U.S. Army Corps of Engineers
South Atlantic Division

Final
Work Plan
Remedial Investigation/Feasibility Study
Former Incinerator
Former Richmond Naval Air Station
Miami, Florida
FUDS Project No. I04FL003806

In Support of:

FUDS Program Category: HTRW Remedial Investigation / Feasibility Study

Prepared for:

U.S. Army Corps of Engineers, Jacksonville District
701 San Marco Boulevard
Jacksonville, Florida 32207

Contract: W91278-14-D-0017
Task Order: CS04

March 2016

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List of Acronyms

ADR	Automated Data Review
Aerostar	Aerostar SES LLC
Ag	silver
As	arsenic
BaPE	Benzo(a)pyrene Equivalent
BLS	Below Land Surface
BoP	Bureau of Prisons
CoC	Chain of Custody
COC	Contaminant of Concern
Cr	chromium
CG	Clear Glass Jar/Bottle
DERP-FUDS	Defense Environmental Restoration Program-Formerly Used Defense Sites
DMP	Data Management Plan
DoD	Department of Defense
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FTL	Field Team Leader
GCAL	Gulf Coast Analytical Laboratories, LLC
GCTL	Groundwater Cleanup Target Level
HDPE	High Density Polyethylene
HTRW	Hazardous, Toxic, and Radioactive Waste
ID	Identification
IDW	Investigative Derived Waste
ITR	Independent Technical Review
NAS	Naval Air Station
NELAP	National Environmental Laboratory Accreditation Program
OVA/FID	Organic Vapor Analyzer/Flame Ionization Detector
OVT	Organic Vapor Testing
PAH	Polynuclear Aromatic Hydrocarbon
PM	Project Manager
POC	Point of Contact
ppm	Parts Per Million
PWS	Performance Work Statement
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RNASI	Richmond Naval Air Station Incinerator
SB	Subsurface Soil Sample
SCTL	Soil Cleanup Target Level
SEDD	Staged Electronic Data Deliverable
SI	Site Inspection
SOP	Standard Operating Procedures
SS	Surface Soil Sample
SSHP	Site Safety and Health Plan
SVOC	Semi-volatile Organic Compound
USACE	Unites States Army Corps of Engineers
VOC	Volatile Organic Compound
WP	Work Plan

1.0 DATA MANAGEMENT PLAN

1.1 INTRODUCTION

Aerostar SES LLC (Aerostar) has prepared the Draft Final Work Plan (WP) including this Draft Final Data Management Plan (DMP) to support the Remedial Investigation/Feasibility Study (RI/FS) at the former Richmond Naval Air Station (NAS) Former Incinerator, Miami, Florida. Aerostar is conducting this RI/FS pursuant to the United States Army Corps of Engineers (USACE) Jacksonville District's Performance Work Statement (PWS), *Remedial Investigation/Feasibility Study at the Former Richmond Naval Air Station, Miami, Florida, Defense Environmental Restoration Program – Formerly Used Defense Site (DERP-FUDS) Property No. I04FL0038, DERP-FUDS Hazardous, Toxic, and Radioactive Waste (HTRW) Project No. I04FL003806, Former Incinerator, Contract Number W91278-14-D-0017, Task Order CS04, dated June 3, 2014*. A copy of the PWS is included in **Appendix A**. Aerostar will furnish all labor, equipment, materials, lower-tier subcontractors, and supplies to perform the PWS identified herein. All work will be completed in compliance with current federal, state, and local regulations, and in accordance with standard industry practice.

The purpose of this investigation effort is to conduct a RI/FS at the Former Incinerator location in compliance with Comprehensive Response Compensation and Liability Act (CERCLA), the Department of Defense (DoD), Army, USACE, and Florida Department of Environmental Protection (FDEP) regulations and guidance. The USACE evaluated the Site Inspection (SI) Report and initiated this RI/FS effort to identify and delineate contaminants related to former DoD activities. A Decision Document will be prepared upon completion of the FS.

The scope of the DMP includes planning, collecting, evaluating, and reporting information gathered during the sampling activities associated with the RI at the Former Incinerator location on the federal prison property at the former Richmond Naval Air Station (NAS).

The former Richmond NAS has been evaluated under the requirements of the Defense Environmental Restoration Program (DERP), for Formerly Used Defense Sites (FUDS) Program. Based on that evaluation, the former Richmond NAS has been determined to have been formerly used by the DoD, was transferred from DoD control prior to October 17, 1986, and met other eligibility requirements; therefore, is eligible for site investigation and remediation, as necessary, under the FUDS program. A potential hazardous, toxic, radioactive waste (HTRW) project was identified in an SI Report completed by the FDEP in July 2011. The SI Report revealed contamination at a former DoD site; former Incinerator located on Bureau of Prisons (BoP) property. Under the DERP FUDS program, the USACE evaluated the SI Report and authorized a new HTRW project, 06, to further investigate the area. A site location map is provided as **Figure 1**.

Site Description/History

The U.S. Navy began constructing Richmond NAS in 1942 as a Lighter-Than-Air blimp base. The approximately 2,108-acre base was designed to be entirely self-sufficient and included a mess hall, medical clinic, recreational areas, barracks, and water and sewer systems. The Navy also constructed three blimp hangars; mooring-out sites; a helium plant; and maintenance, propeller, battery, welding, plating, and paint shops, along with other support facilities. The hangars were more than 1,000 feet long, 175 feet high and 297 feet wide with an interior floor space of approximately 7 acres. In addition to being home to a blimp squadron, Richmond NAS also provided maintenance services and supplies to the airships in the Gulf of Mexico and Caribbean region.

In September 1945, the area began preparing for a hurricane. Believing the hangers at Richmond NAS were hurricane proof, the military moved aircraft from nearby bases into the blimp hangars. By the time the hurricane hit, more than 300 aircraft were in the hangers along with 25 blimps. During the storm, the roof of Hangar 1 blew off, and shortly thereafter, a fire blazed that quickly spread to the other hangars. Within hours, all three hangars and everything in them were destroyed. The base was never re-built, and by November 1945, it was closed. Currently, the area of the RI is on the Federal BoP property. The land is not used by the BoP.

The FDEP conducted assessment activities at the site and identified soil contamination in the area of the former incinerator. During the SI, FDEP advanced soil borings, collected soil samples, installed one monitor well and collected groundwater samples in the area of the former incinerator. FDEP collected eight surface [0-2 feet below land surface (BLS)] soil samples and five subsurface soil samples (2-4 feet BLS). The soil samples were analyzed for volatile organic compounds (VOCs); semi-volatile organic compounds (SVOCs); eight Resource Conservation and Recovery Act (RCRA) metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver; and dioxins/furans. During the SI, FDEP collected three background soil samples. The background soil samples were also analyzed for VOCs, SVOCs, eight RCRA metals, and dioxins/furans. Figure 3 from the SI shows the location of the background samples and is included in **Appendix B**. A photograph of the incinerator building is also included in **Appendix B**.

FDEP installed one shallow temporary monitor well to 14 feet BLS southeast of the incinerator building. A groundwater sample was collected from the well and analyzed for VOCs, SVOCs, 8 RCRA metals, and dioxins/furans.

The soil sampling conducted as part of the SI identified three polynuclear aromatic hydrocarbon (PAH) compounds benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene in one soil sample above the Leachability Soil Cleanup Target Levels (SCTLs) established in FDEP Chapter 62-777, Florida Administrative Code (FAC). Silver was also detected in one soil sample and chromium in two soil samples above the Leachability SCTLs. Benzo(a)Pyrene Equivalent (BaPE) concentrations, arsenic, and total dioxin Toxic Equivalent (TEQ) concentrations were detected in soil samples above the Residential FDEP Chapter 62-777, FAC SCTLs. As requested by DERM, Aerostar will collect barium and lead samples from depths of 0-0.5 foot BLS and 0.5-2 feet BLS at 14 boring locations surrounding the former incinerator. No contaminants of concern (COCs) were detected in the groundwater above the Groundwater Cleanup Target Levels (GCTLs) established in FDEP Chapter 62-777, FAC.

1.2 INVESTIGATION PLANNING

All sampling data will be recorded in the Field Team Leader's (FTL) log book. The sampling data will include sample ID, sample date and time, laboratory analysis, and where the sample was collected. Other physical records pertaining to project activities including chain of custody (CoC) records and waste manifests will be kept in a secure folder and maintained by the FTL. The Aerostar Project Manager (PM) will receive detailed daily reports to minimize the potential for miscommunications as the project transitions between the various phases.

The objective of the WP including the DMP is to provide procedures for collecting soil and groundwater samples during the RI and evaluating the results of the laboratory analyses in accordance with FDEP Chapter 62-777 SCTLs and GCTLs. The analytical results will be used to prepare a RI report and a Feasibility Study (FS). Based on the risk assessment conducted as part of the RI, the FS will evaluate available remedial technologies to reduce the exposure to COCs. The goal of the FS is to provide a remedial technology that will reduce or eliminate the exposure of DoD COCs that achieves Regulatory

acceptance. Additional soil samples will be collected as needed for waste characterization analyses to comply with the requirements from the appropriate disposal facility for IDW generated during this RI.

Aerostar will prepare an Excel spreadsheet showing the proposed sampling locations, matrices, and test methods will be during the project. The database information will be used to produce a sample plan and sampling kit including site map, sample labels, and CoC to direct the field efforts at the site. A unique identification (ID) for each sample collection location (Station ID), and each sample collected from that location will be tracked using a unique sample identifier (Sample ID). Proposed sampling locations are illustrated on **Figure 2**.

The Final Quality Control Plan (QCP) established an Independent Technical Review (ITR) person for all deliverables. An ITR is a review by a qualified person or team not involved in the day-to-day production of a project/product, for the purpose of confirming the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices. All products will be subjected to an ITR. ITR is a holistic, comprehensive review of the project. While ITR is a critical component of quality control, it will not replace checks or other quality control processes. Each ITR team member should review each product for consistency across the various disciplines of the project. ITR team members must also review his/her discipline's elements and how they impact and align with the project's functions. Comments will be limited to those that are required to ensure adequacy of the product; it will not be the reviewer's prerogative to dictate matters based solely on personal preferences. Aerostar will follow the guidance for the ITR outlined in USACE document ER-1110-1-12, *Quality Management* (July 2006), Chapter 3.

The ITR is managed by the ITR Leader. The ITR Leader will select individuals, as necessary, to assist in the ITR of each project deliverable. Each project team member is responsible for ensuring a quality product in his/her functional area through internal checks, project reviews, and seamless interaction with the ITR member representing his/her function area. The project is conducted with full communication between project team members so that the development of one discipline’s project features does not interfere with other disciplines.

Aerostar has developed the QCP to specify the roles and actions of the project and ITR members. This QCP has been prepared by the project staff, and internally reviewed by the PM. In addition, the ITR leader has performed independent technical assessments of this version of this document.

Aerostar project team members will be responsible for writing the QCP, SSHP, and Summary Reports. Each project team member’s review will focus on his/her area of expertise. The ITR will then follow the protocol outlined in this QCP.

The draft, check copy, and final deliverables (QCP, SSHP, and RI/FS Report) will be submitted to the Aerostar ITR for a thorough review prior to being submitted to the USACE.

Conceptual Site Model

DoD COCs identified during the SI include PAHs, arsenic, chromium, silver, dioxins and furans in soil. No COCs were identified in the groundwater during the SI.

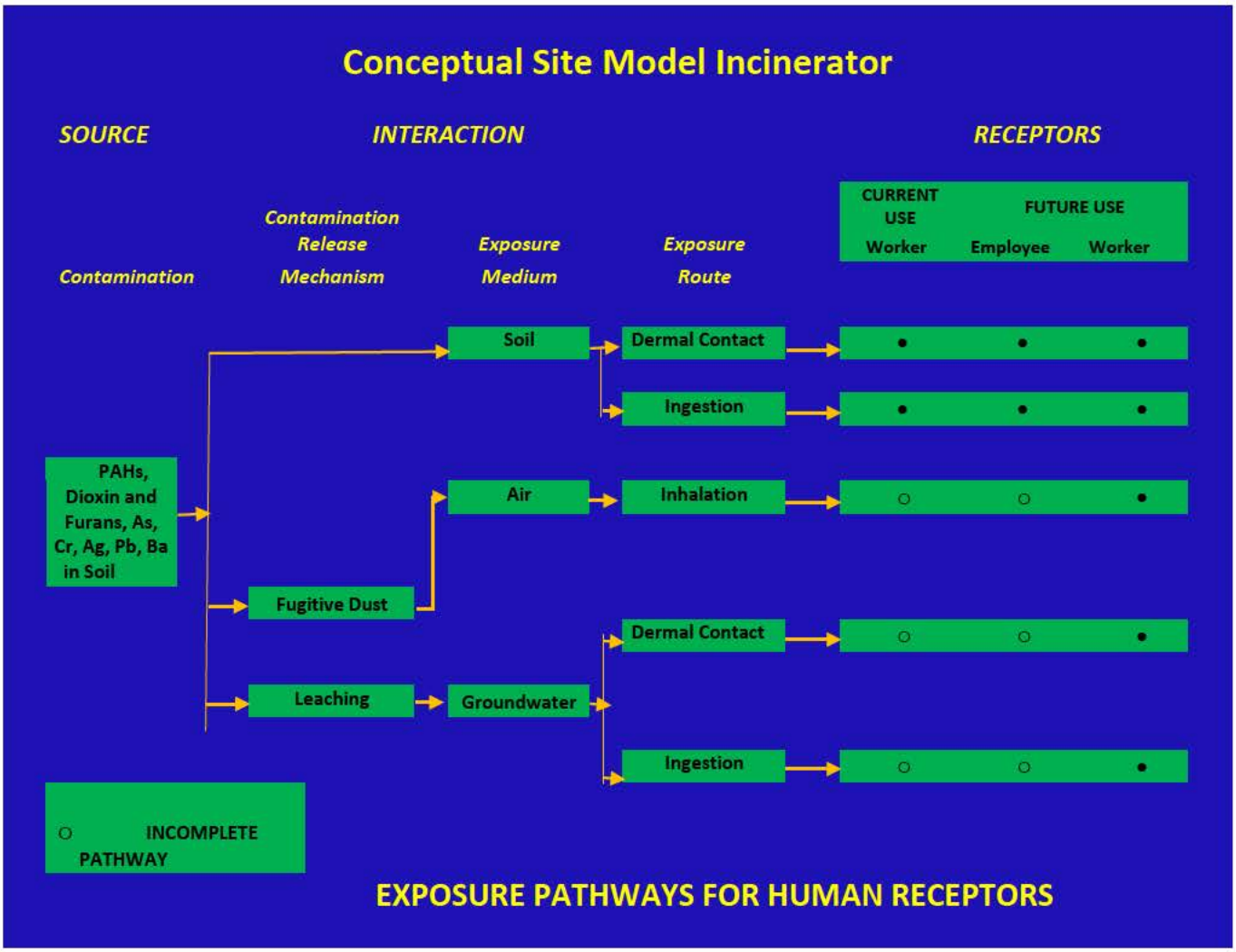
Baseline Risk Assessment

The analytical data resulting from the analysis of the soil and groundwater samples collected from Richmond NAS former Incinerator during the RI will be utilized in the CERCLA Baseline Risk Assessment. Project action limits will be established once COCs have been determined upon CTLs from Chapter 62-777, FAC. During the RI, the Risk Assessors will develop screening toxicity values representing a no-observed-adverse-effect level based on exposure pathways and the potential receptor species present. The analytical data results will be used to develop a potential exposure level that will then be compared to the no-observed-adverse-effect level. This resulting comparison will be used to determine the need for further investigation or the actions to be taken in accordance with Applicable or Relevant Appropriate Requirements (ARARs).

Conceptual Site Model

Known and Potential Sources	Impacted Media	Contaminants of Concern	Exposure Route	Receptors	
Incinerator ash	Surface Soil	PAHs, arsenic, barium, chromium, lead silver, and Dioxins/Furans	Inhalation of vapors or dust (soil), Dermal, Incidental ingestion	Current Construction workers	Future Construction workers
	Subsurface Soil	PAHs, arsenic, barium, chromium, lead silver, and Dioxins/Furans	Dermal, Incidental ingestion	Current Construction workers	Future Construction workers
Incinerator ash	Groundwater	PAHs, arsenic, barium, chromium, lead silver, and Dioxins/Furans	Incidental ingestion, Dermal	Current Irrigation well	Future Private or public wells, Construction workers

Conceptual Site Model



1.2.1 Sample Identification

1.2.1.1 Proposed Soil Sampling

For soil samples collected during the RI, the Station ID for Richmond NAS will have a project name and a sequential number to make it unique. Richmond NAS Incinerator RI/FS will be designated RNASI. Soil samples will be collected in the area of previously identified impacted soil at multiple depths (0-0.5 feet BLS and 0.5-2 feet BLS. Aerostar will designate the 0-0.5 foot BLS as a surface sample (SS) and the subsequent sample from a depth of 0.5-2 as subsurface soil (SB) sample.

Grab samples will be collected in the area of the prior FDEP SI using a Geoprobe and will be screened for the presence of volatile organic vapors using an Organic Vapor Analyzer equipped with a Flame Ionization Detector (OVA-FID). Soil sampling will be conducted in accordance with FDEP SOP FS1000 for General Sampling Procedures and FS3000 for Soil, revised March 1, 2014.

For those samples collected for laboratory analyses, the sample ID will contain the Station ID, designation as a surface sample or a subsurface sample, the sample designation keyed to the location of a soil sample from the FDEP SI that identifies the location of Aerostar's sample, a sequential sample number, and a character suffix denoting the depth that the sample was collected. Thus, the format of the Station ID will be RNASI-SS3501-0-0.5 or RNASI-SB3501-0.5-2.

Where:

RNASI	is the project name – Richmond NAS Incinerator
SS or SB	is a surface or subsurface soil sample
35	is the sample designation location from the FDEP SI
01, 02	is the sequential number for the location (e.g., 01, 02)
0-0.5, 0.5-2	is the characters to indicate the depth interval the sample was collected e.g., (0-0.5') = the surface sample, (0.5-2') = subsurface samples. This information will identify the Sample ID. RNASI-SS3501-0-0.5 and RNASI-SB3501-0.5-2 will relate to the same surface location.

1.2.1.2 Groundwater Sampling

For groundwater samples, the Station ID will have the same reference (RNASI), the monitor well will be designated MW, and a sequential number to make it unique (###).

For those samples collected for laboratory analyses, the sample ID will contain the Station ID monitor well designation. Thus, the format of the Station ID will be RNASI-MW###.

Where:

RNASI-MW	is the code for project name and monitor well designation;
###	is the sequential number for the monitor well and sample.

For example, the first monitor well installed will be RNASI-MW001 and the groundwater sample will have a Sample ID as RNASI-MW001. The groundwater sample collected from the well will have the same designations as the well. Aerostar will screen the soil during the installation of the monitor wells. If elevated OVA values are reported, Aerostar will collect a soil sample for laboratory analysis of PAHs by EPA Method 8270SIM. Aerostar will also collect soil samples from 0-0.5 feet BLS and 0.5-2 feet BLS for the analysis of dioxins/furans during the installation of the four monitor wells to confirm previous dioxin/furan concentrations detected during the SI.

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1.2.1.3 Investigative Derived Waste Sampling

For IDW samples collected for laboratory analyses, the sample ID will contain the drum or container type Label ID and a character suffix denoting the number in sequence. Thus, the format of the IDW ID will be RNASI-IDW-Drum/Container Type### and the Sample ID will be RNASI-IDW-Drum###.

Where:

RNASI	is Richmond Naval Air Station Incinerator
IDW	is Investigative Derived Waste
###	is the sequential number for the drum/container type (e.g., 001, 002)

For example, the sample collected from Drum 001 will have a station ID of RNASI-IDW-Drum001 and a sample ID as RNASI-IDW-Drum001.

Table 1-1: Sampling and Analysis Plan

Sample Locations	Matrix	Analysis	Analytical Procedures	Holding Time[(1)]	Preservation Requirements	Sample Containers
Remedial Investigation	Soil	PAHs and BaPE	EPA Method 8270 SIM	14 days to extract / 40 days to analysis	Ice to 0-6°C	4 ounce, CG
		Dioxin/Furans	EPA Method 8290A	30 days to extract / 45 days to analysis	Ice to 0-6°C	4 ounce, CG
		Arsenic, Barium, Chromium, Lead, and Silver	EPA Method 6020A	6 months	Ice to 0-6°C	4 ounce, CG
Remedial Investigation	Groundwater	PAHs	EPA Method 8270 SIM	7 days to extract / 40 days to analysis	Ice to 0-6°C	1 Liter, AG
		Dioxin/Furans	EPA Method 8290A	30 days to extract / 45 days to analysis	Ice to 0-6°C	1 Liter, CG
		Arsenic, Barium, Chromium, Lead, and Silver	EPA Method 6020A	6 months	Adjust pH < 2 with Nitric Acid Ice to 0-6°C	0.5 Liter, HDPE
IDW Pre-disposal	Soil	PAHs and BaPE	EPA Method 8270 SIM	14 days to extract / 40 days to analysis	Ice to 0-6°C	4 ounce, CG
		Dioxin/Furans	EPA Method 8290A	30 days to extract / 45 days to analysis	Ice to 0-6°C	4 ounce, CG
		Arsenic, Barium, Chromium, Lead, and Silver	EPA Method 6020A	6 months	Ice to 0-6°C	4 ounce, CG
IDW Pre-disposal	Groundwater/ Purge/Decon Water	PAHs	EPA Method 8270	7 days to extract/ 40 days to analysis	Ice to 0-6°C	1 Liter, CG
		Dioxin/Furans	EPA Method 8290A	30 days to extract / 45 days to analysis	Ice to 0-6°C	1 Liter, CG
		Arsenic, Barium, Chromium, Lead, and Silver	EPA Method 6020	6 months	Adjust pH < 2 with Nitric Acid Ice to 0-6°C	0.5 Liter, HDPE

[1] Holding time is based time from collection of sample.
AG Amber Glass bottle/jar with Teflon lined screw cap
CG Clear Glass bottle/jar with Teflon lined screw cap
HDPE High Density Polyethylene

1.2.2 Sample Information

Other information that will be reported with the samples includes the following:

- Sample matrix (e.g., soil, water)
- Sample type (e.g., normal, field duplicate)
- Upper sampling depth
- Lower sampling depth
- Date and time of sample collection

- Sampling equipment used (e.g., drill, hand auger, split spoon)
- Sampling method (composite, grab)

1.3 DATA COLLECTION

The FTL will distribute and review the site sampling plan and sampling kits. If modifications to this approved plan are made during the field effort, the FTL will be responsible for adjusting the station/sample identifications and sampling plan using the guidelines discussed above.

1.3.1 Sampling Data

Bottle labels will be directly affixed to each container from the laboratory. The FTL will write the applicable information on each label. Each label will specify the destination laboratory, appropriate Sample ID, Station ID, analysis codes, and other pertinent information. The FTL will hand-enter the date and time collected and will initial each bottle label. The sampling information from the labels will be included in the field book.

Once the sampling information has been entered, the CoC forms will be generated and included in the sample coolers that are sent to the laboratory. The data and visual observations will be documented in the field book. The samples will be submitted to Gulf Coast Analytical Laboratories, LLC (GCAL) for analysis of PAHs and metals and GCAL will submit samples to their subcontract laboratory Cape Fear Analytical, LLC for analysis of dioxins/furans.

The field notes will be kept by Aerostar in the Jacksonville, Florida office and will be available upon request.

1.3.2 Laboratory Data

The unique Sample ID will be used for correspondence with the laboratory. The analytical data will be delivered in a Staged Electronic Data Deliverable (SEDD) format as well as MS Excel spreadsheet from the laboratory with a reference to each applicable Sample ID. The laboratory deliverable will be reviewed by the PM to verify that the appropriate tests were performed by the laboratory before submitting the data for internal validation. Aerostar's chemist will review and validate the data. Aerostar's chemist will also check the SEDD file using the latest version of the Automated Data Review (ADR) software program.

Within 15 business days after Aerostar receives the data from GCAL, Aerostar will deliver to the USACE a Data Quality Table which will include each COC, GCAL's published reporting Method Detection Limits (MDLs), Limits of Detection (LODs), and Limits of Quantitation (LOQs) for each contaminant, and the reported concentration. The MDL is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence. If a substance is detected at or above the MDL, it can be reliably stated with 99% confidence that the analyte is present; therefore a 1% chance that the analyte is not present (a false positive) exists. Although a result at or above the MDL indicates that the analyte is present, the absence of a result at or above the MDL is inconclusive (i.e., one cannot confidently state whether the analyte is present or absent), because the false negative rate at the MDL is 50%. The LOD is the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a 99% confidence level. In other words, if a sample has a true concentration at the LOD, there is a minimum probability of 99% of reporting a detection (a measured value greater than or equal to the MDL) and a 1% chance of reporting a non-detect (a false negative). The LOQ is the lowest concentration of an analyte in a sample that can be determined with acceptable precision and accuracy under stated conditions of the test. The table will also list the applicable regulatory limits for each contaminant. The table will be provided in Microsoft Excel format.

Analytes that are non-detects will be reported at the MDL with a U Qualifier in accordance with FDEP Chapter 62-160 FAC. An analyte concentration detected between the MDL and the LOQ will be qualified with a J Qualifier. The LOD will be provided for data review as the concentration below which a false negative may be reported at a rate less than 1%. If the FDEP CTL for a specific analyte is below the LOQ, the LOQ will become the CTL for that specific analyte.

1.4 GENERAL SAMPLING APPROACH

The following sampling approach will aid in characterizing the soil and groundwater samples collected during sampling activities associated with the project.

- Prior notification of USACE PM assigned to the project.
- The field sampling team will consist of one individual who will collect the sample, monitor adherence to FDEP Standard Operating Procedures (SOPs) and sampling procedures, record any difficulty encountered, monitor health and safety procedures, and document other information pertinent to the investigation. The second member of the team is responsible for setting up the sampling equipment at each location, including the pump, tubing, sample containers, and coolers.
- Sample collection for chemical analysis will be performed with either disposable sampling devices or decontaminated, stainless steel or Teflon® devices. All sampling equipment will be decontaminated in accordance with the procedures outlined later in this plan.
- The analytical laboratory will provide pre-cleaned sample containers (preserved if necessary). All sample container records will be maintained by the analytical laboratory and will be available upon request.
- A sample that is representative of the matrix being sampled will be collected.
- Sample custody will be maintained from the time of sample collection to receipt by the laboratory.
- Aerostar will contact Sunshine Utility Locators and/or a private utility contractor to clear locations prior to advancing boreholes or installing monitor wells.

All field notes will be recorded in indelible ink on standard forms or in bound notebooks. A field log will be completed by the FTL. This log will be signed and dated daily. Significant events occurring during the day will be recorded and reported to the PM. Daily communication is essential to evaluate whether timely corrective actions are necessary. The field notebook will provide a place for the field team members to sign and date the entries.

1.4.1 Field Documentation

Bound field log books will be maintained by the FTL to provide a daily record of significant events, observations, and measurements during sampling events.

All entries will be signed and dated. All information pertinent to sampling will be recorded in bound log books. Entries in the log book will include at least the following:

- Name and title of author, date and time of entry, and weather/environmental conditions during field activity
- Location of sampling activity
- Name and title of field crew
- Name and title of any site visitors
- Sample matrix (for example, soil)
- Sample collection method

- Number and volume of sample(s) taken
- Date and time of collection
- Sample identification number(s)
- Sample distribution (for example, laboratory)
- Field observations
  - A field measurements made, such as pH, temperature, and conductivity, if applicable
- All sample documents such as the following:
  - Dates and method of sample shipments
  - CoC forms
- Sample handling (preservation)

All original data recorded in field log books, sample labels, and CoC forms will be written with indelible ink. None of these accountable, serialized documents (field log books, CoC forms) are to be destroyed or thrown away, even if one is illegible or contains inaccuracies requiring document replacement. If an error is made on an accountable document assigned to one individual, that individual will make all corrections simply by crossing a line through the error, initializing the correction, and entering the correct information. The erroneous information will not be obliterated. Any subsequent error discovered on an accountable document will be corrected by the person who made the entry and will be initialed by the person who made said error.

1.4.2 Sampling Containers

The FTL is responsible for proper sampling, labelling of samples, preserving, and shipping of samples to GCAL to meet required holding times. The samples submitted to GCAL will be analyzed in-house for PAHs and metals and GCAL will submit samples to their subcontract laboratory Cape Fear Analytical, LLC for analysis of dioxins/furans.

Table 1-1: Sampling and Analyses Plan, identifies the proper sample containers, preservation techniques, and maximum holding times for samples collected at the site. Section 1.2.1 describes the numbering system to be used during sampling.

1.4.3 Sample Chain of Custody

The sample custody and documentation procedures described in this section will be followed throughout all sample collection. Components of sample custody procedures include the use of field log books, sample labels, custody seals, and CoC forms. Each person involved with sample handling will be trained in CoC procedures before the start of the field program. The CoC form will accompany the sample(s) during shipment from the field to the laboratory. If samples are split and sent to different laboratories, a copy of the CoC form will accompany each split sample.

The information provided on the CoC form will include the following:

- The project name
- The sampling station number or sample number
- Date and time of collection
- Grab or composite sample designation
- Number of containers
- Sample matrix
- The analytical methods required
- Preservative codes

- A brief description of the type of sample and sampling location
- Signature of individuals involved in the sample transfer
- The time and date of sample receipts

CoC records initiated in the field will be placed in a sealed plastic bag and taped to the inside of the shipping containers used for sample transport from the field to the laboratory. This record will be used to document sample custody transfer from the field sampler to the laboratory.

1.4.4 Sample Custody in the Field

The following procedures will be used to document, establish, and maintain custody of field samples.

- Sample labels will be completed in indelible ink to ensure that the labels are legible
- All sample-related information will be recorded in the project log book
- The FTL will retain custody of the samples until they are transferred or properly dispatched
- During the course of, and at the end of, the field work, the FTL will determine whether these procedures have been followed, and whether additional samples are required

1.4.5 Sample Delivery

Samples will be shipped via an overnight service, or other courier, to the designated laboratory. During sampling and sample shipment work, the FTL will contact the laboratory daily to inform it of shipments. Hard plastic ice chests or coolers with similar durability will be used for shipping samples. Styrofoam or bubble wrap will be used as packing material to protect the samples from breakage during shipment. After packing is complete, the cooler will then be taped shut with custody seals affixed across top and bottom joints.

The following procedures will be used when transferring the samples for shipment:

- Samples will be accompanied by a CoC form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the field sampler to another person or to the laboratory.
- Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate signed CoC form enclosed in each cooler.
- Whenever samples are split with a government agency, a separate CoC form will be prepared for those samples and marked to indicate with whom the samples are being split.
- All packages will be accompanied by a CoC form showing identification of the contents. The original record will accompany the shipment, and a copy will be retained by the FTL.

1.4.5.1 Sample Receipt, Handling Custody, and Holding Time

Upon receipt of the samples, the laboratory will fill out a sample receipt form that will be emailed within 24 hours to the Aerostar PM. The sample receipt form will include the following:

- The laboratory report number
- The analytical methods requested
- Number and type of sampling containers received
- Type of preservative used for each analytical method
- Temperature of shipping container upon arrival to the laboratory
- Indication of samples received within holding time

- The date and time samples are received

This form will be included in the final laboratory analytical report submitted to USACE.

1.4.5.2 Corrective Action of Incoming Samples

Unless notified by the Aerostar PM following review of the sample receipt form, the laboratory will proceed with requested analytical methods. If any problems are identified on the sample receipt form, the Aerostar PM will immediately inform the USACE PM.

1.5 FIELD PROCEDURES

All samples collected for laboratory analyses will be collected in appropriate sample containers (with appropriate preservatives) and placed on ice prior to shipment to GCAL. Samples will be shipped on a daily basis to ensure holding times are met. All sampling procedures will follow FDEP SOPs.

Soil samples will be collected at one foot intervals for OVA-FID screening during the RI. The soil samples will be placed into OVT Environmental Products Soil Headspace Sampling Containers to the appropriate level and allowed to equilibrate for approximately 5 minutes. The headspace will then be screened using the OVA-FID with and without a carbon filter so a determination can be made whether naturally occurring organic vapors (methane) are having an effect on the OVA-FID levels detected. Soil will be screened to the groundwater table (estimated to be approximately six feet BLS). The samples will be collected using a direct-push drilling rig and macro core sampler. Soils with hydrocarbon vapors above 10 parts per million (ppm) will be considered impacted by hydrocarbons.

1.5.1 Soil Sampling Procedures

The biased sampling method is to step out 40 feet from each of the seven soil sample locations where impacted soil was identified during the SI and collect representative soil samples at multiple depths. In addition, a second step out will be conducted another 40 feet from each location to collect another round of soil samples for laboratory analysis. The second round of samples will be held at the laboratory and placed on hold until the first round of samples are analyzed. If there are exceedances detected in the first set of samples, the second round of samples will be analyzed. If exceedances exist during the second step out sampling event, a third step out event will be conducted under a separate mobilization event.

Aerostar will collect surface soil samples (0-0.5 foot BLS) using a stainless steel hand auger. The hand auger will be driven into the ground to a depth of 0.5 feet BLS. The hand auger will be decontaminated between sampling locations by washing with a brush and a solution of Liquinox and water. The hand auger will be allowed to air dry before the next soil sampling location. If limestone is present within six inches of land surface, a soil sample may not be able to be collected using the hand auger. The soil boring log will indicate that refusal was encountered at the surface and a surface soil sample was not collected.

The subsurface soil samples (0.5-2 feet BLS) will be collected using a direct-push drill rig and macro core sampling device or a truck-mounted rig with split-spoon sampling capabilities. During direct-push sampling, a clear acetate sheath will be placed in the macro core sampling tool and driven into the ground from 0.5 to 2 feet BLS. The sampling tool will be removed from the ground and the sheath removed from the sampling tool. Soil samples will be collected from the sheath after cutting the sheath with a razor tool to enable access to the soil column. The soil samples will be collected from the sheath over the appropriate depth interval and placed into laboratory-supplied containers.

The macro tool sampling device will be decontaminated between sampling locations by washing with a brush and a solution of Liquinox and water.

The soil samples will be placed into the appropriate laboratory-supplied containers and transported under chain of custody to GCAL, a National Environmental Laboratory Accreditation Program (NELAP) and DoD Environmental Laboratory Accreditation Program (ELAP) certified laboratory for analysis. Soil samples will be analyzed for PAHs and BaPE using Environmental Protection Agency (EPA) Method 8270SIM; dioxins/furans using EPA Method 8290A; arsenic (As), barium (Ba), chromium (Cr), lead (Pb), and silver (Ag) metals using EPA Method 6020.

The soil samples will be collected in accordance with the guidelines established in Chapter 62-160, FAC and in accordance with the requirements established in the FDEP Standard Operating Procedures (SOP)-001/01, FS1000 for General Sampling Procedures, revised May 15, 2014, and FS3000 for Soil, revised March 1, 2014. A copy of the referenced SOPs is included in **Appendix C**. The proposed soil sample locations are shown in **Figure 2**

1.5.2 Groundwater Sampling Procedures

Four permanent shallow monitor wells will be installed to further evaluate the groundwater at the site. Aerostar will obtain monitor well construction permits from the South Florida Water Management District prior to installing the monitor wells. Groundwater samples will be collected from the monitor wells using a peristaltic pump and dedicated polyethylene tubing. The groundwater samples will be stored in appropriate laboratory-supplied sample containers, placed on ice in a shipping cooler and submitted to Gulf Coast Analytical Laboratories in Baton Rouge, LA for analyses of the parameters listed for PAHs using EPA Method 8270SIM; and As, Cr, and Ag metals using EPA Method 6020.

Samples will be submitted to Cape Fear Analytical in Wilmington, NC for dioxins/furans using EPA Method 8290A.

Groundwater sampling will be conducted in accordance with the guidelines established in Chapter 62-780, FAC; the FDEP SOP-001/01, FS2200 for groundwater sampling, effective date May 13, 2014. A copy of the referenced SOPs is included in **Appendix C**.

TABLE 1-2: Sampling and Analytical Requirements

Matrix	No. Field Samples	QC Dup.	No. Field Equip. Blank	No. Trip Blank	Total Samples	QA MS/ MSD	QA Trip Blanks	Total QA Samples	Analysis	Analytical Procedures	Holding Time to Extraction	Preservation Requirements	Sample Containers	Total Samples
RI/Soil	28	2	2	0	32	2/2	0	4	PAHs	8270 SIM	14 days	Ice to 6°C	4 oz. CG	36
	28	2	2	0	32	2/2	0	4	Dioxin/ Furans	8290A	30 days	Ice to 6°C	4 oz. CG	36
	28	2	2	0	32	2/2	0	4	As	6020A	180 days	Ice to 6°C	4 oz. CG	36
	28	2	2	0	32	2/2	0	4	Ba	6020A	180 days	Ice to 6°C	4 oz. CG	36
	28	2	2	0	32	2/2	0	4	Cr	6020A	180 days	Ice to 6°C	4 oz. CG	36
	28	2	2	0	32	2/2	0	4	Pb	6020A	180 days	Ice to 6°C	4 oz. CG	36
	28	2	2	0	32	2/2	0	4	Ag	6020A	180 days	Ice to 6°C	4 oz. CG	36
RI/ Ground water	4	1	1	0	6	1/1	0	2	PAHs	8270 SIM	7 days	Ice to 6°C	1 Liter AG	8
	4	1	1	0	6	1/1	0	2	Dioxin/ Furans	8290A	30 days	Ice to 6°C	1 Liter CG	8
	4	1	1	0	6	1/1	0	2	As	6020A	180 days	HNO_3	0.5 Liter HDPE	8
	4	1	1	0	6	1/1	0	2	Ba	6020A	180 days	HNO_3	0.5 Liter HDPE	8
	4	1	1	0	6	1/1	0	2	Cr	6020A	180 days	HNO_3	0.5 Liter HDPE	8
	4	1	1	0	6	1/1	0	2	Pb	6020A	180 days	HNO_3	0.5 Liter HDPE	8
	4	1	1	0	6	1/1	0	2	Ag	6020A	180 days	HNO_3	0.5 Liter HDPE	8
IDW/ Soil	6	0	0	0	6	0	0	0	PAHs	8270 SIM	14 days	Ice to 6°C	4 oz. CG	6
	6	0	0	0	6	0	0	0	Dioxin/ Furans	8290A	30 days	Ice to 6°C	4 oz. CG	6
	6	0	0	0	6	0	0	0	As/ Ba/Cr/ Pb/Ag	6020A	180 days	Ice to 6°C	4 oz. CG	6

oz. = ounce

1.5.3 Decontamination of Sampling Equipment

All the sampling equipment (including hand augers, auger buckets, well points, bowls, and related mixing equipment) associated with this project will be decontaminated by personnel wearing disposable latex gloves or vinyl gloves and using the following procedure (DEP-SOP-001/01, FS 1000 General Sampling Procedures).

- Wash with tap water and Liquinox, using a brush if necessary to remove particulate matter and surface films
- Rinse with tap water
- Rinse with analyte-free water
- Air dry

- Wrap with aluminium foil, if appropriate, to prevent contamination if equipment is going to be stored or transported

1.5.4 Calibration Procedures

Field Instruments: Field instruments will be calibrated daily before beginning sampling activities. The method and frequency of calibration for the instruments used for each field activity are described in this section.

OVA-FID Calibration: The primary calibration of the OVA-FID is performed at the factory to 100 ppm methane gas or isopropylene. Secondary calibration will be performed according to manufacturer's specifications at the beginning of each sampling activity. Those specifications are included in the Site Safety Health Plan (SSHP).

The meter will be zeroed to background levels on a daily basis by field personnel. The OVA-FID will be checked at the end of the day against a 100 ppm methane calibration gas.

Aerostar will perform initial and continuing calibration verification of groundwater sampling meters including pH, specific conductivity, dissolved oxygen, and turbidity. Calibration standards will be used following the FDEP SOPs.

1.6 LABORATORY ANALYSES

See Table 1-2 for the laboratory analytical parameters and the proposed number of soil and groundwater samples to be collected during the RI. The samples will be submitted to GCAL for analysis. IntraLabs Inc. (IntraLabs) coordinates the sampling activities required for this project between Aerostar, GCAL, and Cape Fear Analytical, LLC. In addition, IntraLabs reviews the laboratory analytical data generated by GCAL prior to Aerostar receiving the laboratory data. The address and point of contact (POC) information for IntraLabs, GCAL, and Cape Fear Analytical, LLC are:

IntraLabs Inc., 1909 Southampton Road, Jacksonville, Florida 32207
Technical Manager – Mr. Tommy Carr, Telephone: (904) 396-6868, Fax: (904) 396-3933

Gulf Coast Analytical Laboratories, LLC (GCAL), 7979 GSRI Avenue, Baton Rouge, LA 70820
Project Manager – Ms. Regina Haney, Telephone: (225) 769-4900

Cape Fear Analytical, LLC; 3306 Kitty Hawk Road, Wilmington, NC, 28405
Project Manager – Mr. Michael Larkins, Telephone: (910) 795-0421

1.7 DATA EVALUATION

The data evaluation phase of the project includes activities to assess the validity and technical significance of the field data. The subcontracted laboratories will provide Level II Quality Assurance/Quality Control (QA/QC) data packages confirming the validity of the analyses.

1.7.1 Data Validation

The Aerostar Chemist will review the electronic database file and supporting hard-copy reports to assess the quality of the data with respect to the method and project-specific requirements. Aerostar will conduct a systemic review of the primary data set for compliance with the established QC criteria based on the following:

- Sample condition upon receipt
- Holding time
- Analytical QC Samples (e.g., method blanks, laboratory control samples, matrix spikes, duplicates)
- Surrogate recoveries
- Field-submitted duplicate samples
- Equipment blank results

1.7.2 Technical Evaluation

The Aerostar PM will review the validated electronic database file and supporting hard-copy reports to assess the quality of the data with respect to the project-specific requirements. Once the information in the database file is complete, it will be used by various members of the project team to support the technical evaluations regarding site conditions and disposal of wastes.

1.8 REFERENCES

Aerostar SES LLC, December 2014, TPP Memorandum Meeting No. 1.

Aerostar SES LLC, January 2015, Final Quality Control Plan.

Florida Department of Environmental Protection Site Inspection Report, July 2011.

USACE document ER-1110-1-12, *Quality Management* (July 2006), Chapter 3.

USACE, September 5, 2014, Performance Work Statement.

FIGURES

FIGURE 1. RI/FS INCINERATOR SITE LOCATION MAP

AerostarSES LLC

RI/FS INCINERATOR SITE
MIAMI-DADE COUNTY, FLORIDA
FOLIO #: 30-5926-000-0010

Feet
0 400 800
1 inch = 800 feet

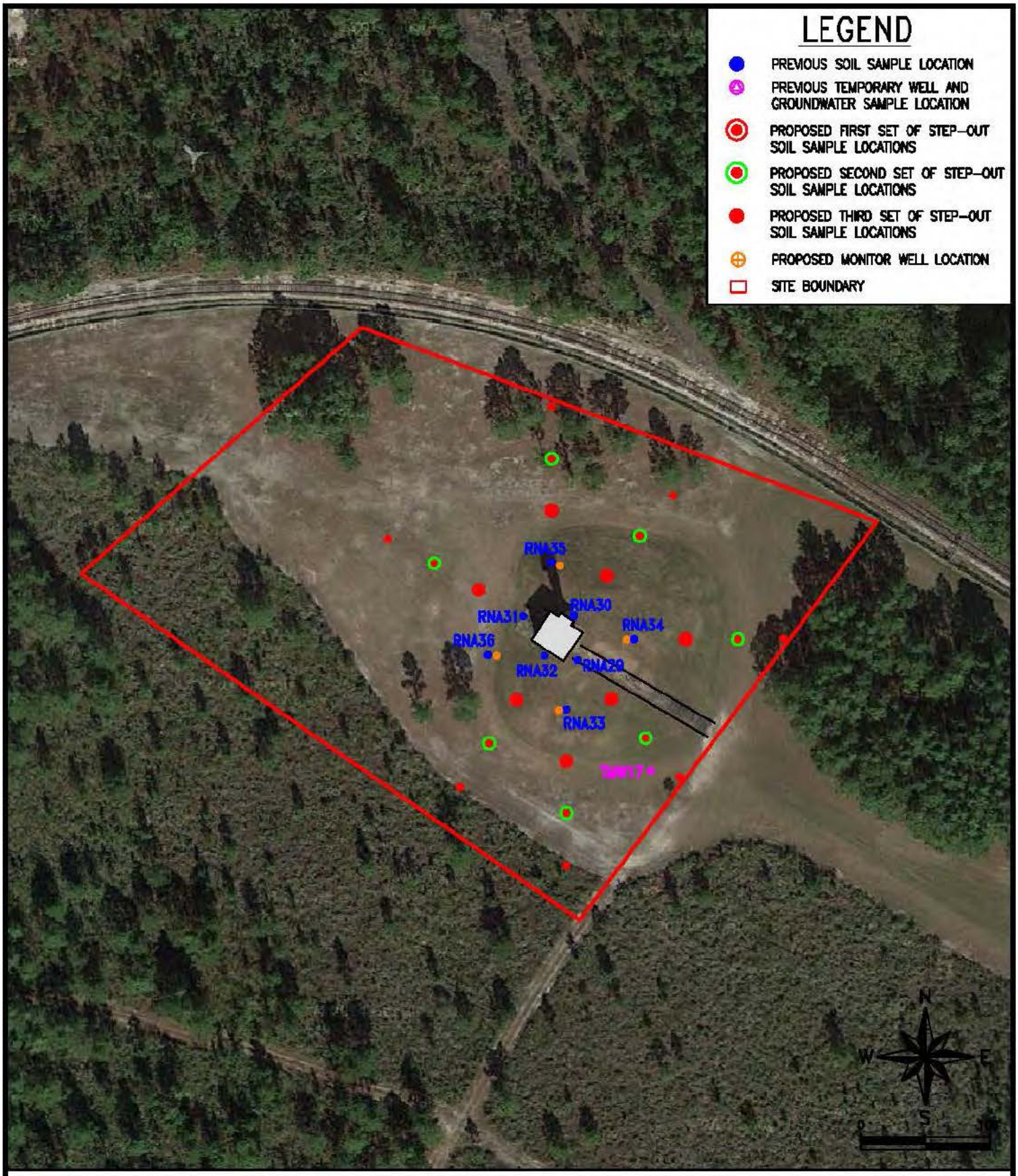

FIGURE 2 – SITE MAP WITH PREVIOUS AND PROPOSED SAMPLING LOCATIONS

AerostarSES LLC	RI/FS INCINERATOR SITE FORMER RICHMOND NAVAL AIR STATION MIAMI, MIAMI-DADE COUNTY, FLORIDA	SCALE: 1" = 100'-0" DATE: FEBRUARY 2016 REVIEWED: B. YOUNG