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NAS CECIL FIELD, FL
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PHASE I SAMPLING AND ANALYSIS WORK PLAN FOR BUILDING 324 NAS CECIL FIELD FL

12/31/2003

TETRA TECH NUS INC

Phase I Sampling and Analysis Work Plan
Building 324
Naval Air Station Cecil Field
Jacksonville, Florida

December 31, 2003

Site History

Building 324, constructed in 1989, is a one-story sheet metal building on a concrete slab with a pitched roof. The building is located approximately 150 feet northeast of 10th Street and Jet Road. As part of the 1994 Environmental Baseline Survey (EBS), a records review, an interview with individuals familiar with the building, and a visual survey of the building and its perimeter was conducted for Building 324. According to the EBS, the building was periodically used by DYN-COR, a private contractor, as an engine maintenance facility. Hazardous materials present included paint, paint remover, and corrosion preventative. Non-potable water service to this facility is piped from the jet engine test cell area. There were no requirements for sewage disposal at Building 324; therefore, it was not connected to the base sanitary sewer system. Storm water runoff is channeled to Sal Taylor Creek through storm drains. No indications of hazardous material release to the soil, surface water, groundwater, or air were noted during the inspection conducted as part of the EBS.

In November 2003, Golder began a due diligence investigation for Akerman/Embraer, which is interested in building a hangar in the area of Building 324. During this investigation, five shallow and 10 deep temporary wells were installed in the Building 324 area. Trichloroethene (TCE) was detected in excess of its Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) in groundwater from wells screened at 25 to 30 feet below ground surface (bgs). Golder collected several groundwater samples from the shallow zone (5 to15 feet bgs); all were either non-detect or less than GCTLs. TtNUS resampled temporary wells with the highest TCE concentrations, 324-TMW-2D and 324-TMW-10D, on December 17, 2003 to verify the levels of TCE. Golder's TCE results for these wells were 220 ug/L and 260 ug/L, respectively. TtNUS' TCE results for -2D and -10D were 399 ug/L and 295 ug/L respectively. Two permanent flush mount monitoring wells were installed at the previous locations of -2D and -10D on December 19, 2003. These well were sampled on December 23, 2003. The analytic results are pending. TtNUS collected water level measurements and surveyed the relative elevations of the Golder temporary wells and the two flush-mount permanent wells to evaluate groundwater flow direction. As presented on Figure A groundwater flow direction in the 25 to 30-foot zone is generally to the southeast.

Investigation Plan

TtNUS is planning to conduct a direct push technology (DPT) investigation, including soil and groundwater sampling, during the week of January 5, 2004 to delineate the location of the source area (if present), the boundaries of the plume, and the locations for permanent monitoring wells. Groundwater samples will be collected at a depth of 30–foot bgs to establish the horizontal extent of the contamination in that zone. Once this zone has been delineated, groundwater sampling will be conducted above and beneath the highest TCE concentration to identify the vertical limits of the plume. After the plume boundaries have been established, soil sampling will be conducted in the source area in two foot intervals to the water table to characterize contamination in this area.

The objective of this investigation is to characterize groundwater conditions utilizing DPT to collect groundwater samples. The number of groundwater samples will be determined using the results of the initial groundwater samples. The initial number of samples to be collected during the first three days is anticipated to be 18. The proposed sampling locations are based on prior sampling events conducted by Golder. Approximate locations of the proposed groundwater sampling locations are identified on Figure B and described in Table 1.

Assumptions/Field Observations

1) Building 324 has two standard access doors and a bay door. One doorway is located near the northeastern corner of the building facing north. The other doorway is located near the southwestern corner facing south. The bay door is located on the western side of the building.
2) No floor drains exist in the building.
3) Wash water from any cleaning that may have been done within the building would have exited out the bay door and discharged onto the ground.
4) Samples from existing Golder temporary wells and DPT samples collected by TtNUS will be analyzed for volatile organic compounds (VOCs). TCE was the only constituent that exceeded GCTLs during the Golder investigation.
5) Laboratory turnaround time for DPT groundwater samples is scheduled to be 24 hours.

Sampling Sequence

Friday – December 26, 2003

TtNUS will resampled the upgradient temporary monitoring well 324-TMW-11D to verify the TCE contamination identified during the sampling conducted by Golder. If the results from this sample are less than GCTLs, samples from proposed borings CEF-324-DPT-17 and -18, scheduled for collection on January 7, 2004, will not be required. If contamination is confirmed, then samples will be collected to identify the horizontal and vertical extent of contamination.

Monday - January 5, 2004

At five locations, DPT points will be advanced to a depth of 30 feet bgs, and groundwater samples will be collected from that depth interval and submitted for analysis. These sample locations are shown in red on Figure B. Location 324-DPT-01 will be installed approximately 5 feet west of the midpoint of western wall of Building 324 which contains the bay door. Location 324-DPT-02 will be installed approximately 25 feet upgradient of 324-DPT-01. Location 324-DPT-03 will be installed at the northwestern corner of Building 324. Location 324-DPT-04 will be installed midway along the northern wall of Building 324. Location 324-DPT-05 will be installed along the southern wall of Building 324, midway between temporary well 324-TMW-10D and 324-TMW-4S. These sample locations were selected to attempt to locate the source of the TCE contamination.

Tuesday - January 6, 2004

At five locations, DPT points will be advanced to a depth of 30 feet bgs, and groundwater samples will be collected from that depth interval and submitted for analysis. These sample locations are shown in blue on Figure B. These sample results will be used to delineate the downgradient edge of the plume. Location 324-DPT-06 will be installed 25 feet to the southwest of temporary well 324-TMW-9D. Location 324-DPT-07 will be installed 25 feet southeast of temporary well 324-TMW-9D. Location 324-DPT-08 will be installed midway between 324-DPT-07 and 324-DPT-09. Location 324-DPT-09 will be installed 100 feet southeast of the previous highest TCE concentration. Location 324-DPT-10 will be installed 40 feet east of temporary well 324-TMW-1D.

Wednesday - January 7, 2004

Sample results from groundwater samples collected on Monday at locations 324-DPT-01 to 324-DPT-05 will be obtained and evaluated. If maximum TCE concentrations continue to be located at 324-TMW-2D and 324-TMW-10D, 324-DPT-11 shown in green will be installed to a depth of 50 feet bgs and sampled. This location will be used to evaluate the vertical extent of the plume.

If the new groundwater sample results show that the maximum TCE concentration occurs at a location other than 324-TMW-2D or 324-TMW-10D, 324-DPT-11 will be installed at a new location with the maximum TCE concentration to evaluate the vertical extents of the plume. If more than one location

exceed the TCE concentrations greater than identified in Golder temporary wells 324-TMW-2D and/or 324-TMW-10D, then additional DPTs will be installed at these new locations for vertical plume evaluation.

If the results from 324-DPT-09 collected on Tuesday exceed FDEP GCTLs, then 324-DPT-12 will be installed to a depth of 30 feet bgs approximately 25 feet downgradient of 324-DPT-09 and sampled. If results are not greater than FDEP GCTLs in 324-DPT-09, then 324-DPT-12 will not be required because the downgradient limit will have been identified.

If VOC concentrations in 324-DPT-02 continue to exceed GCTLs, CEF-324-DPT-13, -14, and -15 will be installed. 324-DPT-13 will be installed approximately 25 feet northwest of 324-DPT-02 to a depth of 25 to 30 feet bgs and sampled. The location of this DPT boring relative to a nearby cleared and regraded area within the woods may be moved based on the physical make up of the area.. 324-DPT-14 will be installed to a depth of 30 feet bgs approximately 25 feet west of 324-DPT-13. 324-DPT-15 will be installed to a depth of 30 feet bgs approximately 25 feet east of 324-DPT-13.

If the results from the sample collected December 26, 2003 from 324-TMW-11D are less than GCTLs, 324-DPT-16 will be installed to a depth of 30 feet bgs approximately midway between 324-DPT-03 and 324-TMW-11D and sampled. If the results exceed GCTLs, 324-DPT-17 and 324-DPT-18 will be installed to depth of 30 feet bgs approximately 25 feet north and east of 324-TMW-11D, respectively, and sampled.

Thursday - January 8, 2004 and thereafter

If the horizontal extent of the TCE plume has not been identified then additional DPT locations and groundwater samples will be collected and analyzed. If the plume has been delineated horizontally, four DPTs will be installed in the area of highest detected VOC concentrations (based on previous and current data) and sampled at the groundwater interface to evaluate potential shallow groundwater contamination in the assumed source area. After a source area is established, soil sampling will be conducted in that area to evaluate potential soil contamination.

Sampling and Analysis

The DPT installation and sampling activities, quality assurance/quality control (QA/QC) procedures, and data validation requirements for field activities described in this Work Plan are in general agreement with the U.S. EPA Region IV Environmental Investigation Standard Operating Procedures (SOPs) and Quality Assurance Manual (EISOPQAM), FDEP SOPs FS3000, Remedial Investigation report for Sites 36 and 37, and current Tetra Tech NUS, Inc. (TtNUS) SOPs. Florida Administrative Code (FAC) 62-160, Quality Assurance Rule (FAC 62-160) was updated in April 2002 and incorporates new SOPs developed and adopted by the FDEP for the collection and analysis of environmental media. Accordingly, the soil and groundwater sampling activities conducted in this work plan will abide by SOPs FS3000 (for soil) and FS2200 (for groundwater), both of which reference additional applicable SOPs as necessary.

Prior to the installation of the DPTs, utilities must be located or cleared by TtNUS.

The soil samples will be collected as grab samples using plastic, disposable trowels. The proposed soil sample locations shall be marked with a wooden stake or pin flag labeled with the sample identification as listed in Table 1 and surveyed by a registered land surveyor.

Personnel protection equipment and other waste trash (e.g. disposable trowels) will not be considered hazardous and will be disposed in a municipal landfill. Such trash will be collected in a plastic bag and disposed in a suitable trash receptacle. Removed soil from the surface soil sampling in excess of sampling volume requirements will be placed back on the ground.

Sampling handling, bottleware, preservation, and holding time requirements for the analysis proposed for this sampling event are as identified in the following table:

Analysis	Analytical Method	Bottleware	Preservation	Holding Time(1)
Groundwater				
TCL VOCs	SW-846 8260B	3 x 40 mL Glass vial; Teflon-lined septum cap	Cool to 4° C HCl to pH < 2	14 days to analysis
Soil				
TCL VOCs	SW-846 8260B	2 40-ml glass; Teflon-lined septum	Cool to 4° C pH < 2 with HCl	14 days to analysis

(1) Holding times are measured from the date/time of sample collection.

DPT groundwater analytical results will be reported on a *24-hour* turn around basis.
Soil analytic results will be reported on a 7 day turn around basis.

The laboratory contracted to do this work is as follows:

ACCUTEST SOUTHEAST
4405 Vineland Road, Suite C-15
Orlando, Florida 32881
Attention: Linda Williams
(407) 425-6700
Fax: (407) 425-0707

As agreed upon by the BCT, the collection of rinsate and trip blanks has been eliminated at NAS Cecil Field. In addition, field blanks will not be collected during this sampling program because there will be minimal decontamination of sampling equipment. In accordance with these changes, the following table summarizes the frequency and type of field QA/QC samples to be collected for this sampling program.

Type of Samples	Frequency	Samples to be Collected
Field Duplicate	1/10 sample/matrix	1 soil / 1 groundwater (minimum) ***Update when total #s are finalized***
Lab MS/MSD	1/20 samples/matrix	1 soil (1)/ 1 groundwater (1) (minimum)

(1) MS/MSD is a laboratory QA/QC requirement, separate samples not required, only additional volume (2x).

As agreed upon by the BCT, formal data validation has been eliminated from the nstallation restoration program at NAS Cecil Field. However, the analytical data packages generated by the analytical laboratory will be reviewed by Tetra Tech NUS personnel to eliminate false positives and false negative results.

Table 1
Phase I Sampling and Analysis Work Plan
Building 324
NAS Cecil Field, Jacksonville, Florida

Page 1 of 3

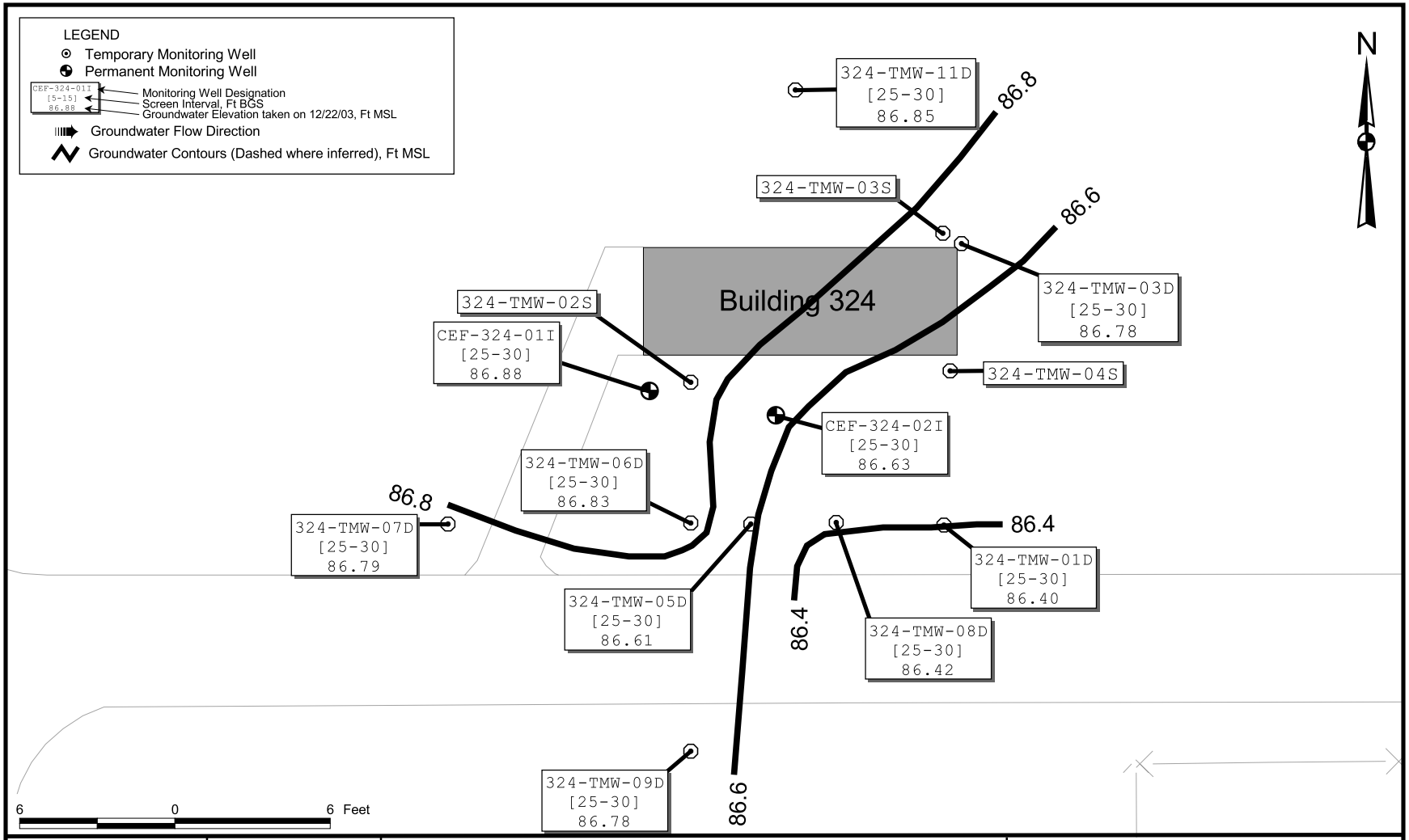
Sample ID CEF-324-	Location	Sample Interval (feet bgs)	Analysis
			TCL VOCs
Groundwater			
Day 1			
TW-01-30	Approximately 5 feet west of the midpoint of western wall/bay door of Building 324.	30	X
TW-02-30	Approximately 25 feet upgradient of 324-DPT-01	30	X
TW-03-30	At the northwestern corner of Building 324	30	X
TW-04-30	Midway along the northern wall of Building 324	30	X
TW-05-30	Along the southern wall of Building 324, midway between temporary well 324-TMW-10D and 324-TMW-4S	30	X
Day 2			
TW-06-30	25 feet southwest of temporary well 324-TMW-9D.	30	X
TW-07-30	25 feet southeast of temporary well 324-TMW-9D	30	X
TW-08-30	Midway between 324-DPT-07 and 324-DPT-09	30	X
TW-09-30	100 feet southeast of the previous highest TCE concentrations (-2D and -10D)	30	X
TW-10-30	40 feet east of temporary well 324-TMW-1D	30	X

Table 1 (continued)
Phase I Sampling and Analysis Work Plan
Building 324
NAS Cecil Field, Jacksonville, Florida

Sample ID CEF-324-	Location	Sample Interval (feet bgs)	Analysis
			TCL VOCs
Day 3			
TW-11-50	Sample results from groundwater samples collected at locations 324-DPT-01 to 324-DPT-05 will be obtained and evaluated. If maximum TCE concentrations continue to be located at 324-TMW-2D and 324-TMW-10D, 324-DPT-11 will be installed to a depth of 45 to 50 feet bgs and sampled. This location will be used to evaluate the vertical extent of the plume. If the maximum TCE concentration occurs at a location other than 324-TMW-2D or 324-TMW-10D, 324-DPT-11 will be installed at that location for vertical plume evaluation.	50	X
TW-12-30	If VOC concentrations in groundwater from 324-DPT-09 are **greater than GCTLs**, then 324-DPT-12 will be installed to a depth of 25 to 30 feet bgs approximately 25 feet downgradient of 324-DPT-09 and sampled. This sample will be held until the results of 324-DPT-09 are evaluated.	30	X
TW-13-30	If VOC concentrations in 324-DPT-02 continue to exceed GCTLs, CEF-324-DPT-13, -14, and -15 will be installed. 324-DPT-13 will be installed approximately 25 feet northwest of 324-DPT-02 to a depth of 25 to 30 feet bgs and sampled. The location of this DPT boring relative to a nearby cleared and regarded area within the woods. The DPT location may be moved based on site conditions. 324-DPT-14 will be installed to a depth of 25 to 30 feet bgs approximately 25 feet west of 324-DPT-13. 324-DPT-15 will be installed to a depth of 25 to 30 feet bgs approximately 25 feet east of 324-DPT-13.	30	X
TW-14-30		30	X
TW-15-30		30	X
TW-16-30	If the results from the sample collected December 26, 2003 from 324-TMW-11D are less than GCTLs, 324-DPT-16 will be installed approximately midway between 324-DPT-03 and 324-TMW-11D and sampled. If the results exceed GCTLs, 324-DPT-17 and 324-DPT-18 will be installed to depths of 25 to 30 feet bgs approximately 25 feet north and east of 324-TMW-11D, respectively, and sampled.	30	X

Table 1 (continued)
Phase I Sampling and Analysis Work Plan
Building 324
NAS Cecil Field, Jacksonville, Florida

Sample ID CEF-324-	Location	Sample Interval (feet bgs)	Analysis
			TCL VOCs
Day 4			
TBD	If the horizontal extent of the TCE plume has not been identified then additional DPT locations and groundwater samples will be collected and analyzed. If the plume has been delineated horizontally, four DPTs will be installed in the area of highest detected VOC concentrations (based on previous and current data) and sampled at the groundwater interface to evaluate potential shallow groundwater contamination in the assumed source area. After a source area is established, soil sampling will be conducted in that area to evaluate potential soil contamination.	TBD	X
Soil			
SB-01-XX	Samples will be collected from four locations in two foot intervals using Macro-Core® or similar samplers. Each interval will be evaluated using a PID. The results will be recorded and the interval within the saturated zone with having the highest PID reading will be analyzed at the fixed based laboratory.	TBD	X



DRAWN BY: MJJ	DATE: 24Dec03	POTENTIOMETRIC SURFACE MAP UPPER INTERMEDIATE ZONE (25 - 30 FEET BGS) BUILDING 324 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER: 0039
CHECKED BY:	DATE:		APPROVED BY: — DATE: —
COST/SCHEDULE-AREA			APPROVED BY: — DATE: —
SCALE: AS NOTED			DRAWING NO.: FIGURE A / REV: 0

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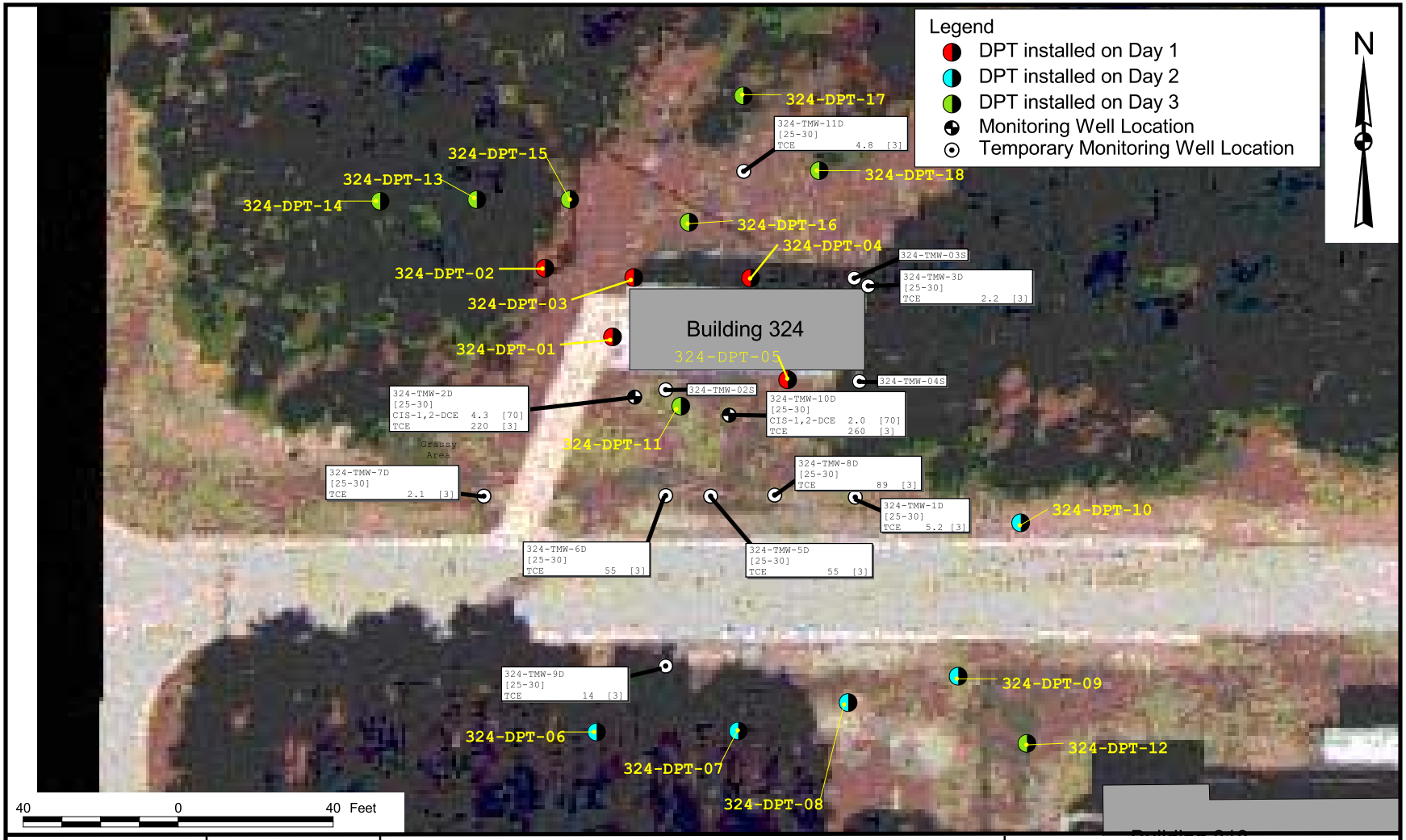

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SCALE	
AS NOTED	

PROPOSED SAMPLE LOCATION MAP

BUILDING 324

NAVAL AIR STATION CECIL FIELD

JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
0039	
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FIGURE B	0

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