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FINAL SAMPLING WORK PLAN FOR SITE 98, SITE 325, AND AREA OF CONCERN 2
SOUTH DOCK NSA PANAMA CITY FL
3/1/2012
NAVFAC SOUTHERN



**FINAL
SAMPLING WORK PLAN
FOR
BUILDING 98, SITE 325, and
AREA OF CONCERN (AOC)-2/SOUTH DOCK**

**NSA PANAMA CITY,
PANAMA CITY BEACH, FLORIDA**

MARCH, 2012

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PROFESSIONAL ENGINEERING CERTIFICATION

This document and the opinions herein were developed in accordance with commonly accepted practices and procedures consistent with industry standards, and was prepared under the direction of a registered professional engineer.

Date: 5 April 2012
John D. Schoolfield
Massachusetts PE License
No. 43006
Expires June 2012



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ACRONYMS AND ABBREVIATIONS

ASS	Air Sparge System
ABB-ES	ABB Environmental Services, Inc.
bls	Below Land Surface
CA	Contamination Assessment
CAR	Contamination Assessment Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COMET	Compliance and Enforcement Activity Tracking
CSS	Coastal Systems Station
DCE	Dichloroethene
DPT	Direct Push Technology
DSCP	Dry Cleaner Solvent Cleanup Program
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
FOL	Field Operations Leader
ft	Feet
GCTL	Groundwater Cleanup Target Level
gpm	Gallons per minute
GPR	Ground Penetrating Radar
GPS	Global Positioning System
HASP	Health and Safety Plan
HRS	Hazard Ranking System
ID#	Identification Number
IDW	Investigative Derived Waste
LTM	Long Term Monitoring
µg/L	Micrograms per liter
NGVD	National Geodetic Vertical Datum
NSA	Naval Support Activity
NTU	Nephelometric Turbidity Unit
O&M	Operations and Maintenance
OVA	Organic Vapor Analyzer
pH	Potential of Hydrogen
RAP	Remedial Action Plan
SCTL	Soil Cleanup Target Level
SOP	Standard Operating Procedure
SVE	Soil Vapor Extraction
TPHCWG	Total Petroleum Hydrocarbons Criteria Working Group
TRPH	Total Recoverable Petroleum Hydrocarbons
SACAL	SACAL Environmental & Management Company
SWMU	Solid Waste Management Unit
UST	Underground Storage Tank
VOA	Volatile Organic Aromatic
VOC	Volatile Organic Compound

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1 INTRODUCTION

NSA Panama City is a Navy facility involved in research and development since 1945. The base contains a number of sites that have undergone environmental cleanup under the Defense Environmental Restoration Program (DERP). This work plan will focus on three of these sites, Building 98, Site 365, and AOC-2.

1.1 Purpose

The overall purpose of this SI Work Plan is to facilitate environmental sampling to gather data for assessment of three separate sites at NSA Panama City. The intent of the work plan is to describe sampling objectives, sample locations, collection methodology, field measurements and laboratory analytical methods to be used. Each sampling effort has site specific objectives and is tailored to fill data gaps specific for the subject site. Each site and the corresponding sampling effort is described below:

2 BUILDING 98

Building 98 is located in a developed area at the eastern side of the facility. The site includes a large asphalt paved parking lot surrounded by offices, storage, warehouse buildings, and a lay down storage compound. The site is encompassed within the groundwater Land Use Control (LUC) boundaries of another site, AOC-1. AOC-1 was investigated previously under the Resource Conservation and Recovery Act (RCRA) program and the FDEP petroleum program.

Building 98 was once the location of 560 gallon underground storage tank (UST) containing diesel heating oil used for provide heating for the building. The tank was removed on 8 August 1997, as detailed in the document *Closure Assessment Report underground Storage Tank Building 98 NSWC CSS Panama City, Florida (Dec, 1997)*. At this time, contaminated soil was encountered and removed based on the head space screening techniques (62-770 FAC). Contaminated soil was removed horizontally and vertically until hydrocarbon levels in the surrounding soil were less than 50 parts per million (ppm), resulting in approximately 2 cubic yards of soil being removed.

The tank pit was eight feet wide, ten feet long and five feet deep. A temporary well was installed and sampled for volatiles by EPA Method 8260, semi-volatiles by EPA Method 8270, Lead by EPA Method 239.2 and Ethylene Dibromide by EPA Method 504. The laboratory analytical report indicated that groundwater was contaminated with petroleum hydrocarbons.

The groundwater at this location is immediately down gradient of former fire training area, AOC-1, and is administered under the AOC-1 Groundwater Operable Unit. Administrative controls include a land use control program for the ground water along with long term groundwater monitoring. Therefore, the groundwater for this site is address under the AOC-1 program.

2.1 Building 98 Soil Sampling Objectives:

The soil surrounding the tank pit has not been sampled for off-site laboratory analyses and a contaminant assessment report has not been performed for the soil at this location. Therefore, purpose of the sampling effort under this Work Plan is to gather data on the soil surrounding the former UST. This will complete the assessment of potential soil contamination as recommended in the UST Closure Report.

3 SITE 325

Site 325 is located in a highly developed area at the eastern side of the facility just south of the helicopter landing pad. The site includes a large asphalt/concrete paved parking lot surrounded by office and storage and warehouse buildings and three relatively new above ground storage tanks (ASTs) which replaced three older underground storage tanks (USTs) that have been removed.

The three former 20,000-gallon fiberglass USTs were installed in 1976 and one 300-gallon UST was installed in 1984. All tanks were used for the storage of JP-5 jet fuel. In 1989, a leak was discovered in an underground pipeline associated with the middle UST (UST #2), resulting in contamination at the site.

Previous investigations at Site 325 are summarized below.

- A Contamination Assessment (CA) was conducted from 1992 to 1994 by ABB Environmental Services, Inc. (ABB-ES). During that time ten soil borings and three monitoring wells were installed. Several groundwater samples exceeded FDEP cleanup target levels for benzene and total naphthalenes, and one well contained 1.25 feet of free product. It was discovered that piping associated with UST # 2 was leaking. The Activity removed and replace the old 20,000-gallon USTs and begin free product removal at the site.
- During the excavation 83 soil samples were screened with an organic vapor analyzer (OVA). Excessively contaminated soil (>50 ppm) was removed (about 490 cubic yards) and replaced with clean fill material. Only the amount of soil required to excavate the tanks and pipelines were removed; therefore, some contaminated soil remained onsite. An attempt to remove all free product during the excavation was conducted. The groundwater surface was vacuumed for three hours; the amount of free product removed was not measurable.
- A CAR was submitted in January 1996 that summarized additional contamination assessment work. Based on the findings of isolated free product and groundwater contamination, ABB-ES recommended an IRA.
- In May of 1996, ABB-ES submitted a RAP containing identified contaminants of concern (VOAs, PAHs, TRPH, ethylene dibromide, and dissolved lead), the extent of contamination, exposure pathways (very limited), limitations to clean up, and remedial treatment options, which included source abatement through free product monitoring and recovery, soil vapor extraction (SVE) and groundwater monitoring with components for future potential installation of an air sparge system (ASS).
- In July 2004, the construction completion report was submitted for the SVE and ASS system at the site. The report summarized the SVE installation in 1997 and completion in 1998. The system operated bimonthly through December 2001 (no free product was recorded since June 2001). In 2002, CH2M Hill replaced the mobile SVE/ASS system with updated system components.
- In December 2006, the SVE/AAS system was turned off after groundwater analytical results remained below laboratory detection limits for the previous six consecutive quarters in the monitor wells. Groundwater monitoring continued after the system was turned off.

- In December 2007, an exceedence of the TRPH GCTL of 5 mg/L (6.9 mg/L) was detected in one monitoring well, MW-8.
- In December 2008, groundwater monitoring indicated that TRPH concentrations exceeded the GCTL of 5 mg/L in two monitor wells, MW-8 (13.3 mg/L) and MW-23 (16.0 mg/L), suggesting that some rebounding may be occurring at the site following completion of the 2006 SVE/ASS soil treatment. At this time, seven soil borings were advanced across the site and soil samples collected for analysis by the Florida TPH CWG method. Analytical results for all of the soil sample samples were below the TPH CWG criteria.
- Groundwater sampling in March 2010 indicated only one monitoring well, MW-23 exceeded the TRPH GCTL of 5 mg/L (12.0 mg/L).

3.1 Site 325 Soil Sampling Objectives:

Based on the history of this site, past soil sampling, and the location of monitoring wells, both with and without GCTL exceedences, it is possible a lingering source of groundwater contamination may be present in soil immediately up gradient of MW-23 and MW-08. The purpose of the proposed soil sampling effort at Site 325 is to collect soil samples in this up gradient area to determine if soil contamination is present at this location.

4 AOC-2/SOUTH DOCK

AOC 2 is located in a highly developed area at the southern end of the facility. The site includes a large asphalt/concrete paved parking area and is surrounded by offices, maintenance and storage buildings with the Explosive Ordnance Disposal Compound to the west. AOC-2 extends southward along a utility corridor to the South Dock. A former AST (AST 11), constructed in 1943, was previously located at AOC-2. It was originally used to store diesel fuel. Petroleum products were transferred to the AST from the South Dock via a 6-inch diameter underground transfer line connected to a pump house at the South Dock. A smaller, 3-inch diameter transfer line connected AST 11 to a fuel pump house located approximately 100 feet (ft) to the northwest of the tank (the current location of Building 543). A circular earthen berm spaced approximately 60 ft from the tank provided secondary containment.

The pump house associated with AST 11 was used to distribute fuel from AST 11 and tanks associated with the former fuel dispensing facility located approximately 200 ft to the northwest of AST 11 (the current location of Building 400). Two parallel 3-inch diameter transfer lines distributed diesel fuel and gasoline from the pump house to the South Dock. Additional smaller diameter fuel lines may have been used to distribute fuel to other locations in the vicinity of AST 11. The former fuel dispensing station included two USTs, UST 12 and UST 13, which were removed in the early 1970s. No documentation is available for the condition of the tanks during removal.

Approximately 50,000 gallons of diesel fuel were reportedly released from the tank system in 1953. The exact location of the leak and whether or not the underground piping had failed is unknown. AST 11 was completely refurbished in 1957, including replacement of 28 bottom plates. The tank was then reportedly used to store gasoline, aviation fuel, diesel fuel, and waste oil. Numerous small leaks, primarily at the tank seams, were reported to have occurred both before and after the tank had been refurbished. In the mid 1960s, an estimated 10,000 gallons of product were released from ruptured fuel transfer lines located between the dock and storage tank. Following the rupture, seepage of product was observed in Alligator Bayou at the South Dock bulkhead.

AST 11 and the containment berm were removed in 1979. Reportedly, the bottom plates of the tank had completely deteriorated. The transfer piping from the tank wall to the containment berm was removed. The remaining piping was capped and abandoned in place. Based on utility drawings, the fuel dispensing station was removed after 1984. Building 400 was built in the area of the former fuel dispensing station. Building 543 has recently been constructed in the area of the former fuel pump house, and the Special Operations Facility has recently been constructed near AOC 2. All of these areas are likely to have contributed to the contamination found at AOC 2.

In 2007/2008, excavation was performed to remove contaminated soil and floating petroleum product at AOC-2. During excavation, a concrete pipe juncture vault was discovered that contained floating product. The vault and surrounding contaminated soil was removed and water/product vacuumed from the open excavation. The area of excavation was backfilled with clean soil and restored.

4.1 AOC 2

The main portion of AOC-2 (minus the South Dock) contains numerous area-wide historical soil sample locations where samples were collected in the 1990s. Sample data from the 1990s shows wide spread but spotty areas of soil contamination from petroleum hydrocarbons. Since these data were collected, enough time has elapsed so that naturally occurring degradation of hydrocarbons may have brought contaminant concentrations down to acceptable levels. Furthermore, a better analytical methodology, Total Petroleum Hydrocarbons Criteria Working Group (TPHCWG), has been developed that is much better at quantifying contamination from petroleum hydrocarbons

4.1.1 AOC-2 Soil Sampling Objectives:

The Navy plans to evaluate the extent of LUCs needed for soil at AOC-2 given the previous remedial activity, the time elapse since area-wide sampling, and better analytical methodology now available. Therefore, sampling is planned for historical sample point locations across AOC-2 where soil criteria exceedences were previously detected to gather updated analytical data on current soil conditions for this portion of AOC-2.

4.2 South Dock

The South Dock is the Southern-most reach of AOC-2 and is at the southern end of the facility along Alligator Bayou. The site consists of an asphalt/concrete paved elongated area adjacent to the pier to the south and bounded by office, storage and ship maintenance buildings to the north.

During reconstruction activities in 2009, floating product was observed beneath the South Dock relieving platform. The relieving platform is a concrete structure located 7 feet below the deck of the South Dock and adjoins the head wall. It runs the length of the head wall, and extends 25 feet inland from the head wall. During reconstruction, the relief platform with inter connected support structures were left in place without alteration with the exception of a few temporary holes drilled through the platform in order to anchor the new head wall to the platform. It was determined that the petroleum product found beneath the relieving platform was inaccessible and technically impractical to address due to the presence of the complex and numerous beams, support cables, cathodic protection wiring, and pilings that provide the structural integrity of the dock. Additionally, it was not considered feasible that the product would migrate through the new head wall to Alligator Bay; therefore, the product would be left in place. However, the product will continue to act as a source of dissolved petroleum compounds to groundwater and this dissolved groundwater contamination may migrate to the north (inland) away from the dock.

4.2.1 Groundwater Sampling Objectives:

The Navy intends to place the South Dock under LUCs. The LUC boundary for groundwater will extend from the South Dock concrete deck northward (inland) to uncontaminated groundwater. In order to determine a reasonable boundary for the groundwater LUCs, groundwater sampling is planned at locations extending northward from the South Dock.

5 PROPOSED FIELD ACTIVITIES

5.1 Soil Assessment

Prior to the commencement of intrusive activities, a facility dig permit with utility clearance will be obtained for the activities.

5.1.1 Soil Screening

Soil screening sample locations for Building 98, Site 325, and AOC 2 are shown on Figures 4, 5, and 6, respectively. The soil screening interval will be 0 to 1 foot, 1 to 2 feet, 2 to 4 feet, 4 to 6 feet, and 6 to 8 feet or until the groundwater interface occurs. Soil from each interval will be collected using a DPT drill rig 2 foot core or decontaminated stainless steel, hand auger, stored in an airtight sampling container and allowed to sit for a minimum of 10 minutes to allow volatilization. Upon completion of sample collection, the airtight sample container will be screened for UST related soil gas using an FID, and results will be recorded on sample log sheets and used to determine the progression of the soil investigation. Tables 3-1, 3-2 and 3-3 demonstrate the sampling activities proposed for each site. A copy of a soil boring log is provided in Appendix A.

TABLE 5-1 SUMMARY OF SCREENING ACTIVITIES BUILDING 98

Sample Type	Sample Depth feet bls	Sample Frequency	Parameters
DPT/Hand	0-1	6+ locations	FID Screening
Auger Soil	1-2	6+ locations	FID Screening
Screening	2-4	6+ locations	FID Screening
Sample	4-6	6+ locations	FID Screening
	6-8	6+ locations	FID Screening

TABLE 5-2 SUMMARY OF SCREENING ACTIVITIES SITE 325

Sample Type	Sample Depth feet bls	Sample Frequency	Parameters
DPT/Hand	0-1	6+ locations	FID Screening
Auger Soil	1-2	6+ locations	FID Screening
Screening	2-4	6+ locations	FID Screening
Sample	4-6	6+ locations	FID Screening
	6-8	6+ locations	FID Screening

TABLE 5-3 SUMMARY OF SCREENING ACTIVITIES AOC 2

Sample Type	Sample Depth feet bls	Sample Frequency	Parameters
DPT/Hand	0-1	15+ locations	FID Screening
Auger Soil	1-2	15+ locations	FID Screening
Screening	2-4	15+ locations	FID Screening
Sample	4-6	15+ locations	FID Screening
	6-8	15+ locations	FID Screening

5.1.2 Soil Sampling

Once the screening is complete, the location and depths of sample collection for off-site laboratory analysis will be determined in the field by on-site personnel based on data collected using FID screening process. Table 3-4 details the sample frequency and analytical groups to be performed for each site. A copy of a soil sampling sheet is included in Appendix A.

TABLE 5-4 SUMMARY OF SOIL SAMPLING ACTIVITIES SITES 98, 325, AND AOC 2

Site	Analytical Group	No. of Sampling Locations ²	No. of Samples
98	Table B of Chapter 62-770 FDEP Petroleum Contaminant Site Cleanup Criteria & TPHCWG ¹	TBD (Plan 6 samples provided to the Laboratory)	TBD
325	Table B of Chapter 62-770 FDEP Petroleum Contaminant Site Cleanup Criteria & TPHCWG ¹	TBD (Plan for 10 samples provided to the Laboratory)	TBD
AOC 2	Table B of Chapter 62-770 FDEP Petroleum Contaminant Site Cleanup Criteria& TPHCWG ¹	TBD (Plan for 10 samples provided to the Laboratory)	TBD

Notes:

1. Any soil samples exceeding the Table B FL-PRO criteria will be further analyzed by the Total Hydrocarbon Criteria Working Group (TPHCWG) method.
2. Soil samples not collected at one site may be used to collect additional samples at another site

All sampling equipment used will be decontaminated between each sampling location. Decontamination will be conducted in accordance with FDEP SOPs. Sampling will be conducted in accordance with FDEP Standard Operating Procedures (SOPs) 001/01: FS3000: *Soil Sampling* and FS1000: *General Sampling Procedures* [3].

Soil displaced during the investigation will be containerized and disposed of in accordance with FDEP SOPs. A summary of soil sampling activities is provided in Table 3-1. A copy of the Soil Sampling Log is provided in Appendix A.

Soil samples will be collected using a DPT drill rig 2 ft core sampler. Locations that cannot be accessed by the DPT rig may be sampled using a stainless steel hand auger. In this instance, one decontaminated stainless steel hand auger bucket will be used for each sample interval. Samples for VOC analyses will not be mixed, but will be directly collected from the sampler as required by FDEP SOPs. Soil samples will be placed in laboratory-provided sample containers, sealed, labeled, packed on ice, and shipped under chain-of-custody protocol to a fixed-based laboratory for analysis.

5.2 Groundwater Assessment

Groundwater sampling is planned at locations extending northward from the South Dock in order to determine a reasonable boundary for groundwater LUCs in this area. The locations of proposed micro-wells are shown on Figure 8

5.2.1 Temporary Micro Well Installation

SACAL will install up to 7 temporary micro wells or well points using a DPT rig when possible. In areas where DPT rig access is not possible, temporary wells may be installed using hand augers. Each temporary well will be advanced to a depth of approximately 12 feet bls and screened across the water table. Each temporary well will be constructed of nominal 1-inch diameter, pre-packed schedule-40 polyvinyl chloride (PVC) with 10 feet of 0.010-inch pre-packed slotted screen and PVC end-cap or well point located at the bottom of each well. The outside annular space of the well screen will be filled with 20/30 silica sand to 1 foot above the well screen. In addition, a minimum 1 foot of fine choke sand (30/65 graded) will be placed above the sand pack. Upon completion, each micro well will be developed by pumping with a peristaltic pump until it produces non-turbid water. The proposed areas for micro well installation are shown on Figure 8.

Micro well installation and abandonment will be conducted in accordance with FDEP's SOPs and in compliance with the Northwest Florida Water Management District rules and regulations.

5.2.2 Groundwater Sampling

Prior to sampling, each existing and newly installed micro well or well point will be purged with a variable speed, peristaltic pump, using low-flow technique. The pump speed will be adjusted to match the draw-down in the well. Field parameters (including temperature, pH, specific conductance, and turbidity) will be measured at the initiation of the purging process. When field parameters stabilize and water turbidity is less than 5 nephelometric units (NTU), the groundwater sample will be collected. This numeric value is less than the FDEP stabilization criteria of 20 NTU because samples will be analyzed for metals (lead). Field experience has shown that lower turbidity readings produce more representative groundwater analytical results for metals. Stabilization will be recognized when the pH remains constant (within 0.2 Standard Unit), specific conductivity varies no more than 10 percent and temperature is constant for at least three consecutive readings. If parameters have not stabilized or turbidity of less than 5 NTU cannot be achieved after a reasonable period of time, continuation of the purging process will be left to the discretion of the NAVFAC RPM. Specific FDEP SOPs to be consulted for each parameter are provided below in Table 3-6.

TABLE 5-5 SOP REFERENCES

Parameter	FDEP SOP Title	FDEP SOP No.
pH	Field Measurement of Hydrogen Ion Activity	FT1100
Specific Conductance	Field Measurement of Specific Conductance	FT1200
Temperature	Field Measurement of Temperature	FT1400
Dissolved Oxygen	Field Measurement of Dissolved Oxygen	FT1500
Turbidity	Field Measurement of Turbidity	FT1600
Oxidation-Reduction Potential	Oxidation-Reduction Potential	FT2100

Groundwater samples will be collected from the temporary micro wells with Teflon® tubing and a peristaltic pump, using low flow/low stress sampling techniques. Groundwater samples for VOC analyses will be collected directly from the inserted tubing using the straw or reverse flow method and analyzed as described in FDEP SOPs. Following the investigation, the tubing and down-hole components will be withdrawn and the boreholes backfilled, from bottom to top, with appropriate soil cuttings.

TABLE 5-6 SUMMARY OF GROUNDWATER SAMPLING ACTIVITIES, SOUTH DOCK

Analytical Group	No. of Sampling Locations	No. of Field Duplicates	No. of MS/MSDs	No. of Equip. Blanks	No. of Trip Blanks	Total No. Samples to Lab
Table B of Chapter 62-770 FDEP Petroleum Contaminant Site Cleanup Criteria	7	1	1	1	1 per cooler VOCs	12

Notes:

FL-PRO = Florida Petroleum Range Organics

MS/MSDs = matrix spike/matrix spike duplicate

6 SAMPLE HANDLING AND FIELD PROCEDURES

6.1 Field Procedures

The following field procedures will be used.

6.2 Sampling Identification System

Each sample will be assigned a unique codified sample identification number as follows:

Soil Sample Nomenclature:

1		2		3		4		%
<u>PCY</u>	-	<u>XXXX</u>		<u>ZZZ</u>	-	<u>SF/SB</u>	-	YYY

1. PCY = NSA Panama City Site
2. XXXX = Site (0098, 0325, AOC2)
3. ZZZ = Sample Depth
4. SF = Surface Soil Sample; SB = Subsurface soil
5. YYY = Sample ID number

Groundwater Sample Nomenclature:

1		2		3		4
<u>PCY</u>	-	<u>SODO</u>	-	<u>GW</u>	-	YYY

1. PCY = NSA Panama City Site
2. Site (SODO= South Dock)
3. GW = Groundwater
4. YYY = Sample ID number

6.3 Sample Packaging and Shipping

Samples will be packaged and shipped in accordance with FDEP SOP 001/01 FS1000: *General Sampling* and applicable sections of FS2200 and FS3000. FS1000 also addresses the topics of containers and sample preservations.

6.4 Sample Custody

Custody of samples will be maintained and documented at all times. Chain-of-custody begins with the collection of the samples in the field. Applicable sections of the USEPA Field Branches Quality System and Technical Procedures will be followed.

6.5 Quality Control Samples

Pre-rinsate blanks will be collected prior to commencement of the soil and groundwater assessment events in general accordance to FDEP SOP 001/01 FQ1000: Field Quality Control Requirement. In addition, duplicate samples will be collected and trip blank samples will accompany each cooler containing VOC samples.

6.6 Equipment Calibration

The FID will be calibrated according to manufacturer standards as outlined in FDEP SOPs. The field instruments including the YSI 556 Water Quality Multimeter, and Lamotte 2120e Turbidity Meter will be calibrated daily and/or according to FDEP SOPs FT1000: General Field Testing and Measurement. Calibration will be documented on an Equipment Calibration Log.

6.7 Record Keeping

In addition to chain-of-custody records, standard forms will be completed for sample description and documentation. These shall include sample log sheets (for soil and groundwater samples), daily activities record, and logbooks. The Field Operations Leader (FOL) will maintain a bound, weather-proof field notebook. The FOL, or designee, will record pertinent information related to sampling or field activities.

6.8 IDW Management

During the field event, containers will be provided for the collection and disposal of all Site generated IDW. IDW liquids (i.g. purge and decontamination water) will be transported to the NSA Panama City Oil/Water separator facility, located behind the Fire Department on Gull Road, for disposal. IDW soil, to include drill cuttings and excess soil from sampling, will be containerized and transported to the NSA Hazardous Waste storage and Disposal Facility located on-base at 401 Solomons Drive. Following receipt of the analytical results, the IDW will be properly disposed as per FDEP regulations. Appropriate IDW documentation will be maintained in the project field logbook/files.

6.9 Decontamination

The equipment involved in field sampling activities will be decontaminated prior to and during sampling activities in accordance to FDEP SOP FC1000.

6.10 Reporting

Information obtained from field activities detailed in this work plan will be incorporated into the Draft and Final SI Report scheduled for completion in the fourth quarter of 2011.

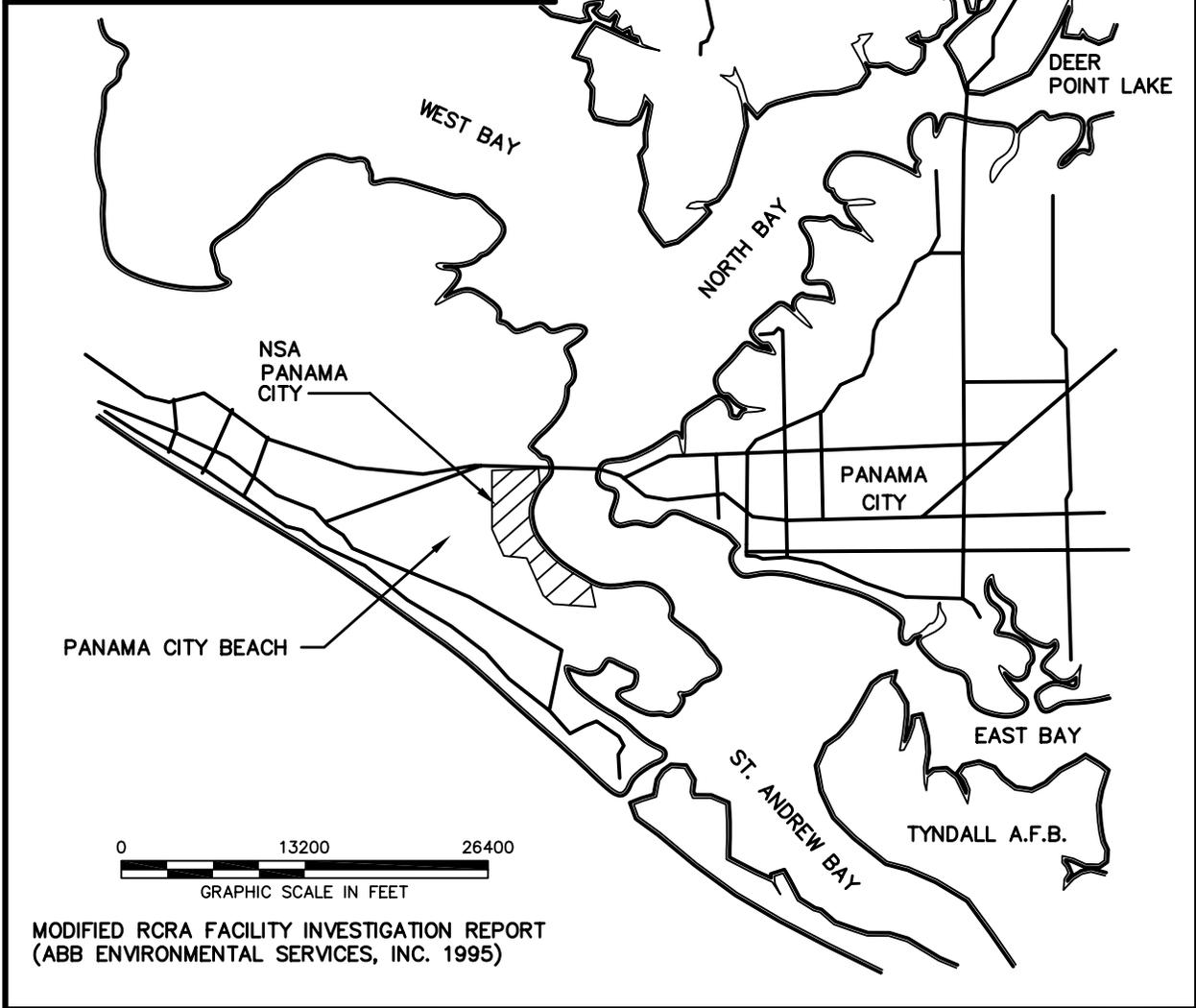
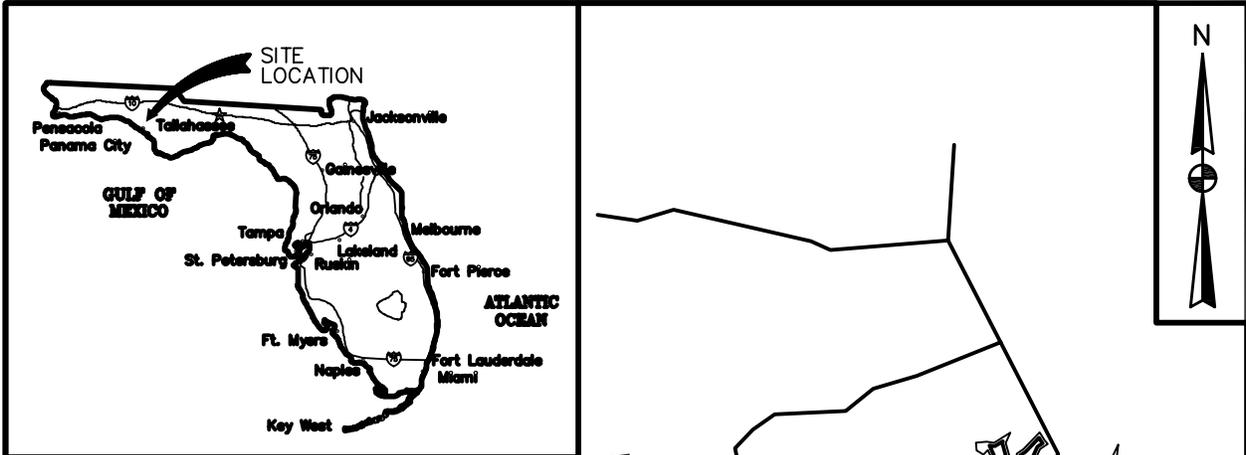
7 REFERENCES

ABB-ES, 1996. Resource Conservation and Recovery Act Facility Investigation, Coastal Systems Station (CSS) Panama City, Panama City, Florida, prepared by ABB Environmental Services, Inc, January.

APPENDIX A

FIGURES

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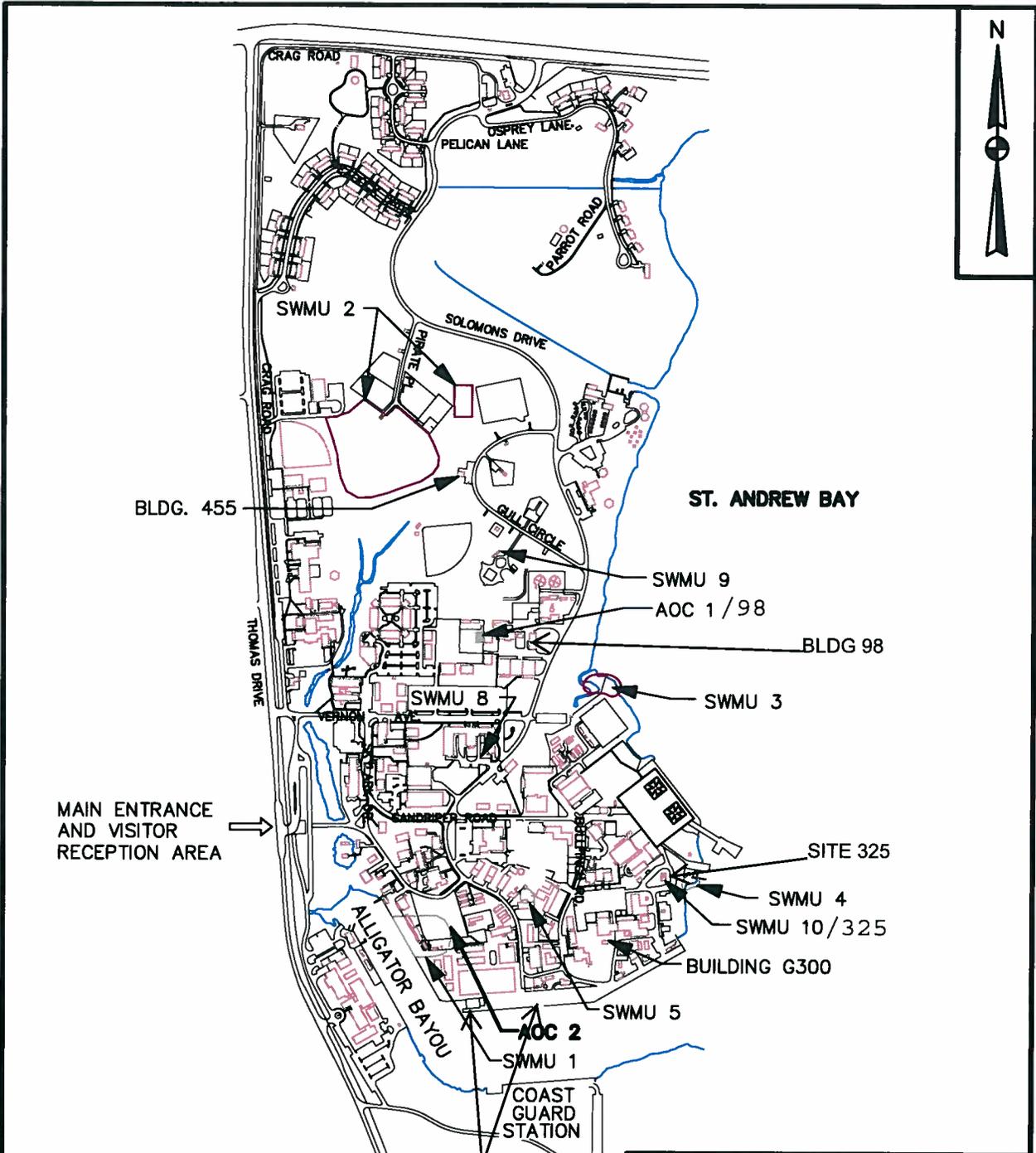
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 (ABB ENVIRONMENTAL SERVICES, INC. 1995)

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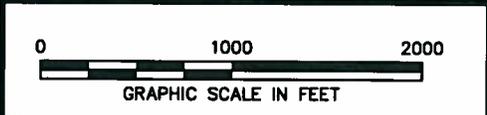


WORK PLAN FOR SITES 98, 325,
 AOC 2 AND SOUTH DOCK
 NAS PANAMA CITY
 PANAMA CITY BEACH, FLORIDA

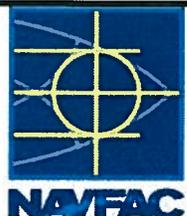
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MAIN ENTRANCE AND VISITOR RECEPTION AREA

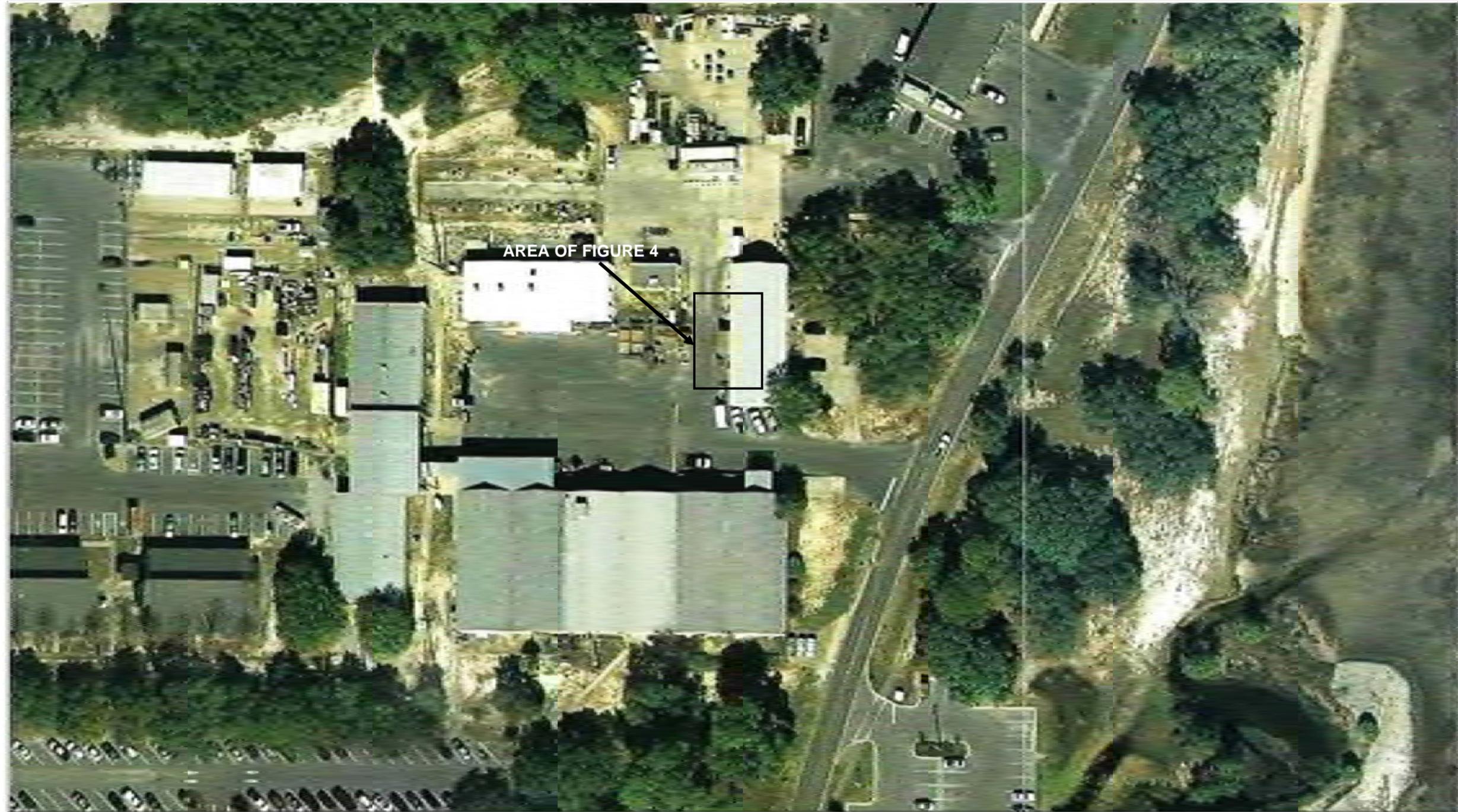


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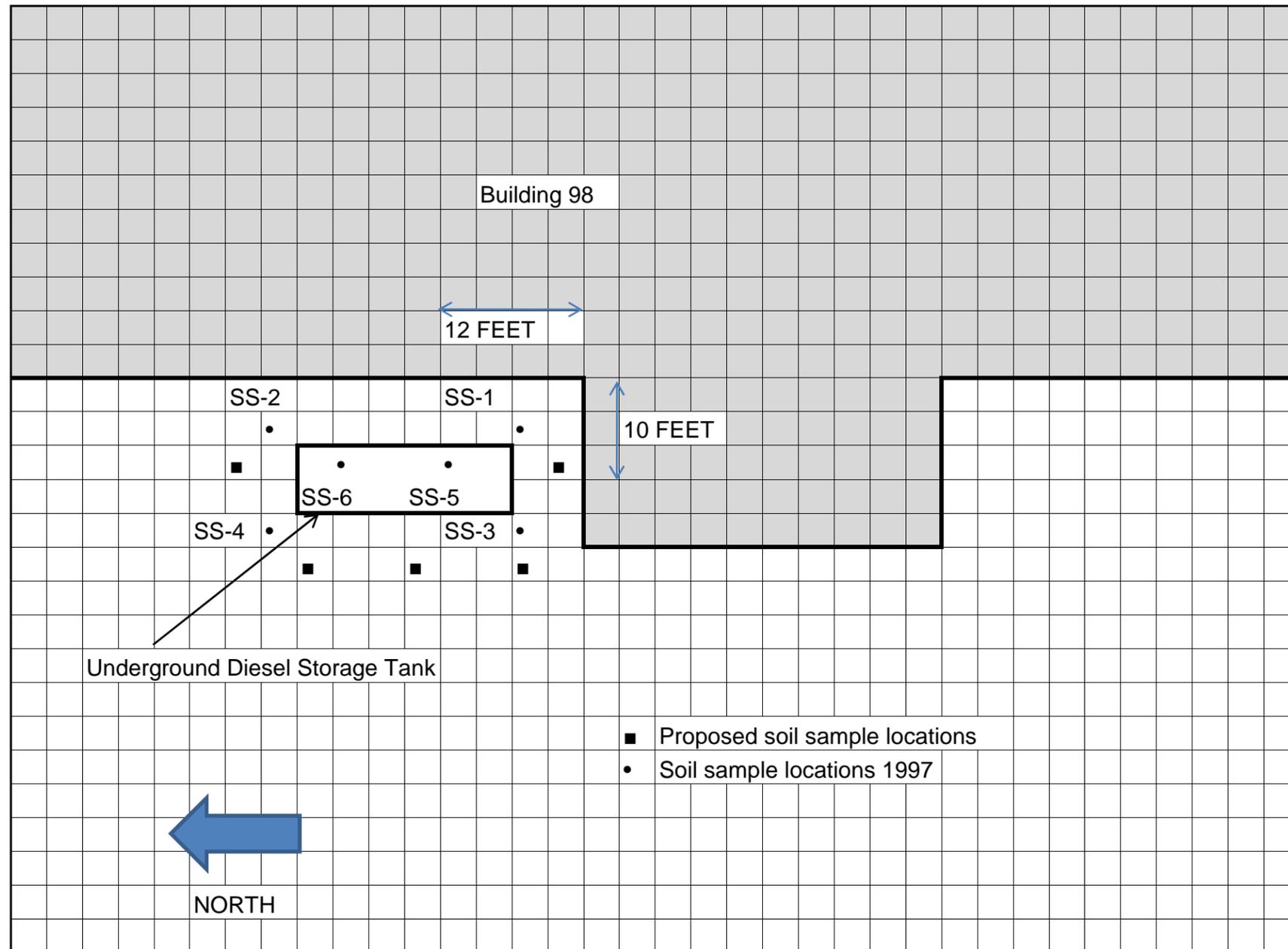


**SITE LOCATION MAP
WORK PLAN FOR SITES 98, 325, AOC
2 AND SOUTH DOCK
NSA PANAMA CITY
PANAMA CITY BEACH, FLORIDA**

CONTRACT NO. 0328	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV. 0



DRAWN BY	DATE	 FOR SITE 98 LOCATION MAP WORK PLAN FOR SITES 98, 325, AOC2 AND SOUTH DOCK NSA PANAMA CITY PANAMA CITY BEACH, FLORIDA	CONTRACT NO	
CHECKED BY	DATE		OWNER NO.	
REVIEWED BY	DATE		APPROVED BY	DATE
			DRAWING NO. FIGURE 3	REV. 0

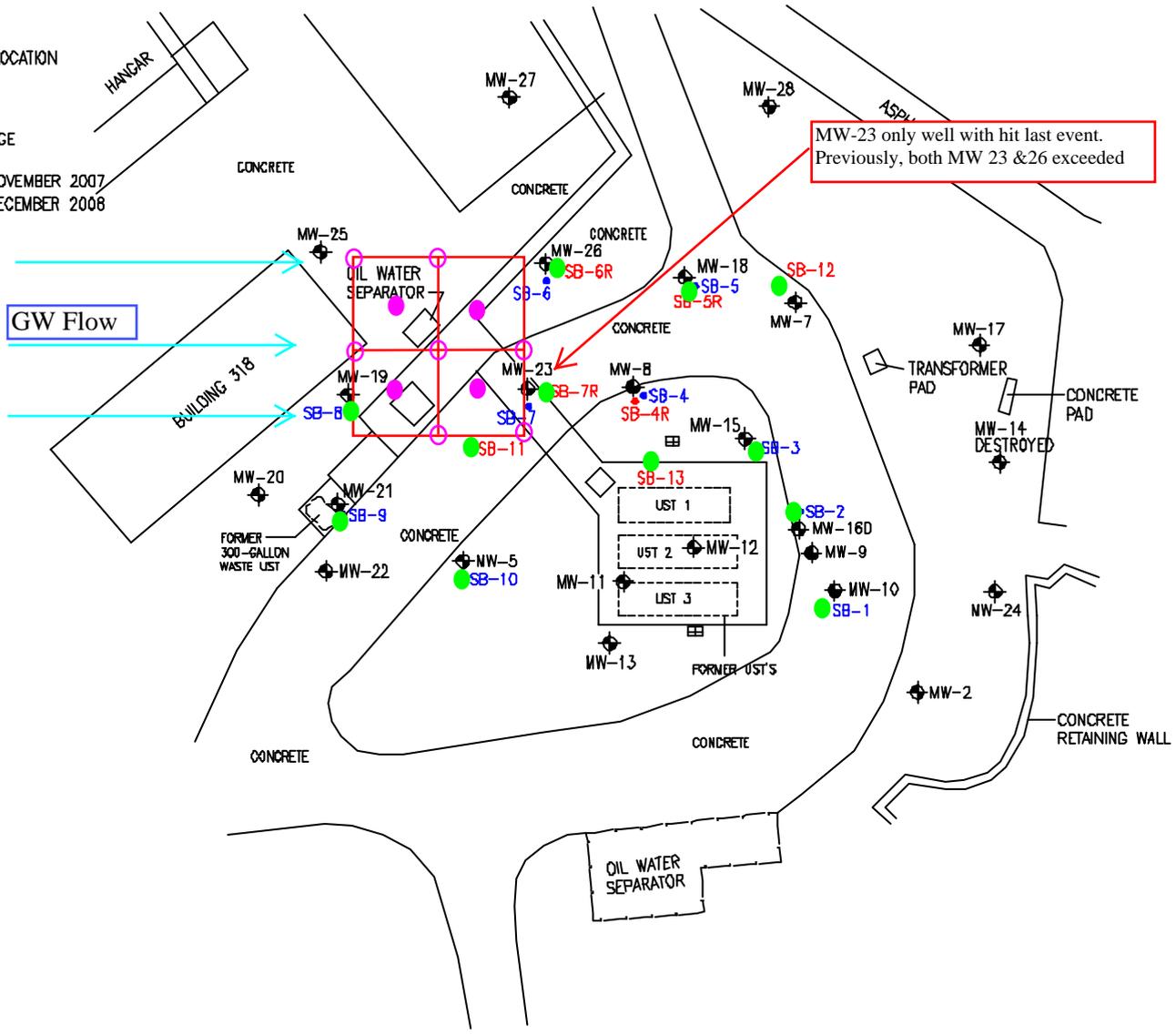


DRAWN BY:	DATE:		PROPOSED SOIL SAMPLE LOCATIONS FOR SITE 98 WORK PLAN FOR SITES 98, 325, AOC2 AND SOUTH DOCK NSA PANAMA CITY PANAMA CITY BEACH, FLORIDA		CONTRACT NO:	
CHECKED BY:	DATE:				OWNER NO.	
REVIEWED BY:	DATE:				APPROVED BY: DATE:	
					DRAWING NO. FIGURE 4	REV. 0

LEGEND

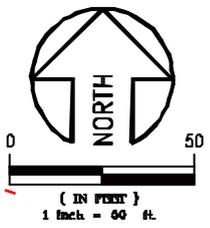
- ◆ MONITORING/RECOVERY WELL LOCATION
- ◆ MONITORING WELL LOCATION
- ▤ STORM DRAIN
- UST FORMER UNDERGROUND STORAGE TANK LOCATION
- SB-10 SOIL BORINGS ADVANCED IN NOVEMBER 2007
- SB-4R SOIL BORINGS ADVANCED IN DECEMBER 2008
- MW-25 MONITORING WELL

- Initial Sample Location
- Potential Step Out Location



MW-23 only well with hit last event. Previously, both MW 23 & 26 exceeded

GW Flow



JOB: 0404-188-09

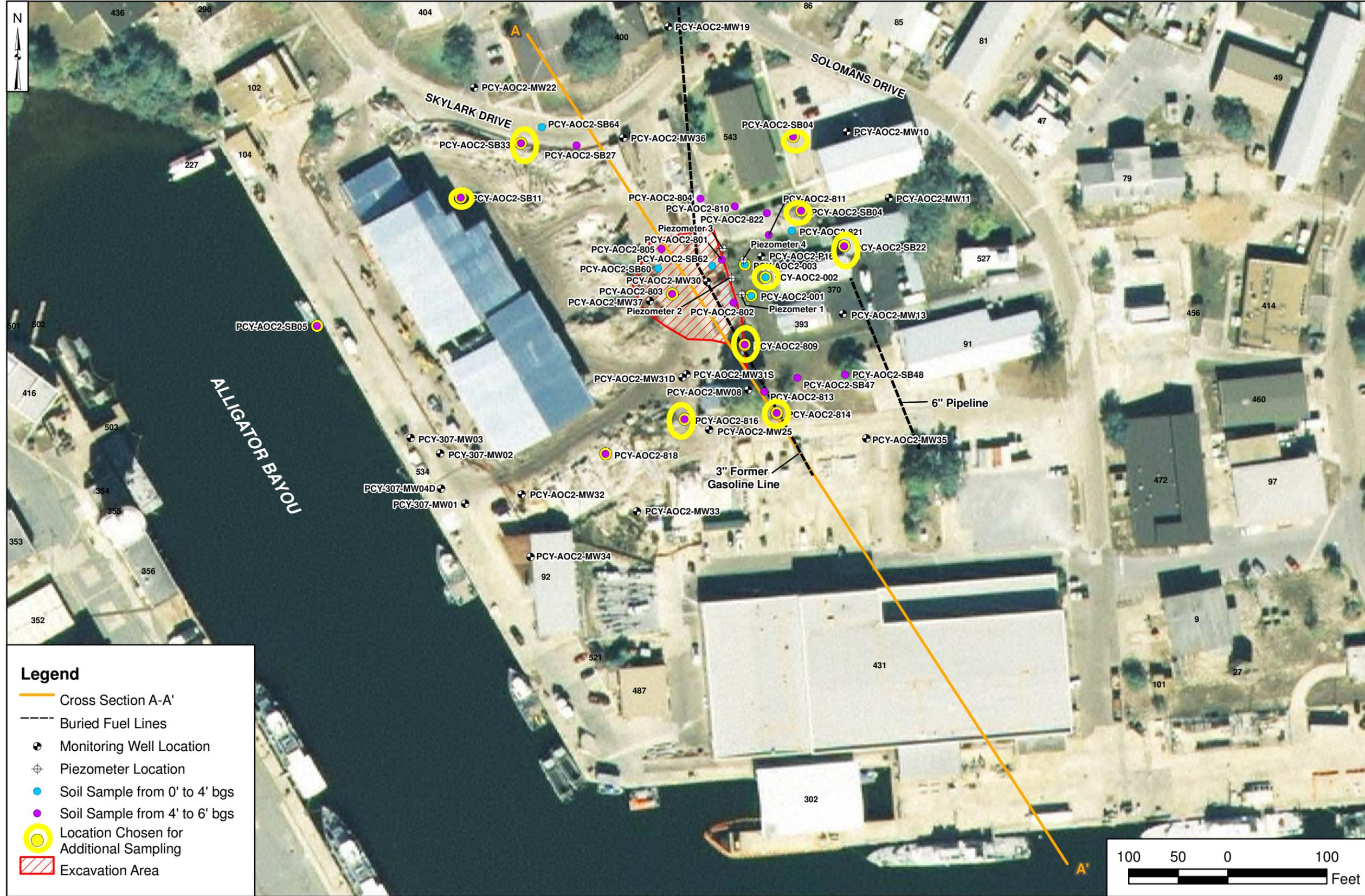
FIGURE 6 - Site 325 Soil Sampling Locations



SITE 325
NSA - PANAMA CITY
PANAMA CITY, BAY COUNTY, FLORIDA

DRAWN BY: WIEN

DATE: 2/10/08



Legend

- Cross Section A-A'
- Buried Fuel Lines
- Monitoring Well Location
- Piezometer Location
- Soil Sample from 0' to 4' bgs
- Soil Sample from 4' to 6' bgs
- Location Chosen for Additional Sampling
- Excavation Area

CONTRACT NUMBER CTO 0326	APPROVED BY	APPROVED BY	REV 0
DATE	DATE	DATE	FIGURE NO. FIGURE 6

PROPOSED SOIL SAMPLE LOCATIONS FOR SITE AOC 2
 WORK PLAN FOR SITES 98, 325, AOC 2 AND SOUTH DOCK
 NSA PANAMA CITY
 PANAMA CITY BEACH, FLORIDA



DRAWN BY T. WHEATON	DATE 11/29/10	SCALE AS NOTED
CHECKED BY L. SMITH	DATE 06/17/11	
COST/SCHEDULE-AREA		



Proposed Micro-Well Locations

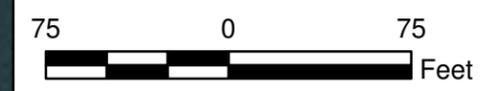
- Round 1
- Round 2 step outs (if needed)
- Existing Clean MW location

CONTRACT NUMBER CTO 0326	DATE
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 3	REV 0

PROPOSED SAMPLE LOCATIONS
 SOUTH DOCK AREA
 NSA PANAMA CITY
 PANAMA CITY, FLORIDA



DRAWN BY T. WHEATON	DATE 11/29/10
CHECKED BY L. SMITH	DATE 11/29/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	



ALLIGATOR BAYOU