19 | 2.3 | 0.30 U | 1.7 I | 1.9 I | **100** |
| Cobalt | 0.35 I | 2.0 I | 3.8 | 0.25 U | 1.8 I | 0.25 U | 0.62 I | 1.4 I | 1.8 I | 0.70 I | 2.1 | **140** |
| Copper | 4.2 I | 3.0 I | 1.4 I | 3.5 I | 2.6 I | 2.8 I | 0.84 U | 6.7 I | 4.8 I | 0.86 I | 3.4 I | **1000** |
| Lead | 3.2 U | 3.2 U | 4.0 I | 3.2 U | 3.2 U | 3.2 U | 3.2 U | 9.0 I | **30** | 8.0 I | 3.2 U | **15** |
| Thallium | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 2.4 U | 6.1 I | **2** |
| Tin | 0.73 U | 0.73 U | 0.73 U | 0.73 U | 0.73 U | 0.73 U | 0.74 I | 0.73 U | 0.73 U | 8.5 I | 0.73 U | **4200** |
| Vanadium | 2.8 | 3.1 | 8.6 | 1.4 | 1.9 | 4.2 | 11 | 4.0 | 1.6 | 0.21 U | 3.0 | **49** |
| Zinc | 10 | 13 | 19 | 6.9 I | 7.6 I | 9.2 I | 19 | 49 | 25 | 16 | 11 | **5000** |
| **September 10, 2015** | | | | | | | | | | | | |
| Lead | NS | NS | NS | NS | NS | 1.1 U | CNL | 1.1 U | 1.5 I | 1.1 U | 1.1 U | **15** |

Notes: GCTL = Florida Groundwater Cleanup Target Level per Chapter 62-777, Florida Administrative Code (FAC) and Chapter 62-550 FAC
Results reported in micrograms per liter (µg/l).
U = Indicates that the compound was analyzed for but not detected.
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
CNL = Could not locate.
**Bold** = Concentration meets or exceeds Florida GCTL.

# Site No. 27

# Sunland Park Debris Staging Area


Florida Department of Environmental Protection
Water Assurance Compliance System
Solid Waste Facility Inventory Report
06/20/2025

Generate Excel Spreadsheet of Current Results

No guarantee as to the accuracy of the information in this database is implied or expressed.
While additional information may have been submitted to the Department, manpower and resources
are not always available to ensure updates of this information to the database are made in a timely manner.
Any specific information missing from the database may be obtained by a file review for the particular facility at the appropriate District office.

*For Testsite Data Links:*
**I**: TestSite Inventory Report
**R**: TestSite Result Report
**C**: Regulatory Comparison Report

*For Detail Links:*
**A**: Facility Activities
**M**: GIS Map on this Facility [*New and Improved]
**D**: Documents in OCULUS
**P**: PA Permits
**E**: Sending Feedback to Address Data Errors

| TestSite Data | Detail Links | Facility ID | Facility Name | City | Address | County | District | Class | Class Type | Class Status |
|---|---|---|---|---|---|---|---|---|---|---|
| I R C | A M D P E | 98048 | SUNLAND PARK DEBRIS STAGING AREA | SANFORD | 180 COLLINS DRIVE | SEMINOLE | CD | DISASTER DEBRIS MANAGEMENT SITE | 910 | INACTIVE |