QUALITY ASSURANCE PROJECT PLAN UPDATE
RCRA COMPLIANCE MONITORING
HANGAR 1000, INDUSTRIAL SLUDGE DRYING BEDS, DOMESTIC SLUDGE DRYING BEDS, POLISHING POND AND BUILDING 101
NAVAL AIR STATION JACKSONVILLE
JACKSONVILLE, FLORIDA

POST CLOSURE PERMIT NO. HF16288092

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
Tetra Tech NUS, Inc.
Foster Plaza 7, 661 Andersen Drive
Pittsburgh, Pennsylvania 15220

Jane Beason - RCRA Program Manager
Department of the Navy – NAS Jacksonville — 12/11/01 Date

Mark Peterson, P.G. – Task Order Manager
Tetra Tech NUS, Inc. — 12/11/01 Date

Paul Frank – QA Manager
Tetra Tech NUS, Inc. — Date

Harry Behzadi, Ph.D. – Laboratory Director
Accutest Laboratories, Orlando — Date

Svetlana Izosimova, Ph.D. – Laboratory Quality Assurance Officer
Accutest Laboratories, Orlando — Date

Robert Harris – Laboratory Director
Southwest Laboratory of Oklahoma — Date

QUALITY ASSURANCE PROJECT PLAN UPDATE
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Paul Frank – QA Manager Tetra Tech NUS, Inc.	Date
Harry Behzadi, Ph.D. – Laboratory Director Accutest Laboratories, Orlando	11/12/01 Date
Svetlana Izosimova, Ph.D. – Laboratory Quality Assurance Officer Accutest Laboratories, Orlando	11-12-01 Date
Robert Harris – Laboratory Director Southwest Laboratory of Oklahoma	Date

QUALITY ASSURANCE PROJECT PLAN UPDATE
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Paul Frank – QA Manager Tetra Tech NUS, Inc.	Date
Harry Behzadi, Ph.D. – Laboratory Director Accutest Laboratories, Orlando	Date
David Speis – Laboratory Quality Assurance Officer Accutest Laboratories, Orlando	Date
Robert Harris – Laboratory Director Southwest Laboratory of Oklahoma	11/19/01 Date

Chuck Hoover

11/19/01

Chuck Hoover – Laboratory Quality Assurance Officer
Southwest Laboratory Of Oklahoma

Date

DEP Project Manager

Date

_____ _____

Chuck Hoover – Laboratory Quality Assurance Officer Date
Southwest Laboratory Of Oklahoma

_____ _____

DEP Project Manager Date

Section 2.0 TABLE OF CONTENTS

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Section 3.0 PROJECT DESCRIPTION

3.1 SITE IDENTIFICATION AND HISTORY

Site Name: Hangar 1000
Industrial Sludge Drying Beds (ISDB)
Domestic Sludge Drying Beds (DSDB)
Polishing Pond (PP)

Site Address: Naval Air Station, Jacksonville, Florida

3.1.1 Hangar 1000 Site History

The Hangar 1000 regulated unit consisted of two underground storage tanks (UST) (Tank A and Tank B) which were operated from the late 1960s or early 1970s until they were closed in approximately 1993. Tank A was a 750-gallon concrete tank used as a solvent and water separator. Effluent from this unit was discharged through a pipe to the nearby storm sewer system. Tank B was a 2,000-gallon steel UST, which received solvent overflow from Tank A, and waste oils and solvents discharged from other operations at the facility.

In December 1993, a closure plan for this unit was submitted to and approved by the Florida Department of Environmental Protection (FDEP). Tanks A and B and the associated piping system were removed in March 1994. No evidence of soil contamination was detected in the tank excavations. Quarterly sampling performed in 1994 and 1995 after the tank closure activities indicated that 1,1-dichloroethene (1,1-DCE) was present in the groundwater above risk-based concentrations.

Based on historical data, groundwater flow at the Hangar 1000 regulated unit is to the southeast.

3.1.2 ISDB Site History

The ISDB consisted of four beds used to dewater wastewater treatment sludges from electroplating operations. Each drying bed extended across an area of 15 feet by 18 feet. The drying beds were enclosed with retaining walls constructed of 8-inch-thick concrete reinforced with Number 5 reinforcing steel on 12-inch spacings, with an underlying 10-inch-thick gravel layer. The beds were underdrained, and the liquids were returned to the WWTP. Approximately 8,250 gallons of dried sludge was excavated annually from the surface impoundment.

Based on groundwater elevations measured in January 2001, the direction of groundwater flow, in the shallow zone aquifer beneath the ISDB, is to the southeast. Results from the January 2001 sampling event indicated cadmium, iron, and Radium 226 were detected in the groundwater above risk-based concentrations.

3.1.3 DSDB Site History

The DSDB was used for the treatment and storage of sludge resulting from the treatment of rinse water from electroplating operations, from paint stripping and parts cleaning operations, and from the aerobic digester of the WWTP. The DSDB consisted of five beds. Each bed was approximately 50 feet by 50 feet with a 3-foot-high wall constructed of 8-inch concrete blocks and reinforced with wire ties. The bottom of the bed was unlined and was underlain by a 7-inch-deep layer of sand, a 3-inch-deep layer of fine gravel, and a 7- to 12 inch-deep layer of coarse gravel.

Based on groundwater elevations measured in January 2001, the direction of groundwater flow, in the shallow zone aquifer beneath the DSDB, is to the southeast. Results from the January 2001 sampling event indicated lead, vanadium, sodium, iron, manganese, gross beta, and Radium 226 were detected in the groundwater above risk-based concentrations.

3.1.4 Polishing Pond Site History

The PP was constructed in 1970 to provide additional settling for 2.36 million gallons per day of combined domestic and industrial wastewater treated effluent. The PP was unlined and had a surface area of 3.8 acres and an average depth of 3.5 feet. The PP was closed in accordance with the Resource Conservation Recovery Act (RCRA ACT) after undergoing remediation activities during spring 1997.

Based on groundwater elevations measured in January 2001, the direction of groundwater flow, in the shallow zone aquifer beneath the PP, is to the north-northeast. Results from the January 2001 sampling event indicated lead, chromium, vanadium, iron, manganese, gross alpha, and Radium 226 were detected in the groundwater above risk-based concentrations.

3.1.5 Summary of Historical Data

A summary of historical data and maximum concentrations for each constituent at each site is provided in Tables 3-1a, 3-1b, 3-1c, and 3-1d.

Historical data for Hangar 1000 is provided on Table 3-1a; however, many previously detected constituents are now non-detect and not in the current sampling program. A list of current constituents in the sampling program is provided in Appendix 1 on Table A-1.

3.2 PROJECT SCOPE AND PURPOSE

This project is to conduct RCRA Compliance monitoring in accordance with Post Closure Permit Number 0074237-005-HF, dated November 19, 2001 for the sites listed below. Requirements of the Post Closure Permit are as follows.

3.2.1 Purpose of this Project

3.2.1.1 Hangar 1000

Sampling of the groundwater underneath Hangar 1000 will be done on a semi-annual basis. Monitoring wells MW-8, MW-8D, MW-10, MW-14, MW-15, MW-17, MW-19, MW-22 and MW-23 will be sampled under the existing monitoring program.

3.2.1.2 Industrial Sludge Drying Beds

Sampling of the groundwater at the ISDBs will be done on an annual basis. Monitoring wells included in the monitoring program include NAS 4-4, NAS 4-5 and NAS 4-12D. A background well NAS 4-9 will be sampled once per sampling event for all of the Waste Management Areas.

3.2.1.3 Domestic Sludge Drying Beds

Sampling of the groundwater at the DSDBs will be done on an annual basis. Monitoring wells included in the monitoring program include NAS 41-2, NAS 41-3, NAS 41-4 and NAS 41-6.

3.2.1.4 Polishing Pond

Sampling of the groundwater at the Polishing Pond will be done on an annual basis. Monitoring wells included in the monitoring program include MW 42-5, MW42-6D, MW-42-7, 42-8 and MW017.

TABLE 3-1
SUMMARY OF HISTORICAL DATA

Table 3-1a
Hangar 1000

Parameter	Max Concentration *	Parameter	Max Concentration *
Barium	0.432 mg/L	Trichloroethene	2.2 mg/L
Cadmium	0.00306 mg/L	Trichlorofluoroethane	3.5 mg/L
Chromium	0.213 mg/L	Vinyl chloride	0.0017 mg/L
Lead	0.143 mg/L	Acenaphthalene	0.077 mg/L
Acetone	0.14 mg/L	Bis (2-ethylhexyl) phthalate	0.0032 mg/L
Benzene	0.008 mg/L	Benzo(a)anthracene	0.07 mg/L
Ethyl Benzene	0.007 mg/L	Benzo(a)pyrene	0.07 mg/L
Toluene	0.031 mg/L	Benzo(b)fluoranthene	0.069 mg/L
Xylenes	0.1 mg/L	Benzo(k)fluoranthene	0.066 mg/L
Bromoethane	0.0065 mg/L	Cresol	0.087 mg/L
1,1-DCA	0.63 mg/L	2-Chlorophenol	0.058 mg/L
1,2-DCA	0.0017 mg/L	Chrysene	0.086 mg/L
1,1-DCE	2.5 mg/L	Benzo(a,h)anthracene	0.079 mg/L
1,2-DCE (mixed)	5 mg/L	Indeno(1,2,3-cd)pyrene	0.062 mg/L
Tetrachloroethene	0.035 mg/L	p-Cresol	0.1 mg/L
Toluene	1.7 mg/L	Naphthalene	0.13 mg/L
1,1,1-TCA	3.6 mg/L	4-Nitrophenol	0.12 mg/L
1,1,2-TCA	0.0047 mg/L	N-nitroso-di-n-propylamine	0.053 mg/L
Methylethyl ketone	0.19 mg/L	Pentachlorophenol	0.13 mg/L
Methylene chloride	0.003 mg/L	2,4-Dimethylphenol	0.018 mg/L
Phenol	0.085 mg/L		

Table 3-1b
ISDB

Parameter	Max Concentration *	Parameter	Max Concentration *
Barium	0.060 mg/L	Gross alpha and beta	13.6 pCi/L
Cadmium	0.034mg/L	Radium 226	7.00 pCi/L
Chromium	0.0031 mg/L	Total coliform	>100**
Manganese	0.037 mg/L		
Nickel	0.0052 mg/L		
Sodium	19.1 mg/L		
Vanadium	0.013 mg/L		
Zinc	0.024 mg/L		

* Maximum concentration is listed instead of concentration range because most constituents were not detected at multiple locations.
** Greater than 100 colonies per 100mL

TABLE 3-1 Continued
SUMMARY OF HISTORICAL DATA

Table 3-1c
DSDB

Parameter	Max Concentration *	Parameter	Max Concentration *
Arsenic	0.0093 mg/L	Gross alpha	11.8 pCi/L
Barium	0.25 mg/L	Gross beta	103 pCi/L
Chromium	0.034 mg/L	Radium 226	5.43 pCi/L
Copper	0.0063 mg/L	Total coliform	>100**
Iron	7.1 mg/L	Chloride	77 mg/L
Lead	0.024 mg/L	Fluoride	2 mg/L
Manganese	0.37 mg/L		
Mercury	0.00017 mg/L		
Nickel	0.041 mg/L		
Sodium	345 mg/L		
Vanadium	0.1 mg/L		
Zinc	0.042 mg/L		

* Maximum concentration is listed instead of concentration range because most constituents were not detected at multiple locations.

Table 3-1d
PP

Parameter	Max Concentration *	Parameter	Max Concentration *
Arsenic	0.019 mg/L	Gross alpha	28.5 pCi/L
Barium	0.078 mg/L	Gross beta	15.8pCi/L
Chromium	0.12 mg/L	Radium 226	8.02 pCi/L
Copper	0.025 mg/L	Radium 228	1.70 pCi/L
Iron	60.9 mg/L	Total coliform	>100**
Lead	0.047 mg/L	Chloride	73 mg/L
Manganese	0.17 mg/L	Fluoride	0.23 mg/L
Mercury	0.00028 mg/L		
Nickel	0.027 mg/L		
Sodium	56.4mg/L		
Vanadium	0.19 mg/L		
Zinc	0.11 mg/L		

* Maximum concentration is listed instead of concentration range because most constituents were not detected at multiple locations.
** Greater than 100 colonies per 100mL

3.2.2 Intended End Use of Data:

__✓__ Permit Compliance (Permit No. 0074237-005-HF)
___ Feasibility Study
___ Consent Order Compliance
___ Remedial Action
___ Contamination Assessment
___ Water Quality Database (Specify which Database: _____)
___ Facility Operating Report
___ Other: _____

3.2.3 Project Schedule and Scope of Work

__January 7, 2002__
Project Beginning Date

__March 31, 2005 (due to end of contract with consultant)_
Project Ending Date

Major Project Tasks

The major tasks for Hangar 1000 of this project include:

Begin annual and semi-annual sampling field activities	01 Jan 02
Groundwater samples chemical analysis by Accutest and Southwest Laboratory of Oklahoma	30 days
Data validation, chemical database entry and GIS	14 days
Navy Review Draft-Final Reports – Annual Events (PSC 41,42,43) and Semi-Annual Event 1 (Hangar 1000)	24 Mar 02
Submit Final Reports Annual Events (PSC 41,42,43) and Semi-Annual Event 1 (Hangar 1000)	27 Mar 02
Begin second semi-annual sampling event activities	01 Jul 02
Groundwater samples chemical analysis by Accutest	30 days
Data validation, chemical database entry and GIS	14 days
Navy Review Draft-Final Semi-Annual Report Event 2 (Hangar 1000)	18 Sep 02
Submit Final Semi-Annual Report Event 2 (Hangar 1000)	27 Sep 02

3.3 PROJECT ORGANIZATION

3.3.1 Project Organization

Sample collection activities will be conducted by **Tetra Tech NUS, Inc**. personnel The confirmation, annual and semi-annual analytical work will be performed by Accutest Laboratories, Inc. (Accutest), who is a Florida Department of Health – Division of Laboratory Services laboratory certified to perform the analyses requested for this project. Southwest Laboratory of Oklahoma, who is Florida Department of Health – Division of Laboratory Services laboratory certified, will perform radiological chemistry for the annual sampling.

Accutest, FL has a current FDEP-approved Comprehensive Quality Assurance Plan (CompQAP) (CompQAP number 940304), last updated June 24, 2000, **Southwest Laboratory** has a current FDEP-approved Comprehensive Quality Assurance Plan (CompQAP) (CompQAP number 890099), last updated March 30, 2000

Refer to Figure 3.1 for the specific organization of this project.

3.3.2 Personnel Modifications or Additions

The following personnel are not included in the CompQAPs of the referenced organizations (include brief descriptions of project responsibilities):

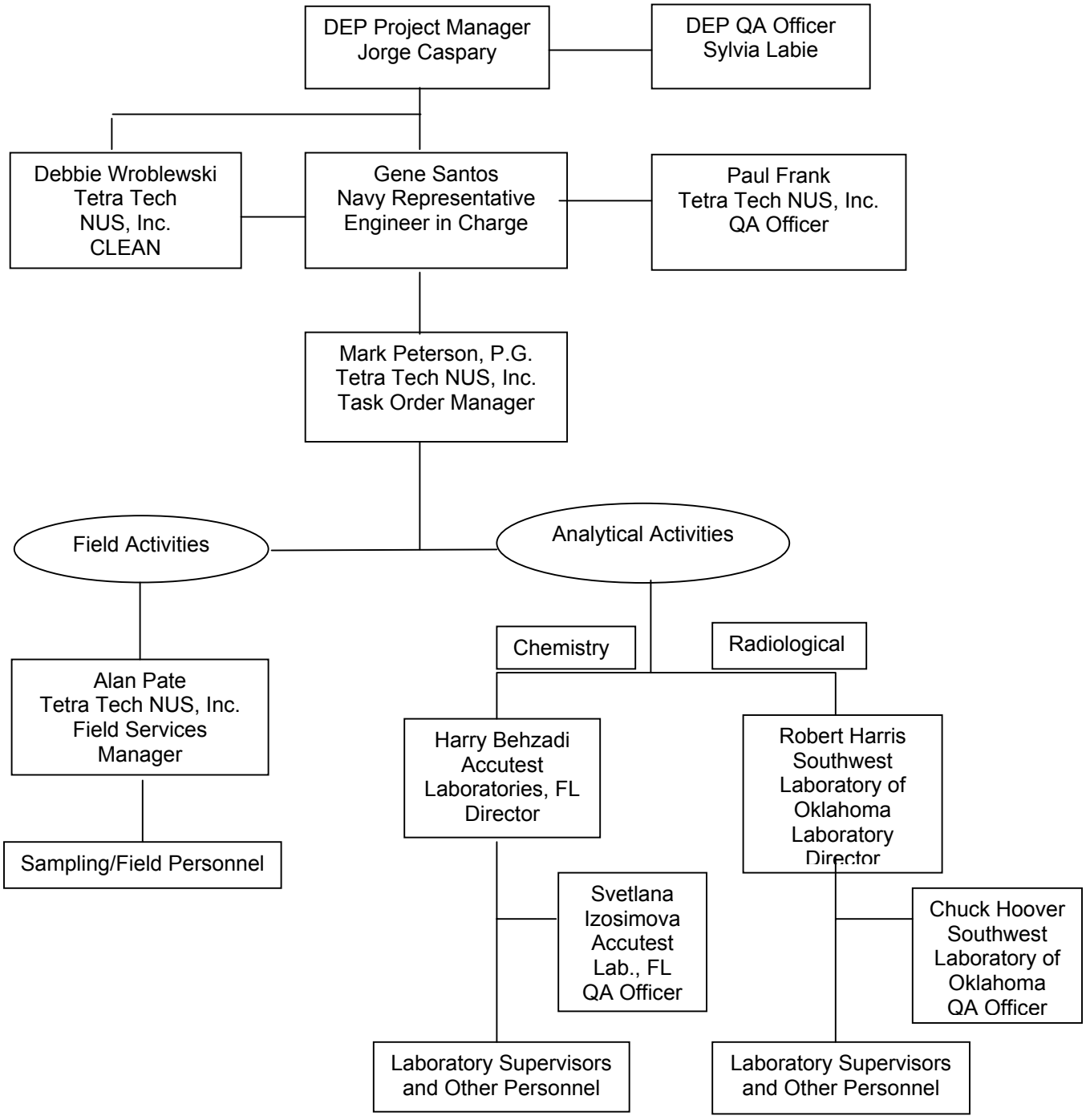
A. Field Personnel

   1. No modifications

B. Laboratory Personnel

   1. No modifications

FIGURE 3-1
PROJECT ORGANIZATION



3.4 PROJECT OBJECTIVES

3.4.1 Data Quality Objectives

X The data quality objectives for this project are the routine QA targets listed in the laboratory CompQAP.

N/A The minimum detection limits specified in the laboratory CompQAP and are included as a part of Table 3-2.

N/A The precision and accuracy requirements differ from the routine targets specified in the laboratory CompQAP and are included as a part of Table 3-2.

3.4.2 Proposed Sample Locations for Projects

a. See Figure 3-2 for a map of the Hangar 1000 site.

H10-GW-MW-5	H10-GW-MW-14
H10-GW-MW-6	H10-GW-MW-15
H10-GW-MW-08	H10-GW-MW-17
H10-GW-MW-08D	H10-GW-MW-19
H10-GW-MW-9	H10-GW-MW-22
H10-GW-MW-10	H10-GW-MW-23

b. See Figure 3-3 for a map of the ISDB, DSDB, and PP

ISDB	**DSDB**	**PP**
NAS 4-4	NAS 41-2	MW-42-5R
NAS 4-12D	NAS 41-3	MW-42-6D
	NAS 41-4	MW-42-7R
	NAS 41-6	MW-42-8R
	NAS 4-5	MW017

c. A background well NAS 4-9 will be sampled once per sampling event for all the Waste Management Areas.

See Table 3-2 of this Section for a summary of the sampling and analysis activities.

3.4.3 Summary of Matrix Types, Analytical Methods and QA Targets

Field and laboratory analytical measurements are presented in Table 3-2.

Rev. 1
09/25/01

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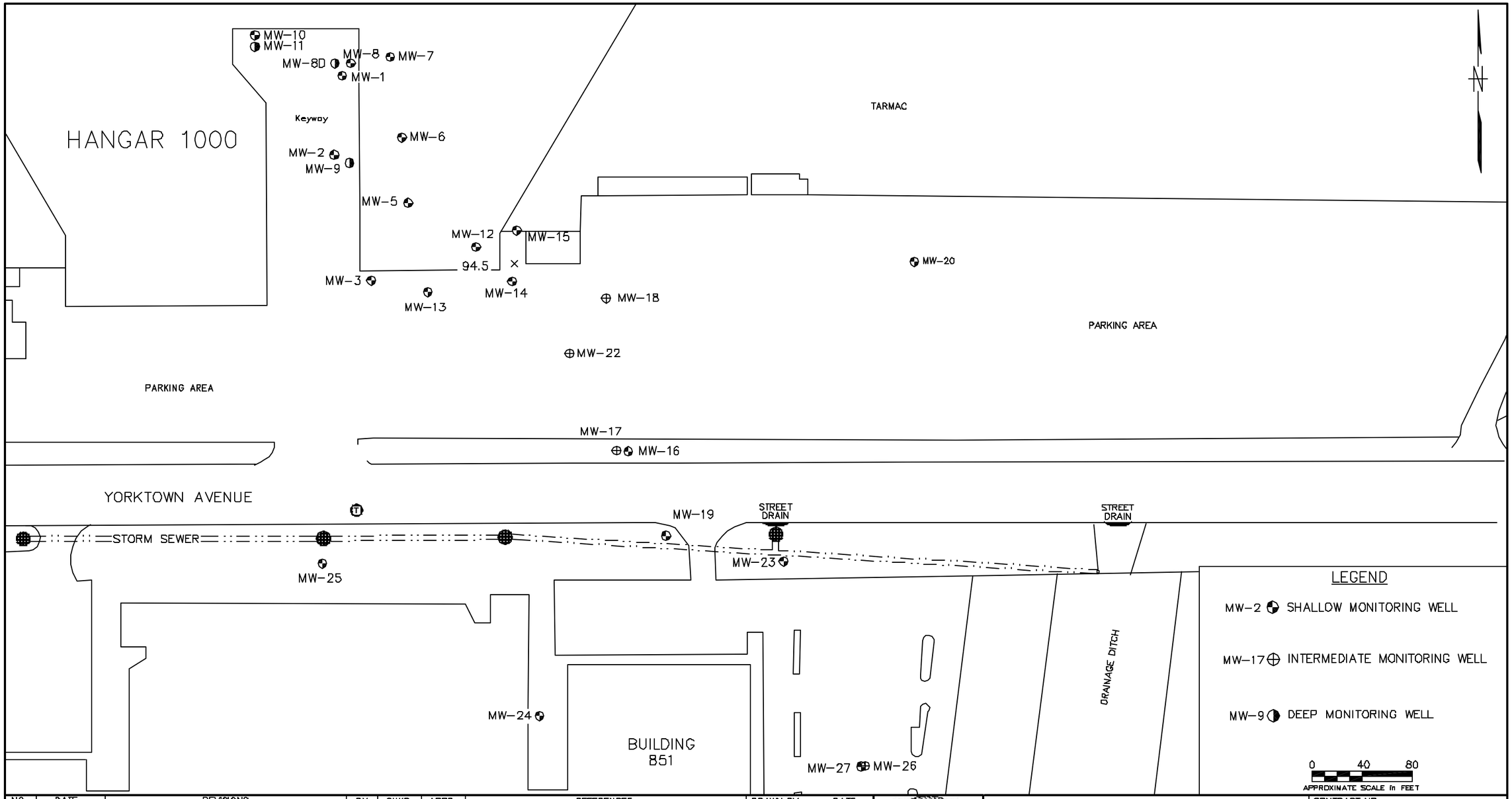

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 4/4/01
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE PLAN SHOWING MONITORING WELL LOCATIONS
HANGAR 1000
NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

CONTRACT NO. 4145
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3-2
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

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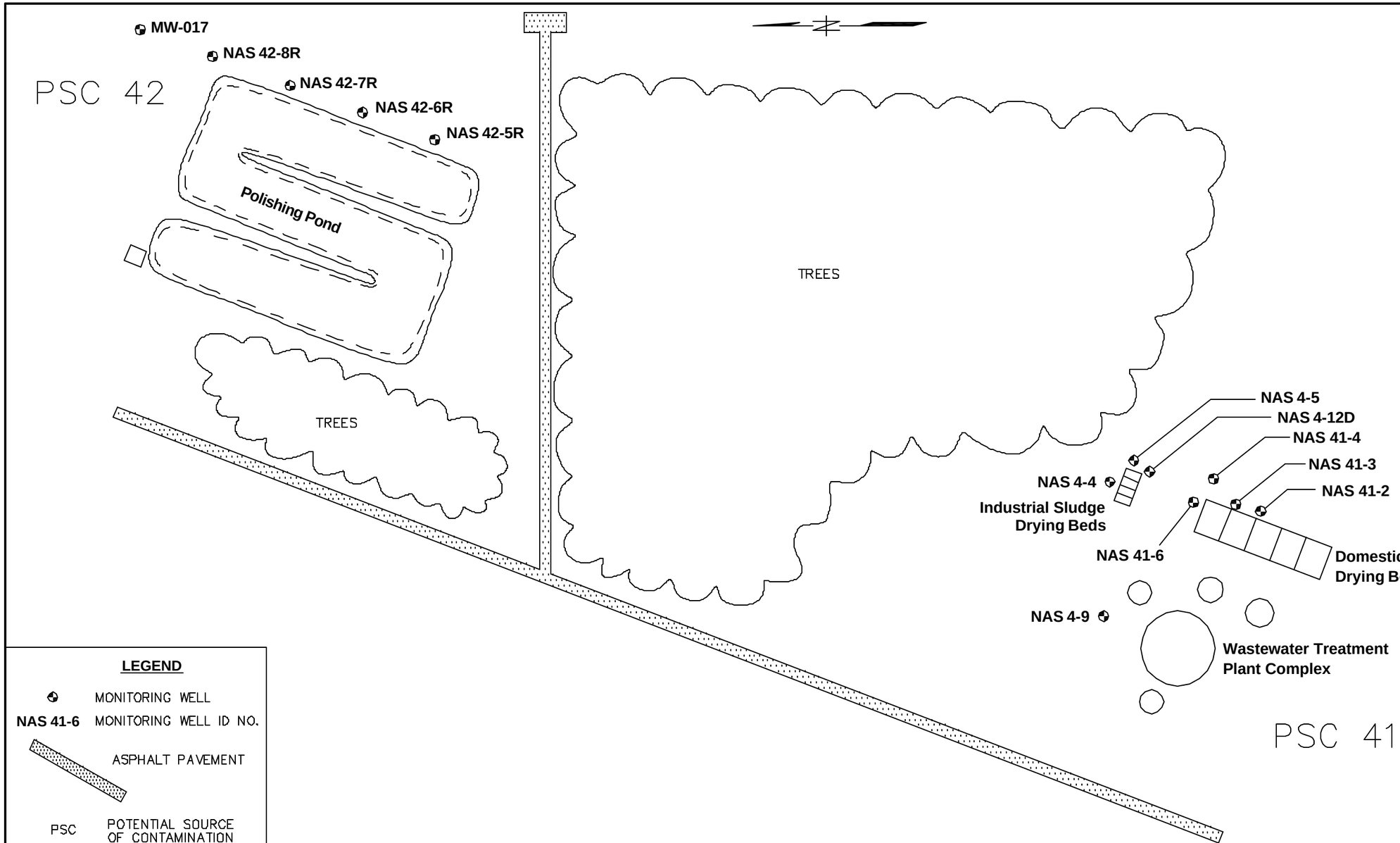

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY LLK DATE 3/16/01
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

SITE PLAN
SLUDGE DRYING BEDS and POLISHING POND
PSC 41, 42, and 43
NAS JACKSONVILLE
JACKSONVILLE, FLORIDA

CONTRACT NO. 3885
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3-3
REV. 0

FORM CADD NO. SDIV_BH.DWG - REV 0 - 1/20/98

TABLE 3-2a
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR HANGAR 1000

The standards outlined in DEP Rule **62- 785** are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: **Tetra Tech NUS, Inc.**, whose CompQAP is **980038** with annual approval on **June 13, 2000**

PARAMETER*	METHOD
pH	Horiba U-22 pH Probe (based on EPA 150.1)
Specific Conductance	Horiba U-22 Specific Conductance probe (based on EPA 120.1)
Temperature	Horiba U-22 Electronic thermometer (based on EPA 170.1)
Turbidity	Horiba U-22 Turbidity probe (based on EPA 180.1)
Dissolved Oxygen	Horiba U-22 DO probe (based on ASTM D5543-94/D888-87)
Eh (Oxidation Reduction Potential)	SM 2580B

*These are screening measurements used to evaluate the groundwater quality. Unless otherwise indicated, only water will be tested for the parameter.

LABORATORY ANALYSES WILL BE PERFORMED BY**: ACCUTEST, Inc., FL,** whose COMPQAP is **940304** Revision B with annual approval on **June 24, 2000.**

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Semi-annual (12 wells)	Groundwater	MW-5, MW-6, MW-8,MW-8D,MW-9 MW-10, MW-14, MW-15, MW-17, MW-19, MW-22, MW-23	12	1	0	2	SW-846 5030B/8260B	Select VOCs			
			12			2	SW-846 3520C/8270C	Select SVOCs			
			12			2	SW-846 3050B/6010B	Cadmium and Chromium			
			12			2	SW-846 8310	PAHs			
			12			2	EPA 325.3 or 300.0	Chloride			
			12			2	EPA 376.1 or 300.0	Sulfide			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3-2b
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE INDUSTRIAL SLUDGE DRYING BED

The standards outlined in DEP Rule **62- 785** are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: **Tetra Tech NUS, Inc.,** whose CompQAP is **980038** with annual approval on **June 13, 2000**

PARAMETER*	**METHOD**
pH	Horiba U-22 pH Probe (based on EPA 150.1)
Specific Conductance	Horiba U-22 Specific Conductance probe (based on EPA 120.1)
Temperature	Horiba U-22 Electronic thermometer (based on EPA 170.1)
Turbidity	Horiba U-22 Turbidity probe (based on EPA 180.1)
Dissolved Oxygen	Horiba U-22 DO probe (based on ASTM D5543-94/D888-87)
Eh (Oxidation Reduction Potential)	SM 2580B

*These are screening measurements used to evaluate the groundwater quality. Unless otherwise indicated, only water will be tested for the parameter.

LABORATORY ANALYSES WILL BE PERFORMED BY**: ACCUTEST, Inc., FL,** whose COMPQAP is **940304** Revision B with annual approval on **June 24, 2000**

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Annual (3wells)	Groundwater	NAS 4-4, NAS 4-5, NAS 4-12D	3	1			SW-846 5030B/8260B	Select VOCs			
			3				SW-846 3050B/6010B	As,Cd,Cr,Fe,Pb,Mn,Na ,V,Zn			
			3				SW 846-7196A	Hexavalent chromium			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler with VOC analysis.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3-2b Continued
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE INDUSTRIAL SLUDGE DRYING BED

LABORATORY ANALYSES WILL BE PERFORMED BY: SOUTHWEST LABORATORY OF OKLAHOMA whose COMPQAP is 890099 with annual approval on March 30, 2000.

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Annual (3 wells)	Groundwater	NAS 4-4, NAS 4-5, NAS 4-12D	3				EPA 900.0	Gross alpha and beta			
			3				EPA 903.0	Total Alpha Radium			
			3				EPA 904.0	Radium 228			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler with VOC analysis.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3-2c
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE DOMESTIC SLUDGE DRYING BED

The standards outlined in DEP Rule **62- 785** are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: **Tetra Tech NUS, Inc.,** whose CompQAP is **980038** with annual approval on **June 13, 2000**

PARAMETER*	**METHOD**
pH	Horiba U-22 pH Probe (based on EPA 150.1)
Specific Conductance	Horiba U-22 Specific Conductance probe (based on EPA 120.1)
Temperature	Horiba U-22 Electronic thermometer (based on EPA 170.1)
Turbidity	Horiba U-22 Turbidity probe (based on EPA 180.1)
Dissolved Oxygen	Horiba U-22 DO probe (based on ASTM D5543-94/D888-87)
Eh (Oxidation Reduction Potential)	SM 2580B

*These are screening measurements used to evaluate the groundwater quality. Unless otherwise indicated, only water will be tested for the parameter.

LABORATORY ANALYSES WILL BE PERFORMED BY**: ACCUTEST, Inc., FL,** whose COMPQAP is **940304** Revision B with annual approval on **June 24, 2000**

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Annual (4 wells)	Groundwater	NAS 41-2, NAS 41-3, NAS 41-4, NAS 41-6	4	1		1	SW-846 5030B/8260B	Select VOCs			
			4				SW-846 3050B/6010B	As,Cd,Cr,Fe,Pb,Mn,Na ,V,Zn			
			4				SW 846-7196A	Hexavalent chromium			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler – VOCs only.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3-2c Continued
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE DOMESTIC SLUDGE DRYING BED

LABORATORY ANALYSES WILL BE PERFORMED BY **SOUTHWEST LABORATORY OF OKLAHOMA** whose COMPQAP is 890099 with annual approval on **March 30, 2000.**

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Annual (4 wells)	Groundwater	NAS 41-2, NAS 41-3, NAS 41-4, NAS 41-6	4			1	EPA 900.0	Gross alpha and beta			
			4				EPA 903.0	Total Alpha Radium			
			4				EPA 904.0	Radium 228			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler – VOCs only.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3-2d
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE POLISHING POND

The standards outlined in DEP Rule **62- 785** are the limit criteria for this project. The detection limits reported for this project shall at least meet, or be lower than the stated standards.

FIELD MEASUREMENTS WILL BE PERFORMED BY: **Tetra Tech NUS, Inc.,** whose CompQAP is **980038** with annual approval on **June 13, 2000**

PARAMETER*	**METHOD**
pH	Horiba U-22 pH Probe (based on EPA 150.1)
Specific Conductance	Horiba U-22 Specific Conductance probe (based on EPA 120.1)
Temperature	Horiba U-22 Electronic thermometer (based on EPA 170.1)
Turbidity	Horiba U-22 Turbidity probe (based on EPA 180.1)
Dissolved Oxygen	Horiba U-22 DO probe (based on ASTM D5543-94/D888-87)
Eh (Oxidation Reduction Potential)	SM 2580B

*These are screening measurements used to evaluate the groundwater quality. Unless otherwise indicated, only water will be tested for the parameter.

LABORATORY ANALYSES WILL BE PERFORMED BY**: ACCUTEST, Inc., FL,** whose COMPQAP is **940304** Revision B with annual approval on **June 24, 2000**

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Annual (5 wells)	Groundwater	NAS 42-5R, NAS 42-6R, NAS 42-7R, NAS 42-8-2R, MS 017	5	1		1	SW-846 5030B/8260B	Select VOCs			
			5				SW-846 3050B/6010B	As,Cd,Cr,Fe,Pb,Mn,Na ,V,Zn			
			5				SW 846-7196A	Hexavalent chromium			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler – VOCs only.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

TABLE 3-2d Continued
PROPOSED SAMPLES, MATRICES AND ANALYTICAL METHODS FOR THE POLISHING POND

LABORATORY ANALYSES WILL BE PERFORMED BY SOUTHWEST LABORATORY OF OKLAHOMA whose COMPQAP is 890099 with annual approval on March 30, 2000.

									QA Targets[1]		
FREQUENCY	**SAMPLE MATRIX**	**SAMPLE SOURCE**	**# SAMPLES**	**TB[2]**	**EB**	**FD**	**ANALYTICAL METHOD #**	**COMPONENT[3,4]**	**P**	**A**	**MDL**
Annual (5 wells)	Groundwater	NAS 42-5R, NAS 42-6R, NAS 42-7R, NAS 42-8-2R, MS 017	5			1	EPA 900.0	Gross alpha and beta			
			5				EPA 903.0	Total Alpha Radium			
			5				EPA 904.0	Radium 228			

TB – Trip Blank
EB – Equipment Blank
FD – Field Duplicate
MDL – Method Detection Limit
GW – Groundwater
P – Precision
A – Accuracy

[1]These values need to be completed if the Data Quality Objectives stated in the project description are different from the routine QA objectives cited in the CompQAP(s) or are not included in the CompQAP(s).
[2]One trip blank will be used in each sample cooler – VOCs only.
[3]These components are listed as target analytes in the laboratory CompQAP.
[4]Select target analytes are listed in Appendix 1 of this QAPP and are part of the routine target analytes for SW-846 methods cited in this QAPP.

Section 4.0 FIELD PROCEDURES AND QUALITY CONTROL

This section specifies the protocols and procedures to be used by **Tetra Tech NUS, Inc.** personnel when conducting sampling activities for this project.

4.1 SAMPLING EQUIPMENT

See Table 4.1 for a list of the equipment to be used for this project.

4.2 FIELD ACTIVITIES

See Table 4.2

4.2.1 Sampling Protocols

Sampling protocols for this project that are not specified by the CompQAP specified in Table 4.2 include the following:

Only the protocols specified in the CompQAP will be used for this project.

4.2.2 Disposal Protocols

Disposal protocols for this project for handling wastes differ from those specified by the CompQAP. Investigation Derived Wastes (IDW) will be handled according to the following protocols:

Purge waters will be contained on-site at each location until the end of the sampling event. IDW generated will be classified under an existing waste profile, provided by the Facilities and Engineering Department, and will be disposed of by NAS Jacksonville at the completion of sampling.

4.3 FIELD MEASUREMENTS

Field measurements are listed in Table 3.2 of this QAPP. The field screening measurements that will be made are:

Dissolved Oxygen	Horiba U-22 (based on ASTM D5543-94/D888-87)
pH	Horiba U-22 pH Probe (based on EPA 150.1)
Specific Conductance	Horiba U-22 Specific Conductance probe (based on EPA#120.1)
Temperature	Horiba U-22 Electronic thermometer (based on EPA 170.1)
Turbidity	Horiba U-22 Turbidity probe (based on EPA 180.1)
Eh (Oxidation Reduction Potential)	Horiba U-22 ORP probe (based on SM 2580B)

TABLE 4-1
PROPOSED SAMPLING EQUIPMENT

The following equipment may be used by **Tetra Tech NUS, Inc.** for this project. With the exception of additional equipment, discussions on use and restrictions are included in CompQAP Number **980038** updated with annual amendments, which were approved **June 13, 2000.**

EQUIPMENT DESCRIPTION	CONSTRUCTION MATERIALS	USE
Purging Equipment (include construction of tubing, tail pipes, etc.)		
1. Low-flow peristaltic pump	N/A	Purging
Sampling Equipment		
1. Tubing	Teflon	GW Sampling
2. Tubing	Other Plastic (Medical grade silicone)	GW Sampling
3. Low-flow peristaltic pump	N/A	GW Sampling

Additional equipment not address in the CompQAP includes [1]:

1. none

[1] If the sampling protocols for using this equipment are not included in the cited CompQAP, the sampling protocols must be discussed in Section 4.2.1 of this Quality Assurance Project Plan.

Field Measurement Equipment (construction does not need to be specified)

1. Horiba Water Quality Meter U-22 (for water quality screening)

TABLE 4-2
FIELD ACTIVITIES

The following field protocols will be used by **Tetra Tech NUS, Inc.** personnel. The Comprehensive QA Plan Number for **Tetra Tech NUS, Inc.** is **980038**. The date of the last update approval is **June 13, 2000**.

All protocols, procedures and policies in the above-mentioned document which are pertinent to this Quality Assurance Project Plan will be followed and are summarized below:

	VOCs	Extractable Organics	Metals	Inorganic Anions	Organics	Physical Properties	Other RAD chemistry
Groundwater	X	X	X	X			X
Groundwater (in-place plumbing)							
Potable Water							
Surface Water							
Soil							
Sediment/Sludge							
Automatic Samplers							
Field Filtration							
Waste Water							
Stormwater							
Air							

SAMPLE CONTAINERS

Sample containers will be provided by the Florida Department of Health – Division of Laboratory Services approved laboratory, ACCUTEST, Inc. and Southwest Laboratories of Oklahoma. **The Accutest Florida facility and Southwest Laboratory facility will supply all sampling containers. ***

__X__ Sample containers will be pre-preserved by the above-referenced organizations and be provided; **OR**

- Accutest will provide sample containers for the following test: VOCs, SVOCs, Metals, and Inorganics
- Southwest Laboratory of Oklahoma will provide sample containers for Radiological analysis

____ Field organizations will preserve samples onsite using protocols outlined in the CompQAP.

EQUIPMENT DECONTAMINATION

Equipment decontamination will follow protocols outlined in the above-referenced CompQAP. *

EQUIPMENT SHALL BE PRECLEANED PRIOR TO ON-SITE ARRIVAL

*** If more than one organization is involved with these activities, this QAPP must specifically identify the equipment and/or sample containers to be provided by each organization.**

WASTE DISPOSAL

___ The procedures for handling wastes from equipment cleaning and from sampling are discussed in the above-referenced CompQAP.

X The disposal procedures for handling wastes for this project differ from those outlined in the above-referenced CompQAP and are outlined in Section 4.2.2.

Section 5.0 LABORATORY PROCEDURES AND QUALITY CONTROL

The laboratory analyses shall be conducted by **Accutest, Inc**. Florida facility and **Southwest Laboratory of Oklahoma.**

Section 5.0a ACCUTEST, INC., FLORIDA FACILITY

The Comprehensive QA Plan Number for the **Accutest** Florida facility is **940304**. The date of the last update approval is **June 24, 2000.**

All protocols, procedures and policies in the above-mentioned document that are pertinent to this Quality Assurance Project Plan shall be followed. The laboratory shall analyze the samples for this project by the methods specified in Table 3.2 of this QAPP.

Section 5.0b SOUTHWEST LABORATORY OF OKLAHOMA.

The Comprehensive QA Plan Number for the **Southwest Laboratory of Oklahoma** facility is **890099** with annual approval on **March 30, 2000.**

All protocols, procedures and policies in the above-mentioned document that are pertinent to this Quality Assurance Project Plan shall be followed. The laboratory shall analyze the samples for this project by the methods specified in Table 3.2 of this QAPP.

5.1 QUALITY CONTROL CHECKS, ACCUTEST, FLORIDA FACILITY

The types of laboratory control checks that will be used when analyzing samples for this project in the Accutest Florida facility are;

Chemical:

___ Reagent Blanks	_X_ Matrix Spikes
_X_ Duplicate Samples	___ QC Check Samples
_X_ Duplicate Matrix Spikes	_X_ QC Check Standards
_X_ Continuing Calibration Standards	
_X_ Other: _LCS_____	

Microbiology:

_X _ Duplicates	_X _ Control Blanks (MF)
_X _ Carry over blanks (MF)	_X _ Dilution Blanks (MPN)
_X _ Positive & Negative Controls	
___ Other: _____	

5.1a QUALITY CONTROL CHECKS, SOUTHWEST LABORATORY OF OKLAHOMA

The types of laboratory control checks that will be used when analyzing samples for this project in the Southwest Laboratory of Broken Arrow, Oklahoma facility are;

Radiological:

_X_ Reagent Blanks	_X_ Matrix Spikes[1]
_X_ Duplicate Samples	___ QC Check Samples
_X_ Duplicate Matrix Spikes[1]	_X_ QC Check Standards
_X_ Other: _LCS_____	

[1] Gross Alpha/Beta Only

Section 6.0 QUALITY ASSURANCE MANAGEMENT

6.1 CORRECTIVE ACTIONS

In addition to corrective actions cited in the approved Comprehensive QA Plans, all involved parties will initiate any corrective action deemed necessary by FDEP.

6.2 PERFORMANCE AND SYSTEM AUDITS

6.2.1 Field Activities

Specific audits planned for this project are:

Audit Type	Frequency/Date	Description
1. Routine	As indicated in CompQAP (DER SOP 12.0)	Routine

6.2.2 Laboratory Activities

Specific audits planned for this project are:

Audit Type	Frequency/Date	Description
1. Routine	As indicated in CompQAP (DER SOP 12.0)	Routine

ALL INVOLVED PARTIES WILL CONSENT TO AUDITS BY FDEP IF DEEMED NECESSARY.

6.3 QUALITY ASSURANCE REPORTS

Project specific QA Reports will be submitted to FDEP and the Navy with the final annual and semi-annual reports.

Appendix 1
Primary Contaminants of Interest

The following table presents primary VOC, SVOC and metal contaminants of interest for Hangar 1000. Also presented are the Florida of Administrative Code (F.A.C.) 62-785 acceptance limits for those chemicals.

TABLE A.1
Constituents and Standards[1] - Hangar 1000

Naval Air Station Jacksonville
Jacksonville, Florida

Volatile Organic Compounds		Semi-Volatile Organic Compounds	
Parameter	**Regulatory Limit ug/L**	**Parameter**	**Regulatory Limit ug/L**
Acetone	700	Acenaphthene	20
Benzene	1	Benzo(a)anthracene	0.2
n-butanol	700	Benzo(a)pyrene	0.2
Carbon Disulfide	700	Benzo(b)fluoranthene	0.2
Carbon Tetrachloride	3	Benzo(k)fluoranthene	0.5
Chlorobenzene	100	Carbazole	4
Cyclohexanone	35,000	2-Chlorophenol	35
1,1-Dichloroethane	70	Chrysene	4.8
1,2-Dichloroethane	3	Dibenz(a,h)anthracene	0.2
1,1-Dichloroethene	7	2,4-Dinitrotoluene [3]	0.2
1,2-Dichloroethene (total)	63	Indeno(1,2,3-cd)pyrene	0.2
Ethylbenzene	700	2-Methylphenol	35
Isobutanol	2,100	3-Methylphenol	35
Methanol	5,000	4-Methylphenol	4
Methylene Chloride	5	Naphthalene	20
2-Nitropropane	PQL[2]	4-Nitrophenol	56
Tetrachloroethane	3	N-nitroso-di-n-propylamine	4
Toluene	40	Pentachlorophenol [3]	1
1,1,1-Trichloroethane	200	Phenol	10
1,1,2-Trichloroethane	5	Pyridine	7
2-Butanone (MEK)	4200		
Trichloroethene	3	**Metals Parameter**	**Regulatory Limit ug/L**
1,1,1-Trichloro-1,2,2,-Trifluoroethane	PQL[2]	Chromium, Total	100
Xylenes	20	Cadmium	5
Vinyl Chloride	1		

Notes:
1 As listed in Table 1 of Chapter 62-777, Florida Administrative Code (F.A.C.)
2 Neither 2-Nitropropane nor 1,1,1-Trichloro-1,2,2-Trifluoroethane has a groundwater standard listed in Chapter 62-785, F.A.C. The Practical Quantitation Limit (PQL) for each parameter will therefore serve as the standard.
3 Lowest attainable MDL using EPA Method 8270 will be accepted in lieu of Method 8270 Single Ion Monitoring.

Appendix 2
Primary Contaminants of Interest

The following table presents primary VOC, SVOC and metal contaminants of interest for ISDB, DSDB, and PP. Also presented are the Florida of Administrative Code (F.A.C.) 62-785 acceptance limits for those chemicals.

TABLE A.2
Constituents and Standards(1) – ISDB, DSDB, PP

Naval Air Station Jacksonville
Jacksonville, Florida

Parameter	Regulatory Limit ug/L	Parameter	Regulatory Limit ug/L
Volatile Organic Compounds		**Metals (cont'd)**	
Benzene	1	Silver	0.1
Vinyl chloride	1	Sodium	160
Metals		Vanadium	0.049
Arsenic	0.05	Zinc	5
Barium	2	**Inorganics**	
Cadmium	0.005	Hexavalent chromium	0.1
Chromium	0.1	Cyanide complexed	0.2
Copper	1	Chloride	250
Iron	0.3	Fluoride	2
Lead	0.015	Nitrate	10
Manganese	0.05	**Radiological Chemistry (pCi/L)**	
Mercury	0.002	Gross alpha	15
Nickel	0.1	Gross beta	4
Selenium	0.05	Radium 226 & 228 (combined)	5

Notes:
1 As listed in Table 1 of Chapter 62-777, Florida Administrative Code (F.A.C.)
NA = Not applicable