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FINAL TIER II SAMPLING AND ANALYSIS PLAN FOR PRELIMINARY SUBSURFACE INVESTIGATION AQUADRIVE FUEL SYSTEM NAS CORPUS CHRISTI TX
10/1/2011
TETRA TECH

Comprehensive **L**ong-term **E**nvironmental **A**ction **N**avy

CONTRACT NUMBER N62467-08-D-1001

Rev. 1
10/19/11

Final
Tier II Sampling and Analysis Plan

Preliminary Subsurface Investigation
Aquadrive Fuel System

Naval Auxiliary Landing Field Cabaniss
Corpus Christi, Texas

Contract Task Order JM65

October 2011

NAVFAC
Naval Facilities Engineering Command
NAVFAC SOUTHEAST

NAS Jacksonville
Jacksonville, Florida 32212-0030

TETRA TECH NUS, Inc.

Title and Approval Page
(UFP-QAPP Manual Section 2.1)

Final

TIER II SAMPLING AND ANALYSIS PLAN

October 2011

Preliminary Subsurface Investigation
Aquadrive Fuel System
Naval Auxiliary Landing Field Cabaniss
Corpus Christi, Texas

Prepared for:
Department of the Navy
Naval Facilities Engineering Command
Southeast
NAS Jacksonville Building 903
Jacksonville, Florida 32212-0030

Prepared by:
Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19046-1433
(601) 491-9688

Prepared under:
Contract Number N62470-08-D-1001
Contract Task Order JM65

Review Signature:

10/19/2011
Thomas Johnston/Quality Assurance Manager — Date
Tetra Tech NUS, Inc.

10/19/2011
Larry Basilio/Project Manager — Date
Tetra Tech NUS, Inc.

Approval Signature:

LATHAM.ERICO.DEMETRIUS.1243926552
Digitally signed by LATHAM.ERICO.DEMETRIUS.1243926552
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USN, cn=LATHAM.ERICO.DEMETRIUS.1243926552
Date: 2011.10.20 11:07:53 -04'00'

Erico Latham/Navy Remedial Project Manager — Date
NAVFAC

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Tread Kissam/Navy Quality Assurance Officer — Date
NAVFAC

EXECUTIVE SUMMARY

This Sampling and Analysis (SAP) encompasses the Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) requirements for the Preliminary Subsurface Investigation (PSI) of the former Aquadrive Fuel System at Naval Auxiliary Landing Field (NALF) Cabaniss, located in Corpus Christi, Texas. This SAP and the accompanying Health and Safety Plan (HASP) constitute the Work Plan to address a one-time investigation of the Aquadrive Fuel System. This SAP/Work Plan (hereafter called SAP), is the primary planning document, addressing data quality objectives, specific protocols for sample collection, sample handling and storage, chain-of-custody, laboratory and field analyses, data validation, and data reporting.

This SAP has been prepared by Tetra Tech NUS, Inc. (Tetra Tech) on behalf of Naval Facilities Engineering Command Southeast (NAVFAC SE) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62470-08-D-1001, Contract Task Order (CTO) JM65. This SAP was generated for and complies with applicable United States Navy, the United States Environmental Protection Agency (USEPA), and the Texas Commission on Environmental Quality (TCEQ) requirements, regulations, guidance, and technical standards. This includes the Department of Defense (DoD), Department of Energy (DOE), and USEPA Interagency Data Quality Task Force (IDQTF) environmental requirements regarding federal facilities. To comply with IDQTF requirements, this SAP is presented in the standard worksheets as specified in the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) guidance document (IDQTF, 2005) and as approved by NAVFAC for a Tier II UFP Sampling and Analysis Plan (UFP-SAP) format.

NALF Cabaniss was commissioned in 1941 and currently encompasses a total of 923 acres. NALF Cabaniss is located on the eastern side of Nueces County, Texas, and lies approximately eight miles west of Naval Air Station Corpus Christi (NASCC). North of the current boundary are former buildings and recreational areas that were once a part of the installation. These areas were transferred to the General Services Administration (GSA) for disposal in 1958, and are now the property of the local school district. NALF Cabaniss is an outlying field (OLF) with the current primary role of supporting naval air training operations originating from NASCC.

On July 30, 2008, NASCC Environmental received a report of oil coming out of the ground at NALF Cabaniss from two underground vaults that were associated with an abandoned Aquadrive fuel delivery system (NASCC, 2008). The amount of product that seeped out was unknown, but the fuel involved is believed to be aviation gasoline (avgas).

The former fuel system at NALF Cabaniss was apparently composed of approximately 40 vaults, 20 underground storage tanks (USTs) and interconnected fuel, water and air lines. Ten of the vaults and all the USTs are located on property that was given to GSA in 1958 when the base was converted to an OLF. The primary fuel used in the system is believed to be aviation gasoline (Avgas).

No information was found during a records search or interviews of base personnel related to the closure of the USTs. Therefore, it is not known if the USTs, valves, vaults, and lines currently located outside Navy-owned property were removed or abandoned.

This investigation is being conducted to determine if soil and/or groundwater on Navy-owned property has been impacted by historical releases from the former Aquadrive Fuel System and to determine if additional investigation is required.

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ACRONYMS AND ABBREVIATIONS

^{o}C	Degree Celsius
%D	Percent difference
%R	Percent recovery
AES	Atomic Emission Spectrometry
Avgas	Aviation gasoline
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylene
CA	Corrective action
CAS	Chemical Abstracts System
CCISD	Corpus Christi Independent School District
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
COC	Contaminant of concern
CSM	Conceptual site model
CTO	Contract Task Order
DoD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
DQI	Data quality indicator
DQO	Data quality objective
DVM	Data Validation Manager
EDD	Electronic data deliverables
ELAP	Environmental Laboratory Accreditation Program
FID	Flame ionization detector
FM	Farm-to-Market
FOL	Field Operations Leader
FP	Flashpoint
FSP	Field Sampling Plan
FTMR	Field Task Modification Request Form
FUDS	Formerly Used Defense Site
g	Gram
GC/MS	Gas chromatography/mass spectrometry
GSA	General Services Administration
HASP	Health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCl	Hydrochloric acid
HNO3	Nitric acid
HSM	Health and Safety Manager
ICAL	initial calibration
ICP	Inductively Coupled Plasma
IDQTF	Interagency Data Quality Task Force
IDW	Investigation-derived waste
IRP	Installation Restoration Program
IS	Internal standard
LANT	Mid-Atlantic
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection
LOQ	Limit of Quantification
MDL	Method Detection Limit
mg/kg	Milligrams per kilogram

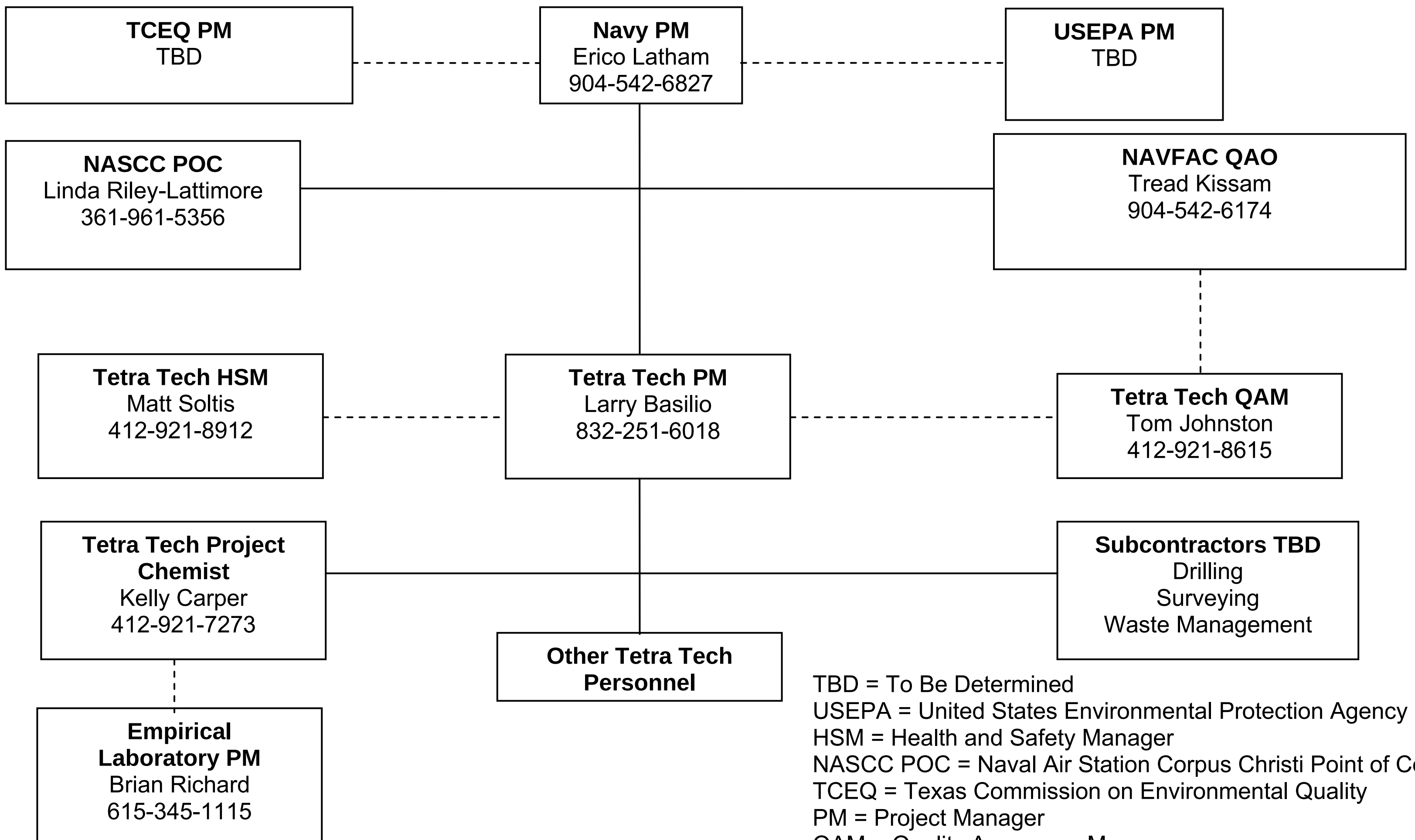
mg/L	Milligrams per liter
mL	Milliliter
MPC	Measurement Performance Criteria
MPI	Measurement Performance Indicators
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MTBE	Methyl tertiary-butyl ether
NAAS	Naval Auxiliary Air Station
NAD	North American Datum
NALF	Naval Auxiliary Landing Field
NASCC	Naval Air Station Corpus Christi
NAVFAC	Naval Facilities Engineering Command
NEDD	Naval electronic data deliverable
NELAP	National Environmental Laboratory Accreditation Program
NGVD	National Geodetic Vertical Datum
NIRIS	Naval Installation Restoration Information Solution
OLF	Outlying field
ORP	Oxidation reduction potential
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic aromatic hydrocarbon
PAL	Project action limit
PID	Photoionization detector
PM	Project manager
POC	Point of contact
PQL	Practical quantitation limit
PSI	Preliminary Subsurface Investigation
PST	Petroleum storage tank
PVC	Polyvinyl chloride
QA	Quality assurance
QAM	Quality Assurance Manager
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality control
QSM	Quality System Manual
RDR	Release Determination Report
RPD	Relative Percent Difference
RPM	Remedial Project Manager
RT	Retention Times
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SDG	Sample Data Group
SI	Site Investigation
SOP	Standard operating procedure
SOW	Statement of work
SQL	Structured Query Language
SSO	Site Safety Officer
SVOC	Semivolatile organic compound
TAC	Texas Administrative Code
TBD	To be determined
TCEQ	Texas Commission on Environmental Quality
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total dissolved solids
Tetra Tech	Tetra Tech NUS, Inc.
TOX	Total organic halides

TPH	Total petroleum hydrocarbons
UFP	Uniform Federal Policy
USEPA	United States Environmental Protection Agency
UST	Underground storage tank
VOC	Volatile organic compound

Worksheet 1 Project Organizational Chart

(UFP-QAPP Manual Section 2.4.1 – Worksheet #5)

Lines of Authority ———————— Lines of Communication - - - - - - - - - - - - - -



TBD = To Be Determined
USEPA = United States Environmental Protection Agency
HSM = Health and Safety Manager
NASCC POC = Naval Air Station Corpus Christi Point of Contact
TCEQ = Texas Commission on Environmental Quality
PM = Project Manager
QAM = Quality Assurance Manager
QAO = Quality Assurance Officer Manager

Worksheet 2 Communication Pathways

(UFP-QAPP Manual Section 2.4.2 – Worksheet #6)

The communication pathways for the SAP are shown below.

Communication Drivers	Responsible Person Affiliation	Name	Phone Number and/or E-Mail	Procedure
Sampling and Analysis Plan (SAP) amendments	Tetra Tech NUS, Inc. (Tetra Tech) PM Navy Remedial Project Manager (RPM)	Larry Basilio Erico Latham	832-251-6018 904-542-6827	After realizing an amendment is needed, Tetra Tech PM will document the proposed changes via a Field Task Modification Request (FTMR) form within five days and send the Navy RPM a concurrence letter within seven days of identifying the need for change for review and approval. The Navy RPM will sign the letter within five days of receipt, if approved. The Tetra Tech PM will send scope changes to the Project Team via e-mail within one business day.
Schedule changes	Tetra Tech PM Navy RPM NASCC POC	Larry Basilio Erico Latham Linda Riley-Lattimore	832-251-6018 904-542-6827 361-961-5356	The Tetra Tech PM will verbally inform the Navy RPM and the NASCC POC on the day that schedule change is known and document via a schedule concurrence letter within seven days or prior to the first affected deliverable date.
Gaining Site Access	Navy RPM NASCC POC	Erico Latham Linda Riley-Lattimore	904-542-6827 361-961-5356	The NASCC POC will be contacted verbally or by e-mail at least one week prior to work at Naval Auxiliary Landing Field (NALF) Cabaniss.
Regulatory Agency Interface	Navy RPM	Erico Latham	904-542-6827	The Navy RPM will contact each regulatory agency verbally or by e-mail within 24 hours of recognizing the issue when an issue arises.

Communication Drivers	Responsible Person Affiliation	Name	Phone Number and/or E-Mail	Procedure
Field issues that require changes in scope or implementation of field work	Tetra Tech Field Operations Leader (FOL) Tetra Tech PM Navy RPM	TBD Larry Basilio Erico Latham	TBD 832-251-6018 904-542-6827	The Tetra Tech FOL will inform Tetra Tech PM verbally the day the issue is realized. Tetra Tech PM will inform the Navy RPM of the issue (verbally or via e-mail) within one day of the Tetra Tech FOL's notification. Tetra Tech PM will also send a concurrence letter to the Navy RPM within seven days, if project scope is affected. The Navy RPM will sign the letter within five days of receipt, if scope change is warranted. The scope change is to be implemented before further work is executed. The Tetra Tech PM will document the change via a FTMR form within two days of identifying the need for change and will obtain required approvals within five days of initiating the form. The form will be placed in the project file, with signatures as determined by the Tetra Tech PM.
Obtaining Utility Clearance for Intrusive Activities	Tetra Tech FOL Navy RPM NASCC POC	TBD Erico Latham Linda Riley-Lattimore	TBD 904-542-6827 361-961-5356	The Tetra Tech FOL will coordinate at verbally or by e-mail with the NASCC POC at least one week in advance to obtain a Digging Permit. Tetra Tech will contact Texas One call.
Stop work recommendations, for example, to protect workers from unsafe conditions/situations or to prevent a degradation in quality of work	Tetra Tech FOL/Site Safety Officer (SSO) Tetra Tech PM Tetra Tech QAM Navy RPM NASCC POC	TBD Larry Basilio Tom Johnston Erico Latham Linda Riley-Lattimore	TBD 832-251-6018 412-921-8615 904-542-6827 361-961-5356	The Tetra Tech FOL will inform onsite personnel, subcontractor(s), the NASCC POC, and the identified Project Team members within one hour (verbally or by e-mail).
Field data quality issues	Tetra Tech FOL/SSO Tetra Tech PM	TBD Larry Basilio	TBD 832-251-6018	The Tetra Tech FOL will inform the Tetra Tech PM verbally or by e-mail on the same day that a field data quality issue is discovered.

Communication Drivers	Responsible Person Affiliation	Name	Phone Number and/or E-Mail	Procedure
Laboratory analytical data quality issues	Empirical Laboratory PM Tetra Tech Project Chemist Tetra Tech Data Validation Manager (DVM) Tetra Tech PM Navy RPM	Brian Richard Kelly Carper Joe Samchuck Larry Basilio Erico Latham	615-345-1113 412-921-7273 412-921-8510 832-251-6018 904-542-6827	The Empirical Laboratory PM will notify (verbally or via e-mail) the Tetra Tech Project Chemist within one business day of when an issue related to laboratory data is discovered. The Tetra Tech Project Chemist will notify (verbally or via e-mail) the DVM and the Tetra Tech PM within one business day. Tetra Tech DVM or Project Chemist notifies Tetra Tech PM verbally or via e-mail within 48 hrs of validation completion that a non-routine and significant laboratory quality deficiency has been detected that could affect this project and/or other projects. The Tetra Tech PM verbally advises the – Navy RPM within 24 hours of notification from the Tetra Tech Project Chemist or DVM. The Navy RPM takes corrective action appropriate for the identified deficiency. Examples of significant laboratory deficiencies include data reported that has a corresponding failed tune or initial calibration verification. Corrective actions may include a consult with the Navy Chemist.
Reporting Laboratory Quality Variances	Empirical Laboratory PM Tetra Tech Project Chemist Tetra Tech PM Tetra Tech FOL	Brian Richard Kelly Carper Larry Basilio TBD	615-345-1113 412-921-7273 832-251-6018 TBD	Any planned SOP variances from the quality elements specified in the Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.1 (April 2009) are identified in Worksheet #10. The Laboratory PM will notify (verbally or via e-mail) the Tetra Tech Project Chemist of any variance from the quality limits identified in this SAP on the day that the variance becomes known. The Tetra Tech Project Chemist will notify (verbally

Communication Drivers	Responsible Person Affiliation	Name	Phone Number and/or E-Mail	Procedure
				or via e-mail) the Tetra Tech PM within one business day of the need for corrective action, if the variance is a significant issue. The Tetra Tech PM will notify (verbally or via e-mail) the Laboratory PM and the Tetra Tech FOL and Project Chemist within one business day of any required corrective action. The Laboratory QAM will document all quality variances in the Case Narrative of the Analytical Laboratory Report.
Reporting Concerns Involving Laboratory Performance	Tetra Tech Project Chemist Tetra Tech PM Tetra Tech FOL Emperical Laboratory PM	Kelly Carper Larry Basilio TBD Brian Richard	412-921-7273 832-251-6018 TBD 615-345-1113	If reported analytical results are inconsistent with the planned details identified in this SAP, the Tetra Tech Project Chemist will notify (verbally or via e-mail) the Tetra Tech PM within one business day of identifying a concern to determine if corrective action is needed. The Tetra Tech PM will notify (verbally or via e-mail) the Laboratory PM and the Tetra Tech FOL and Project Chemist within one business day of any required corrective action.
Notification of Non-Usable Data	Empirical Laboratory PM Tetra Tech Project Chemist Tetra Tech DVM Tetra Tech PM	Brian Richard Kelly Carper Joseph Samchuck Larry Basilio	9615-345-1113 412-921-7273 412-921-8510 832-251-6018	If the laboratory determines that any data they have generated is non-usable, the Laboratory PM will notify (verbally or via e-mail) the Tetra Tech Project Chemist within one business day of when the issue is discovered. The Tetra Tech Project Chemist will notify (verbally or via e-mail) the Tetra Tech DVM and the Tetra Tech PM within one business day of the need for corrective action, if the non-usable data is a significant issue (e.g., critical sample data). Corrective action may include resampling and/or reanalyzing the affected samples. If a Tetra Tech Data Validator identifies non-usable

Communication Drivers	Responsible Person Affiliation	Name	Phone Number and/or E-Mail	Procedure
				data during the data validation process, the Tetra Tech DVM will notify the Tetra Tech PM verbally or via e-mail within 48 hours of validation completion that a non-routine and significant laboratory quality deficiency has resulted in non-usable data. The Tetra Tech PM will take corrective action appropriate for the identified deficiency to ensure the project objectives are met.
Sample Receipt Variances	Empirical Laboratory PM Tetra Tech FOL Tetra Tech PM	Brian Richard TBD Larry Basilio	615-345-1115 TBD 832-251-6018	The Laboratory PM will notify (verbally or via e-mail) the Tetra Tech FOL immediately upon receipt of any chain of custody/sample receipt variances for clarification or direction from the Tetra Tech FOL. The Tetra Tech FOL will notify (verbally or via e-mail) the Tetra Tech PM within 1 business day, if corrective action is required. The Tetra Tech PM will notify (verbally or via e-mail) the Laboratory PM and the Tetra Tech FOL within 1 business day of any required corrective action.

Worksheet 3 Project Planning Session Participants Sheet

(UFP-QAPP Manual Section 2.5.1 – Worksheet #9)

Project Name:	Preliminary Subsurface Investigation	**Site Name:**	Aquadrive Fuel System
Projected Date(s) of Sampling:	Winter 2011	**Site Location:**	NALF Cabaniss, Texas
Project Manager:	Larry Basilio		
Date of Session:	August 17, 2011		
Scoping Session Purpose:	Preliminary Kick-off Teleconference Meeting		

Name	Title	Affiliation	Phone #	E-mail Address	Project Role
Erico Latham	Navy RPM	NAVFAC SE	904-542-6827	erico.latham@navy.mil	RPM
Tread Kissam	Navy RPM	NAVFACE SE	904-542-6174	benjamin.kissam@navy.mil	RPM
Arlen Andrews	Environmental Program Director	NASCC	361-961-5353	arlan.andrews@navy.mil	Environmental Manager
Gary LeFlore	Installation Restoration Program (IRP) Manager	NASCC	361-961-3704	gary.leflore@navy.mil	NASCC IRP Manager
Ross Ybarra		NASCC	361-961-2170	ross.ybarra@navy.mil	NASCC POC
Linda Riley-Lattimore		NASCC	361-961-5356	linda.riley-lattimor@navy.mil	NASCC POC
Larry Basilio	PM	Tetra Tech	832-251-6018	larry.basilio@tetratech.com	PM
Bridget Twigg	Geologist	Tetra Tech	832-251-5195	bridget.twigg@tetratech.com	Geologist

Comments/Decisions: Initial kick-off meeting with NAVFAC SE, NASCC and Tetra Tech. Site visit set for week of September 6, 2011.

Action Item: Tetra Tech will review Formerly Used Defense Site (FUDS) records.

Project Name:	Preliminary Subsurface Investigation	**Site Name:**	Aquadrive Fuel System
Projected Date(s) of Sampling:	Winter 2011	**Site Location:**	NALF Cabaniss, Texas
Project Manager:	Larry Basilio		
Date of Session:	September 20, 2011		
Scoping Session Purpose:	Tetra Tech Data Quality Objectives (DQO) Discussion with Navy (Teleconference)		

Name	Title	Affiliation	Phone #	E-mail Address	Project Role
Erico Latham	Navy RPM	NAVFAC SE	904-542-6827	erico.latham@navy.mil	RPM
Tread Kissam	Navy RPM	NAVFACE SE	904-542-6174	benjamin.kissam@navy.mil	RPM
Linda Riley-Lattimore		NASCC	361-961-5356	linda.riley-lattimor@navy.mil	NASCC POC
Larry Basilio	PM	Tetra Tech	832-251-6018	larry.basilio@tetratech.com	PM

Comments/Decisions: Tetra Tech and Navy discussion to determine data quality objectives (DQOs). The Team reviewed the DQO scoping document (Appendix A). The analyte list was agreed to and one boring location was moved. Team agreed with the remainder of the document. The UFP SAP will not be submitted to the Navy chemist for review.

Action Items: Tetra Tech will incorporate Navy comments to the scoping document.

Worksheet 4 Conceptual Site Model

(UFP-QAPP Manual Section 2.5.2 – Worksheet #10)

4.1 Site Description

NALF Cabaniss encompasses a total of 923 acres and is located on the eastern side of Nueces County, Texas, and lies approximately eight miles west of NASCC. Figure 1 shows the general location of NALF Cabaniss. The installation is immediately bounded on the east by Brezina Road, on the north by Ayers Street and Farm-to-Market (FM) 286, to the west by Saratoga Road, and to the south by Oso Creek, a perennial water body that ultimately flows into Oso Bay. Beyond Oso Creek are agricultural and industrial properties. The area east of the installation is comprised of mixed agricultural, industrial, and residential areas. North of the current boundary are former buildings and recreational areas that were once a part of the installation. These areas were transferred to the General Services Administration (GSA) for disposal in 1958, and are now the property of the local school district. Residential zones lie beyond these buildings to the north. A former landfill is located directly west of the installation.

NALF Cabaniss is an outlying field (OLF) with the current primary role of supporting naval air training operations originating from NASCC. The installation was originally constructed with four 5,000-foot runways. Only two runways, oriented in north/south and northwest/southeast directions, are presently active and maintained. The airfield is lighted, to allow for night flight training, and daylight training is also conducted.

4.2 Site History

Naval Auxiliary Air Station (NAAS) Cabaniss Field was commissioned on July 9, 1941. NAAS Cabaniss Field was established for the purpose of intermediate and advanced flight training for naval aviators. As an auxiliary station, NAAS Cabaniss Field was outfitted with landing fields, runways, hangars, shops, barracks, a mess hall, and a recreational center. Following the conclusion of World War II, NAAS Cabaniss Field was temporarily decommissioned. In 1950, NAAS Cabaniss Field was reopened. In 1958, NAAS Cabaniss Field was converted from an auxiliary air station, which required personnel housing and support facilities, to an OLF, which required only the landing field proper. As a result, approximately 346 acres in the northern section of the installation were determined to be excess and given over to the GSA for disposal. This portion of the property was comprised mainly of administrative and housing facilities.

The installation was commissioned as a NALF in June 1969. NALF Cabaniss is currently in use as an OLF for primary flight training out of NASCC. Current flight training includes touch-and go, night training, and other student training operations.

On July 30, 2008, NASCC Environmental received a report of oil coming out of the ground at NALF Cabaniss (NASCC, 2008). The oil was determined to be coming from an underground vault (13-D) that was possibly part of an abandoned Aquadrive Fuel System. Initial inspection found oil seeping from one other vault (10-D). Both vaults were cleaned of excess surface oil and the vaults were covered with oil-absorbent booms and sandbags. The amount of oil that seeped out was unknown. Both vaults are surrounded by unsealed concrete with a thin asphalt top layer. The oil seeped out and traveled from vault 13-D across the pavement to an expansion joint where an undetermined amount of oil seeped through to the substrate.

Research into historical aerial photos and archived drawings gave hints into the location and structure of the original fuel system. The most recent drawings of the site that have been located are dated 1950. All drawings are either incomplete or were drawn for other projects and only show the fuel system as a general feature. More detailed drawings were found for similar fuel systems previously located at NASCC that are recorded as removed or filled in place, and for NALF Waldron.

The fuel system at NALF Cabaniss was apparently composed of approximately 40 vaults, 20 underground storage tanks (USTs), and interconnected fuel, water and air lines. Figure 2 shows the locations of the components of the fuel system. Note that ten of the vaults and all the USTs are located on property that was given to GSA in 1958 when the base was converted to an OLF. The primary fuel used in the system is believed to be Avgas.

No information was found during a records search or interviews of base personnel related to the closure of the USTs. Therefore, it is not known is the USTs, valves, vaults, and lines currently located outside Navy-owned property were removal or abandonment in place.

A FUDS number has been assigned to NALF Cabaniss, K06TX0150. No information is available from the FUDS website detailing the specifics of the site or if any environmental work has been conducted.

4.3 Previous Investigations

A Site Investigation (NASCC, 2008) was conducted by NASCC environmental personnel in October 2008 in response to a report of oil coming out of the ground at NALF Cabaniss. Oil was found to be emanating from an underground vault believed to be part of an abandoned Aquadrive Fuel System. The initial assessment found a number of similar vaults, one of which was also seeping oil. NASCC Environmental staff responded and collected samples of the oil, water, and sediment/soil within eight of the vaults. Soil samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) metals and total petroleum hydrocarbons (TPH), water samples were analyzed for TCLP metals, and oil samples were analyzed for flashpoint (FP), total organic halides (TOX), TCLP metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs).

TOX concentration was measured at 20.3 milligrams per Liter (mg/L) in one oil/water sample, but all samples were non-detect for VOCs and SVOCs. Detected metals concentrations were less than the Texas-Specific Soil Background Concentration. All flashpoints were reported to be above 200 degrees Fahrenheit. All other constituents were less than the practical quantitation limits (PQLs).

4.4 Remedial Actions

On October 16, 2008 a remedial operation was conducted at the two vaults that were found seeping oil. A vacuum truck removed liquids and solids from the two vaults. A pressure washer was used to rinse residue from the vaults and agitate solids into a pumpable solution.

4.5 Site Reconnaissance

On September 7 and 8, 2011, Tetra Tech visited NALF Cabaniss to conduct a site reconnaissance. Each of the accessible vaults were opened and inspected. An oil/water mixture was observed in vaults 10-D, 13-D and 23-D. A sheen was observed on the water in the concrete vault that contained a portion of the fuel line that was formerly connected to the fuel farm. A search for vaults on property currently owned by the Corpus Christi Independent School District (CCISD) was also conducted. According to records, 10 vaults were located on the property. Three vaults locations were found, but the vaults themselves appeared to have been removed and/or were filled with soil. Six vaults could not be found. The expected locations were covered by piles of dirt and/or heavy vegetation. One location was covered with concrete with no evidence of a vault. Mr. Buster Terry of CCISD, indicated he was not aware of any oil seepage from the vaults on the property.

4.6 Conceptual Site Model

The components of a detailed conceptual model (CSM) representing an understanding of the site were presented in PowerPoint format at the DQO planning meeting. The PowerPoint slide presentation is included with the meeting documents in Appendix A, which presents the basis for this conceptual site model. A graphical summary of the CSM based on current site conditions is presented on Figure 3. The text below describes the CSM.

4.6.1 Geology

The presumed geology in this area was extrapolated from borings installed in the southeast portions of NALF Cabaniss near the former ranges (Tetra Tech, 2009). In general, the geologic section consisted of an upper fine-grained unit and a lower coarse-grained unit. This lower coarse-grained unit contained the first zone of saturated material. The upper fine-grained unit consisted of a gray to tan with depth, lean clay with a varying amount of admixed silt. The silt content generally increased with depth. Caliche nodules were present in the upper portions of the section. The thickness of the unit was between 17 and 18 feet.

The lower coarse-grained unit was the first unit in which saturated sediments were encountered. The contact between the two units was generally well defined. This unit consisted of a gray to tan very fine grained silty sand. This unit exhibited characteristics of a flowing sand in that the sand entered the borehole and rose several feet within the borehole at the transition point from the upper and lower units. Because the borings were terminated with this lower unit, the true thickness of the lower coarse-grained zone was unable to be determined (Tetra Tech, 2009).

4.6.2 Hydrogeology

As discussed previously, the lower-coarse grained unit was the zone in which saturated materials were first encountered. Groundwater at the site appears to be under semi-confined conditions as exhibited by the flowing sands encountered and the fact that water was measured in the well at a higher level than was encountered during drilling. Depth to static groundwater was measured at approximately 15 feet and 18.5 feet below ground surface (bgs) in the two temporary wells installed at the former ranges near Oso Creek. The actual water-bearing unit was encountered between 17 and 18 feet bgs.

Surface water features are not present at the site and storm water runoff from the paved areas is directed into the storm water sewer system. Oso Creek is located approximately 4,000 feet south of the site and is the nearest surface water body.

The site is underlain by low permeability clays, which cause the majority of precipitation to run-off with only a small percentage recharging the groundwater. The regional aquifer, the Gulf Coast Aquifer, is predominantly sandy material overlying a clay zone with low permeability. Regional groundwater flow in the Corpus Christi area is generally to the northeast towards the ocean; local flow paths at NALF Cabaniss are unknown. Artesian aquifers located 250 to 2,800 feet bgs in the Corpus Christi area are moderately to highly saline and, therefore, have limited potential use. Therefore, potable water for the NALF Cabaniss and the City of Corpus Christi is supplied from Lake Corpus Christi, 38 miles to the northwest of the field.

4.6.3 Contaminant Sources

The primary source of contamination at the site is from past releases from the former Aquadrive Fuel System. Operational dates of the former Aquadrive Fuel System are unknown; however, NALF Cabaniss was commissioned in 1941 and the portion of the base that contained the fuel tanks was released as excess property to GSA in 1958. No information is available on the removal or closure of the former Aquadrive Fuel System.

The primary fuel used in the system is believed to have been aviation gasoline (Avgas). Avgas is an aviation fuel used to power piston-engine aircraft. The main petroleum component used in blending Avgas is alkylate, which is essentially a mixture of various isooctanes. The chemical groups associated with Avgas could include benzene, toluene, ethylbenzene, and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), and TPH. Methyl tertiary-buytl ether (MTBE) is not considered a contaminant as its use post dates the operational time frame of the facility; however, tetraethyl lead could have been used as an additive in Avgas during the operational time frame of the facility.

4.6.4 Migration Routes

NALF Cabaniss has been an industrial area supporting aircraft training activities for more than 70 years. Contaminants, if present, would be found primarily in the shallow subsurface soil. Contaminants could potentially leach in subsurface soil and groundwater. The Navy-owned property around the former Aquadrive Fuel System is covered by concrete. This cover may limit infiltration of storm water into the subsurface during rain events. If the contaminants reach groundwater, the contaminants may migrate through groundwater. Migration pathways may include a low level dissolved phase Avgas and degradation products in a hydraulic downgradient direction.

Because the site and adjacent area is paved with concrete there is no completed human health risk pathway on Navy-owned property. Current and potential receptors at NALF Cabaniss include adult and adolescent trespassers, maintenance workers, construction workers, occupational workers, and future residents. Because waste material may be present in the subsurface, subsurface soil may be contaminated and groundwater that comes in contact with the waste may also become contaminated. As the groundwater migrates through the site, downgradient subsurface soil (smear zone during water table fluctuations) and groundwater may also be impacted.

4.6.5 Potential Receptors and Land Use

NALF Cabaniss has been an industrial area supporting aircraft training activities for more than 70 years. Structures at NALF Cabaniss include a fire station and air control tower. The Navy-owned property around the former Aquadrive Fuel System is covered with concrete. There are no plans to develop the site for uses other than the current flight training activities. NALF Cabaniss is a fenced installation; however, no security personnel are posted at the entrances. NALF Cabaniss is not continuously manned. Typical operations occur weekdays and during daylight hours.

Current and potential on-site receptors at the site include Navy personnel, adult and adolescent trespassers, maintenance workers, construction workers, and occupational workers. Residential site users are not considered receptors as there are no plans to develop the site; however, residential site users will be evaluated for completeness and to assist in remedy selection, if required.

Current and potential off-site receptors at the site include adults and adolescents, maintenance workers, construction workers, and occupational workers. Residential site users are not considered receptors as the area is considered commercial; however, residential site users will be evaluated for completeness and to assist in remedy selection, if required.

Potentially complete exposure pathways for contaminants exist in the surface and subsurface soil (dermal contact, incidental ingestion, and inhalation of dust and vapors). The Navy-owned property around the former Aquadrive Fuel System is covered by concrete. Therefore any potential contaminants are covered by a cap making access to potential contaminants unlikely.

Potentially complete exposure pathways for contaminants exist in groundwater (dermal contact, incidental ingestion). However, due to the stratigraphy, slow migration rates are expected to limit migration of contaminants. Groundwater at the site is not used for residential, industrial, or irrigation purposes.

Pathways for exposure for surface water and sediment are considered incomplete.

NALF Cabaniss is an operational facility that includes a fire station and air control tower with a paved area used for parking. Groundwater is not used for any purpose at NALF Cabaniss.

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SCALE AS NOTED				FIGURE NO. 1 / REV 0

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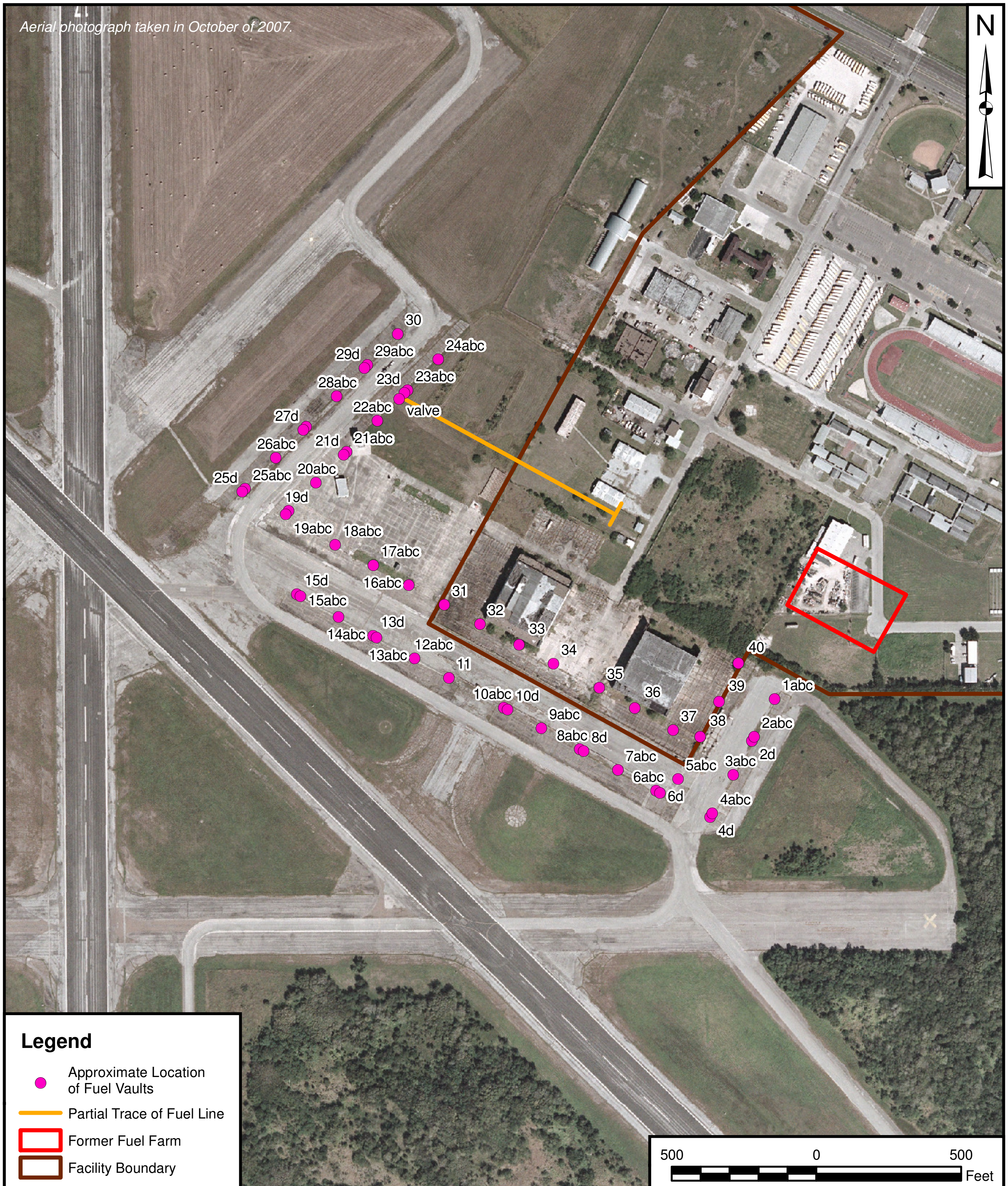

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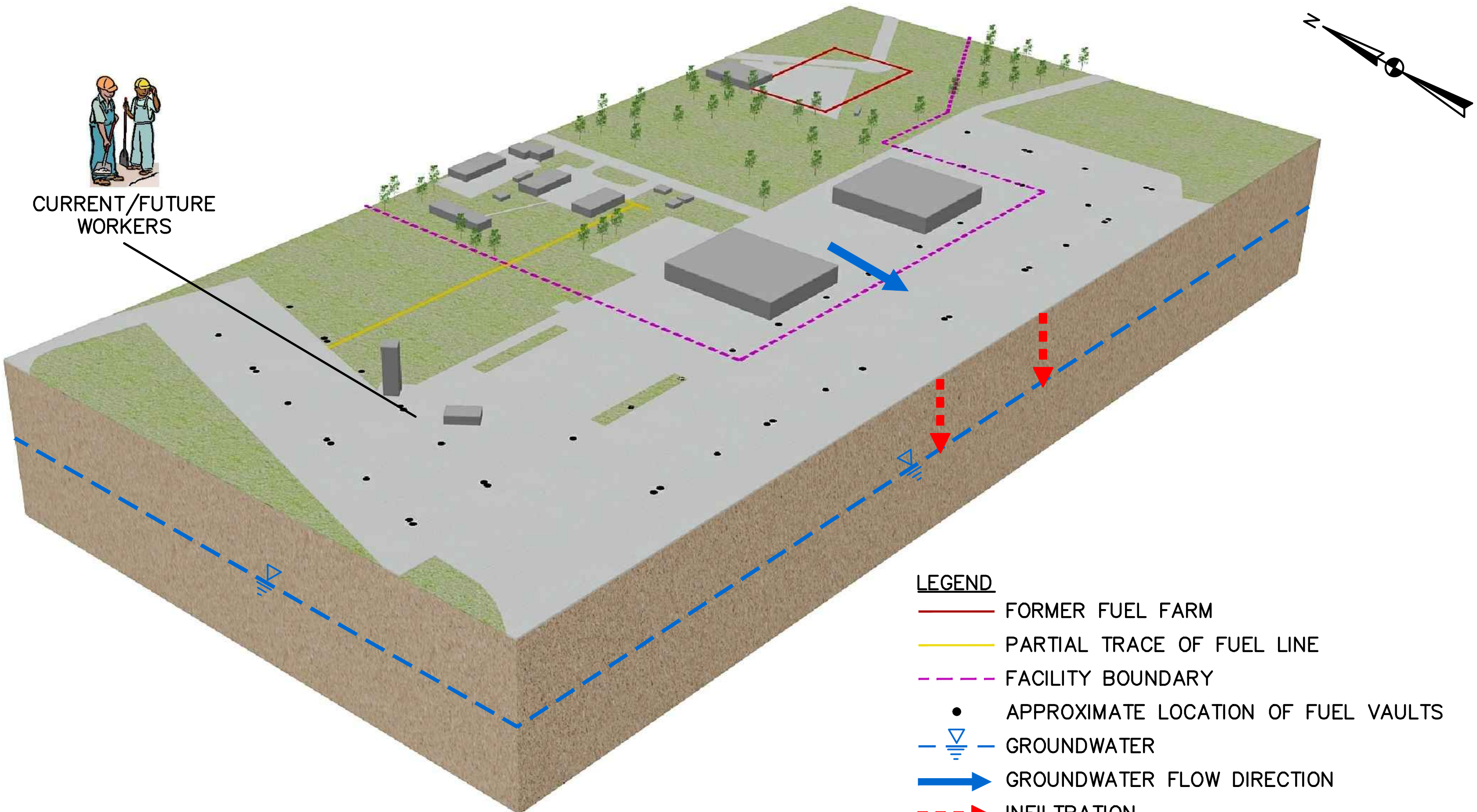
FUEL SYSTEM LOCATIONS
AQUADRIVE FUEL SYSTEM
NALF CABANISS, TEXAS

CONTRACT NUMBER	CTO NUMBER
1001	JM65
APPROVED BY ___	DATE ___
APPROVED BY ___	DATE ___
FIGURE NO. 2	REV 0



LEGEND

- FORMER FUEL FARM
- PARTIAL TRACE OF FUEL LINE
- FACILITY BOUNDARY
- APPROXIMATE LOCATION OF FUEL VAULTS
- GROUNDWATER
- GROUNDWATER FLOW DIRECTION
- INFILTRATION

NOTE: INFILTRATION MAY HAVE CARRIED CONTAMINATION INTO THE SOIL AND GROUNDWATER.

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Worksheet 5 Data Quality Objectives/Systematic Planning Process Statements

(UFP-QAPP Manual Section 2.6.1 – Worksheet #11)

5.1 Problem Definition

Based on the reporting of a fuel release from the Aquadrive fuel system, environmental contamination may exist in soil and/or groundwater at the site. A Preliminary Subsurface Investigation (PSI) must be conducted to determine if a release to the environment has occurred on Navy-owned property. Comparison of analytical data to regulatory and risk based criteria (Texas Petroleum Storage Tank Action Levels) will be used to determine if a release has occurred and if there is a potential for unacceptable risk from exposure to contaminated soil or groundwater and therefore, the need to conduct additional investigation.

This PSI is being conducted in accordance with the Texas Petroleum Storage Tank (PST) Program rules (Title 30 of the Texas Administrative Codes[TAC], Chapter 334). The Texas PST rules specify the assessment, monitoring, cleanup, reporting, and other requirements for PST sites in Texas.

5.1.1 Information Inputs

To resolve the problem identified in Worksheet 5.1, the following information is needed:

1. Surface and subsurface soil field screening: A photoionization detector (PID) for hydrocarbon vapor detection for characterization of contaminants and for selecting samples for laboratory analysis. This data is not considered definitive and any decision making will be made with laboratory analytical results.

2. Field investigation parameters: Water table level, groundwater dissolved oxygen, conductivity, pH, temperature, turbidity, and oxidation-reduction potential. These data will assist with site characterization and, when combined with chemical soil and groundwater data, will assist with understanding the nature and extent of site contamination. These groundwater measurements will be used to determine when groundwater samples are representative of the groundwater being investigated.

3. Chemical soil and groundwater data: Soil and groundwater concentrations of BTEX, low level PAHs, total lead, and TPH will be analyzed at a fixed based laboratory. The complete list of analytes is presented in Worksheet 9. The sampling methods are presented in Worksheet 8 and

the analytical methods are presented in Worksheet 10. The selected analyte groups presented are those that are likely to be associated with historical site activities as identified in the CSM.

4. Project Action Limit (PALs) to conduct comparisons of site soil and groundwater data. The selected laboratory should be able to achieve Limits of Quantitation (LOQs) and Limits of Detection (LODs) that are low enough to measure constituent concentrations at less than the PAL. The PALs are identified in Worksheet 9. The Texas PST Program Action Levels risk-based human health criteria will be used as PALs during this investigation. Action levels are taken from Table 1 of TCEQ publication RG-411, April 2010, revised September 2011.

5. Quality control sample results for estimating precision, bias, and contamination potential. Quality control (QC) samples will be collected at the frequencies established in Worksheet 6.

5.2 Study Area Boundaries

The horizontal boundary will encompass the area that based on historical information, is most likely impacted by site activities. The soil column is from the surface to the top of the first encountered groundwater estimated at 15 feet bgs. The horizontal boundary for soil is the area within NALF Cabaniss (no drilling or sampling will be conducted on property not owned by the Navy). Figure 2 shows the on-site and off-site areas.

The vertical boundary for the soil investigation is defined by the vertical limit of contamination or first encountered water table, whichever is encountered first.

The vertical boundary for the groundwater investigation is defined by the water table and depth of the aquifer. Groundwater populations of interest include groundwater within the first encountered shallow aquifer anticipated to be encountered at approximately 15 feet bgs.

5.3 Analytic Approach

Decision rule for release determination is provided below.

In order to determine whether a release has occurred, individual analyte concentrations will be determined in surface and subsurface soil and groundwater through laboratory analysis. These concentrations will be compared to the Texas PST Action Levels listed in Worksheet 9.

- If any target analyte concentrations for soil or groundwater exceed the PAL and background, which is also the PAL, then the PSI will recommend that the site proceed to the Site Investigation (SI) phase; otherwise, no further action will be taken.
- If the only exceedances are due to the PSL being lower than the laboratory Method Detection Limit (MDL), the Project Team agrees that no exceedances exist and that no further action is required, in accordance with the TCEQ guidance document RG-411 (TCEQ, April 2010, revised September 2011).

5.4 Performance Criteria

Achieving the desired level of decision making confidence is based largely on obtaining the designated data and on Project Team discussions. Data will be validated and reviewed in accordance with criteria presented in Worksheet 12. If data quality deficiencies are identified through these evaluations, the Project Team will determine an appropriate course of action that could include collecting additional data.

Data collected during this investigation must be representative of the targeted population, generated by sufficiently sensitive analytical methods that are operating within QC limits, and comparable in terms of quality and representativeness in light of project objectives and decision rules. Laboratory QC limits and PALs are presented in subsequent worksheets. PALs include Texas PST Program Action Levels (Table 1, RG-411) and will be used for comparison to soil and groundwater concentrations. To evaluate data quality, the processes and criteria described in Worksheet 12 will be used. Data quality deficiencies must be brought to the attention of all Project Team members for their consideration as to how the deficiencies affect attainment of project objectives.

5.5 Sampling Design and Rationale

Details of the sampling design, rationale, and locations are provided in Worksheets 7 and 8.

Worksheet 6 Field Quality Control Samples

(UFP-QAPP Manual Section 2.6.2 – Worksheet #12)

QC Sample	Analytical Group	Frequency	Data Quality Indicators (DQIs)	Measurement Performance Criteria (MPCs)
Trip Blank	BTEX	One per cooler	Bias/Contamination	No target analytes > ½ LOQ >LOQ for common laboratory contaminants), unless target analytes in field samples are > 10x those in trip blank.
Equipment Rinsate Blank[1]	BTEX, Low Level PAHs, TPH, and Lead	One per 20 samples	Bias/Contamination	No target analytes > ½ LOQ (>LOQ for common laboratory contaminants), unless target analytes in field samples are > 10x those in rinsate blank.
Field Duplicate	All analytical groups	One per 10 field samples	Precision	Values > 5X LOQ: Relative Percent Difference (RPD) must be ≤30 (aqueous)[2,3] ; ≤50 (solids)[2,3].
Temperature Blank	All analytical groups	One per cooler	Representativeness	Temperature must be above freezing and ≤ 6 Degrees Celsius (^{o}C).

Notes:

1 – Equipment rinsate blanks will be collected if non-dedicated sampling equipment is used. For disposable equipment, one sample per batch of disposable equipment will be collected.
2- If duplicate values for non-metals are less than five times the LOQ, the absolute difference should be less than or equal to two times the LOQ.
3- If duplicate values for metals are less than five times the LOQ, the absolute difference should be less than or equal to four times the LOQ.

Worksheet 7 Sampling Design and Rationale

(UFP-QAPP Manual Section 3.1.1 – Worksheet #17)

The sampling activities to be conducted at the site are presented below, including the proposed sample locations, sampling methods, and a rationale for the sampling activities. The proposed sample locations are presented on Figure 4. The proposed sampling locations and analytes are presented in Table 7-1. The analytical program is presented in Table 8-1. The field quality control samples required are specified in Table 8-2.

The potential for release of contaminants to the environment from the former Aquadrive Fuel System operations has not been determined. It is possible that soil and/or groundwater in the vicinity of the Aquadrive Fuel System have been impacted by the release of contaminants. The determination if a release to the environment (soil and/or groundwater) has occurred will be defined during this investigation.

7.1 Soil Sampling Design and Rationale

Surface and subsurface soil samples will be collected from the soil borings installed at the site. The soil boring locations are shown on Figure 4. A biased sampling strategy was selected to represent areas of the site that would most likely be impacted to determine if a release has occurred.

Seventeen (17) soil borings will be drilled to 10 feet bgs. Soil samples collected will be field screened using a PID. If evidence of contamination (e.g., elevated PID reading, visual, or olfactory) is noted a soil sample will be collected at the interval with the highest reading or observed contamination for laboratory analysis. If no evidence of contamination is noted, then the soil sample will be collected at the bottom of the boring (10 feet bgs). Three additional soil borings will be drilled to the first encountered groundwater and converted to monitoring wells. One soil sample will be collected from each boring based on evidence of contamination as described above. If no evidence of contamination is noted, the soil sample will be collected at the top of the water table (estimated at 15 feet bgs).

The soil samples collected will be analyzed for BTEX, low level PAHs, total lead, and TPH. The soil analytical data collected will be compared to soil PALs to determine if a release to the environment has occurred.

7.2 Groundwater Sampling Design and Rationale

Groundwater samples will be collected from the newly installed monitoring wells at the site. The monitoring well locations are shown on Figure 4. A biased sampling strategy was selected to represent areas of the site that would most likely be impacted to determine if a release has occurred.

Groundwater data collected during the PSI will be used to characterize groundwater. The groundwater samples will be analyzed for BTEX, low level PAHs, total lead, and TPH. The groundwater data collected will be compared to groundwater PALs to determine if a release to the environment has occurred. Additionally, one groundwater sample will also be analyzed for total dissolved solids (TDS). TDS results will be used to classify the groundwater resource category according to the TCEQ guidance document RG-366/TRRP-8: Groundwater Classification (TCEQ, March 2010).

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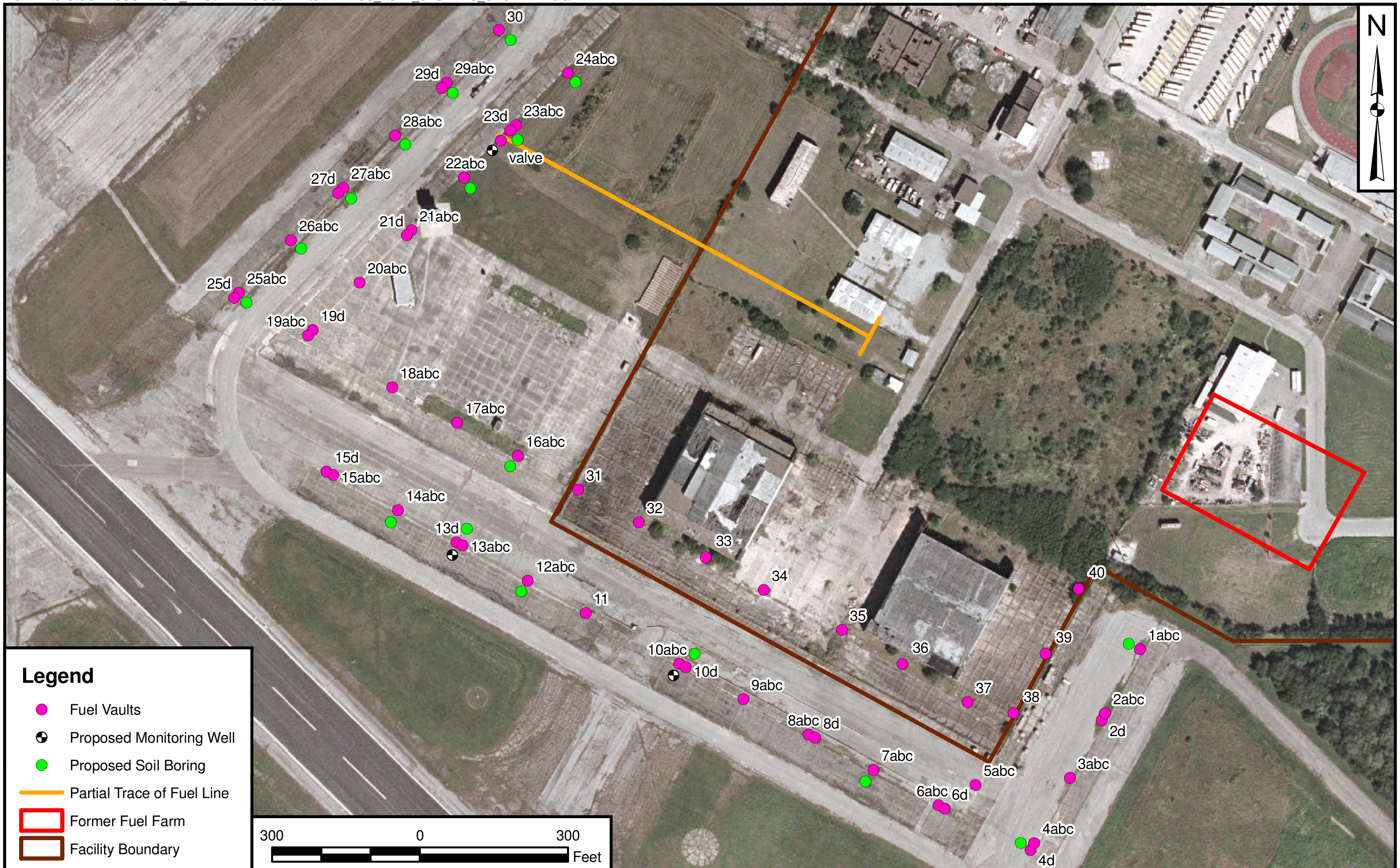

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K. MOORE	9/16/11
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PROPOSED SAMPLE LOCATIONS
AQUADRIVE FUEL SYSTEM
NALF CABANISS, TEXAS

CONTRACT NUMBER	CTO NUMBER
1001	JM65
APPROVED BY	DATE
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FIGURE NO. 4	REV 0

Table 7-1
Sample Locations, Laboratory Analytical Program, SOPs

Sampling Location (1)	Sampling ID Number (2)	Matrix	Depth (2) (feet bgs)	Analytical Group	Sampling SOP Reference
SB01	AF-SS01xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB02	AF-SS02xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB03	AF-SS03xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB04	AF-SS04xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB05	AF-SS05xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB06	AF-SS06xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB07	AF-SS07xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB08	AF-SS08xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB09	AF-SS09xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB10	AF-SS10xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB11	AF-SS11xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB12	AF-SS12xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB12	AF-SS13xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB14	AF-SS14xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB15	AF-SS15xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB16	AF-SS16xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB17	AF-SS17xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB18	AF-SS18xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB19	AF-SS19xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB20	AF-SS20xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH	SOP-05
SB01	AF-GW01	Groundwater	NA	BTEX, PAHs, TPH, total lead, TDS	SOP-09
SB02	AF-GW02	Groundwater	NA	BTEX, PAHs, total lead, TPH	SOP-09
SB03	AF-GW03	Groundwater	NA	BTEX, PAHs, total lead, TPH	SOP-09

1. Sample locations are shown on Figure 4. Soil borings SB01, 03, and 03 will be converted to monitoring wells.
2. Sample depth and thus samples ID will be determined in the field. Refer to SOP-02, Sample Identification Nomenclature for specifics of the sample ID numbering scheme. Field duplicate locations will be determined in the field by the FOL.

SOP – Standard Operating Procedure
NA – not applicable

Worksheet 8 Field Project Implementation (Field Project Instructions)

(UFP-QAPP Manual Section 5.2.3 – Worksheets #14, 18, 19, 20, 21, and 30)

8.1 Project and Field Objectives

The objective of the field work is to obtain the soil and groundwater data that are needed to meet the project objectives. Soil and groundwater analytical data will be used to determine if a release to the environment has occurred. Project objectives are described in more detail in Section 5.1.

8.2 Field Project Tasks

(UFP-QAPP Manual Section 2.8.1 – Worksheet #14)

Site specific Standard Operating Procedures (SOPs) and Field Forms have been developed for field activities and are referenced by title in Table 8-3 and copies are located in Appendix B. Field tasks are summarized below with a short description for each task.

8.2.1 MOBILIZATION/DEMOBILIZATION

Mobilization shall consist of the delivery of equipment, materials, and supplies to the site, the complete assembly in satisfactory working order of such equipment at the site, and the satisfactory storage at the site of such materials and supplies. Tetra Tech will coordinate with the Navy to identify locations for the storage of equipment and supplies, and coordinating investigation-derived waste (IDW) containerization and removal. Tetra Tech will coordinate with the Navy POC at NASCC regarding security and access issues, and daily activities. Site-specific Health and Safety Training should be provided as part of the site mobilization. Demobilization shall consist of the prompt and timely removal of equipment, materials, and supplies from the site following completion of the work. Demobilization also includes the cleanup and removal of IDW generated during sampling.

8.2.2 SITE-SPECIFIC HEALTH AND SAFETY TRAINING

Each site worker will be required to have completed appropriate Hazardous Waste Operations and Emergency Response (HAZWOPER) training (40-hour course and annual 8-hour refresher) specified in Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120(e). Project-specific safety requirements are addressed in greater detail in the site-specific Health and Safety Plan (HASP). Tetra Tech will submit a site-specific HASP to the Navy that addresses safety requirements in further detail.

8.2.3 Site Access

The Tetra Tech FOL or designee will coordinate site access with the NASCC POC.

8.2.4 Utility Clearance

One week prior to the commencement of any intrusive activities, Tetra Tech will coordinate with the NASCC POC to obtain a Digging Permit to identify and mark-out utilities that may be present within the proposed soil boring areas. Subsurface utilities will also be cleared by notifying the Texas One-Call utility clearing service.

8.2.5 Soil Boring Field Screening

To maximize the efficiency and cost/effectiveness of soil sampling from soil borings, field screening will be used to identify contaminated soil and semi-quantitatively assess the magnitude of contamination using a PID to identify the presence of VOCs in soil cores.

PID – A PID will be used to continuously scan all soils from core samples to obtain a qualitative approximation as to whether a soil may be contaminated with VOCs, and to determine the appropriate depth interval to submit for chemical analysis.

8.2.6 Soil Sampling

Soil samples will be collected for site characterization and to determine if a release to the environment has occurred.

A concrete coring subcontractor will cut holes in the concrete to access the soil beneath the concrete. After the samples are collected the core holes will be filled with concrete.

A drilling subcontractor will advance the proposed 17 soil borings to an estimated total depth of 10 feet bgs (the water table averages about 15 to 20 feet bgs) using direct push technology or hollow stem auger drilling method. The three monitoring wells will be drilled to the top of first encountered water. The soil sampling will proceed continuously from the land surface to the total depth of each boring. One soil sample will be collected for laboratory analysis from each soil boring. Sampling will be in accordance with SOP-01.

Soil samples will be analyzed for BTEX, low level PAHs, total lead, and TPH. The numbers and types of samples to be collected along with associated analytical programs are presented in Table 7-1. The sample numbering scheme will be in accordance with SOP-02. Sampling labeling will be in accordance with SOP-03 and sample containers, preservation, packaging, and shipping will be in accordance with SOP-04.

A soil boring log will be prepared for each boring with soil descriptions and all relevant information, observations, depth to saturated soils/water table, and PID field screening results as per SOP-05. Sample depths will be included on each log.

8.2.7 MONITORING WELL INSTALLATION

Three monitoring wells will be installed during this investigation. The monitoring wells will be installed at the first encountered groundwater at approximately15 to 20 feet bgs in accordance with SOP-06.

8.2.8 Monitoring Well Development

At least 24 hours after the annular grout has been emplaced, the monitoring wells shall be developed either with a submersible pump by pumping and/or overpumping or by bailing until the discharge water is clear and free of sediment to the satisfaction of the Tetra Tech Geologist or for a maximum of four hours per well. Turbidity will be monitored with a nephelometer. Development will be conducted in accordance with SOP-07.

8.2.9 Groundwater Level Measurements

Groundwater elevation measurements will be taken by the Tetra Tech FOL or designee to determine the groundwater flow direction beneath the site. All measurements will be collected within a period of consistent weather conditions to minimize atmospheric or precipitation effects on groundwater levels. The water levels will also be obtained a minimum of 12 to 24 hours after a significant rainfall event in order to negate the effects of short-term fluctuations in hydraulic head. The water level meter will be decontaminated prior to use and between each monitoring well. The depth will be measured in units of feet with respect to the top of the polyvinyl chloride (PVC) well riser. Water levels will be recorded on a Tetra Tech water level measurement form.

8.2.10 GROUNDWATER SAMPLING

Groundwater samples will be collected from the monitoring wells using low flow sampling techniques in accordance with SOP-08 and SOP-09. Groundwater samples collected will be analyzed for BTEX, low level PAHs, total lead, and TPH. One groundwater sample will also be analyzed for TDS. The numbers and types of samples to be collected along with associated analytical programs are presented in Table 7-1. The sample numbering scheme will be in accordance with SOP-02. Sampling labeling will be in accordance with SOP-03 and sample containers, preservation, packaging, and shipping will be in accordance with SOP-04.

8.2.11 SURVEYING

The locations and elevations of all newly installed soil borings/monitoring wells will be surveyed using the Texas State Plane Coordinate System. The North American Datum (NAD) 1983 will be used as the horizontal datum. Sample locations will be surveyed to the nearest 0.10 foot. Vertical elevations will be referenced to 1988 National Geodetic Vertical Datum (NGVD). A surveyor licensed in the State of Texas will be used to obtain the vertical and horizontal locations of the monitoring wells.

8.2.12 FIELD DECONTAMINATION PROCEDURES

Decontamination of major equipment and sampling equipment will be in accordance with SOP-10. An area for the decontamination pad will be arranged by the FOL through NASCC personnel. Tap water will be drawn from the potable municipal water supply at NALF Cabaniss.

8.2.13 MONITORING EQUIPMENT CALIBRATION

Field equipment will be calibrated by the FOL or designee accordance with manufacturer’s guidance. Documentation of the field equipment calibration is required.

8.2.14 INVESTIGATION-DERIVED WASTE MANAGEMENT

All solid and liquid wastes generated as a result of this investigation will be handled in accordance with the procedures described in SOP-11.

Soil cuttings will be containerized in Department of Transportation (DOT)-approved (DOT specification 17C) 55-gallon drums. These cuttings will be tested and then disposed of off-site. Purge water and decontamination water will be collected in drums, and these waters will be tested and then disposed of off-site.

Drums of IDW will be stored at a location designated by NASCC personnel and will remain there until waste characterization results are available and disposal is implemented. The drums will be labeled as soon as possible after they are filled and will be arranged into rows (no more than two drums deep) separated by content (e.g., liquids and solids) for easy access.

Personal protective equipment (gloves, wipes, discarded paper towels, etc.) will be properly discarded on-base in a solid waste dumpster.

8.2.15 Field Documentation Procedures

Field documentation will be performed in accordance with SOP-12.

A summary of all field activities will be properly recorded in a bound logbook with consecutively numbered pages that cannot be removed. Logbooks will be assigned to field personnel and will be stored in a secured area when not in use.

All entries will be written in ink, and no erasures will be made. If an incorrect entry is made, striking a single line through the incorrect information will make the correction; the person making the correction will initial and date the change.

8.3 Additional Project Tasks

Additional project-related tasks include:

- Analytical tasks
- Data management and data review
- Project reports

8.3.1 Analytical Tasks

Chemical analyses will be performed by Empirical and PEL a division of Spectrum Analytical (PEL), which are both DoD Environmental Laboratory Accreditation Program (ELAP)-accredited as well as Texas Nation Environmental Laboratory Accreditation Program (NELAP) accredited laboratories. Copies of Empirical's and PEL's accreditations are included in Appendix C. Analyses will be performed in accordance with the analytical methods identified in Table 8-1. Empirical and PEL will meet the PALs specified in Worksheet 9 and will perform the chemical analyses following laboratory-specific SOPs (see Section 10) developed based on the methods listed in Table 8-1.

All soil results will be reported by the laboratory on an adjusted dry-weight basis. Results of percent moisture will be reported in each analytical data package and associated electronic data deliverable

(EDD) files. This information will also be captured in the project database, which will eventually be uploaded to the Naval Installation Restoration Information Solution (NIRIS) database. Percent moisture information will also be captured.

The analytical data packages provided by Empirical and PEL will be in a Contract Laboratory Program-Statement of Work (CLP-SOW)-like format and will be fully validatable and contain raw data, summary forms for all sample and laboratory method blank data, and summary forms containing all method-specific QC (results, percent recoveries [%Rs], RPDs, relative standard deviations [RSDs], and/or percent differences [%D], etc.).

8.3.2 Data Management and Data Review

The principal data generated for this project will be from field data and laboratory analytical data. Field sampling log sheets will be organized by date and medium, and filed in the project files. The field logbooks for this project will be used only for this site and will also be categorized and maintained in the project files after the completion of the field program. Project personnel completing concurrent field sampling activities may maintain multiple field logbooks. When possible, logbooks will be segregated by sampling activity. The field logbooks will be titled based on date and activity.

The data handling procedures to be followed by the laboratories will meet the requirements of the technical specifications. Electronic data results will be automatically downloaded into the Tetra Tech database in accordance with the proprietary Tetra Tech processes.

The Tetra Tech PM (or designee) is responsible for the overall tracking and control of data generated for the project.

- **Data Tracking**. Data are tracked from generation to archiving in the Tetra Tech project-specific files. The Tetra Tech Project Chemist (or designee) is responsible for tracking the samples collected and shipped to the laboratories. Upon receipt of the data packages from the laboratories, the Tetra Tech Project Chemist will monitor the data validation effort, which includes verifying that the data packages are complete and results for all samples have been delivered by the laboratories.

- **Data Storage, Archiving, and Retrieval**. The data packages received from the laboratories are tracked in the data validation logbook. After the data are validated, the data packages are entered into the Tetra Tech Navy Comprehensive Long Term Environmental Action Navy (CLEAN) file system and archived in secure files. The field records including field log books, sample logs, chain-of-custody records, and field calibration logs will be submitted by the Tetra Tech FOL to be entered into the Navy CLEAN file system prior to archiving in secure project files. Project files are audited for accuracy and completeness. At the completion of the Navy contract, the records will be stored by Tetra Tech.

- **Data Security**. Access to Tetra Tech project files is restricted to designated personnel only. Records can only be borrowed temporarily from the project file using a sign-out system. The Tetra Tech Data Manager maintains the electronic data files, and access to the data files is restricted to qualified personnel only. File and data backup procedures are routinely performed.

- **Electronic Data**. All electronic data will be compiled into a NIRIS electronic data deliverable (NEDD) and loaded into NIRIS.

- **Data Review**. This review comprises data verification, validation, and usability assessment. The data verification and validation processes and requirements are described in Worksheet 12. The data usability assessment will, at a minimum, constitute evaluation of the following characteristics to ensure that the amount, type, and quality of data are sufficient to achieve project objectives. The means of conducting these evaluations will vary depending on the nature of the data. For example, soil borings and well construction logs will generally be evaluated qualitatively or semiquantitatively whereas precision, accuracy, and sensitivity of analytical data will generally be evaluated quantitatively and may be based on, or may supplement, data validation findings.

- **Data Usability Assessment.** At the direction of the Tetra Tech PM, a data usability assessment will be performed by key individuals (e.g., the project geologist, project chemist, statistician, and risk assessor) on behalf of the Project Team. The objective will be to evaluate all aspects of data quality and usability in the context of the problem statement and decisions to be made to determine whether the project data are usable as intended. Key elements of this review, several of which relate to performance specifications in field and laboratory SOPs and SAP Sections, are as follows:

  - Precision – Ensuring project precision objective are satisfied and that laboratory precision is no less precise than field precision.

  - Accuracy – Ensuring project accuracy objectives are satisfied.

  - Sensitivity – Ensuring analytical sensitivity goals were achieved.

  - Completeness – Ensuring that all of the scheduled sampling and analysis was completed.

- Comparability – Ensuring secondary and primary data are comparable enough to satisfy project objectives and that current data are projected to be comparable to future data, as necessary.

- Representativeness – Ensuring samples were collected from the intended locations and depths, and at the specified times, and that the analyses were conducted as specified in this Work Plan.

These evaluations require reviews across data packages rather than the individual data package reviews conducted during data validation. For calculating exposure point concentrations, temporal trends, data correlations, background comparisons, outlier identification, etc., non-detects will be represented by one-half the detection limit.

Additional evaluations, conducted at the Tetra Tech PM direction, may be necessary to explore physical and chemical relationships. Examples include, but are not limited to:

- Evaluating soil boring logs and well construction diagrams to determine whether any physical anomalies may have been present and that all physical anomalies have been considered when evaluating the representativeness and comparability of data.

- Evaluating groundwater characteristics such as seepage velocities, pH, oxidation reduction potential (ORP), and specific conductivity in the context of the geologic formation (coal/shale versus limestone/sandstone) to assess whether the reported values are reasonable.

- Comparing dissolved and total metals concentrations to ensure the dissolved metal concentration is not greater (within experimental uncertainty) than the total metal concentration in a particular sample.

If data are found to be usable for their intended purpose, the data usability assessment output will be one or more standard report tables indicating data qualifications for each analytical result. If significant usability limitations are identified, the Tetra Tech PM will determine how best to represent the data limitations. These limitations will be shared with the rest of the Project Team for their evaluation before finalization of the project report.

8.3.3 Project Report

A Release Determination Report (RDR) (TCEQ-00621, revised 08/29/2009) will be prepared summarizing the results of all field activities and presenting all information collected.

Table 8-1 - Analytical SOP Requirements

(UFP-QAPP Manual Section 3.1.1 - Worksheets #19 and 30)

Empirical point of contact, e-mail address, and phone number: Brian Richard, brichard@empirlabs.com, 615-345-1115 Ext. 249
Address:
Empirical Laboratories, LLC, 621 Mainstream Drive, Suite 270 Nashville, TN 37228
Data Package Turnaround time: 21 days
Tentative Sampling Dates: January 2011

PEL point of contact, e-mail address, and phone number: Mark Gudnason ,mgudnason@pelab.com , 813-888-9507
Address:
PEL a Division of Spectrum Analytical, Inc., 8405 Benjamin Rd. Suite A. Tampa, FL 33634

Matrix	**Analytical Group**	**Analytical and Preparation Method / SOP Reference**[1]	**Containers** (number, size, and type)	**Sample Volume** (units)	**Preservation Requirements** (chemical, temperature, light protected)	**Maximum Holding Time** (preparation/ analysis)
Groundwater	BTEX	SW-846 5030/8260B, Empirical SOP-202	Three - 40 milliliter (mL) glass vials	5 mL	Hydrochloric acid (HCl) to pH <2; Cool to above freezing and ≤ 6 °C; no headspace	14 days to analysis
	Low Level PAHs	SW-846 3510C/8270C Empirical SOP-201/300	Two 1 - liter (L) glass amber bottles	1,000 mL	Cool to above freezing and ≤ 6 °C	7 days until extraction/40 days to analysis
	TPH (C6-C12, C>12-28, and C>28-C35)	TX1005 PEL SOP00016	Two - 40 mL glass vials	30 mL	HCl to pH<2; Cool to above freezing and ≤ 6 °C	7 days until extraction/14 days to analysis
	Lead	SW-846 3010A/6010C, Empirical SOP-100/105	One – 500 mL plastic bottle	50 mL	Nitric acid (HNO_3) to pH <2; Cool to < 6 °C	180 days to analysis
	TDS	USEPA 160.1	One 250-mL polyethylene bottle	100 mL	Cool to above freezing and ≤ 6 °C	7 days to analysis
Soil	BTEX	SW-846 5035/8260B Empirical SOP-202/225	Three 5-gram (g) Encore samplers or terracores	5 g	Sodium bisulfate in water, cool to above freezing and ≤ 6 °C; methanol, freeze to < -10°C	48 hours from sampling to preparation, 14 days to

Matrix	**Analytical Group**	**Analytical and Preparation Method / SOP Reference**[1]	**Containers** (number, size, and type)	**Sample Volume** (units)	**Preservation Requirements** (chemical, temperature, light protected)	**Maximum Holding Time** (preparation/ analysis)
						analysis
	Low Level PAHs	SW-846 3546/ 8270C-Low Empirical SOP-201/343	One 4-ounce (oz) glass jar with a Teflon-lined lid	30 g	Cool to above freezing and ≤6 °C	14 days until extraction, 40 days to analysis
	Lead	SW-846 3050B/ 6010C Empirical SOP-100/105	One 4-oz glass jar	1 to 2 g	Cool to ≤ 6 °C	180 days to analysis except mercury, 28 days for mercury
	TPH (C6-C12, C>12-C28, and C>28 to C35)	TX1005 PEL SOP00016	One 4-oz glass jar with a Teflon-lined lid	10 g	Cool to above freezing and ≤ 6 °C	14 days until extraction/ 14 days to analysis
Soil IDW	TCLP VOCs	SW-846 1311/8260B	One 4-oz glass jar with a Teflon-lined lid	4 oz	Cool to above freezing and ≤ 6 °C	14 days to analysis
Soil and Aqueous IDW	Reactivity	SW-846 9012 and 9030	One 500-mL polyethylene bottle/One 4-oz glass wide-mouth jar	500 mL/4 oz	Cool to above freezing and ≤ 6 °C	14 days to analysis
Soil and Aqueous IDW	Ignitability	SW-846 1010	One 500-mL polyethylene bottle/One 4-oz glass wide-mouth jar	500 mL/4 oz	Cool to above freezing and ≤ 6 °C	14 days to analysis
Soil and Aqueous IDW	pH	SW-846 9045D (soil)/ 9040C (aqueous)	One 500-mL polyethylene bottle/One 4-oz glass wide-mouth jar	500 mL/4 oz	Cool to above freezing and ≤ 6 °C	14 days to analysis

Notes:
1. Specify the appropriate reference letter or number from the Analytical SOP References table (Section 10).
2. Aqueous and Soil IDW sample analyses are presented on this worksheet for the utilization of field personnel. QC information is not presented in any of the remaining worksheets as these samples are for waste disposal, not decision making purposes. IDW samples will not be validated.

TABLE 8-2 - FIELD QUALITY CONTROL SAMPLE SUMMARY TABLE
(UFP-QAPP Manual Section 3.1.1 - Worksheet #20)

Matrix	Analytical Group	No. of Sampling Locations	No. of Field Duplicates	No. of MS/MSDs[1]	No. of Field Blanks	No. of Equipment Rinsate Blanks	No. of VOC Trip Blanks	Total No. of Samples to Lab
Groundwater	BTEX	3	1	1/1	0	1	1	6
	Low Level PAHs	3	1	1/1	0	1	NA	5
	TPH (all carbon ranges)	3	1	1/1	0	1	NA	5
	Lead	3	1	1/1	0	1	NA	5
Soil	BTEX	20	2	1/1	0	1	4	27
	Low Level PAHs	20	2	1/1	0	1	NA	23
	TPH (all carbon ranges)	20	2	1/1	0	1	NA	23
	Lead	20	2	1/1	0	1	NA	23

1 Although matrix spike (MS)/MS duplicate (MSD) samples are not typically considered field QC samples, they are included here because location determination is often established in the field. MS/MSD samples are not included in the total number of samples sent to the laboratory.

Table 8-3 - Field SOPs Reference Table
(UFP-QAPP Manual Section 3.1.2 – Worksheet #21)

SOP Reference Number	Title/Author	Revision Date or Version Number	Project Specific SOP?	Comments
SOP-01	Soil Sampling	Tetra Tech	Y	Refer to Appendix B for Field SOPs
SOP-02	Sample Identification Nomenclature	Tetra Tech	Y	
SOP-03	Sample Labeling	Tetra Tech	Y	
SOP-04	Sample Preservation, Packaging, and Shipping	Tetra Tech	Y	
SOP-05	Borehole and Soil Sample Logging	Tetra Tech	Y	
SOP-06	Monitoring Well Installation	Tetra Tech	Y	
SOP-07	Monitoring Well Development	Tetra Tech	Y	
SOP-08	Low-Flow Well Purging and Stabilization	Tetra Tech	Y	
SOP-09	Groundwater Sampling	Tetra Tech	Y	
SOP-10	Decontamination of Field Sampling Equipment	Tetra Tech	Y	
SOP-11	Management of Investigation Derived Waste	Tetra Tech	Y	
SOP-12	Sample Custody and Documentation of Field Activities	Tetra Tech	Y	

Table 8-4 - Sample Details Table

(UFP-QAPP Manual Section 3.1.1 and 3.5.2.3 – Worksheet #18)

Sampling Location [1]	Sampling ID Number [2]	Matrix	Depth [2] (ft bgs)	Analytical Group[2]
SB01	AF-SS01xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB02	AF-SS02xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB03	AF-SS03xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB04	AF-SS04xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB05	AF-SS05xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB06	AF-SS06xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB07	AF-SS07xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB08	AF-SS08xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB09	AF-SS09xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB10	AF-SS10xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB11	AF-SS11xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB12	AF-SS12xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB12	AF-SS13xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB14	AF-SS14xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB15	AF-SS15xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB16	AF-SS16xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
SB17	AF-SS17xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
MW01	AF-MW01xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
MW02	AF-MW02xxx	Soil	TBD	BTEX, PAHs, total lead, TPH
MW03	AF-MW03xxxx	Soil	TBD	BTEX, PAHs, total lead, TPH
MW01	AF-GW01	Groundwater	NA	BTEX, PAHs, total lead, TPH, TDS
MW02	AF-GW02	Groundwater	NA	BTEX, PAHs, total lead, TPH
MW03	AF-GW03	Groundwater	NA	BTEX, PAHs, total lead, TPH

Worksheet 9 Reference Limits and Evaluation Tables

(UFP-QAPP Manual Section 2.8.1 – Worksheet #15)

Matrix: Soil
Analytical: BTEX

Analyte	CAS Number	PAL (mg/kg)	PAL Reference[1]	PQLG (mg/kg)	Empirical		
					LOQ (mg/kg)	LOD (mg/kg)	MDL (mg/kg)
BENZENE	71-43-2	0.12	PST Program Action Levels	0.0396	0.005	0.0025	0.00125
ETHYLBENZENE	100-41-4	36.8	PST Program Action Levels	12.1	0.005	0.0025	0.00125
TOLUENE	108-88-3	39.1	PST Program Action Levels	13	0.005	0.0025	0.00125
O-XYLENE	95-94-6	NC	None	NC	0.005	0.0025	0.00125
m,p-XYLENE	179601-23-1	NC	None	NC	0.010	0.005	0.0025
TOTAL XYLENES	NA	117	PST Program Action Levels	38.6	0.015	0.0075	0.00375

Notes:
CAS – Chemical Abstracts Service
PAL – Project Action Limit
mg/kg – Milligrams per kilogram
PQLG – Project Quantitation Limit Goal
NA – Not Applicable
NC – No Criteria

[1]PAL References – PST Program Action Levels: TCEQ Petroleum Storage Tank Program Action Levels, 30 TAC Chapter 334 (TCEQ, April, 2010, revised September 2011).

Matrix: Soil
Analytical: Low level PAHs

Analyte	**CAS Number**	**PAL (mg/kg)**	**PAL Reference[1]**	**PQLG (mg/kg)**	**Empirical**		
					LOQ (mg/kg)	**LOD (mg/kg)**	**MDL (mg/kg)**
ACENAPHTHENE	83-32-9	34.1	PST Program Action Levels	11.3	0.0667	0.0333	0.0167
ACENAPHTHYLENE	208-96-8	54.7	PST Program Action Levels	18	0.0667	0.0333	0.0167
ANTHRACENE	120-12-7	2.04	PST Program Action Levels	0.67	0.0667	0.0333	0.0167
BENZO (A) ANTHRACENE	56-55-3	0.877	PST Program Action Levels	0.289	0.0667	0.0333	0.0167
BENZO (A) PYRENE	50-32-8	0.0877	PST Program Action Levels	0.0289	0.0667	0.0333	0.0167
BENZO (B) FLUOROANTHENE	205-99-2	0.877	PST Program Action Levels	0.289	0.0667	0.0333	0.0167
BENZO (G,H,I) PERYLENE	191-24-2	0.824	PST Program Action Levels	0.27	0.0667	0.0333	0.0167
BENZO (K) FLUOROANTHENE	207-08-9	1.35	PST Program Action Levels	0.44	0.0667	0.0333	0.0167
CHRYSENE	218-01-9	1.24	PST Program Action Levels	0.41	0.0667	0.0333	0.0167
DIBENZO (A,H) ANTHRACENE	53-70-3	0.0877	PST Program Action Levels	0.0289	0.0667	0.0333	0.0167
DIBENZOFURAN	132-64-9	48.8	PST Program Action Levels	16.1	0.0133	0.00067	0.00333
FLUORANTHENE	206-44-0	25.5	PST Program Action Levels	8.4	0.0667	0.0333	0.0167
FLUORENE	86-73-7	30.2	PST Program Action Levels	10	0.0667	0.0333	0.0167
INDENO (1,2,3-CD) PYRENE	193-39-5	0.877	PST Program Action Levels	0.289	0.0667	0.0333	0.0167
NAPHTHALENE	91-20-3	99.7	PST Program Action Levels	32.9	0.0667	0.0333	0.0167
PHENANTHRENE	85-01-8	28.2	PST Program Action Levels	9.3	0.0667	0.0333	0.0167
PYRENE	129-00-0	10.3	PST Program Action Levels	3.4	0.0667	0.0333	0.0167

Notes:

[1]PAL References – PST Program Action Levels: TCEQ Petroleum Storage Tank Program Action Levels, 30 TAC Chapter 334 (TCEQ, April 2010, revised September 2011).

Matrix: Soil
Analytical: TPH

Analyte	CAS Number	PAL (mg/kg)	PAL Reference[1]	PQLG (mg/kg)	PEL		
					LOQ (mg/kg)	LOD (mg/kg)	MDL (mg/kg)
TPH C6-C12	NA	NA	PST Program Action Levels	17	50	50	25
TPH >C12-28	NA	NA	PST Program Action Levels	17	50	50	25
TPH >C28-C35	NA	NA	PST Program Action Levels	17	50	50	25

Notes:

[1]PAL References – PST Program Action Levels: TCEQ Petroleum Storage Tank Program Action Levels, 30 TAC Chapter 334 (TCEQ, March 2009).

Matrix: Soil
Analytical: Lead

Analyte	CAS Number	PAL (mg/kg)	PAL Reference[1]	PQLG (mg/kg)	Empirical		
					LOQ (mg/kg)	LOD (mg/kg)	MDL (mg/kg)
Lead	7439-92-1	500	Texas Risk Reduction Program	165	1	0.6	0.3

Notes:

[1]PAL References – Tier 1 Residential Soil PCL, Table 1, Texas Risk Reduction Program, 30 TAC Chapter 350 (TCEQ, May 24, 2011).

Matrix: Groundwater
Analytical: BTEX

Analyte	CAS Number	Project Action Limit (mg/L)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/L)	Empirical		
					LOQ (mg/L)	LOD (mg/L)	MDL (mg/L)
BENZENE	71-43-2	0.005	PST Program Action Levels	0.0017	0.001	0.0005	0.00025
ETHYLBENZENE	100-41-4	0.7	PST Program Action Levels	0.23	0.001	0.0005	0.00025
TOLUENE	108-88-3	1	PST Program Action Levels	0.33	0.001	0.0005	0.00025
O-XYLENE	95-94-6	NC	None	NC	0.001	0.0005	0.00025
m,p-XYLENE	179601-23-1	NC	None	NC	0.002	0.001	0.0005
TOTAL XYLENES	NA	10	PST Program Action Levels	3.3	0.003	0.0015	0.00075

Notes:

[1]PAL References – PST Program Action Levels: TCEQ Petroleum Storage Tank Program Action Levels, 30 TAC Chapter 334 (TCEQ, April 2010, revised September 2011).

Matrix: Groundwater
Analytical: Low Level PAHs

Analyte	CAS Number	PAL (mg/L)	PAL Reference[1]	PQLG (mg/L)	Empirical		
					LOQ (mg/L)	LOD (mg/L)	MDL (mg/L)
ACENAPHTHENE	83-32-9	2.19	PST Program Action Levels	0.72	0.0002	0.0001	0.00005
ACENAPHTHYLENE	208-96-8	11	PST Program Action Levels	3.63	0.0002	0.0001	0.00005
ANTHRACENE	120-12-7	2.19	PST Program Action Levels	0.72	0.0002	0.0001	0.00005
BENZO (A) ANTHRACENE	**56-55-3**	**0.000117**	**PST Program Action Levels**	**0.0000386**	**0.0002**	**0.0001**	**0.00005**
BENZO (A) PYRENE	50-32-8	0.0002	PST Program Action Levels	0.00066	0.0002	0.0001	0.00005
BENZO (B) FLUOROANTHENE	**205-99-2**	**0.000117**	**PST Program Action Levels**	**0.0000386**	**0.0002**	**0.0001**	**0.00005**
BENZO (G,H,I) PERYLENE	191-24-2	1.1	PST Program Action Levels	0.363	0.0002	0.0001	0.00005
BENZO (K) FLUOROANTHENE	207-08-9	0.00117	PST Program Action Levels	0.0003861	0.0002	0.0001	0.00005
CHRYSENE	218-01-9	0.0117	PST Program Action Levels	0.003861	0.0002	0.0001	0.00005
DIBENZO (A,H) ANTHRACENE	**53-70-3**	**0.0002**	**PST Program Action Levels**	**0.000066**	**0.0002**	**0.0001**	**0.00005**
DIBENZOFURN	132-64-9	0.146	PST Program Action Levels	0.048	0.0004	0.0002	0.0001
FLUORANTHENE	206-44-0	1.46	PST Program Action Levels	0.48	0.0002	0.0001	0.00005
FLUORENE	86-73-7	1.46	PST Program Action Levels	0.48	0.0002	0.0001	0.00005
INDENO (1,2,3-CD) PYRENE	**193-39-5**	**0.000117**	**PST Program Action Levels**	**0.0000386**	**0.0002**	**0.0001**	**0.00005**
NAPHTHALENE	91-20-3	0.73	PST Program Action Levels	0.24	0.0002	0.0001	0.00005
PHENANTHRENE	85-01-8	1.1	PST Program Action Levels	0.363	0.0002	0.0001	0.00005
PYRENE	129-00-0	1.1	PST Program Action Levels	0.363	0.0002	0.0001	0.00005

Notes:
[1]PAL References – PST Program Action Levels: TCEQ Petroleum Storage Tank Program Action Levels, 30 TAC Chapter 334 (TCEQ, April 2010, revised September 2011).

Bolded rows indicate that the PAL is between the laboratory LOQ and MDL. The Project Team has agreed to accept this data for decision making as long as results below the LOQ are "J" qualified and discussed in the RDR Report.

Shaded and Bold row indicate the PAL is less than the MDL; therefore, the Project Team has agreed to replace the PALs with the laboratory MDLs for decision making purposes, as described in "Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs)" (TCEQ, April 2010).

Matrix: Groundwater
Analytical: TPH

Analyte	CAS Number	Project Action Limit (mg/L)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/L)	PEL		
					LOQ (mg/L)	LOD (mg/L)	MDL (mg/L)
TPH C6-C12	NA	NA	PST Program Action Levels	1.7	5	5	2.5
TPH >C12-C28	NA	NA	PST Program Action Levels	1.7	5	5	2.5
TPH >C28-C35	NA	NA	PST Program Action Levels	1.7	5	5	2.5

Notes:

[1]PAL References – PST Program Action Levels: TCEQ Petroleum Storage Tank Program Action Levels, 30 TAC Chapter 334 (TCEQ, April 2010, revised September 2011).

Matrix: Groundwater
Analytical: Lead

Analyte	CAS Number	Project Action Limit (mg/L)	Project Action Limit Reference	Project Quantitation Limit Goal (mg/L)	PEL		
					LOQ (mg/L)	LOD (mg/L)	MDL (mg/L)
Lead	7439-92-1	0.0015	Texas Risk Reduction Program	0.000495	3	3	1.5

Notes:

[1]PAL References – Tier 1 Residential Groundwater Soil PCL, Table 3, Texas Risk Reduction Program, 30 TAC Chapter 350 (TCEQ, May 24, 2011).

Worksheet 10 Analytical SOP References Table

(UFP-QAPP Manual Section 3.2.1 – Worksheet #23)

Lab SOP Number	Title, Revision Date, and / or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Variance to QSM? (Y/N)	Modified for Project Work?[1] (Y/N)
Empirical SOP-100	Metals Digestion/ Preparation, Methods 3005A/ USEPA CLP ILMO 4.1 Aqueous, 3010A, 3030C, 3050B, USEPA CLP ILMO 4.1 (Soil/Sediment), 200.7, Standard Methods 3030C (Revision 21, 09/01/10)	Definitive	Groundwater, soil, and aqueous field QC samples/ Lead	NA/Preparation	Empirical	N	N
Empirical SOP-105	Metals by Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES) Technique, SW-846 Methods 6010B, 6010C, USEPA Method 200.7, Standard Methods 19th Edition 2340B, USEPA CLP ILMO 4.1 (Revision 16, 04/11/10)	Definitive	Groundwater, soil, and aqueous field QC samples/ Lead	ICP-AES	Empirical	N	N
Empirical SOP-201	Gas Chromatography/ Mass Spectroscopy (GC/MS) Semivolatiles by Method 625 and SW846 Method 8270C and 8270D (Revision 20, 04/26/10)	Definitive	Groundwater, soil, and aqueous field QC samples/ Low Level PAHs	Gas Chromatography/ Mass Spectroscopy (GC/MS)	Empirical	N	N
Empirical SOP-202	GC/MS Volatiles using USEPA Method 624 and SW846 Method 8260B, Including Appendix IX Compounds (Revision 23, 09/09/10)	Definitive	Groundwater, soil, and aqueous field QC samples/ BTEX	GC/MS	Empirical	N	N
Empirical SOP-225	GC/MS Volatile Non-Aqueous Matrix Extraction using SW-846 Method 5035 for 8260B Analysis (Revision 9, 09/07/10)	Definitive	Soil samples/ BTEX Extraction	GC/MS	Empirical	N	N
Empirical SOP-300	GC/MS Semivolatile BNA-Aqueous Matrix Extraction Using SW-846 Method 3510C for 8270C/625 Analysis (Revision 18, 04/26/10)	Definitive	Groundwater and aqueous field QC samples/ Low Level PAH extraction	Extraction	Empirical	N	N
Empirical SOP-343	BNA, Pesticides/PCBs, and TPH non-Aqueous Matrix (Microwave Extraction) using SW-846 3546 (Revision 01, 09/09/10)	Definitive	Soil samples/ Low Level PAH Extraction	NA/ Extraction	Empirical	N	N
PEL SOP-00016	Extraction, Fractionation, and Analysis of Aqueous and Soil Samples for Total	Definitive	Groundwater, soil, and aqueous field	Gas Chromatography/ Flame Ionization	PEL	NA	N

Lab SOP Number	Title, Revision Date, and / or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Variance to QSM? (Y/N)	Modified for Project Work?[1] (Y/N)
	Petroleum Hydrocarbons by Gas Chromatography (TNRCC1005/1006 and FL TPHCWG) (Revision 10, 02/14/11)		QC samples/ TPH	Detector (GC/FID)			
PEL SOP-00096	Sample Preparation: Extraction of Total Petroleum Hydrocarbons, TNRCC Method 1005 / 1006 (Revision 8, 01/19/11)	Definitive	Groundwater, soil, and aqueous field QC samples/ TPH Extraction	NA	PEL	NA	N

Notes:
Empirical and PEL are both DoD ELAP and Texas NELAP accredited. Copies of their accreditations are provided in Appendix C.

Worksheet 11 Laboratory QC Samples Table

(UFP-QAPP Manual Section 3.4 – Worksheet #28)

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	BTEX
Analytical Method/SOP Reference	SW-846 8260B Empirical SOP-202

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action (CA)	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPC)
Method Blank	One per preparation batch of 20 or fewer samples of similar matrix.	No analytes > ½ LOQ, except common lab contaminants, which must be < LOQ.	Investigate source of contamination. Rerun method blank prior to analysis of samples if possible. Evaluate the samples and associated QC: if blank results are above LOQ, then report sample results which are < LOQ or > 10X the blank concentration. Reanalyze blank and samples >LOQ and < 10X the blank.	Analyst, Supervisor	Bias/ Contamination	Same as QC Acceptance Limits.
Surrogate	Four per sample: Dibromofluoromethane 1,2-dichloroethane-d4 Toluene-d8 BFB	%Rs must meet the Department of Defense Quality Systems Manual for Environmental Laboratories (DoD QSM) Version 4.1 limits as per Appendix G of the DoD QSM.	If sample volume is available, then re-prepare and reanalyze for confirmation of matrix interference when appropriate.	Analyst, Supervisor	Accuracy/ Bias	Same as QC Acceptance Limits.

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	BTEX
Analytical Method/SOP Reference	SW-846 8260B Empirical SOP-202

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action (CA)	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPC)
Laboratory Control Sample (LCS) / Laboratory Control Sample Duplicate (LCSD) (not required)	One is performed for each batch of up to 20 samples.	%Rs must meet the DoD QSM Version 4.1 limits as per Appendix G of the DoD QSM. If LCSD performed - The RPD between LCS and LCSD must be ≤ 30%.	Correct problem, then reprepare and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to DOD QSM Version 4.1 Table G-1 for number of marginal exceedences allowed. Contact Client if samples cannot be reprepared within hold time.	Analyst, Supervisor	Accuracy/ Bias Precision also, if LCSD is analyzed	Same as QC Acceptance Limits.
MS/MSD	One per sample delivery group (SDG) or every 20 samples of similar matrix.	%Rs should meet the DoD QSM Version 4.1 limits as per Appendix G of the DoD QSM. The RPD between MS and MSD should be ≤ 30%.	Corrective actions will not be taken for samples when recoveries are outside limits and surrogate and LCS criteria are met. If both the LCS and MS/MSD %Rs are unacceptable, then re-prepare the samples and QC.	Analyst, Supervisor	Accuracy/ Bias/ Precision	Same as QC Acceptance Limits.
Internal Standard (IS)	Three per sample: Fluorobenzene Chlorobenzene-d5 1,4-dichlorobezene-d4	Retention times (RTs) for ISs must be within ± 30 seconds and the IS response areas must be within -50% to +100% of	Inspect mass spectrometer or gas chromatograph for malfunctions; mandatory reanalysis of samples analyzed while system was malfunctioning.	Analyst, Supervisor	Accuracy/ Bias	Same as QC Acceptance Limits.

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	BTEX
Analytical Method/SOP Reference	SW-846 8260B Empirical SOP-202

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action (CA)	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPC)
		the midpoint standard of the initial calibration (ICAL) curve.				
Results between DL and LOQ	NA	Apply “J” qualifier to results detected between DL and LOQ.	NA.	Analyst, Supervisor	Accuracy	Same as QC Acceptance Limits.

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	Low Level PAHs
Analytical Method/SOP Reference	SW-846 8270D Empirical SOP-201

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	CA	Person(s) Responsible for Corrective Action	DQI	MPC
Method Blank	One per preparation batch of 20 or fewer samples of similar matrix.	No target compounds > ½ the LOQ.	(1) Investigate source of contamination (2) Re-prepare and analyze method blank and all samples processed with the contaminated blank.	Analyst, Supervisor	Bias/ Contamination	Same as QC Acceptance Limits.
Surrogates	Two per sample: 2-Fluorobiphenyl Terphenyl-d14	%Rs must meet the DoD QSM Version 4.1 limits as per Appendix G of the DoD QSM	(1) Check chromatogram for interference; if found, then flag data. (2) If not found, then check instrument performance; if problem is found, then correct and reanalyze. (3) If still out, then re-extract and analyze sample. (4) If reanalysis is out, then flag data.	Analyst, Supervisor	Accuracy/ Bias	Same as QC Acceptance Limits.
MS/MSD	One per SDG or every 20 samples of similar matrix.	%Rs should meet the DoD QSM Version 4.1 limits as per Appendix G of the DoD QSM. The RPD between MS and MSD should be ≤ 30%.	Corrective Action will not be taken for samples when %Rs are outside limits and surrogate and LCS criteria are met. If both the LCS and MS/MSD are unacceptable, then re-prepare the samples and QC.	Analyst, Supervisor	Accuracy/ Bias / Precision	Same as QC Acceptance Limits.

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	Low Level PAHs
Analytical Method/SOP Reference	SW-846 8270D Empirical SOP-201

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	CA	Person(s) Responsible for Corrective Action	DQI	MPC
LCS LCSD (not required)	One is performed for each batch of up to 20 samples.	%Rs must meet the DoD QSM Version 4.1 limits as per Appendix G of the DoD QSM. If LCSD performed - The RPD between LCS and LCSD must be ≤ 30%.	Correct problem, then reprepare and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available. Refer to DOD QSM Version 4.1 Table G-1 for number of marginal exceedences allowed. Contact Client if samples cannot be reprepared within hold time.	Analyst, Supervisor	Accuracy / Bias/ Precision also, if LCSD is analyzed	Same as QC Acceptance Limits.
IS	Six per sample: 1,4-Dichlorobenzene-d4 Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 Perylene-d12	RTs must be within ± 30 seconds and the response areas must be within -50% to +100% of the ICAL midpoint standard for each IS.	Reanalyze affected samples.	Analyst, Supervisor	Accuracy/ Bias	Same as QC Acceptance Limits.
Results between DL and LOQ	NA	Apply "J" qualifier to results detected between DL and LOQ.	NA.	Analyst, Supervisor	Accuracy	Same as QC Acceptance Limits.

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	TPH
Analytical Method / SOP Reference	TX1005 PEL SOP-00016

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	CA	Person(s) Responsible for Corrective Action	DQI	MPC
Method Blank	One per preparatory batch.	For common laboratory contaminants, no analytes detected > LOQ	Correct problem; if required, reprepare then reanalyze method blank and all samples processed with the contaminated blank.	Analyst, Supervisor	Bias/ Contamination	Same as QC Acceptance Limits.
LCS	One LCS containing all analytes required to be reported, including surrogates per preparatory batch.	%Rs must be within 60-140%.	Correct problem, then reprepare and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available	Analyst, Supervisor	Accuracy/ Bias	Same as QC Acceptance Limits.
MS/MSD	One MS/MSD per preparatory batch per matrix.	%Rs should be within 60-140%. The RPD between MS and MSD should be ≤ 30%.	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Analyst, Supervisor	Accuracy/ Bias Precision	Same as QC Acceptance Limits.
Surrogate Spike	One surrogate in all field and QC samples: 1-chlorooctane.	%Rs must be within 50-130%.	For QC and field samples, correct problem, then reprepare and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available.	Analyst, Supervisor	Accuracy/ Bias	Same as QC Acceptance Limits.

Matrix	Groundwater, Soil, and Aqueous Field QC Samples
Analytical Group	Lead
Analytical Method/SOP Reference	SW-846 6010C, / Empirical SOP-104

QC Sample	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Method Blank	One per digestion batch of 20 or fewer samples.	All target analytes must be ≤ ½ LOQ.	If the blank value > LOQ, then report sample results. If the blank value < LOQ or > 10x the blank value; then redigest. If blank value is less than negative LOQ, then report sample results. If > 10x the absolute value of the blank result, then redigest.	Analyst, Supervisor	Bias/ Contamination	Same as QC Acceptance Limits.
LCS LCSD (not required)	One is performed for each batch of up to 20 samples.	%R must be within 80-120% of true value.	Redigest and reanalyze all associated samples for affected analyte.	Analyst, Supervisor	Accuracy/ Bias Precision also, if LCSD is analyzed	Same as QC Acceptance Limits.
Duplicate Sample	One per preparation batch of 20 or fewer samples of similar matrix.	The RPD between the original sample and duplicate should be ≤20%.	Narrate any results that are outside control limits.	Analyst, Supervisor	Precision	Same as QC Acceptance Limits.

Worksheet 12 Data Verification and Validation (Steps I and IIa/IIb) Process Table

(UFP-QAPP Manual Section 5.2.1, UFP-QAPP Manual Section 5.2.2, Figure 37 UFP-QAPP Manual, Table 9 UFP-QAPP Manual – Worksheets #34, 35, 36)

Data Review Input	Description	Responsible for Verification (name, organization)	Internal/ External
Chain-of-Custody Forms	The Tetra Tech FOL or designee will review and sign the chain-of-custody form to verify that all samples listed are included in the shipment to the laboratory and the sample information is accurate. The forms will be signed by the sampler and a copy will be retained for the project file, the Tetra Tech PM, and the Tetra Tech Data Validators. The Tetra Tech FOL or designee will review the chain-of-custody form to verify that all samples listed in the Work Plan have been collected. All deviations should be documented in the report.	Sampler and FOL, Tetra Tech	Internal
Chain-of-Custody Forms	1 - The Laboratory Sample Custodian will review the sample shipment for completeness and integrity, and sign accepting the shipment. 2- The Tetra Tech Data Validators will check that the chain-of-custody form was signed and dated by the Tetra Tech FOL or designee relinquishing the samples and also by the Laboratory Sample Custodian receiving the samples for analyses.	1 - Laboratory Sample Custodian, Empirical 2 - Data Validators, Tetra Tech	External
Chain-of-Custody Forms and Work Plan	Ensure that the custody and integrity of the samples was maintained from collection to analysis and the custody records are complete and any deviations are recorded. Review that the samples were shipped and stored at the required temperature and preservation conditions for chemically-preserved samples meet the requirements listed in the Work Plan. Ensure that the analyses were performed within the holding times listed in the Work Plan.	Data Validators, Tetra Tech	External

Data Review Input	Description	Responsible for Verification (name, organization)	Internal/ External
Sample Log Sheets, Chain-of-Custody Forms, Work Plan, and Laboratory sample login documentation	Verify that information recorded in the log sheets is accurate and complete. Verify that samples were correctly identified, that sampling location coordinates are accurate, and that documentation establishes an unbroken trail of documented chain-of-custody from sample collection to report generation. Verify that the correct sampling and analytical methods/SOPs were applied. Verify that the sampling plan was implemented and carried out as written and that any deviations are documented. Document any discrepancies in the final report.	PM, FOL, or designee, Tetra Tech	Internal
Work Plan, Analytical SOPs, and Analytical Data Packages	Ensure that all laboratory SOPs were followed. Verify that the correct analytical methods/SOPs were applied. Establish that all method QC samples were analyzed and in control as listed in the analytical SOPs. If method QA is not in control, the Laboratory QAM will contact the Tetra Tech PM verbally or via e-mail for guidance prior to report preparation.	Laboratory QAM, Empirical	Internal
Work Plan/ Chain-of-Custody Forms	Check that all field QC samples determined necessary were collected as required.	FOL or designee, Tetra Tech	Internal
Analytical Data Package	Verify all analytical data packages for completeness. The Laboratory QAM will sign the case narrative for each data package.	Laboratory QAM, Empirical	Internal
Electronic Data Deliverables (EDDs)/ Analytical Data Packages	Check each EDD against the chain-of-custody and hard copy data package for accuracy and completeness. Compare laboratory analytical results to the electronic analytical results to verify accuracy. Evaluate sample results for laboratory contamination and qualify false detections using the laboratory method/preparation blank summaries. Qualify analyte concentrations between the DL and the LOQ as estimated. Remove extraneous laboratory qualifiers from the validation qualifier.	Data Validators, Tetra Tech	External
Analytical Data Package	Verify each data package for completeness. Request missing information from the Laboratory PM.	Data Validators, Tetra Tech	External
Work Plan/ Laboratory Data Packages/ EDDs	Ensure that the laboratory QC samples were analyzed and that the MPCs listed in were met for all field samples and QC analyses. Check that specified field QC samples were collected and analyzed and that the analytical QC criteria set up for this project were met.	Data Validators, Tetra Tech	External

Data Review Input	Description	Responsible for Verification (name, organization)	Internal/ External
Work Plan/ Laboratory Data Packages/ EDDs	Check the field sampling precision by calculating RPDs for field duplicate samples. Check laboratory precision by reviewing the RPD or percent difference values from laboratory duplicate analyses; MS/MSDs; and LCS/LCSD, if available. Ensure compliance with the methods and project MPCs accuracy goals listed in the Work Plan.	Data Validators, Tetra Tech	External
Work Plan/ Laboratory Data Packages/ EDDs	Check that the laboratory recorded the temperature at sample receipt and the pH of samples preserved with acid or base to ensure sample integrity from sample collection to analysis.	Data Validators, Tetra Tech	External
Work Plan/ Laboratory Data Packages/ EDDs	Review the chain-of-custody forms generated in the field to ensure that the required analytical samples have been collected, appropriate sample identifications have been used, and correct analytical methods have been applied. The Tetra Tech Data Validator will verify that elements of the data package required for validation are present, and if not, the laboratory will be contacted and the missing information will be requested. Check that all data have been transferred correctly and completely to the Tetra Tech Structured Query Language (SQL) database.	Data Validators, Tetra Tech	External
Work Plan/ Laboratory Data Packages/ EDDs	Ensure that the project LOQs listed in Work Plan were achieved.	Data Validators, Tetra Tech	External
Work Plan/ Laboratory Data Packages/ EDDs	Discuss the impact on DLs that are elevated because of matrix interferences. Be especially cognizant of and evaluate the impact of sample dilutions on low-concentration analytes when the dilution was performed because of the high concentration of one or more other contaminants. Document this usability issue and inform the Tetra Tech PM. Review and add PALs to the laboratory EDDs. Flag samples and notify the Tetra Tech PM of samples that exceed PALs listed in Work Plan.	Data Validators, Tetra Tech	External
Work Plan/ Laboratory Data Packages/ EDDs	Ensure that all QC samples specified in the Work Plan were collected and analyzed and that the associated results were within prescribed Work Plan acceptance limits. Ensure that QC samples and standards prescribed in analytical SOPs were analyzed and within the prescribed control limits. If any significant QC deviations	Data Validators, Tetra Tech	External

Data Review Input	**Description**	**Responsible for Verification (name, organization)**	**Internal/ External**
	occur, the Laboratory QAM shall have contacted the Tetra Tech PM.		
Work Plan/ Laboratory Data Packages/ EDDs	Summarize deviations from methods, procedures, or contracts in the Data Validation Report. Determine the impact of any deviation from sampling or analytical methods and SOPs requirements and matrix interferences effect on the analytical results. Qualify data results based on method or QC deviation and explain all the data qualifications. Print a copy of qualified data stored the project database to depict data qualifiers and data qualifier codes that summarize the reason for data qualifications. Determine if the data met the MPCs and determine the impact of any deviations on the technical usability of the data.	Data Validators, Tetra Tech	External

12.1 Validation Summary

Analytical Group	Validation Criteria	Data Validator (title and organizational affiliation)
BTEX, Low Level PAHs, and TPH	25 percent full validation and 75 percent limited validation will be performed using criteria for SW-846 Methods 8260B, 8270D, and TX-1005 listed in this SAP and the current DoD QSM. If not included in the aforementioned, then the logic outlined in the TCEQ Regulatory Guidance "Review and Reporting of contaminant of concern (COC) Concentration Data under TRRP" RG-366/ TRRP-13 (TCEQ, May 2010) will be used to apply qualifiers to data.	Data Validation Specialist, Tetra Tech
Lead	25% full validation and 75% limited validation will be performed using criteria for SW-846 6010C listed in this SAP and the current DoD QSM. If not included in and the aforementioned, then the logic outlined in the TCEQ Regulatory Guidance "Review and Reporting of COC Concentration Data under TRRP" RG-366/ TRRP-13 (TCEQ, May 2010) will be used to apply qualifiers to data.	Data Validation Specialist, Tetra Tech

Limited data validation will be performed. This type of review limits the data review to specific review parameters (Data Completeness/Data Verification, Holding Times, Calibrations, Blank Contamination, and Detection Limits) to determine gross deficiencies only. The limited data validation is best expressed as a review to preclude the possibility of not detecting an analyte that is present in a sample and to eliminate false detections. Raw data are not evaluated and sample result verification is not conducted. A formal report, similar to a full data validation report, is prepared but the scope is more limited than a full validation report. The data packages provided by the laboratory will be expansive enough to allow future complete formal data validation, if necessary.

IDW samples will not be validated.

REFERENCES

IDQTF (Interagency Data Quality Task Force), 2005. Uniform Federal Policy for Quality Assurance Project Plans. Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs, Parts 1, 2A, 2B, and 2C. Final, Version 1. March.

NASCC (Naval Air Station Corpus Christi), October 2008. Cabaniss Site Investigation Report. NASCC, Corpus Christi, Texas.

OSHA (Occupational Safety and Health Administration) General Industry Standards, Chapter 29, Code of Federal Regulations (CFR) 1910.120.

Tetra Tech (Tetra Tech NUS, Inc.), September 2009. Site Inspection Report for the Incinerator Disposal Site, NALF Cabaniss, Corpus Christi, Texas. Tetra Tech, Pittsburgh, Pennsylvania.

TCEQ (Texas Commission on Environmental Quality), 2009. Petroleum Storage Tank Program Action Levels, 30 Texas Administrative Code (TAC) Chapter 334. March.

TCEQ, 2009. Release Determination Report Form (TCEQ 00621). Revised August 29, 2009.

TCEQ, 2010. Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs). TCEQ Regulatory Guidance, RG-411. April, revised September 2011.

TCEQ, 2010. Review and Reporting of COC Concentration Data under TRRP. TCEQ Regulatory Guidance, RG-366/TRRP-13. May.

USDoD (United States Department of Defense), 2009. Department of Defense Quality Systems Manual for Environmental Laboratories. Version 4.1. April.

USEPA (United States Environmental Protection Agency), 2006. EPA Requirements for Quality Assurance Project Plans (QA/R-5). EPA/240/B-01/003 March 2001 (re-issued May 2006).

USEPA, 2006a. Guidance on Systematic Planning Using the Data Quality Objectives Process. EPA QA/G-4, EPA/240/B-06/001. USEPA Office of Environmental Information, Washington DC. February.

USEPA, 2008. Test Methods for Evaluating Solid Waste; Physical/Chemical Methods (SW-846), 3rd Edition, up to and Including Update IV. Office of Solid Waste and Emergency Response, Washington, DC. February.

APPENDIX A

DQO MEETING MINUTES

TETRA TECH

Aquadrive Fuel System Study

Data Quality Objective Scoping
Uniform Federal Policy
Sampling and Analysis Plan

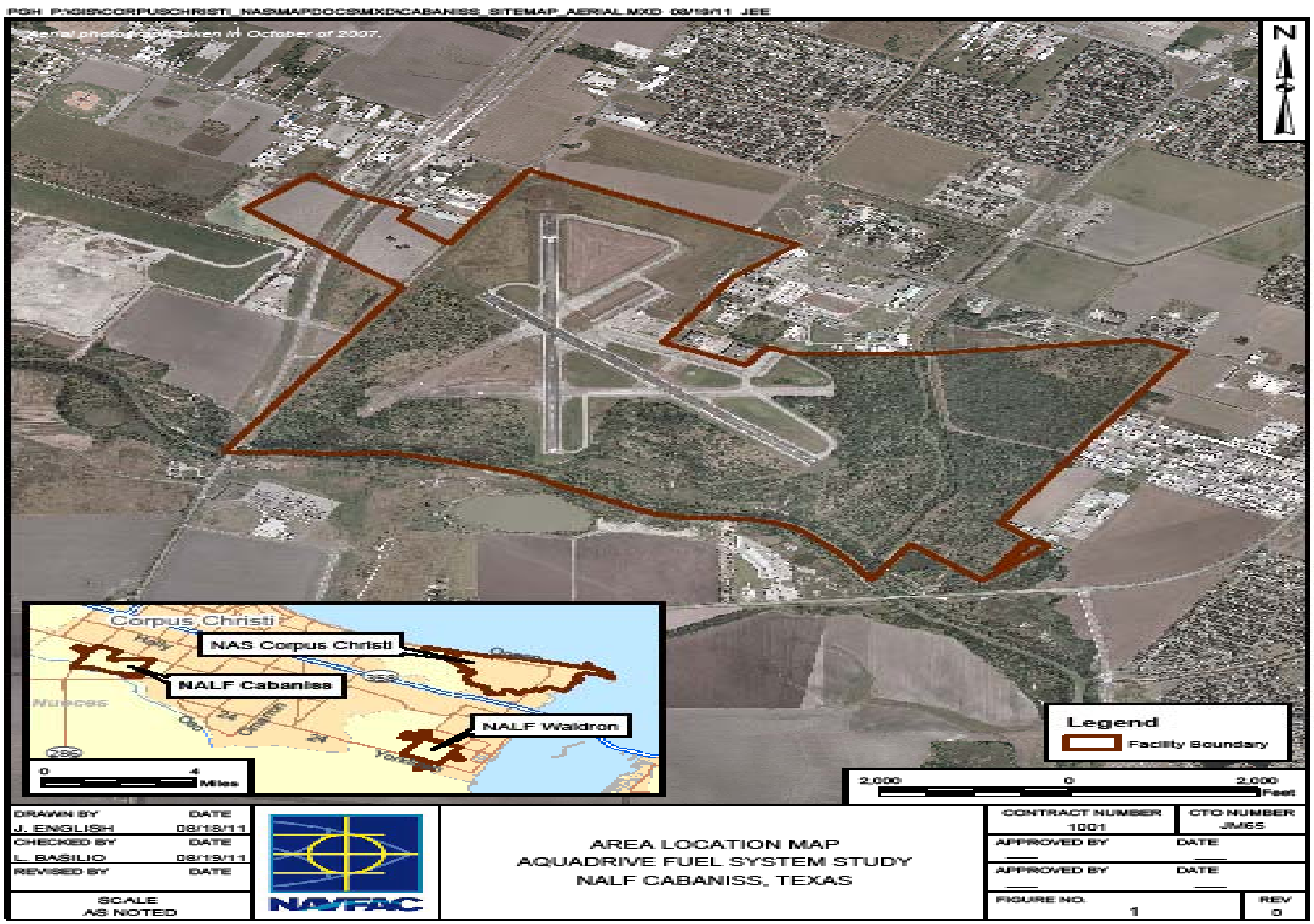
NALF Cabaniss
Corpus Christi, Texas
September 20, 2011

Presentation Outline

- Review site history
- Review available information
- Develop data quality objectives (DQOs)
- Define data collection plan

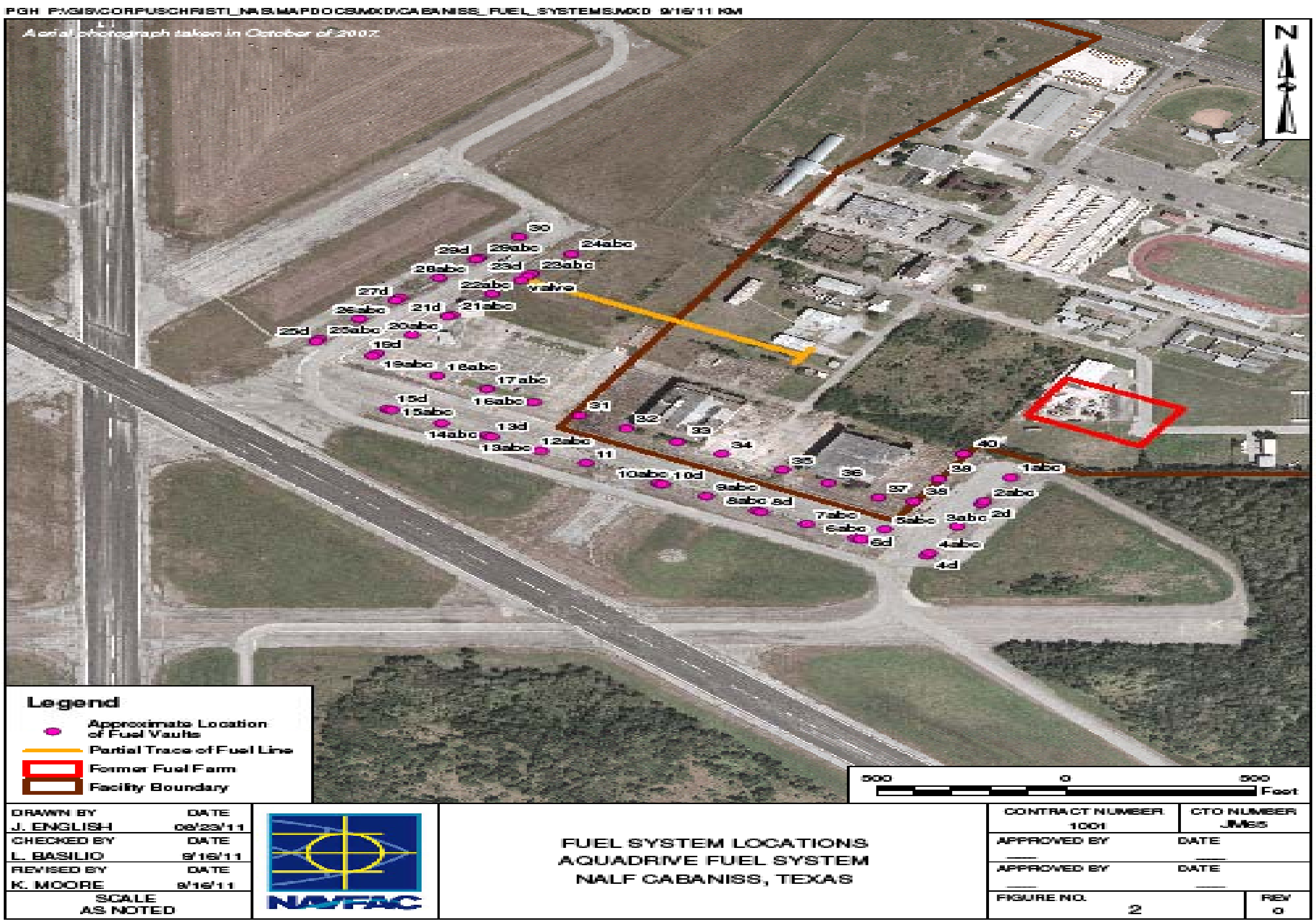
TETRA TECH

Site Location



TETRA TECH

Site Layout



Aerial photograph taken in October of 2007.
N
Legend
Approximate Location of Fuel Vaults
Partial Trace of Fuel Line
Former Fuel Farm
Facility Boundary
500 0 500 Feet
valve
DRAWN BY J. ENGLISH DATE 08/23/11
CHECKED BY L. BASILIO DATE 8/16/11
REVISED BY K. MOORE DATE 8/16/11
SCALE AS NOTED
NAVFAC
FUEL SYSTEM LOCATIONS
AQUADRIVE FUEL SYSTEM
NALF CABANISS, TEXAS
CONTRACT NUMBER 1001
CTO NUMBER JM65
APPROVED BY
DATE
APPROVED BY
DATE
FIGURE NO. 2
REV 0

History and Site Description

- NALF Cabaniss is an outlying field supporting Naval air training operations out of NAS Corpus Christi.
- Commissioned in 1941.
- Approximately 923 acres.
- Primary mission was flight training.
- 1958 was converted from an air station to outlying field.
- In 1958, approximately 346 acres in northern section of installation were given to GSA for disposal.

TETRA TECH

History and Site Description (cont.)

- NALF Cabaniss is covered with tall grasses, shrubs, trees, and other low-lying vegetation.
- Grasses and other vegetation near the operational runways are maintained through periodic mowing in support of flight training operations.
- NALF Cabaniss is bounded to the south by Oso Creek, a perennial water body that ultimately flows into Oso Bay.
- Beyond Oso Creek are agricultural and industrial properties.

TETRA TECH

History and Site Description (cont.)

- The area east of the installation is comprised of a mix of agricultural, industrial, and residential areas.
- North of the current boundary are former buildings and recreational areas that were once a part of the installation, were transferred to the General Services Administration (GSA) for disposal in 1958, and are now the property of the Corpus Christi Independent School District and private entities.
- Residential zones lie beyond these buildings to the north.
- A former landfill is located directly west of the installation.

TETRA TECH

History and Site Description (cont.)

- Aquadrive fuel system used to fuel aircraft.
- System included:
  - Approximately 12 25,000 gallon USTs
  - Approximately 40 subsurface vaults
  - Approximately 6,000 feet of piping
- Operational dates unknown but estimated from 1941 to 1958.
- No records found related to closure, removal or disposition of the fuel system including associated underground storage tanks.

TETRA TECH

History and Site Description (cont.)

- Fuel tanks were located on property no longer owned by the Navy. The property is owned by private entities.
- Ten fuel vaults are located on property no longer owned by the Navy. The property is owned by the Corpus Christi Independent School District.

TETRA TECH

History and Site Description (cont.)

- Formerly Used Defense Sites (FUDS)
  - Listed in FUDS as site K06TX0150.
  - Listed as property for “potential” inclusion in FUDS list.
  - No other information available.

TETRA TECH

History and Site Description (cont.)

- Topography
  - Predominantly flat with slight dip to south towards Oso Creek.
- Geology
  - Clay with sparse beds of lenticular clayey sand.
- Hydrology
  - No natural lakes, rivers or streams are present.
  - Surface water runoff drains to south and east .
  - Oso Creek is 4,000 feet to south.

History and Site Description (cont.)

- Hydrogeology
  - Depth to first encountered groundwater is assumed <15 feet bgs.
  - Shallow groundwater zone consists of clay with sparse beds of lenticular clayey sand.
  - Groundwater flows is assumed to flow south towards Oso Creek.
  - Shallow groundwater is not known to be used in the area.

History and Site Description (cont.)

- Endangered and Special Status Species
  - There are no Federal or State endangered or threatened plant or animal species at NALF Cabaniss.
- Wetlands are present at the southern end of the installation near Oso Creek.

TETRA TECH

History and Site Description (cont.)

- Land Use
  - NALF Cabaniss is an active facility supporting flight training operations.
- Access Control/Restrictions
  - NALF Cabaniss is a fenced installation with a locked gate. Security personnel are not posted at the entrances.
  - The likelihood of trespassers gaining access to the site is considered low due to the installation fencing .

TETRA TECH

Previous Investigations

- Site Investigation Report (NASCC, 2008)
  - Conducted in response to report of oil seeping out of ground.
  - Two fuel vaults found to be seeping oil.
  - Oil removed.
  - Soil, water , and oil samples collected.
  - Analyzed for TCLP metals, TPH, TOX, flashpoint, VOCs, SVOCs.
  - Results less than action levels.

TETRA TECH

Conceptual Site Model

- Target Analytes
  - Include chemicals associated with aircraft fueling operations (aviation gasoline).
    - Benzene, Toluene, Ethylbenzene, Xylene (BTEX)
    - Poly Aromatic Hydrocarbons (PAHs)
    - Total Petroleum Hydrocarbons (TPH)
    - Total Lead
    - Total Dissolved Solids (TDS)

TETRA TECH

Conceptual Site Model

- Contaminant Migration Routes
  - Contaminants, if present, would be found primarily in the shallow subsurface.
  - Contaminants could potentially leach into subsurface soil and groundwater.
  - The site is covered with concrete and asphalt tarmac, taxiways and runways. This cover may limit infiltration of storm water into the subsurface during rain events.

TETRA TECH

Conceptual Site Model

- Receptors
  - Current potential on-site receptors include:
    - Navy personnel (e.g., air operations personnel and Public Works personnel).
    - Contractors performing maintenance or other activities.
    - Trespassers are not considered receptors as the facility is fenced.
  - Current potential off-site receptors include:
    - Adults, adolescents, maintenance workers, construction worker, and occupational workers.
    - The off-site area immediately beyond the installation fence to the east and north is commercial; therefore, residential receptors are not considered.

Conceptual Site Model

- Exposure Pathways
  - Soil
    - Soil impacted by potential contaminants represent a potential source medium for receptors.
    - The site is covered by concrete and asphalt tarmac, taxiways and runways.
    - Therefore any potential contaminants are essentially covered by a cap of impermeable material making potential contaminants inaccessible to human receptors.
    - Thus, dermal contact, ingestion, and inhalation exposures to potential contamination are not anticipated.

TETRA TECH

Conceptual Site Model

- Exposure Pathways
  - Groundwater
    - Chemicals can potentially leach through the soil into groundwater.
    - Groundwater impacted by chemicals represents a potential source medium for receptors.
    - Groundwater in the vicinity of the site is not used.
    - Thus, dermal contact, ingestion, and inhalation exposures to chemicals are not anticipated.

Conceptual Site Model

- Exposure Pathways
  - Surface water/Sediment
    - The nearest surface water body is 4,000 feet south.
    - Due to the flat topography and vegetative cover on the surface, and clayey discontinuous nature of the shallow water bearing zone, potential contaminants are not likely to affect surface water/sediment.
    - Thus, dermal contact, ingestion, and inhalation exposures to potential contaminants are not anticipated.

TETRA TECH

Problem Statement

- Environmental contamination may exist in soil or groundwater at the site.
- Soil and groundwater data are needed to determine if a release to the environment has occurred.
- Soil and groundwater data are needed to characterize the nature of contamination.
- An investigation must be conducted to determine if contamination is present and if any unacceptable human risk from exposure to contaminated site media exists.

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Study Area Boundaries

- The vertical boundary for soil extends to the top of the first encountered groundwater.
- The vertical boundary for groundwater includes the first encountered groundwater, which generally occurs at approximately 15 feet bgs.
- Investigation to address soil and groundwater only.
- The horizontal boundary for soil is the area within the confines of NALF Cabaniss (no off site drilling or sampling).
- Ecological receptors are not included in this scope of work.

TETRA TECH

Release Determination Decision Rule

- In order to determine whether a release to soil or groundwater has occurred, analytical results will be compared to Texas Petroleum Storage Tank (PST) Program Action Levels.
- If analytical results for soil and groundwater are less than Texas PST Program Action Levels, the Project Team will recommend no further action.
- If analytical results for soil and groundwater are greater than Texas PST program Action levels, the Project Team will recommend the site for ER,N eligibility to proceed to the Site Investigation (SI) phase.

TETRA TECH

Information Inputs

- Subsurface Soil Sampling
- Groundwater Sampling
- Chemical Data
- Project Action Limits

TETRA TECH

Sampling Approach

- Event I: Site Visit (completed).
- Event II: Soil Boring/Monitor Well Installation.
- Event III: Subsurface soil samples and groundwater samples will be collected.

TETRA TECH

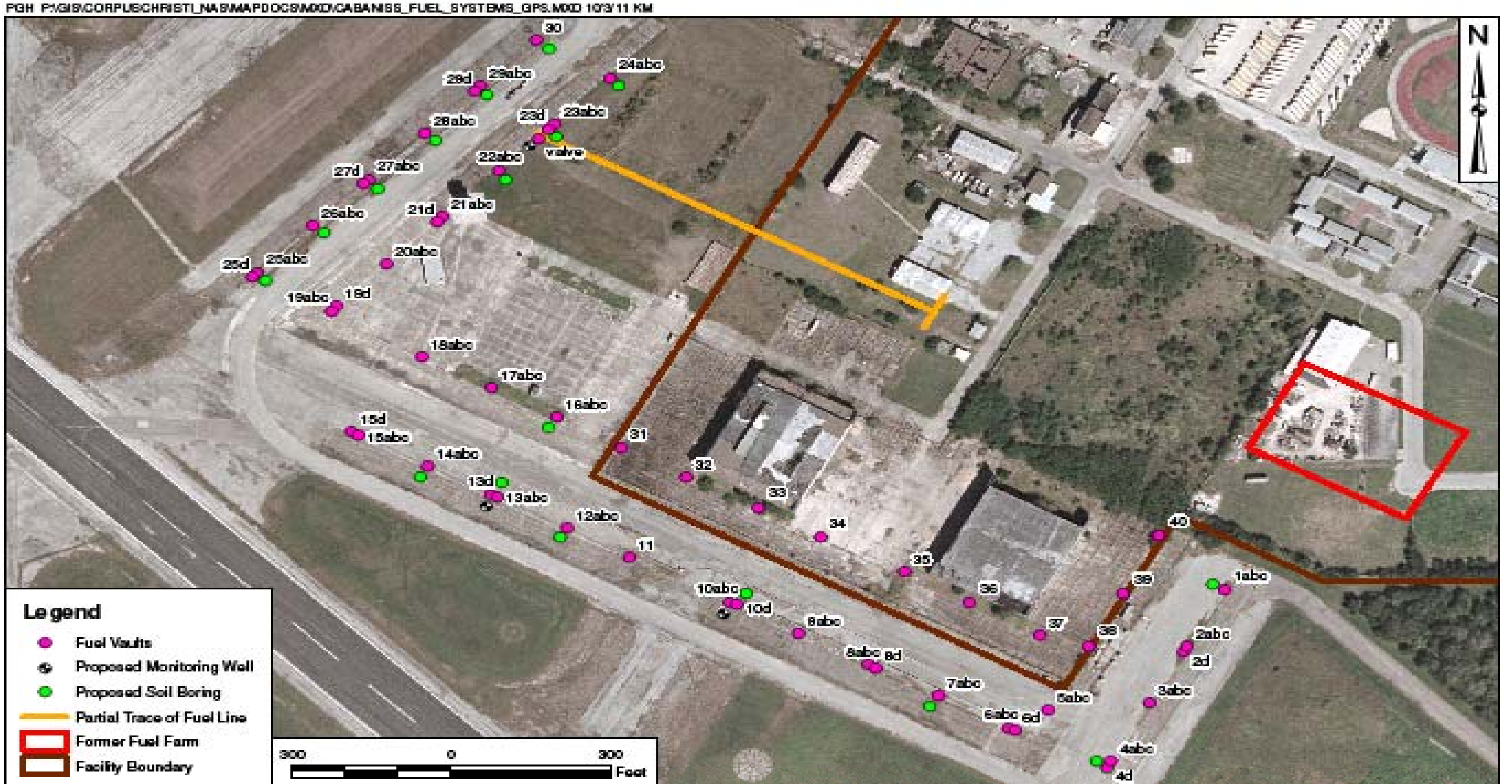
Soil Boring/Monitor Well Installation

- Locations will be based on the results of the site visit and historical information.
- Up to 20 soil borings will be installed.
- Three monitoring wells will be installed.
- Locations will be on NALF Cabaniss property only.

TETRA TECH

Proposed Sampling Locations

PGH P:\GIS\CORPUSCHRISTI_NAS\MAPDOCS\MXD\CABANISS_FUEL_SYSTEMS_GPS.MXD 10/3/11 KM



DRAWN BY J. ENGLISH	DATE 09/23/11	NAVFAC	PROPOSED SAMPLE LOCATIONS AQUADRIVE FUEL SYSTEM NALF CABANISS, TEXAS	CONTRACT NUMBER 1001	CTO NUMBER JM65
CHECKED BY L. BASILIO	DATE 10/3/11			APPROVED BY —	DATE —
REVISED BY K. MOORE	DATE 9/16/11			APPROVED BY —	DATE —
SCALE AS NOTED				FIGURE NO. 4	REV 0

TETRA TECH

Sample Analysis

- Soil and groundwater samples will be collected for laboratory analysis.
- Soil and groundwater sample will be analyzed for:
  - BTEX
  - PAHs
  - TPH
  - Total Lead
  - Totals Dissolved Solids

TETRA TECH

Schedule

Task	Start	End	Status	Comment
Project Award	8/1/2011	8/1/2011	Complete	
Kick off Teleconfernce	8/8/2011	8/8/2011	Complete	
Kick Off Teleconference with Installation	8/17/2011	8/17/2011	Complete	
Site Visit/Data Collection	9/7/2011	9/8/2011	Complete	
Prepare Draft CSM/DQO	9/9/2011	9/20/2011	Complete	
CSM/DQO Teleconference	9/20/2011	9/20/2011	Complete	
Prepare Draft UFP SAP	9/15/2011	10/7/2011		
Submit Draft UFP SAP	10/7/2011	10/7/2011		
Navy Review	10/7/2011	10/21/2011		
Receive Comments/Resolution	10/21/2011	10/28/2011		
Prepare Final UFP SAP	10/28/2011	11/4/2011		
Submit Final UFP SAP	11/4/2011	11/4/2011		
Field Work	11/7/2011	11/14/2011		
Laboratory Analysis	11/7/2011	12/14/2011		
Data Validation	12/14/2011	1/14/2012		
Prepare Draft Report	12/14/2011	2/14/2012		4 weeks from validation
Submit Draft Report	2/14/2012	2/14/2012		
Navy Review	2/14/2012	3/6/2012		
Receive Comments/Resolution	3/6/2012	3/20/2012		
Prepare Final Report	3/20/2012	3/30/2012		
Submit Final Report	3/30/2012	3/30/2012		

TETRA TECH

APPENDIX B

FIELD STANDARD OPERATING PROCEDURES

APPENDIX B

SOP TABLE OF CONTENTS

STANDARD OPERATING PROCEDURE

SOP-01

SOIL SAMPLING

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the procedures to be used to collect surface, nearsurface, and subsurface soil samples.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Disposable medical-grade gloves (e.g., latex, nitrile)
Writing utensil (preferably black pen with indelible ink)
Indelible marker
Required decontamination materials
Sealable polyethylene bags
Sample labels
Shipping containers (containing ice)
Disposable plastic trowels or stainless steel trowels
Stainless steel mixing bowls
Sample containers: Sample containers are certified clean by the laboratory supplying the containers.
Soil Sample Log Forms
Daily Activity Logs
Chain-of-Custody Form
Soil Boring Log

3.0 PROCEDURE FOR PRESERVING AND COLLECTING SOIL SAMPLES FOR VOLATILE ORGANIC COMPOUND ANALYSIS

Soil samples for volatile organic compound (VOC) analysis will be collected using Method SW-846, 5035. Soil samples collected for VOC analysis shall be obtained using a TerraCore Sampling Kit. The sampling kit consists of one TerraCore syringe and four VOC vials. Three of the VOC vials are filled with a mixture of DI water and sodium bisulfate and one VOC vial is filled with methanol. The VOC vials will be pre-

prepared by the analytical laboratory. Collect the sample in the following manner for each TerraCore™ sampler:

1. Scene Safety - Evaluate the area where sampling will occur. Ensure that the area is safe from physical, chemical, and natural hazards. Clear or barricade those hazards that have been identified.
2. Wear the appropriate personal protective equipment (PPE). This will include, at a minimum, safety glasses and nitrile surgeon's gloves. If you must kneel on the ground or place equipment on the surface being sampled, cover the ground surface with plastic to minimize surface contamination of your equipment and clothing. Wear knee pads to protect your knees from kneeling on hard or uneven surfaces.
3. Expose the area to be sampled using a hand trowel or similar device to remove surface debris.
4. Pull the disposable plunger back to the required location.
5. Push the Terracore syringe into the freshly exposed soil surface, forcing soil into the sampler.
6. Rotate the plunger that was seated in the handle until it is aligned with the slots in the body. Place the mouth of the sampler into the VOC vial and extrude the soil sample into the VOC vial and cap the bottle tightly. Repeat until all four VOC vials are filled.
10. Label the VOC vials with appropriate information in accordance with SOP-02.
11. Place the samples inside a lined cooler with ice and cool to 4°C ± 2 °C. Make sure any required trip blanks and temperature blanks are also in the cooler.
13. The disposable plunger shall be disposed of properly.

Using this type of sampling device eliminates the need for field preservation and the shipping restrictions associated with preservatives. A complete set of instructions is included with each TerraCore™ sampler. After the TerraCore™samples are collected; they should be placed on ice immediately and delivered to the laboratory within 48 hours (following the chain-of-custody and documentation procedures outlined in SOP-03). Samples must be preserved by the laboratory within 48 hours of sample collection.

4.0 PROCEDURE FOR PRESERVING AND COLLECTING SOIL SAMPLES FOR NON-VOLATILE ORGANIC COMPOUND ANALYSIS

Samples collected for non-volatile analyses may be collected as either grab or composite samples as follows:

1. With a stainless steel trowel or other approved tool, transfer a portion of soil to be sampled to a stainless steel bowl or disposable inert plastic tray.
2. Remove roots, vegetation, sticks, and stones larger than the size of a green pea.

3. Thoroughly mix the soil in the bowl or tray to obtain as uniform a texture and color as practicable. The soil type, moisture content, amount of vegetation, and other factors may affect the amount of time required to obtain a properly mixed sample. In some cases, it may be impossible to obtain a uniform sample appearance. Use the field logbook to describe any significant difficulties encountered in obtaining a uniform mixture.
4. Transfer the mixed soil to the appropriate sample containers and close the containers.
5. Label the sample containers in accordance with SOP-02.
6. Place the containers in a cooler of ice as soon after collection as possible.
7. Prepare the sample shipment and ship the samples in accordance with SOP-03.

5.0 ATTACHMENTS

1. Soil and Sediment Sample Log Sheet

ATTACHMENT 1

SOIL AND SEDIMENT SAMPLE LOG SHEET

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: ____________
Project No.: ____________

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type: ____________

Sample ID No.: ____________
Sample Location: ____________
Sampled By: ____________
C.O.C. No.: ____________

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

STANDARD OPERATING PROCEDURE
SOP-02

SAMPLE IDENTIFICATION NOMENCLATURE

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to establish a consistent sample nomenclature system that will facilitate subsequent data management at the Naval Auxiliary Landing Field Cabaniss. The sample nomenclature system has been devised such that the following objectives can be attained.

- Sorting of data by site, location, or matrix
- Maintenance of consistency (field, laboratory, and database sample numbers)
- Accommodation of all project-specific requirements
- Accommodation of laboratory sample number length constraints
- Ease of sample identification

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Writing utensil (preferably black pen with indelible ink)
Sample container labels

3.0 SAMPLE IDENTIFICATION NOMENCLATURE

3.1 <u>Samples</u>

All samples will be properly labeled with a sample label affixed to the sample container. Each sample will be assigned a unique sample tracking number.

3.1.1 Sample Numbering Scheme

The sample tracking number will consist of a four- or five-segment alpha-numeric code that identifies the sample's associated with the NALF Cabaniss site, sample type, location, and for aqueous samples, where applicable, whether a sample is filtered, and/or the sample round number. For soil samples, the final four tracking numbers will identify the depth in units of feet below ground surface (bgs) at which the sample was collected.

The alphanumeric coding to be used is explained in the following diagram and subsequent definitions:

AA	**AA**	**NN**	**NNNN (Soils only)**	**AA**
Site Acronym	Matrix	Sample Location Number	Sequential depth interval from freshly exposed surface	Blank Type

Character Type:

A = Alpha

N = Numeric

Site Name (NN):

AF = AquaDrive Fuel System

Matrix Code (AA):

SS = Soil Sample (soil boring)

MW = Soil Sample (monitoring well)

GW = Groundwater

Location Number (NNa):

Sequential number beginning with “01” for each matrix.

Depth Interval:

This code section will be used for soil samples only.

The depth code is used to note the depth bgs at which a soil sample is collected. The first two numbers of the four-number code specify the top interval and the third and fourth specify the bottom interval in feet bgs of the sample. The depths will be noted in whole numbers only; further detail, if needed, will be recorded on the sample log sheet, boring log, logbook, etc.

Blank Type (AA):

This code section will be used for field or equipment blanks only.

RB = Rinsate Blank
FB = Field Blank
TB = Trip Blank

3.1.2 Examples of Sample Nomenclature

A soil sample collected from the site, sampling location 03, to a depth of 0 to 1 foot bgs would be labeled as "AFSS030001". A soil sample collected from the site, sampling location 010, to a depth of 5 to 6 feet bgs would be labeled as "AFSS100506".

A groundwater sample collected from the site, sample location 05 would be labeled as "AFGW05".

A rinsate blank associated with a soil sample collected from the site, sampling location 04, to a depth of 0 to 1 foot bgs would be labeled as "LFSS040001RB".

3.2 Field Quality Assurance/Quality Control (QA/QC) Sample Nomenclature

Field QA/QC samples are described in this UFP SAP. They will be designated using a different coding system than the one used for regular field samples.

3.2.1 QC Sample Numbering

The QC code will consist of a three- to four-segment alpha-numeric code that identifies the sample QC type, the date the sample was collected, and the number of this type of QC sample collected on that date.

AA	NNNNNN	NN
QC Type	Date	Sequence Number (per day)

Character Type:

A = Alpha
N = Numeric

QC Types:

FD = Field Duplicate
TB = Trip Blank

The sampling time recorded on the Chain-of-Custody Form, labels, and tags for field duplicate samples will be 0000 so that the samples are "blind" to the laboratory. Notes detailing the sample number, time, date, and type will be recorded on the sample log sheets and will document the location of the duplicate sample (sample log sheets are not provided to the laboratory).

3.2.2 Examples of Field QA/QC Sample Nomenclature

The first duplicate of the day at the site for a surface soil sample collected on March 24, 2011 would be designated as FD03241101.

The third duplicate of the day taken at the site for a surface soil sample collected on April 12, 2011 would be designated as FD04121103.

The first trip blank associated with samples collected on March 18, 2011 would be designated as TB03181101.

STANDARD OPERATING PROCEDURE
SOP-03

SAMPLE LABELING

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the procedures to be used for labeling sample containers. Sample labels are used to document the sample ID, date, time, analysis to be performed, preservative, matrix, sampler, and the analytical laboratory. A sample label will be attached to each sample container.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Writing utensil (preferably black pen with indelible ink)
Disposable medical-grade gloves (e.g. latex, nitrile)
Sample log sheets
Required sample containers: All sample containers for analysis by fix-based laboratories will be supplied and deemed certified clean by the laboratory.
Preprinted sample labels
Chain-of-custody records
Sealable polyethylene bags
Heavy-duty cooler
Ice

3.0 PROCEDURES

3.1 The following information will be electronically printed on each sample label prior to mobilizing for field activities. Additional "generic" labels will also be printed prior to mobilization to be used for field QC and backups.

- Project number (CTO JM65)
- Sample location ID
- Contract Task Order number

- Sample ID
- Matrix
- Preservative
- Analysis to be performed
- Laboratory name

3.2 Select the container(s) that are appropriate for a given sample. Select the sample-specific ID label(s), complete date, time, and sampler name, and affix to the sample container(s).

3.3 Fill the appropriate containers with sample material. Securely close the container lids without overtightening.

3.4 Place the sample container in a sealable polyethylene bag and place in a cooler containing ice.

Example of a sample label is attached at the end of this SOP.

4.0 ATTACHMENTS

1. Sample Label

ATTACHMENT 1

SAMPLE LABEL

Tetra Tech NUS, Inc. 661 Andersen Drive Pittsburgh, 15220 (412)921-7090	**Project:** **Location:** **CTO:**	
Sample No:		**Matrix:**
Date:	**Time:**	**Preserve:**
Analysis:		
Sampled by:	**Laboratory**	

STANDARD OPERATING PROCEDURE

SOP-04

SAMPLE PRESERVATION, PACKAGING, AND SHIPPING

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the procedures for sample preservation, packaging, and shipping to be used in handling soil, sediment, and aqueous samples.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Shipping labels
Custody seals
Chain-of-custody (COC) form(s)
Sample containers with preservatives: All sample containers for analysis by fixed-base laboratories will be supplied, with preservatives added (if required) and deemed certified clean by the laboratory.
Sample shipping containers (coolers): All sample shipping containers are supplied by the laboratory.
Packaging material: Bubble wrap, sealable polyethylene bags, strapping tape, etc.

3.0 PROCEDURES FOR SAMPLE PRESERVATION, PACKAGING, AND SHIPPING

3.1 The laboratory provides sample containers with preservative already included (as required) for the analytical parameter for which the sample is to be analyzed. All samples will be held, stored, and shipped at 4°C. This will be accomplished through refrigeration (used to hold samples prior to shipment) and/or ice.

3.2 The sampler shall maintain custody of the samples until the samples are relinquished to another custodian or to the common carrier.

3.3 Check that each sample container is properly labeled, the container lid is securely fastened, and the container is sealed in a polyethylene bag.

3.4 If the container is glass, place the sample container into a bubble-out shipping bag and seal the bag using the self-sealing, pressure sensitive tape supplied with the bag.

3.5 Inspect the insulated shipping cooler. Check for any cracks, holes, broken handles, etc. If the cooler has a drain plug, make certain it is sealed shut, both inside and outside of the cooler. If the cooler is questionable for shipping, the cooler must be discarded.

3.6 Put ice into sealable polyethylene bags and place a layer of the sealed bags on the bottom of the cooler. Place the sample containers into the shipping cooler on top of the ice in an upright position (containers will be upright, with the exception of any 40-ml vials). Place sealable polyethylene bags of ice flat against the sides of the cooler. Continue filling the cooler with samples until the cooler is nearly full and the movement of the sample containers is limited.

3.7 Add a final layer of ice sealed in polyethylene bags to the top of the samples just before the cooler is closed and sealed.

3.8 Place the original (top) signed copy of the COC form inside a sealable polyethylene bag. Tape the bag to the inside of the lid of the shipping cooler.

3.9 Close the cooler and seal the cooler with approximately four wraps of strapping tape at each end of the cooler. Prior to wrapping the last wrap of strapping tape, apply a signed and dated custody seal to each side of the cooler (one per side). Cover the custody seal with the last wrap of tape. This will provide a tamper evident custody seal system for the sample shipment.

3.10 Affix shipping labels to each of the coolers, ensuring all of the shipping information is filled in properly. Overnight (e.g., FedEx Priority Overnight) courier services will be used for all sample shipments.

3.11 All samples will be shipped to the laboratory no more than 72 hours after collection. Under no circumstances should sample hold times be exceeded.

STANDARD OPERATING PROCEDURE
SOP-05

BOREHOLE AND SOIL SAMPLE LOGGING

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the standard procedures and technical guidance on the logging of soil cores.

2.0 FIELD FORMS AND EQUIPMENT

Knife
Ruler (marked in tenths and hundredths of feet)
Boring Log: An example of this form is attached.
Photoionization detector (PID)
Writing utensil (preferably black pen with indelible ink)

3.0 RESPONSIBILITIES

A field geologist or engineer is responsible for supervising all boring activities and assuring that each borehole is properly and completely logged.

4.0 PROCEDURES FOR BOREHOLE AND SAMPLE LOGGING

To maintain a consistent classification of soil, it is imperative that the field geologist understands and accurately uses the field classification system described in this SOP. This identification is based on visual examination and manual tests.

4.1 USCS Classification

Soils are to be classified according to the Unified Soil Classification System (USCS). This method of classification is detailed in Figure 1 (attached to this SOP).

This method of classification identifies soil types on the basis of grain size and cohesiveness.

Fine-grained soils, or fines, are smaller than the No. 200 sieve and are of two types: silt (M) and clay (C). Some classification systems define size ranges for these soil particles, but for field classification purposes, they are identified by their respective behaviors. Organic material (O) is a common component of soil but has no distinguishable size range; it is recognized by its composition. The careful study of the USCS will aid in developing the competence and consistency necessary for the classification of soils.

Coarse-grained soils will be divided into categories: rock fragments, sand, or gravel. The terms "sand" and "gravel" not only refer to the size of the soil particles but also to their depositional history. To insure accuracy in description, the term "rock fragments" will be used to indicate angular granular materials resulting from the breakup of rock. The sharp edges that are typically observed indicate little or no transport from their source area; and therefore, the term provides additional information in reconstructing the depositional environment of the soils encountered. When the term "rock fragments" is used, it will be followed by a size designation such as "(1/4 inchΦ-1/2 inchΦ)" or "coarse-sand size" either immediately after the entry or in the remarks column. The USCS classification would not be affected by this variation in terms.

4.2 <u>Color</u>

Soil colors will be described utilizing a single color descriptor preceded, when necessary, by a modifier to denote variations in shade or color mixtures. A soil could therefore be referred to as "gray" or "light gray" or "blue-gray." Because color can be utilized in correlating units between sampling locations, it is important for color descriptions to be consistent from one boring to another.

Colors must be described while the sample is still moist. Soil samples will be broken or split vertically to describe colors. Samplers tend to smear the sample surface, creating color variations between the sample interior and exterior.

The term "mottled" will be used to indicate soils irregularly marked with spots of different colors. Mottling in soils usually indicates poor aeration and lack of good drainage.

4.3 <u>Relative Density and Consistency</u>

To classify the relative density and/or consistency of a soil, the geologist is to first identify the soil type. Granular soils contain predominantly sands and gravels. They are non-cohesive (particles do not adhere well when compressed). Finer-grained soils (silts and clays) are cohesive (particles will adhere together when compressed).
Granular soils are given the USCS classifications GW, GP, GM, SW, SP, SM, GC, or SC (see Figure 1).

The consistency of cohesive soils is determined by performing field tests and identifying the consistency as shown in the following table.

CONSISTENCY FOR COHESIVE SOILS

Consistency	Standard Penetration Resistance (Blows per Foot)	Unconfined Compressive Strength (Tons/Sq. Foot by pocket penetration)	Field Identification
Very soft	0 to 2	Less than 0.25	Easily penetrated several inches by fist.
Soft	2 to 4	0.25 to 0.50	Easily penetrated several inches by thumb.
Medium stiff	4 to 8	0.50 to 1.0	Can be penetrated several inches by thumb with moderate effort.
Stiff	8 to 15	1.0 to 2.0	Readily indented by thumb but penetrated only with great effort.
Very stiff	15 to 30	2.0 to 4.0	Readily indented by thumbnail.
Hard	Over 30	More than 4.0	Indented with difficulty by thumbnail.

Cohesive soils are given the USCS classifications ML, MH, CL, CH, OL, or OH (see Figure 1).

The consistency of cohesive soils is determined by hand by determining the resistance to penetration by the thumb. The thumb determination methods are conducted on a selected sample of the soil, preferably the lowest 0.5 foot of the sample. The sample will be broken in half and the thumb pushed into the end of the sample to determine the consistency. Do not determine consistency by attempting to penetrate a rock fragment. If the sample is decomposed rock, it is classified as a soft decomposed rock rather than a hard soil. One of the other methods will be used in conjunction with it. The designations used to describe the consistency of cohesive soils are shown in the above-listed table.

4.4 Weight Percentages

In nature, soils are consist of particles of varying size and shape and are combinations of the various grain types. The following terms are useful in the description of soil:

Terms of Identifying Proportion of the Component	Defining Range of Percentages by Weight
Trace	0 - 10 percent

Some	11 - 30 percent
Adjective form of the soil type (e.g., sandy)	31 - 50 percent

Examples:

- Silty fine sand: 50 to 69 percent fine sand, 31 to 50 percent silt.
- Medium to coarse sand, some silt: 70 to 80 percent medium to coarse sand, 11 to 30 percent silt.
- Fine sandy silt, trace clay: 50 to 68 percent silt, 31 to 49 percent fine sand, 1 to 10 percent clay.
- Clayey silt, some coarse sand: 70 to 89 percent clayey silt, 11 to 30 percent coarse sand.

4.5 Moisture

Moisture content is estimated in the field according to four categories: dry, moist, wet, and saturated. In dry soil, there appears to be little or no water. Saturated samples obviously have all the water they can hold. Moist and wet classifications are somewhat subjective and often are determined by the individual's judgment. A suggested parameter for this would be calling a soil wet if rolling it in the gloved hand or on a porous surface liberates water (i.e., dirties or muddies the surface). Whatever method is adopted for describing moisture, it is important that the method used by an individual remains consistent throughout an entire field activity.

4.6 Classification of Soil Grain Size for Chemical Analysis

To determine the gross grain size classification (e.g., clay, silt, and sand) from the USCS classification described above, the following table will be used.

Gross Soil Grain Size Classification	USCS Abbreviation	Description
Clay	CL	inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	CH	inorganic clays of high plasticity, fat clays.
	OH	organic clays of medium to high plasticity, organic silts.
Silt	ML	inorganic silts and very fine sands, rock four, silty or clayey fine sands with slight plasticity.
	OL	organic silts and organic silty clays of low plasticity
	MH	inorganic silts, micaceous or diatomaceous fine sand or silty soils.
Sand	SW	well graded sands, gravelly sands, little or no fines.
	SP	poorly graded sands, gravelly sands, little or no fines.
	SM	silty sands, sand-silt mixtures.
	SC	clayey sands, sand-clay mixtures.

4.7 Summary of Soil Classification

In summary, soils will be classified in a similar manner by each geologist/engineer at a project site. The hierarchy of classification is as follows:

- Density and/or consistency
- Color
- Plasticity (optional)
- Soil types
- Moisture content
- Other distinguishing features
- Grain size
- Depositional environment

5.0 ATTACHMENTS

1. Figure 1 - Unified Soil Classification System
2. Example of a Boring Log

ATTACHMENT 1

FIGURE 1 - UNIFIED SOIL CLASSIFICATION SYSTEM

Unified Soil Classification System

Coarse Grained Soils (more than half of soil > No. 200 sieve)	**Gravels** (More than half of coarse fraction > no. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Sandy gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-silt mixtures
	Sands (More than half of coarse fraction < no. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
Fine Grained Soils (more than half of soil < No. 200 sieve)	**Silts and Clays** LL = < 50	ML	Inorganic silts and very fine sands, rock flour, silty fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays LL = > 50	MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils, elastic silts
		CH	Inorganic silts of high plasticity, fat clays
		OH	Organic clays of high plasticity, organic silty clays, organic silts
Highly Organic Soils		Pt	Peat and other highly organic soils

Grain Size Chart

Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size In Millimeters
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel	3" to No. 4	76.2 to 7.76
coarse	3" to 3/4"	76.2 to 4.76
fine	3/4" to No.4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
coarse	No.4 to No. 10	4.76 to 2.00
medium	No. 10 to No. 40	2.00 to 0.420
fine	No. 40 to No. 200	0.420 to 0.074
Silt and Clay	Below No. 200	Below 0.074

Relative Density (SPT)

SANDS AND GRAVELS	BLOWS/FOOT
VERY LOOSE	0 – 4
LOOSE	4 – 10
MEDIUM DENSE	10 – 30
DENSE	32 – 50
VERY DENSE	OVER 50

Consistency (SPT)

SILTS AND CLAYS	BLOWS/FOOT
VERY SOFT	0 – 2
SOFT	2 – 4
MEDIUM STIFF	4 – 8
STIFF	8 – 16
VERY STIFF	16 – 22
HARD	OVER 32

ATTACHMENT 2

BORING LOG

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: ____________ BORING No.: ____________
PROJECT NUMBER: ____________ DATE: ____________
DRILLING COMPANY: ____________ GEOLOGIST: ____________
DRILLING RIG: ____________ DRILLER: ____________

					MATERIAL DESCRIPTION					PID/FID Reading (ppm)			
Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**

* When rock coring, enter rock brokeness.
** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ____________

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: ____________

STANDARD OPERATING PROCEDURE
SOP-06

MONITORING WELL INSTALLATION

1.0 PURPOSE

This procedure provides general guidance and information pertaining to proper design and installation of groundwater monitoring wells. The methods described herein are specific for monitoring well construction at NALF Cabaniss.

2.0 RESPONSIBILITIES

Driller - The driller provides adequate and operable equipment, sufficient quantities of materials, and an experienced and efficient labor force capable of performing all phases of proper monitoring well installation and construction. The drilling contractor personnel must have all the health and safety training required to perform the work, as specified in the health and safety plan. All well drilling activities shall be performed under the direct supervision of a driller licensed in the State of Texas. The driller is also responsible for obtaining, in advance, any required permits for drilling and monitoring well installation and construction for the State of Texas.

Field Geologist - The field geologist supervises and documents well installation and construction performed by the driller and ensures that the screen interval for each monitoring well is properly placed to provide representative groundwater data from the monitored interval. Geotechnical engineers, field technicians, or other suitable trained personnel may also serve in this capacity.

Site Safety Officer – The site safety officer is responsible for clearing the drill site for underground and overhead utilities or other potentially hazardous obstructions.

3.0 REQUIRED EQUIPMENT/ITEMS

The following list includes equipment and items required for monitoring well installation:

Health and safety equipment as required by the HASP and the site safety officer.

Well drilling and installation equipment with associated materials (typically supplied by the driller). Wells can be installed using either hollow-stem auger (HSA) or Direct push techniques (DPT) drilling methods.

Hydrogeologic equipment (weighted engineer's tape, water-level indicator, retractable engineer's rule, electronic calculator, clipboard, mirror and flashlight for observing downhole activities, paint and ink marker for marking monitoring wells, sample jars, well installation forms, boring logs, soil sample log forms, chain-of-custody records, sample coolers with ice, and a field notebook).

4.0 WELL INSTALLATION AND CONSTRUCTION

Monitoring wells shall be constructed using nominal 2-inch ID, PVC riser and nominal 2-inch ID, PVC factory slotted screen (.010 slot). Clean silica sand of U.S. Standard Sieve Size No. 20 to 40 will be used for the sand pack, 100 percent certified pure sodium bentonite will be used for the seal above the sand pack and hydrated. The depths of backfill materials will be constantly monitored, if possible, during well installation using a weighted stainless-steel or fiberglass tape measure. The well boring grouted in place using cement-bentonite grout.

HOLLOW-STEM AUGER DRILLING

The following procedures shall be used for hollow-stem auger drilling for well installation. Nominal 3½ or 4½-inch ID hollow-stem augers will be used to install the well borings. All hollow-stem auger drilling will include continuous sampling to the bottom of the boring as per SOP-10. Once the boring reaches the desired depth, the screen and the riser pipe are in place, the annulus of the boring will be backfilled with clean silica sand filter pack from the bottom of the boring to 2 to 3 feet above the top of the well screen. As the filter pack is being installed, the level of sand will be several inches up inside of the augers to ensure that an adequate filter pack is installed around the well screen. A bentonite seal will be installed above the filter pack to the ground surface or approximately 2 linear feet which ever is the smaller length. The depths of the backfill materials will be constantly monitored during the monitoring well installation with a weighted stainless steel or plastic tape. The exact depth and thickness of backfill materials will be determined in the field by the TtNUS representative. A cement-bentonite grout will mixed and tremied into the annulus. When the well is completed and grouted to surface, a locking protective steel casing with a hinged cap will be placed over the top of the well.

5.0 DOCUMENTATION OF FIELD ACTIVITIES

A critical part of monitoring well installation is recording of significant details and events in the site logbook, on field forms, and in a field logbook. Details of borehole logging are contained in SOP-10.

6.0 ATTACHMENTS

1. Overburden Monitoring Well Sheet

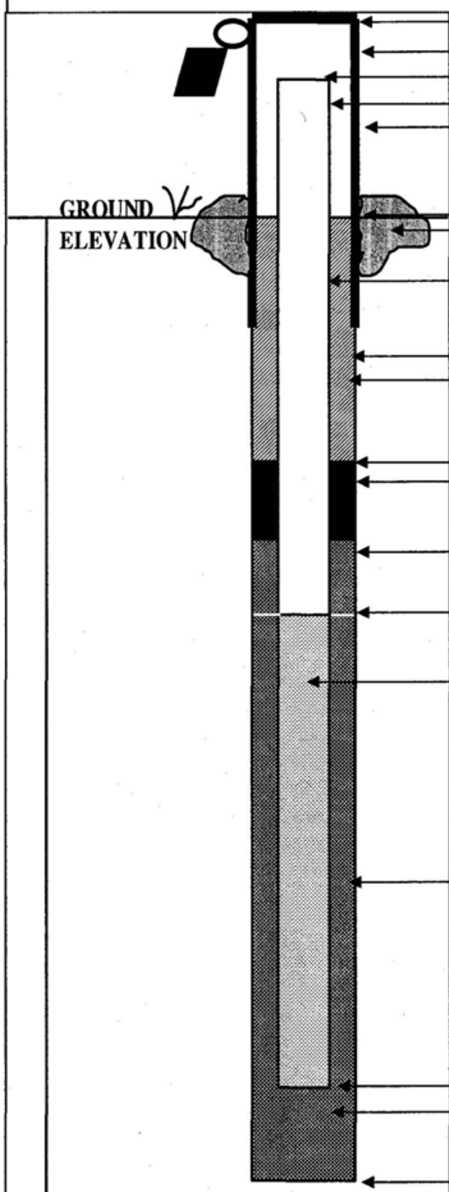
ATTACHMENT 1

OVERBURDEN MONITORING WELL SHEET

BORING NO.: ______

Tetra Tech NUS, Inc. **TEMPORARY OVERBURDEN MONITORING WELL SHEET**

PROJECT:	______	DRILLING Co.:	______	BORING No.:	______
PROJECT No.:	______	DRILLER:	______	DATE COMPLETED:	______
SITE:	______	DRILLING METHOD:	______	NORTHING:	______
GEOLOGIST:	______	DEV. METHOD:	______	EASTING:	______



ELEVATION OF TOP OF SURFACE CASING: ______
STICK -UP TOP OF SURFACE CASING: ______
ELEVATION OF TOP OF RISER PIPE: ______
RISER STICK-UP ABOVE GROUND SURFACE: ______
I.D. OF SURFACE CASING: ______
TYPE OF SURFACE CASING: ______

GROUND ELEVATION: ______
TYPE OF SURFACE SEAL: ______

RISER PIPE I.D.: ______
TYPE OF RISER PIPE: ______

BOREHOLE DIAMETER: ______
TYPE OF SEAL: ______

ELEVATION / DEPTH OF SEAL: ___ / ___
TYPE OF SEAL: ______

ELEVATION / DEPTH TOP OF FILTER PACK: ___ / ___

ELEVATION / DEPTH TOP OF SCREEN: ___ / ___

TYPE OF SCREEN: ______

SLOT SIZE X LENGTH: ______

I.D. OF SCREEN: ______

TYPE OF FILTER PACK: ______

ELEVATION / DEPTH BOTTOM OF SCREEN: ___ / ___
ELEVATION / DEPTH BOTTOM OF FILTER PACK: ___ / ___
TYPE OF BACKFILL BELOW WELL: ______
ELEVATION / DEPTH OF BOREHOLE: ___ / ___

STANDARD OPERATING PROCEDURE
SOP-07

MONITORING WELL DEVELOPMENT

1.0 PURPOSE

This procedure provides general guidance and information pertaining to proper development of new and existing monitoring wells. The methods described herein are specific for monitoring wells located at NALF Cabaniss.

2.0 RESPONSIBILITIES

The drilling contractor or TtNUS personnel shall provide adequate and operable equipment, sufficient quantities of materials, and an experienced and efficient labor force capable of developing monitoring wells. The field personnel must have all the health and safety training required to perform the work, as specified in the health and safety plan (HASP).

3.0 REQUIRED EQUIPMENT/ITEMS

The following list includes equipment and items required for monitoring well development:

Health and safety equipment as required by the HASP and the site safety officer.

Well development equipment with associated materials (supplied by the driller or TtNUS).

Hydrogeologic equipment (water-level indicator, electronic calculator, clipboard, paint and ink marker for marking existing monitoring wells, well development forms, and a field notebook).

4.0 WELL DEVELOPMENT METHODS

The development of new monitoring wells will not occur until at least 24 hours after the well has been installed and grouted. This time is required so that the grout in the annulus can set and harden. The purpose of well development is to stabilize and increase the permeability of the sand pack and the well screen and to restore the permeability of the formation that may have been reduced by drilling operations. Wells are typically developed until all fine material and drilling water, if any, is removed from the well.

Wells will be developed by bailing and surging, and/or by pumping and surging, as determined by the TtNUS field geologist. The subcontractor may provide the surge block and pump used during development. The wells will be developed until the discharge water is visibly clear or as determined by the TtNUS field geologist. The TtNUS field geologist will obtain field parameters, such as pH, temperature, conductivity, and turbidity during development. All development water will be containerized in 55-gallon drums.

A surge block or a bailer that is approximately the same diameter as the well casing may be used to agitate the water, causing it to move in and out of the screens. This movement of water pulls fine materials into the well, where they may be removed by any of several methods, and prevents bridging of sand particles in the gravel pack.

Development should proceed until the following criteria are met:

- The well water is clear to the unaided eye.
- When field parameters become stable +/- 10%.

or

- A minimum removal of five times the standing water volume in the well (to include the well screen and casing plus saturated borehole annulus, assuming 30% annular porosity).

If for any reason the above criteria cannot be met, the site geologist should document the event in writing and consult with the Task Order Manager regarding an alternate plan of action.

Well development must be completed at least 24 hours before well sampling. The intent of this hiatus is to provide time for the groundwater surrounding the newly developed well to sufficiently equilibrate to static conditions.

5.0 ATTACHMENTS

1. Monitoring Well Development Record

ATTACHMENT 1

MONITORING WELL DEVELOPMENT RECORD

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Page ___ of _____

Well: ____________________
Site: ____________________
Date Installed: ____________________
Date Developed: ____________________
Dev. Method: ____________________
Pump Type: ____________________

Depth to Bottom (ft.): ____________________
Static Water Level Before (ft.): ____________________
Static Water Level After (ft.): ____________________
Screen Length (ft.): ____________________
One Well Volume (gal/L): ____________________
Casing ID (in.): ____________________

Responsible Personnel: ____________________
Drilling Company: ____________________
Project Name: ____________________
Project Number: ____________________
PID Readings: Bore Hole_____ppm
PID Readings: Breathing Zone_____ppm

Time	Cumulative Water Volume (Gal.)	Flow Rate (mL/min.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units _____)	Turbidity (NTU)	Remarks (odor, color, etc.)

STANDARD OPERATING PROCEDURE

SOP-08

LOW-FLOW WELL PURGING AND STABILIZATION

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedure for well purging and stabilization utilizing low-flow techniques.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

The following field forms and equipment are required for low-flow purging.

Low-Flow Purge Data Sheet: A copy of this form is attached at the end of this SOP.
Ground Water Sample Log Sheet: A copy of this form and instructions for its completion are included in SOP-18.
Bound field logbook
Writing utensil
Well key
Electronic water-level indicator: The water-level indicator must have a cable of sufficient length to reach the water surface and be capable of measurements of 0.01 foot.
Submersible Bladder Pump: QED Sample Pro or equivalent using twin bonded ¼-inch PE tubing.
Electronic Programmable Controller, MP-10: This controller regulates air flow in a bladder pump.
Cylinder of compressed nitrogen with regulator: Compressed gas serves as the power source for the bladder pump.
Peristaltic Pump: Using siliclastic tubing and ¼-inch PE tubing
Multiple parameter water-quality meter: This unit measures and displays field parameters measured in the field including pH, dissolved oxygen, oxidation-reduction potential (ORP), temperature, and specific conductance (see SOP-12).
Flow-through cell adapter for water-quality meter
LaMotte Turbidity Meter: Used to measure turbidity.
Purge water containers
Graduated cylinder and stopwatch: Used to calculate flow rate.
Decontamination supplies: SOP-04 describes required decontamination supplies.

Disposable medical-grade gloves (e.g., latex, nitrile)

3.0 PROCEDURES FOR WELL PURGING

3.1 Prior to mobilizing to the site, clean, check for proper operation, and calibrate above equipment in accordance with manufacturer requirements as necessary.

3.2 Obtain a static water-level measurement of the well to be purged. Record the information on the Groundwater Sample Log Sheet (see SOP-18) and the Low-Flow Purge Data Sheet. Leave the water-level meter suspended in the well casing.

3.3 Calculate saturated screen length well casing volume as follows:

1. Obtain the total depth of the well by measurement.

2. Using the static water level determined in Step 3.2 of this SOP, the total depth of the well and the screen length, calculate the saturated screen length well casing volume using the following formula:

$$\mathbf{V = (0.163)(T)(r^2)}$$

where:

V	=	Static casing volume of well (in gallons).
T	=	Vertical height of water column (linear feet of water) across the screen interval.
0.163	=	A constant conversion factor that compensates for the conversion of the casing radius from inches to feet, the conversion of cubic feet to gallons, and pi.
r	=	Inside radius of the well casing (in inches).

Note: For wells of 1-inch radius (2-inch diameter), V = 0.163 gallons per foot of water column. The minimum purge volume should be two saturated screen lengths.

3.4 Wells shall be purged using either a submersible bladder pump or surface peristaltic pump. For wells with a nominal ID of 1-inch the peristaltic pump will be used to purge and sample the well. If the depth to water level exceeds the capacity (about 25 ft to water) of the peristaltic pump then a submersible bladder pump will be used to purge and sample the well. Follow steps 3.5 through 3.9 for bladder pump procedures skip to 3.10 for peristaltic pump procedures.

3.5 Connect the pump controller to the well pump air supply (at the well cap) by following the instructions in the pump control manual. The pump controller must be turned off when it is being connected.

3.6 Connect the nitrogen cylinder to the pump controller. The nitrogen cylinder valve must be closed and the regulator line pressure set at zero pounds per square inch (psi) when it is being connected.

3.7 Following the instructions found in the water-quality meter manual, connect the flow-through cell to the pump discharge line (at the well cap).

3.8 Place the discharge tubing from the flow-through cell to direct the purge water discharge into the graduated cylinder or purge water container.

3.9 Following the instructions in the pump controller manual, start pumping water from the well.

3.10 Peristaltic pump may be used to purge and sample groundwater monitoring wells. Attach monitoring well tubing to the input side of the pump via the siliclastic tubing and the out from the pump to the input side of the flow through cell.

3.11 Start with the initial pump rate set at approximately 0.1 liters per minute. Use the graduated cylinder and stopwatch to measure the pumping rate. Adjust pumping rates as necessary to prevent drawdown from exceeding 0.3 foot during purging. If no drawdown is noted, the pump rate may be increased (to a max of 0.5 liters per minute) to expedite the purging and sampling event. The pump rate will be reduced if turbidity is greater than 10 NTUs after all other field parameters have stabilized. Slow recovering wells will be identified and purged at the beginning of the workday. If possible, samples will be collected from these wells within the same 8-hour workday and no later than 24 hours after the start of purging.

The time to sample any given well will vary greatly due to the many variables associated with low flow purging and sampling:

- Stabilization of parameters

- Possible drawdown
- Variable pump rates

Normally, the time from the start of purging to the end of sampling will be between 1 and 4 hours.

3.12 Measure the well water level using the water-level meter every 5 minutes. Record the well water level on the Low-Flow Purge Data Form (attached at the end of this SOP).

3.13 Every 5 minutes, record on the Low-Flow Purge Data Form the water-quality parameters (pH, specific conductance, temperature, turbidity, oxidation-reduction potential, and dissolved oxygen) measured by the water-quality meter and turbidity meter. If the cell needs to be cleaned during purging operations, continue pumping (allow the pump to discharge into a container) and disconnect the cell. Rinse the cell with distilled water. After cleaning is completed, reconnect the flow-through cell and continue purging. Document the cell cleaning on the Low-Flow Purge Data Form.

3.14 Measure the flow rate using a graduated cylinder. Remeasure the flow rate any time the pump rate is adjusted.

3.15 During purging, check for the presence of bubbles in the flow-through cell. The presence of bubbles is an indication that connections are not tight. If bubbles are observed, check for loose connections.

3.16 Stabilization is achieved and sampling can begin when a minimum of two saturated screen lengths volume has been removed and three consecutive readings, taken at 5 minute intervals, are within the following limits:

- pH ± 0.1 standard units
- Specific conduct ± 5%
- Temperature ± 10%
- Turbidity less than 10 NTUs
- Dissolved oxygen ± 10%

If the above conditions have still not been met after the well has been purged for 4 hours, purging will be considered complete and sampling can begin. For the wells, if the above condition(s) have not been met after three well point volumes have been removed, this will be recorded on the field sample form and the groundwater sample collection can commence.

Record the final well stabilization parameters from the Low-Flow Purge Data From onto the Groundwater Sample Log Form.

If there is a need to leave a well during purging, there are two options:

- One, if the sampler must move for 30 minutes or less but still has a clear line of sight to the well, the sampler may leave the pump running and watch the well from a distance until he or she is able to return to the well.

- Two, if for whatever reason, the sampler must stop purging for an extended period of time or a clear line of sight cannot be maintained, the pump and cell will be shut down. All equipment and supplies will be loaded into the sample vehicle, and the well will be secured before the sampler departs.

In both cases, the time purging was stopped and restarted will be noted on the Low-Flow Purge Data Form.

3.17 Rinse the flow-through cell, the water-quality meter probes, and the turbidity cell with analyte-free water and pack the cell and meters for transport.

4.0 ATTACHMENTS

1. Low-Flow Purge Data Sheet

ATTACHMENT 1

LOW-FLOW PURGE DATA SHEET

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT : ____________ WELL ID.: ____________
PROJECT NUMBER: ____________ DATE: ____________
PROJECT SITE NAME: ____________ WEATHER: ____________

Time (Hrs.)	Water Level (Ft. below TOC)	Volume (gal/L)	Flowrate (mL/min)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments

Water Quality Meter (S/N) ____________ Pump Intake Depth ____________
Control Box Type (S/N) ____________
Turbidity Meter (S/N) ____________

SIGNATURE(S): ____________

PAGE___OF___

STANDARD OPERATING PROCEDURE
SOP-09

GROUNDWATER SAMPLING

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedure for collecting groundwater samples from permanent and temporary monitoring wells. Low-flow sampling techniques will be used for groundwater sampling at NALF Cabaniss.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

The following field forms and equipment are required for low-flow sampling of monitoring wells:

Writing utensil (preferably black ink)

Stainless steel Geoprobe Screen Point Groundwater Sampler (or equivalent)

Groundwater Sample Log Form: A copy of this form is attached at the end of this SOP

Low Flow Purge Data Sheet: A copy of this form is attached at the end of SOP-17

Bound field log book

Chain-of-Custody Form

Bladder pump: With accessories: twin bonded ¼-inch tubing, MP-10 control box, nitrogen gas cylinder, and nitrogen regulator.

Peristaltic pump: Silicon and ¼-inch tubing.

Required sample containers with appropriate preservative: All sample containers for analysis by fixed-base laboratories will be supplied and deemed certified clean by the laboratory.

Surgical gloves

Water-level indicator

0.45-micron filter cartridge: If the metal analysis requires field filtering.

Bucket: to collect development/purge water

Calculator, wristwatch, and timer

Stainless steel clamps

Plastic storage bags

Shipping containers with ice

3.0 SAMPLING PROCEDURES FOR MONITORING WELLS

3.1 Groundwater sampling may be initiated when the monitoring well has been purged and stabilized in accordance with SOP-17.

3.2 Record the sample start time (using military time) on the Groundwater Sample Log Sheet. Record the field measurements for pH, oxidation-reduction potential (ORP), specific conductance, temperature, dissolved oxygen, and turbidity.

3.3 With the pump continuing to run, disconnect the flow-through cell from the pump discharge tube and immediately start filling sample bottles directly from the pump discharge. All sample containers will be supplied by the laboratory, and the laboratory will pre-preserve all sample containers, where appropriate.

3.4 Allow the pump discharge to flow gently down the inside of the container with minimal turbulence when filling sample containers. Avoid immersing the discharge tube into the sample as the sample container is being filled. Sample containers for volatile constituents (VOCs) must be completely filled so that no headspace exists in the container. The VOC vials will be filled to the top so that a convex meniscus is formed. Gently secure the cap, turn the vial upside down, and check to see if any air has been trapped inside the vial. If so, open the cap, reform the meniscus, and attempt again to secure the lid without trapping air in the sample. All other sample containers can have air space included when the container lid is secured.

3.5 Cap each container immediately after filling.

3.6 Record the sample time on the Groundwater Sample Log Form, the sample label, and the sample label.

3.7 Place the tagged sample container into a plastic storage bag and then into a cooler containing ice.

3.8 Enter the proper information on the Chain-of-Custody Form for each sample container (see SOP-03).

3.9 Repeat steps 3.3 through 3.9 for each sample container collected.

3.10 The pump rate should not be adjusted after sampling has commenced. If it becomes necessary to adjust the pump rate, document the change on the Groundwater Sample Log Form.

3.11 All samples will be collected into pre-preserved bottles (if required) supplied by an approved laboratory. All samples will be collected in the following sequence (where applicable):

- Volatile organic compounds (VOCs)
- Other organics
- Metals
- Other Inorganics
- Filtered Metals

3.12 Filtered aliquots of groundwater may be collected and analyzed for dissolved metals. Without turning off the pump, attach a disposable, inline, 0.45-um filter cartridge at the end of the discharge tube. Fill sample containers marked for dissolved metals so that the laboratory knows that these aliquots are distinct sample fractions and that the results should be reported as dissolved analytes.

3.13 Repeat steps 3.5 through 3.9 for the filtered sample containers.

3.14 After completion of sample collection, remove the bladder pump (if bladder pump is used for sampling) from the well and decontaminate the pump following the procedures in SOP-04. Leave dedicated tubing inside the well for possible future sampling events.

3.15 Replace the outer protective well cap and lock the well.

3.16 All equipment should be cleaned and packed into the sample vehicle, along with the sample cooler for transport. Disposable gloves and other equipment should be placed in a plastic trash bag and handled as investigation-derived waste (SOP-09).

4.0 SAMPLING PROCEDURES FOR TEMPORARY MONITORING WELLS

4.1 Groundwater samples shall be collected from temporary monitoring wells. Temporary monitoring wells shall be constructed as per SOP-16.

4.2 The temporary monitoring wells shall be developed as per SOP-15 prior to purging.

4.3 The temporary monitoring wells shall be purged as per SOP-17.

4.4 Samples will be collected using the peristaltic pump following procedures in Section 3.0 of this SOP.

4.5 Proceed to abandon the temporary well as per SOP-16.

5.0 ATTACHMENTS

1. Groundwater Sample Log Sheet

ATTACHMENT 1

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: ____________________
Project No.: ____________________

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type: ____________________
[] QA Sample Type: ____________________

Sample ID No.: ____________
Sample Location: ____________
Sampled By: ____________
C.O.C. No.: ____________
Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time:	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

STANDARD OPERATING PROCEDURE
SOP-10

DECONTAMINATION OF FIELD SAMPLING EQUIPMENT

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedures to be followed when decontaminating non-dedicated field sampling equipment during the field investigations.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Writing utensil (preferably black pen with indelible ink)
Non-latex rubber or plastic gloves
Cotton gloves
Field logbook
Potable water
Deionized water
LiquiNox detergent
Brushes, spray bottles, paper towels, etc.
Container to collect and transport decontamination fluids

3.0 DECONTAMINATION PROCEDURES

3.1 Don non-latex and/or cotton gloves and decontaminate sampling equipment (in accordance with the following steps) prior to field sampling and between samples.

3.2 Rinse the equipment with potable water. Rinsing may be conducted by spraying with water from a spray bottle or by dipping. Collect the potable water rinsate into a container.

3.3 Wash the equipment with a solution of LiquiNox detergent. Prepare the LiquiNox wash solution in accordance with the instructions on the LiquiNox container. Collect the LiquiNox wash solution into a container. Use brushes or sprays as appropriate for the equipment. If oily residue has accumulated on the sampling equipment, remove the residue with an isopropanol wash and repeat the Liquinox wash.

3.4 Rinse the equipment with potable water. Rinsing may be conducted by spraying with water from a spray bottle or by dipping. Collect the potable water rinsate into a container.

3.5 Rinse the equipment with deionized water. Rinsing may be conducted by spraying with water from a spray bottle or by dipping. Collect the deionized water rinsate into a container.

3.6 Remove excess water by air drying, shaking, or by wiping with paper towels as necessary.

3.7 Document decontamination by recording it in the field logbook.

3.8 Containerized decontamination solutions will be managed in accordance with the procedures described in SOP-09 and this UFP SAP.

STANDARD OPERATING PROCEDURE
SOP-11

MANAGEMENT OF INVESTIGATION-DERIVED WASTE

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes how investigation-derived waste (IDW) will be collected, segregated, classified, and managed during the field investigations at the NAS Kingsville facility. The following types of IDW will be generated during this investigation:

- Decontamination solutions
- Soil and drill cuttings
- Purge and development water
- Personal protective equipment and clothing (PPE)
- Miscellaneous trash and incidental items

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Health and safety equipment (with PPE)
Decontamination equipment
Field logbook
Writing utensil (preferably black pen with indelible ink)
Plastic sheeting and/or tarps
55-gallon drums with sealable lids
IDW labels for drums
Wastewater container tanks
Plastic garbage bags

3.0 PROCEDURES

Management of IDW includes the collection, segregation, temporary storage, classification, final disposal, and documentation of the waste-handling activities if necessary.

3.1 Liquid Wastes

Liquid wastes that will be generated during the site activities include purge and development water from monitoring wells and decontamination solutions from sampling equipment. These wastes will be collected and transported to a central location at NALF Cabaniss. This waste will remain there until waste characterization results are available and disposal is implemented.

3.2 Solid Wastes

Solid wastes that may be generated during the site activities include collection of soil from surface soil sampling and drill cuttings from subsurface soil sampling. These wastes will be collected and transported to a central location at NALF Cabaniss. This waste will remain there until waste characterization results are available and disposal is implemented.

3.3 PPE and Incidental Trash

All PPE wastes and incidental trash materials (e.g., wrapping or packing materials from supply cartons, waste paper) will be decontaminated (if contaminated), double bagged, securely tied shut, and placed in a designated waste receptacle at NALF Cabaniss.

3.4 Waste Profiling

Waste Profiling will be completed as follows:

Liquids – One IDW aliquot will be collected from each drum of liquids and composited into one liquid sample. The liquid sample will be analyzed for Toxicity Characteristic Leaching Procedure (TCLP) volatiles (VOCs), total petroleum hydrocarbons (TPH), and reactivity, corrosivity, and ignitability (RCI).

Solids – One IDW aliquot will be collected from each drum of solids and composited into one solid sample. The solid sample will be analyzed for TCLP VOCs, TPH, and RCI.

STANDARD OPERATING PROCEDURE

SOP-12

SAMPLE CUSTODY AND DOCUMENTATION OF FIELD ACTIVITIES

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedures for sample custody and documentation of field sampling and field analyses activities.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

The following logbooks, forms, labels, and equipment are required.

Writing utensil (preferably black pen with indelible ink)
Site logbook
Field logbook
Sample label
Chain-of-Custody Form
Custody seals
Equipment calibration log
Soil and Sediment Sample Log Sheet
Groundwater Sample Log Sheet

3.0 PROCEDURES

This section describes custody and documentation procedures. All entries made into the logbooks, custody documents, logs, and log sheets described in this SOP must be made in indelible ink (black is preferred). No erasures are permitted. If an incorrect entry is made, the entry will be crossed out with a single strike mark, initialed, and dated.

3.1 Site Logbook

The site logbook is a hard-bound, paginated, controlled-distribution record book in which all major on-site activities are documented. At a minimum, the following activities and events will be recorded (daily) in the site logbook:

- All field personnel present
- Arrival/departure of site visitors
- Arrival/departure of equipment
- Start or completion of sampling activities
- Daily on-site activities performed each day
- Sample pickup information
- Health and safety issues
- Weather conditions

The site logbook is initiated at the start of the first on-site activity (e.g., site visit or initial reconnaissance survey). Entries are to be made for every day that on-site activities take place.

The following information must be recorded on the cover of each site logbook:

- Project name
- Project number
- Book number
- Start date
- End date

Information recorded daily in the site logbook need not be duplicated in other field notebooks but must summarize the contents of these other notebooks and refer to specific page locations in these notebooks for detailed information (where applicable). At the completion of each day's entries, the site logbook must be signed and dated by the field operations leader (FOL).

3.2 Field Logbooks

The field logbook is a separate dedicated notebook used by field personnel to document his or her activities in the field. This notebook is hardbound and paginated.

3.3 Sample Labels

Adhesive sample container labels must be completed and applied to every sample container. Information on the label includes the project name, location, sample number, date, time, preservative, analysis, matrix, sampler's initials, and the name of the laboratory performing the analysis.

3.4 Chain-of-Custody Form

The Chain-of-Custody Form (COC) is a multi-part form that is initiated as samples are acquired and accompanies a sample (or group of samples) as it is transferred from person to person. Each COC is numbered. This form must accompany any samples collected for laboratory chemical analysis. A copy of a blank COC form is attached at the end of this SOP.

The FOL must include the name of the laboratory in the "Remarks" section to ensure that the samples are forwarded to the correct location. If more than one COC is necessary for any cooler, the FOL will indicate "Page __ of __" on each COC. The original (top) signed copy of the COC will be placed inside a sealable polyethylene bag and taped inside the lid of the shipping cooler. Once the samples are received at the laboratory, the sample custodian checks the contents of the cooler(s) against the enclosed COC(s). Any problems are noted on the enclosed COC Form (bottle breakage, discrepancies between the sample labels, COC form, etc.) and will be resolved through communication between the laboratory point-of-contact and the Task Order Manager (TOM). The COC form is signed and retained by the laboratory and becomes part of the sample's corresponding analytical data package.

3.5 Custody Seal

The custody seal is an adhesive-backed label, and it is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field and sealed in coolers for transit to the laboratory. The custody seals are signed and dated by the samplers and affixed across the opening edges of each cooler (two seals per cooler) containing environmental samples. The laboratory sample custodian will examine the custody seal for evidence of tampering and will notify the Tetra Tech TOM if evidence of tampering is observed.

3.6 Equipment Calibration Log

The Equipment Calibration Log is used to document calibration of measuring equipment used in the field. The Equipment Calibration Log documents that the manufacturer's instructions were followed for calibration of the equipment, including frequency and type of standard or calibration device. An Equipment Calibration Log must be maintained for each electronic measuring device requiring calibration. Entries must be made for each day the equipment is used.

3.7 Sample Log Sheets

The Soil and Sediment Sample Log Sheets are used to document the sampling of soils and sediments (see SOPs-05 and -08).

4.0 ATTACHMENTS

1. Chain-of-Custody Record
2. Equipment Calibration Log
3. Soil and Sediment Sample Log
4. Groundwater Sample Log Sheet

ATTACHMENT 1

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY | NUMBER | PAGE ____ OF ____

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
		CARRIER/WAYBILL NUMBER	CITY, STATE

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G)
PRESERVATIVE USED
TYPE OF ANALYSIS

DATE YEAR	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS								COMMENTS

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME
COMMENTS					

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

ATTACHMENT 2

EQUIPMENT CALIBRATION LOG

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: __________ INSTRUMENT NAME/MODEL: __________

SITE NAME: __________ MANUFACTURER: __________

PROJECT No.: __________ SERIAL NUMBER: __________

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

ATTACHMENT 3

SOIL AND SEDIMENT SAMPLE LOG SHEET

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: ____________________
Project No.: ____________________

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: ____________________
[] QA Sample Type: ____________________

Sample ID No.: ______________
Sample Location: ______________
Sampled By: ______________
C.O.C. No.: ______________

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

ATTACHMENT 4

GROUNDWATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc.
Houston, Texas

GROUNDWATER SAMPLE LOG SHEET

Page 1 of 1

Project Site Name: ______
Project No.: ______

[] Domestic Well Data
[] Monitoring Well Data
[] Other Well Type: ______
[] QA Sample Type: ______

Sample ID No.: ______
Sample Location: ______
Sampled By: ______
C.O.C. No.: ______
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Date:								
Time:	Visual	Standard	mS/cm	°C	NTU	mg/l		
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	TBD	TBD
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	

TBD: To Be Determined

APPENDIX C

LABORATORY ACCREDITATION

LABORATORY
ACCREDITATION
BUREAU

Certificate of Accreditation

ISO/IEC 17025:2005 ***Certificate Number L2226***

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228

has met the requirements set forth in L-A-B's policies and procedures, all requirements of ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories" and the U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).*

The accredited lab has demonstrated technical competence to a defined "Scope of Accreditation" and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Accreditation Granted through: November 30, 2012

R. Douglas Leonard, Jr., Managing Director
Laboratory Accreditation Bureau
Presented the 30th of November 2009

*See the laboratory's Scope of Accreditation for details of the DoD ELAP requirements
Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

LABORATORY ACCREDITATION BUREAU

Scope of Accreditation
For
Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228
Marcia K. McGinnity
877-345-1113

In recognition of a successful assessment to ISO/IEC 17025:2005 and the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in the DoD Quality Systems Manual for Environmental Laboratories (DoD QSM v4.1) based on the National Environmental Laboratory Accreditation Conference Chapter 5 Quality Systems Standard (NELAC Voted Revision June 5, 2003), accreditation is granted to Empirical Laboratories, LLC to perform the following tests:

Accreditation granted through: **November 30, 2012**

Testing - Environmental

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B	1,1,1-Trichloroethane (1,1,1-TCA)
GC/MS	EPA 8260B	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B	1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113; Freon 113)
GC/MS	EPA 8260B	1,1,2-Trichloroethane
GC/MS	EPA 8260B	1,1-Dichloroethane (1,1-DCA)
GC/MS	EPA 8260B	1,1-Dichloroethene (1,1-DCE)
GC/MS	EPA 8260B	1,1-Dichloropropene
GC/MS	EPA 8260B	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B	1,2,3-Trichloropropane
GC/MS	EPA 8260B	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B	1,2-Dibromo-3-chloropropane (DBCP)
GC/MS	EPA 8260B	1,2-Dibromoethane (EDB)
GC/MS	EPA 8260B	1,2-Dichlorobenzene
GC/MS	EPA 8260B	1,2-Dichloroethane (EDC)
GC/MS	EPA 8260B	1,2-Dichloropropane
GC/MS	EPA 8260B	1,3,5-Trimethylbenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B	1,3-Dichlorobenzene
GC/MS	EPA 8260B	1,3-Dichloropropane
GC/MS	EPA 8260B	1,4-Dichlorobenzene
GC/MS	EPA 8260B	1,4-Dioxane
GC/MS	EPA 8260B	1-Chlorohexane
GC/MS	EPA 8260B	2,2-Dichloropropane
GC/MS	EPA 8260B	2-Butanone (Methyl ethyl ketone; MEK)
GC/MS	EPA 8260B	2-Chloroethyl vinyl ether
GC/MS	EPA 8260B	2-Chlorotoluene
GC/MS	EPA 8260B	2-Hexanone (Methyl butyl ketone; MBK)
GC/MS	EPA 8260B	4-Chlorotoluene
GC/MS	EPA 8260B	4-Methyl-2-pentanone (Methyl isobutyl ketone; MIBK)
GC/MS	EPA 8260B	Acetone
GC/MS	EPA 8260B	Acetonirile
GC/MS	EPA 8260B	Acrolein
GC/MS	EPA 8260B	Acrylonitrile
GC/MS	EPA 8260B	Allyl chloride
GC/MS	EPA 8260B	Benzene
GC/MS	EPA 8260B	Bromobenzene
GC/MS	EPA 8260B	Bromochloromethane
GC/MS	EPA 8260B	Bromodichloromethane
GC/MS	EPA 8260B	Bromoform
GC/MS	EPA 8260B	Bromomethane
GC/MS	EPA 8260B	Carbon Disulfide
GC/MS	EPA 8260B	Carbon Tetrachloride
GC/MS	EPA 8260B	Chlorobenzene
GC/MS	EPA 8260B	Chloroethane
GC/MS	EPA 8260B	Chloroform
GC/MS	EPA 8260B	Chloromethane
GC/MS	EPA 8260B	Chloroprene
GC/MS	EPA 8260B	cis-1,2-Dichloroethene (cis-1,2-DCE)
GC/MS	EPA 8260B	cis-1,3-Dichloropropene
GC/MS	EPA 8260B	cis-1,4-Dichloro-2-butene

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260B	Cyclohexane
GC/MS	EPA 8260B	Dibromochloromethane
GC/MS	EPA 8260B	Dibromomethane
GC/MS	EPA 8260B	Dichlorodifluoromethane (CFC-12)
GC/MS	EPA 8260B	Di-isopropyl ether
GC/MS	EPA 8260B	ETBE
GC/MS	EPA 8260B	Ethyl methacrylate
GC/MS	EPA 8260B	Ethylbenzene
GC/MS	EPA 8260B	Hexachlorobutadiene
GC/MS	EPA 8260B	Hexane
GC/MS	EPA 8260B	Iodomethane
GC/MS	EPA 8260B	Isobutyl alcohol
GC/MS	EPA 8260B	Isopropylbenzene (Cumene)
GC/MS	EPA 8260B	Methacrylonitrile
GC/MS	EPA 8260B	Methyl Acetate
GC/MS	EPA 8260B	Methyl methacrylate
GC/MS	EPA 8260B	Methyl Tertiary Butyl Ether (MTBE)
GC/MS	EPA 8260B	Methylcyclohexane
GC/MS	EPA 8260B	Methylene Chloride, or Dichloromethane
GC/MS	EPA 8260B	Naphthalene
GC/MS	EPA 8260B	n-Butylbenzene
GC/MS	EPA 8260B	n-Propylbenzene
GC/MS	EPA 8260B	p-Isopropyltoluene
GC/MS	EPA 8260B	Propionitrile
GC/MS	EPA 8260B	sec-Butylbenzene
GC/MS	EPA 8260B	Styrene
GC/MS	EPA 8260B	t-Butyl alcohol
GC/MS	EPA 8260B	tert-Amyl methyl ether
GC/MS	EPA 8260B	tert-Butylbenzene
GC/MS	EPA 8260B	Tetrachloroethene (PCE; PERC)
GC/MS	EPA 8260B	Tetrahydrofuran
GC/MS	EPA 8260B	Toluene
GC/MS	EPA 8260B	trans-1,2-Dichloroethene (trans-1,2-DCE)

LABORATORY ACCREDITATION BUREAU

Certificate # L2226

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260B	trans-1,3-Dichloropropene
GC/MS	EPA 8260B	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260B	Trichloroethene (TCE)
GC/MS	EPA 8260B	Trichlorofluoromethane (CFC-11)
GC/MS	EPA 8260B	Vinyl acetate
GC/MS	EPA 8260B	Vinyl Chloride (VC)
GC/MS	EPA 8260B	Xylenes (Total)
GC/MS	EPA 8270C/D	1,1'-Biphenyl
GC/MS	EPA 8270C/D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/D	1,2-Dichlorobenzene
GC/MS	EPA 8270C/D	1,2-Diphenylhydrazine
GC/MS	EPA 8270C/D	1,3-Dichlorobenzene
GC/MS	EPA 8270C/D	1,4-Dichlorobenzene
GC/MS	EPA 8270C/D	1,4-Dioxane
GC/MS	EPA 8270C/D	1-Methylnaphthalene
GC/MS	EPA 8270C/D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/D	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/D	2,4,6-Trichlorophenol (TCP)
GC/MS	EPA 8270C/D	2,4-Dichlorophenol (DCP)
GC/MS	EPA 8270C/D	2,4-Dimethylphenol
GC/MS	EPA 8270C/D	2,4-Dinitrophenol
GC/MS	EPA 8270C/D	2,4-Dinitrotoluene (DNT)
GC/MS	EPA 8270C/D	2,6-Dichlorophenol
GC/MS	EPA 8270C/D	2,6-Dinitrotoluene
GC/MS	EPA 8270C/D	2-Chloronaphthalene
GC/MS	EPA 8270C/D	2-Chlorophenol
GC/MS	EPA 8270C/D	2-Methylnaphthalene
GC/MS	EPA 8270C/D	2-Methylphenol (o-Cresol)
GC/MS	EPA 8270C/D	2-Nitroaniline
GC/MS	EPA 8270C/D	2-Nitrophenol (ONP)
GC/MS	EPA 8270C/D	3,3'-Dichlorobenzidine (DCB)
GC/MS	EPA 8270C/D	3-Methylphenol

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	3-Nitroaniline
GC/MS	EPA 8270C/D	4,6-Dinitro-2-methylphenol (DNOC)
GC/MS	EPA 8270C/D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/D	4-Chloroaniline
GC/MS	EPA 8270C/D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/D	4-Methylphenol (p-Cresol)
GC/MS	EPA 8270C/D	4-Nitroaniline (PNA)
GC/MS	EPA 8270C/D	4-Nitrophenol (PNP)
GC/MS	EPA 8270C/D	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270C/D	Acenaphthene
GC/MS	EPA 8270C/D	Acenaphthylene
GC/MS	EPA 8270C/D	Acetaphenone
GC/MS	EPA 8270C/D	Aniline
GC/MS	EPA 8270C/D	Anthracene
GC/MS	EPA 8270C/D	Atrazine
GC/MS	EPA 8270C/D	Benzaldehyde
GC/MS	EPA 8270C/D	Benzidine
GC/MS	EPA 8270C/D	Benzo(a)anthracene
GC/MS	EPA 8270C/D	Benzo(a)pyrene
GC/MS	EPA 8270C/D	Benzo(b)fluoranthene
GC/MS	EPA 8270C/D	Benzo(g,h,i)perylene
GC/MS	EPA 8270C/D	Benzo(k)fluoranthene
GC/MS	EPA 8270C/D	Benzoic Acid
GC/MS	EPA 8270C/D	Benzyl alcohol
GC/MS	EPA 8270C/D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270C/D	bis(2-Chloroethyl)ether (BCEE)
GC/MS	EPA 8270C/D	Bis(2-chloroisopropyl)ether, or 2,2'-oxybis (1-Chloropropane)
GC/MS	EPA 8270C/D	bis(2-Ethylhexyl)phthalate (BEHP)
GC/MS	EPA 8270C/D	Butyl benzyl phthalate (BBP)
GC/MS	EPA 8270C/D	Caprolactam
GC/MS	EPA 8270C/D	Carbazole

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	Chrysene
GC/MS	EPA 8270C/D	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/D	Dibenzofuran (DBF)
GC/MS	EPA 8270C/D	Diethyl phthalate (DEP)
GC/MS	EPA 8270C/D	Dimethyl phthalate (DMP)
GC/MS	EPA 8270C/D	Di-n-butyl phthalate (DBP)
GC/MS	EPA 8270C/D	Di-n-octyl phthalate (DNOP)
GC/MS	EPA 8270C/D	Fluoranthene
GC/MS	EPA 8270C/D	Fluorene
GC/MS	EPA 8270C/D	Hexachlorobenzene (HCB)
GC/MS	EPA 8270C/D	Hexachlorobutadiene (HCBD)
GC/MS	EPA 8270C/D	Hexachlorocyclopentadiene (HCCPD)
GC/MS	EPA 8270C/D	Hexachloroethane (HCE)
GC/MS	EPA 8270C/D	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270C/D	Isophorone
GC/MS	EPA 8270C/D	Naphthalene
GC/MS	EPA 8270C/D	Nitrobenzene
GC/MS	EPA 8270C/D	N-Nitrosodimethylamine
GC/MS	EPA 8270C/D	N-Nitroso-di-n-propylamine (NDPA)
GC/MS	EPA 8270C/D	N-nitrosodiphenylamine (NDPHA)
GC/MS	EPA 8270C/D	Pentachlorophenol
GC/MS	EPA 8270C/D	Phenanthrene
GC/MS	EPA 8270C/D	Phenol
GC/MS	EPA 8270C/D	Pyrene
GC/MS	EPA 8270C/D	Pyridine
GC/ECD	EPA 8081A/B	4,4'-DDD
GC/ECD	EPA 8081A/B	4,4'-DDE
GC/ECD	EPA 8081A/B	4,4'-DDT
GC/ECD	EPA 8081A/B	Aldrin
GC/ECD	EPA 8081A/B	alpha-BHC (alpha-HCH)
GC/ECD	EPA 8081A/B	alpha-Chlordane
GC/ECD	EPA 8081A/B	beta-BHC (beta-HCH)
GC/ECD	EPA 8081A/B	delta-BHC (delta-HCH)

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8081A/B	Dieldrin
GC/ECD	EPA 8081A/B	Endosulfan I
GC/ECD	EPA 8081A/B	Endosulfan II
GC/ECD	EPA 8081A/B	Endosulfan sulfate
GC/ECD	EPA 8081A/B	Endrin
GC/ECD	EPA 8081A/B	Endrin aldehyde
GC/ECD	EPA 8081A/B	Endrin ketone
GC/ECD	EPA 8081A/B	gamma-BHC (Lindane; gamma-HCH)
GC/ECD	EPA 8081A/B	gamma-Chlordane
GC/ECD	EPA 8081A/B	Heptachlor
GC/ECD	EPA 8081A/B	Heptachlor epoxide
GC/ECD	EPA 8081A/B	Methoxychlor
GC/ECD	EPA 8081A/B	Chlordane
GC/ECD	EPA 8081A/B	Toxaphene
GC/ECD	EPA 8082 /A	Aroclor-1016
GC/ECD	EPA 8082 /A	Aroclor-1221
GC/ECD	EPA 8082 /A	Aroclor-1232
GC/ECD	EPA 8082 /A	Aroclor-1242
GC/ECD	EPA 8082 /A	Aroclor-1248
GC/ECD	EPA 8082 /A	Aroclor-1254
GC/ECD	EPA 8082 /A	Aroclor-1260
GC/ECD	EPA 8082 /A	Aroclor-1262
GC/ECD	EPA 8082 /A	Aroclor-1268
GC/ECD	EPA 8151A	2,4,5-T
GC/ECD	EPA 8151A	2,4,5-TP (Silvex)
GC/ECD	EPA 8151A	2,4-D
GC/ECD	EPA 8151A	2,4-DB
GC/ECD	EPA 8151A	Dalapon
GC/ECD	EPA 8151A	Dicamba
GC/ECD	EPA 8151A	Dichlorprop
GC/ECD	EPA 8151A	Dinoseb
GC/ECD	EPA 8151A	MCPA
GC/ECD	EPA 8151A	MCPP (Mecoprop)

Non-Potable Water		
Technology	**Method**	**Analyte**
HPLC/UV	EPA 8330A/B	1,3,5-Trinitrobenzene
HPLC/UV	EPA 8330A/B	1,3-Dinitrobenzene
HPLC/UV	EPA 8330A/B	2,4,6-Trinitrophenylmethylnitramine (Tetryl)
HPLC/UV	EPA 8330A/B	2,4,6-Trinitrotoluene (TNT)
HPLC/UV	EPA 8330A/B	2,4-Dinitrotoluene (DNT)
HPLC/UV	EPA 8330A/B	2,6-Dinitrotoluene
HPLC/UV	EPA 8330A/B	2-Amino-4,6-dinitrotoluene
HPLC/UV	EPA 8330A/B	2-Nitrotoluene (ONT)
HPLC/UV	EPA 8330A/B	3,5-Dinitroaniline
HPLC/UV	EPA 8330A/B	3-Nitrotoluene
HPLC/UV	EPA 8330A/B	4-Amino-2,6-dinitrotoluene
HPLC/UV	EPA 8330A/B	4-Nitrotoluene (PNT)
HPLC/UV	EPA 8330A/B	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
HPLC/UV	EPA 8330A/B	Nitrobenzene
HPLC/UV	EPA 8330A/B	Nitroglycerin
HPLC/UV	EPA 8330A/B	Nitroguanidine
HPLC/UV	EPA 8330A/B	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC/UV	EPA 8330A/B	3,5-Dinitroaniline
HPLC/UV	EPA 8330A/B	PETN
GC/FID	FLPRO	Petroleum Range Organics
GC/FID	EPA 8015B	TPH DRO
GC/FID	EPA 8015B	TPH GRO
GC/FID	RSK-175	Methane
GC/FID	RSK-175	Ethane
GC/FID	RSK-175	Ethene
GC/ECD	EPA 8011	1,2-Dibromoethane (EDB)
GC/ECD	EPA 8011	1,2-Dibromo-3-chloropropane (DBCP)
HPLC/MS	EPA 6850	Perchlorate
ICP	EPA 6010B/C	Aluminum
ICP	EPA 6010B/C	Antimony
ICP	EPA 6010B/C	Arsenic
ICP	EPA 6010B/C	Barium
ICP	EPA 6010B/C	Beryllium

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP	EPA 6010B/C	Boron
ICP	EPA 6010B/C	Cadmium
ICP	EPA 6010B/C	Calcium
ICP	EPA 6010B/C	Chromium, total
ICP	EPA 6010B/C	Cobalt
ICP	EPA 6010B/C	Copper
ICP	EPA 6010B/C	Iron
ICP	EPA 6010B/C	Lead
ICP	EPA 6010B/C	Magnesium
ICP	EPA 6010B/C	Manganese
CVAA	EPA 7470A	Mercury
ICP	EPA 6010B/C	Molybdenum
ICP	EPA 6010B/C	Nickel
ICP	EPA 6010B/C	Potassium
ICP	EPA 6010B/C	Selenium
ICP	EPA 6010B/C	Silver
ICP	EPA 6010B/C	Sodium
ICP	EPA 6010B/C	Strontium
ICP	EPA 6010B/C	Thallium
ICP	EPA 6010B/C	Tin
ICP	EPA 6010B/C	Titanium
ICP	EPA 6010B/C	Vanadium
ICP	EPA 6010B/C	Zinc
IC	EPA 300.0	Chloride
IC	EPA 300.0	Fluoride
IC	EPA 300.0	Nitrate
IC	EPA 300.0	Nitrite
IC	EPA 300.0	Sulfate
IC	EPA 9056A	Chloride
IC	EPA 9056A	Fluoride
IC	EPA 9056A	Nitrate
IC	EPA 9056A	Nitrite
IC	EPA 9056A	Sulfate

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Non-Potable Water		
Technology	**Method**	**Analyte**
Titration	SM 2320B $20^{th}/21^{st}$ edition	Alkalinity
Colorimetric	SM 4500 B, G, $20^{th}/21^{st}$ edition	Ammonia
Colorimetric	EPA 410.4	COD
UV/Vis	EPA 7196A	Hexavalent Chromium
Colorimetric	EPA 353.2	Nitrocellulose
Colorimetric	EPA 353.2	Nitrate/Nitrite
Gravimetric	EPA 1664A	O&G
Titration	Chap.7, Sect. 7.3.4 Mod.	Reactive Sulfide
Titration	SM 4500 S-2CF, $20^{th}/21^{st}$ edition	Sulfide
UV/Vis	SM 4500 P B5, E, $20^{th}/21^{st}$ edition	Total Phosphorus (as P)
UV/Vis	SM 4500 PE, $20^{th}/21^{st}$ edition	Ortho-Phosphate (as P)
TOC	9060A/SM5310C, $20^{th}/21^{st}$ edition	Total Organic Carbon
Gravimetric	SM 2540C, $20^{th}/21^{st}$ edition	TDS
Gravimetric	SM 2540D, $20^{th}/21^{st}$ edition	TSS
Colorimetric	EPA 9012A/B	Cyanide
Physical	EPA 1010A	Ignitability
Physical	EPA 9095B	Paint Filter
Probe	EPA 9040B/C	pH
Preparation	**Method**	**Type**
Preparation	EPA 1311	TCLP
Preparation	EPA 3005A	Metals digestion
Preparation	EPA 3010A	Metals digestion
Preparation	EPA 3510C	Organics Liquid Extraction
Preparation	EPA 5030A/B	Purge and Trap Water

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B	1,1,1-Trichloroethane (1,1,1-TCA)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B	1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113; Freon 113)
GC/MS	EPA 8260B	1,1,2-Trichloroethane
GC/MS	EPA 8260B	1,1-Dichloroethane (1,1-DCA)
GC/MS	EPA 8260B	1,1-Dichloroethene (1,1-DCE)
GC/MS	EPA 8260B	1,1-Dichloropropene
GC/MS	EPA 8260B	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B	1,2,3-Trichloropropane
GC/MS	EPA 8260B	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B	1,2-Dibromo-3-chloropropane (DBCP)
GC/MS	EPA 8260B	1,2-Dibromoethane (EDB)
GC/MS	EPA 8260B	1,2-Dichlorobenzene
GC/MS	EPA 8260B	1,2-Dichloroethane (EDC)
GC/MS	EPA 8260B	1,2-Dichloropropane
GC/MS	EPA 8260B	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B	1,3-Dichlorobenzene
GC/MS	EPA 8260B	1,3-Dichloropropane
GC/MS	EPA 8260B	1,4-Dichlorobenzene
GC/MS	EPA 8260B	1,4-Dioxane
GC/MS	EPA 8260B	2,2-Dichloropropane
GC/MS	EPA 8260B	2-Butanone (Methyl ethyl ketone; MEK)
GC/MS	EPA 8260B	2-Chlorotoluene
GC/MS	EPA 8260B	2-Hexanone (Methyl butyl ketone; MBK)
GC/MS	EPA 8260B	4-Chlorotoluene
GC/MS	EPA 8260B	4-Methyl-2-pentanone (Methyl isobutyl ketone; MIBK)
GC/MS	EPA 8260B	Acetone
GC/MS	EPA 8260B	Acetonitrile
GC/MS	EPA 8260B	Acrolein
GC/MS	EPA 8260B	Acrylonitrile
GC/MS	EPA 8260B	Allyl chloride

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Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B	Benzene
GC/MS	EPA 8260B	Bromobenzene
GC/MS	EPA 8260B	Bromochloromethane
GC/MS	EPA 8260B	Bromodichloromethane
GC/MS	EPA 8260B	Bromoform
GC/MS	EPA 8260B	Bromomethane
GC/MS	EPA 8260B	Carbon Disulfide
GC/MS	EPA 8260B	Carbon Tetrachloride
GC/MS	EPA 8260B	Chlorobenzene
GC/MS	EPA 8260B	Chloroethane
GC/MS	EPA 8260B	Chloroform
GC/MS	EPA 8260B	Chloromethane
GC/MS	EPA 8260B	Chloroprene
GC/MS	EPA 8260B	cis-1,2-Dichloroethene (cis-1,2-DCE)
GC/MS	EPA 8260B	cis-1,3-Dichloropropene
GC/MS	EPA 8260B	cis-1,4-Dichloro-2-butene
GC/MS	EPA 8260B	Cyclohexane
GC/MS	EPA 8260B	Dibromochloromethane
GC/MS	EPA 8260B	Dibromomethane
GC/MS	EPA 8260B	Dichlorodifluoromethane (CFC-12)
GC/MS	EPA 8260B	Ethyl methacrylate
GC/MS	EPA 8260B	Ethylbenzene
GC/MS	EPA 8260B	Hexachlorobutadiene
GC/MS	EPA 8260B	Hexane
GC/MS	EPA 8260B	Iodomethane
GC/MS	EPA 8260B	Isobutyl alcohol
GC/MS	EPA 8260B	Isopropylbenzene (Cumene)
GC/MS	EPA 8260B	Methacrylonitrile
GC/MS	EPA 8260B	Methyl Acetate
GC/MS	EPA 8260B	Methyl methacrylate
GC/MS	EPA 8260B	Methyl Tertiary Butyl Ether (MTBE)
GC/MS	EPA 8260B	Methylcyclohexane

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B	Methylene Chloride, or Dichloromethane
GC/MS	EPA 8260B	Naphthalene
GC/MS	EPA 8260B	n-Butylbenzene
GC/MS	EPA 8260B	n-Propylbenzene
GC/MS	EPA 8260B	p-Isopropyltoluene
GC/MS	EPA 8260B	Propionitrile
GC/MS	EPA 8260B	sec-Butylbenzene
GC/MS	EPA 8260B	Styrene
GC/MS	EPA 8260B	tert-Butylbenzene
GC/MS	EPA 8260B	Tetrachloroethene (PCE; PERC)
GC/MS	EPA 8260B	Toluene
GC/MS	EPA 8260B	trans-1,2-Dichloroethene (trans-1,2-DCE)
GC/MS	EPA 8260B	trans-1,3-Dichloropropene
GC/MS	EPA 8260B	trans-1,4-Dichloro-2-butene
GC/MS	EPA 8260B	Trichloroethene (TCE)
GC/MS	EPA 8260B	Trichlorofluoromethane (CFC-11)
GC/MS	EPA 8260B	Vinyl acetate
GC/MS	EPA 8260B	Vinyl Chloride (VC)
GC/MS	EPA 8260B	Xylenes (Total)
GC/MS	EPA 8270C/D	Bis(2-chloroisopropyl)ether, or 2,2'-oxybis (1-Chloropropane)
GC/MS	EPA 8270C/D	1,1'-Biphenyl
GC/MS	EPA 8270C/D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270C/D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/D	1,2-Dichlorobenzene
GC/MS	EPA 8270C/D	1,2-Diphenylhydrazine
GC/MS	EPA 8270C/D	1,3-Dichlorobenzene
GC/MS	EPA 8270C/D	1,4-Dichlorobenzene
GC/MS	EPA 8270C/D	1,4-Dioxane
GC/MS	EPA 8270C/D	1-Methylnaphthalene
GC/MS	EPA 8270C/D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/D	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/D	2,4,6-Trichlorophenol (TCP)

LABORATORY ACCREDITATION BUREAU

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Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	2,4-Dichlorophenol (DCP)
GC/MS	EPA 8270C/D	2,4-Dimethylphenol
GC/MS	EPA 8270C/D	2,4-Dinitrophenol
GC/MS	EPA 8270C/D	2,4-Dinitrotoluene (DNT)
GC/MS	EPA 8270C/D	2,6-Dichlorophenol
GC/MS	EPA 8270C/D	2,6-Dinitrotoluene
GC/MS	EPA 8270C/D	2-Chloronaphthalene
GC/MS	EPA 8270C/D	2-Chlorophenol
GC/MS	EPA 8270C/D	2-Methylnaphthalene
GC/MS	EPA 8270C/D	2-Methylphenol (o-Cresol)
GC/MS	EPA 8270C/D	2-Nitroaniline
GC/MS	EPA 8270C/D	2-Nitrophenol (ONP)
GC/MS	EPA 8270C/D	3,3'-Dichlorobenzidine (DCB)
GC/MS	EPA 8270C/D	3-Methylphenol
GC/MS	EPA 8270C/D	3-Nitroaniline
GC/MS	EPA 8270C/D	4,6-Dinitro-2-methylphenol (DNOC)
GC/MS	EPA 8270C/D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/D	4-Chloroaniline
GC/MS	EPA 8270C/D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/D	4-Methylphenol (p-Cresol)
GC/MS	EPA 8270C/D	4-Nitroaniline (PNA)
GC/MS	EPA 8270C/D	4-Nitrophenol (PNP)
GC/MS	EPA 8270C/D	Acenaphthene
GC/MS	EPA 8270C/D	Acenaphthylene
GC/MS	EPA 8270C/D	Acetaphenone
GC/MS	EPA 8270C/D	Aniline
GC/MS	EPA 8270C/D	Anthracene
GC/MS	EPA 8270C/D	Atrazine
GC/MS	EPA 8270C/D	Benzaldehyde
GC/MS	EPA 8270C/D	Benzidine
GC/MS	EPA 8270C/D	Benzo(a)anthracene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	Benzo(a)anthracene
GC/MS	EPA 8270C/D	Benzo(a)pyrene
GC/MS	EPA 8270C/D	Benzo(b)fluoranthene
GC/MS	EPA 8270C/D	Benzo(g,h,i)perylene
GC/MS	EPA 8270C/D	Benzo(k)fluoranthene
GC/MS	EPA 8270C/D	Benzoic Acid
GC/MS	EPA 8270C/D	Benzyl alcohol
GC/MS	EPA 8270C/D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270C/D	bis(2-Chloroethyl)ether (BCEE)
GC/MS	EPA 8270C/D	bis(2-Ethylhexyl)phthalate (BEHP)
GC/MS	EPA 8270C/D	Butyl benzyl phthalate (BBP)
GC/MS	EPA 8270C/D	Caprolactam
GC/MS	EPA 8270C/D	Carbazole
GC/MS	EPA 8270C/D	Chrysene
GC/MS	EPA 8270C/D	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/D	Dibenzofuran (DBF)
GC/MS	EPA 8270C/D	Diethyl phthalate (DEP)
GC/MS	EPA 8270C/D	Dimethyl phthalate (DMP)
GC/MS	EPA 8270C/D	Di-n-butyl phthalate (DBP)
GC/MS	EPA 8270C/D	Di-n-octyl phthalate (DNOP)
GC/MS	EPA 8270C/D	Fluoranthene
GC/MS	EPA 8270C/D	Fluorene
GC/MS	EPA 8270C/D	Hexachlorobenzene (HCB)
GC/MS	EPA 8270C/D	Hexachlorobutadiene (HCBD)
GC/MS	EPA 8270C/D	Hexachlorocyclopentadiene (HCCPD)
GC/MS	EPA 8270C/D	Hexachloroethane (HCE)
GC/MS	EPA 8270C/D	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270C/D	Isophorone
GC/MS	EPA 8270C/D	Naphthalene
GC/MS	EPA 8270C/D	Nitrobenzene
GC/MS	EPA 8270C/D	N-Nitrosodimethylamine
GC/MS	EPA 8270C/D	N-Nitroso-di-n-propylamine (NDPA)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/D	N-nitrosodiphenylamine (NDPHA)
GC/MS	EPA 8270C/D	Pentachlorophenol
GC/MS	EPA 8270C/D	Phenanthrene
GC/MS	EPA 8270C/D	Phenol
GC/MS	EPA 8270C/D	Pyrene
GC/MS	EPA 8270C/D	Pyridine
GC/ECD	EPA 8081A/B	4,4'-DDD
GC/ECD	EPA 8081A/B	4,4'-DDE
GC/ECD	EPA 8081A/B	4,4'-DDT
GC/ECD	EPA 8081A/B	Aldrin
GC/ECD	EPA 8081A/B	alpha-BHC (alpha-HCH)
GC/ECD	EPA 8081A/B	alpha-Chlordane
GC/ECD	EPA 8081A/B	beta-BHC (beta-HCH)
GC/ECD	EPA 8081A/B	delta-BHC (delta-HCH)
GC/ECD	EPA 8081A/B	Chlordane
GC/ECD	EPA 8081A/B	Dieldrin
GC/ECD	EPA 8081A/B	Endosulfan I
GC/ECD	EPA 8081A/B	Endosulfan II
GC/ECD	EPA 8081A/B	Endosulfan sulfate
GC/ECD	EPA 8081A/B	Endrin
GC/ECD	EPA 8081A/B	Endrin aldehyde
GC/ECD	EPA 8081A/B	Endrin ketone
GC/ECD	EPA 8081A/B	gamma-BHC (Lindane; gamma-HCH)
GC/ECD	EPA 8081A/B	gamma-Chlordane
GC/ECD	EPA 8081A/B	Heptachlor
GC/ECD	EPA 8081A/B	Heptachlor epoxide
GC/ECD	EPA 8081A/B	Methoxychlor
GC/ECD	EPA 8081A/B	Toxaphene
GC/ECD	EPA 8082 /A	Aroclor-1016
GC/ECD	EPA 8082 /A	Aroclor-1221
GC/ECD	EPA 8082 /A	Aroclor-1232
GC/ECD	EPA 8082 /A	Aroclor-1242

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8082 /A	Aroclor-1248
GC/ECD	EPA 8082 /A	Aroclor-1254
GC/ECD	EPA 8082 /A	Aroclor-1260
GC/ECD	EPA 8082 /A	Aroclor-1262
GC/ECD	EPA 8082 /A	Aroclor-1268
GC/ECD	EPA 8151A	2,4,5-T
GC/ECD	EPA 8151A	2,4,5-TP (Silvex)
GC/ECD	EPA 8151A	2,4-D
GC/ECD	EPA 8151A	2,4-DB
GC/ECD	EPA 8151A	Dalapon
GC/ECD	EPA 8151A	Dicamba
GC/ECD	EPA 8151A	Dichlorprop
GC/ECD	EPA 8151A	Dinoseb
GC/ECD	EPA 8151A	MCPA
GC/ECD	EPA 8151A	MCPP (Mecoprop)
HPLC/UV	EPA 8330A	1,3,5-Trinitrobenzene
HPLC/UV	EPA 8330A	1,3-Dinitrobenzene
HPLC/UV	EPA 8330A	2,4,6-Trinitrophenylmethylnitramine (Tetryl)
HPLC/UV	EPA 8330A	2,4,6-Trinitrotoluene (TNT)
HPLC/UV	EPA 8330A	2,4-Dinitrotoluene (DNT)
HPLC/UV	EPA 8330A	2,6-Dinitrotoluene
HPLC/UV	EPA 8330A	2-Amino-4,6-dinitrotoluene
HPLC/UV	EPA 8330A	2-Nitrotoluene (ONT)
HPLC/UV	EPA 8330A	3-Nitrotoluene
HPLC/UV	EPA 8330A	3,5-Dinitroaniline
HPLC/UV	EPA 8330A	4-Amino-2,6-dinitrotoluene
HPLC/UV	EPA 8330A	4-Nitrotoluene (PNT)
HPLC/UV	EPA 8330A	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
HPLC/UV	EPA 8330A	Nitroglycerin
HPLC/UV	EPA 8330A	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC/UV	EPA 8330A	Nitrobenzene
HPLC/UV	EPA 8330A	Nitroguanidine

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
HPLC/UV	EPA 8330A	PETN
HPLC/UV	EPA 8330B	1,3,5-Trinitrobenzene
HPLC/UV	EPA 8330B	1,3-Dinitrobenzene
HPLC/UV	EPA 8330B	2,4,6-Trinitrophenylmethylnitramine (Tetryl)
HPLC/UV	EPA 8330B	2,4,6-Trinitrotoluene (TNT)
HPLC/UV	EPA 8330B	2,4-Dinitrotoluene (DNT)
HPLC/UV	EPA 8330B	2,6-Dinitrotoluene
HPLC/UV	EPA 8330B	2-Amino-4,6-dinitrotoluene
HPLC/UV	EPA 8330B	2-Nitrotoluene (ONT)
HPLC/UV	EPA 8330B	3-Nitrotoluene
HPLC/UV	EPA 8330B	3,5-Dinitroaniline
HPLC/UV	EPA 8330B	4-Amino-2,6-dinitrotoluene
HPLC/UV	EPA 8330B	4-Nitrotoluene (PNT)
HPLC/UV	EPA 8330B	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)
HPLC/UV	EPA 8330B	Nitroglycerin
HPLC/UV	EPA 8330B	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC/UV	EPA 8330B	Nitrobenzene
HPLC/UV	EPA 8330B	Nitroguanidine
HPLC/UV	EPA 8330B	PETN
GC/FID	FLPRO	Petroleum Range Organics
GC/FID	EPA 8015B	TPH DRO
GC/FID	EPA 8015B	TPH GRO
HPLC/MS	EPA 6850	Perchlorate
ICP	EPA 6010B/C	Aluminum
ICP	EPA 6010B/C	Antimony
ICP	EPA 6010B/C	Arsenic
ICP	EPA 6010B/C	Barium
ICP	EPA 6010B/C	Beryllium
ICP	EPA 6010B/C	Boron
ICP	EPA 6010B/C	Cadmium
ICP	EPA 6010B/C	Calcium
ICP	EPA 6010B/C	Chromium, total

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP	EPA 6010B/C	Cobalt
ICP	EPA 6010B/C	Copper
ICP	EPA 6010B/C	Iron
ICP	EPA 6010B/C	Lead
ICP	EPA 6010B/C	Magnesium
ICP	EPA 6010B/C	Manganese
CVAA	EPA 7471A/B	Mercury
ICP	EPA 6010B/C	Molybdenum
ICP	EPA 6010B/C	Nickel
ICP	EPA 6010B/C	Potassium
ICP	EPA 6010B/C	Selenium
ICP	EPA 6010B/C	Silver
ICP	EPA 6010B/C	Sodium
ICP	EPA 6010B/C	Strontium
ICP	EPA 6010B/C	Tin
ICP	EPA 6010B/C	Titanium
ICP	EPA 6010B/C	Thallium
ICP	EPA 6010B/C	Vanadium
ICP	EPA 6010B/C	Zinc
UV/Vis	EPA 7196A	Hexavalent Chromium
TOC	Lloyd Kahn	Total Organic Carbon
Colorimetric	EPA 353.2	Nitrocellulose
Colorimetric	EPA 9012A/B	Cyanide
Titration	Chap.7, Sect. 7.3.4 Mod.	Reactive Sulfide
Titration	EPA 9034	Sulfide
Probe	EPA 9045C/D	pH
Preparation	**Method**	**Type**
Preparation	EPA 1311	TCLP
Preparation	EPA 1312	SPLP
Preparation	NJ Modified 3060A	Hexavalent Chromium
Preparation	EPA 3050B	Metals Digestion
Preparation	EPA 3546	Organics Microwave Extraction

Certificate # L2226

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
Preparation	EPA 3550B/C	Organics Sonication
Preparation	SM 2540B 20th/21st edition	Percent Solids (Percent Moisture)
Preparation	EPA 5035 /A	Purge and Trap Solid

Notes:

1) This laboratory offers commercial testing service.

Approved By: ______________________ Date: April 8, 2011

R. Douglas Leonard
Chief Technical Officer

Issued: 11/30/09 Revised: 2/9/10 Revised: 3/31/10 Revised: 10/8/10 Revised: 1/25/11 Revised: 4/8/11

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228-1229

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Certificate Number: T104704307-10-2
Effective Date: 1/1/2011
Expiration Date: 12/31/2011

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	T104704307-10-2
Expiration Date:	12/31/2011
Issue Date:	1/1/2011

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228-1229

These fields of accreditation supercedeall previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non Potable Water***

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	NJ	1610	10006403

Method EPA 1664

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (O&G)	NJ	1803	10127409

Method EPA 180.1

Analyte	AB	Analyte ID	Method ID
Turbidity	NJ	2055	10011606

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Chloride	NJ	1575	10053006
Fluoride	NJ	1730	10053006
Nitrate as N	NJ	1810	10053006
Nitrite as N	NJ	1840	10053006
Sulfate	NJ	2000	10053006

Method EPA 335.4

Analyte	AB	Analyte ID	Method ID
Total cyanide	NJ	1645	10061402

Method EPA 351.2

Analyte	AB	Analyte ID	Method ID
Kjeldahl nitrogen - total	NJ	1795	10065200

Method EPA 353.2

Analyte	AB	Analyte ID	Method ID
Nitrate-nitrite	NJ	1820	10067400

Method EPA 410.4

Analyte	AB	Analyte ID	Method ID
Chemical oxygen demand	NJ	1565	10077200

Method EPA 420.1

Analyte	AB	Analyte ID	Method ID
Total phenolics	NJ	1905	10079400

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Expiration Date: 12/31/2011
Issue Date: 1/1/2011

Empirical Laboratories, LLC

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Nashville, TN 37228-1229

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Matrix: ***Non Potable Water***

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	NJ	1905	10080203

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	NJ	1000	10155201
Antimony	NJ	1005	10155201
Arsenic	NJ	1010	10155201
Barium	NJ	1015	10155201
Beryllium	NJ	1020	10155201
Boron	NJ	1025	10155201
Cadmium	NJ	1030	10155201
Calcium	NJ	1035	10155201
Chromium	NJ	1040	10155201
Cobalt	NJ	1050	10155201
Copper	NJ	1055	10155201
Iron	NJ	1070	10155201
Lead	NJ	1075	10155201
Magnesium	NJ	1085	10155201
Manganese	NJ	1090	10155201
Molybdenum	NJ	1100	10155201
Nickel	NJ	1105	10155201
Potassium	NJ	1125	10155201
Selenium	NJ	1140	10155201
Silver	NJ	1150	10155201
Sodium	NJ	1155	10155201
Thallium	NJ	1165	10155201
Tin	NJ	1175	10155201
Vanadium	NJ	1185	10155201
Zinc	NJ	1190	10155201

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Matrix: ***Non Potable Water***

Method EPA 7470

Analyte	AB	Analyte ID	Method ID
Mercury	NJ	1095	10165603

Method EPA 8011

Analyte	AB	Analyte ID	Method ID
1,2-Dibromo-3-chloropropane (DBCP)	NJ	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	NJ	4585	10173009

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	NJ	9369	10173203
Gasoline range organics (GRO)	NJ	9408	10173203

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	NJ	7355	10178402
4,4'-DDE	NJ	7360	10178402
4,4'-DDT	NJ	7365	10178402
Aldrin	NJ	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	NJ	7110	10178402
alpha-Chlordane	NJ	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	NJ	7115	10178402
Chlordane (tech.)	NJ	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	NJ	7105	10178402
Dieldrin	NJ	7470	10178402
Endosulfan I	NJ	7510	10178402
Endosulfan II	NJ	7515	10178402
Endosulfan sulfate	NJ	7520	10178402
Endrin	NJ	7540	10178402
Endrin aldehyde	NJ	7530	10178402
Endrin ketone	NJ	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	NJ	7120	10178402
gamma-Chlordane	NJ	7245	10178402

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Matrix: ***Non Potable Water***

Heptachlor	NJ	7685	10178402
Heptachlor epoxide	NJ	7690	10178402
Methoxychlor	NJ	7810	10178402
Toxaphene (Chlorinated camphene)	NJ	8250	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	NJ	8880	10179007
Aroclor-1221 (PCB-1221)	NJ	8885	10179007
Aroclor-1232 (PCB-1232)	NJ	8890	10179007
Aroclor-1242 (PCB-1242)	NJ	8895	10179007
Aroclor-1248 (PCB-1248)	NJ	8900	10179007
Aroclor-1254 (PCB-1254)	NJ	8905	10179007
Aroclor-1260 (PCB-1260)	NJ	8910	10179007

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	NJ	8655	10183003
2,4-D	NJ	8545	10183003
Dalapon	NJ	8555	10183003
Dicamba	NJ	8595	10183003
Dichloroprop (Dichlorprop)	NJ	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	NJ	8620	10183003
MCPA	NJ	7775	10183003
MCPP	NJ	7780	10183003
Silvex (2,4,5-TP)	NJ	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	NJ	5105	10184404
1,1,1-Trichloroethane	NJ	5160	10184404
1,1,2,2-Tetrachloroethane	NJ	5110	10184404
1,1,2-Trichloroethane	NJ	5165	10184404
1,1-Dichloroethane	NJ	4630	10184404

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Matrix: ***Non Potable Water***

1,1-Dichloroethylene (1,1-Dichloroethene)	NJ	4640	10184404
1,2,3-Trichlorobenzene	NJ	5150	10184404
1,2,3-Trichloropropane	NJ	5180	10184404
1,2,4-Trichlorobenzene	NJ	5155	10184404
1,2,4-Trimethylbenzene	NJ	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	NJ	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	NJ	4585	10184404
1,2-Dichlorobenzene	NJ	4610	10184404
1,2-Dichloroethane	NJ	4635	10184404
1,2-Dichloropropane	NJ	4655	10184404
1,3,5-Trimethylbenzene	NJ	5215	10184404
1,3-Dichlorobenzene	NJ	4615	10184404
1,3-Dichloropropane	NJ	4660	10184404
1,4-Dichlorobenzene	NJ	4620	10184404
1,4-Dioxane (1,4- Diethyleneoxide)	NJ	4735	10184404
2-Butanone (Methyl ethyl ketone, MEK)	NJ	4410	10184404
2-Hexanone	NJ	4860	10184404
4-Isopropyltoluene	NJ	4915	10184404
4-Methyl-2-pentanone (MIBK)	NJ	4995	10184404
Acetone	NJ	4315	10184404
Acetonitrile	NJ	4320	10184404
Acrolein (Propenal)	NJ	4325	10184404
Acrylonitrile	NJ	4340	10184404
Benzene	NJ	4375	10184404
Bromochloromethane	NJ	4390	10184404
Bromodichloromethane	NJ	4395	10184404
Bromoform	NJ	4400	10184404
Bromomethane (Methyl bromide)	NJ	4950	10184404
Carbon disulfide	NJ	4450	10184404
Carbon tetrachloride	NJ	4455	10184404

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Matrix: ***Non Potable Water***

Chlorobenzene	NJ	4475	10184404
Chloroethane	NJ	4485	10184404
Chloroform	NJ	4505	10184404
Chloromethane (Methyl chloride)	NJ	4960	10184404
cis-1,2-Dichloroethylene	NJ	4645	10184404
cis-1,3-Dichloropropylene	NJ	4680	10184404
Dibromochloromethane	NJ	4575	10184404
Dibromomethane	NJ	4595	10184404
Dichlorodifluoromethane	NJ	4625	10184404
Ethyl methacrylate	NJ	4810	10184404
Ethylbenzene	NJ	4765	10184404
Hexachlorobutadiene	NJ	4835	10184404
Iodomethane (Methyl iodide)	NJ	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	NJ	4875	10184404
Isopropylbenzene	NJ	4900	10184404
Methacrylonitrile	NJ	4925	10184404
Methyl methacrylate	NJ	4990	10184404
Methyl tert-butyl ether (MTBE)	NJ	5000	10184404
Methylene chloride	NJ	4975	10184404
Naphthalene	NJ	5005	10184404
n-Butylbenzene	NJ	4435	10184404
n-Propylbenzene	NJ	5090	10184404
Propionitrile (Ethyl cyanide)	NJ	5080	10184404
sec-Butylbenzene	NJ	4440	10184404
Styrene	NJ	5100	10184404
tert-Butylbenzene	NJ	4445	10184404
Tetrachloroethylene (Perchloroethylene)	NJ	5115	10184404
Toluene	NJ	5140	10184404
trans-1,2-Dichloroethylene	NJ	4700	10184404
trans-1,4-Dichloro-2-butene	NJ	4605	10184404

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Matrix: ***Non Potable Water***

Trichloroethene (Trichloroethylene)	NJ	5170	10184404
Trichlorofluoromethane	NJ	5175	10184404
Trichlorotrifluoroethane	NJ	5185	10184404
Vinyl acetate	NJ	5225	10184404
Vinyl chloride	NJ	5235	10184404
Xylene (total)	NJ	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	NJ	6715	10185203
1,2,4-Trichlorobenzene	NJ	5155	10185203
1,2-Dichlorobenzene	NJ	4610	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	NJ	6885	10185203
1,3-Dichlorobenzene	NJ	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	NJ	6160	10185203
1,4-Dichlorobenzene	NJ	4620	10185203
1,4-Naphthoquinone	NJ	6420	10185203
1,4-Phenylenediamine	NJ	6630	10185203
1-Naphthylamine	NJ	6425	10185203
2,3,4,6-Tetrachlorophenol	NJ	6735	10185203
2,4,5-Trichlorophenol	NJ	6835	10185203
2,4,6-Trichlorophenol	NJ	6840	10185203
2,4-Dichlorophenol	NJ	6000	10185203
2,4-Dimethylphenol	NJ	6130	10185203
2,4-Dinitrophenol	NJ	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	NJ	6185	10185203
2,6-Dichlorophenol	NJ	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	NJ	6190	10185203
2-Acetylaminofluorene	NJ	5515	10185203
2-Chloronaphthalene	NJ	5795	10185203
2-Chlorophenol	NJ	5800	10185203

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Matrix: ***Non Potable Water***

2-Methyl-4,6-dinitrophenol	NJ	6360	10185203
2-Methylnaphthalene	NJ	6385	10185203
2-Methylphenol (o-Cresol)	NJ	6400	10185203
2-Naphthylamine	NJ	6430	10185203
2-Nitroaniline	NJ	6460	10185203
2-Nitrophenol	NJ	6490	10185203
2-Picoline (2-Methylpyridine)	NJ	5050	10185203
3,3'-Dichlorobenzidine	NJ	5945	10185203
3,3'-Dimethylbenzidine	NJ	6120	10185203
3-Methylcholanthrene	NJ	6355	10185203
3-Methylphenol (m-Cresol)	NJ	6405	10185203
3-Nitroaniline	NJ	6465	10185203
4-Aminobiphenyl	NJ	5540	10185203
4-Bromophenyl phenyl ether	NJ	5660	10185203
4-Chloro-3-methylphenol	NJ	5700	10185203
4-Chloroaniline	NJ	5745	10185203
4-Chlorophenyl phenylether	NJ	5825	10185203
4-Dimethyl aminoazobenzene	NJ	6105	10185203
4-Methylphenol (p-Cresol)	NJ	6410	10185203
4-Nitroaniline	NJ	6470	10185203
4-Nitrophenol	NJ	6500	10185203
5-Nitro-o-toluidine	NJ	6570	10185203
7,12-Dimethylbenz(a) anthracene	NJ	6115	10185203
a-a-Dimethylphenethylamine	NJ	6125	10185203
Acenaphthene	NJ	5500	10185203
Acenaphthylene	NJ	5505	10185203
Acetophenone	NJ	5510	10185203
Aniline	NJ	5545	10185203
Anthracene	NJ	5555	10185203
Aramite	NJ	5560	10185203

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Matrix: ***Non Potable Water***

Benzo(a)anthracene	NJ	5575	10185203
Benzo(a)pyrene	NJ	5580	10185203
Benzo(b)fluoranthene	NJ	5585	10185203
Benzo(g,h,i)perylene	NJ	5590	10185203
Benzo(k)fluoranthene	NJ	5600	10185203
Benzyl alcohol	NJ	5630	10185203
bis(2-Chloroethoxy)methane	NJ	5760	10185203
bis(2-Chloroethyl) ether	NJ	5765	10185203
bis(2-Chloroisopropyl) ether	NJ	5780	10185203
bis(2-Ethylhexyl) phthalate (DEHP)	NJ	6255	10185203
Butyl benzyl phthalate	NJ	5670	10185203
Carbazole	NJ	5680	10185203
Chrysene	NJ	5855	10185203
Diallate	NJ	7405	10185203
Dibenz(a,h) anthracene	NJ	5895	10185203
Dibenzofuran	NJ	5905	10185203
Diethyl phthalate	NJ	6070	10185203
Dimethoate	NJ	7475	10185203
Dimethyl phthalate	NJ	6135	10185203
Di-n-butyl phthalate	NJ	5925	10185203
Di-n-octyl phthalate	NJ	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	NJ	8620	10185203
Diphenylamine	NJ	6205	10185203
Disulfoton	NJ	8625	10185203
Ethyl methanesulfonate	NJ	6260	10185203
Famphur	NJ	7580	10185203
Fluoranthene	NJ	6265	10185203
Fluorene	NJ	6270	10185203
Hexachlorobenzene	NJ	6275	10185203
Hexachlorobutadiene	NJ	4835	10185203

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Matrix: ***Non Potable Water***

Hexachlorocyclopentadiene	NJ	6285	10185203
Hexachloroethane	NJ	4840	10185203
Hexachlorophene	NJ	6290	10185203
Hexachloropropene	NJ	6295	10185203
Indeno(1,2,3-cd) pyrene	NJ	6315	10185203
Isodrin	NJ	7725	10185203
Isophorone	NJ	6320	10185203
Isosafrole	NJ	6325	10185203
Kepone	NJ	7740	10185203
Methapyrilene	NJ	6345	10185203
Methyl methanesulfonate	NJ	6375	10185203
Naphthalene	NJ	5005	10185203
Nitrobenzene	NJ	5015	10185203
Nitroquinoline-1-oxide	NJ	6515	10185203
n-Nitrosodiethylamine	NJ	6525	10185203
n-Nitrosodimethylamine	NJ	6530	10185203
n-Nitroso-di-n-butylamine	NJ	5025	10185203
n-Nitrosodi-n-propylamine	NJ	6545	10185203
n-Nitrosodiphenylamine	NJ	6535	10185203
n-Nitrosomethylethylamine	NJ	6550	10185203
n-Nitrosomorpholine	NJ	6555	10185203
n-Nitrosopiperidine	NJ	6560	10185203
n-Nitrosopyrrolidine	NJ	6565	10185203
o,o,o-Triethyl phosphorothioate	NJ	8290	10185203
o-Toluidine	NJ	5145	10185203
Parathion, ethyl	NJ	7955	10185203
Parathion, methyl (Methyl parathion)	NJ	7825	10185203
Pentachlorobenzene	NJ	6590	10185203
Pentachloronitrobenzene	NJ	6600	10185203
Pentachlorophenol	NJ	6605	10185203

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Matrix: ***Non Potable Water***

Analyte	AB	Analyte ID	Method ID
Phenacetin	NJ	6610	10185203
Phenanthrene	NJ	6615	10185203
Phenol	NJ	6625	10185203
Phorate	NJ	7985	10185203
Pronamide (Kerb)	NJ	6650	10185203
Pyrene	NJ	6665	10185203
Pyridine	NJ	5095	10185203
Safrole	NJ	6685	10185203
Sulfotepp	NJ	8155	10185203
Thionazin (Zinophos)	NJ	8235	10185203

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	NJ	1505	20003003

Method SM 2540 B

Analyte	AB	Analyte ID	Method ID
Residue-total	NJ	1950	20004608

Method SM 2540 C

Analyte	AB	Analyte ID	Method ID
Residue-filterable (TDS)	NJ	1955	20004404

Method SM 2540 D

Analyte	AB	Analyte ID	Method ID
Residue-nonfilterable (TSS)	NJ	1960	20004802

Method SM 3500 Cr D

Analyte	AB	Analyte ID	Method ID
Chromium VI	NJ	1045	20009001

Method SM 4500 H+ B

Analyte	AB	Analyte ID	Method ID
pH	NJ	1900	20016404

Method SM 4500 NH3 B

Analyte	AB	Analyte ID	Method ID
Ammonia as N	NJ	1515	20022804

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Matrix: ***Non Potable Water***

Method SM 4500 NH3 G

Analyte	AB	Analyte ID	Method ID
Ammonia as N	NJ	1515	20023205

Method SM 4500 P E

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	NJ	1870	20025803
Phosphorus, total	NJ	1910	20025803

Method SM 4500 S E

Analyte	AB	Analyte ID	Method ID
Sulfide	NJ	2005	20026408

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand	NJ	1530	20027401
Carbonaceous BOD, CBOD	NJ	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID
Total organic carbon	NJ	2040	20028006

Method SM 5310 C

Analyte	AB	Analyte ID	Method ID
Total organic carbon	NJ	2040	20028200

Method SM 5310 D

Analyte	AB	Analyte ID	Method ID
Total organic carbon	NJ	2040	20028404

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Matrix: ***Solid & Hazardous Material***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	NJ	1780	10116606

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	NJ	849	10118806

Method EPA 1664

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (O&G)	NJ	1803	10127409

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	NJ	1000	10155201
Antimony	NJ	1005	10155201
Arsenic	NJ	1010	10155201
Barium	NJ	1015	10155201
Beryllium	NJ	1020	10155201
Cadmium	NJ	1030	10155201
Calcium	NJ	1035	10155201
Chromium	NJ	1040	10155201
Cobalt	NJ	1050	10155201
Copper	NJ	1055	10155201
Iron	NJ	1070	10155201
Lead	NJ	1075	10155201
Magnesium	NJ	1085	10155201
Manganese	NJ	1090	10155201
Molybdenum	NJ	1100	10155201
Nickel	NJ	1105	10155201
Potassium	NJ	1125	10155201
Selenium	NJ	1140	10155201
Silver	NJ	1150	10155201
Sodium	NJ	1155	10155201

Matrix: ***Solid & Hazardous Material***

Thallium	NJ	1165	10155201
Tin	NJ	1175	10155201
Vanadium	NJ	1185	10155201
Zinc	NJ	1190	10155201

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium VI	NJ	1045	10162206

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	NJ	1095	10166004

Method EPA 8011

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2-Dibromo-3-chloropropane (DBCP)	NJ	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	NJ	4585	10173009

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	NJ	9369	10173203
Gasoline range organics (GRO)	NJ	9408	10173203

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	NJ	7355	10178402
4,4'-DDE	NJ	7360	10178402
4,4'-DDT	NJ	7365	10178402
Aldrin	NJ	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	NJ	7110	10178402
alpha-Chlordane	NJ	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	NJ	7115	10178402
Chlordane (tech.)	NJ	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	NJ	7105	10178402
Dieldrin	NJ	7470	10178402
Endosulfan I	NJ	7510	10178402

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Empirical Laboratories, LLC

621 Mainstream Drive, Suite 270
Nashville, TN 37228-1229

Certificate: T104704307-10-2
Expiration Date: 12/31/2011
Issue Date: 1/1/2011

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Matrix: ***Solid & Hazardous Material***

Endosulfan II	NJ	7515	10178402
Endosulfan sulfate	NJ	7520	10178402
Endrin	NJ	7540	10178402
Endrin aldehyde	NJ	7530	10178402
Endrin ketone	NJ	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	NJ	7120	10178402
gamma-Chlordane	NJ	7245	10178402
Heptachlor	NJ	7685	10178402
Heptachlor epoxide	NJ	7690	10178402
Methoxychlor	NJ	7810	10178402
Toxaphene (Chlorinated camphene)	NJ	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	NJ	8880	10179007
Aroclor-1221 (PCB-1221)	NJ	8885	10179007
Aroclor-1232 (PCB-1232)	NJ	8890	10179007
Aroclor-1242 (PCB-1242)	NJ	8895	10179007
Aroclor-1248 (PCB-1248)	NJ	8900	10179007
Aroclor-1254 (PCB-1254)	NJ	8905	10179007
Aroclor-1260 (PCB-1260)	NJ	8910	10179007

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	NJ	8655	10183003
2,4-D	NJ	8545	10183003
Dalapon	NJ	8555	10183003
Dicamba	NJ	8595	10183003
Dichloroprop (Dichlorprop)	NJ	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	NJ	8620	10183003
MCPA	NJ	7775	10183003
MCPP	NJ	7780	10183003
Silvex (2,4,5-TP)	NJ	8650	10183003

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Matrix: ***Solid & Hazardous Material***

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	NJ	5105	10184404
1,1,1-Trichloroethane	NJ	5160	10184404
1,1,2,2-Tetrachloroethane	NJ	5110	10184404
1,1,2-Trichloroethane	NJ	5165	10184404
1,1-Dichloroethane	NJ	4630	10184404
1,1-Dichloroethylene (1,1-Dichloroethene)	NJ	4640	10184404
1,2,3-Trichlorobenzene	NJ	5150	10184404
1,2,3-Trichloropropane	NJ	5180	10184404
1,2,4-Trichlorobenzene	NJ	5155	10184404
1,2,4-Trimethylbenzene	NJ	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	NJ	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	NJ	4585	10184404
1,2-Dichlorobenzene	NJ	4610	10184404
1,2-Dichloroethane	NJ	4635	10184404
1,2-Dichloropropane	NJ	4655	10184404
1,3,5-Trimethylbenzene	NJ	5215	10184404
1,3-Dichlorobenzene	NJ	4615	10184404
1,3-Dichloropropane	NJ	4660	10184404
1,4-Dichlorobenzene	NJ	4620	10184404
1,4-Dioxane (1,4- Diethyleneoxide)	NJ	4735	10184404
2-Butanone (Methyl ethyl ketone, MEK)	NJ	4410	10184404
2-Hexanone	NJ	4860	10184404
4-Isopropyltoluene	NJ	4915	10184404
4-Methyl-2-pentanone (MIBK)	NJ	4995	10184404
Acetone	NJ	4315	10184404
Acetonitrile	NJ	4320	10184404
Acrolein (Propenal)	NJ	4325	10184404
Acrylonitrile	NJ	4340	10184404

Texas Commission on Environmental Quality

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Matrix: ***Solid & Hazardous Material***

Benzene	NJ	4375	10184404
Bromochloromethane	NJ	4390	10184404
Bromodichloromethane	NJ	4395	10184404
Bromoform	NJ	4400	10184404
Bromomethane (Methyl bromide)	NJ	4950	10184404
Carbon disulfide	NJ	4450	10184404
Carbon tetrachloride	NJ	4455	10184404
Chlorobenzene	NJ	4475	10184404
Chloroethane	NJ	4485	10184404
Chloroform	NJ	4505	10184404
Chloromethane (Methyl chloride)	NJ	4960	10184404
cis-1,2-Dichloroethylene	NJ	4645	10184404
cis-1,3-Dichloropropylene	NJ	4680	10184404
Dibromochloromethane	NJ	4575	10184404
Dibromomethane	NJ	4595	10184404
Dichlorodifluoromethane	NJ	4625	10184404
Ethyl methacrylate	NJ	4810	10184404
Ethylbenzene	NJ	4765	10184404
Hexachlorobutadiene	NJ	4835	10184404
Iodomethane (Methyl iodide)	NJ	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	NJ	4875	10184404
Isopropylbenzene	NJ	4900	10184404
Methacrylonitrile	NJ	4925	10184404
Methyl methacrylate	NJ	4990	10184404
Methyl tert-butyl ether (MTBE)	NJ	5000	10184404
Methylene chloride	NJ	4975	10184404
Naphthalene	NJ	5005	10184404
n-Butylbenzene	NJ	4435	10184404
n-Propylbenzene	NJ	5090	10184404
Propionitrile (Ethyl cyanide)	NJ	5080	10184404

Matrix: ***Solid & Hazardous Material***

sec-Butylbenzene	NJ	4440	10184404
Styrene	NJ	5100	10184404
tert-Butylbenzene	NJ	4445	10184404
Tetrachloroethylene (Perchloroethylene)	NJ	5115	10184404
Toluene	NJ	5140	10184404
trans-1,2-Dichloroethylene	NJ	4700	10184404
trans-1,4-Dichloro-2-butene	NJ	4605	10184404
Trichloroethene (Trichloroethylene)	NJ	5170	10184404
Trichlorofluoromethane	NJ	5175	10184404
Trichlorotrifluoroethane	NJ	5185	10184404
Vinyl acetate	NJ	5225	10184404
Vinyl chloride	NJ	5235	10184404
Xylene (total)	NJ	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	NJ	6715	10185203
1,2,4-Trichlorobenzene	NJ	5155	10185203
1,2-Dichlorobenzene	NJ	4610	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	NJ	6885	10185203
1,3-Dichlorobenzene	NJ	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	NJ	6160	10185203
1,4-Dichlorobenzene	NJ	4620	10185203
1,4-Naphthoquinone	NJ	6420	10185203
1,4-Phenylenediamine	NJ	6630	10185203
1-Naphthylamine	NJ	6425	10185203
2,3,4,6-Tetrachlorophenol	NJ	6735	10185203
2,4,5-Trichlorophenol	NJ	6835	10185203
2,4,6-Trichlorophenol	NJ	6840	10185203
2,4-Dichlorophenol	NJ	6000	10185203
2,4-Dimethylphenol	NJ	6130	10185203

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Matrix: ***Solid & Hazardous Material***

2,4-Dinitrophenol	NJ	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	NJ	6185	10185203
2,6-Dichlorophenol	NJ	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	NJ	6190	10185203
2-Acetylaminofluorene	NJ	5515	10185203
2-Chloronaphthalene	NJ	5795	10185203
2-Chlorophenol	NJ	5800	10185203
2-Methyl-4,6-dinitrophenol	NJ	6360	10185203
2-Methylnaphthalene	NJ	6385	10185203
2-Methylphenol (o-Cresol)	NJ	6400	10185203
2-Naphthylamine	NJ	6430	10185203
2-Nitroaniline	NJ	6460	10185203
2-Nitrophenol	NJ	6490	10185203
2-Picoline (2-Methylpyridine)	NJ	5050	10185203
3,3'-Dichlorobenzidine	NJ	5945	10185203
3,3'-Dimethylbenzidine	NJ	6120	10185203
3-Methylcholanthrene	NJ	6355	10185203
3-Methylphenol (m-Cresol)	NJ	6405	10185203
3-Nitroaniline	NJ	6465	10185203
4-Aminobiphenyl	NJ	5540	10185203
4-Bromophenyl phenyl ether	NJ	5660	10185203
4-Chloro-3-methylphenol	NJ	5700	10185203
4-Chloroaniline	NJ	5745	10185203
4-Chlorophenyl phenylether	NJ	5825	10185203
4-Methylphenol (p-Cresol)	NJ	6410	10185203
4-Nitroaniline	NJ	6470	10185203
4-Nitrophenol	NJ	6500	10185203
5-Nitro-o-toluidine	NJ	6570	10185203
7,12-Dimethylbenz(a) anthracene	NJ	6115	10185203
a-a-Dimethylphenethylamine	NJ	6125	10185203

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Matrix: ***Solid & Hazardous Material***

Acenaphthene	NJ	5500	10185203
Acenaphthylene	NJ	5505	10185203
Acetophenone	NJ	5510	10185203
Aniline	NJ	5545	10185203
Anthracene	NJ	5555	10185203
Aramite	NJ	5560	10185203
Benzo(a)anthracene	NJ	5575	10185203
Benzo(a)pyrene	NJ	5580	10185203
Benzo(b)fluoranthene	NJ	5585	10185203
Benzo(g,h,i)perylene	NJ	5590	10185203
Benzo(k)fluoranthene	NJ	5600	10185203
Benzyl alcohol	NJ	5630	10185203
bis(2-Chloroethoxy)methane	NJ	5760	10185203
bis(2-Chloroethyl) ether	NJ	5765	10185203
bis(2-Chloroisopropyl) ether	NJ	5780	10185203
bis(2-Ethylhexyl) phthalate (DEHP)	NJ	6255	10185203
Butyl benzyl phthalate	NJ	5670	10185203
Carbazole	NJ	5680	10185203
Chlorobenzilate	NJ	7260	10185203
Chrysene	NJ	5855	10185203
Diallate	NJ	7405	10185203
Dibenz(a,h) anthracene	NJ	5895	10185203
Dibenzofuran	NJ	5905	10185203
Diethyl phthalate	NJ	6070	10185203
Dimethoate	NJ	7475	10185203
Dimethyl phthalate	NJ	6135	10185203
Di-n-butyl phthalate	NJ	5925	10185203
Di-n-octyl phthalate	NJ	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	NJ	8620	10185203
Diphenylamine	NJ	6205	10185203

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Matrix: ***Solid & Hazardous Material***

Disulfoton	NJ	8625	10185203
Ethyl methanesulfonate	NJ	6260	10185203
Famphur	NJ	7580	10185203
Fluoranthene	NJ	6265	10185203
Fluorene	NJ	6270	10185203
Hexachlorobenzene	NJ	6275	10185203
Hexachlorobutadiene	NJ	4835	10185203
Hexachlorocyclopentadiene	NJ	6285	10185203
Hexachloroethane	NJ	4840	10185203
Hexachlorophene	NJ	6290	10185203
Hexachloropropene	NJ	6295	10185203
Indeno(1,2,3-cd) pyrene	NJ	6315	10185203
Isodrin	NJ	7725	10185203
Isophorone	NJ	6320	10185203
Isosafrole	NJ	6325	10185203
Kepone	NJ	7740	10185203
Methapyrilene	NJ	6345	10185203
Methyl methanesulfonate	NJ	6375	10185203
Naphthalene	NJ	5005	10185203
Nitrobenzene	NJ	5015	10185203
Nitroquinoline-1-oxide	NJ	6515	10185203
n-Nitrosodiethylamine	NJ	6525	10185203
n-Nitrosodimethylamine	NJ	6530	10185203
n-Nitroso-di-n-butylamine	NJ	5025	10185203
n-Nitrosodi-n-propylamine	NJ	6545	10185203
n-Nitrosodiphenylamine	NJ	6535	10185203
n-Nitrosomethylethylamine	NJ	6550	10185203
n-Nitrosomorpholine	NJ	6555	10185203
n-Nitrosopiperidine	NJ	6560	10185203
n-Nitrosopyrrolidine	NJ	6565	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

	Certificate:	T104704307-10-2
Empirical Laboratories, LLC	Expiration Date:	12/31/2011
621 Mainstream Drive, Suite 270 Nashville, TN 37228-1229	Issue Date:	1/1/2011

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Matrix: ***Solid & Hazardous Material***

o,o,o-Triethyl phosphorothioate	NJ	8290	10185203
o-Toluidine	NJ	5145	10185203
Parathion, ethyl	NJ	7955	10185203
Parathion, methyl (Methyl parathion)	NJ	7825	10185203
Pentachlorobenzene	NJ	6590	10185203
Pentachloronitrobenzene	NJ	6600	10185203
Pentachlorophenol	NJ	6605	10185203
Phenacetin	NJ	6610	10185203
Phenanthrene	NJ	6615	10185203
Phenol	NJ	6625	10185203
Phorate	NJ	7985	10185203
Pronamide (Kerb)	NJ	6650	10185203
Pyrene	NJ	6665	10185203
Pyridine	NJ	5095	10185203
Safrole	NJ	6685	10185203
Sulfotepp	NJ	8155	10185203
Thionazin (Zinophos)	NJ	8235	10185203

Method EPA 9012

Analyte	AB	Analyte ID	Method ID
Total Cyanide	NJ	1635	10193201

Method EPA 9040

Analyte	AB	Analyte ID	Method ID
Corrosivity	NJ	1615	10196802
pH	NJ	1900	10196802

Method EPA 9045

Analyte	AB	Analyte ID	Method ID
pH	NJ	1900	10197805

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Chloride	NJ	1575	10199209
Fluoride	NJ	1730	10199209

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Matrix: ***Solid & Hazardous Material***

Nitrate as N	NJ	1810	10199209
Nitrite as N	NJ	1840	10199209
Sulfate	NJ	2000	10199209

Method EPA 9060

Analyte	AB	Analyte ID	Method ID
Total organic carbon	NJ	2040	10200201

Method EPA 9095

Analyte	AB	Analyte ID	Method ID
Paint Filter Test	NJ	10312	10204009

LABORATORY
ACCREDITATION
BUREAU

Certificate of Accreditation

ISO/IEC 17025:2005 **Certificate Number L2259**

Spectrum Analytical, Inc.

featuring Hanibal Technology, Florida Division

8405 Benjamin Road, Suite A
Tampa, FL 33634

has met the requirements set forth in L-A-B's policies and procedures, all requirements of ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories" and the U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).*

The accredited lab has demonstrated technical competence to a defined "Scope of Accreditation" and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Accreditation Granted through: July 13, 2013

R. Douglas Leonard, Jr., Managing Director
Laboratory Accreditation Bureau
Presented the 10th of June 2011

*See the laboratory's Scope of Accreditation for details of the DoD ELAP requirements
Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

LABORATORY ACCREDITATION BUREAU

Certificate # L2259

Scope of Accreditation For Spectrum Analytical, Inc. featuring Hanibal Technology, Florida Division

8405 Benjamin Road, Suite A
Tampa, FL 33634
Mark-Allen W. Barnard
813-888-9507

In recognition of a successful assessment to ISO/IEC 17025:2005 and the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in the DoD Quality Systems Manual for Environmental Laboratories (DoD QSM v4.2) based on the National Environmental Laboratory Accreditation Conference Chapter 5 Quality Systems Standard (NELAC Voted Revision June 5, 2003), accreditation is granted to Spectrum Analytical, Inc. featuring Hanibal Technology, Florida Division to perform the following tests:

Accreditation granted through: **July 13, 2013**

Testing – Environmental

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8011	1,2-Dibromo-3-chloropropane (DBCP)
GC/ECD	EPA 8011	1,2-Dibromoethane (EDB)
GC/ECD	EPA 8081A/8081B	4,4'-DDD
GC/ECD	EPA 8081A/8081B	4,4'-DDE
GC/ECD	EPA 8081A/8081B	4,4'-DDT
GC/ECD	EPA 8081A/8081B	Aldrin
GC/ECD	EPA 8081A/8081B	alpha-BHC
GC/ECD	EPA 8081A/8081B	alpha-Chlordane
GC/ECD	EPA 8081A/8081B	beta-BHC
GC/ECD	EPA 8081A/8081B	Chlordane
GC/ECD	EPA 8081A/8081B	delta-BHC
GC/ECD	EPA 8081A/8081B	Dieldrin
GC/ECD	EPA 8081A/8081B	Endosulfan I
GC/ECD	EPA 8081A/8081B	Endosulfan II
GC/ECD	EPA 8081A/8081B	Endosulfan sulfate

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8081A/8081B	Endrin
GC/ECD	EPA 8081A/8081B	Endrin aldehyde
GC/ECD	EPA 8081A/8081B	Endrin ketone
GC/ECD	EPA 8081A/8081B	gamma-BHC (Lindane)
GC/ECD	EPA 8081A/8081B	gamma-Chlordane
GC/ECD	EPA 8081A/8081B	Heptachlor
GC/ECD	EPA 8081A/8081B	Heptachlor epoxide
GC/ECD	EPA 8081A/8081B	Methoxychlor
GC/ECD	EPA 8081A/8081B	Mirex
GC/ECD	EPA 8081A/8081B	Toxaphene
GC/ECD	EPA 8082/8082A	Aroclor-1016
GC/ECD	EPA 8082/8082A	Aroclor-1221
GC/ECD	EPA 8082/8082A	Aroclor-1232
GC/ECD	EPA 8082/8082A	Aroclor-1242
GC/ECD	EPA 8082/8082A	Aroclor-1248
GC/ECD	EPA 8082/8082A	Aroclor-1254
GC/ECD	EPA 8082/8082A	Aroclor-1260
GC/ECD	EPA 8151/8151A	2,4,5-T
GC/ECD	EPA 8151/8151A	2,4,5-TP (Silvex)
GC/ECD	EPA 8151/8151A	2,4-D
GC/ECD	EPA 8151/8151A	2,4-DB
GC/ECD	EPA 8151/8151A	Dalapon
GC/ECD	EPA 8151/8151A	Dicamba
GC/ECD	EPA 8151/8151A	Dichloroprop
GC/ECD	EPA 8151/8151A	Dinoseb
GC/ECD	EPA 8151/8151A	MCPA
GC/ECD	EPA 8151/8151A	MCPP
GC/ECD	EPA 8151/8151A	Pentachlorophenol
GC/ECD	EPA 8151/8151A	Picloram
GC/FID	FL PRO	Total Petroleum Hydrocarbons
GC/FID	EPA RSK-175	Ethane

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/FID	EPA RSK-175	Ethene
GC/FID	EPA RSK-175	Methane
GC/FID	EPA 8015C	TPH C10-C28
GC/FID	EPA 8015C	TPH >C6-C10
GC/FID	TX1005	TPH C10-C28
GC/FID	TX1005	TPH C6-C12
GC/FID	TPH-Direct	C6-C8 Aliphatic
GC/FID	TPH-Direct	C8-C10 Aliphatic
GC/FID	TPH-Direct	C10-C12 Aliphatic
GC/FID	TPH-Direct	C12-C16 Aliphatic
GC/FID	TPH-Direct	C16-C21 Aliphatic
GC/FID	TPH-Direct	C21-C35 Aliphatic
GC/FID	TPH-Direct	C7-C8 Aromatic
GC/FID	TPH-Direct	C8-C10 Aromatic
GC/FID	TPH-Direct	C10-C12 Aromatic
GC/FID	TPH-Direct	C12-C16 Aromatic
GC/FID	TPH-Direct	C16-C21 Aromatic
GC/FID	TPH-Direct	C21-C35 Aromatic
GC/MS	EPA 8260B/8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethylene
GC/MS	EPA 8260B/8260C	1,1-Dichloropropene
GC/MS	EPA 8260B/8260C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260C	1,2,3-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trimethylbenzene

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Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	1,2-Dibromo-3-chloropropane (DBCP)
GC/MS	EPA 8260B/8260C	1,2-Dibromoethane (EDB)
GC/MS	EPA 8260B/8260C	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,2-Dichloroethane
GC/MS	EPA 8260B/8260C	1,2-Dichloroethene (total)
GC/MS	EPA 8260B/8260C	1,2-Dichloropropane
GC/MS	EPA 8260B/8260C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,3-Dichloropropane
GC/MS	EPA 8260B/8260C	1,4-Dioxane
GC/MS	EPA 8260B/8260C	1,4-Dichloro-2-butene
GC/MS	EPA 8260B/8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1-Chlorohexane
GC/MS	EPA 8260B/8260C	2,2-Dichloropropane
GC/MS	EPA 8260B/8260C	2-Butanone
GC/MS	EPA 8260B/8260C	2-Chloro-1,1,1-trifluoroethane
GC/MS	EPA 8260B/8260C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260B/8260C	2-Chlorotoluene
GC/MS	EPA 8260B/8260C	2-Hexanone
GC/MS	EPA 8260B/8260C	2-Nitropropane
GC/MS	EPA 8260B/8260C	3,3-Dimethyl-1-butanol
GC/MS	EPA 8260B/8260C	4-Chlorotoluene
GC/MS	EPA 8260B/8260C	4-Isopropyltoluene
GC/MS	EPA 8260B/8260C	4-Methyl-2-pentanone
GC/MS	EPA 8260B/8260C	Acetone
GC/MS	EPA 8260B/8260C	Acetonitrile
GC/MS	EPA 8260B/8260C	Acrolein
GC/MS	EPA 8260B/8260C	Acrylonitrile
GC/MS	EPA 8260B/8260C	Allyl chloride
GC/MS	EPA 8260B/8260C	Benzene
GC/MS	EPA 8260B/8260C	Benzyl chloride

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	Bromobenzene
GC/MS	EPA 8260B/8260C	Bromochloromethane
GC/MS	EPA 8260B/8260C	Bromodichloromethane
GC/MS	EPA 8260B/8260C	Bromoethane
GC/MS	EPA 8260B/8260C	Bromoform
GC/MS	EPA 8260B/8260C	Carbon disulfide
GC/MS	EPA 8260B/8260C	Carbon tetrachloride
GC/MS	EPA 8260B/8260C	Chlorobenzene
GC/MS	EPA 8260B/8260C	Chlorodibromomethane
GC/MS	EPA 8260B/8260C	Chloroethane
GC/MS	EPA 8260B/8260C	Chloroform
GC/MS	EPA 8260B/8260C	Chloroprene
GC/MS	EPA 8260B/8260C	Chlorotrifluoroethylene
GC/MS	EPA 8260B/8260C	cis-1,2-Dichloroethylene
GC/MS	EPA 8260B/8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Cyclohexane
GC/MS	EPA 8260B/8260C	Cyclohexanone
GC/MS	EPA 8260B/8260C	Dibromomethane
GC/MS	EPA 8260B/8260C	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260C	Diethyl ether
GC/MS	EPA 8260B/8260C	Di-isopropylether (DIPE)
GC/MS	EPA 8260B/8260C	Ethanol
GC/MS	EPA 8260B/8260C	Ethyl acetate
GC/MS	EPA 8260B/8260C	Ethyl methacrylate
GC/MS	EPA 8260B/8260C	Ethyl-t-butylether (ETBE)
GC/MS	EPA 8260B/8260C	Ethylbenzene
GC/MS	EPA 8260B/8260C	Hexachlorobutadiene
GC/MS	EPA 8260B/8260C	Iodomethane
GC/MS	EPA 8260B/8260C	Isobutyl alcohol
GC/MS	EPA 8260B/8260C	Isopropylbenzene (Cumene)
GC/MS	EPA 8260B/8260C	m+p-Xylene

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Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	Methacrylonitrile
GC/MS	EPA 8260B/8260C	Methyl acetate
GC/MS	EPA 8260B/8260C	Methyl bromide
GC/MS	EPA 8260B/8260C	Methyl chloride
GC/MS	EPA 8260B/8260C	Methylcyclohexane
GC/MS	EPA 8260B/8260C	Methyl methacrylate
GC/MS	EPA 8260B/8260C	Methylene chloride
GC/MS	EPA 8260B/8260C	Methyl tert-butyl ether
GC/MS	EPA 8260B/8260C	Naphthalene
GC/MS	EPA 8260B/8260C	n-Butylbenzene
GC/MS	EPA 8260B/8260C	n-hexane (C6)
GC/MS	EPA 8260B/8260C	n-Propylbenzene
GC/MS	EPA 8260B/8260C	o-Xylene
GC/MS	EPA 8260B/8260C	Propionitrile
GC/MS	EPA 8260B/8260C	sec-Butylbenzene
GC/MS	EPA 8260B/8260C	Styrene
GC/MS	EPA 8260B/8260C	t-Amyl alcohol
GC/MS	EPA 8260B/8260C	t-Butyl alcohol
GC/MS	EPA 8260B/8260C	t-Butyl formate
GC/MS	EPA 8260B/8260C	tert-Amyl-methyl-ether (TAME)
GC/MS	EPA 8260B/8260C	tert-Butylbenzene
GC/MS	EPA 8260B/8260C	Tetrachloroethylene
GC/MS	EPA 8260B/8260C	Tetrahydrofuran
GC/MS	EPA 8260B/8260C	Toluene
GC/MS	EPA 8260B/8260C	trans-1,3-Dichloropropylene
GC/MS	EPA 8260B/8260C	Trichloroethene
GC/MS	EPA 8260B/8260C	Trichlorofluoromethane
GC/MS	EPA 8260B/8260C	Vinyl acetate
GC/MS	EPA 8260B/8260C	Vinyl chloride
GC/MS	EPA 8260B/8260C	Xylene (total)
GC/MS	EPA 8270B/8270C/8270D	o,o,o-Triethyl phosphorothioate

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C/8270D	1,2 Diphenylhydrazine
GC/MS	EPA 8270B/8270C/8270D	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270B/8270C/8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270B/8270C/8270D	1,2-Dichlorobenzene
GC/MS	EPA 8270B/8270C/8270D	1,3,5-Trinitrobenzene
GC/MS	EPA 8270B/8270C/8270D	1,3-Dichlorobenzene
GC/MS	EPA 8270B/8270C/8270D	1,3-Dinitrobenzene
GC/MS	EPA 8270B/8270C/8270D	1,4-Dichlorobenzene
GC/MS	EPA 8270B/8270C/8270D	1,4-Naphthoquinone
GC/MS	EPA 8270B/8270C/8270D	1-Methylnaphthalene
GC/MS	EPA 8270B/8270C/8270D	1-Naphthylamine
GC/MS	EPA 8270B/8270C/8270D	2,2′-Oxybis(1-chloropropane)
GC/MS	EPA 8270B/8270C/8270D	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270B/8270C/8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270B/8270C/8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270B/8270C/8270D	2,4-Dichlorophenol
GC/MS	EPA 8270B/8270C/8270D	2,4-Dimethylphenol
GC/MS	EPA 8270B/8270C/8270D	2,4-Dinitrophenol
GC/MS	EPA 8270B/8270C/8270D	2,4-Dinitrotoluene
GC/MS	EPA 8270B/8270C/8270D	2,6-Dichlorophenol
GC/MS	EPA 8270B/8270C/8270D	2,6-Dinitrotoluene
GC/MS	EPA 8270B/8270C/8270D	2-Acetylaminofluorene
GC/MS	EPA 8270B/8270C/8270D	2-Chloronaphthalene
GC/MS	EPA 8270B/8270C/8270D	2-Chlorophenol
GC/MS	EPA 8270B/8270C/8270D	2-Methyl-4,6-dinitrophenol
GC/MS	EPA 8270B/8270C/8270D	2-Methylnaphthalene
GC/MS	EPA 8270B/8270C/8270D	2-Methylphenol (o-Cresol)
GC/MS	EPA 8270B/8270C/8270D	2-Naphthylamine
GC/MS	EPA 8270B/8270C/8270D	2-Nitroaniline
GC/MS	EPA 8270B/8270C/8270D	2-Nitrophenol
GC/MS	EPA 8270B/8270C/8270D	2-Picoline

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C/8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270B/8270C/8270D	3,3'-Dimethylbenzidine
GC/MS	EPA 8270B/8270C/8270D	3-Methylcholanthrene
GC/MS	EPA 8270B/8270C/8270D	3-Nitroaniline
GC/MS	EPA 8270B/8270C/8270D	4-Aminobiphenyl
GC/MS	EPA 8270B/8270C/8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270B/8270C/8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270B/8270C/8270D	4-Chloroaniline
GC/MS	EPA 8270B/8270C/8270D	4-Chlorophenyl phenylether
GC/MS	EPA 8270B/8270C/8270D	4-Dimethyl aminoazobenzene
GC/MS	EPA 8270B/8270C/8270D	4-Methylphenol
GC/MS	EPA 8270B/8270C/8270D	4-Nitroaniline
GC/MS	EPA 8270B/8270C/8270D	4-Nitrophenol
GC/MS	EPA 8270B/8270C/8270D	4-Nitroquinoline-1-oxide
GC/MS	EPA 8270B/8270C/8270D	5-Nitro-o-toluidine
GC/MS	EPA 8270B/8270C/8270D	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270B/8270C/8270D	a-a-Dimethylphenethylamine
GC/MS	EPA 8270B/8270C/8270D	Acenaphthene
GC/MS	EPA 8270B/8270C/8270D	Acenaphthylene
GC/MS	EPA 8270B/8270C/8270D	Acetophenone
GC/MS	EPA 8270B/8270C/8270D	Aniline
GC/MS	EPA 8270B/8270C/8270D	Anthracene
GC/MS	EPA 8270B/8270C/8270D	Aramite
GC/MS	EPA 8270B/8270C/8270D	Atrazine
GC/MS	EPA 8270B/8270C/8270D	Benzaldehyde
GC/MS	EPA 8270B/8270C/8270D	Benzidine
GC/MS	EPA 8270B/8270C/8270D	Benzo(a)anthracene
GC/MS	EPA 8270B/8270C/8270D	Benzo(a)pyrene
GC/MS	EPA 8270B/8270C/8270D	Benzo(b)fluoranthene
GC/MS	EPA 8270B/8270C/8270D	Benzo(g,h,i)perylene
GC/MS	EPA 8270B/8270C/8270D	Benzo(k)fluoranthene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C/8270D	Benzoic acid
GC/MS	EPA 8270B/8270C/8270D	Benzyl alcohol
GC/MS	EPA 8270B/8270C/8270D	Biphenyl
GC/MS	EPA 8270B/8270C/8270D	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270B/8270C/8270D	bis(2-Chloroethyl)ether
GC/MS	EPA 8270B/8270C/8270D	bis(2-ethylhexyl)phthalate
GC/MS	EPA 8270B/8270C/8270D	Butyl benzyl phthalate
GC/MS	EPA 8270B/8270C/8270D	Caprolactam
GC/MS	EPA 8270B/8270C/8270D	Carbazole
GC/MS	EPA 8270B/8270C/8270D	Chlorobenzilate
GC/MS	EPA 8270B/8270C/8270D	Chrysene
GC/MS	EPA 8270B/8270C/8270D	Cresols (total)
GC/MS	EPA 8270B/8270C/8270D	Diallate (Avadex)
GC/MS	EPA 8270B/8270C/8270D	Dibenz(a,h)anthracene
GC/MS	EPA 8270B/8270C/8270D	Dibenz(a,j)acridine
GC/MS	EPA 8270B/8270C/8270D	Dibenzofuran
GC/MS	EPA 8270B/8270C/8270D	Diethylphthalate
GC/MS	EPA 8270B/8270C/8270D	Dimethyl-phthalate
GC/MS	EPA 8270B/8270C/8270D	Di-n-butylphthalate
GC/MS	EPA 8270B/8270C/8270D	Di-n-octylphthalate
GC/MS	EPA 8270B/8270C/8270D	Dinoseb
GC/MS	EPA 8270B/8270C/8270D	Ethyl methanesulfonate
GC/MS	EPA 8270B/8270C/8270D	Fluoranthene
GC/MS	EPA 8270B/8270C/8270D	Fluorene
GC/MS	EPA 8270B/8270C/8270D	Hexachlorobenzene
GC/MS	EPA 8270B/8270C/8270D	Hexachlorobutadiene
GC/MS	EPA 8270B/8270C/8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270B/8270C/8270D	Hexachloroethane
GC/MS	EPA 8270B/8270C/8270D	Hexachloropropene
GC/MS	EPA 8270B/8270C/8270D	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270B/8270C/8270D	Isodrin

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Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C/8270D	Isophorone
GC/MS	EPA 8270B/8270C/8270D	Isosafrole
GC/MS	EPA 8270B/8270C/8270D	Kepone
GC/MS	EPA 8270B/8270C/8270D	Methapyriline
GC/MS	EPA 8270B/8270C/8270D	Methyl methanesulfonate
GC/MS	EPA 8270B/8270C/8270D	Naphthalene
GC/MS	EPA 8270B/8270C/8270D	Nitrobenzene
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosodibutylamine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosodiethylamine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosodimethylamine
GC/MS	EPA 8270B/8270C/8270D	n-Nitroso-di-n-propylamine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosodiphenylamine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosomethylethylamine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosomorpholine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosopiperidine
GC/MS	EPA 8270B/8270C/8270D	n-Nitrosopyrrolidine
GC/MS	EPA 8270B/8270C/8270D	o-Toluidine
GC/MS	EPA 8270B/8270C/8270D	Pentachlorobenzene
GC/MS	EPA 8270B/8270C/8270D	Pentachloroethane
GC/MS	EPA 8270B/8270C/8270D	Pentachloronitrobenzene(PCNB)
GC/MS	EPA 8270B/8270C/8270D	Pentachlorophenol
GC/MS	EPA 8270B/8270C/8270D	Phenacetin
GC/MS	EPA 8270B/8270C/8270D	Phenanthrene
GC/MS	EPA 8270B/8270C/8270D	Phenol
GC/MS	EPA 8270B/8270C/8270D	p-Phenylenediamine
GC/MS	EPA 8270B/8270C/8270D	Pronamide
GC/MS	EPA 8270B/8270C/8270D	Pyrene
GC/MS	EPA 8270B/8270C/8270D	Pyridine
GC/MS	EPA 8270B/8270C/8270D	Safrole
HPLC/UV	EPA 8310	1-Methylnaphthalene
HPLC/UV	EPA 8310	2-Methylnaphthalene

Non-Potable Water		
Technology	**Method**	**Analyte**
HPLC/UV	EPA 8310	Acenaphthene
HPLC/UV	EPA 8310	Acenaphthylene
HPLC/UV	EPA 8310	Anthracene
HPLC/UV	EPA 8310	Benzo(a)anthracene
HPLC/UV	EPA 8310	Benzo(a)pyrene
HPLC/UV	EPA 8310	Benzo(b)fluoranthene
HPLC/UV	EPA 8310	Benzo(g,h,i)perylene
HPLC/UV	EPA 8310	Benzo(k)fluoranthene
HPLC/UV	EPA 8310	Chrysene
HPLC/UV	EPA 8310	Dibenz(a,h)anthracene
HPLC/UV	EPA 8310	Fluoranthene
HPLC/UV	EPA 8310	Fluorene
HPLC/UV	EPA 8310	Indeno(1,2,3-cd)pyrene
HPLC/UV	EPA 8310	Naphthalene
HPLC/UV	EPA 8310	Phenanthrene
HPLC/UV	EPA 8310	Pyrene
HPLC/UV	EPA 8315Mod	Formaldehyde
HPLC/UV	EPA 8315Mod	Hydrazine
HPLC/UV	EPA 8330A	1-nitroso-3,5-dinitro-1,3,5- triazacyclohexane (MNX)
HPLC/UV	EPA 8330A	1,3,5-Trinitrobenzene
HPLC/UV	EPA 8330A	1,3-Dinitrobenzene
HPLC/UV	EPA 8330A	2,4,6-Trinitrotoluene
HPLC/UV	EPA 8330A	2,4-Dinitrotoluene
HPLC/UV	EPA 8330A	2,6-Dinitrotoluene
HPLC/UV	EPA 8330A	2-Amino-4,6-dinitrotoluene
HPLC/UV	EPA 8330A	2-Nitrotoluene
HPLC/UV	EPA 8330A	3-Nitrotoluene
HPLC/UV	EPA 8330A	3,5-Dinitroaniline
HPLC/UV	EPA 8330A	4-Amino-2,6-dinitrotoluene
HPLC/UV	EPA 8330A	4-Nitrotoluene
HPLC/UV	EPA 8330A	Methyl-2,4,6-trinitrophenylnitramine (tetryl)

Non-Potable Water		
Technology	**Method**	**Analyte**
HPLC/UV	EPA 8330A	Nitrobenzene
HPLC/UV	EPA 8330A	Nitroglycerin
HPLC/UV	EPA 8330A	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC/UV	EPA 8330A	Pentaerythritoltetranitrate (PETN)
HPLC/UV	EPA 8330A	RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)
IC-COND	EPA 300.1/9056A	Bromide
IC-COND	EPA 300.1/9056A	Chloride
IC-COND	EPA 300.1/9056A	Fluoride
IC-COND	EPA 300.1/9056A	Nitrate
IC-COND	EPA 300.1/9056A	Nitrite
IC-COND	EPA 300.1/9056A	Orthophosphate
IC-COND	EPA 300.1/9056A	Sulfate
IC-COND	EPA 314.0	Perchlorate
ICP-AES	EPA 6010B/6010C	Aluminum
ICP-AES	EPA 6010B/6010C	Antimony
ICP-AES	EPA 6010B/6010C	Arsenic
ICP-AES	EPA 6010B/6010C	Barium
ICP-AES	EPA 6010B/6010C	Beryllium
ICP-AES	EPA 6010B/6010C	Cadmium
ICP-AES	EPA 6010B/6010C	Calcium
ICP-AES	EPA 6010B/6010C	Chromium
ICP-AES	EPA 6010B/6010C	Cobalt
ICP-AES	EPA 6010B/6010C	Copper
ICP-AES	EPA 6010B/6010C	Iron
ICP-AES	EPA 6010B/6010C	Lead
ICP-AES	EPA 6010B/6010C	Magnesium
ICP-AES	EPA 6010B/6010C	Manganese
ICP-AES	EPA 6010B/6010C	Molybdenum
ICP-AES	EPA 6010B/6010C	Nickel
ICP-AES	EPA 6010B/6010C	Potassium
ICP-AES	EPA 6010B/6010C	Selenium

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C	Silver
ICP-AES	EPA 6010B/6010C	Sodium
ICP-AES	EPA 6010B/6010C	Strontium
ICP-AES	EPA 6010B/6010C	Thallium
ICP-AES	EPA 6010B/6010C	Tin
ICP-AES	EPA 6010B/6010C	Titanium
ICP-AES	EPA 6010B/6010C	Vanadium
ICP-AES	EPA 6010B/6010C	Zinc
GFAA	EPA 7010	Antimony
GFAA	EPA 7010	Arsenic
GFAA	EPA 7010	Lead
GFAA	EPA 7010	Selenium
GFAA	EPA 7010	Thallium
GFAA	EPA 7041	Antimony
GFAA	EPA 7060A	Arsenic
GFAA	EPA 7421	Lead
GFAA	EPA 7740	Selenium
GFAA	EPA 7841	Thallium
CVAA	EPA 7470/7470A	Mercury
Gravimetric	EPA 160.1/SM 2540C	Residue-filterable (TDS)
Gravimetric	EPA 160.2/SM 2540D	Total Suspended Solids
Gravimetric	EPA 1664A (HEM)	Oil & Grease
Probe	EPA 150.1/9040/ SM 4500-H+ B	pH
Titration	EPA 310.1/SM 2320B	Alkalinity (Bicarbonate)
Titration	EPA 310.1/SM 2320B	Alkalinity (Carbonate)
Titration	EPA 310.1/SM 2320B	Alkalinity (Hydroxide)
Titration	EPA 310.1/SM 2320B	Alkalinity (Total)
Titration	EPA 376.1/SM 4500-S_2^- F	Sulfide
TOC-IR	EPA 9060/9060A/SM 5310B	Total Organic Carbon
TURB	EPA 375.4/ASTM D516-90	Sulfate
Calculation	SM 2340B	Hardness

Non-Potable Water		
Technology	**Method**	**Analyte**
Colorimetric	EPA 325.2/SM 4500-Cl^- E	Chloride
Colorimetric	EPA 350.1/SM 4500-NH_3 G	Ammonia
Colorimetric	EPA 351.2/SM 4500-Norg D	Total Kjeldahl Nitrogen
Colorimetric	EPA 353.2/SM 4500-NO_3^- F	Nitrate
Colorimetric	EPA 353.2/SM 4500-NO_3^- F	Nitrate + Nitrite
Colorimetric	EPA 354.1/SM 4500-NO_3^- F	Nitrite
Colorimetric	EPA 365.1/SM 4500-P F	Orthophosphate
Colorimetric	EPA 365.4/SM 4500-P F	Total Phosphorus
Colorimetric	SM 3500-Cr D	Chromium VI
Colorimetric	SM 3500-Fe D	Ferrous Iron
Colorimetric	EPA 7196A	Chromium VI
Colorimetric/Distillation	EPA 9012B	Total and Amenable Cyanide
Preparation	**Method**	**Type**
Inorganic Preparation	EPA 3005A	Hotblock
Inorganic Preparation	EPA 3010A	Hotblock
Inorganic Preparation	EPA 3020A	Hotblock
Leaching Preparation	EPA 1311	TCLP Leaching, Volatiles ZHE and SVOA/Metals
Preparation	EPA 1312	Synthetic Precipitation Leaching Procedure
Organic Preparation	EPA 3500C	Organic Extraction and Sample Preparation
Organic Preparation	EPA 3510C	Separatory Funnel
Volatile Organic Preparation	EPA 5030/5030A	Purge and Trap
Volatile Organic Preparation	EPA 5021	Equilibrium Headspace Analysis
Organic Preparation	EPA 3620C	Florisil Cleanup
Organic Preparation	EPA 3630C	Silica Gel Cleanup
Organic Preparation	EPA 3660B	Sulfur Cleanup (Copper)
Organic Preparation	EPA 3665A	Sulfuric Acid Cleanup

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8081A/8081B	4,4'-DDD
GC/ECD	EPA 8081A/8081B	4,4'-DDE
GC/ECD	EPA 8081A/8081B	4,4'-DDT
GC/ECD	EPA 8081A/8081B	Aldrin
GC/ECD	EPA 8081A/8081B	alpha-BHC
GC/ECD	EPA 8081A/8081B	alpha-Chlordane
GC/ECD	EPA 8081A/8081B	beta-BHC
GC/ECD	EPA 8081A/8081B	Chlordane
GC/ECD	EPA 8081A/8081B	delta-BHC
GC/ECD	EPA 8081A/8081B	Dieldrin
GC/ECD	EPA 8081A/8081B	Endosulfan I
GC/ECD	EPA 8081A/8081B	Endosulfan II
GC/ECD	EPA 8081A/8081B	Endosulfan sulfate
GC/ECD	EPA 8081A/8081B	Endrin
GC/ECD	EPA 8081A/8081B	Endrin aldehyde
GC/ECD	EPA 8081A/8081B	Endrin ketone
GC/ECD	EPA 8081A/8081B	gamma-BHC (Lindane)
GC/ECD	EPA 8081A/8081B	gamma-Chlordane
GC/ECD	EPA 8081A/8081B	Heptachlor
GC/ECD	EPA 8081A/8081B	Heptachlor epoxide
GC/ECD	EPA 8081A/8081B	Methoxychlor
GC/ECD	EPA 8081A/8081B	Mirex
GC/ECD	EPA 8081A/8081B	Toxaphene
GC/ECD	EPA 8082/8082A	Aroclor-1016
GC/ECD	EPA 8082/8082A	Aroclor-1221
GC/ECD	EPA 8082/8082A	Aroclor-1232
GC/ECD	EPA 8082/8082A	Aroclor-1242
GC/ECD	EPA 8082/8082A	Aroclor-1248
GC/ECD	EPA 8082/8082A	Aroclor-1254
GC/ECD	EPA 8082/8082A	Aroclor-1260
GC/ECD	EPA 8151/8151A	2,4,5-T

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/ECD	EPA 8151/8151A	2,4,5-TP (Silvex)
GC/ECD	EPA 8151/8151A	2,4'-D
GC/ECD	EPA 8151/8151A	2,4-DB
GC/ECD	EPA 8151/8151A	Dalapon
GC/ECD	EPA 8151/8151A	Dicamba
GC/ECD	EPA 8151/8151A	Dichloroprop
GC/ECD	EPA 8151/8151A	Dinoseb
GC/ECD	EPA 8151/8151A	MCPA
GC/ECD	EPA 8151/8151A	MCPP
GC/ECD	EPA 8151/8151A	Pentachlorophenol
GC/ECD	EPA 8151/8151A	Picloram
GC/FID	FL PRO	Total Petroleum Hydrocarbons
GC/FID	EPA 8015C	TPH C10-C28
GC/FID	EPA 8015C	TPH >C6-C10
GC/FID	TX1005	TPH C12-28
GC/FID	TX1005	TPH C6-C12
GC/FID	TPH-Direct	C6-C8 Aliphatic
GC/FID	TPH-Direct	C8-C10 Aliphatic
GC/FID	TPH-Direct	C10-C12 Aliphatic
GC/FID	TPH-Direct	C12-C16 Aliphatic
GC/FID	TPH-Direct	C16-C21 Aliphatic
GC/FID	TPH-Direct	C21-C35 Aliphatic
GC/FID	TPH-Direct	C7-C8 Aromatic
GC/FID	TPH-Direct	C8-C10 Aromatic
GC/FID	TPH-Direct	C10-C12 Aromatic
GC/FID	TPH-Direct	C12-C16 Aromatic
GC/FID	TPH-Direct	C16-C21 Aromatic
GC/FID	TPH-Direct	C21-C35 Aromatic
GC/MS	EPA 8260B/8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2,2-Tetrachloroethane

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloro-1,2,2-trifluoroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethylene
GC/MS	EPA 8260B/8260C	1,1-Dichloropropene
GC/MS	EPA 8260B/8260C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260C	1,2,3-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,2-Dibromo-3-chloropropane (DBCP)
GC/MS	EPA 8260B/8260C	1,2-Dibromoethane (EDB)
GC/MS	EPA 8260B/8260C	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,2-Dichloroethane
GC/MS	EPA 8260B/8260C	1,2-Dichloroethene (total)
GC/MS	EPA 8260B/8260C	1,2-Dichloropropane
GC/MS	EPA 8260B/8260C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,3-Dichloropropane
GC/MS	EPA 8260B/8260C	1,4-Dioxane
GC/MS	EPA 8260B/8260C	1,4-Dichloro-2-butene
GC/MS	EPA 8260B/8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1-Chlorohexane
GC/MS	EPA 8260B/8260C	2,2-Dichloropropane
GC/MS	EPA 8260B/8260C	2-Butanone
GC/MS	EPA 8260B/8260C	2-Chloro-1,1,1-trifluoroethane
GC/MS	EPA 8260B/8260C	2-Chloroethyl vinyl ether
GC/MS	EPA 8260B/8260C	2-Chlorotoluene
GC/MS	EPA 8260B/8260C	2-Hexanone
GC/MS	EPA 8260B/8260C	2-Nitropropane
GC/MS	EPA 8260B/8260C	3,3-Dimethyl-1-butanol

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	4-Chlorotoluene
GC/MS	EPA 8260B/8260C	4-Isopropyltoluene
GC/MS	EPA 8260B/8260C	4-Methyl-2-pentanone
GC/MS	EPA 8260B/8260C	Acetone
GC/MS	EPA 8260B/8260C	Acetonitrile
GC/MS	EPA 8260B/8260C	Acrolein
GC/MS	EPA 8260B/8260C	Acrylonitrile
GC/MS	EPA 8260B/8260C	Allyl chloride
GC/MS	EPA 8260B/8260C	Benzene
GC/MS	EPA 8260B/8260C	Benzyl chloride
GC/MS	EPA 8260B/8260C	Bromobenzene
GC/MS	EPA 8260B/8260C	Bromochloromethane
GC/MS	EPA 8260B/8260C	Bromodichloromethane
GC/MS	EPA 8260B/8260C	Bromoethane
GC/MS	EPA 8260B/8260C	Bromoform
GC/MS	EPA 8260B/8260C	Carbon disulfide
GC/MS	EPA 8260B/8260C	Carbon tetrachloride
GC/MS	EPA 8260B/8260C	Chlorobenzene
GC/MS	EPA 8260B/8260C	Chlorodibromomethane
GC/MS	EPA 8260B/8260C	Chloroethane
GC/MS	EPA 8260B/8260C	Chloroform
GC/MS	EPA 8260B/8260C	Chloroprene
GC/MS	EPA 8260B/8260C	Chlorotrifluoroethylene
GC/MS	EPA 8260B/8260C	cis-1,2-Dichloroethylene
GC/MS	EPA 8260B/8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Cyclohexane
GC/MS	EPA 8260B/8260C	Cyclohexanone
GC/MS	EPA 8260B/8260C	Dibromomethane
GC/MS	EPA 8260B/8260C	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260C	Diethyl Ether
GC/MS	EPA 8260B/8260C	Di-isopropylether (DIPE)

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	Ethanol
GC/MS	EPA 8260B/8260C	Ethyl acetate
GC/MS	EPA 8260B/8260C	Ethyl methacrylate
GC/MS	EPA 8260B/8260C	Ethyl tert-butyl ether
GC/MS	EPA 8260B/8260C	Ethylbenzene
GC/MS	EPA 8260B/8260C	Hexachlorobutadiene
GC/MS	EPA 8260B/8260C	Iodomethane
GC/MS	EPA 8260B/8260C	Isobutyl alcohol
GC/MS	EPA 8260B/8260C	Isopropylbenzene (Cumene)
GC/MS	EPA 8260B/8260C	m+p-Xylene
GC/MS	EPA 8260B/8260C	Methacrylonitrile
GC/MS	EPA 8260B/8260C	Methyl acetate
GC/MS	EPA 8260B/8260C	Methyl bromide
GC/MS	EPA 8260B/8260C	Methyl chloride
GC/MS	EPA 8260B/8260C	Methylcyclohexane
GC/MS	EPA 8260B/8260C	Methyl methacrylate
GC/MS	EPA 8260B/8260C	Methylene chloride
GC/MS	EPA 8260B/8260C	Methyl tert-butyl ether (MTBE)
GC/MS	EPA 8260B/8260C	Naphthalene
GC/MS	EPA 8260B/8260C	n-Butylbenzene
GC/MS	EPA 8260B/8260C	n-hexane (C6)
GC/MS	EPA 8260B/8260C	n-Propylbenzene
GC/MS	EPA 8260B/8260C	o-Xylene
GC/MS	EPA 8260B/8260C	Propionitrile
GC/MS	EPA 8260B/8260C	sec-Butylbenzene
GC/MS	EPA 8260B/8260C	Styrene
GC/MS	EPA 8260B/8260C	t-Amyl alcohol
GC/MS	EPA 8260B/8260C	t-Butyl alcohol
GC/MS	EPA 8260B/8260C	t-Butyl formate
GC/MS	EPA 8260B/8260C	tert-Amyl methyl ether (TAME)
GC/MS	EPA 8260B/8260C	tert-Butylbenzene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	Tetrachloroethylene
GC/MS	EPA 8260B/8260C	Tetrahydrofuran
GC/MS	EPA 8260B/8260C	Toluene
GC/MS	EPA 8260B/8260C	trans-1,3-Dichloropropylene
GC/MS	EPA 8260B/8260C	Trichloroethene
GC/MS	EPA 8260B/8260C	Trichlorofluoromethane
GC/MS	EPA 8260B/8260C	Vinyl acetate
GC/MS	EPA 8260B/8260C	Vinyl chloride
GC/MS	EPA 8260B/8260C	Xylene (total)
GC/MS	EPA 8270B/8270C	o,o,o-Triethyl phosphorothioate
GC/MS	EPA 8270B/8270C	1,2 Diphenylhydrazine
GC/MS	EPA 8270B/8270C	1,2,4,5-Tetrachlorobenzene
GC/MS	EPA 8270B/8270C	1,2,4-Trichlorobenzene
GC/MS	EPA 8270B/8270C	1,2-Dichlorobenzene
GC/MS	EPA 8270B/8270C	1,3,5-Trinitrobenzene
GC/MS	EPA 8270B/8270C	1,3-Dichlorobenzene
GC/MS	EPA 8270B/8270C	1,3-Dinitrobenzene
GC/MS	EPA 8270B/8270C	1,4-Dichlorobenzene
GC/MS	EPA 8270B/8270C	1,4-Naphthoquinone
GC/MS	EPA 8270B/8270C	1-Methylnaphthalene
GC/MS	EPA 8270B/8270C	1-Naphthylamine
GC/MS	EPA 8270B/8270C	2,2′-Oxybis(1-chloropropane)
GC/MS	EPA 8270B/8270C	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270B/8270C	2,4,5-Trichlorophenol
GC/MS	EPA 8270B/8270C	2,4,6-Trichlorophenol
GC/MS	EPA 8270B/8270C	2,4-Dichlorophenol
GC/MS	EPA 8270B/8270C	2,4-Dimethylphenol
GC/MS	EPA 8270B/8270C	2,4-Dinitrophenol
GC/MS	EPA 8270B/8270C	2,4-Dinitrotoluene
GC/MS	EPA 8270B/8270C	2,6-Dichlorophenol
GC/MS	EPA 8270B/8270C	2,6-Dinitrotoluene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C	2-Acetylaminofluorene
GC/MS	EPA 8270B/8270C	2-Chloronaphthalene
GC/MS	EPA 8270B/8270C	2-Chlorophenol
GC/MS	EPA 8270B/8270C	2-Methyl-4,6-dinitrophenol
GC/MS	EPA 8270B/8270C	2-Methylnaphthalene
GC/MS	EPA 8270B/8270C	2-Methylphenol (o-Cresol)
GC/MS	EPA 8270B/8270C	2-Naphthylamine
GC/MS	EPA 8270B/8270C	2-Nitroaniline
GC/MS	EPA 8270B/8270C	2-Nitrophenol
GC/MS	EPA 8270B/8270C	2-Picoline
GC/MS	EPA 8270B/8270C	3,3'-Dichlorobenzidine
GC/MS	EPA 8270B/8270C	3,3'-Dimethylbenzidine
GC/MS	EPA 8270B/8270C	3-Methylcholanthrene
GC/MS	EPA 8270B/8270C	3-Nitroaniline
GC/MS	EPA 8270B/8270C	4-Aminobiphenyl
GC/MS	EPA 8270B/8270C	4-Bromophenyl-phenylether
GC/MS	EPA 8270B/8270C	4-Chloro-3-methylphenol
GC/MS	EPA 8270B/8270C	4-Chloroaniline
GC/MS	EPA 8270B/8270C	4-Chlorophenyl-phenylether
GC/MS	EPA 8270B/8270C	4-Methylphenol
GC/MS	EPA 8270B/8270C	4-Nitroaniline
GC/MS	EPA 8270B/8270C	4-Nitrophenol
GC/MS	EPA 8270B/8270C	4-Nitroquinoline-1-oxide
GC/MS	EPA 8270B/8270C	5-Nitro-o-toluidine
GC/MS	EPA 8270B/8270C	7,12-Dimethylbenz(a)anthracene
GC/MS	EPA 8270B/8270C	a-a-Dimethylphenethylamine
GC/MS	EPA 8270B/8270C	Acenaphthene
GC/MS	EPA 8270B/8270C	Acenaphthylene
GC/MS	EPA 8270B/8270C	Acetophenone
GC/MS	EPA 8270B/8270C	Aniline
GC/MS	EPA 8270B/8270C	Anthracene

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Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C	Aramite
GC/MS	EPA 8270B/8270C	Atrazine
GC/MS	EPA 8270B/8270C	Benzaldehyde
GC/MS	EPA 8270B/8270C	Benzidine
GC/MS	EPA 8270B/8270C	Benzo(a)anthracene
GC/MS	EPA 8270B/8270C	Benzo(a)pyrene
GC/MS	EPA 8270B/8270C	Benzo(b)fluoranthene
GC/MS	EPA 8270B/8270C	Benzo(g,h,i)perylene
GC/MS	EPA 8270B/8270C	Benzo(k)fluoranthene
GC/MS	EPA 8270B/8270C	Benzoic acid
GC/MS	EPA 8270B/8270C	Benzyl alcohol
GC/MS	EPA 8270B/8270C	Biphenyl
GC/MS	EPA 8270B/8270C	bis(2-Chloroethoxy)methane
GC/MS	EPA 8270B/8270C	bis(2-Chloroethyl)ether
GC/MS	EPA 8270B/8270C	bis(2-ethylhexyl)phthalate
GC/MS	EPA 8270B/8270C	Butylbenzylphthalate
GC/MS	EPA 8270B/8270C	Caprolactam
GC/MS	EPA 8270B/8270C	Carbazole
GC/MS	EPA 8270B/8270C	Chlorobenzilate
GC/MS	EPA 8270B/8270C	Chrysene
GC/MS	EPA 8270B/8270C	Cresols (total)
GC/MS	EPA 8270B/8270C	Diallate (Avadex)
GC/MS	EPA 8270B/8270C	Dibenz(a,h)anthracene
GC/MS	EPA 8270B/8270C	Dibenz(a,j)acridine
GC/MS	EPA 8270B/8270C	Dibenzofuran
GC/MS	EPA 8270B/8270C	Diethylphthalate
GC/MS	EPA 8270B/8270C	Dimethyl-phthalate
GC/MS	EPA 8270B/8270C	Di-n-butylphthalate
GC/MS	EPA 8270B/8270C	Di-n-octylphthalate
GC/MS	EPA 8270B/8270C	Dinoseb
GC/MS	EPA 8270B/8270C	Ethyl methanesulfonate

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C	Fluoranthene
GC/MS	EPA 8270B/8270C	Fluorene
GC/MS	EPA 8270B/8270C	Hexachlorobenzene
GC/MS	EPA 8270B/8270C	Hexachlorobutadiene
GC/MS	EPA 8270B/8270C	Hexachlorocyclopentadiene
GC/MS	EPA 8270B/8270C	Hexachloroethane
GC/MS	EPA 8270B/8270C	Hexachloropropene
GC/MS	EPA 8270B/8270C	Indeno(1,2,3-cd)pyrene
GC/MS	EPA 8270B/8270C	Isodrin
GC/MS	EPA 8270B/8270C	Isophorone
GC/MS	EPA 8270B/8270C	Isosafrole
GC/MS	EPA 8270B/8270C	Kepone
GC/MS	EPA 8270B/8270C	Methapyriline
GC/MS	EPA 8270B/8270C	Methylmethanesulfonate
GC/MS	EPA 8270B/8270C	Naphthalene
GC/MS	EPA 8270B/8270C	Nitrobenzene
GC/MS	EPA 8270B/8270C	N-Nitrosodibutylamine
GC/MS	EPA 8270B/8270C	N-Nitrosodiethylamine
GC/MS	EPA 8270B/8270C	N-Nitrosodimethylamine
GC/MS	EPA 8270B/8270C	N-Nitroso-di-n-propylamine
GC/MS	EPA 8270B/8270C	N-Nitrosodiphenylamine
GC/MS	EPA 8270B/8270C	N-Nitrosomethylethylamine
GC/MS	EPA 8270B/8270C	N-Nitrosomorpholine
GC/MS	EPA 8270B/8270C	N-Nitrosopiperidine
GC/MS	EPA 8270B/8270C	N-Nitrosopyrrolidine
GC/MS	EPA 8270B/8270C	o-Toluidine
GC/MS	EPA 8270B/8270C	p-Dimethylaminoazobenzene
GC/MS	EPA 8270B/8270C	Pentachlorobenzene
GC/MS	EPA 8270B/8270C	Pentachloroethane
GC/MS	EPA 8270B/8270C	Pentachloronitrobenzene (PCNB)
GC/MS	EPA 8270B/8270C	Pentachlorophenol

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270B/8270C	Phenacetin
GC/MS	EPA 8270B/8270C	Phenanthrene
GC/MS	EPA 8270B/8270C	Phenol
GC/MS	EPA 8270B/8270C	p-Phenylenediamine
GC/MS	EPA 8270B/8270C	Pronamide
GC/MS	EPA 8270B/8270C	Pyrene
GC/MS	EPA 8270B/8270C	Pyridine
GC/MS	EPA 8270B/8270C	Safrole
HPLC/UV	EPA 8310	1-Methylnaphthalene
HPLC/UV	EPA 8310	2-Methylnaphthalene
HPLC/UV	EPA 8310	Acenaphthene
HPLC/UV	EPA 8310	Acenaphthylene
HPLC/UV	EPA 8310	Anthracene
HPLC/UV	EPA 8310	Benzo(a)anthracene
HPLC/UV	EPA 8310	Benzo(a)pyrene
HPLC/UV	EPA 8310	Benzo(b)fluoranthene
HPLC/UV	EPA 8310	Benzo(g,h,i)perylene
HPLC/UV	EPA 8310	Benzo(k)fluoranthene
HPLC/UV	EPA 8310	Chrysene
HPLC/UV	EPA 8310	Dibenz(a,h)anthracene
HPLC/UV	EPA 8310	Fluoranthene
HPLC/UV	EPA 8310	Fluorene
HPLC/UV	EPA 8310	Indeno(1,2,3-cd)pyrene
HPLC/UV	EPA 8310	Naphthalene
HPLC/UV	EPA 8310	Phenanthrene
HPLC/UV	EPA 8310	Pyrene
HPLC/UV	EPA 8315Mod	Formaldehyde
HPLC/UV	EPA 8330A / 8330B	1-nitroso-3,5-dinitro-1,3,5- triazacyclohexane (MNX)
HPLC/UV	EPA 8330A / 8330B	1,3,5-Trinitrobenzene
HPLC/UV	EPA 8330A / 8330B	1,3-Dinitrobenzene
HPLC/UV	EPA 8330A / 8330B	2,4,6-Trinitrotoluene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
HPLC/UV	EPA 8330A / 8330B	2,4-Dinitrotoluene
HPLC/UV	EPA 8330A / 8330B	2,6-Dinitrotoluene
HPLC/UV	EPA 8330A / 8330B	2-Amino-4,6-dinitrotoluene
HPLC/UV	EPA 8330A / 8330B	2-Nitrotoluene
HPLC/UV	EPA 8330A / 8330B	3-Nitrotoluene
HPLC/UV	EPA 8330A / 8330B	3,5-Dinitroaniline
HPLC/UV	EPA 8330A / 8330B	4-Amino-2,6-dinitrotoluene
HPLC/UV	EPA 8330A / 8330B	4-Nitrotoluene
HPLC/UV	EPA 8330A / 8330B	Methyl-2,4,6-trinitrophenylnitramine (tetryl)
HPLC/UV	EPA 8330A / 8330B	Nitrobenzene
HPLC/UV	EPA 8330A / 8330B	Nitroglycerin
HPLC/UV	EPA 8330A / 8330B	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)
HPLC/UV	EPA 8330A / 8330B	Pentaerythritoltetranitrate (PETN)
HPLC/UV	EPA 8330A / 8330B	RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)
IC-COND	EPA 314.0Mod	Perchlorate
IC-COND	EPA 9056Mod	Bromide
IC-COND	EPA 9056Mod	Chloride
IC-COND	EPA 9056Mod	Fluoride
IC-COND	EPA 9056Mod	Nitrate
IC-COND	EPA 9056Mod	Nitrite
IC-COND	EPA 9056Mod	Phosphate
IC-COND	EPA 9056Mod	Sulfate
ICP-AES	EPA 6010B/6010C	Aluminum
ICP-AES	EPA 6010B/6010C	Antimony
ICP-AES	EPA 6010B/6010C	Arsenic
ICP-AES	EPA 6010B/6010C	Barium
ICP-AES	EPA 6010B/6010C	Beryllium
ICP-AES	EPA 6010B/6010C	Cadmium
ICP-AES	EPA 6010B/6010C	Calcium
ICP-AES	EPA 6010B/6010C	Chromium
ICP-AES	EPA 6010B/6010C	Cobalt

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C	Copper
ICP-AES	EPA 6010B/6010C	Iron
ICP-AES	EPA 6010B/6010C	Lead
ICP-AES	EPA 6010B/6010C	Magnesium
ICP-AES	EPA 6010B/6010C	Manganese
ICP-AES	EPA 6010B/6010C	Molybdenum
ICP-AES	EPA 6010B/6010C	Nickel
ICP-AES	EPA 6010B/6010C	Potassium
ICP-AES	EPA 6010B/6010C	Selenium
ICP-AES	EPA 6010B/6010C	Silver
ICP-AES	EPA 6010B/6010C	Sodium
ICP-AES	EPA 6010B/6010C	Strontium
ICP-AES	EPA 6010B/6010C	Thallium
ICP-AES	EPA 6010B/6010C	Tin
ICP-AES	EPA 6010B/6010C	Titanium
ICP-AES	EPA 6010B/6010C	Vanadium
ICP-AES	EPA 6010B/6010C	Zinc
GFAA	EPA 7010	Antimony
GFAA	EPA 7010	Arsenic
GFAA	EPA 7010	Lead
GFAA	EPA 7010	Selenium
GFAA	EPA 7010	Thallium
GFAA	EPA 7041	Antimony
GFAA	EPA 7060A	Arsenic
GFAA	EPA 7421	Lead
GFAA	EPA 7740	Selenium
GFAA	EPA 7841	Thallium
CVAA	EPA 7471A/7471B	Mercury
Colorimetric	EPA 7196A	Chromium VI
Colorimetric/Distillation	EPA 9012B	Total and Amenable Cyanide
TOC-IR	EPA 9060/9060A/ SM 5310B	Total Organic Carbon

LABORATORY ACCREDITATION BUREAU

Certificate # L2259

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
Probe	EPA 9045C	pH
Preparation	**Method**	**Type**
Preparation	EPA 1311	Toxicity Characteristic Leaching Procedure
Preparation	EPA 1312	Synthetic Precipitation Leaching Procedure
Organic Preparation	EPA 3500C	Organic Extraction and Sample Preparation
Organic Preparation	EPA 3550B/3550C	Sonication
Organic Preparation	EPA 3545A	Pressurized Fluid Extraction
Inorganic Preparation	EPA 3050B	Hotblock
Inorganic Preparation	EPA 3060 A	Alkaline Digestion for Hexavalent Chromium
Volatile Organics Preparation	EPA 5035/5035A	Closed System Purge and Trap
Organic Preparation	EPA 3580/3580A	Waste dilution
Organic Preparation	EPA 3585	Waste dilution for Volatile Organics
Organic Preparation	EPA 3620C	Florisil Cleanup
Organic Preparation	EPA 3630C	Silica Gel Cleanup
Organic Preparation	EPA 3660B	Sulfur Cleanup (Copper)
Organic Preparation	EPA 3665A	Sulfuric Acid Cleanup

Notes:

1) This laboratory offers commercial testing service.

Approved by: ______________________
R. Douglas Leonard
Chief Technical Officer

Date: June 29, 2011

Issued: 7/13/10 Revised: 7/16/10 Revised: 1/20/11 Revised: 3/14/11 Revised: 6/10/11
Revised: 6/29/11

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Spectrum Analytical, Inc. Featuring Hanibal Technology Florida Division

8405 Benjamin Road, Suite A
Tampa, FL 33634-1235

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Certificate Number: T104704408-11-3
Effective Date: 7/1/2011
Expiration Date: 6/30/2012

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Spectrum Analytical, Inc. Featuring Hanibal Technology Florida Division	**Expiration Date:**	**6/30/2012**
8405 Benjamin Road, Suite A **Tampa, FL 33634-1235**	**Issue Date:**	**7/1/2011**

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Matrix: ***Non-Potable Water***

Method ASTM D516

Analyte	AB	Analyte ID	Method ID
Sulfate	FL	2000	30002201

Method EPA 150.1

Analyte	AB	Analyte ID	Method ID
pH	FL	1900	10008409

Method EPA 160.1

Analyte	AB	Analyte ID	Method ID
Residue-filterable (TDS)	FL	1955	10009208

Method EPA 160.2

Analyte	AB	Analyte ID	Method ID
Residue-nonfilterable (TSS)	FL	1960	10009606

Method EPA 1664

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	FL	1803	10127409

Method EPA 300.1

Analyte	AB	Analyte ID	Method ID
Bromide	FL	1540	10053608
Chloride	FL	1575	10053608
Fluoride	FL	1730	10053608
Nitrate as N	FL	1810	10053608
Nitrite as N	FL	1840	10053608
Orthophosphate as P	FL	1870	10053608
Sulfate	FL	2000	10053608

Method EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	FL	1505	10054805

Method EPA 314.0

Analyte	AB	Analyte ID	Method ID
Perchlorate	FL	1895	10055400

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Matrix: ***Non-Potable Water***

Method EPA 325.2

Analyte	AB	Analyte ID	Method ID
Chloride	FL	1575	10057202

Method EPA 350.1

Analyte	AB	Analyte ID	Method ID
Ammonia as N	FL	1515	10063408

Method EPA 351.2

Analyte	AB	Analyte ID	Method ID
Kjeldahl nitrogen - total (TKN)	FL	1795	10065200

Method EPA 353.2

Analyte	AB	Analyte ID	Method ID
Nitrate as N	FL	1810	10067400
Nitrate-nitrite	FL	1820	10067400
Nitrite as N	FL	1840	10067400

Method EPA 354.1

Analyte	AB	Analyte ID	Method ID
Nitrite as N	FL	1840	10068607

Method EPA 365.1

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	FL	1870	10069804

Method EPA 365.4

Analyte	AB	Analyte ID	Method ID
Phosphorus	FL	1910	10071202

Method EPA 375.4

Analyte	AB	Analyte ID	Method ID
Sulfate	FL	2000	10073800

Method EPA 376.1

Analyte	AB	Analyte ID	Method ID
Sulfide	FL	2005	10074201

Method EPA 415.1

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	FL	2040	10078407

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Matrix: ***Non-Potable Water***

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	FL	1000	10155201
Antimony	FL	1005	10155201
Arsenic	FL	1010	10155201
Barium	FL	1015	10155201
Beryllium	FL	1020	10155201
Cadmium	FL	1030	10155201
Calcium	FL	1035	10155201
Chromium	FL	1040	10155201
Cobalt	FL	1050	10155201
Copper	FL	1055	10155201
Iron	FL	1070	10155201
Lead	FL	1075	10155201
Magnesium	FL	1085	10155201
Manganese	FL	1090	10155201
Molybdenum	FL	1100	10155201
Nickel	FL	1105	10155201
Potassium	FL	1125	10155201
Selenium	FL	1140	10155201
Silver	FL	1150	10155201
Sodium	FL	1155	10155201
Thallium	FL	1165	10155201
Tin	FL	1175	10155201
Titanium	FL	1180	10155405
Vanadium	FL	1185	10155201
Zinc	FL	1190	10155201

Method EPA 7010

Analyte	AB	Analyte ID	Method ID
Arsenic	FL	1010	10157809
Lead	FL	1075	10157809

Matrix: ***Non-Potable Water***

Selenium	FL	1140	10157809
Thallium	FL	1165	10157809

Method EPA 7041

Analyte	AB	Analyte ID	Method ID
Antimony	FL	1005	10158404

Method EPA 7060

Analyte	AB	Analyte ID	Method ID
Arsenic	FL	1010	10158608

Method EPA 7421

Analyte	AB	Analyte ID	Method ID
Lead	FL	1075	10164600

Method EPA 7470

Analyte	AB	Analyte ID	Method ID
Mercury	FL	1095	10165603

Method EPA 7740

Analyte	AB	Analyte ID	Method ID
Selenium	FL	1140	10168602

Method EPA 7841

Analyte	AB	Analyte ID	Method ID
Thallium	FL	1165	10170602

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	FL	9369	10173203
Gasoline range organics (GRO)	FL	9408	10173203

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	FL	7355	10178402
4,4'-DDE	FL	7360	10178402
4,4'-DDT	FL	7365	10178402
Aldrin	FL	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	FL	7110	10178402

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Matrix: ***Non-Potable Water***

Analyte	AB	Analyte ID	Method ID
alpha-Chlordane	FL	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	FL	7115	10178402
Chlordane (tech.)	FL	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	FL	7105	10178402
Dieldrin	FL	7470	10178402
Endosulfan I	FL	7510	10178402
Endosulfan II	FL	7515	10178402
Endosulfan sulfate	FL	7520	10178402
Endrin	FL	7540	10178402
Endrin aldehyde	FL	7530	10178402
Endrin ketone	FL	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	FL	7120	10178402
gamma-Chlordane	FL	7245	10178402
Heptachlor	FL	7685	10178402
Heptachlor epoxide	FL	7690	10178402
Methoxychlor	FL	7810	10178402
Toxaphene (Chlorinated camphene)	FL	8250	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	FL	8880	10179007
Aroclor-1221 (PCB-1221)	FL	8885	10179007
Aroclor-1232 (PCB-1232)	FL	8890	10179007
Aroclor-1242 (PCB-1242)	FL	8895	10179007
Aroclor-1248 (PCB-1248)	FL	8900	10179007
Aroclor-1254 (PCB-1254)	FL	8905	10179007
Aroclor-1260 (PCB-1260)	FL	8910	10179007

Method EPA 8141

Analyte	AB	Analyte ID	Method ID
Atrazine	FL	7065	10181803
Azinphos-ethyl (Ethyl guthion)	FL	7070	10181803
Azinphos-methyl (Guthion)	FL	7075	10181803

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Matrix: *Non-Potable Water*

Bolstar (Sulprofos)	FL	7125	10181803
Chlorfenvinphos	FL	7255	10182000
Chlorpyrifos (Dursban)	FL	7300	10181803
Coumaphos	FL	7315	10181803
Demeton-o	FL	7395	10181803
Demeton-s	FL	7385	10181803
Diazinon	FL	7410	10181803
Dichlorovos (DDVP, Dichlorvos)	FL	8610	10181803
Dimethoate	FL	7475	10181803
Disulfoton	FL	8625	10181803
EPN (Phosphonothioic acid, phenyl-, O-ethyl O-(p-nitrophenyl) ester)	FL	7550	10181803
Ethion	FL	7565	10181803
Ethoprop	FL	7570	10181803
Famphur	FL	7580	10181803
Fensulfothion	FL	7600	10181803
Fenthion	FL	7605	10181803
Leptophos	FL	7755	10181803
Malathion	FL	7770	10181803
Merphos	FL	7785	10181803
Methyl parathion (Parathion, methyl)	FL	7825	10181803
Mevinphos	FL	7850	10181803
Naled	FL	7905	10181803
Parathion, ethyl	FL	7955	10181803
Phorate	FL	7985	10181803
Phosphamidon	FL	8005	10181803
Ronnel	FL	8110	10181803
Simazine	FL	8125	10181803
Stirophos (Tetrachlorvinphos)	FL	8200	10181803
Sulfotepp	FL	8155	10181803
Terbufos	FL	8185	10181803

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Matrix: ***Non-Potable Water***

Tetraethyl pyrophosphate (TEPP)	FL	8210	10181803
Thionazin (Zinophos)	FL	8235	10181803
Tokuthion (Prothiophos)	FL	8245	10181803
Trichloronate	FL	8275	10181803

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	FL	8655	10183003
2,4-D	FL	8545	10183003
2,4-DB	FL	8560	10183003
Dalapon	FL	8555	10183003
Dicamba	FL	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	FL	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	FL	8620	10183003
MCPA	FL	7775	10183003
MCPP	FL	7780	10183003
Pentachlorophenol	FL	6605	10183003
Picloram	FL	8645	10183003
Silvex (2,4,5-TP)	FL	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	FL	5105	10184404
1,1,1-Trichloroethane	FL	5160	10184404
1,1,2,2-Tetrachloroethane	FL	5110	10184404
1,1,2-Trichloroethane	FL	5165	10184404
1,1-Dichloroethane	FL	4630	10184404
1,1-Dichloroethylene	FL	4640	10184404
1,1-Dichloropropene	FL	4670	10184404
1,2,3-Trichlorobenzene	FL	5150	10184404
1,2,3-Trichloropropane	FL	5180	10184404
1,2,4-Trichlorobenzene	FL	5155	10184404
1,2,4-Trimethylbenzene	FL	5210	10184404

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

1,2-Dibromo-3-chloropropane (DBCP)	FL	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	FL	4585	10184404
1,2-Dichlorobenzene	FL	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	FL	4635	10184404
1,2-Dichloropropane	FL	4655	10184404
1,3,5-Trimethylbenzene	FL	5215	10184404
1,3-Dichlorobenzene	FL	4615	10184404
1,3-Dichloropropane	FL	4660	10184404
1,4-Dichlorobenzene	FL	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	FL	4735	10184404
1-Chlorohexane	FL	4510	10184404
2,2-Dichloropropane	FL	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	FL	4410	10184404
2-Chloroethyl vinyl ether	FL	4500	10184404
2-Chlorotoluene	FL	4535	10184404
2-Hexanone (MBK)	FL	4860	10184404
2-Nitropropane	FL	5020	10184802
4-Chlorotoluene	FL	4540	10184404
4-Isopropyltoluene (p-Cymene)	FL	4915	10184404
4-Methyl-2-pentanone (MIBK)	FL	4995	10184404
Acetone (2-Propanone)	FL	4315	10184404
Acetonitrile	FL	4320	10184404
Acrolein (Propenal)	FL	4325	10184404
Acrylonitrile	FL	4340	10184404
Allyl chloride (3-Chloropropene)	FL	4355	10184404
Benzene	FL	4375	10184404
Benzyl chloride	FL	5635	10184802
Bromobenzene	FL	4385	10184404
Bromochloromethane	FL	4390	10184404
Bromodichloromethane	FL	4395	10184404

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Matrix: ***Non-Potable Water***

Bromoform	FL	4400	10184404
Carbon disulfide	FL	4450	10184404
Carbon tetrachloride	FL	4455	10184404
Chlorobenzene	FL	4475	10184404
Chlorodibromomethane	FL	4575	10184404
Chloroethane (Ethyl chloride)	FL	4485	10184404
Chloroform	FL	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	FL	4525	10184404
cis-1,2-Dichloroethylene	FL	4645	10184404
cis-1,3-Dichloropropene	FL	4680	10184404
cis-1,4-Dichloro-2-butene	FL	4600	10184802
Dibromomethane (Methylene bromide)	FL	4595	10184404
Dichlorodifluoromethane (Freon-12)	FL	4625	10184404
Diethyl ether	FL	4725	10184404
Ethanol	FL	4750	10184404
Ethyl acetate	FL	4755	10184404
Ethyl methacrylate	FL	4810	10184404
Ethylbenzene	FL	4765	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	FL	4770	10184608
Hexachlorobutadiene	FL	4835	10184404
Iodomethane (Methyl iodide)	FL	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	FL	4875	10184404
Isopropylbenzene (Cumene)	FL	4900	10184404
m+p-xylene	FL	5240	10184802
Methacrylonitrile	FL	4925	10184404
Methyl bromide (Bromomethane)	FL	4950	10184404
Methyl chloride (Chloromethane)	FL	4960	10184404
Methyl methacrylate	FL	4990	10184404
Methyl tert-butyl ether (MTBE)	FL	5000	10184404
Methylene chloride (Dichloromethane)	FL	4975	10184404

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Matrix: ***Non-Potable Water***

Naphthalene	FL	5005	10184404
n-Butylbenzene	FL	4435	10184404
n-Propylbenzene	FL	5090	10184404
o-Xylene	FL	5250	10184802
Propionitrile (Ethyl cyanide)	FL	5080	10184404
sec-Butylbenzene	FL	4440	10184404
Styrene	FL	5100	10184404
T-amylmethylether (TAME)	FL	4370	10184802
tert-Butyl alcohol	FL	4420	10184802
tert-Butylbenzene	FL	4445	10184404
Tetrachloroethylene (Perchloroethylene)	FL	5115	10184404
Toluene	FL	5140	10184404
trans-1,2-Dichloroethylene	FL	4700	10184404
trans-1,3-Dichloropropylene	FL	4685	10184404
trans-1,4-Dichloro-2-butene	FL	4605	10184404
Trichloroethene (Trichloroethylene)	FL	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	FL	5175	10184404
Vinyl acetate	FL	5225	10184404
Vinyl chloride	FL	5235	10184404
Xylene (total)	FL	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	FL	6715	10185203
1,2,4-Trichlorobenzene	FL	5155	10185203
1,2-Dichlorobenzene	FL	4610	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	FL	6885	10185203
1,3-Dichlorobenzene	FL	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	FL	6160	10185203
1,4-Dichlorobenzene	FL	4620	10185203
1,4-Naphthoquinone	FL	6420	10185203

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Matrix: ***Non-Potable Water***

1,4-Phenylenediamine	FL	6630	10185203
1-Naphthylamine	FL	6425	10185203
2,3,4,6-Tetrachlorophenol	FL	6735	10185203
2,4,5-Trichlorophenol	FL	6835	10185203
2,4,6-Trichlorophenol	FL	6840	10185203
2,4-Dichlorophenol	FL	6000	10185203
2,4-Dimethylphenol	FL	6130	10185203
2,4-Dinitrophenol	FL	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	FL	6185	10185203
2,6-Dichlorophenol	FL	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	FL	6190	10185203
2-Acetylaminofluorene	FL	5515	10185203
2-Chloronaphthalene	FL	5795	10185203
2-Chlorophenol	FL	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	FL	6360	10185203
2-Methylaniline (o-Toluidine)	FL	5145	10185203
2-Methylnaphthalene	FL	6385	10185203
2-Methylphenol (o-Cresol)	FL	6400	10185203
2-Naphthylamine	FL	6430	10185203
2-Nitroaniline	FL	6460	10185203
2-Nitrophenol	FL	6490	10185203
2-Picoline (2-Methylpyridine)	FL	5050	10185203
3,3'-Dichlorobenzidine	FL	5945	10185203
3,3'-Dimethylbenzidine	FL	6120	10185203
3-Methylcholanthrene	FL	6355	10185203
3-Methylphenol (m-Cresol)	FL	6405	10185407
3-Nitroaniline	FL	6465	10185203
4-Aminobiphenyl	FL	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	FL	5660	10185203
4-Chloro-3-methylphenol	FL	5700	10185203

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Matrix: ***Non-Potable Water***

4-Chloroaniline	FL	5745	10185203
4-Chlorophenyl phenylether	FL	5825	10185203
4-Dimethyl aminoazobenzene	FL	6105	10185203
4-Methylphenol (p-Cresol)	FL	6410	10185203
4-Nitroaniline	FL	6470	10185203
4-Nitrophenol	FL	6500	10185203
5-Nitro-o-toluidine	FL	6570	10185203
7,12-Dimethylbenz(a) anthracene	FL	6115	10185203
a-a-Dimethylphenethylamine	FL	6125	10185203
Acenaphthene	FL	5500	10185203
Acenaphthylene	FL	5505	10185203
Acetophenone	FL	5510	10185203
Aniline	FL	5545	10185203
Anthracene	FL	5555	10185203
Aramite	FL	5560	10185203
Benzidine	FL	5595	10185203
Benzo(a)anthracene	FL	5575	10185203
Benzo(a)pyrene	FL	5580	10185203
Benzo(b)fluoranthene	FL	5585	10185203
Benzo(g,h,i)perylene	FL	5590	10185203
Benzo(k)fluoranthene	FL	5600	10185203
Benzoic acid	FL	5610	10185203
Benzyl alcohol	FL	5630	10185203
bis(2-Chloroethoxy)methane	FL	5760	10185203
bis(2-Chloroethyl) ether	FL	5765	10185203
bis(2-Chloroisopropyl) ether	FL	5780	10185203
bis(2-Ethylhexyl) phthalate (DEHP)	FL	6255	10185203
Butyl benzyl phthalate	FL	5670	10185203
Carbazole	FL	5680	10185203
Chlorobenzilate	FL	7260	10185203

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8405 Benjamin Road, Suite A
Tampa, FL 33634-1235

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Matrix: ***Non-Potable Water***

Chrysene	FL	5855	10185203
Diallate	FL	7405	10185203
Dibenz(a,h) anthracene	FL	5895	10185203
Dibenz(a,j) acridine	FL	5900	10185203
Dibenzofuran	FL	5905	10185203
Diethyl phthalate	FL	6070	10185203
Dimethyl phthalate	FL	6135	10185203
Di-n-butyl phthalate	FL	5925	10185203
Di-n-octyl phthalate	FL	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	FL	8620	10185203
Ethyl methanesulfonate	FL	6260	10185203
Fluoranthene	FL	6265	10185203
Fluorene	FL	6270	10185203
Hexachlorobenzene	FL	6275	10185203
Hexachlorobutadiene	FL	4835	10185203
Hexachlorocyclopentadiene	FL	6285	10185203
Hexachloroethane	FL	4840	10185203
Hexachloropropene	FL	6295	10185203
Indeno(1,2,3-cd) pyrene	FL	6315	10185203
Isodrin	FL	7725	10185203
Isophorone	FL	6320	10185203
Isosafrole	FL	6325	10185203
Kepone	FL	7740	10185203
Methapyrilene	FL	6345	10185203
Methyl methanesulfonate	FL	6375	10185203
Naphthalene	FL	5005	10185203
Nitrobenzene	FL	5015	10185203
Nitroquinoline-1-oxide	FL	6515	10185203
n-Nitrosodiethylamine	FL	6525	10185203
n-Nitrosodimethylamine	FL	6530	10185203

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Matrix: *Non-Potable Water*

n-Nitrosodi-n-butylamine	FL	5025	10185203
n-Nitrosodi-n-propylamine	FL	6545	10185203
n-Nitrosodiphenylamine	FL	6535	10185203
n-Nitrosomethylethylamine	FL	6550	10185203
n-Nitrosomorpholine	FL	6555	10185203
n-Nitrosopiperidine	FL	6560	10185203
n-Nitrosopyrrolidine	FL	6565	10185203
o,o,o-Triethyl phosphorothioate	FL	8290	10185203
Pentachlorobenzene	FL	6590	10185203
Pentachloronitrobenzene (PCNB)	FL	6600	10185203
Pentachlorophenol	FL	6605	10185203
Phenacetin	FL	6610	10185203
Phenanthrene	FL	6615	10185203
Phenol	FL	6625	10185203
Pronamide (Kerb)	FL	6650	10185805
Pyrene	FL	6665	10185203
Pyridine	FL	5095	10185203
Safrole	FL	6685	10185203

Method EPA 8310

Analyte	AB	Analyte ID	Method ID
Acenaphthene	FL	5500	10187607
Acenaphthylene	FL	5505	10187607
Anthracene	FL	5555	10187607
Benzo(a)anthracene	FL	5575	10187607
Benzo(a)pyrene	FL	5580	10187607
Benzo(b)fluoranthene	FL	5585	10187607
Benzo(g,h,i)perylene	FL	5590	10187607
Benzo(k)fluoranthene	FL	5600	10187607
Chrysene	FL	5855	10187607
Dibenz(a,h) anthracene	FL	5895	10187607

Matrix: ***Non-Potable Water***

Fluoranthene	FL	6265	10187607
Fluorene	FL	6270	10187607
Indeno(1,2,3-cd) pyrene	FL	6315	10187607
Naphthalene	FL	5005	10187607
Phenanthrene	FL	6615	10187607
Pyrene	FL	6665	10187607

Method EPA 8330

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	FL	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	FL	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	FL	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	FL	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	FL	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	FL	9303	10189807
2-Nitrotoluene	FL	9507	10189807
3-Nitrotoluene	FL	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	FL	9306	10189807
4-Nitrotoluene	FL	9513	10189807
Nitrobenzene	FL	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	FL	9522	10189807
Pentaerythritoltetranitrate (PETN)	FL	9558	10190008
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	FL	9432	10189807
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	FL	9633	10189807

Method EPA 9012

Analyte	AB	Analyte ID	Method ID
Total cyanide	FL	1645	10193405

Method EPA 9060

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	FL	2040	10200201

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID

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Matrix: ***Non-Potable Water***

Alkalinity as $CaCO_3$	FL	1505	20003003

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	FL	1955	20004404

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	FL	1960	20004802

Method SM 4500-Cl^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	FL	1575	20019209

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	FL	1900	20016404

Method SM 4500-NH3 G

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	FL	1515	20023205

Method SM 4500-NO3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate-nitrite	FL	1820	20024402
Nitrite as N	FL	1840	20024402

Method SM 4500-P F

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	FL	1870	20026000

Method SM 4500-$S2^-$ F

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	FL	2005	20126209

Method SM 5310 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	FL	2040	20028006

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Matrix: ***Solid & Chemical Materials***

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	FL	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	FL	850	10119003

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	FL	1000	10155201
Antimony	FL	1005	10155201
Arsenic	FL	1010	10155201
Barium	FL	1015	10155201
Beryllium	FL	1020	10155201
Cadmium	FL	1030	10155201
Calcium	FL	1035	10155201
Chromium	FL	1040	10155201
Cobalt	FL	1050	10155201
Copper	FL	1055	10155201
Iron	FL	1070	10155201
Lead	FL	1075	10155201
Magnesium	FL	1085	10155201
Manganese	FL	1090	10155201
Molybdenum	FL	1100	10155201
Nickel	FL	1105	10155201
Potassium	FL	1125	10155201
Selenium	FL	1140	10155201
Silver	FL	1150	10155201
Sodium	FL	1155	10155201
Thallium	FL	1165	10155201
Tin	FL	1175	10155201
Vanadium	FL	1185	10155201

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Matrix: ***Solid & Chemical Materials***

Zinc	FL	1190	10155201

Method EPA 7010

Analyte	AB	Analyte ID	Method ID
Antimony	FL	1005	10157809
Arsenic	FL	1010	10157809
Lead	FL	1075	10157809
Selenium	FL	1140	10157809
Thallium	FL	1165	10157809

Method EPA 7041

Analyte	AB	Analyte ID	Method ID
Antimony	FL	1005	10158404

Method EPA 7060

Analyte	AB	Analyte ID	Method ID
Arsenic	FL	1010	10158802

Method EPA 7421

Analyte	AB	Analyte ID	Method ID
Lead	FL	1075	10164600

Method EPA 7471

Analyte	AB	Analyte ID	Method ID
Mercury	FL	1095	10166004

Method EPA 7740

Analyte	AB	Analyte ID	Method ID
Selenium	FL	1140	10168602

Method EPA 7841

Analyte	AB	Analyte ID	Method ID
Thallium	FL	1165	10170602

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	FL	9369	10173203
Gasoline range organics (GRO)	FL	9408	10173203

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Matrix: ***Solid & Chemical Materials***

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	FL	7355	10178402
4,4'-DDE	FL	7360	10178402
4,4'-DDT	FL	7365	10178402
Aldrin	FL	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	FL	7110	10178402
alpha-Chlordane	FL	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	FL	7115	10178402
Chlordane (tech.)	FL	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	FL	7105	10178402
Dieldrin	FL	7470	10178402
Endosulfan I	FL	7510	10178402
Endosulfan II	FL	7515	10178402
Endosulfan sulfate	FL	7520	10178402
Endrin	FL	7540	10178402
Endrin aldehyde	FL	7530	10178402
Endrin ketone	FL	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	FL	7120	10178402
gamma-Chlordane	FL	7245	10178402
Heptachlor	FL	7685	10178402
Heptachlor epoxide	FL	7690	10178402
Methoxychlor	FL	7810	10178402
Toxaphene (Chlorinated camphene)	FL	8250	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	FL	8880	10179007
Aroclor-1221 (PCB-1221)	FL	8885	10179007
Aroclor-1232 (PCB-1232)	FL	8890	10179007
Aroclor-1242 (PCB-1242)	FL	8895	10179007
Aroclor-1248 (PCB-1248)	FL	8900	10179007

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Matrix: ***Solid & Chemical Materials***

Aroclor-1254 (PCB-1254)	FL	8905	10179007
Aroclor-1260 (PCB-1260)	FL	8910	10179007

Method EPA 8141

Analyte	AB	Analyte ID	Method ID
Atrazine	FL	7065	10181803
Azinphos-ethyl (Ethyl guthion)	FL	7070	10181803
Azinphos-methyl (Guthion)	FL	7075	10181803
Bolstar (Sulprofos)	FL	7125	10181803
Carbophenothion	FL	7220	10181803
Chlorfenvinphos	FL	7255	10182000
Chlorpyrifos (Dursban)	FL	7300	10181803
Coumaphos	FL	7315	10181803
Demeton-o	FL	7395	10181803
Demeton-s	FL	7385	10181803
Diazinon	FL	7410	10181803
Dichlorovos (DDVP, Dichlorvos)	FL	8610	10181803
Dimethoate	FL	7475	10181803
Dioxathion	FL	7495	10181803
Disulfoton	FL	8625	10181803
EPN (Phosphonothioic acid, phenyl-, O-ethyl O-(p-nitrophenyl) ester)	FL	7550	10181803
Ethion	FL	7565	10181803
Ethoprop	FL	7570	10181803
Famphur	FL	7580	10181803
Fensulfothion	FL	7600	10181803
Fenthion	FL	7605	10181803
Leptophos	FL	7755	10181803
Malathion	FL	7770	10181803
Merphos	FL	7785	10181803
Methyl parathion (Parathion, methyl)	FL	7825	10181803
Mevinphos	FL	7850	10181803

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Matrix: ***Solid & Chemical Materials***

Monocrotophos	FL	7880	10181803
Naled	FL	7905	10181803
Parathion, ethyl	FL	7955	10181803
Phorate	FL	7985	10181803
Phosmet (Imidan)	FL	8000	10181803
Phosphamidon	FL	8005	10181803
Ronnel	FL	8110	10181803
Simazine	FL	8125	10181803
Stirophos (Tetrachlorvinphos)	FL	8200	10181803
Sulfotepp	FL	8155	10181803
Terbufos	FL	8185	10181803
Tetraethyl pyrophosphate (TEPP)	FL	8210	10181803
Thionazin (Zinophos)	FL	8235	10181803
Tokuthion (Prothiophos)	FL	8245	10181803
Trichloronate	FL	8275	10181803

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	FL	8655	10183003
2,4-D	FL	8545	10183003
2,4-DB	FL	8560	10183003
Dalapon	FL	8555	10183003
Dicamba	FL	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	FL	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	FL	8620	10183003
MCPA	FL	7775	10183003
MCPP	FL	7780	10183003
Pentachlorophenol	FL	6605	10183003
Picloram	FL	8645	10183003
Silvex (2,4,5-TP)	FL	8650	10183003

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Solid & Chemical Materials***

1,1,1,2-Tetrachloroethane	FL	5105	10184404
1,1,1-Trichloroethane	FL	5160	10184404
1,1,2,2-Tetrachloroethane	FL	5110	10184404
1,1,2-Trichloroethane	FL	5165	10184404
1,1-Dichloroethane	FL	4630	10184404
1,1-Dichloroethylene	FL	4640	10184404
1,1-Dichloropropene	FL	4670	10184404
1,2,3-Trichlorobenzene	FL	5150	10184404
1,2,3-Trichloropropane	FL	5180	10184404
1,2,4-Trichlorobenzene	FL	5155	10184404
1,2,4-Trimethylbenzene	FL	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	FL	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	FL	4585	10184404
1,2-Dichlorobenzene	FL	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	FL	4635	10184404
1,2-Dichloropropane	FL	4655	10184404
1,3,5-Trimethylbenzene	FL	5215	10184404
1,3-Dichlorobenzene	FL	4615	10184404
1,3-Dichloropropane	FL	4660	10184404
1,4-Dichlorobenzene	FL	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	FL	4735	10184404
1-Chlorohexane	FL	4510	10184404
2,2-Dichloropropane	FL	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	FL	4410	10184404
2-Chloroethyl vinyl ether	FL	4500	10184608
2-Chlorotoluene	FL	4535	10184404
2-Hexanone (MBK)	FL	4860	10184404
2-Nitropropane	FL	5020	10184608
4-Chlorotoluene	FL	4540	10184404
4-Isopropyltoluene (p-Cymene)	FL	4915	10184404

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Matrix: ***Solid & Chemical Materials***

4-Methyl-2-pentanone (MIBK)	FL	4995	10184404
Acetone (2-Propanone)	FL	4315	10184404
Acetonitrile	FL	4320	10184404
Acrolein (Propenal)	FL	4325	10184404
Acrylonitrile	FL	4340	10184404
Allyl chloride (3-Chloropropene)	FL	4355	10184404
Benzene	FL	4375	10184404
Benzyl chloride	FL	5635	10184404
Bromobenzene	FL	4385	10184404
Bromochloromethane	FL	4390	10184404
Bromodichloromethane	FL	4395	10184404
Bromoform	FL	4400	10184404
Carbon disulfide	FL	4450	10184404
Carbon tetrachloride	FL	4455	10184404
Chlorobenzene	FL	4475	10184404
Chlorodibromomethane	FL	4575	10184404
Chloroethane (Ethyl chloride)	FL	4485	10184404
Chloroform	FL	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	FL	4525	10184404
cis-1,2-Dichloroethylene	FL	4645	10184404
cis-1,3-Dichloropropene	FL	4680	10184404
cis-1,4-Dichloro-2-butene	FL	4600	10184608
Dibromomethane (Methylene bromide)	FL	4595	10184404
Dichlorodifluoromethane (Freon-12)	FL	4625	10184404
Diethyl ether	FL	4725	10184608
Ethyl acetate	FL	4755	10184608
Ethyl methacrylate	FL	4810	10184404
Ethylbenzene	FL	4765	10184404
Hexachlorobutadiene	FL	4835	10184404
Iodomethane (Methyl iodide)	FL	4870	10184404

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Matrix: ***Solid & Chemical Materials***

Isobutyl alcohol (2-Methyl-1-propanol)	FL	4875	10184404
Isopropylbenzene (Cumene)	FL	4900	10184404
Methacrylonitrile	FL	4925	10184404
Methyl bromide (Bromomethane)	FL	4950	10184404
Methyl chloride (Chloromethane)	FL	4960	10184404
Methyl methacrylate	FL	4990	10184404
Methyl tert-butyl ether (MTBE)	FL	5000	10184404
Methylene chloride (Dichloromethane)	FL	4975	10184404
Naphthalene	FL	5005	10184404
n-Butylbenzene	FL	4435	10184404
n-Propylbenzene	FL	5090	10184404
Propionitrile (Ethyl cyanide)	FL	5080	10184404
sec-Butylbenzene	FL	4440	10184404
Styrene	FL	5100	10184404
tert-Butyl alcohol	FL	4420	10184802
tert-Butylbenzene	FL	4445	10184404
Tetrachloroethylene (Perchloroethylene)	FL	5115	10184404
Toluene	FL	5140	10184404
trans-1,2-Dichloroethylene	FL	4700	10184404
trans-1,3-Dichloropropylene	FL	4685	10184404
trans-1,4-Dichloro-2-butene	FL	4605	10184404
Trichloroethene (Trichloroethylene)	FL	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	FL	5175	10184404
Vinyl acetate	FL	5225	10184404
Vinyl chloride	FL	5235	10184404
Xylene (total)	FL	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	FL	6715	10185203
1,2,4-Trichlorobenzene	FL	5155	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	T104704408-11-3
Expiration Date:	6/30/2012
Issue Date:	7/1/2011

Spectrum Analytical, Inc. Featuring Hanibal Technology Florida Division

8405 Benjamin Road, Suite A
Tampa, FL 33634-1235

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Matrix: ***Solid & Chemical Materials***

1,2-Dichlorobenzene	FL	4610	10185203
1,2-Diphenylhydrazine	FL	6220	10186002
1,3,5-Trinitrobenzene (1,3,5-TNB)	FL	6885	10185203
1,3-Dichlorobenzene	FL	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	FL	6160	10185203
1,4-Dichlorobenzene	FL	4620	10185203
1,4-Naphthoquinone	FL	6420	10185203
1,4-Phenylenediamine	FL	6630	10185203
1-Naphthylamine	FL	6425	10185203
2,3,4,6-Tetrachlorophenol	FL	6735	10185203
2,4,5-Trichlorophenol	FL	6835	10185203
2,4,6-Trichlorophenol	FL	6840	10185203
2,4-Dichlorophenol	FL	6000	10185203
2,4-Dimethylphenol	FL	6130	10185203
2,4-Dinitrophenol	FL	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	FL	6185	10185203
2,6-Dichlorophenol	FL	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	FL	6190	10185203
2-Acetylaminofluorene	FL	5515	10185203
2-Chloronaphthalene	FL	5795	10185203
2-Chlorophenol	FL	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	FL	6360	10185203
2-Methylaniline (o-Toluidine)	FL	5145	10185203
2-Methylnaphthalene	FL	6385	10185203
2-Methylphenol (o-Cresol)	FL	6400	10185203
2-Naphthylamine	FL	6430	10185203
2-Nitroaniline	FL	6460	10185203
2-Nitrophenol	FL	6490	10185203
2-Picoline (2-Methylpyridine)	FL	5050	10185203
3,3'-Dichlorobenzidine	FL	5945	10185203

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Matrix: ***Solid & Chemical Materials***

3,3'-Dimethylbenzidine	FL	6120	10185203
3-Methylcholanthrene	FL	6355	10185203
3-Nitroaniline	FL	6465	10185203
4-Aminobiphenyl	FL	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	FL	5660	10185203
4-Chloro-3-methylphenol	FL	5700	10185203
4-Chloroaniline	FL	5745	10185203
4-Chlorophenyl phenylether	FL	5825	10185203
4-Methylphenol (p-Cresol)	FL	6410	10185203
4-Nitroaniline	FL	6470	10185203
4-Nitrophenol	FL	6500	10185203
5-Nitro-o-toluidine	FL	6570	10185203
7,12-Dimethylbenz(a) anthracene	FL	6115	10185203
a-a-Dimethylphenethylamine	FL	6125	10185203
Acenaphthene	FL	5500	10185203
Acenaphthylene	FL	5505	10185203
Acetophenone	FL	5510	10185203
Aniline	FL	5545	10185203
Anthracene	FL	5555	10185203
Aramite	FL	5560	10185203
Benzidine	FL	5595	10185203
Benzo(a)anthracene	FL	5575	10185203
Benzo(a)pyrene	FL	5580	10185203
Benzo(b)fluoranthene	FL	5585	10185203
Benzo(g,h,i)perylene	FL	5590	10185203
Benzo(k)fluoranthene	FL	5600	10185203
Benzoic acid	FL	5610	10185203
Benzyl alcohol	FL	5630	10185203
bis(2-Chloroethoxy)methane	FL	5760	10185203
bis(2-Chloroethyl) ether	FL	5765	10185203

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Matrix: ***Solid & Chemical Materials***

bis(2-Chloroisopropyl) ether	FL	5780	10185203
bis(2-Ethylhexyl) phthalate (DEHP)	FL	6255	10185203
Butyl benzyl phthalate	FL	5670	10185203
Carbazole	FL	5680	10185203
Chlorobenzilate	FL	7260	10185203
Chrysene	FL	5855	10185203
Diallate	FL	7405	10185203
Dibenz(a,h) anthracene	FL	5895	10185203
Dibenz(a,j) acridine	FL	5900	10185203
Dibenzofuran	FL	5905	10185203
Diethyl phthalate	FL	6070	10185203
Dimethyl phthalate	FL	6135	10185203
Di-n-butyl phthalate	FL	5925	10185203
Di-n-octyl phthalate	FL	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	FL	8620	10185203
Ethyl methanesulfonate	FL	6260	10185203
Fluoranthene	FL	6265	10185203
Fluorene	FL	6270	10185203
Hexachlorobenzene	FL	6275	10185203
Hexachlorobutadiene	FL	4835	10185203
Hexachlorocyclopentadiene	FL	6285	10185203
Hexachloroethane	FL	4840	10185203
Hexachloropropene	FL	6295	10185203
Indeno(1,2,3-cd) pyrene	FL	6315	10185203
Isodrin	FL	7725	10185203
Isophorone	FL	6320	10185203
Isosafrole	FL	6325	10185203
Kepone	FL	7740	10185203
Methapyrilene	FL	6345	10185203
Methyl methanesulfonate	FL	6375	10185203

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Matrix: ***Solid & Chemical Materials***

Naphthalene	FL	5005	10185203
Nitrobenzene	FL	5015	10185203
Nitroquinoline-1-oxide	FL	6515	10185203
n-Nitrosodiethylamine	FL	6525	10185203
n-Nitrosodimethylamine	FL	6530	10185203
n-Nitrosodi-n-butylamine	FL	5025	10185203
n-Nitrosodi-n-propylamine	FL	6545	10185203
n-Nitrosodiphenylamine	FL	6535	10185203
n-Nitrosomethylethylamine	FL	6550	10185203
n-Nitrosomorpholine	FL	6555	10185203
n-Nitrosopiperidine	FL	6560	10185203
n-Nitrosopyrrolidine	FL	6565	10185203
o,o,o-Triethyl phosphorothioate	FL	8290	10185203
Pentachlorobenzene	FL	6590	10185203
Pentachloronitrobenzene (PCNB)	FL	6600	10185203
Pentachlorophenol	FL	6605	10185203
Phenacetin	FL	6610	10185203
Phenanthrene	FL	6615	10185203
Phenol	FL	6625	10185203
Pronamide (Kerb)	FL	6650	10185203
Pyrene	FL	6665	10185203
Pyridine	FL	5095	10185203
Safrole	FL	6685	10185203

Method EPA 8310

Analyte	**AB**	**Analyte ID**	**Method ID**
Acenaphthene	FL	5500	10187607
Acenaphthylene	FL	5505	10187607
Anthracene	FL	5555	10187607
Benzo(a)anthracene	FL	5575	10187607
Benzo(a)pyrene	FL	5580	10187607

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Matrix: ***Solid & Chemical Materials***

Benzo(b)fluoranthene	FL	5585	10187607
Benzo(g,h,i)perylene	FL	5590	10187607
Benzo(k)fluoranthene	FL	5600	10187607
Chrysene	FL	5855	10187607
Dibenz(a,h) anthracene	FL	5895	10187607
Fluoranthene	FL	6265	10187607
Fluorene	FL	6270	10187607
Indeno(1,2,3-cd) pyrene	FL	6315	10187607
Naphthalene	FL	5005	10187607
Phenanthrene	FL	6615	10187607
Pyrene	FL	6665	10187607

Method EPA 8330

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	FL	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	FL	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	FL	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	FL	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	FL	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	FL	9303	10189807
2-Nitrotoluene	FL	9507	10189807
3-Nitrotoluene	FL	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	FL	9306	10189807
4-Nitrotoluene	FL	9513	10189807
Nitrobenzene	FL	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	FL	9522	10189807
Pentaerythritoltetranitrate (PETN)	FL	9558	10190008
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	FL	9432	10189807
Tetryl (methyl-2,4,6-trinitrophenylnitramine)	FL	9633	10189807

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	FL	2050	90019208