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SAMPLING AND ANALYSIS PLAN FOR SOLID WASTE MANAGEMENT UNIT 22 (SWMU 22)
LEAD AZIDE POND PHASE I NSA CRANE IN
1/1/2011
TETRA TECH

20

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62470-08-D-1001

Rev. 0
01/11

Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) for SWMU 22 – Lead Azide Pond Phase I Resource Conservation and Recovery Act Facility Investigation

Naval Support Activity Crane
Crane, Indiana

Contract Task Order F279

January 2011

NAVFAC
Naval Facilities Engineering Command
Midwest
201 Decatur Avenue
Building 1A, Code EV
Great Lakes, Illinois 60088

TETRA TECH NUS, Inc.

SAP Worksheet No. 1 -- Title and Approval Page
(UFP-QAPP Manual Section 2.1)

SAMPLING AND ANALYSIS PLAN
(Field Sampling Plan and Quality Assurance Project Plan)
December 2010

PHASE I RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION

SWMU 22 – LEAD AZIDE POND
NAVAL SUPPORT ACTIVITY CRANE
CRANE, INDIANA

Prepared for:
Naval Facilities Engineering Command Midwest
201 Decatur Avenue, Building 1A
Great Lakes, Illinois 60088

Prepared by:
Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260
King of Prussia, Pennsylvania 19406
610-491-9688

Prepared under:
Comprehensive Long-Term Environmental Action Navy
Contract No. N62470-08-D-1001
Contract Task Order F279

Review Signatures:

12-14-10
Tom Johnston, PhD/CLEAN Quality Assurance Manager/Date
Tetra Tech NUS, Inc.

12/14/10
Timothy S. Evans/Project Manager/Date
Tetra Tech NUS, Inc.

Approval Signatures:

1/10/11
Thomas J. Brent/Crane Project Manager/Date
NSA Crane Environmental Restoration Site Manager

1/18/11
Doug Griffin/PPM/Date
Indiana Department of Environmental Management

(Government Chemist Signature on Attached Sheet)
Government Chemist/Date
NAVFAC QA Review

SAP Worksheet No. 1 -- Title and Approval Page

(UFP-QAPP Manual Section 2.1)

DRAFT
SAMPLING AND ANALYSIS PLAN
(Field Sampling Plan and Quality Assurance Project Plan)
November 2010

PHASE I RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION

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Review Signatures:

T. Johnston 11-11-10
Tom Johnston, PhD/CLEAN Quality Assurance Manager/Date
Tetra Tech NUS, Inc.

11-11-10
Timothy S. Evans/Project Manager/Date
Tetra Tech NUS, Inc.

Approval Signatures:

Thomas J. Brent/Crane Project Manager/Date
NSA Crane Environmental Restoration Site Manager

Doug Griffin/RPM/Date
Indiana Department of Environmental Management

NIELSENJANICE.L.1069943540 Digitally signed by NIELSENJANICE.L.1069943540 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USN, cn=NIELSENJANICE.L.1069943540 Date: 2010.11.08 09:10:00 -05'00'

Government Chemist/Date
NAVFAC QA Review

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (Tetra Tech) has prepared this Sampling and Analysis Plan (SAP) that encompasses Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) requirements for the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at Solid Waste Management Unit (SWMU) 22 – Lead Azide Pond at Naval Support Activity (NSA) Crane, Crane, Indiana under Contract Task Order (CTO) F279, Contract N62470-08-D-1001, Comprehensive Long-Term Environmental Action Navy (CLEAN).

The SAP contained herein was generated for and complies with applicable United States (U.S.) Department of the Navy (Navy), U. S. Environmental Protection Agency (USEPA) Region 5, and Indiana Department of Environmental Management (IDEM) 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 format of standard worksheets specified in the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) guidance documents (IDQTF, 2005).

This SAP outlines the organization, project management, objectives, planned activities, measurement, data acquisition, assessment, oversight, and data review procedures associated with the planned investigations at SWMU 22. Protocols for sample collection, handling, and storage, chain-of-custody, laboratory and field analyses, data validation, and reporting are also addressed in this SAP.

SWMU 22 is the area referred to as the Explosive Actuated Device (EAD)/ Booster Area or the "Backline". The Booster Area was designed and constructed to load 5-inch rockets during World War II. EADs were loaded with explosives such as lead azide, lead styphnate, tetryl, RDX, and black powder. Building 136 was used for the propellant portion, Building 138 was the pressing building for warheads, and Building 2520 was the final assembly building. A conveyor tunnel connected Building 136 and 2520 in support of the former process. The area is currently operated by the Army and is involved in the production of small explosive charges and fuse maintenance. The buildings associated with the Backline are planned to be demolished in 2011. An unlined retention pond was located at the northern end of the Backline. It received overflow wastewater from sumps associated with the process buildings. The retention pond was removed in 1981.

The objective of this project is to provide sufficient data to support decisions regarding potential remedial action if contamination is identified above conservative, risk-based screening criteria; or conversely no further action (NFA) if concentrations of constituents of concern are determined not to be present at significant levels. Investigation procedures will comply with the site-specific field Standard Operating

Procedures (SOPs), included in Appendix A, and laboratory analytical procedures will comply with the laboratory SOPs. The field work and sampling are scheduled to begin in January 2011. A complete schedule is detailed in SAP Worksheet No. 16.

The field activities under this SAP will be conducted in accordance with the *Site-Specific Health and Safety Plan* (Tetra Tech, 2010).

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ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
%R	Percent Recovery
%RSD	Percent Relative Standard Deviation
ABG	Ammunition Burning Ground
amu	Atomic Mass Unit
APPL	APPL, Inc.
bgs	Below Ground Surface
CA	Corrective Action
CAS	Chemical Abstract Service
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Environmental Concern
CSM	Conceptual Site Model
CTO	Contract Task Order
CVAA	Cold Vapor Atomic Absorption
CWAP	Comprehensive Work Approval Process
DAF	Dilution Attenuation Factor
DL	Detection Limit
DO	Dissolved Oxygen
DoD	Department of Defense
DOE	Department of Energy
DPT	Direct-Push Technology
DQI	Data Quality Indicator
DQO	Data Quality Objective
DVM	Data Validation Manager
EAD	Explosive Actuated Device
Eco SSL	Ecological Soil Screening Level
EDD	Electronic Data Deliverable
ELAP	Environmental Laboratory Approval Program
ERA	Ecological Risk Assessment
ERSM	Environmental Restoration Site Manager
ESI	Electrospray Ionization
FD	Field Duplicate

FOL	Field Operations Leader
FLAA	Flame Atomic Absorption
FSP	Field Sampling Plan
FTMR	Field Task Modification Request
GW-DCL	Groundwater Default Closure Level
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDOP	Horizontal Dilution of Precision
HHRA	Human Health Risk Assessment
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine / His/Her Majesty's Explosive
HNO_3	Nitric Acid
HPLC	High Pressure Liquid Chromatography
HSM	Health and Safety Manager
IAS	Initial Assessment Study
ICAL	Initial Calibration
ICP-MS	Inductively Coupled Plasma - Mass Spectrometry
ICS	Interference Check Standard
ICV	Initial Calibration Verification
I-DCL	Industrial Default Closure Level
IDEM	Indiana Department of Environmental Management
IDEM SW	Indiana Minimum Surface Water Quality Standards
IDQTF	Intergovernmental Data Quality Task Force
IDW	Investigation-Derived Waste
IRCDQM	Installation Restoration Chemical Data Quality Manual
IS	Internal Standard
IUPPS	Indiana Underground Plant Protection Services
L	Liter
LANL	Los Alamos National Laboratory
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LIMS	Laboratory Information Management System
LOD	Limit of Detection
LODV	Limit of Detection Verification
LOQ	Limit of Quantitation
LUC	Land Use Control
MCT	Matrix Conductivity Threshold
mg/kg	Milligram per Kilogram

mg/L	Milligram per Liter
MPC	Measurement Performance Criterion
MS	Matrix Spike
MSD	Matrix Spike Duplicate
msl	Mean Sea Level
NA	Not Applicable
NAVFAC	Naval Facilities Engineering Command
Navy	U. S. Department of the Navy
NEESA	Naval Energy and Environmental Support Activity
NFA	No Further Action
NIRIS	Naval Installation Restoration Information Solutions
NSA	Naval Support Activity
NTU	Nephelometric Turbidity Unit
ORP	Oxidation-Reduction Potential
OSHA	Occupational Safety and Health Administration
oz	Ounce
PDF	Portable Document Format
PETN	Pentaerythritol tetranitrate
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
ppm	Part per Million
PQO	Project Quality Objective
psi	Pounds per Square Inch
PSL	Project Screening Level
PT	Proficiency Testing (previously known as performance evaluation sample)
QA	Quality Assurance
QAM	Quality Assurance Manager
QAPP	Quality Assurance Project Plan
QC	Quality Control
QSM	Quality Systems Manual
r	Linear Regression Correlation Coefficient
R3 SED BTAG	USEPA Region 3 Biological Technical Assistance Group Freshwater Sediment Screening Benchmark
R3 SW BTAG	USEPA Region 3 Biological Technical Assistance Group Freshwater Surface Water Screening Benchmark
R5 ESL	USEPA Region 5 Ecological Screening Level
RCRA	Resource Conservation and Recovery Act

R-DCL	Residential Default Closure Level
RDX	Octahydro-1,3,5,7-tetranitro-1,3,5-triazine / Royal Demolition Explosive
RF	Response Factor
RFI	Resource Conservation and Recovery Act Facility Investigation
RISC	Risk Integrated System of Closure
RL	Reporting Limit
RPD	Relative Percent Difference
RPM	Remedial Project Manager
R-RSL	Residential Regional Screening Level
RRT	Relative Response Time
R-SSL	Risk-Based Migration-to-Groundwater Soil Screening Level
RT	Retention Time
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SOP	Standard Operating Procedure
SQL	Structured Query Language
SRM	Standard Reference Material
SSL	Soil Screening Level
SSO	Site Safety Officer
SWMU	Solid Waste Management Unit
TBD	To Be Determined
Tetra Tech	Tetra Tech NUS, Inc.
Tetryl	Methyl-2,4,6-trinitrophenylnitramine
TNT	2,4,6-Trinitrotoluene
TOC	Total Organic Carbon
T-RSL	Tapwater Regional Screening Level
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plans
µg/L	Microgram per Liter
U.S.	United States
USAEHA	United States Army Environmental Hygiene Agency
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

SAP Worksheet No. 2 -- SAP Identifying Information

(UFP-QAPP Manual Section 2.2.4)

Site Name/Number:	Lead Azide Pond
Operable Units:	Solid Waste Management Unit (SWMU) 22
Contractor Name:	Tetra Tech NUS, Inc. (Tetra Tech)
Contract Number:	N62470-08-D-1001
Contract Title:	Comprehensive Long-Term Environmental Action Navy (CLEAN)
Work Assignment Number:	Contract Task Order (CTO) F279

1. This Sampling and Analysis Plan (SAP) was prepared in accordance with the requirements of the Intergovernmental Data Quality Task Force (IDQTF) document, *Uniform Federal Policy for Quality Assurance Plans* (UFP-QAPP) (IDQTF, 2005) and the United States Environmental Protection Agency (USEPA) document, *Guidance for Quality Assurance Project Plans, QA/G-5* (USEPA, 2002a).

2. Identify regulatory program: The Indiana Department of Environmental Management (IDEM) Hazardous Waste Closure and Corrective Action Programs, which implement and enforce the Resource Conservation and Recovery Act (RCRA) at NSA Crane, and related state laws and rules.

3. This SAP is a project-specific SAP.

4. List dates of scoping sessions that were held:

Scoping Session	Date
Data Quality Objective (DQO) Meeting	May 12, 2010

5. List dates and titles of any SAP documents written for previous site work that are relevant to the current investigation.

Title	Date
None	

6. List organizational partners (stakeholders) and connection with lead organization:

IDEM (regulatory oversight), USEPA Region 5 (regulatory oversight), Naval Facilities Engineering Command (NAVFAC) Midwest (property owner), Tetra Tech (Navy contractor)

7. Lead organization: IDEM (regulatory oversight)

8. If any required SAP elements or required information are not applicable to the project or are provided elsewhere, then note the omitted SAP elements and provide an explanation for their exclusion below:

Not Applicable (NA), as there are no exclusions.

SAP Worksheet No. 3 -- Distribution List

(UFP-QAPP Manual Section 2.3.1)

Name of SAP Recipient	Title/Role	Organization	Telephone Number	E-Mail Address or Mailing Address	Document Control Number
Howard Hickey	Navy Remedial Project Manager (RPM)/ Manages Project Activities for the Navy	NAVFAC Midwest 201 Decatur Avenue Building 1A Great Lakes, IL 60088	847-688-2600 X243	howard.hickey@navy.mil	NA
Tom Brent	Environmental Restoration Site Manager (ERSM)/ Facility Point of Contact (POC)	NAVFAC PWD Crane Code PRC42, Building 3245 300 Highway 361 Crane, IN 47522	812-854-6160	thomas.brent@navy.mil	NA
To Be Determined (TBD)	Government Chemist	NAVFAC Atlantic	TBD	TBD	NA
Bonnie Capito	Administrative Record Librarian	NAVFAC Atlantic	757-322-4785	bonnie.capito@navy.mil	NA
Doug Griffin	State RPM/ Provides Regulator Input	IDEM Office of Land Quality 100 North Senate Avenue Indianapolis, IN 46204-2241	317-233-2710	dgriffin@idem.in.gov	NA
Peter Ramanauskas	USEPA RPM/ Provides Regulator Input	USEPA Region 5 77 West Jackson Blvd. Chicago, IL 60604	312-866-7890	ramanauskas.peter@epa.gov	NA
John Trepanowski (copy of cover letter only)	Program Manager/ Manages Navy Initiatives	Tetra Tech 234 Mall Boulevard Suite 260 King of Prussia, PA 19406	610-382-1532	john.trepanowski@tetratech.com	NA
Garth Glenn (copy of cover letter only)	Deputy Program Manager/ Manages Program Activities	Tetra Tech 5700 Lake Wright Drive Suite 309 Norfolk, VA 23502	757-461-3926	garth.glenn@tetratech.com	NA

Name of SAP Recipient	Title/Role	Organization	Telephone Number	E-Mail Address or Mailing Address	Document Control Number
Ralph Basinski	Activity Coordinator/ Coordinates and oversees Tetra Tech projects at NSA Crane	Tetra Tech 661 Andersen Drive Foster Plaza 7 Pittsburgh, PA 15220	412-921-8308	ralph.basinski@tetratech.com	NA
Tim Evans	Project Manager (PM)/ Manages Project Activities		412-921-7281	tim.evans@tetratech.com	NA
TBD	Field Operations Leader (FOL) and Site Safety Officer (SSO)/ Manages Field Operation and Site Safety Issues		TBD	TBD	NA
Tom Johnston, PhD (electronic copy only)	Quality Assurance Manager (QAM)/ Manages Corporate Quality Assurance (QA) Program and Implementation		412-921-8615	tom.johnston@tetratech.com	NA
Matt Soltis [Health and Safety Plan (HASP) only]	Health and Safety Manager (HSM)/ Manages Corporate Health and Safety Program		412-921-8912	matt.soltis@tetratech.com	NA
Joe Samchuck (electronic copy only)	Data Validation Manager (DVM)/ Manages Data Validation		412-921-8510	joseph.samchuck@tetratech.com	NA
Lee Leck (electronic copy only)	Data Manager/ Manages Databases		412-921-8856	lee.leck@tetratech.com	NA
Mark Traxler (electronic copy only)	Project Chemist/ Provides Coordination with Laboratory	Tetra Tech 234 Mall Boulevard Suite 260 King of Prussia, PA 19406	610-382-1171	mark.traxler@tetratech.com	NA
Cynthia Clark (electronic copy only)	Laboratory PM/ Representative for Laboratory and Analytical Issues	APPL, Inc. (APPL) 908 N. Temperance Avenue Clovis, CA 93611	559-275-2175	cclark@applinc.com	NA
Driller (TBD) (electronic copy only)	Direct-Push Technology (DPT) Subcontractor PM/ Provides DPT Services	TBD	TBD	TBD	NA

SAP Worksheet No. 4 -- Project Personnel Sign-Off Sheet

(UFP-QAPP Manual Section 2.3.2)

Certification that project personnel have read the text will be obtained by one of the following methods as applicable:

1. In the case of regulatory agency personnel with oversight authority, approval letters or e-mails will constitute verification that applicable sections of the SAP have been reviewed. Copies of regulatory agency approval letters / e-mails will be retained in the project files and are listed in Worksheet No. 29 as project records.

2. E-mails will be sent to the Navy, Tetra Tech, and subcontractor project personnel whom will be requested to verify by e-mail that they have read the applicable SAP / sections and the date on which they were reviewed. Copies of the verification e-mail will be included in the project files and are identified in Worksheet No. 29.

   Copies of the signed Worksheets No. 1 and 4 will be retained in the project files and are identified as a project documents in Worksheet No. 29.

Name [1]	Organization/Title/Role	Telephone Number	Signature/E-Mail Receipt	SAP Section Reviewed	Date SAP Read
Navy and Regulator Project Team Personnel					
Howard Hickey	NAVFAC Midwest / Navy RPM/ Manages Project Activities for the Navy	847-688-2600 X243	See Worksheet No. 1 for signature	All	
Tom Brent	NSA Crane/ ERSM/ Facility POC	812-854-6160	See Worksheet No. 1 for signature	All	
Doug Griffin	IDEM/ RPM/ Provides Regulator Input	317-233-2710	See Worksheet No. 1 for signature	All	
Peter Ramanauskas	USEPA/ RPM/ Provides Regulator Input	312-866-7890	See Worksheet No. 1 for signature	All	

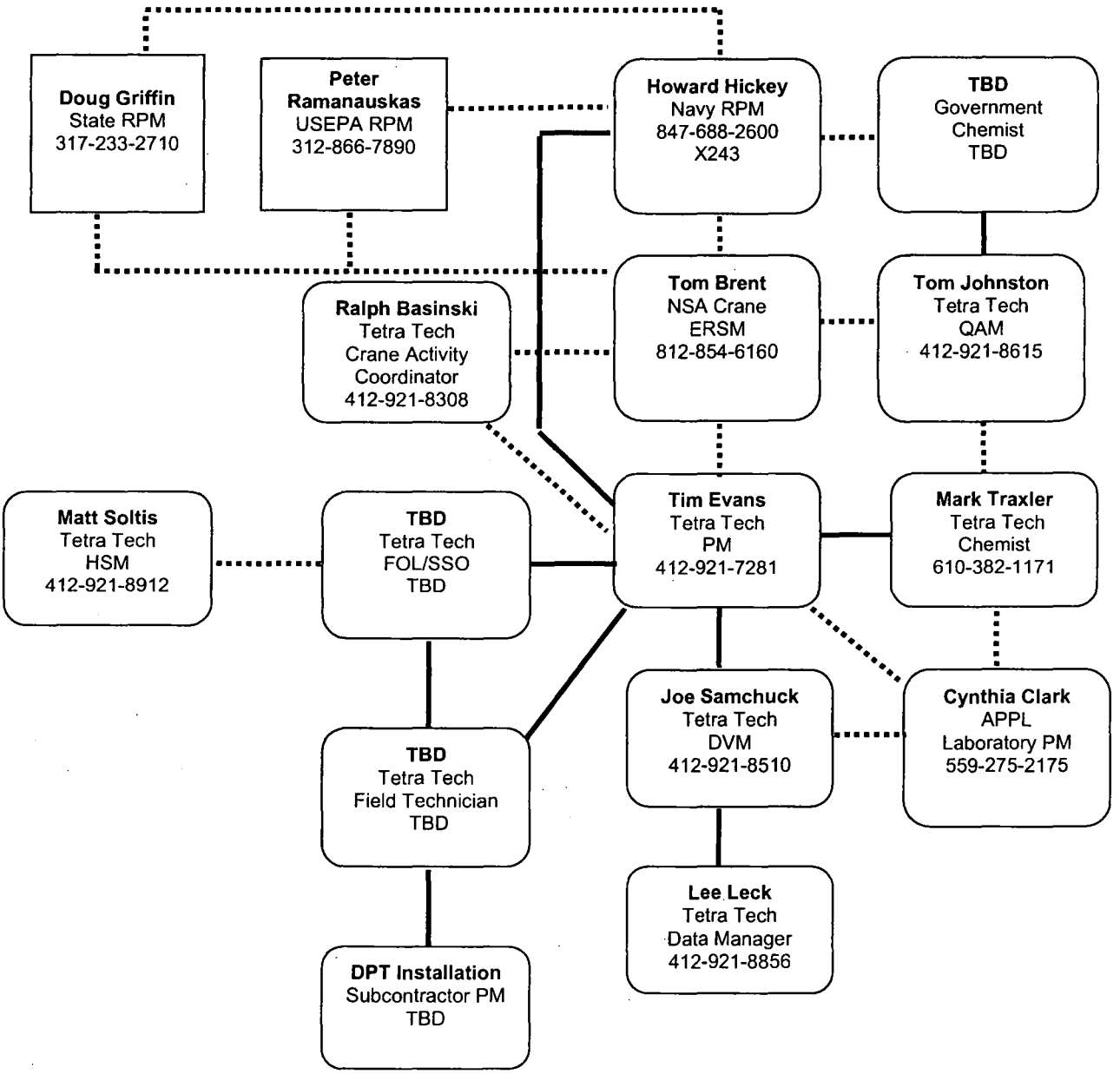
Name [1]	Organization/Title/Role	Telephone Number	Signature/E-Mail Receipt	SAP Section Reviewed	Date SAP Read
Tetra Tech Project Team Personnel					
Tim Evans	Tetra Tech/ PM/ Manages Project Activities	412-921-7281	See Worksheet No. 1 for signature	All	
TBD	Tetra Tech/ FOL/SSO/ Manages Field Operation and Site Safety Issues	TBD		All	
Tom Johnston, PhD	Tetra Tech/ QAM/ Manages Corporate QA Program and Implementation	412-921-8615	See Worksheet No. 1 for signature	All	
Matt Soltis	Tetra Tech/ HSM/ Manages Corporate Health and Safety Program	412-921-8912	See HASP for signature	HASP	
Mark Traxler	Tetra Tech/ Project Chemist/ Provides Coordination with laboratory	610-382-1171		All	
Joe Samchuck	Tetra Tech/ DVM/ Manages data validation	412-921-8510		Worksheet Nos. 12, 14, 15, 19, 20, 23-28, 30, and 34-37	
Lee Leck	Tetra Tech/ Data Manager/ Manages Databases	412-921-8856		Worksheet Nos. 12, 14, 15, 19, 20, 23-28, 30, and 34-37	
Subcontractor Personnel					
Cynthia Clark	APPL/ Laboratory PM/ Representative for Laboratory and Analytical Issues	559-275-2175		Worksheet Nos. 6, 12, 14, 15, 19, 23-28, 30, and 34-36	
Driller (TBD)	DPT Subcontractor PM/ Provides DPT Services	TBD		Worksheet Nos. 6, 14, 17, and Figures	

1 Persons listed on this worksheet will be responsible for distributing the SAP to the appropriate people within their organization.

SAP Worksheet No. 5 -- Project Organizational Chart

(UFP-QAPP Manual Section 2.4.1)

Lines of Authority ——— ..... Lines of Communication



SAP Worksheet No. 6 -- Communication Pathways

(UFP-QAPP Manual Section 2.4.2)

Communication Driver	Responsible Affiliation	Name	Phone Number and/or E-Mail	Procedure
SAP amendments	Tetra Tech FOL/SSO Tetra Tech PM Navy RPM	TBD Tim Evans Howard Hickey	TBD 412-921-7281 847-688-2600 x243	The Tetra Tech FOL will verbally inform the Tetra Tech PM within 24 hours of realizing a need for an amendment. The 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. SAP amendments will be submitted by the Tetra Tech PM to the Navy RPM for review and approval. The Tetra Tech PM will send scope changes to the Project Team via e-mail within one business day.
Changes in field work schedule	Tetra Tech PM Navy RPM NSA Crane ERSM	Tim Evans Howard Hickey Tom Brent	412-921-7281 847-688-2600 x243 812-854-6160	The Tetra Tech PM will verbally inform the Navy RPM and the NSA Crane ERSM on the day that a schedule change is known and will document the change via schedule impact letter within one business day of when the impact is realized.
Issues in the field that result in changes in scope of field work	Tetra Tech FOL/SSO Tetra Tech PM Navy RPM NSA Crane ERSM	TBD Tim Evans Howard Hickey Tom Brent	TBD 412-921-7281 847-688-2600 x243 812-854-6160	The Tetra Tech FOL will verbally inform the Tetra Tech PM on the day that the issue is discovered. The Tetra Tech PM will inform the Navy RPM and the NSA Crane ERSM (verbally or via e-mail) within one business day of discovery. The Navy RPM will issue a scope change (verbally or via e-mail), if warranted. The scope change is to be implemented before further work is executed. The Tetra Tech PM will document the change via an FTMR form within two days of identifying the need for change and will obtain required approvals within five days of initiating the form.

Communication Driver	Responsible Affiliation	Name	Phone Number and/or E-Mail	Procedure
Recommendations to stop work and initiate work upon corrective action	Tetra Tech FOL/SSO Tetra Tech PM Tetra Tech QAM Tetra Tech Project Chemist Tetra Tech HSM Navy RPM NSA Crane ERSM	TBD Tim Evans Tom Johnston Mark Traxler Matt Soltis Howard Hickey Tom Brent	TBD 412-921-7281 412-921-8615 610-382-1171 412-921-8912 847-688-2600 x243 812-854-6160	If Tetra Tech is the responsible party for a stop work command, the Tetra Tech FOL will inform onsite personnel, subcontractor(s), the NSA Crane ERSM, and the identified Project Team members within one hour (verbally or by e-mail). If a subcontractor is the responsible party, the subcontractor PM must inform the Tetra Tech FOL within 15 minutes, and the Tetra Tech FOL will then follow the procedure listed above.
Corrective action for field program	Tetra Tech PM Tetra Tech QAM Navy RPM	Tim Evans Tom Johnston Howard Hickey	412-921-7281 412-921-8615 847-688-2600 x243	The Tetra Tech QAM will notify the Tetra Tech PM verbally or by e-mail within one business day that the corrective action has been completed. The Tetra Tech PM will then notify the Navy RPM (verbally or by e-mail) within one business day
Field data quality issues	Tetra Tech FOL/SSO Tetra Tech PM	TBD Tim Evans	TBD 412-921-7281	The Tetra Tech FOL will inform the Tetra Tech PM (verbally or via e-mail) on the same day that a field data quality issue is discovered.
Analytical data quality issues	APPL Laboratory PM Tetra Tech Project Chemist Tetra Tech PM NSA Crane ERSM	Cynthia Clark Mark Traxler Tim Evans Tom Brent	559-275-2175 610-382-1171 412-921-7281 812-854-6160	The Laboratory PM will notify (verbally or by 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 by e-mail) the data validation staff and the Tetra Tech PM within one business day. The Tetra Tech PM will notify (verbally or via e-mail) the NSA Crane ERSM of significant analytical data quality issues within one business day of resolution.

SAP Worksheet No. 7 -- Personnel Responsibilities and Qualifications Table

(UFP-QAPP Manual Section 2.4.3)

Name	Title/Role	Organizational Affiliation	Responsibilities
Howard Hickey	Navy RPM/ Manages Project Activities for the Navy	NAVFAC Midwest	Oversees project implementation, including scoping, data review, and evaluation.
Tom Brent	ERSM/ Manages daily site activities related to this project	NSA Crane	Oversees site activities, participates in scoping, conducts data review and evaluation, and reviews the SAP.
Doug Griffin	RPM/ Provides Regulator Input	IDEM	Participates in scoping, conducts data review and evaluation, and approves the SAP on behalf of IDEM.
Peter Ramanauskas	RPM/ Provides Regulator Input	USEPA Region 5	Participates in scoping, data review, and evaluation, and approves the SAP on behalf of USEPA.
Ralph Basinski	Activity Coordinator/ Oversees project activities	Tetra Tech	Oversees project implementation, including scoping, data review, and evaluation, for all Tetra Tech projects at NSA Crane.
Tim Evans	PM/ Manages project on a daily basis	Tetra Tech	Oversees project, financial, schedule, and technical day-to-day management of the project.
TBD	FOL/SSO/ Manages field operations and oversees site activities to ensure safety requirements are met	Tetra Tech	As FOL, supervises, coordinates, and performs field sampling activities. As the SSO, is responsible for on-site project-specific health and safety training and monitoring site conditions. Details of these responsibilities are presented in the HASP.
Tom Johnston	QAM/ Oversees program and project QA activities	Tetra Tech	Ensures that quality aspects of the CLEAN Program are implemented.
Matt Soltis	HSM/ Oversees health and safety activities	Tetra Tech	Oversees the Tetra Tech CLEAN Program Health and Safety Program.

Name	Title/Role	Organizational Affiliation	Responsibilities
Mark Traxler	Project Chemist/ Conducts data validation and reporting	Tetra Tech	Participates in project scoping, prepares laboratory scopes of work, and coordinates laboratory-related functions with laboratory. Oversees data quality reviews and QA of data validation deliverables.
Joseph Samchuck	DVM/ Oversees data validation activities	Tetra Tech	Manages data validation activities within Tetra Tech, including ensuring QA of data validation deliverables, providing technical advice on data usability, and coordinating and maintaining the data validation review schedule.
Lee Leck	Data Manager/ Oversees database activities	Tetra Tech	Manages Tetra Tech databases and ensures input of data.
Cynthia Clark	Laboratory PM/ Manages project	APPL	Coordinates analyses with laboratory chemists, ensures that scope of work is followed, provides QA of data packages, and communicates with Tetra Tech project staff.
TBD	DPT Driller	TBD	Performs DPT soil borings according to scope of work.

In some cases, one person may be designated responsibilities for more than one position. For example, the Tetra Tech FOL will be responsible for SSO duties. This action will be performed only as credentials, experience, and availability permits.

SAP Worksheet No. 8 -- Special Personnel Training Requirements Table

(UFP-QAPP Manual Section 2.4.4)

Each site worker will be required to have completed a 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) course (and 8-hour refresher training, if applicable) in health and safety training as described under Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120(e). Safety requirements are addressed in greater detail in the site-specific HASP.

SAP Worksheet No. 9 -- Project Scoping Session Participants Sheet

(UFP-QAPP Manual Section 2.5.1)

Project Name: Phase I RFI **Projected Date(s) of Sampling:** Summer 2010 **Project Manager:** Tim Evans	**Site Name:** SWMU 22 – Lead Azide Pond **Site Location:** Crane, Indiana

Date of Session: May 12, 2010
Scoping Session Purpose: DQO Scoping Meeting

Name	Title	Affiliation	Phone #	E-Mail Address	Project Role
Tim Evans	PM	Tetra Tech	412-921-7281	tim.evans@tetratech.com	Management
Tom Brent	ERSM	NSA Crane	812-854-6160	thomas.brent@navy.mil	Management
Peter Ramanauskas	RPM	EPA Region 5	312-866-7890	ramanauskas.peter@epa.gov	EPA RPM
Doug Griffin	RPM	IDEM	317-233-2710	dgriffin@idem.in.gov	State RPM
Tom Johnston	QAM	Tetra Tech	412-921-8615	tom.johnston@tetratech.com	QA Management
Ralph Basinski	Crane Activity Coordinator	Tetra Tech	412-921-8308	ralph.basinski@tetratech.com	Management /Oversight
Mark Traxler	Project Chemist	Tetra Tech	610-382-1171	mark.traxler@tetratech.com	Chemist/ DQO Facilitator

Comments/Decisions: Discussed SWMU 22 historical use and available data. Discussed the steps for the Phase I RFI in accordance with the UFP-SAP format.

Action Items: Tetra Tech assigned the task to prepare the draft UFP-SAP.

Consensus Decisions: See meeting minutes in Appendix C. The meeting participants developed project quality objectives (PQOs) using USEPA's seven-step DQO process. Consensus decisions included the following:

- Phase I RFI activities will be limited to investigation of soil, surface water, and sediment to determine whether SWMU 22 site-related contaminant levels are greater than conservative, risk-based Project Screening Levels (PSLs). Nature and extent delineation, risk assessments, and corrective measures will be addressed in later phases, if necessary; groundwater would be investigated during later phases, if necessary.

- Collect surface soil samples (from 0 to 2 feet below ground surface [bgs]) and subsurface soil samples (3 to 4 feet bgs) to address the main investigative areas of the site (as identified in Worksheet No. 18); and collect surface water and collocated sediment samples (from 0 to 6 inches bgs) from the headwater to Turkey Creek and two drainage areas that flow to the headwater to Turkey Creek.

  - Collect 16 biased surface soil samples and 14 biased subsurface samples from areas that may be impacted from chemicals due to historical site activities, including near various buildings, the former pond and surrounding area, and an area south of Building 0136.

  - Collect three surface water samples and three collocated sediment samples from each of two on-site surface drainages that ultimately flow to the headwater to Turkey Creek, and three surface water samples and three collocated sediment samples from the headwater to Turkey Creek.

  - These quantities were deemed to be sufficient by the IDEM RPM to meet the PQOs for Phase I activities.

- Analyze collected samples for a specific list of target analytes based on historical use within each particular area. It was agreed that the specific list of target analytes will be analyzed for all samples, include the eight RCRA metals, the full SW-846 Method 8330B list of explosives, and perchlorate following SW-846 Method 6850. In addition, sediment samples will be analyzed for Total Organic Carbon (TOC) to support ecological risk calculations, if necessary, and a few soil samples will additionally be analyzed for pH to support risk assessments and to support discussions regarding the potential migration of metals.

- If any of the risk-based screening criteria are exceeded in Phase I samples, the Project Team will evaluate the distribution, magnitude, and significance of the exceedance(s) to determine the most appropriate path forward with the ideal goal of clean closure under IDEM residential default closure level (R-DCL) criteria, if possible and cost-effective.

- The Project Team agreed that the standard Detection Limits (DLs), Limits of Detection (LOD), and Limits of Quantitation (LOQs) that Department of Defense (DoD) Environmental Laboratory Program (ELAP) accredited laboratories are capable of attaining under normal conditions for SW-846 Methods 6020A/7470A/7471(A or B) for RCRA Metals, 8330B for explosives, and 6850 for perchlorate would be sufficient to meet the Phase I project needs, regardless of the lowest applicable risk-based criteria values. Applicable screening criteria for human health and ecological receptors were identified in the Strawman presentation and further clarified during the meeting.

- The Project Team did not plan for specific Phase II and Phase III (i.e., permanent groundwater well installation and long-term monitoring) RFI field activities in the event they are required, based on the results of the Phase I, but did discuss the potential need for additional data, if exceedances are identified at SWMU 22. The data collection design and performance criteria to be applied to data collected during the Phase I RFI will support screening-level human health and ecological risk assessments and will assist in developing the Phase II RFI sampling design and rationale to further evaluate risk and to complete the delineation of any identified contamination. Details of Phase II activities were not presented in this UFP-SAP because they would be addressed separately in an Addendum.

SAP Worksheet No. 10 -- Conceptual Site Model

(UFP-QAPP Manual Section 2.5.2)

This worksheet presents general background information about SWMU 22 – Lead Azide Pond (Site) and a conceptual site model (CSM) that describes potential contamination routes and possible exposure pathways. The CSM served as the basis for developing the sampling and analysis program.

10.1 PHYSICAL SITE DESCRIPTION

SWMU 22 is within the area referred to as the Explosive Actuated Device (EAD)/ Booster Area. The Site is located along Highway H-45 in the north-central area of NSA Crane, about a mile and a half south of Lake Greenwood (Figure 10-1). SWMU 22 sits at an elevation around 760 feet mean sea level (msl). The east and south sides of the Site slope gently down to an elevation around 650 feet msl. The area surrounding SWMU 22 is forested.

The nearest surface water drainage, a headwater to Turkey Creek, is located approximately 550 feet east of the Site. As shown on the SWMU 22 Base and Site Location Map on Figure 10-1, the headwater of Turkey Creek runs into Turkey Creek proper approximately 1-1/2 miles south of the Site.

NSA Crane is in the unglaciated Crawford upland physiographic province of southern Indiana. The Crawford upland physiographic province is a rugged dissected plateau bordered on the west by the Wabash lowland and on the east by the Mitchell plain. Bedrock geology is mapped as Pennsylvanian and Mississippian sandstones, limestones, and shales overlain by Quaternary age deposits. Groundwater flow in the area generally mimics topography and is assumed to flow south and west to the headwaters of Turkey Creek. Depth to groundwater is unknown; based on other sites in the area with known groundwater depths, it is expected to be less than 20 feet bgs. It was observed during a site visit in September 2009 that bedrock is exposed in various areas of SWMU 22.

The nearest residences are approximately 5 miles northwest of the Site in the village of Crane, which is located just west of NSA Crane. There are no known historical or cultural concerns, such as Native American burial grounds, historic landmarks on, or in the vicinity of, the Site. There are no land use controls (LUCs) associated with the Site.

10.2 SITE HISTORY

The Booster Area was designed and constructed to load 5-inch rockets during World War II. EADs were loaded with explosives such as lead azide, lead styphnate, tetryl, RDX, and black powder. The area is currently operated by the Army and is involved in the production of small explosive charges and fuse maintenance.

The site layout of SWMU 22 is illustrated on Figure 10-2. SWMU 22 can be considered as three distinct production areas:

- Building 136 - Propellant Portion Building (including Lead Azide Pond)
- Building 138 - Pressing Building
- Building 2520- Final Assembly Building

Building 136 was used for the propellant portion, Building 138 was the pressing building for warheads, and Building 2520 was the final assembly building. A conveyor tunnel connects Building 136 and 2520 in support of the process.

Building 136 Area and Lead Azide Pond

In the 1960s, a detonator loading line was established in Building 136 where lead azide and other sensitive explosives were loaded into small detonators. For Building 136 activities, processes were conducted progressively in the buildings north of Building 136, referred to as the "Backline". According to the Initial Assessment Study (IAS) conducted in 1983 by the Naval Energy and Environmental Support Activity (NEESA) (NEESA, 1983), the initiating materials were not manufactured at SWMU 22; the materials were shipped to SWMU 22 water- or alcohol-wet. The manufacturing processes associated with Building 136 involved the following:

1. Raw materials were received in Building 2855 and in the wet magazine Building 2856.
2. Materials were dried in Buildings 2857 and 2858.
3. Materials were physically screened in Buildings 2859 and 2860. Buildings 2861 and 2862 were dry storage.
4. The final weighing and blending operation occurred in Building 2863.
5. Final loading occurred in Building 136 by press loading or pouring.

Operations at the Backline were discontinued in the 1980s. Building 136 is currently used for work for classified flares.

Many of these buildings have earthen berms built around them in case of explosion, and each building in the Backline has at least two sumps into which screening and rinse waters drained. The screening and rinse waters were neutralized in the individual sumps. Solids from the sumps were collected and transported to the Ammunition Burning Ground (ABG) for treatment by flashing. Overflow from the sumps went to a retention pond (referred to as the Lead Azide Pond) north of Building 2856 via gravity flow in terra cotta pipes. It was reported that approximately 2,300 gallons of wastewater were generated by the

complex per week (8 hours operation, 5 days a week) (United States Army Environmental Hygiene Agency [USAEHA], 1979). The location of the retention pond is illustrated on Figure 10-2.

The retention pond was unlined and received wastewater from the Backline operations. The pond was in use between the years of 1961 to 1977. It was estimated that 100 pounds of lead salts were discharged into the pond during this period (NEESA, 1983). The pond was located approximately 50 feet south of the western portion of Building 2520 and approximately 30 feet northeast of Building 2856 (Figure 10-2). The pond was approximately 15 feet long by 8 feet wide by 3 feet deep. Periodically, the pond was pumped out, and sediments were removed from the pond and taken to the ABG for disposal (A.T. Kearney, Inc., 1987). It was stated in an internal Navy document (Status Report Environmental Projects, dated January 30, 1980), that overflow from the pond discharged into the watershed and ultimately into the headwater to Turkey Creek. In 1981, the pond was closed. Contaminated soil and effluent were removed from the site to an approved landfill by a state-certified waste hauler (A.T. Kearney, Inc, 1987). The pond was filled in and no longer exists (NEESA, 1983). No other documentation was discovered concerning the volume of material removed from the pond.

An 8.5- by 10- by 7-foot deep reaction sump unit was constructed near the former pond to receive the wastewater after the pond became inactive (Figure 10-2). Flow from the unit was directed to the sanitary sewer. The discharge from the sump was capped in 1982, and the piping was directed to a wastewater treatment plant (WWTP) (Building 3074). The location of the former lead azide pond and sump are shown on Figures 10-2 through 10-4.

A WWTP facility (Building 3074) was built in 1982 to treat wastewaters generated from Building 136 operations. Wastewater from the Building 136 area flowed to the lift station, constructed in the former reaction sump, and was then pumped to Building 3074. The WWTP facility was reportedly never used due to discontinuation of operations on the Backline.

In an internal Navy memorandum (Replacement of Sewer Lines in B-136 Complex, dated August 20, 1990), it was reported that the lift station received water during rainfall events when site operations were not occurring. It was suspected that one or more of the lines were leaking. The memorandum reported that the wastewaters may have contained lead azide, tetrazene, lead styphnate, and NOL-130 (mix of barium nitrate, antimony trisulfide, lead azide, lead styphnate, and tetrazene). The memorandum indicated that the complex is constructed on bedrock.

Building 138 Area

Building 138 has been used since at least the 1950s for pressing small charge weights in pellet form, principally with black powder. Building 2533, located north of Building 138, reportedly has been used for mixing of explosive powders.

Building 2520 Area

The assembly of finished items such as of MK95 detonators or boosters took place in Building 2520 (NEESA, 1983). Building 2803, located southeast of Building 2520, was used to test rocket components in live firing tests. Recently, Building 2520 has been cleaned out.

10.3 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Surface water and sediment samples were collected in 1979 from the drainage ditch below the pond (USAEHA, 1979). The sample locations are shown on Figure 10-4. Surface water from the drainage ditch had lead concentrations ranging from 0.18 to 1.99 milligrams per liter (mg/L) and RDX concentrations of 0.02 to 4.4 mg/L. Sediment from the drainage ditch had a reported lead concentration of 2.86 milligrams per 1 gram, or 2,860 milligrams per kilogram (mg/kg). A sediment sample from the bottom of the pond had a reported lead concentration of 12.9 milligrams per 1 gram, or 12,900 mg/kg.

According to the IAS (NEESA, 1983) sludge samples from the Lead Azide Pond (date and location of collection not identified) had concentrations of lead varying from 0.03 parts per million (ppm) to 17 ppm; barium from less than 0.1 to 1.0 ppm; antimony from 0.5 to 2.0 ppm; and chromium from less than 1.0 to about 1,300 ppm.

A water sample from a drainage outfall (Outfall 028 on Figure 10-2) north of Building 2520 was collected during a storm water event in April 1996. The analysis identified a concentration of the nitroamine RDX at 4.1 micrograms per liter (ug/L). Lead was not detected in the same sample. Surface water samples collected as part of the Storm Water Pollution Prevention Plan from the same location in 2005, 2006, 2007, 2008, and 2009, had no detections of RDX above the laboratory DLs. Lead was detected at concentrations of 0.0048 mg/L in 2005 and 0.001 mg/L and 0.001 mg/L in 2006 and 2007, respectively. Lead was not detected in storm water runoff in 2008 and 2009.

10.4 CURRENT CONDITIONS

The area is currently operated by the Army and is involved in the production of small explosive charges and fuse maintenance. Building 136 is currently used for work for classified flares. Operations at the Backline were discontinued in the 1980s, and the buildings are scheduled for demolition in 2011.

The current site conditions were observed during a site visit in September 2009. Photographs from the site visit are provided in Appendix D. During the site visit in September 2009, the Backline buildings and associated sumps (Photograph Nos. 1, 2, 3, and 5 of Appendix D) were present but not in use, except for Building 136 and 2520 and the buildings associated with Building 138 operations (Buildings 138, 2706, and 2533). The lift station (former reaction sump) was also present (Photograph No. 10 of Appendix D). The pumps in the lift station are present and piped to discharge to the wastewater treatment facility (Building 3074) but are not in use due to discontinuation of activities at the site, as noted above. The former discharge to the sanitary sewer had been capped with a blind flanged during the conversion of the reaction sump to the lift station. The blind flange is currently rotated slightly to allow precipitation that collects in the lift station to discharge via gravity flow to the sanitary sewer.

It was observed that a drainage swale exists in the area of the former Lead Azide Pond (Photograph No. 8 of Appendix D). The drainage had some standing water (about 4 inches) and tall grass growing along it. The drainage runs east from the area of the former Lead Azide Pond and enters a culvert near Building 2803. The culvert pipe discharges to the hillside on the eastern side of the site (see Figure 10-2 and Photograph No. 9 of Appendix D).

An area of vegetation was observed on the hill slope south of the site that differed from the surrounding area (i.e., an area of low undergrowth was observed within a forested area) (Figure 10-5). Several drainage pipes were noted to discharge to the hill slope, up the slope from the area of differing vegetation. In addition, an area of grass was observed south-southeast of the site. No operations are known for this area. These areas are visible on the aerial photograph from 1966 (Figure 10-5).

10.5 CONCEPTUAL SITE MODEL

Based on site operations and recent observations as described in Sections 10.4 and 10.5, contamination at the site is expected to be related to the "Backline" (i.e., Building 136 and the associated process buildings and features) and the potential migration pathways from it. Therefore, areas of interest include the following:

- Former Lead Azide Retention Pond Area.
- Drainage pathways from Building 136 via sewer lines to the Lead Azide Pond.
- Drainage leading from the Lead Azide Pond towards the headwater to Turkey Creek.
- Drainages leading from the buildings on the northern portion of SWMU 22 towards the headwater to Turkey Creek.
- The area of differing vegetation on the hill slope south of the site.

As explosives have been handled in Building 2520 and potentially in other buildings in the northern portion of SWMU 22, and given that RDX was detected in 1996 in surface water discharging from SWMU 22, the potential also exists for historical releases to site media from the northern portion of the site.

The areas of interest are shown on Figures 10-2 through 10-5.

Figure 10-6 illustrates the CSM developed for SWMU 22.

10.5.1 Sources and Potential Contaminants

The primary source of contamination at the site is anticipated to be related to the screening and rinse waters generated in the processes at the site. The waters were collected in sumps at the site buildings, but overflow went to the former retention pond on-site via sewer lines. Infiltration through the unlined pond and from the leaking sewer lines from the Backline represents sources of potential contamination at SWMU 22. From 1961 to 1981, the potential for release into soil and groundwater was high due to lead salts and other constituents in the wastewater from the site being discharged to the retention pond. The potential for release to surface water exists due to the drainage pathway leading from the Lead Azide Pond to the eastern slope of the site and into the headwater to Turkey Creek. Minor releases may have also occurred as the wastewater travelled from Building 136, through the series of sumps, and then into the Lead Azide Pond.

The site-related constituents include metals (primarily lead) and explosives-related compounds (primarily RDX and tetryl). In addition, as rocket motors were tested in Building 2803, perchlorate is also considered a potential site-related constituent.

10.5.2 Contamination Migration Pathways

Based on available information, releases occurred directly into the soil, as well as into surface water flowing towards the headwater to Turkey Creek during storm events. The principal pathway at the site is migration of contaminants from the former retention pond to the drainage and surface water bodies. Constituents may migrate from soil through the vadose zone to groundwater; constituents may migrate through groundwater and be discharged to the surface water.

After release to the soil, contamination may 1) present a complete exposure pathway to human and ecological receptors, and/or 2) serve as a source of contamination to groundwater and soil and present a complete exposure pathway through those routes. The impacts of contamination from groundwater and surface water runoff may present direct exposure to receptors in and along the headwater to Turkey Creek.

10.5.3 Receptors and Exposure Pathways

Human receptors include persons who currently, or could in the future, interact with contaminated media. Persons currently using the Site include industrial or construction workers and trespassers. However, given that the future land use is unknown, it is customary to evaluate the future use of a property as residential and recreational. Therefore, potential future receptors include residents and persons recreating at the Site. Human receptors may be exposed to different media, based on their specific activities. These media include surface and subsurface soil, groundwater, surface water, and sediment. Potential exposure pathways may include dermal contact with, inhalation of, or ingestion of soil, or dermal contact with or ingestion of contaminated surface water or sediment.

Ecological receptors include animal and plant species that could be affected by the contaminants that are present. Typically, ecological receptors can be exposed only to surface media – surface soil, surface water, and upper layers of wetland sediments. Exposure of ecological receptors to groundwater and subsurface soil is not anticipated; however, contamination in subsurface soil or groundwater may serve as sources of contamination to sediments or surface water through subsurface transport or diffuse flow to streams. The exposure medium for ecological receptors is surface soil, sediment, and surface water. Terrestrial plants, invertebrates, and vertebrates are exposed to the surface soil by direct contact and ingestion of soil and other food items. Aquatic and semi-aquatic vegetation, benthic invertebrates, and aquatic organisms may be exposed to the surface water and sediment by direct contact and/or ingestion of sediment and surface water and other food items. The benthic invertebrates or other aquatic organisms may be consumed by wildlife. Although terrestrial vertebrates may be exposed to chemicals found in the air via inhalation, this is not considered a significant pathway.

SAP Worksheet No. 11 -- Project Quality Objectives/Systematic Planning Process Statements

(UFP-QAPP Manual Section 2.6.1)

This section describes the development of PQOs using EPA's seven-step DQO/Systematic Planning Process.

11.1 PROBLEM DEFINITION

It is unknown whether residual site-related contaminants persist in site media at levels that could pose an unacceptable level of human health or environmental risk. Therefore, the site must be investigated to determine whether unacceptable environmental conditions are present and corrective action or additional investigation is necessary. To efficiently and cost effectively use resources, it may be necessary to investigate the site in phases; therefore, phases following the initial investigation only occur as necessary based on information acquired.

11.2 INFORMATION INPUTS

The following physical and chemical data are needed to attain project objectives:

1. Chemical Data: Surface soil, subsurface soil, and sediment chemical data are needed to determine if target analytes are present in site media at concentrations greater than risk-based screening criteria. The list of chemical target analytes and Project Screening Levels (PSLs) associated with these analytes for each matrix is presented in Worksheet No. 15. Selection of target analytes was based on site operational knowledge and the CSM. The sampling methods are presented in Worksheet No. 18, and analytical methods are presented in Worksheet No. 19.

2. Project Screening Levels: The SWMU 22 RFI requires chemical data that can be compared to current USEPA and IDEM residential surface soil, subsurface soil, sediment, surface water, and groundwater (if necessary) risk-based screening criteria. A comprehensive list of the relevant environmental and medium-specific risk-based screening levels for the target analytes was determined (for the metals, explosives, and perchlorate). The risk and regulatory criteria applicable to SWMU 22 include the IDEM RISC Default Closure Tables, Residential and Industrial Closure Levels; EPA Regions 3, 6, and 9 Residential Regional Screening Levels (R-RSLs) and risk-based migration-to-groundwater Soil Screening Levels (R-SSLs) for human health risk screening and for use in a Human Health Risk Assessment (HHRA) during the RFI, if necessary. The surface soil, sediment, and surface water ecological benchmarks for ecological risk screening and for use in an Ecological Risk Assessment (ERA) include the EPA Ecological Soil Screening Levels (Eco SSL) (for soil), EPA Region 5 RCRA Ecological Screening Levels (R5 ESL) (for soil, sediment, and surface water), EPA

Region 3 Biological Technical Assistance Group (R3 BTAG) Freshwater Surface Water and Sediment Screening Benchmarks (for surface water and sediment), Nitroaromatic Munition Compounds: Environmental Effects and Screening Values from Talmage et al., (1999) (for surface water), toxicity data from Ecotoxicology of Explosives (Sunahara et al., 2009) (for soil and sediment), and ECORISK Database (Release 2.4) (LANL, 2009) (for soil). The criterion for each analyte represents the PSL for each environmental matrix listed in Worksheet No. 15. Backup tables for the selection of PSLs are presented in Appendix E.

3. Survey Data: Survey coordinate data will be collected and documented in order to map the sampling locations with sub-meter accuracy. The survey will be relative to the Indiana State Plane Coordinate System (West Zone).

If the Phase I data indicate that an additional phase of investigation is warranted, it will be necessary to determine the nature and extent of contamination in soil and possibly in other media, and to estimate the level of risks at SWMU 22. At that time, specific data requirements for the next phase of investigation will be determined.

The background data set for various media at NSA Crane will also be used to determine whether metals present on-site are naturally occurring, or are site-related. Background data are described in the *Base-Wide Background Soil Investigation for Naval Surface Warfare Center Crane* (Tetra Tech, 2001).

11.3 STUDY AREA BOUNDARIES

The study will be performed in a phased manner and address the entire area of SWMU 22 plus the adjoining stream, an unnamed tributary to Turkey Creek, as shown on Figure 11-1. If elevated levels of site-related contaminants are discovered, one of the objectives of subsequent phases (Phase II and III) will be to define the boundaries of the contamination, which will require that both contaminated and non-contaminated media be sampled (i.e., the perimeter of the impacted area must be established).

Phase I

The Phase I boundaries for this RFI will consist of:

- Surface and subsurface soil from areas with the greatest potential for chemical impacts from process activities at the site. These areas include:

- Area of the former Lead Azide Pond;
- Area of the sewer lines and sumps from the Backline buildings toward the former Lead Azide Pond;
- Drainages from the Former Lead Azide Pond toward the unnamed tributary to Turkey Creek;
- Drainages north of Building 2520 leading toward Outfall 028; and
- The area of low undergrowth vegetation (possibly related to environmental stress) on the hill slope south of the site.

- Surface water and collocated sediment in the unnamed tributary to Turkey Creek from approximately 100 feet upgradient to 200 feet downgradient from the discharge points from the site to the unnamed tributary to Turkey Creek. This area represents the area most likely to have become contaminated from SWMU 22, if chemical releases occurred.

(Note: solid matrices [soil and sediment] have been identified in this SAP as soil being in areas outside of watercourses or drainages and sediment being material in watercourses or drainages, whether saturated or dry. The provenance of the sediments will evaluated during human health or ecological risk assessments, if necessary, in order to determine how to address them. Sediments may be considered as surface soil during the risk assessments, depending on the location conditions. For example, sediments collected from the hillslope drainages will be considered as surface soils during risk assessments, given the lack of standing water in the watercourses.)

The following items address the horizontal, vertical, and temporal boundaries for Phase I of the study.

1. The soil population of interest is soil bounded by the outer perimeter of the area where process operations took place, based upon information from aerial photographs and documents, as identified on Figure 11-1. The Backline area of SWMU 22 and the unnamed tributary to Turkey Creek are included for investigation.

2. The vertical boundary of the Phase I study is soil from the ground surface to the top of the water table or top of bedrock, whichever is shallower. The depth interval of interest for surface soil is 0 to 2 feet bgs. The subsurface soil interval of interest is 3 to 5 feet bgs based on the increased likelihood of contamination to be present near the bottom of the former pond or near the subsurface pipes at that depth. Vertical expansion (deeper depths) may be necessary in Phase II, if target analyte concentrations are detected in subsurface soil at concentrations that exceed the PSLs. Bedrock may be shallow at the site, based on outcrops being present at the site. If the water table is not encountered in the overburden, subsurface soil samples will be collected from the interval above the bedrock surface.

3. Surface water from the drainage ditch below the former pond, the drainage north of Building 2520, and the unnamed tributary to Turkey Creek is the targeted surface water population. Sediment throughout the stream bed is also a population of interest; however, if sediment is not widely available, depositional areas will be investigated. Surface water and collocated sediment upgradient and downgradient of the site will be investigated to distinguish impacts from the site and impacts from other sources.

4. All target analyte concentrations are anticipated to be relatively unchanged (stable) over the course of time needed to conduct the environmental investigations and into the foreseeable future; therefore, no temporal constraints exist. SWMU 22 RFI Phase I field activities are scheduled for the first quarter of early 2011. Phase II and Phase III activities, if deemed necessary, will be conducted in a timely manner after Phase I.

Additional Phases

If Phase I results indicate a need to conduct subsequent phases of investigation and revise the study boundaries, data needs and criteria will developed in subsequent phases and proposed in an addendum to this UFP-SAP.

If Phase I results indicate that groundwater is, or may be, contaminated, the groundwater population of interest would be the groundwater that may have been contaminated by releases from the SWMU 22 site-related activities, including leaks and other releases from operations. This is generally groundwater located downgradient from the known release and other operations areas. Upgradient groundwater is also of interest to provide a reference population and to help delineate contamination. Given the exposure of bedrock at the site, it is presumed groundwater is in the bedrock at the site.

11.4 ANALYTIC APPROACH

The analytic approach for this RFI includes decision rules related to characterizing the site, delineating potential contamination, and assessing potential risk. Additionally, quality assurance data to be collected is described in Worksheet Nos. 20 and 28.

The decision rules for Phase I data use are as follows:

1. If all target analyte concentrations in surface soil, subsurface soil, sediment, and surface water in the initial round of sampling are less than the PSLs, then recommend NFA; otherwise, advance to Rule 2. The target analytes include a specific list of explosives, perchlorate, and RCRA metals (see

Worksheet No. 15). Perchlorate will not be analyzed in sediments, due to its high solubility, in accordance with the DoD Perchlorate Policy (DoD, 2007).

2. For each target analyte, if the maximum measured concentration in any medium exceeds its human health screening value and background value (if applicable), then classify the chemical as a Contaminant of Potential Concern (COPC) for that medium and risk type; otherwise, exclude the chemical from further consideration in the risk screening. Comparisons to background concentrations will only be used to evaluate metals contamination because the metals occur naturally in all environmental media;, explosives do not occur naturally and perchlorate is not expected to be present at measurable concentrations due to natural causes at this site. The comparative method will be used as outlined in the Base-Wide Background Soil Investigation (Tetra Tech, 2001), when the soil type present at the site can be determined or matched to a particular soil type considered in the Background Study. The geochemical method will be used as outlined in the Background Study when the soil type present is unknown or cannot be matched to a particular soil type considered in the Background Study. If surface water or sediment locations upstream of the site indicate upstream sources of contamination as the sole source of contamination at the site, no further action will be taken for these media for the RFI.

If COPCs are identified for any analyte, then proceed to a Phase II investigation.

11.5 PERFORMANCE OR ACCEPTANCE CRITERIA

Simple comparisons of measured concentrations to PSLs and background concentrations (for metals) are planned for Phase I. The Project Team will use the results of the Phase I activities to determine whether the amount and type of data collected are sufficient to support the attainment of project objectives. If all data have been collected as planned herein and no data usability issues exist, the data will be considered sufficient to meet project objectives. Refer to Worksheet No. 37 for a discussion of the data usability process.

Performance and acceptance criteria for subsequent phases will be defined in an addendum to this UFP-SAP.

11.6 PLANS FOR OBTAINING DATA

Based on the information presented above, a detailed plan was developed to obtain the necessary data to answer the problem. The sampling design and rationale for all samples that will be collected are provided in Worksheet No. 17.

SAP Worksheet No. 12 -- Measurement Performance Criteria Table – Field Quality Control Samples

(UFP-QAPP Manual Section 2.6.2)

Quality Control (QC) Sample	Analytical Group	Frequency	Data Quality Indicators (DQIs)	Measurement Performance Criteria (MPCs)	QC Sample Assesses Error for Sampling (S), Analytical (A) or Both (S&A)
Equipment Rinsate Blank	All analytical groups	One per 20 field samples per matrix per sampling equipment[1].	Accuracy/Bias/ Contamination	No analytes ≥ ½ LOQ, except common laboratory contaminants, which must be < LOQ.	S & A
Field Duplicate (FD)	All analytical groups	One per 20 field samples collected per matrix.	Precision	Values > 5X LOQ: Relative Percent Difference (RPD) must be ≤30[2,3] (aqueous), ≤50[2,3] (solid).	S & A
Cooler Temperature Indicator	All analytical groups	One per cooler.	Representativeness	Temperature must be between 0 and 6 degrees Celsius (°C).	S

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 < 5x LOQ, the absolute difference should be < 2x LOQ.
3 If duplicate values for metals are < 5x LOQ, the absolute difference should be < 4x LOQ.

SAP Worksheet No. 13 -- Secondary Data Criteria and Limitations Table

(UFP-QAPP Manual Section 2.7)

Secondary Data	Data Source (originating organization, report title and date)	Data Generator(s) (originating organization, data types, data generation/ collection dates)	How Data Will Be Used	Limitations on Data Use
None	NA	NA	NA	No secondary data will be used.

SAP Worksheet No. 14 -- Summary of Project Tasks

(UFP-QAPP Manual Section 2.8.1)

14.1 FIELD INVESTIGATION TASK PLAN

Site-specific SOPs have been developed for field activities at NSA Crane and are located in Appendix A. Field tasks are summarized below with a short description for each task.

- Mobilization/Demobilization
- Utility Clearance
- Site-Specific Health and Safety Training
- Monitoring Equipment Calibration
- Sample Collection Tasks
- Surface Water and Sediment Sampling
- Surface and Subsurface Soil Sampling
- Investigation-Derived Waste (IDW) Management
- Field Decontamination Procedures
- Field Documentation Procedures
- Sample Handling
- Global Positioning System (GPS) Locating

Mobilization/Demobilization

Mobilization will consist of the delivery of all equipment, materials, and supplies to the site, complete assembly in satisfactory working order of all such equipment at the site, and satisfactory storage at the site of all such materials and supplies. The Tetra Tech FOL or designee will coordinate with the NSA Crane ERSM to identify appropriate locations for the storage of equipment and supplies. Site-specific health and safety training for all Tetra Tech field personnel and subcontractors will be provided as part of site mobilization.

Demobilization will consist of the prompt and timely removal of all equipment, materials, and supplies from the site following completion of the work. Demobilization includes the cleanup and removal of waste generated during the performance of the investigation.

Utility Clearance

Prior to commencing any work at NSA Crane, the Comprehensive Work Approval Process (CWAP) will be followed. The CWAP will identify constraints in the work area, such as the locations of eagle's nests,

archaeological sites, wetlands, etc., that may affect work at the site and other requirements that must be met prior to commencing work. One week prior to the commencement of any subsurface intrusive activities, the Tetra Tech FOL or designee will contact Indiana Underground Plant Protection Services (IUPPS) to complete a utility clearance ticket for the areas under investigation. Work permits, if required by the facility, will be obtained prior to conducting field activities. The Tetra Tech FOL will be responsible for coordinating these activities.

Site-Specific Health and Safety Training

There are no specialized/non-routine project-specific training requirements or certifications needed by personnel to successfully complete the project or tasks. All field personnel will have appropriate training to conduct the field activities to which they are assigned. Each site worker will be required to have completed the OSHA 40-hour course (and 8-hour refresher, if applicable) in health and safety training. Safety requirements are addressed in greater detail in the site-specific HASP.

Monitoring Equipment Calibration

Monitoring equipment calibration procedures are described in Worksheet No. 22.

Sample Collection Tasks

The sampling and analysis program is outlined in Worksheet No. 18. Sample collection will be in accordance with the site-specific SOPs in Appendix A. The sampling requirements for each type of analysis (i.e., bottleware, preservation, holding time) are listed in Worksheet No. 19. Field and laboratory QC samples will also be collected as outlined in Worksheet No. 20.

Surface Water and Sediment Sampling

The surface water sampling procedures discussed in SOP-05 (Surface Water Sampling, Appendix A) will be followed. If enough water is available, water quality parameters will be measured and recorded during the collection of each surface water sample using a multi-parameter water quality meter in accordance with SOP-06 (Measurement of Water Quality Parameters, Appendix A). During sediment sampling the procedures discussed in SOP-07 (Sediment Sampling, Appendix A) will be followed. The PM or FOL will coordinate with NSA Crane regarding the timing of and locations where samples are collected for surface water sampling so as not to conflict with regulatory sampling activities.

Surface and Subsurface Soil Sampling

Surface and subsurface soil samples will be collected in accordance with SOP-08 (Borehole Advancement and Soil Coring Using Direct-Push Technology (DPT) and Hand Auger Techniques, Appendix A). Surface soil only samples (locations 22SS001 and 22SS002) will be collected with a hand auger due to access limitations (i.e., steep hillslope). Subsurface soil samples (all other locations) will be collected using a DPT; one subsurface soil location maybe sampled using a hand auger if the DPT cannot access the location. The subsurface soil borings will be described by the field personnel in accordance with SOP-09 (Soil Sample Logging, Appendix A). Any qualitative visual signs of potential contamination (such as soil staining) will be noted on the soil boring log. The surface and subsurface soil samples will be collected in accordance with SOP-10 (Surface and Subsurface Soil Sampling, Appendix A).

Investigation-Derived Waste Management

It is not anticipated that significant volumes of solid or semi-solid investigation-derived waste (IDW) in the form of soil or sediment will be generated during field activities, including during collection of subsurface samples using DPT. Soil will be replaced into the boring from which it was excavated. Grossly contaminated material that is brought to the surface will not be returned to the boring but will be segregated from other excavated soil and. The grossly contaminated material will be containerized for proper off-site disposal, pending analytical results.

IDW that is generated, including personal protective equipment (PPE) and decontamination fluids, will be handled in accordance with SOP-11 (Management of Investigation-Derived Waste, Appendix A).

Field Decontamination Procedures

Decontamination of sampling equipment will not be necessary for dedicated and disposable hand trowels. Decontamination of reusable sampling equipment (e.g., non-disposable hand trowels, hand augers, or DPT) will be conducted prior to sampling and between samples at each location. Decontamination of equipment will be conducted according to the sequence established in SOP-12 (Decontamination of Field Sampling Equipment, Appendix A).

Field Documentation Procedures

Field documentation will be performed in accordance with SOP-03 (Sample Custody and Documentation of Field Activity, Appendix A).

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.

At a minimum, the following information will be recorded in the site logbook:

- Name of the person to whom the logbook is assigned.
- Project name.
- Project start date.
- Names and responsibilities of on-site project personnel including subcontractor personnel.
- Arrival/departure of site visitors.
- Arrival/departure of equipment.
- Sampling activities and sample log sheet references.
- Description of subcontractor activities.
- Sample pick-up information including chain-of-custody form numbers, air bill numbers, carriers, times, and dates.
- Descriptions of borehole activities and operations.
- Descriptions of monitoring well installation activities and operations, if monitoring wells are deemed necessary.
- Health and safety issues.
- Description of photographs including date, time, photographer, picture number, location, and compass direction of each photograph.

All logbook 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, and the person making the correction will initial and date the change.

Sample Handling

Methods for sample handling will be in accordance with SOP-03 (Sample Custody and Documentation of Field Activities, Appendix A). Sample containers will be provided certified-clean (I-Chem 300 or equivalent) from APPL. Sample labeling will be in accordance with SOP-01 (Sample Labeling, Appendix A), and the sample numbering scheme will be in accordance with Worksheet No. 27 and SOP-02 (Sample Identification and Nomenclature, Appendix A). The selection of sample containers, sample preservation, packaging, and shipping will be in accordance with Worksheet No. 19 and SOP-04 (Sample Preservation, Packaging, and Shipping, Appendix A).

Global Positioning System Locating

A GPS unit will be used to locate all sampling points in accordance with SOP-13 (Global Positioning System, Appendix A). The GPS equipment will be checked on control monuments before and after day's use, and these checks will be documented in the field notebook. To ensure sub-meter accuracy, the GPS SOP requires a minimum of six satellites to capture a position.

14.2 ADDITIONAL PROJECT-RELATED TASKS

Additional project-related tasks include:

- Analytical tasks
- Data management
- Assessment and oversight
- Data review
- Project reports

Analytical Tasks

Chemical analyses for explosives, perchlorate, metals, and TOC will be performed by APPL, which is a DoD ELAP accredited laboratory. A copy of the laboratory accreditation for APPL is included in Appendix B. Analyses will be performed in accordance with the analytical methods identified in Worksheet No. 30. APPL will meet the PSLs specified in Worksheet No. 15 and will perform the chemical analyses following laboratory-specific SOPs (see Worksheet Nos. 19 and 23) that were developed based on the methods listed in Worksheet Nos. 19 and 30.

All soil and sediment 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 files. This information will also be captured in the project database, which will eventually be uploaded to the Naval Installation Restoration Information Solutions (NIRIS) database. Percent moisture information will also be captured in the RFI Report.

Data Management

The principal data generated for this project will be from field data and laboratory analytical data. After the RFI is completed, 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 APPL 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 APPL. Upon receipt of the data packages from APPL, the Tetra Tech Project Chemist will oversee the data validation effort, which includes verifying that the data packages are complete and results for all samples have been delivered by APPL.

- **Data Storage, Archiving, and Retrieval**. The data packages received from APPL are tracked in the data validation logbook. After the data are validated, the data packages are entered into the Tetra Tech 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. The 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.

Assessment and Oversight

Refer to Worksheet No. 32 for assessment findings and corrective actions and to Worksheet No. 33 for QA Management Reports.

Data Review - Data verification is described in Worksheet No. 34, data validation is described in Worksheet Nos. 35 and 36, and usability assessment is described in Worksheet No. 37.

Project Reports – Draft and final versions of the RFI Report will be prepared and submitted to the Navy, IDEM, and the USEPA for review. The reports will include the following sections:

- Executive Summary – will include a brief description of the work conducted and the findings.

- Introduction and Background – will include a description of the history of operations and activities at the site and a summary of any previous investigations and removal actions.

- Description of Field Investigations – will include a summary of the work performed in accordance with the approved UFP-SAP and any field modifications as documented by the Tetra Tech FOL. This section will include maps showing the sampling locations and tables summarizing the data collected.

- Data Quality – will include a summary of quantitative analytical performance indicators such as completeness, precision, bias, and sensitivity and qualitative indicators such as representativeness and comparability. This section includes a reconciliation of project data with the DQOs and an identification of deviations from this UFP-SAP.

  A data usability assessment will be used to identify significant deviations in analytical performance that could affect the ability to meet project objectives. The elements of this review are presented in Worksheet No. 37.

- Nature and Extent of Contamination – will include a discussion of the contamination detected in each medium sampled in relation to the CSM of the site. This section will note the removals previously conducted (if applicable), contamination addressed, and any additional contaminants found during this field effort. Detected contaminant concentrations will be tabulated for each medium and depicted on maps.

- Contaminant Fate and Transport – will include a description of the contaminants detected and their behavior in soil, bedrock, groundwater, surface water, and sediment, particularly with emphasis on the future migration of these contaminants to any possible exposure areas.

- Summary and Conclusions – includes a summary of the findings, conclusions as to whether delineation of contamination is adequate, and recommendations for further investigations, if needed.

Tetra Tech will submit the draft report and respond to comments received on the draft report before any additional sampling begins. The final version of the report will submitted in hardcopy and electronic format to the project stakeholders.

SAP Worksheet No. 15 -- Reference Limits and Evaluation Table

(UFP-QAPP Manual Section 2.8.1)

Matrix: Surface Soil (depth: 0 to 2 feet)
Analytical Group: Explosives (SW-846 Method 8330B)

Analyte	CAS Number	Project Screening Levels (mg/kg)		Project Screening Level References[1]	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
1,3,5-Trinitrobenzene	**99-35-4**	78	**0.376**	R-SSL / **R5 ESL**	**0.13**	**0.50**	**0.158**	**0.079**
1,3-Dinitrobenzene	**99-65-0**	**0.066**	0.655	**R-SSL** / R5 ESL	**0.022**	**0.50**	**0.1268**	**0.0634**
2,4,6-Trinitrotoluene (TNT)	**118-96-7**	**0.26**	6	**R-SSL** / Sunahara	**0.087**	**0.50**	**0.166**	**0.083**
2,4-Dinitrotoluene	**121-14-2**	**0.0058**	1.28	**R-SSL** / R5 ESL	**0.0019**	**0.50**	**0.166**	**0.083**
2,6-Dinitrotoluene	**606-20-2**	1.0	**0.0328**	R-SSL / **R5 ESL**	**0.011**	**0.50**	**0.166**	**0.083**
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	46	---	R-SSL / None	15	0.50	0.16	0.08
3-Nitrotoluene	**99-08-1**	**0.068**	---	**R-SSL / None**	**0.023**	**0.50**	**0.142**	**0.071**
2-Nitrotoluene	**88-72-2**	**0.0058**	---	**R-SSL / None**	**0.0019**	**0.50**	**0.132**	**0.066**
4-Nitrotoluene	**99-99-0**	**0.078**	---	**R-SSL / None**	**0.026**	**0.50**	**0.16**	**0.080**
4-Amino-2,6-Dinitrotoluene	19406-51-0	1.1	---	R-SSL / None	0.37	0.50	0.15	0.075
2-Amino-4,6-Dinitrotoluene	35572-78-2	1.1	80	R-SSL / LANL	0.37	0.50	0.15	0.075
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	479-45-8	24	25	R-RSL / LANL	8.0	0.50	0.182	0.091
Nitrobenzene	**98-95-3**	**0.028**	1.31	**IDEM R-DCL** / R5 ESL	**0.0093**	**0.50**	**0.15**	**0.075**
Octahydro-1,3,5,7-tetranitro-1,3,5-triazine (RDX)	**121-82-4**	**0.0046**	98	**R-SSL** / Sunahara	**0.0015**	**0.50**	**0.16**	**0.08**

CAS – Chemical Abstract Service
(1) Surface soil screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); R-SSL – Regions 3, 6, and 9 Soil Screening Level, Risk-Based Migration-to-Groundwater, Dilution Attenuation Factor (DAF) = 20 (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009); Eco SSL – Ecological Soil Screening Level (USEPA, 2008a); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); Sunahara – Ecotoxicity of Explosives (Sunahara et al., 2009); LANL – ECORISK Database (Release 2.4) (LANL, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. **Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD.** All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

Matrix: Surface Soil (depth: 0 to 2 feet)
Analytical Group: Perchlorate (SW-846 Method 6850)

Analyte	CAS Number	Project Screening Levels (mg/kg)		Project Screening Level References[1]	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Perchlorate	14797-73-0	5.5	---	R-RSL / None	1.8	0.006	0.004	0.002

(1) Surface soil screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); R-SSL – Regions 3, 6, and 9 Soil Screening Level, Risk-Based Migration-to-Groundwater, Dilution Attenuation Factor (DAF) = 20 (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009); Eco SSL – Ecological Soil Screening Level (USEPA, 2008a); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); Sunahara – Ecotoxicity of Explosives (Sunahara et al., 2009); LANL – ECORISK Database (Release 2.4) (LANL, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Matrix: Surface Soil (depth: 0 to 2 feet)
Analytical Group: RCRA Metals (SW-846 Methods 6020A and 7471A)

Analyte	CAS Number	Project Screening Levels (mg/kg)		Project Screening Level References[1]	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Arsenic	**7440-38-2**	**0.026**	18	**R-SSL** / Eco SSL	**0.0087**	**0.60**	**0.176**	**0.088**
Barium	7440-39-3	1,500	330	R-RSL / Eco SSL	110	0.50	0.094	0.047
Cadmium	**7440-43-9**	7	**0.36**	R-RSL **/ Eco SSL**	**0.12**	**0.50**	**0.056**	**0.028**
Chromium	7440-47-3	38	26	IDEM R-DCL / Eco SSL	8.7	0.50	0.058	0.029
Lead	7439-92-1	81	11	IDEM R-DCL / Eco SSL	3.7	0.50	0.184	0.092
Mercury	7439-97-6	0.56	0.1	R-RSL / R5 ESL	0.033	0.1	0.0338	0.0169
Selenium	**7782-49-2**	5.2	**0.52**	IDEM R-DCL **/ Eco SSL**	**0.17**	**0.90**	**0.488**	**0.244**
Silver	7440-22-4	31	4.2	IDEM R-DCL / Eco SSL	1.4	0.20	0.072	0.036

(1) Surface soil screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); R-SSL – Regions 3, 6, and 9 Soil Screening Level, Risk-Based Migration-to-Groundwater, Dilution Attenuation Factor (DAF) = 20 (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009); Eco SSL – Ecological Soil Screening Level (USEPA, 2008a); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); Sunahara – Ecotoxicity of Explosives (Sunahara et al., 2009); LANL – ECORISK Database (Release 2.4) (LANL, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD. All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

Matrix: Subsurface Soil (depth: greater than 2 feet)
Analytical Group: Explosives (SW-846 Method 8330B)

Analyte	CAS Number	Project Screening Levels (mg/kg)	Project Screening Level References(1)	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	HHRA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
1,3,5-Trinitrobenzene	99-35-4	78	R-SSL	26	0.50	0.158	0.079
1,3-Dinitrobenzene	**99-65-0**	**0.066**	**R-SSL**	**0.022**	**0.50**	**0.1268**	**0.0634**
TNT	**118-96-7**	**0.26**	**R-SSL**	**0.087**	**0.50**	**0.166**	**0.083**
2,4-Dinitrotoluene	**121-14-2**	**0.0058**	**R-SSL**	**0.0019**	**0.50**	**0.166**	**0.083**
2,6-Dinitrotoluene	**606-20-2**	**0.0328**	**R5 ESL**	**0.011**	**0.50**	**0.166**	**0.083**
HMX	2691-41-0	46	R-SSL	15	0.50	0.16	0.08
3-Nitrotoluene	**99-08-1**	**0.068**	**R-SSL**	**0.023**	**0.50**	**0.142**	**0.071**
2-Nitrotoluene	**88-72-2**	**0.0058**	**R-SSL**	**0.0019**	**0.50**	**0.132**	**0.066**
4-Nitrotoluene	**99-99-0**	**0.078**	**R-SSL**	**0.026**	**0.50**	**0.16**	**0.080**
4-Amino-2,6-Dinitrotoluene	19406-51-0	1.1	R-SSL	0.37	0.50	0.15	0.075
2-Amino-4,6-Dinitrotoluene	35572-78-2	1.1	R-SSL	0.37	0.50	0.15	0.075
Tetryl	479-45-8	24	R-RSL	8.0	0.50	0.182	0.091
Nitrobenzene	**98-95-3**	**0.028**	**R-SSL**	**0.0093**	**0.50**	**0.15**	**0.075**
RDX	**121-82-4**	**0.0046**	**R-RSL**	**0.0015**	**0.50**	**0.16**	**0.08**

(1) Subsurface soil screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); R-SSL – Regions 3, 6, and 9 Soil Screening Level, Risk-Based Migration-to-Groundwater, Dilution Attenuation Factor (DAF) = 20 (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. **Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD.** All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

There is a PSL for human health only (there is no ecological PSL because there is no complete exposure path for ecological receptors).

Matrix: Subsurface Soil (depth: greater than 2 feet)
Analytical Group: Perchlorate (SW-846 Method 6850)

Analyte	CAS Number	Project Screening Levels (mg/kg)	Project Screening Level Reference[1]	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	HHRA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Perchlorate	14797-73-0	5.5	R-RSL	1.8	0.006	0.004	0.002

(1) Subsurface soil screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); R-SSL – Regions 3, 6, and 9 Soil Screening Level, Risk-Based Migration-to-Groundwater, Dilution Attenuation Factor (DAF) = 20 (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009). Refer to Appendix E for further explanation and justification of PSLs.
There is a PSL for human health only (there is no ecological PSL because there is no complete exposure path for ecological receptors).

Matrix: Subsurface Soil (depth: greater than 2 feet)
Analytical Group: RCRA Metals (SW-846 Methods 6020A and 7471A)

Analyte	CAS Number	Project Screening Levels (mg/kg)	Project Screening Level References[1]	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	HHRA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Arsenic	**7440-38-2**	**0.026**	**R-SSL**	**0.0087**	**0.60**	**0.176**	**0.088**
Barium	7440-39-3	1,500	R-RSL	500	0.50	0.094	0.047
Cadmium	7440-43-9	7	R-RSL	2.3	0.50	0.056	0.028
Chromium	7440-47-3	38	IDEM R-DCL	13	0.50	0.058	0.029
Lead	7439-92-1	81	IDEM R-DCL	27	0.50	0.184	0.092
Mercury	7439-97-6	0.56	R-RSL	0.19	0.10	0.0338	0.0169
Selenium	7782-49-2	5.2	IDEM R-DCL	1.7	0.90	0.488	0.244
Silver	7440-22-4	31	IDEM R-DCL	10	0.20	0.072	0.036

(1) Subsurface soil screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); R-SSL – Regions 3, 6, and 9 Soil Screening Level, Risk-Based Migration-to-Groundwater, DAF = 20 (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. **Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD.** All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

There is a PSL for human health only (there is no ecological PSL because there is no complete exposure path for ecological receptors).

Matrix: Sediment
Analytical Group: Explosives (SW-846 Method 8330B)

Analyte	CAS Number	Project Screening Levels (mg/kg)		Project Screening Level References(1)	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
1,3,5-Trinitrobenzene	99-35-4	220	8	R-RSL / Sunahara	2.7	0.50	0.158	0.079
1,3-Dinitrobenzene	**99-65-0**	**0.61**	**0.0081**	**R-RSL / R5 ESL**	**0.0027**	**0.50**	**0.1268**	**0.0634**
TNT	118-96-7	19	4	R-RSL / Sunahara	6.0	0.50	0.166	0.083
2,4-Dinitrotoluene	**121-14-2**	**1.6**	**0.0144**	**R-RSL / R5 ESL**	**0.0048**	**0.50**	**0.166**	**0.083**
2,6-Dinitrotoluene	**606-20-2**	**6.1**	**0.0398**	**R-RSL / R5 ESL**	**0.013**	**0.50**	**0.166**	**0.083**
HMX	2691-41-0	380	126	R-RSL / R5 ESL	42	0.50	0.16	0.08
3-Nitrotoluene	99-08-1	0.61	---	R-RSL / None	0.20	0.50	0.142	0.071
2-Nitrotoluene	88-72-2	2.9	---	R-RSL / None	0.97	0.50	0.132	0.066
4-Nitrotoluene	99-99-0	30	4.06	R-RSL / R3 SED BTAG	1.3	0.50	0.16	0.080
4-Amino-2,6-Dinitrotoluene	19406-51-0	15	---	R-RSL / None	5.0	0.50	0.15	0.075
2-Amino-4,6-Dinitrotoluene	35572-78-2	15	---	R-RSL / None	5.0	0.50	0.15	0.075
Tetryl	**479-45-8**	24	**0.1**	R-RSL / **Sunahara**	**0.033**	**0.50**	**0.182**	**0.091**
Nitrobenzene	**98-95-3**	4.8	**0.145**	R-RSL / **R5 ESL**	**0.048**	**0.50**	**0.15**	**0.075**
RDX	121-82-4	5.5	102	R-RSL / Sunahara	1.8	0.50	0.16	0.08

(1) Sediment screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); R3 SED BTAG – Region 3 Biological Technical Assistance Group Freshwater Sediment Screening Benchmarks (USEPA, 2006a); Sunahara – Ecotoxicity of Explosives (Sunahara et al., 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD. All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

Matrix: Sediment
Analytical Group: RCRA Metals (SW-846 Methods 6020A and 7471A)

Analyte	CAS Number	Project Screening Levels (mg/kg)		Project Screening Level References[1]	Project Quantitation Limit Goal (mg/kg)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (mg/kg)	LOD (mg/kg)	DL (mg/kg)
Arsenic	**7440-38-2**	**0.39**	9.79	**R-RSL** / R5 ESL	**0.13**	**0.60**	**0.176**	**0.088**
Barium	7440-39-3	1,500	---	R-RSL / None	500	0.50	0.094	0.047
Cadmium	7440-43-9	7	0.99	R-RSL / R5 ESL	0.33	0.50	0.056	0.028
Chromium	7440-47-3	430	26	IDEM R-DCL / R5 ESL	8.6	0.50	0.058	0.029
Lead	7439-92-1	81	35.8	IDEM R-DCL / R5 ESL	12	0.50	0.184	0.092
Mercury	7439-97-6	0.56	0.174	R-RSL / R5 ESL	0.058	0.10	0.0338	0.0169
Selenium	7782-49-2	39	2	R-RSL / R3 BTAG	0.67	0.90	0.488	0.244
Silver	7440-22-4	39	0.5	R-RSL / R5 ESL	0.17	0.20	0.072	0.036

(1) Sediment screening references: R-RSL – Regions 3, 6, and 9 Regional Screening Level, Direct Contact Residential (USEPA, 2010); IDEM R-DCL – Residential Default Closure Level (IDEM, 2009); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); R3 SED BTAG – Region 3 Biological Technical Assistance Group Freshwater Sediment Screening Benchmarks (USEPA, 2006a); Sunahara – Ecotoxicity of Explosives (Sunahara et al., 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. **Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD.** All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

Matrix: Surface Water
Analytical Group: Explosives (SW-846 Method 8330B)

Analyte	CAS Number	Project Screening Levels (µg/L)		Project Screening Level References[1]	Project Quantitation Limit Goal (µg/L)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
1,3,5-Trinitrobenzene	99-35-4	110	10	T-RSL / Talmage	3.3	0.50	0.26	0.130
1,3-Dinitrobenzene	**99-65-0**	**0.37**	22	**T-RSL** / R5 ESL	**0.12**	**0.50**	**0.262**	**0.131**
TNT	118-96-7	2.2	100	T-RSL / R3 SW BTAG	0.73	0.50	0.266	0.133
2,4-Dinitrotoluene	**121-14-2**	**0.22**	44	**T-RSL** / R5 ESL	**0.073**	**0.50**	**0.25**	**0.125**
2,6-Dinitrotoluene	606-20-2	3.7	81	T-RSL / R5 ESL	1.2	0.50	0.25	0.125
HMX	2691-41-0	180	150	T-RSL / R3 SW BTAG	60	0.50	0.23	0.115
3-Nitrotoluene	**99-08-1**	**0.37**	750	**T-RSL** / R3 SW BTAG	**0.12**	**0.50**	**0.266**	**0.133**
2-Nitrotoluene	**88-72-2**	**0.31**	750	**T-RSL** / R3 SW BTAG	**0.10**	**0.50**	**0.252**	**0.126**
4-Nitrotoluene	99-99-0	4.2	1,900	T-RSL / R3 SW BTAG	1.4	0.50	0.266	0.133
4-Amino-2,6-Dinitrotoluene	19406-51-0	7.3	1,480	T-RSL / R3 SW BTAG	2.4	0.50	0.20	0.100
2-Amino-4,6-Dinitrotoluene	35572-78-2	7.3	1,480	T-RSL / R3 SW BTAG	2.4	0.50	0.25	0.125
Tetryl	479-45-8	15	—	T-RSL / None	5.0	0.50	0.266	0.133
Nitrobenzene	**98-95-3**	**0.12**	220	**T-RSL** / R5 ESL	**0.040**	**0.50**	**0.252**	**0.126**
RDX	121-82-4	0.61	360	T-RSL / R3 SW BTAG	0.20	0.50	0.246	0.123

(1) Surface water screening references: T-RSL – Regions 3, 6, and 9 Regional Screening Level for Tapwater (USEPA, 2010); IDEM GW-DCL – Residential Groundwater Default Closure Level (IDEM, 2009); IDEM SW – Indiana Minimum Surface Water Quality Standards (IDEM, 2002); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); R3 SW BTAG – Region 3 Biological Technical Assistance Group Freshwater Surface Water Screening Benchmarks (USEPA, 2006b); Talmage – Nitroaromatic Munition Compounds: Environmental Effects and Screening Values (Talmage et al., 1999); USEPA Health Advisory – Interim Drinking Water Health Advisory Level (USEPA, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD. All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

Matrix: Surface Water
Analytical Group: Perchlorate (SW-846 Method 6850)

Analyte	CAS Number	Project Screening Levels (µg/L)		Project Screening Level References[1]	Project Quantitation Limit Goal (µg/L)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
Perchlorate	14797-73-0	15	---	USEPA Health Advisory / None	5.0	0.60	0.40	0.20

(1) Surface water screening references: T-RSL – Regions 3, 6, and 9 Regional Screening Level for Tapwater (USEPA, 2010); IDEM GW-DCL – Residential Groundwater Default Closure Level (IDEM, 2009); IDEM SW – Indiana Minimum Surface Water Quality Standards (IDEM, 2002); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); R3 SW BTAG – Region 3 Biological Technical Assistance Group Freshwater Surface Water Screening Benchmarks (USEPA, 2006b); Talmage – Nitroaromatic Munition Compounds: Environmental Effects and Screening Values (Talmage et al., 1999); USEPA Health Advisory – Interim Drinking Water Health Advisory Level (USEPA, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Matrix: Surface Water
Analytical Group: RCRA Metals (SW-846 Methods 6020A and 7470A)

Analyte	CAS Number	Project Screening Levels (µg/L)		Project Screening Level References[1]	Project Quantitation Limit Goal (µg/L)	APPL		
		HHRA	ERA	HHRA / ERA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
Arsenic	**7440-38-2**	**0.045**	148	**T-RSL** / R5 ESL	**0.015**	**5.0**	**4.9**	**2.45**
Barium	7440-39-3	730	220	T-RSL / R5 ESL	73	5.0	1.5	0.75
Cadmium	**7440-43-9**	**1.8**	**0.15**	**T-RSL / R5 ESL**	**0.050**	**5.0**	**1.02**	**0.51**
Chromium	7440-47-3	50	42	IDEM SW / R5 ESL	14	5.0	2.74	1.37
Lead	**7439-92-1**	15	**1.17**	**IDEM GW-DCL / R5 ESL**	**0.39**	**5.0**	**3.16**	**1.58**
Mercury	**7439-97-6**	**0.057**	**0.0013**	**T-RSL / R5 ESL**	**0.00043**	**0.20**	**0.128**	**0.064**
Selenium	7782-49-2	10	5	IDEM SW / R5 ESL	1.7	5.0	6.34	3.17
Silver	7440-22-4	18	0.12	T-RSL / R5 ESL	0.040	1.0	0.498	0.249

(1) Surface water screening references: T-RSL – Regions 3, 6, and 9 Regional Screening Level for Tapwater (USEPA, 2010); IDEM GW-DCL – Residential Groundwater Default Closure Level (IDEM, 2009); IDEM SW – Indiana Minimum Surface Water Quality Standards (IDEM, 2002); R5 ESL – Region 5 Ecological Screening Level (USEPA, 2003a); R3 SW BTAG – Region 3 Biological Technical Assistance Group Freshwater Surface Water Screening Benchmarks (USEPA, 2006b); Talmage – Nitroaromatic Munition Compounds: Environmental Effects and Screening Values (Talmage et al., 1999); USEPA Health Advisory – Interim Drinking Water Health Advisory Level (USEPA, 2009). Refer to Appendix E for further explanation and justification of PSLs.

Bolded compounds indicate that the PSL is between the laboratory LOQ and LOD. **Bolded and shaded compounds indicate that the PSL is less than both the laboratory LOQ and LOD.** All results will be reported to LODs and any limitations on data use that result from having LODs that are greater than PSLs will be described in the RFI Report. The DLs are presented for informational purposes.

SAP Worksheet No. 16 -- Project Schedule/Timeline Table

(UFP-QAPP Manual Section 2.8.2)

Activities	Organization	Dates (MM/DD/YYYY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Phase I - Soil, Sediment, and Surface Water Sampling	Tetra Tech	01/17/2011	01/28/2011	RFI Report, SWMU 22	3/10/2011 (draft) 09/09/2011 (final)

SAP Worksheet No. 17 -- Sampling Design and Rationale

(UFP-QAPP Manual Section 3.1.1)

The sampling strategy for sampling at SWMU 22 is based on a judgmental (biased) sampling design. The objective of the sampling is to determine if residual contamination related to historical use of the site is present at levels of concern. If contamination is found at levels of concern, additional sampling using a probabilistic sampling design may be necessary to provide statistical confidence to the analytical results and their spatial distribution. After concluding the project scoping, some soil and sediment samples were re-classified as to sample matrix by the project geologist and risk assessor, and one soil sample was added. This resulted in a net increase of two samples from the agreement documented on Worksheet No. 9.

Chemicals that may have been present at SWMU 22 over its operational history and may have potentially impacted environmental media include the following:

- Explosives: the principal explosives of concern include RDX and tetryl based on historical information; however, other explosive compounds [e.g., TNT, tetrazene, and pentaerythritol tetranitrate (PETN)] may have been used at the site.

- Metals: various metals may have been present in materials used in processes at the site and may have been potentially released to site media. The principal metal of concern is lead; however, other metals, such as antimony, arsenic, and chromium, may also be of concern based on site history and historical detections in samples.

- Oxidizer: perchlorate is considered a potential chemical of concern based on historical use of a portion of the property for rocket motor testing.

The study boundaries for the Phase I were identified in Worksheet No. 11. Sampling locations within the study boundaries were selected to investigate areas of potential releases. The areas to be investigated include:

- Backline area, including the former lead azide retention pond area and B2803.
- Drainages from the site toward the tributary of Turkey Creek, and the tributary itself.
- Area on the southern portion of the site, including the grassy area south of paint booth (Building 2764) and the area of differing vegetation on the southern hillslope.

The following discusses the sampling locations, media to be sampled, and analyses. Sampling locations are illustrated on Figures 17-1 and 17-2, and a matrix table of samples is provided in Worksheet No. 18.

Soil borings will be advanced using DPT to collect soil samples, and surface soil only locations will be sampled using a hand auger. Surface water samples will be collected by directly filling the bottles from the stream. Water quality parameters (pH, specific conductivity, turbidity, temperature, oxidation-reduction potential [ORP], and dissolved oxygen [DO]) will be recorded at each sampling location. Sediment samples will be collected by filling the sample jars using either a decontaminated stainless steel trowel or dedicated disposable plastic trowel. Sampling and other field task methodologies are described in Worksheet No. 14.

Backline Area

Soil

Eleven soil borings (22SB001 through 22SB011) will be advanced in the area of the Backline. The boring locations were selected to target areas in which releases may have occurred, based on site drainage pathways (i.e., from sumps to former pond or lift station via sewer pipes). Two soil samples will be collected from each soil boring location. Due to the sensitivity of materials handled and processed in the Backline, it is not anticipated that particulates would have been released to the air and deposited in surface, except in the area of Building 2803 related to venting of rocket motor exhaust. However, surface soil samples will be collected to determine if past operations impacted the surface soil at levels of concern to potential receptors. Subsurface soils will be collected at the depths identified below.

Two soil borings will be advanced in the area of the former Lead Azide Pond and the lift station. Boring 22SB001 is to be advanced within the boundary of the former Lead Azide Pond (with distances from structures shown on Figure 17-2, as determined from historical drawings) to determine if residual contamination is present. Boring 22SB002 will be advanced east of the lift station/former reaction tank to determine if contamination is present resulting from a release(s) from the lift station. One surface (0 to 2 feet) soil sample will be collected from each boring. Two subsurface soil samples will be collected from 22SB001, and one subsurface soil sample will be collected from 22SB002. The subsurface soil samples from 22SB001 will be collected from depths of approximately 3 to 5 feet, which approximates the depth (3 feet) of the former Lead Azide Pond, and 6 to 8 feet, which accounts for possible deepening of the pond through its operational history or during its closing. The subsurface soil sample from 22SB002 will be collected from a depth of approximately 6 to 8 feet, which includes the lower depths of the lift station (8 feet). If refusal on bedrock is encountered before these depths, the samples will be collected from the 2-foot soil interval on the bedrock surface.

Six soil borings (22SB003 through 22SB008) will be advanced along the sewer line in the Backline and near sumps. Boring 22SB003, 22SB004, 22SB006, and 22SB007 will be advanced in areas of pipe joints. Borings 22SB005 and 22SB008 will be advanced adjacent to sumps associated with Buildings

2860 and 2905, respectively. One surface (0 to 2 feet) soil sample and one subsurface soil sample will be collected from each boring. The subsurface soil samples will be collected from a depth of approximately 3 to 5 feet, which approximates the depth of sumps or a depth below the sewer line. If refusal on bedrock is encountered before these depths, the samples will be collected from the 2-foot soil interval on the bedrock surface.

One soil boring (22SB009) will be advanced in the low area west of the walkway between Buildings 136 and 2520. This area is also identified as a dark area in the 1966 aerial photograph. This boring will be to determine if contamination is present due to potential accumulation in this area. One surface (0 to 2 feet) soil sample and one subsurface soil sample will be collected from the boring. The subsurface soil samples will be collected from a depth of approximately 3 to 5 feet, consistent with other samples in the Backline area. If refusal on bedrock is encountered before these depths, the samples will be collected from the 2-foot soil interval on the bedrock surface.

One soil boring (22SB010) will be advanced on the southern side of Building 2803 to determine if contamination is present relating to the historical use of the building for rocket motor testing. The southern side was selected as air vents are on this side of the building, which may have vented particulates. One surface (0 to 2 feet) soil sample and one subsurface soil sample will be collected from the boring. The subsurface soil samples will be collected from a depth of approximately 3 to 5 feet, consistent with other samples in the Backline area. If refusal on bedrock is encountered before these depths, the samples will be collected from the 2-foot soil interval on the bedrock surface.

All soil samples from the Backline area will be analyzed for explosives, RCRA metals, and perchlorate. Two locations (22SB001 and 22SB008) will also be analyzed for pH in the surface and subsurface soil samples.

Surface Water/Sediment

Surface water runoff from the Backline Area is principally to the drainage swale below the former Lead Azide Pond. To determine if residual contamination is present in the drainage ditch below the former Lead Azide Pond, surface water and sediment samples will be collected from three locations (22SW006/SD006, 22SW007/SD007, and 22SW008/SD008) from the culvert west of Building 2803 to below the former pond. The drainage ditch appears to be ephemeral and assumed to be wet following precipitation events. Surface water samples will be collected if present at the time of collection.

The drainage ditch has restricted flow at the western end at the culvert. Therefore, it is assumed that surface water may have been retained in this area, and sediment accumulated in layers. Therefore, to evaluate contamination in this area, sediment samples will be collected from each location from 0 to

6 inches and from 6 inches to 2 feet. The 0- to 6 inch sample is to assess constituents that may represent current exposure, and the 6 inch to 2 feet sample is to determine if contamination is present that may represent a potential future secondary source if exposed or transported downstream.

Sediment samples from the drainage ditch will be collected from the specified locations using a hand auger or DPT, depending on the amount of saturation of the ground. Surface water samples will be collocated with sediment samples.

Surface water and sediment samples will be analyzed for explosives, total RCRA metals, dissolved RCRA metals (surface water only), perchlorate (surface water only), and TOC (sediment samples only).

Site Drainages and Tributary to Turkey Creek

Surface Water/Sediment

Surface water runoff from the Backline area is principally to the drainages in the northeastern portion of the site. Surface water and sediment samples will be collected from site drainages and from the tributary to Turkey Creek located below the site, to provide representative coverage of the watercourses that may have been impacted by SWMU 22 activities. A total of seven collocated surface water and sediment samples (22SW001/SD001 through 22SW005/SD005, 22SW009/S0D09, 22SW010/SD010, and 22SW011/SD011) will be collected from the drainages from SWMU 22 and the principal tributary to Turkey Creek. Locations along the tributary to Turkey Creek will be sampled to determine if historical site operations have impacted the stream. The locations include a point downstream of the site (22SW001/SD001), at the principal discharge of the drainage from the site (22SW002/SD002), and upstream of the site (22SW003/SD003), but downstream of the confluence of the northern drainage to the tributary. A location upstream of the site (22SW011/SD011) will be sampled to determine if impacts from other sources are affecting the conditions of the tributary.

The principal drainage from the site (from east of Building 2803 to the tributary) is situated on a relatively steep slope and assumed to be ephemeral. Limited sediment is anticipated to collect in this drainage. However, to determine if it has been impacted by historical site operations, samples will be collected from mid-slope (22SW004/SD004) and at the discharge of the culvert pipe from the site (22SW005/SD005). Surface water samples will be collected if present at the time of collection. Sediment samples will be collected from 0 to 6 inches.

Based on historical detections of RDX at Outfall 028, samples will be collected from the drainage on the northern portion of the site. Surface water and sediment samples will be collected from the drainage near Outfall 028 (western side of Highway 330) (22SW009/SD009) and from a location north of Building 2520

(downstream of the concrete gutter and the culvert pipe under Highway 330) (22SW010/SD010). Surface water samples will be collected if present at the time of collection. Sediment samples will be collected from 0 to 6 inches.

Surface water and sediment sampling from drainages that ultimately flow to Turkey Creek will be limited to the confines of the stream channel. Sediment samples will be from depositional areas within the stream channel in the tributary to Turkey Creek; sediment samples from the drainages will be from the specified locations along the watercourse. Surface water samples will be collocated with sediment samples.

Surface water and sediment samples will be analyzed for explosives, total RCRA metals, dissolved RCRA metals (surface water only), perchlorate (surface water only), and TOC (sediment samples only). One location (22SD006) will also be analyzed for pH in the 0- to 6 inch samples.

Southern Area

Soil

One soil boring (22SB011) will be advanced in the southern area of SWMU 22. The boring location was selected to investigate the grassy area outside the fence, southeast of the paint booth (Building 2764). No known operations occurred in this area and no distressed vegetation was observed during the site walk, but the grassy area and a gate in the fence for this area is anomalous. One surface (0 to 2 feet) soil sample and one subsurface soil sample will be collected from the boring. The subsurface soil sample will be collected from a depth of approximately 3 to 5 feet, consistent with other samples at SWMU 22. If refusal on bedrock is encountered before these depths, the samples will be collected from the 2-foot soil interval on the bedrock surface.

In addition, two surface (0 to 2 feet) soil samples (22SS001 and 22SS002) will be collected in the southern area to investigate the area of different vegetation on the hillslope.

The soil samples from the southern area of SWMU 22 will be analyzed for explosives, RCRA metals, and perchlorate.

Field Quality Control Samples

Field QC samples will be collected as part of the investigation, including field duplicates and equipment rinsate blanks (if non-dedicated sampling equipment is used). Worksheet No. 20 presents the field QC sample summary. Also, additional sample volume will be collected as necessary for the laboratory QC of

matrix spike/matrix spike duplicate (MS/MSD) analyses (for explosives and perchlorate) and MS/duplicate sample analyses (for RCRA metals).

SAP Worksheet No. 18 -- Sampling Locations and Methods/SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1)

Sampling Location	ID Number	Matrix	Target Depth (feet or inches bgs)	Analytical Group	Number of Samples (identify field duplicates)	Sampling SOP Reference[1]
22SB001	22SB0010002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
				pH	1	
	22SB001XXXX[2] and 22SBDUP01[4]	Soil	3 – 5' [3]	Explosives	1 + 1 FD	
				Perchlorate	1 + 1 FD	
				RCRA Metals	1 + 1 FD	
				pH	1 + 1 FD	
	22SB001XXXX[2]	Soil	6 – 8' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
				pH	1	
22SB002	22SB0020002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB002XXXX[2]	Soil	6 – 8' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SB003	22SB0030002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB003XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SB004	22SB0040002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB004XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	

Sampling Location	ID Number	Matrix	Target Depth (feet or inches bgs)	Analytical Group	Number of Samples (identify field duplicates)	Sampling SOP Reference[1]
22SB005	22SB0050002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB005XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SB006	22SB0060002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB006XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SB007	22SB0070002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB007XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SB008	22SB0080002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
				pH	1	
	22SB008XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
				pH	1	
22SB009	22SB0090002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB009XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	

Sampling Location	ID Number	Matrix	Target Depth (feet or inches bgs)	Analytical Group	Number of Samples (identify field duplicates)	Sampling SOP Reference[1]
22SB010	22SB0100002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB010XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SB011	22SB0110002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
	22SB011XXXX[2]	Soil	3 – 5' [3]	Explosives	1	
				Perchlorate	1	
				RCRA Metals	1	
22SS001	22SS0010002 and 22SSDUP01[4]	Soil	0 – 2'	Explosives	1 + 1FD	SOP-08, SOP-09, SOP-10
				Perchlorate	1 + 1FD	
				RCRA Metals	1 + 1FD	
22SS002	22SS0020002	Soil	0 – 2'	Explosives	1	SOP-08, SOP-09, SOP-10
				Perchlorate	1	
				RCRA Metals	1	
22SW001	22SW001 22SW001-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW002	22SW002 22SW002-F[5] and 22SWDUP01[4] 22SWDUP01-F[5]	Surface Water	At water surface	Explosives	1 + 1 FD	SOP-05, SOP-06
				Perchlorate	1 + 1 FD	
				RCRA Metals	1 + 1 FD	
22SW003	22SW003 22SW003-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW004	22SW004 22SW004-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW005	22SW005 22SW005-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW006	22SW0106 22SW006-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	

Sampling Location	ID Number	Matrix	Target Depth (feet or inches bgs)	Analytical Group	Number of Samples (identify field duplicates)	Sampling SOP Reference[1]
22SW007	22SW007 22SW007-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW008	22SW008 22SW008-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW009	22SW009 22SW009-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW010	22SW010 22SW010-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SW011	22SW011 22SW011-F[5]	Surface Water	At water surface	Explosives	1	SOP-05, SOP-06
				Perchlorate	1	
				RCRA Metals	1	
22SD001	22SD0010006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD002	22SD0020006 and 22SDDUP01[4]	Sediment	0 – 6"	Explosives	1 + 1 FD	SOP-07
				RCRA Metals	1 + 1 FD	
				TOC	1 + 1 FD	
22SD003	22SD0030006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD004	22SD0040006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD005	22SD0050006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	

Sampling Location	ID Number	Matrix	Target Depth (feet or inches bgs)	Analytical Group	Number of Samples (identify field duplicates)	Sampling SOP Reference[1]
22SD006	22SD0060006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				pH	1	
				TOC	1	
	22SD0060624	Sediment	6" – 24"	Explosives	1	SOP-07
				RCRA Metals	1	
				pH	1	
				TOC	1	
22SD007	22SD0070006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
	22SD0070624	Sediment	6" – 24"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD008	22SD0080006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
	22SD0080624	Sediment	6" – 24"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD009	22SD0090006	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD011	22SD0100011	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	
22SD010	22SD0100010	Sediment	0 – 6"	Explosives	1	SOP-07
				RCRA Metals	1	
				TOC	1	

1 SOP or worksheet that describes the sample collection procedures (Worksheet No. 21).
2 XXXX represents the interval of the sample from the top of the soil layer. Depth will be determined in the field based on visual and olafactory observations and where bedrock is encountered. For example, if sample is collected from 3 to 5 feet bgs, the depth will be recorded as 0305.
3 If bedrock is not encountered or there are no visual observations that cause a subsurface depth to be selected in a biased manner, then the 3- to 5-foot bgs depth interval will be selected (except at sampling location SWMU 22 Soil Boring 02, the subsurface sample will be collected at the 6- to 8- foot bgs interval).
4 Field duplicate locations may change in the field based on visual and olfactory observations.
5 For a filtered surface water sample, "-F" will be added to the end of the ID number (e.g. 22SW001-F).

SAP Worksheet No. 19 -- Analytical SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1)

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)
Surface Soil, Subsurface Soil, and Sediment	Explosives	SW-846 8330B APPL MSE018, HPL8330B	One 4-ounce (oz) glass jar	30 grams (g)	Cool to 0 to 6 °C	14 days until extraction, 40 days to analysis
	RCRA Metals (Including Mercury)	SW-846 3050B/6020A, 7471B APPL PRE3050B, ANA6020A, ANA7471B	One 8-oz wide-mouth glass jar	250 g	Cool to 0 to 6 °C	180 days to analysis/ 28 days to anlaysis for mercury
Surface Soil and Subsurface Soil	Perchlorate	SW-846 6850 APPL HPL6850	One 4-oz glass jar	30 g	Cool to 0 to 6 °C	28 days to analysis
Soil and Sediment	pH	SW-846 9045D APPL ANA9045D	One 4-oz glass jar	50 g	Cool to 0 to 6 °C	Analyze as soon as possible
Sediment	TOC	Walkley-Black APPL ANAWALKLEY	One 4-oz wide-mouth amber glass jar	10 g	Cool to 0 to 6 °C	28 days to analysis
Surface Water and Aqueous Field QC Blanks	Explosives	SW-846 8330B APPL MWE3535, HPL8330B	Two 1-liter (L) glass amber bottles	1L	Cool to 0 to 6 °C	7 days until extraction, 40 days to analysis
	Perchlorate	SW-846 6850 APPL HPL6850	Two 1-L glass amber bottles	1L	Cool to 0 to 6 °C	28 days to analysis
	RCRA Metals (Including Mercury) (Total and Dissolved)	SW-846 3010A/6020A, 7470A APPL PRE3010A, ANA6020A, ANA7470A	One 1-L plastic bottle	1L	Cool to 0 to 6 °C; Nitric acid (HNO_3) to pH < 2	180 days to analysis/ 28 days to anlaysis for mercury

1 APPL SOPs are proprietary and are therefore omitted from this SAP, however, the Tt Project Chemist reviewed APPL's SOPs to ensure that they are suitable for this project.

SAP Worksheet No. 20 -- Field Quality Control Sample Summary Table

(UFP-QAPP Manual Section 3.1.1)

Matrix	Analytical Group	No. of Sampling Locations	No. of Field Duplicates	No. of MS/MSDs(1)	No. of Field Blanks	No. of Equip. Blanks	No. of VOC(2) Trip Blanks	No. of PT(3) Samples	Total No. of Samples to Lab
Phase I									
Surface Soil	Explosives	13	1	1/1	0	1	0	0	15
	Perchlorate	13	1	1/1	0	1	0	0	15
	RCRA Metals	13	1	1/1	0	1	0	0	15
	pH	2	0	0/0	0	0	0	0	2
Subsurface Soil	Explosives	12	1	1/1	0	1	0	0	14
	Perchlorate	12	1	1/1	0	1	0	0	14
	RCRA Metals	12	1	1/1	0	1	0	0	14
	pH	2	0	0/0	0	0	0	0	2
Sediment	Explosives	14	1	1/1	0	0	0	0	15
	RCRA Metals	14	1	1/1	0	0	0	0	15
	pH	2	0	0/0	0	0	0	0	2
	TOC	14	1	1/1	0	0	0	0	15
Surface water	Explosives	11	1	1/1	0	0	0	0	11
	Perchlorate	11	1	1/1	0	0	0	0	11
	Total RCRA Metals	11	1	1/1	0	1	0	0	12
	Dissolved RCRA Metals	11	1	1/1	0	1*	0	0	12

1 Although MS/MSDs are not typically considered field QC samples, they are included here because location determination is often established in the field. The MS/MSDs are not included in the total number of samples sent to the laboratory. For total and dissolved metals, a duplicate sample will be collected in place of an MSD.
2 VOC – Volatile Organic Compound.
3 PT – Proficiency Test samples.
* The equipment blank for dissolved metals, if collected, will be obtained by passing rinse water through a 0.45-micron filter.

SAP Worksheet No. 21 -- Project Sampling SOP References Table

(UFP-QAPP Manual Section 3.1.2)

Reference Number	Title, Revision Date, and/or Number	Originating Organization of Sampling SOP	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP-01	Sample Labeling, 05/10, Revision 0.	Tetra Tech	NA	Y (project-specific SOP)	Contained in Appendix A
SOP-02	Sample Identification Nomenclature, 05/10, Revision 0.	Tetra Tech	NA	Y (project-specific SOP)	Contained in Appendix A
SOP-03	Sample Custody and Documentation of Field Activities, 05/10, Revision 0.	Tetra Tech	Field logbook, sample log sheets, boring logs	Y (project-specific SOP)	Contained in Appendix A
SOP-04	Sample Preservation, Packaging, and Shipping, 05/10, Revision 0.	Tetra Tech	NA	Y (project-specific SOP)	Contained in Appendix A
SOP-05	Surface Water Sampling, 05/10, Revision 0.	Tetra Tech	NA	Y (project-specific SOP)	Contained in Appendix A
SOP-06	Measurement of Water Quality Parameters, 05/10, Revision 0.	Tetra Tech	Multi-parameter water quality meter, such as a Horiba U-22	Y (project-specific SOP)	Contained in Appendix A
SOP-07	Sediment Sampling, 05/10, Revision 0.	Tetra Tech	Stainless steel or disposable trowels	Y (project-specific SOP)	Contained in Appendix A
SOP-08	Borehole Advancement and Soil Coring Using Direct-Push Technology (DPT) and Hand Auger Techniques, 05/10, Revision 0.	Tetra Tech	DPT rig, stainless steel augers, extension rods, and T-handle	Y (project-specific SOP)	Contained in Appendix A
SOP-09	Soil Sample Logging, 05/10, Revision 0.	Tetra Tech	NA	Y (project-specific SOP)	Contained in Appendix A
SOP-10	Surface and Subsurface Soil Sampling, 05/10, Revision 0.	Tetra Tech	Stainless steel auger bucket, extension rods, and T-handle	Y (project-specific SOP)	Contained in Appendix A
SOP-11	Management of Investigation-Derived Waste, 05/10, Revision 0.	Tetra Tech	NA	Y (project-specific SOP)	Contained in Appendix A
SOP-12	Decontamination of Field Sampling Equipment, 05/10, Revision 0.	Tetra Tech	Decontamination equipment, scrub brushes, 5-gallon buckets, spray bottles, phosphate free detergent, deionized water	Y (project-specific SOP)	Contained in Appendix A
SOP-13	Global Positioning System, 05/10, Revision 0.	Tetra Tech	GPS unit	Y (project-specific SOP)	Contained in Appendix A

SAP Worksheet No. 22 -- Field Equipment Calibration, Maintenance, Testing, and Inspection Table

(UFP-QAPP Manual Section 3.1.2.4)

Field Equipment	Activity[1]	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[2]	Comments
GPS	Positioning	Beginning and end of each day used	Accuracy: sub-meter horizontal dilution of precision (HDOP) <3, number of satellites at least six.	Wait for better signal, replace unit, or choose alternate location technique	Tetra Tech FOL or designee	SOP-13	SOP located in Appendix A.
DPT Rig	Inspection	Daily	Equipment inspection sheet criteria.	Operator correction or replacement	Tetra Tech FOL or designee	SOP-08	SOP located in Appendix A.
Multi-Parameter Water Quality Meter (YSI 600 Series or similar)	Visual Inspection Calibration/ Verification	Daily Beginning and end of day	Manufacturer's guidance.	Operator correction or replacement	Tetra Tech FOL or designee	SOP-14	SOP located in Appendix A.
Turbidity Meter (LaMotte 2020 or similar)	Visual Inspection Calibration/ Verification	Daily Beginning and end of day	Manufacturer's guidance; calibrations must bracket expected values. Initial Calibration Verification (ICV) must be <10 NTUs.	Operator correction or replacement	Tetra Tech FOL or designee	SOP-06	SOP located in Appendix A.

1 Activities may include calibration, verification, testing, maintenance, and/or inspection.
2 From the Project Sampling SOP References table (Worksheet No. 21).

SAP Worksheet No. 23 -- Analytical SOP References Table

(UFP-QAPP Manual Section 3.2.1)

Lab SOP Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
APPL MSE018	EPA Method 8330 Mechanical Orbital Shaker Extraction for Solid Explosive Samples (Revision 14, 05/05/10).	Definitive	Soil and sediment samples – Explosives	None	APPL	N
APPL MWE3535	EPA Method 3535A Solid Phase Extraction for Aqueous Explosive Samples (Revision 8, 12/29/09).	Definitive	Surface water and aqueous field QC samples – Explosives	None	APPL	N
APPL HPL8330B	Instrument Analysis of Explosives by Using EPA Method 8330B (Revision 1, 05/10/10).	Definitive	Soil, sediment, surface water, and aqueous QC samples/ Explosives	High Performance Liquid Chromatography (HPLC)/ Ultraviolet (UV) Detector	APPL	N
APPL HPL6850	Analysis of Perchlorate in Environmental Samples by EPA 6850 (Revision 9, 10/19/09).	Definitive	Soil, sediment, surface water, and aqueous QC samples/ Perchlorate	HPLC/ Electrospray Ionization (ESI)/ Mass Spectrometer	APPL	N
APPL PRE3050B	Acid Digestion of Sediments, Sludges, and Soils by EPA Method 3050B (Revision 9, 08/20/09).	Definitive	Soil and sediment samples – RCRA Metals (not including mercury)	None	APPL	N
APPL PRE3010A	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by Flame Atomic Absorption (FLAA) or Inductively Coupled Plasma (ICP) Spectroscopy by EPA Method 3010A (Revision 6, 06/16/09).	Definitive	Surface water and aqueous field QC samples – RCRA Metals (not including mercury)	None	APPL	N
APPL ANA6020A	Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) by SW-846 Method 6020A (Revision 16, 05/26/10).	Definitive	Soil, sediment, surface water, and aqueous field QC samples – RCRA Metals (not including mercury)	ICP-MS	APPL	N
APPL ANA7470A	Determination of Mercury in Water by Cold Vapor Atomic Absorption (CVAA) Spectrometry by EPA Method 7470A (Revision 20, 12/07/09).	Definitive	Surface water and aqueous field QC samples – Mercury	CVAA	APPL	N

Lab SOP Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Matrix and Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
APPL ANA7471B	Determination of Mercury in Solid or Semisolid Waste, EPA Method 7471B (Revision 2, 12/07/09).	Definitive	Soil and sediment samples – Mercury	CVAA	APPL	N
APPL ANAWALKLEY	Total Organic Carbon (TOC) in Soil, Walkley-Black (Revision 0, 05/19/10).	Definitive	Sediment samples – TOC	Titration	APPL	N
APPL ANA9045D	pH in Soil and Waste, EPA SW-846 Method 9045D (Revision 14, 04/06/10).	Definitive	Soil and sediment samples - pH	pH Meter	APPL	N
APPL SHR001	Receiving Samples (Revision 36, 05/07/10).	NA	Log-in	NA/Log-in	APPL	N
APPL DOC011	Sample Chain of Custody Database (Revision 8, 09/23/09).	NA	Sample Custody	NA/Sample Custody	APPL	N
APPL SHR012	Sample Disposal and Waste Collection, Storage and Disposal (Revision 11, 06/26/09).	NA	Disposal	NA/Disposal	APPL	N

SAP Worksheet No. 24 -- Analytical Instrument Calibration Table

(UFP-QAPP Manual Section 3.2.2)

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference[1]
HPLC/UV Explosives	Initial Calibration (ICAL) – A minimum of a 5-point calibration curve is analyzed.	After major instrument maintenance; upon failure of CCV.	The percent relative standard deviation (%RSD) for response factors (RFs) for each analyte must be ≤ 20%; or the linear regression correlation coefficient (r) must be ≥ 0.995.	Correct problem then repeat ICAL. No samples may be run until ICAL has passed.	Analyst, Section Manager	APPL HPL8330B
	Initial Calibration Verification (ICV) - Second source	Once after each ICAL, prior to beginning a sample run.	All project analytes must be within established retention time (RT) windows. The percent recovery (%R) of all analytes must be within 80-120% of true value.	Correct problem, re-prepare and re-analyze ICV. If that fails, correct problem and repeat ICAL. No samples may be run until ICV has been verified.	Analyst, Section Manager	
	Continuing Calibration Verification (CCV)	After each 10 field samples and at the end of the analytical sequence.	The %R of all analytes must be within 80-120% of true value.	Correct problem and rerun CCV and all samples analyzed before and after the failing CCV. If that fails, repeat ICAL and re-analyze all samples analyzed since the last successful CCV.	Analyst, Section Manager	
HPLC/ESI/MS Perchlorate	Tune	Prior to ICAL and after any mass calibration or maintenance is performed.	Tuning standards must contain the analytes of interest and meet acceptance criteria outlined in the laboratory SOP.	Re-tune instrument. If the tuning will not meet acceptable criteria, an instrument mass calibration must be performed and the tuning redone. Sample analysis shall not proceed without acceptable tuning.	Analyst, Section Manager	APPL HPL6850
	ICAL – A minimum of a 5-point calibration is prepared.	Upon instrument receipt, major instrument change, or when the CCV does not meet criteria.	The %RSD for RFs must be ≤ 20 % or r must be ≥ 0.995. The concentration corresponding to the absolute value of the Y-intercept of the calibration curve must be ≤ LOD.	Correct problem then repeat ICAL. No samples may be run until ICAL has passed.	Analyst, Section Manager	
	ICV – Second Source	Once after each ICAL, prior to the analysis of samples.	The %R must be within 85-115% of true value.	Correct problem and verify ICV. If that fails, correct problem and repeat ICAL. No samples may be run until ICV has been verified.	Analyst, Section Manager	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference(1)
	CCV	Before sample analysis and after every 10 field samples, and at the end of the sequence.	Low-range standard: Perchlorate must be within 50-150 %R of true value. Mid-range standard: Perchlorate must be within 85-115 %R of true value.	Correct problem and rerun CCV. If that fails, repeat ICAL and re-analyze all samples analyzed since the last successful CCV.	Analyst, Section Manager	
	Limit of Detection Verification (LODV) (per batch)	Prior to sample analysis and at the end of the sequence. It can be analyzed after every 10 samples to reduce the re-analysis rate.	The %R must be within 70-130% of true value. Per the DoD Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.1, the perchlorate spike concentration must be approximately 2 times the LOD.	Correct problem, rerun LODV and all samples since last successful LODV. If a sample with perchlorate concentration at or between the LOD and LOQ is bracketed by a failing LODV, it must be re-analyzed. A sample with a concentration above the LOQ can be reported. Results may not be reported without a valid LODV.	Analyst, Section Manager	
CVAA Mercury	ICAL - a minimum 7-point calibration plus a blank.	At the beginning of each day, or if the QC is out of criteria, prior to sample analysis.	r must be ≥ 0.995.	Re-calibrate and/or perform the necessary equipment maintenance. Check the calibration standards. No samples may be accepted without a valid ICAL.	Analyst, Section Manager	APPL ANA7470A ANA7471B
	ICV – Second Source	Following ICAL, prior to the analysis of samples.	The %R must be within 90-110% of true value.	Investigate reasons for failure, re-analyze once. If still unacceptable, correct problem and repeat ICAL.	Analyst, Section Manager	
	CCV	At the beginning and end of the sequence and after every 10 samples.	The %R must be within 80-120% of true value, except first CCV after ICAL, which must be within 90-110% of true value.	Re-calibrate and/or perform the necessary equipment maintenance. Check the calibration standards. Re-analyze all affected samples.	Analyst, Section Manager	
	Initial Calibration Blank (ICB)	Before beginning a sample run.	No mercury detected > the absolute value of the LOD.	Correct the problem, then re-prepare and re-analyze ICB.	Analyst, Section Manager	
	Continuing Calibration Blank (CCB)	Before beginning a sample run, after every 10 samples, and at the end of the analysis sequence.	No mercury detected > the absolute value of the LOD.	Correct the problem, then re-prepare and re-analyze CCB and all affected samples.	Analyst, Section Manager	

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action	Person Responsible for Corrective Action	SOP Reference[1]
ICP-MS RCRA Metals (not including mercury)	Tune	Prior to ICAL.	Mass calibration must be ≤ 0.1 atomic mass units (amu) from the true value. Resolution must be < 0.9 amu full width at 10% peak height. For stability, RSD must be ≤ 5% for five replicates.	Re-tune and/or clean or replace source, then re-analyze tuning solutions. No samples may be accepted without a valid tune.	Analyst, Section Manager	APPL ANA6020A
	ICAL - a 4-point calibration is prepared for all target analytes.	At the beginning of each day, prior to the analysis of samples.	r must be ≥ 0.995.	Re-calibrate and/or perform the necessary equipment maintenance to correct problem.	Analyst, Section Manager	
	ICV – Second Source	Following ICAL, prior to the analysis of samples.	The %R for all analytes must be within 90-110% of true value.	Re-calibrate and re-analyze ICV.	Analyst, Section Manager	
	ICB	Before beginning a run.	No analytes detected > LOD.	Correct the problem, then re-prepare and re-analyze.	Analyst, Section Manager	
	CCB	Before beginning a run, after every 10 samples, and at the end of the analysis sequence.	No analytes detected > LOD.	Correct the problem, then re-prepare and re-analyze.	Analyst, Section Manager	
	CCV	After every 10 samples, and at the end of the analysis sequence.	The %R for all analytes must be within 90-110% of true value.	Check problem, re-calibrate, and re-analyze any samples not bracketed by passing CCVs.	Analyst, Section Manager	
	Low-Level Calibration Check Standard (if using 1-point ICAL)	Daily after 1-point ICAL and before samples.	The %R for all analytes must be within 80-120% of true value.	Correct problem, then re-analyze. No samples may be analyzed without a valid low-level calibration check standard (should be ≤ LOQ) (if using 1-point ICAL).	Analyst, Section Manager	
pH Meter pH	ICAL – 3 buffer solutions.	Daily before use.	pH meter must be calibrated using three buffers that bracket the expected pH range. Each buffer must read within ± 0.05 pH units.	Repeat calibration until acceptance criteria is met. Replace probe if several attempts are unsuccessful.	Analyst, Section Manager	APPL ANA9045D
	CCV	After every 10 samples, and at the end of the analysis sequence.	pH 7.00 buffer must read within 6.95 – 7.05, inclusive.	Repeat ICAL.	Analyst, Section Manager	
Titrator TOC	Standardize Reagents	Every few days or with each set of analyses.	Standardize against 0.100 Normal potassium dichromate solution.	None.	Analyst, Section Manager	APPL ANAWALKLEY

Notes:
1 From the Analytical SOP References table (Worksheet No. 23).

SAP Worksheet No. 25 -- Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

(UFP-QAPP Manual Section 3.2.3)

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference[1]
HPLC/UV	Check pressure and gas supply daily - change when <200 pounds per square inch (psi), change analytical column as needed, change mobile phase when insufficient for run or contamination, change inlet filters as needed for contamination.	Explosives	Check pump pressure, check for leaks, check for adequate mobile phase.	Prior to ICAL and as necessary.	Acceptable ICAL and CCV.	Correct the problem and repeat ICAL or CCV.	Analyst, Section Manager	APPL HPL8330B
HPLC/ESI/MS	Clean the source and capillary needle. Change analytical column as needed, change mobile phase when insufficient for run or contamination, change inlet filters as needed for contamination.	Perchlorate	Check pump pressure, check for leaks, check for adequate mobile phase.	Prior to ICAL and as necessary.	Acceptable ICAL and CCV.	Correct the problem and repeat ICAL or CCV.	Analyst, Section Manager	APPL HPL6850
CVAA	Replace peristaltic pump tubing, replace mercury lamp, replace drying tube, clean optical cell and/or clean liquid/gas separator as needed. Other maintenance specified in Equipment Maintenance SOP.	Mercury	Tubing, sample probe, optical cell.	Prior to ICAL and as necessary.	Acceptable ICAL and CCV.	Correct the problem and repeat ICAL or CCV.	Analyst, Section Manager	APPL ANA7470A ANA7471B
ICP-MS	Clean plasma torch; clean filters; clean spray and nebulizer chambers; replace pump tubing.	RCRA Metals (not including mercury)	Torch, filters, nebulizer chamber, pump, pump tubing.	Prior to ICAL and as necessary.	Acceptable ICAL and CCV.	Correct the problem and repeat ICAL or CCV.	Analyst, Section Manager	APPL ANA6020A
pH Meter	Clean pH electrode as needed. Refill with fluid as needed.	pH	Inspect pH probe.	As needed.	Acceptable ICAL.	Correct the problem and repeat ICAL.	Analyst, Section Manager	APPL ANA9045D
Titrator	None.	TOC	None.	As needed.	Acceptable ICAL.	Correct the problem and repeat ICAL.	Analyst, Section Manager	APPL ANAWALKLEY

1 From the Analytical SOP References table (Worksheet No. 23).

SAP Worksheet No. 26 -- Sample Handling System

(UFP-QAPP Manual Appendix A)

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): FOL or designee / Tetra Tech
Sample Packaging (Personnel/Organization): FOL or designee / Tetra Tech
Coordination of Shipment (Personnel/Organization): FOL or designee / Tetra Tech
Type of Shipment/Carrier: Overnight courier service (Federal Express)
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Sample Custodian / APPL
Sample Custody and Storage (Personnel/Organization): Sample Custodian / APPL
Sample Preparation (Personnel/Organization): Preparation laboratory staff / APPL
Sample Determinative Analysis (Personnel/Organization): HPLC, HPLC/ESI/MS, ICP-MS, CVAA, pH, TOC / APPL
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): 60 days from submittal of final report
Sample Extract/Digestate Storage (No. of days from extraction/digestion): 60 days from submittal of final report
Biological Sample Storage (No. of days from sample collection): Not applicable
SAMPLE DISPOSAL
Personnel/Organization: Sample Custodian / APPL

SAP Worksheet No. 27 – Sample Custody Requirements Table

(UFP-QAPP Manual Section 3.3.3)

Field Sample Custody Procedures

Following sample collection into the appropriate bottleware, all samples will be immediately placed on ice in a cooler. Glass sample containers will be enclosed in bubble wrap to protect the bottleware during shipment. The cooler will be secured using strapping tape along with a signed custody seal. Sample coolers will be delivered to a local courier location for priority overnight delivery to APPL for analysis. Samples will be preserved as appropriate based on the analytical method. The selected laboratory will provide pre-preserved sample containers for sample collection. Samples will be maintained at 0 to 6°C until delivery to the laboratory. Proper custody procedures will be followed throughout all phases of sample collection and handling.

Chain-of-custody protocols will be used throughout sample handling to establish the evidentiary integrity of sample containers. These protocols will be used to demonstrate that the samples were handled and transferred in a manner that would eliminate possible tampering. Samples for off-site laboratory analysis will be preserved, packaged, and shipped in accordance with SOP-04 (Appendix A).

Chain-of-Custody Procedures

After collection, each sample will be maintained in the sampler's custody until formally transferred to another party (e.g., Federal Express). For all samples collected, chain-of-custody forms will document the date and time of sample collection, sampler's name, and names of all others who subsequently held custody of the sample. Specifications for chemical analyses will also be documented on the chain-of-custody form. SOP-03 (Appendix A) provides further details on the chain-of-custody procedure.

Laboratory Sample Custody Procedures

APPL's Laboratory Information Management System (LIMS) database allows for high sample throughput and allows for custom reporting formats to meet client's specific needs. In addition to tracking samples and storing data results, the LIMS has been modified to perform hundreds of QC checks so that the final report meets project specific data quality objectives as well as APPL's data integrity requirements.

Sample Tracking: Upon receipt, sample containers are labeled with unique bar code identifications. Every time a sample container is used, the analyst requesting the sample scans the barcode to track the new location and time of move into the LIMS. Sample locations, times, dates, and names of analysts who checked out a sample are easily printed and available upon request.

Data Input: Once analyzed, the sample results and QC results are entered into the LIMS database (Labworks®). The majority of the results are directly uploaded from Hewlett Packard's Chemstation software or other instrument appropriate software. This process allows the results to be accurately entered and allows more time for the analyst to review the results.

Data Output: Once all of the data are in the database, they are exported from the LIMS and printed via Microsoft Access. Error checking is performed for a long list of possible data entry problems that can occur. The system is designed to prohibit printing of any results that are not entered correctly as well as identify a list of errors for correction. APPL has also authored a self-calculating "J"-Flag form for clients who want DLs and estimated concentrations below the reporting limit on the sample result form.

Sample Designation System

Each sample collected for analysis will be assigned a unique sample tracking number that will consist of a multi-segment alphanumeric code that identifies the site, sample type (sample medium or QC sample designation), sample location, and sample depth. SOP-02 (Appendix A) addresses sample nomenclature. The alphanumeric coding system to be used is as follows:

Site Identifier:

22 = SWMU 22

Sample Medium:

SS = Surface Soil
SB = Subsurface Soil
SD = Sediment
SW = Surface Water

QA/QC Sample Designation:

RB = Equipment Rinsate Blank
DUP = Field Duplicate

Sample Location:

The names of all planned sample locations are identified in Worksheet No. 18.

For surface and subsurface soil samples, the soil sample depth will be indicated by a four-digit number. The first two digits will represent the upper limit of the sample depth interval (rounded to the nearest foot), and the bottom two digits will represent the lower limit of the depth interval.

Surface water and sediment samples will be assigned a three-digit consecutive number in the order of collection, as designated on Figures 17-1 and 17-2.

QC Sample Number:

All QC samples will be assigned a sequential sample number. For example, the first equipment rinsate blank will be assigned the tracking number 22RB-01. Field duplicate, MS, and MSD samples will be collected from the same location. The field duplicate will be given the same type of sample designation as the samples so that it will be "blind" to the laboratory. The sampling time recorded on the chain-of-custody form, labels and tags for the duplicate samples will be 0000. Notes detailing the sample number, time, date, and type will be recorded on the routine sample log sheets and will document the location of the duplicate sample (sample log sheets are not provided to the laboratory).

All pertinent information regarding sample identification will be recorded in the field logbooks and on sample log sheets where appropriate.

SAP Worksheet No. 28 -- Laboratory QC Samples Table

(UFP-QAPP Manual Section 3.4)

Matrix	Soil, Sediment, Surface Water, and Aqueous Field QC Samples
Analytical Group	Explosives
Analytical Method/ SOP Reference	SW-846 8330B APPL HPL8330B

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPCs)
Method Blank	One per preparatory batch of 20 or fewer samples.	All analytes must be ≤ ½ LOQ.	If the blank results are above ½ LOQ, then report sample results which are non-detect. Otherwise, re-extract and re-analyze associated samples. If not enough sample exists for a re-extraction, the sample will be qualified with a "B" flag.	Analyst, Section Manager, and Data Validator	Bias/ Contamination	Same as Method/SOP QC Acceptance Limits.
Laboratory Control Sample (LCS) Laboratory Control Sample Duplicate (LCSD) (not required)	One per preparatory batch of 20 or fewer samples.	%Rs must meet the APPL in-house limits specified in Table 3 of SOP HPL8330B. RPD must be ≤ 30% (for LCS/LCSD, if LCSD is analyzed).	If the %R of a target analyte in the LCS is greater than the upper control limit, and there are no positive findings for that compound, no further action is taken. Otherwise, re-analyze the LCS and affected samples or flag the results with a "J". If the %R of any target analyte is below the lower control limit, re-analyze the LCS and affected samples.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias Precision also, if LCSD is analyzed	Same as Method/SOP QC Acceptance Limits.
MS/MSD	One per preparatory batch of 20 or fewer samples per matrix.	%Rs should meet the APPL in-house limits specified in Table 3 of SOP HPL8330B. RPD should be ≤ 30% between MS and MSD.	Flag the parent sample with a "J" flag for failed analytes which exceed the acceptance criteria.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias/ Precision	Same as Method/SOP QC Acceptance Limits.
Surrogate Spikes	All field and QC samples - one per sample.	%R (aqueous): 1,2-Dinitrobenzene 70-130 %R (solid): 1,2-Dinitrobenzene 70-130	If surrogate recovery falls outside acceptance criteria, the sample should be re-extracted and re-analyzed.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias	Same as Method/SOP QC Acceptance Limits.
Second Column Confirmation	All positive results must be confirmed.	Results between primary and second column - RPD must be ≤ 40%.	None. Apply J flag if RPD >40% and discuss in the case narrative.	Analyst, Section Manager, and Data Validator	Precision	Same as Method/SOP QC Acceptance Limits.

Matrix	Soil, Surface Water, and Aqueous Field QC Samples
Analytical Group	Perchlorate
Analytical Method/ SOP Reference	SW-846 6850 APPL HPL6850

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPCs)
Isotope Ratio $^{35}Cl/^{37}Cl$	Every sample, batch QC sample, and standard.	Monitor for the daughter ion at masses 83/85. Theoretical ratio ~ 3.06. Ratio must be within 2.3 to 3.8.	If criteria are not met, the sample must be rerun. If the sample was not pretreated, the sample should be re-extracted using cleanup procedures. If, after cleanup, the ratio still fails, use alternative techniques to confirm presence of perchlorate.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias	Same as Method/SOP QC Acceptance Limits.
Internal Standard (IS)	Every sample, batch QC sample, standard, instrument blank, and method blank.	Measured ^{18}O IS area must be within 50-150% of the average IS area counts of the ICAL. Relative retention time (RRT) of the perchlorate ion must be within 0.98-1.02.	Rerun the sample at increasing dilutions until the 50-150% acceptance criteria is met. If criteria cannot be met with dilution, interference is suspected - use additional pretreatment steps.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias	Same as Method/SOP QC Acceptance Limits.
Interference Check Sample (ICS)	One per batch to verify method performance at the matrix conductivity threshold (MCT). At least one ICS must be analyzed daily.	The %R must be within 70-130% of true value.	Correct problem and re-analyze all samples in that batch. Replace cleanup filters or column if necessary. No samples may be reported that are associated with a failing ICS.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias	Same as Method/SOP QC Acceptance Limits.
Reagent Blank	Prior to calibration, after overrange samples, and at the end of the analytical sequence.	No perchlorate detected > ½ LOQ.	Re-analyze reagent blank (until no carryover is observed) and all samples processed since the contaminated blank. Results may not be reported without a valid reagent blank.	Analyst, Section Manager, and Data Validator	Bias/ Contamination	Same as Method/SOP QC Acceptance Limits.
Method Blank	One per preparatory batch of 20 or fewer samples.	Perchlorate must be ≤ ½ LOQ.	Investigate source of contamination and evaluate the samples and associated QC: i.e. If the blank results are above ½ LOQ, then report sample results which are non-detect. Otherwise, re-prepare blank and associated samples.	Analyst, Section Manager, and Data Validator	Bias/ Contamination	Same as Method/SOP QC Acceptance Limits.

Matrix	Soil, Surface Water, and Aqueous Field QC Samples
Analytical Group	Perchlorate
Analytical Method/ SOP Reference	SW-846 6850 APPL HPL6850

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPCs)
LCS LCSD (not required)	One per preparatory batch of 20 or fewer samples. LCS must be spiked at the LOQ.	%Rs must be within 80-120%, as per APPL SOP and DOD QSM version 4.1. RPD should be ≤ 20% for aqueous samples and ≤ 30% for soils. (for LCS/LCSD, if LCSD is analyzed).	If the %R of a target analyte in the LCS is greater than the upper control limit, and there are no positive findings for that compound, no further action is taken. Otherwise, re-analyze the LCS and affected samples or flag the results with a "J". If the %R of any target analyte is below the lower control limit, re-analyze the LCS and affected samples.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias Precision also, if LCSD is analyzed	Same as Method/SOP QC Acceptance Limits.
MS/MSD	One per preparatory batch of 20 or fewer samples per matrix. The MS and MSD must be spiked at the LOQ.	%Rs should be within 80-120%, as per APPL SOP and DOD QSM version 4.1. RPD should be ≤ 20% for aqueous samples and ≤ 30% for soils.	Flag the parent sample with a "J" flag for failed analytes which exceed the acceptance criteria.	Analyst, Section Manager, and Data Validator	Accuracy/ Bias/ Precision	Same as Method/SOP QC Acceptance Limits.

Matrix	Soil, Sediment, Surface Water, and Aqueous Field QC Samples
Analytical Group	RCRA Metals, Including Mercury
Analytical Method/ SOP Reference	SW-846 6020A, 7470A, 7471B APPL ANA6020A, ANA7470A, ANA7471B

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPCs)
Method Blank	One per preparatory batch of 20 or fewer samples per matrix.	No analytes >½ LOQ.	Re-clean, re-test, re-extract, re-analyze, and/or qualify data.	Analyst, Section Manager, and Data Validator	Bias/ Contamination	Same as Method/SOP QC Acceptance Limits.
LCS	One per preparatory batch of 20 or fewer samples per matrix.	%Rs must be within 80-120% of the true value.	Investigate source of problem. Re-digest and re-analyze all associated samples.	Analyst, Section Manager, and Data Validator	Accuracy/Bias	Same as Method/SOP QC Acceptance Limits.
MS	One per preparatory batch of 20 or fewer samples per matrix.	%Rs should be within 80-120% of the true value.	Prepare post-digestion spike for analytes outside limits. Apply "J" flag to the parent sample for the analytes that fail criteria.	Analyst, Section Manager, and Data Validator	Accuracy/Bias	Same as Method/SOP QC Acceptance Limits.
Duplicate Sample	One per batch of 20 or fewer samples per matrix.	RPD should be ≤20%, if both results are >5x LOQ (SOP states >100x the instrument detection limit).	The reason for the out-of-control condition must be found and corrected and all affected samples must be re-analyzed. Flag results with a "J".	Analyst, Section Manager, and Data Validator	Precision	Same as Method/SOP QC Acceptance Limits.
ICP Serial Dilution	One per batch of 20 or fewer samples per matrix.	If original sample result is at least 50x DL, a 5x dilution must agree within 90-110% of the original result.	Flag result with a "J" or dilute and re-analyzed sample to eliminate interference. A chemical or physical interference effect should be suspected.	Analyst, Section Manager, and Data Validator	Precision	Same as Method/SOP QC Acceptance Limits.
IS	Every sample.	IS intensity must be within 80-120% of intensity of the IS in the ICAL.	Re-analyze sample at 5-fold dilution with addition of appropriate amounts of IS.	Analyst, Section Manager, and Data Validator	Precision	Same as Method/SOP QC Acceptance Limits.
Post-Digestion Spike	When serial dilution test fails or analyte concentration for all samples are < 50x LOD.	%R must be within 75-125% of the true value, except mercury, which must be within 85-115% of the true value.	Narrate. If the spike is not recovered within the specified limits, a matrix effect should be suspected.	Analyst, Section Manager, and Data Validator	Accuracy/Bias	Same as Method/SOP QC Acceptance Limits.

Matrix	Soil and Sediment
Analytical Group	pH
Analytical Method/ SOP Reference	SW-846 9045D APPL ANA9045D

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPCs)
Standard Reference Materials (SRM)	Two per preparatory batch of 20 or fewer samples.	Must be within ± 0.05 pH units of true value.	Repeat calibration and re-analyze all samples. If insufficient volume, qualify results as estimated.	Analyst and Section Manager	Accuracy/Bias	Same as Method/SOP QC Acceptance Limits.
Duplicate Sample	One per preparatory batch of 20 or fewer samples per matrix (SOP calls for one for every 10 samples).	For soil and sediment samples, duplicate results should be within 0.2 pH units of each other.	If sufficient sample is available, re-analyze. If not, or repeated attempt still fails, qualify results as estimated.	Analyst and Section Manager	Precision	Same as Method/SOP QC Acceptance Limits.

Matrix	Sediment
Analytical Group	TOC
Analytical Method/ SOP Reference	Walkley-Black APPL ANAWALKLEY

QC Sample	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria (MPCs)
Method Blank	One per batch of 20 or fewer samples per matrix.	No analytes > ½ LOQ.	If the blank results are above ½ LOQ, then report sample results which are non-detect. Otherwise, re-extract and re-analyze associated samples. If not enough sample exists for a re-extraction, the sample will be qualified with a "B" flag.	Analyst, Section Manager	Accuracy/Bias/ Contamination	Same as Method/SOP QC Acceptance Limits.
LCS	One per batch of 20 or fewer samples per matrix.	%R must be within 90-110% of the true value.	If the %R of a target analyte in the LCS is greater than the upper control limit, and there are no positive findings for that compound, no further action is taken. Otherwise, re-analyze the LCS and affected samples or flag the results with a "J". If the %R of any target analyte is below the lower control limit, re-analyze the LCS and affected samples.	Analyst, Section Manager	Accuracy/Bias	Same as Method/SOP QC Acceptance Limits.
MS/MSD	One per batch of 20 or fewer samples per matrix.	%R should be within 75-125% of the true value, if sample <4x spike added. RPD should be ≤ 20%, if both results are >5x LOQ.	Flag the parent sample with a "J" flag for failed analytes which exceed the acceptance criteria.	Analyst, Section Manager	Accuracy/Bias Precision	Same as Method/SOP QC Acceptance Limits.

SAP Worksheet No. 29 -- Project Documents and Records Table

(UFP-QAPP Manual Section 3.5.1)

Document	Where Maintained
Planning Document Certifications Copies of regulatory agency approval letters / e-mails Verification e-mails for review of applicable SAP/sections Signature Pages	All planning document certifications will be maintained in the Tetra Tech project file.
Field Documents Field Logbook Field Sample Forms Chain-of-Custody Records Air Bills Sampling Instrument Calibration Logs Sampling Notes Drilling Logs Photographs FTMR Forms This SAP Health and Safety Plan	Field documents will be maintained in the project file located in the Tetra Tech project office.
Laboratory Documents Sample Receipt, Custody, and Tracking Record Equipment Calibration Logs Sample Preparation Logs Analysis Run Logs Corrective Action Forms Reported Field Sample Results Reported Results for Standards, QC Checks, and QC Samples Raw Data Data Completeness Checklist	Laboratory documents will be included in the hard-copy and Portable Document Format (PDF) deliverables from the laboratory. Laboratory data deliverables will be maintained in the Tetra Tech project file and in long-term data package storage at a third-party professional document storage firm. Electronic data results will be maintained in a database on a password-protected Structured Query Language (SQL) server.
Assessment Findings Field Sampling Audit Checklist (if conducted) Analytical Audit Checklist (if conducted) Data Validation Memoranda (includes tabulated data summary forms)	All assessment documents will be maintained in the Tetra Tech project file.
Reports SWMU 22 RFI Report	All versions of the SWMU 22 RFI Reports and all support documents (e.g., data validation memoranda) will be stored in hard-copy format in the Tetra Tech project file and electronically in the server library.

SAP Worksheet No. 30 -- Analytical Services Table

(UFP-QAPP Manual Section 3.5.2.3)

Matrix	Analytical Group	Sample Location/ ID Number	Analytical Method	Data Package Turnaround Time	Laboratory/ Organization (name and address, contact person and telephone number)	Backup Laboratory/ Organization (name and address, contact person and telephone number)
Soil and Sediment	Explosives	See Worksheet No. 18	SW-846 8330B	21 calendar days	APPL, Inc. 908 N. Temperance Avenue Clovis, CA 93611 Contact: Cynthia Clark Laboratory PM 559-275-2175	NA
	RCRA Metals (Including Mercury)		SW-846 6020A/7471B			
	pH		SW-846 9045D			
Soil	Perchlorate	See Worksheet No. 18	SW-846 6850	21 calendar days		
Sediment	TOC	See Worksheet No. 18	Walkley-Black	21 calendar days		
Surface Water and Aqueous Field QC Samples	Explosives	See Worksheet No. 18	SW-846 8330B	21 calendar days		
	Perchlorate		SW-846 6850			
	RCRA Metals (Including Mercury)		SW-846 6020A/7470A			

SAP Worksheet No. 31 -- Planned Project Assessments Table

(UFP-QAPP Manual Section 4.1.1)

Assessment Type	**Frequency**	**Internal or External**	**Organization Performing Assessment**	**Person(s) Responsible for Performing Assessment** (title and organizational affiliation)	**Person(s) Responsible for Responding to Assessment Findings** (title and organizational affiliation)	**Person(s) Responsible for Identifying and Implementing Corrective Actions** (title and organizational affiliation)	**Person(s) Responsible for Monitoring Effectiveness of Corrective Action** (title and organizational affiliation)
Laboratory Systems Audit[1]	One every 2 years	External	DoD ELAP Accrediting Body	DoD ELAP Accrediting Body Auditor	Laboratory QAM or Laboratory Manager, APPL	Laboratory QAM or Laboratory Manager, APPL	Laboratory QAM or Laboratory Manager, APPL

1 APPL is DoD ELAP accredited by a recognized Accrediting Body. The DoD ELAP accreditation letter is included in Appendix B.

SAP Worksheet No. 32 -- Assessment Findings and Corrective Action Responses

(UFP-QAPP Manual Section 4.1.2)

Assessment Type	**Nature of Deficiencies Documentation**	**Individual(s) Notified of Findings** (name, title, organization)	**Time Frame of Notification**	**Nature of Corrective Action Response Documentation**	**Individual(s) Receiving Corrective Action Response** (name, title, organization)	**Time Frame for Response**
Laboratory System Audit	Written audit report	Frances Lediaev, Laboratory QAM, and/or Leonard Fong, PhD, Laboratory Manager, APPL	Specified by DoD ELAP Accrediting Body	Letter	DoD ELAP Accrediting Body	Specified by DoD ELAP Accrediting Body

SAP Worksheet No. 33 -- QA Management Reports Table

(UFP QAPP Manual Section 4.2)

Type of Report	**Frequency** (daily, weekly monthly, quarterly, annually, etc.)	**Projected Delivery Date(s)**	**Person(s) Responsible for Report Preparation** (title and organizational affiliation)	**Report Recipient(s)** (title and organizational affiliation)
Data Validation Report	Per Sample Delivery Group (SDG)	Within 3 weeks after receiving the data from the laboratory	DVM or designee, Tetra Tech	PM and project file, Tetra Tech
Major Analysis Problem Identification (Internal Tetra Tech Memorandum)	When persistent analysis problems are detected by Tetra Tech that may impact data usability	Immediately upon detection of problem – on the same day	CLEAN QAM, Tetra Tech	PM, CLEAN QAM, Program Manager, and project file, Tetra Tech
Project Monthly Progress Report	Monthly for duration of the project	Monthly	PM, Tetra Tech	Navy RPM, Navy; CLEAN QAM, Program Manager, and project file, Tetra Tech
Laboratory QA Report	When significant plan deviations result from unanticipated circumstances	Immediately upon detection of problem – on the same day	Laboratory PM, APPL	PM and project file, Tetra Tech

SAP Worksheet No. 34 -- Verification (Step I) Process Table

(UFP-QAPP Manual Section 5.2.1)

Verification Input	Description	Internal / External	Responsible for Verification (name, organization)
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.	Internal	Sampler and FOL, Tetra Tech
	The APPL Laboratory Sample Custodian will review the sample shipment for completeness, integrity, and sign accepting the shipment. 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.	Internal/ External	1 - Laboratory Sample Custodian, APPL 2 - Data Validators, Tetra Tech
SAP Sample Tables/ Chain-of-Custody Forms	Verify that all proposed samples listed in the SAP tables have been collected.	Internal	FOL or designee, Tetra Tech
Sample Log Sheets	Verify that information recorded in the log sheets is accurate and complete.	Internal	FOL or designee, Tetra Tech
SAP/ Field Logs/ Analytical Data Packages	Ensure that all sampling SOPs were followed. Verify that deviations have been documented and MPCs have been achieved. Particular attention should be given to 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.	Internal	PM or designee, Tetra Tech
SAP/ Analytical SOPs/ Analytical Data Packages	Ensure that all laboratory SOPs were followed. Verify that the correct analytical methods/SOPs were applied.	Internal	Laboratory QAM, APPL
SAP/ Laboratory SOPs/ Raw Data/ Applicable Control Limits Tables	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.	Internal	Laboratory QAM, APPL
SAP/ Chain-of-Custody Forms	Check that field QC samples listed in Worksheet No. 20 were collected as required.	Internal	FOL or designee, Tetra Tech

Verification Input	Description	Internal / External	Responsible for Verification (name, organization)
Electronic Data Deliverables (EDDs)/ Analytical Data Packages	Each EDD will be verified against the chain-of-custody and hard copy data package for accuracy and completeness. Laboratory analytical results will be verified and compared to the electronic analytical results for accuracy. Sample results will be evaluated for laboratory contamination and will be qualified for false positives using the laboratory method/preparation blank summaries. Positive results reported between the DL and the LOQ will be qualified as estimated. Extraneous laboratory qualifiers will be removed from the validation qualifier.	External	Data Validators, Tetra Tech
Analytical Data Packages	All analytical data packages will be verified internally for completeness by the laboratory performing the work. The Laboratory QAM will sign the case narrative for each data package.	Internal	Laboratory QAM, APPL
	Each data package will be verified for completeness by the Tetra Tech Data Validator. Missing information will be requested by the Tetra Tech Data Validator from the Laboratory PM.	External	Data Validators, Tetra Tech

Notes:
Verification includes field data verification and laboratory data verification. Verification inputs as per Worksheet No. 34 will be checked.

SAP Worksheet No. 35 -- Validation (Steps IIa and IIb) Process Table

(UFP-QAPP Manual Section 5.2.2) (Figure 37 UFP-QAPP Manual) (Table 9 UFP-QAPP Manual)

Step IIa / IIb	Validation Input	Description	Responsible for Validation (name, organization)
IIa	SAP/ Sample Log Sheets	Sample Coordinates - Ensure that sample locations are correct and in accordance with the SAP proposed locations. Document any discrepancies in the final report.	PM, FOL, or designee, Tetra Tech
IIa	Chain-of-Custody Forms	Custody - 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 store at the required temperature and sample pH for chemically-preserved samples meet the requirements listed in Worksheet No. 19. Ensure that the analyses were performed within the holding times listed in Worksheet No. 19.	Project Chemist or Data Validators, Tetra Tech
IIa/IIb	SAP/ Laboratory Data Packages/ EDDs	Accuracy - Ensure that the laboratory QC samples listed in Worksheet No. 28 were analyzed and that the MPCs listed in Worksheet No. 12 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.	Project Chemist or Data Validators, Tetra Tech
		Precision - Check the field sampling precision by calculating the RPD for field duplicate samples. Check the 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 Worksheet No. 12.	
		Representativeness - Check that the laboratory recorded the temperature at sample receipt and the pH of the chemically preserved samples to ensure sample integrity from sample collection to analysis.	
		Completeness - 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. Validation will be performed as per Worksheet No. 36. Check that all data have been transferred correctly and completely to the final SQL database.	

Step IIa / IIb	Validation Input	Description	Responsible for Validation (name, organization)
IIb	SAP/ Laboratory Data Packages/ EDDs	Sensitivity - Ensure that the project LOQs listed in Worksheet No. 15 were achieved.	Project Chemist or Data Validators, Tetra Tech
		PSLs - Discuss the impact on reported DLs due to matrix interferences or sample dilutions performed because of the high concentration of one or more other contaminants, on the other target compounds reported as non-detected. Document this usability issue and inform the Tetra Tech PM. Review and add PSLs to the laboratory EDDs. Flag samples and notify the Tetra Tech PM of samples that exceed PSLs listed in Worksheet No. 15.	
		QA/QC - Ensure that all QC samples specified in the SAP were collected and analyzed and that the associated results were within prescribed SAP 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 occur, the Laboratory QAM shall have contacted the Tetra Tech PM.	
		Deviations - 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 the project database qualified data depicting data qualifiers and data qualifiers 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.	

SAP Worksheet No. 36 -- Analytical Data Validation (Steps IIa and IIb) Summary Table

(UFP-QAPP Manual Section 5.2.2.1)

Step IIa/IIb	Matrix	Analytical Group	Validation Criteria	Data Validator (title and organizational affiliation)
IIa and IIb	Soil, Sediment, Surface Water, and Aqueous QC Samples	Explosives	Limited data validation will be performed using criteria for SW-846 Method 8330B listed in Worksheets Nos. 12, 15, 24, and 28, and the current DoD QSM. If not included in the aforementioned, then the logic outlined in the "USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review" EPA-540/R-99-008 (USEPA, October 1999) will be used to apply qualifiers to data.	Project Chemist or Data Validator, Tetra Tech
IIa and IIb	Soil, Surface Water, and Aqueous QC Samples	Perchlorate	Limited data validation will be performed using criteria for SW-846 Method 6850 listed in Worksheets Nos. 12, 15, 24, and 28, and the current DoD QSM. If not included in the aforementioned, then the logic outlined in the "USEPA CLP National Functional Guidelines for Organic Data Review" EPA-540/R-99-008 (USEPA, October 1999) will be used to apply qualifiers to data.	Project Chemist or Data Validator, Tetra Tech
IIa and IIb	Soil, Sediment, Surface Water, and Aqueous QC Samples	RCRA Metals (Including Mercury)	Limited data validation will be performed using criteria for SW-846 Methods 6020A, 7470A, and 7471B listed in Worksheets Nos. 12, 15, 24, and 28, and the current DoD QSM. If not included in the aforementioned, then the logic outlined in USEPA CLP National Functional Guidelines for Inorganic Data Review, EPA 540-R-04-004 (USEPA, October 2004) will be used to apply qualifiers to data.	Project Chemist or Data Validator, Tetra Tech
IIa and IIb	Soil and Sediment	pH	Data validation will not be performed on pH data.	None
IIa and IIb	Sediment	TOC	Data validation will not be performed on TOC data.	None

Limited data validation focuses the 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 false negatives and to eliminate false positives. 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 APPL will be expansive enough to allow future complete formal data validation to be performed, if necessary.

SAP Worksheet No. 37 -- Usability Assessment

(UFP-QAPP Manual Section 5.2.3)

Data Usability Assessment
The usability of the data generated during the RFI directly affects whether project objectives can be achieved. The following characteristics will be evaluated at a minimum, and the results of these evaluations will be included in the project report. The characteristics will be evaluated for multiple concentration levels if the evaluator determines that this is necessary. To the extent required by the type of data being reviewed, the evaluator will consult with other technically competent individuals to render sound technical assessments of these DQI characteristics: • **Completeness** For each matrix that was scheduled to be sampled, the Tetra Tech FOL acting on behalf of the Project Team will prepare a table listing comparing planned samples/analyses to collected samples/analyses. If deviations from the scheduled sample collection or analyses are identified, the Tetra Tech PM and Project Risk Assessor will determine whether the deviations compromise the ability to meet project objectives. If they do, the Tetra Tech PM will consult with the Navy RPM and other Project Team members, as necessary (determined by the Navy RPM), to develop appropriate corrective actions. • **Precision** The Tetra Tech Project Chemist acting on behalf of the Project Team will determine whether precision goals for field duplicates and laboratory duplicates were met. This will be accomplished by comparing duplicate results to precision goals identified in Worksheet Nos. 12 and 28. This will also include a comparison of field and laboratory precision with the expectation that field duplicate results will be no less precise than laboratory duplicate results. If the goals are not met, or if data have been flagged as estimated (J qualifier), limitations on the use of the data will be described in the project report. **Accuracy** The Tetra Tech Project Chemist acting on behalf of the Project Team will determine whether the accuracy/bias goals were met for project data. This will be accomplished by comparing percent recoveries of LCS, LCSD, MS, MSD, and surrogate compounds to accuracy goals identified in Worksheet No. 28. This assessment will include an evaluation of field and laboratory contamination; instrument calibration variability; and analyte recoveries for surrogates, MSs, and LCSs. If the goals are not met, limitations on the use of the data will be described in the project report. Bias of the qualified results and a description of the impact of identified non-compliances on a specific data package or on the overall project data will also be described in the project report. • **Representativeness** A Tetra Tech Project Scientist identified by the Tetra Tech PM and acting on behalf of the Project Team will determine whether the data are adequately representative of intended populations, both spatially and temporally. This will be accomplished by verifying that samples were collected and processed for analysis in accordance with the SAP, by reviewing spatial and temporal data variations, and by comparing these characteristics to expectations. The usability report will describe the representativeness of the data for each matrix and analytical fraction. This will not require quantitative comparisons unless professional judgment of the Project Scientist indicates that a quantitative analysis is required. • **Comparability** The Tetra Tech Project Chemist acting on behalf of the Project Team will determine whether the data generated under this project are sufficiently comparable to historical site data generated by different methods and for samples collected using different procedures and under different site conditions. This will be accomplished by comparing overall precision and bias among data sets for each matrix and analytical fraction. This will not require quantitative comparisons unless professional judgment of the Tetra Tech Project Chemist indicates that such quantitative analysis is required.

- **Sensitivity**
  The Tetra Tech Project Chemist acting on behalf of the Project Team will determine whether project sensitivity goals listed in Worksheet No. 15 were achieved. The overall sensitivity and LOQs from multiple data sets for each matrix and analysis will be compared. If sensitivity goals are not achieved, the limitations on the data will be described in the project report. The Tetra Tech Project Chemist may enlist the help of the Project Risk Assessor to evaluate deviations from planned sensitivity goals.

- **Project Assumptions and Data Outliers**
  The Tetra Tech PM and designated team members will evaluate whether project assumptions are valid. This will typically be a qualitative evaluation but may be supported by quantitative evaluations. The type of evaluation depends on the assumption being tested. Quantitative assumptions include those related to data distributions (e.g., normal or log-normal) and estimates of data variability. Potential data outliers will be removed if a review of the associated data indicates that the results have an assignable cause that renders them inconsistent with the remainder of the data. During this evaluation, the team will consider whether outliers could be indications of unanticipated site conditions.

Describe the evaluative procedures used to assess overall measurement error associated with the project:

After the completion of data validation, the data and data quality will be reviewed to determine whether sufficient data of acceptable quality are available for decision making. In addition to the evaluations described above, a series of inspections and statistical analyses will be performed to estimate these DQI characteristics. The statistical evaluations will include simple summary statistics for target analytes, such as maximum concentration, minimum concentration, number of samples with non-detected results, number of samples with detected results, and the proportion of samples with detected and non-detected results. The Project Team members identified by the Tetra Tech PM will assess whether the data collectively support the attainment of project objectives. The Project Team will consider whether any missing or rejected data have compromised the ability to make decisions or to make decisions with the desired level of confidence. The data will be evaluated to determine whether missing or rejected data can be compensated for by other data. Although rejected data will generally not be used, there may be reason to use them in a weight-of-evidence argument, especially when they supplement data that have not been rejected. If rejected data are used, their use will be supported by technically defensible rationales.

For statistical comparisons and mathematical manipulations, non-detected values will be represented by a concentration equal to one-half of the sample-specific reporting limit. Duplicate results (original and duplicate) will not be averaged for the purpose of representing the range of concentrations; however, the average of the original and duplicate samples will be used to represent the concentration at a particular sampled location.

Identify the personnel responsible for performing the usability assessment:

The Tetra Tech PM, Project Chemist, FOL, and Project Scientist will be responsible for conducting the listed data usability assessments. The data usability assessment will be reviewed with the NSA Crane ERSM, Navy RPM, IDEM RPM, and USEPA RPM. If deficiencies affecting the attainment of project objectives are identified, the review will take place either in a face-to-face meeting or teleconference, depending on the extent of identified deficiencies. If no significant deficiencies are identified, the data usability assessment will simply be documented in the project report and reviewed during the normal document review cycle.

Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:

The data will be presented in tabular format, including data qualifications such as estimation (J, UJ) or rejection (R). Written documentation will support the non-compliance estimated or rejected data results. The project report will identify and describe the data usability limitations and suggest resampling or other corrective actions, if necessary.

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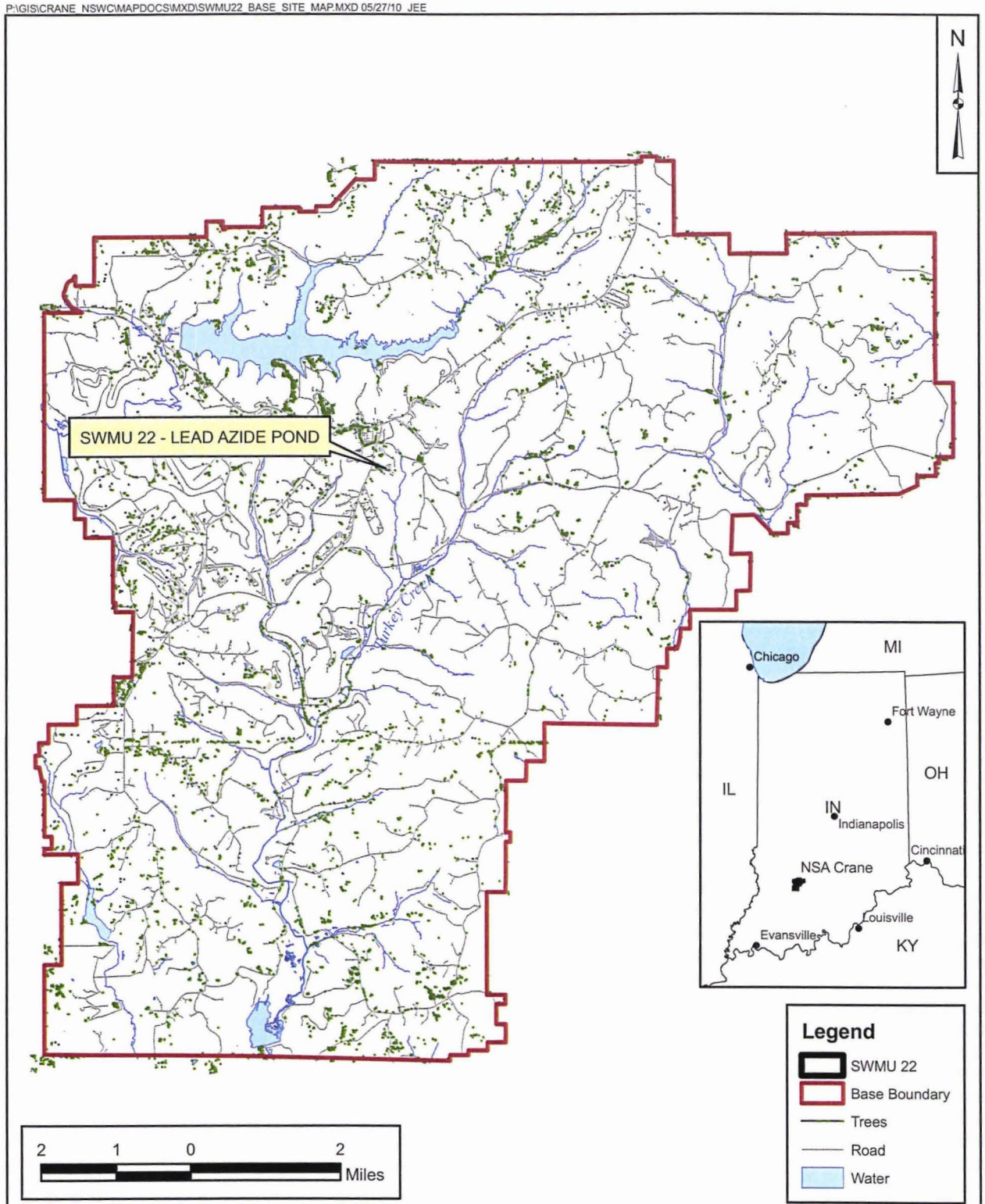

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REVISED BY —	DATE —		APPROVED BY — DATE —
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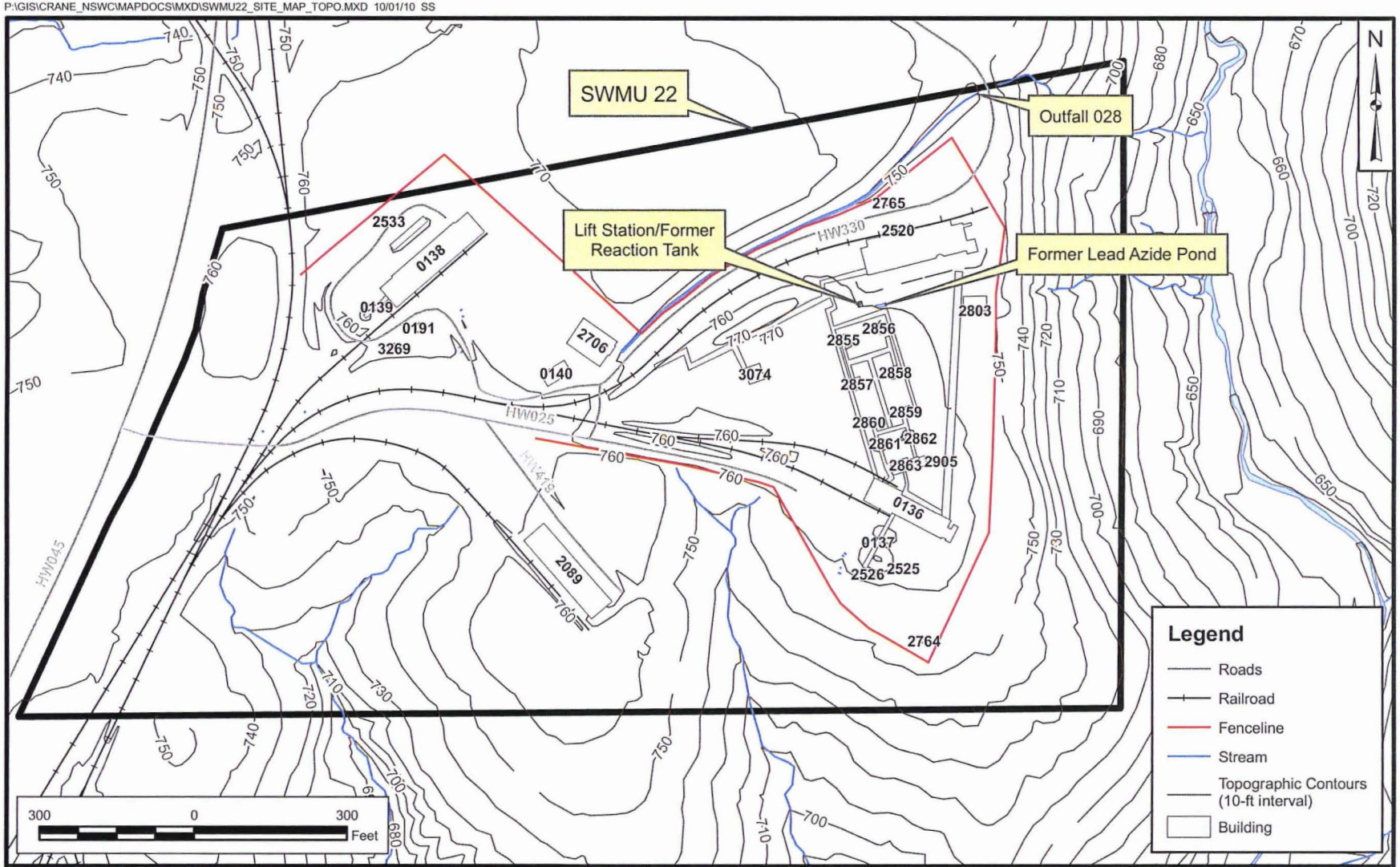

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REVISED BY —	DATE —		APPROVED BY — DATE —
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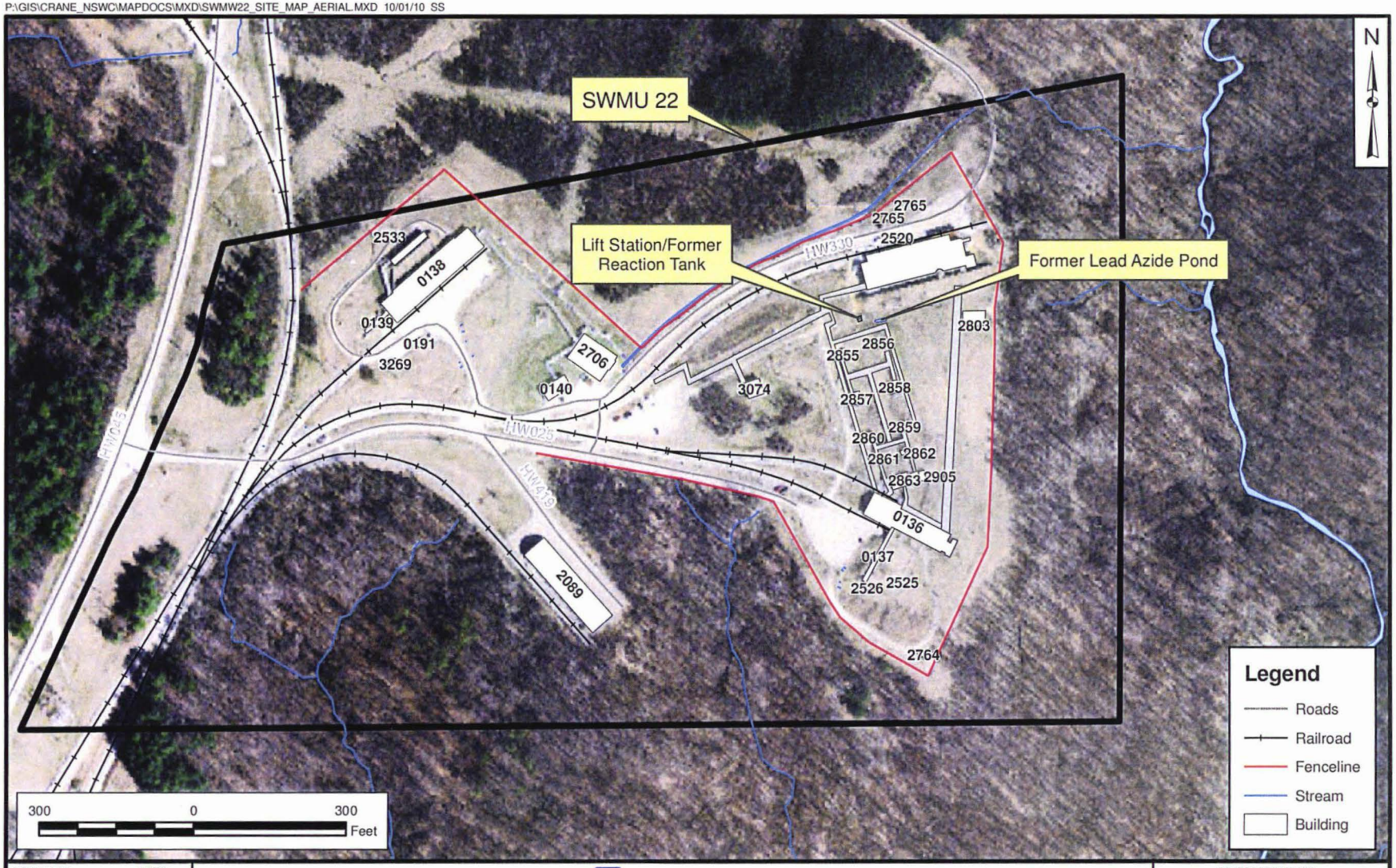

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REVISED BY —	DATE —		APPROVED BY — DATE —
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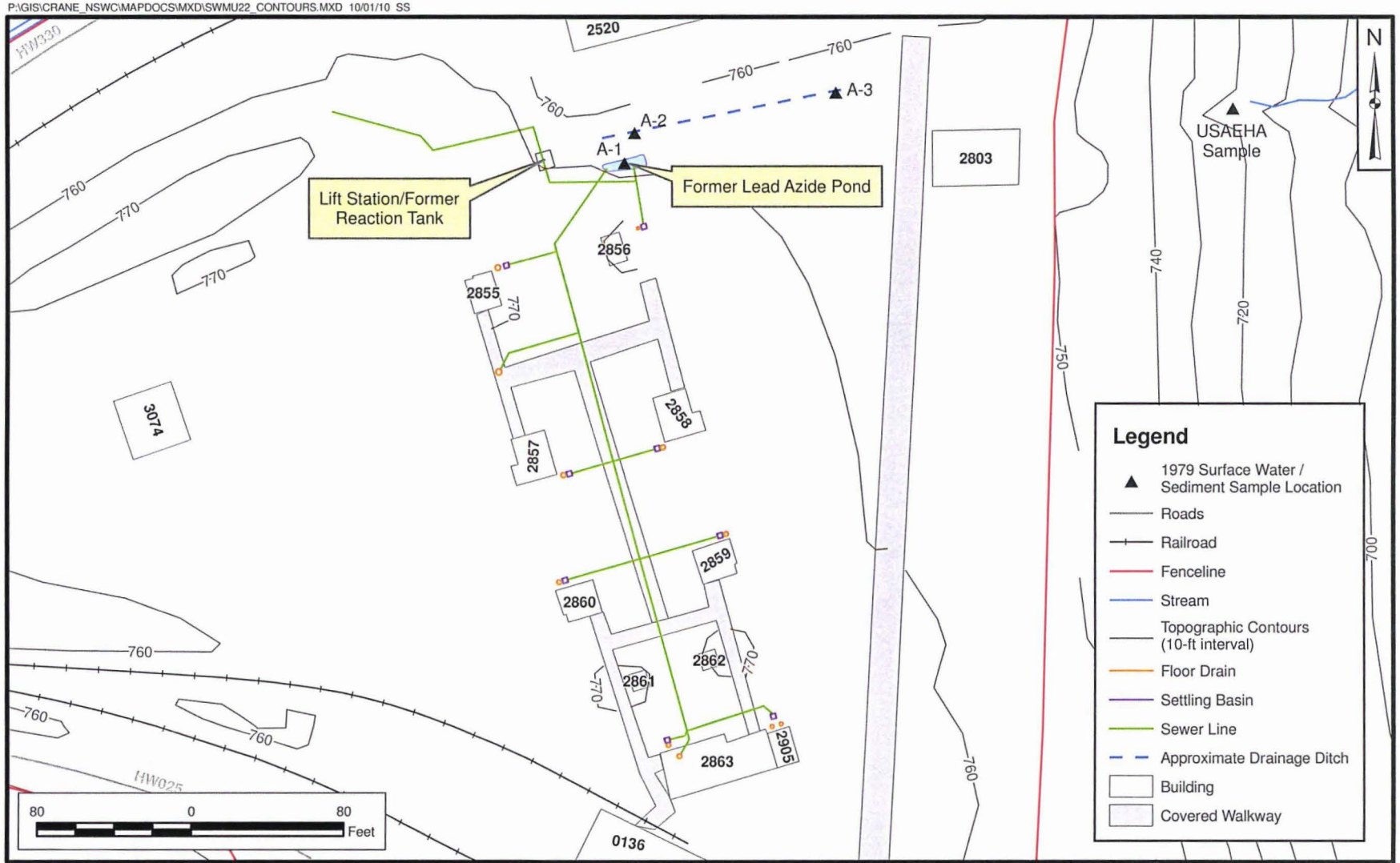

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REVISED BY —	DATE —		APPROVED BY — DATE —
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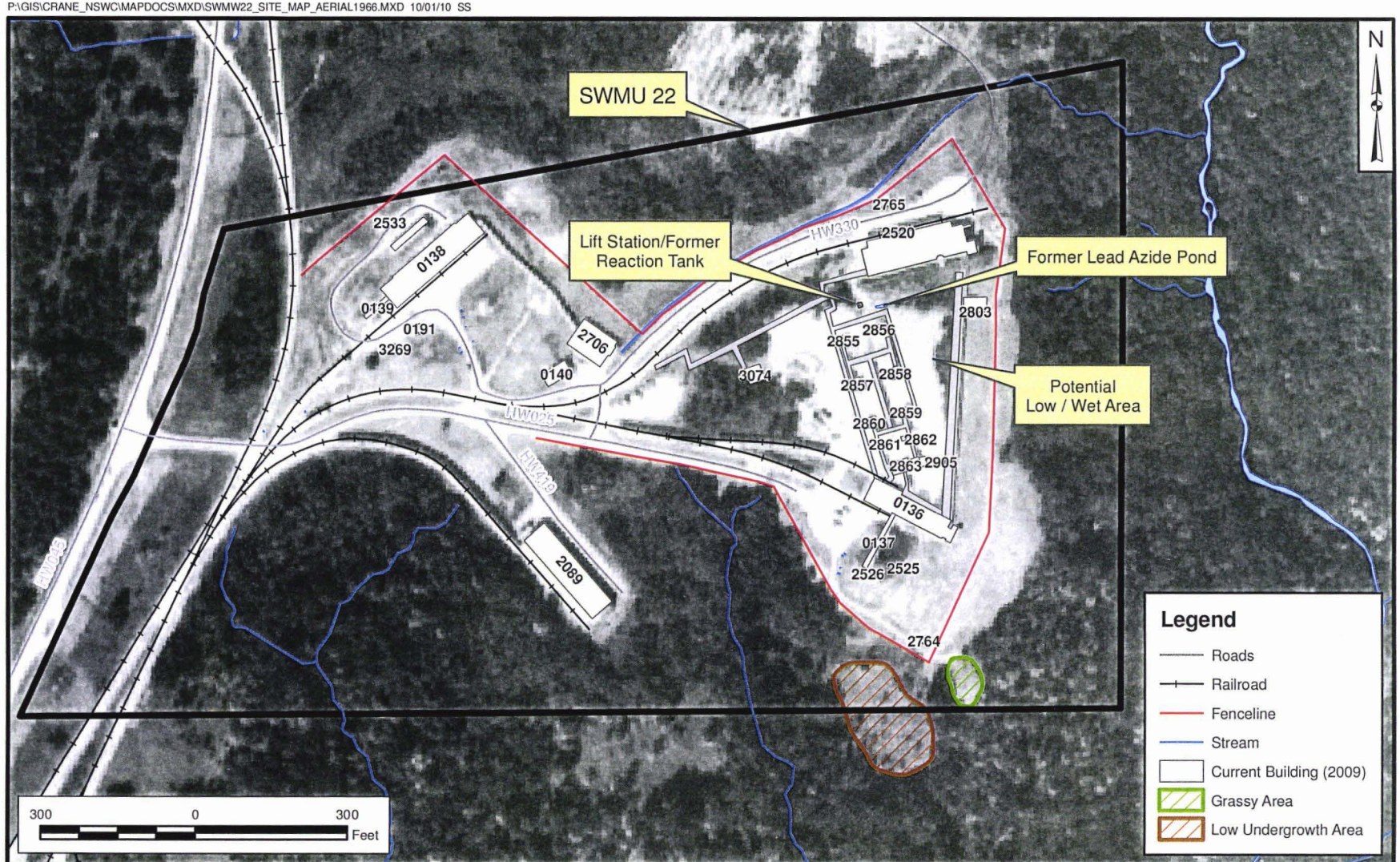

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REVISED BY S. STROZ	DATE 10/01/10		APPROVED BY — DATE —
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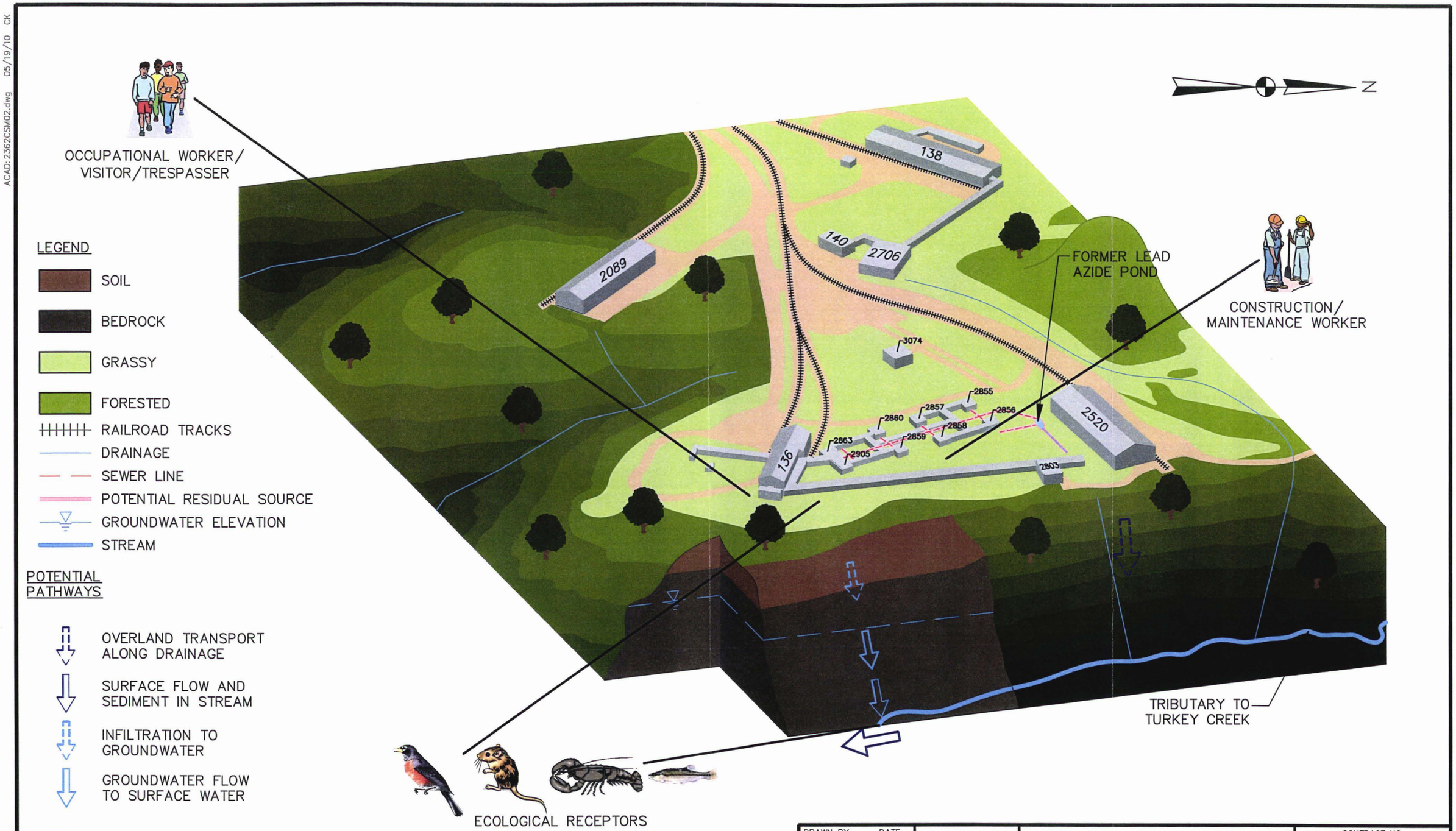

LEGEND

- SOIL
- BEDROCK
- GRASSY
- FORESTED
- RAILROAD TRACKS
- DRAINAGE
- SEWER LINE
- POTENTIAL RESIDUAL SOURCE
- GROUNDWATER ELEVATION
- STREAM

POTENTIAL PATHWAYS

- OVERLAND TRANSPORT ALONG DRAINAGE
- SURFACE FLOW AND SEDIMENT IN STREAM
- INFILTRATION TO GROUNDWATER
- GROUNDWATER FLOW TO SURFACE WATER

NOTE:

CURRENT RECEPTORS SHOWN. HYPOTHETICAL FUTURE RECEPTORS ALSO INCLUDE RECREATIONAL USERS AND RESIDENTS UNDER A CONSERVATIVE RESIDENTIAL SCENARIO.

DRAWN BY CK DATE 5/19/10	Tetra Tech	CONCEPUAL SITE MODEL SWMU 22 – LEAD AZIDE POND NSA CRANE CRANE, INDIANA	CONTRACT NO. 2362
CHECKED BY DATE			OWNER NO. F279
REVISED BY DATE			APPROVED BY DATE
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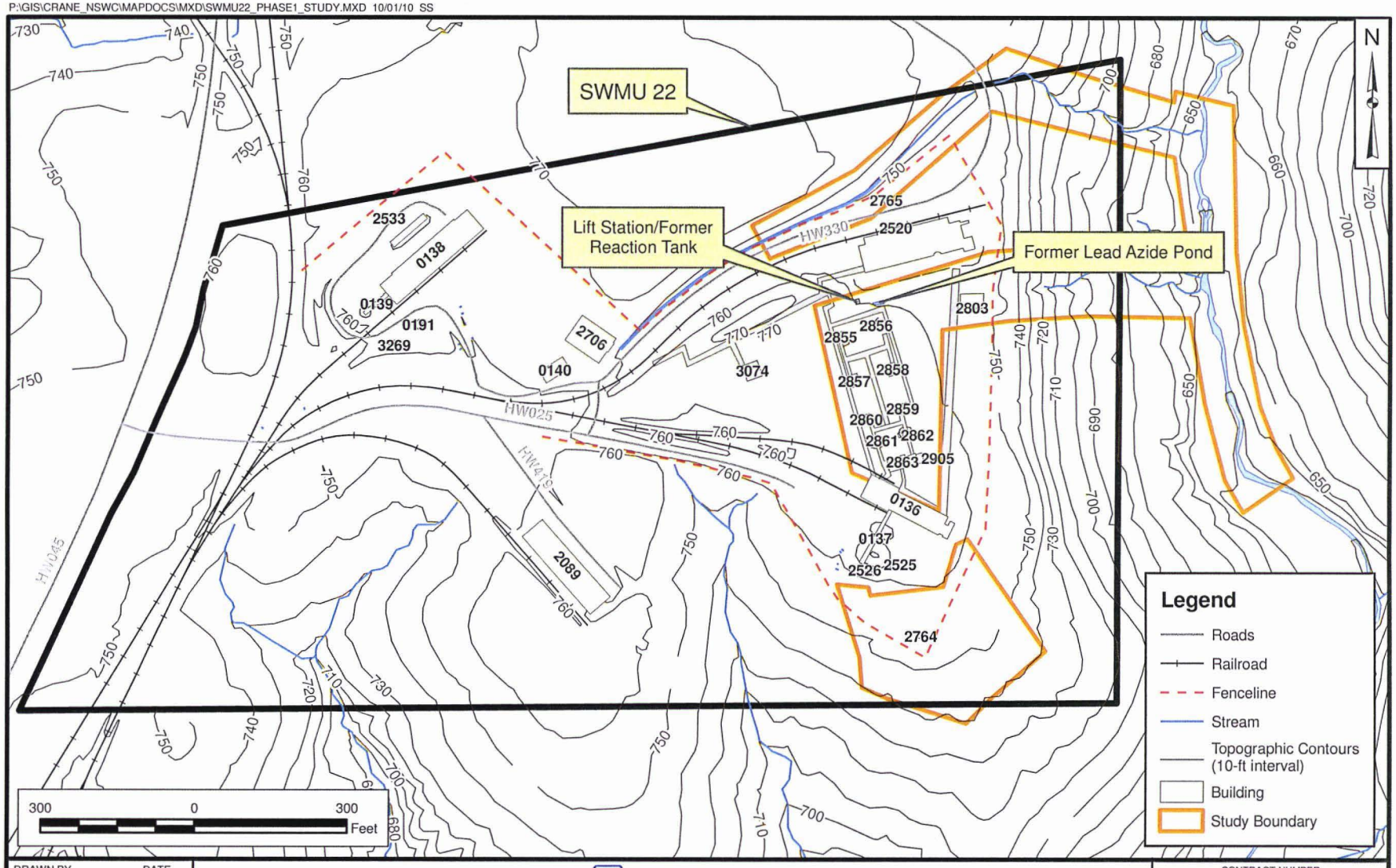

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T. EVANS	10/01/10	SWMU 22 - LEAD AZIDE POND	— / —
REVISED BY	DATE	NSA CRANE	APPROVED BY / DATE
—	—	CRANE, INDIANA	— / —
SCALE			FIGURE NO. / REV
AS NOTED			FIGURE 11-1 / 0

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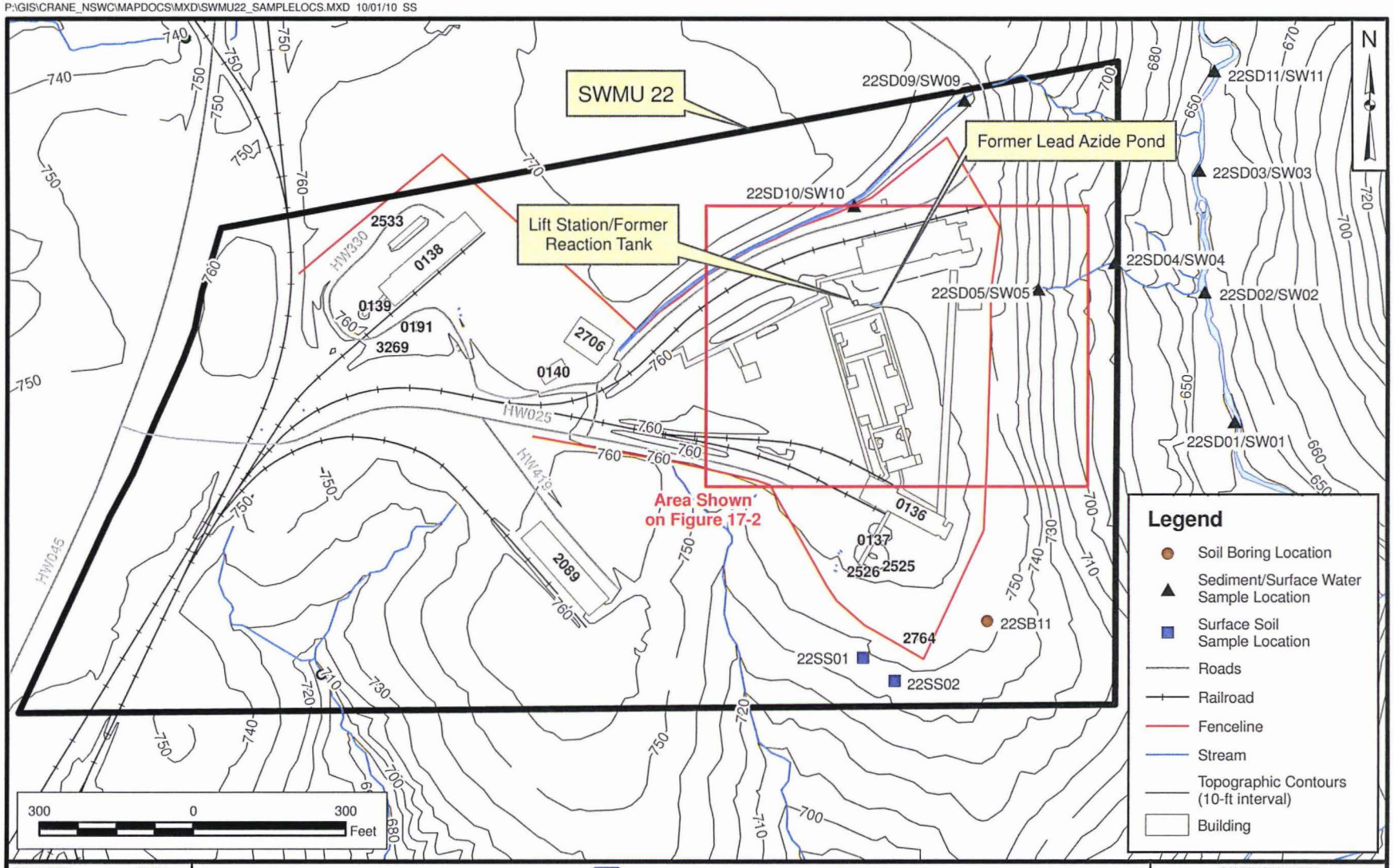

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REVISED BY	DATE	NSA CRANE	APPROVED BY / DATE
—	—	CRANE, INDIANA	— / —
SCALE			FIGURE NO. / REV
AS NOTED			FIGURE 17-1 / 0

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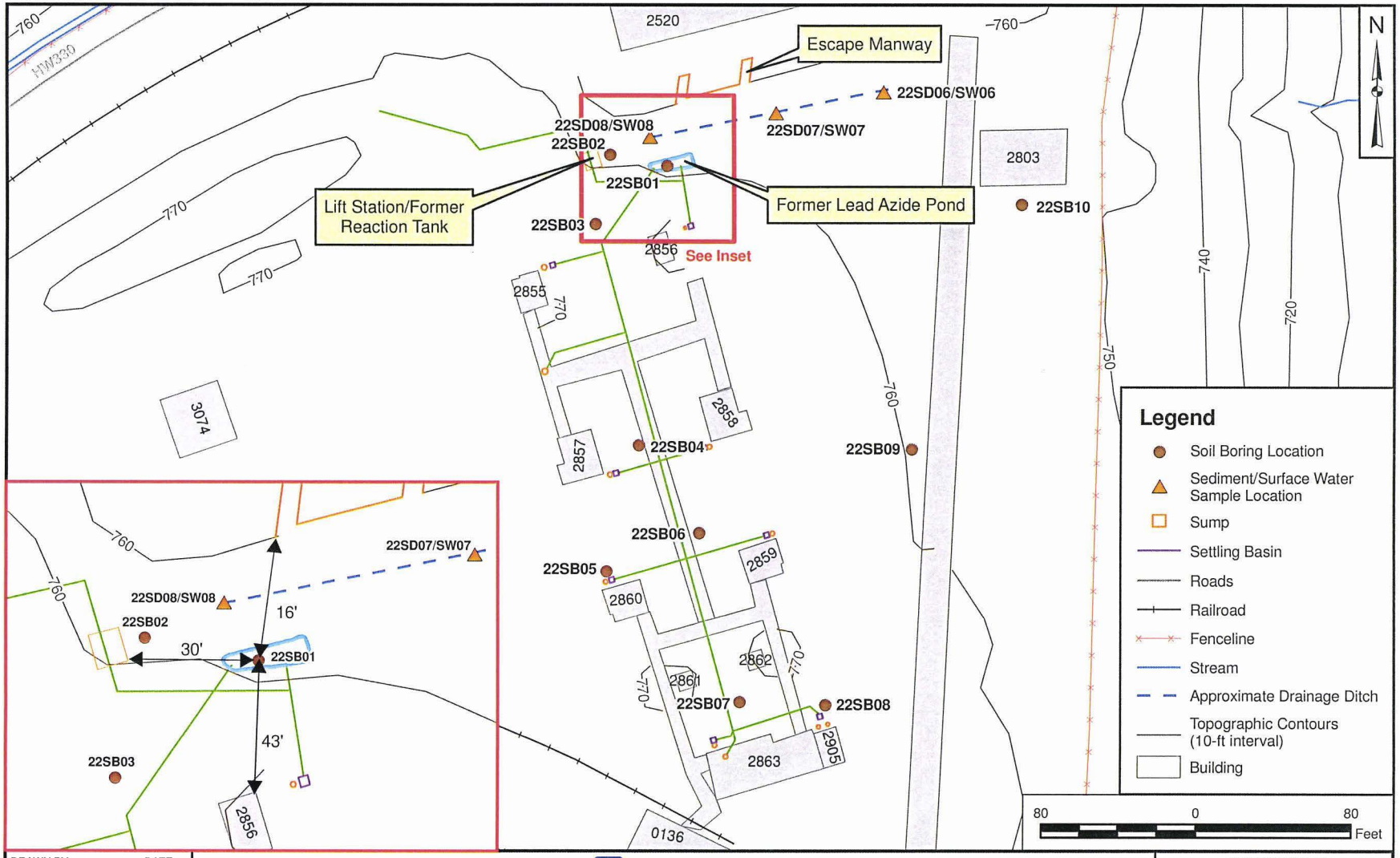

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REVISED BY T. WHEATON	DATE 11/04/10		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 17-2 / REV 0

APPENDIX A

SITE-SPECIFIC FIELD STANDARD OPERATING PROCEDURES

APPENDIX A

FIELD STANDARD OPERATING PROCEDURES

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STANDARD OPERATING PROCEDURE

SOP-01

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 identification number (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.
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
- Sample Location ID
- Contract Task Order Number (CTO F279)
- Sample ID
- Sample 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-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 Support Activity (NSA) Crane. 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

The NSA Crane Environmental Protection Department must approve any deviations from this procedure.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

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

3.0 SAMPLE IDENTIFICATION NOMENCLATURE

3.1 Environmental Samples

All environmental 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 Environmental Sample Numbering Scheme

The sample tracking number will consist of a four- or five-segment alpha-numeric code that identifies the sample's associated Solid Waste Management Unit (SWMU) number, sample type, location, and sample

depth. 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 (rounded to the nearest foot). For sediment samples, the final four tracking numbers will identify the depth in units of inches bgs at which the sample was collected.

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

NN	**AA**	**NNN (-F)**	**NNNN (Soils and Sediment only)**
SWMU Number	Matrix	Sample Location Number	Sequential depth interval from freshly exposed surface

Character Type:

A = Alpha

N = Numeric

SWMU Number (NN):

22 = SWMU 22

Matrix Code (AA):

SS = Surface Soil Sample

SB = Subsurface Soil Sample

SD = Sediment Sample

SW = Surface Water Sample

Location Number (NNN):

Sequential number beginning with "001" for each matrix. If a water sample is field-filtered, "-F" will be written at the end of the sample location number.

Depth Interval (NNNN):

This code section will be used for soil and sediment samples only. The depth code is used to note the depth below ground surface (bgs) at which a soil or sediment sample is collected. The first two numbers of the four-number code specify the top interval, and the third and fourth numbers specify the bottom interval of the sample depth. 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.

For soil samples, the final four tracking numbers will identify the depth in units of feet. Surface soil samples will be collected from 0 to 2 feet bgs. Subsurface soil samples will be collected at depths greater than 2 feet bgs. For sediment samples, the final four tracking numbers will identify the depth in units of inches below the sediment/water interface. Sediment samples will be collected from 0 to 6 inches.

3.1.2 Examples of Sample Nomenclature

The first soil sample collected from sampling location 003 at SWMU 22, at a depth of 0- to 2-feet bgs would be labeled as "22SB0030002".

The sediment sample collected from sediment sampling location 001 at SWMU 22 would be labeled as "22SD0010006".

The surface water sample collected from sampling location 007 at SWMU 22 would be labeled as "22SW007". The filtered fraction for this sample would be labeled as "22SW007-F".

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

Field QA/QC samples are described in the 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 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.

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

The QC types are identified as:

TB = Trip Blank
RB = Rinsate Blank
FD = Field Duplicate

The sampling time recorded on the Chain-of-Custody Form, labels, and tags for 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 SWMU 22 for a surface soil sample collected on October 25, 2010 would be designated as "22FD10251001".

The third duplicate of the day taken at SWMU 22 of a surface soil sample collected on November 3, 2010 would be designated as "22FD11031003".

The first rinsate blank associated with samples collected on November 3, 2010 would be designated as "22RB11031001".

STANDARD OPERATING PROCEDURE

SOP-03

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 Boring Log
Soil and Sediment Sample Log Sheet
Surface Water 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 Tetra Tech 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. At a minimum, the following activities and events will be recorded (daily) in the field logbooks:

- Field personnel for activities in the field logbook
- 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

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 field logbook:

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

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. Sample labeling and nomenclature are described in SOP-01 and SOP-02, respectively.

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. This

form must accompany any samples collected for laboratory chemical analysis. Each COC will be uniquely numbered. 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 upper right hand corner 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 Tetra Tech Project Manager (PM). 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 is part of the chain-of-custody process. Custody seals are used to prevent tampering with samples after they have been collected in the field and sealed in coolers for transit to the laboratory. Custody seals will be signed and dated by the samplers and affixed across the opening edges of each cooler (two seals per cooler on opposite sides) containing environmental samples. The laboratory sample custodian will examine the custody seal for evidence of tampering and will notify the Tetra Tech PM 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 and Surface Water Sample Log Sheets are used to document the sampling of soil, sediment, and surface water. Copies of the sample log sheets are

attached at the end of the SOP. A sample log sheet will be prepared for each sample collected and submitted for laboratory analysis.

4.0 ATTACHMENTS

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

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

DATE YEAR	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS								COMMENTS
						CONTAINER TYPE PLASTIC (P) or GLASS (G)								
						PRESERVATIVE USED								

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. TINUS-001

ATTACHMENT 2
EQUIPMENT CALIBRATION LOG

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:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
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

SURFACE WATER SAMPLE LOG SHEET

Tetra Tech NUS, Inc. **SURFACE WATER SAMPLE LOG SHEET**

Page___ of ___

Project Site Name: _____
Project No.: _____

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: _____
[] QA Sample Type: _____

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

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

SAMPLING DATA:

Date: Time: Depth: Method:	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	ORP mV

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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 degrees Celcius (°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 Line the cooler with large plastic bag, and line the bottom of the cooler with a layer of bubble wrap. Place the sample containers into the shipping cooler in an upright position (containers will be upright, with the exception of any 40-milliliter vials). Continue filling the cooler with ice until the cooler is nearly full and the movement of the sample containers is limited.

3.7 Wrap the large plastic bag closed and secure with tape.

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

SURFACE WATER SAMPLING

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedure for collecting surface water samples at the Naval Support Activity (NSA) Crane facility.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Surface Water Sample Log Sheet: A copy of this form is attached at the end of this SOP.
Field logbook
Writing utensil (preferably black pen with indelible ink)
Multi-parameter water-quality meter: The water-quality meter is used for the measurement of dissolved oxygen, pH, specific conductance, temperature, and oxidation-reduction potential (see SOP-06).
LaMotte Turbidity Meter: Used to measure turbidity in the field (see SOP-06).
Disposable sample containers: Disposable sample containers are used to fill sample containers and transport sample(s) to a pump for filtering.
Sample containers: Certified-clean sample containers will be provided by the laboratory that performs the analyses.
Sample labels: One label is to be completed and attached to each sample container.
0.45-micron filter assembly: These are single-use filter cartridges used to filter samples scheduled for dissolved metals analyses. The filters become investigation-derived waste (IDW) after one use.
Peristaltic pump
Silicon tubing
Ziploc-type plastic storage bags
Shipping containers (coolers)
Trip blank sample (only if Volatile Organic Compounds [VOCs] samples are being collected)
Temperature blank

3.0 SURFACE WATER SAMPLING PROCEDURES

3.1 Surface water sampling will start at the downstream end of a stream and proceed to upstream.

3.2 While standing downstream or from the bank, gently remove any floating leaves or twigs that may be present in a sample pool area in a manner that will not disturb the bottom sediment.

3.3 Obtain measurements of dissolved oxygen, pH, specific conductance, temperature, turbidity, and oxidation-reduction potential immediately downstream of the sample collection point using the multi-parameter water-quality meter and LaMotte Turbidity Meter (see SOP-06). Record the readings in the appropriate fields on the Surface Water Sample Log Sheet.

3.4 Place the sample container(s) into the water at the sampling location at a 45-degree. With the mouth of the container facing upstream, fill the container with water, being careful not to disturb the sediment.

3.5 For dissolved metals sample fractions from sample locations, while standing downstream or from the bank, fill two 1-liter unpreserved polyethylene bottles; use these bottles as transfer bottles via field filtering to preserved samples bottles. Once out of the stream, set up a peristaltic pump for filtering of the dissolved metals samples. Using new, clean, disposable silicone tubing and a 0.45-micron filter, place the intake tubing from the pump into the transfer bottle with the filter attached to the discharge end, and start the pump. Pre-rinse the filter with approximately 50 milliliters of sample water prior to filling the sample containers. Using the discharge from the filter cartridge, fill the sample bottle for dissolved metals.

3.6 All samples will be collected in certified-clean, pre-preserved bottles (if preservation is required for the analysis to be performed) supplied by the laboratory performing the analyses. Sample containers for VOCs must be completely filled so no headspace exists in the container. Other sample containers should <u>not</u> be filled completely; a small amount of air should be left at the top. Sample containers will be collected in the following sequence:

VOCs
Other Organics (including energetic and perchlorate)
Total metals
Water chemistry parameters
Dissolved metals

3.7 Record the date and time that the sample containers are filled on the Surface Water Sample Log Sheet, the sample labels, and the Chain-of-Custody Form.

3.8 After the sample label is completed and checked, place the sample container into a ziploc-type plastic storage bag and place the plastic storage bag holding the sample container into a cooler containing ice.

3.09 Repeat steps 3.3 through 3.8 until all the sample bottles have been filled.

3.10 Estimate the flow rate of the stream or spring. This is an estimate only. Round the flow rate to the nearest 5 gallons and record this number on the Surface Water Sample Log Sheet.

3.11 Decontaminate equipment as necessary, and load the equipment and the sample cooler in the sample vehicle for transport.

4.0 ATTACHMENTS

1. Surface Water Sample Log Sheet

ATTACHMENT 1

SURFACE WATER SAMPLE LOG SHEET

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: _____
Project No.: _____

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: _____
[] QA Sample Type: _____

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

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

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	ORP
Date:	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	mV
Time:								
Depth:								
Method:								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

STANDARD OPERATING PROCEDURE
SOP-06

MEASUREMENT OF WATER QUALITY PARAMETERS

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedure for measurement of water quality parameters during the collection of aqueous samples to support field investigations.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

The following field forms and equipment are required for measuring water quality parameters during aqueous sampling:

Disposable medical-grade gloves (e.g., latex, nitrile)
Writing utensil (preferably black pen with indelible ink)
Plastic storage bags
Multi-Parameter Water Quality Meter
Turbidity Meter
Shipping containers (containing ice)
Sample containers: Sample containers are certified clean by the laboratory supplying the containers.
Surface Water Sample Log Forms.
Field logbook
Chain-of-Custody Form.

3.0 GLOSSARY

Specific Conductance – Conductivity is a numerical expression of the ability of an aqueous solution to carry an electric current. This ability depends on the presence of ions, their total concentration, mobility, valence, and relative concentrations, and on temperature of measurement. Conductivity is highly dependent on temperature and should be reported as specific conductance which is conductivity corrected to a temperature of25°C.

Dissolved Oxygen (DO) – DO levels in natural and wastewater depend on the physical, chemical, and biochemical activities in the water sample.

Oxidation-Reduction Potential (ORP) - A measure of the activity ratio of oxidizing and reducing species as determined by the electromotive force developed by a noble metal electrode, immersed in water, as referenced against a standard hydrogen electrode.

pH - The negative logarithm (base 10) of the hydrogen ion activity. The hydrogen ion activity is related to the hydrogen ion concentration, and, in a relatively weak solution, the two are nearly equal. Thus, for all practical purposes, pH is a measure of the hydrogen ion concentration.

Turbidity – Turbidity in water is caused by suspended matter, such as clay, silt, fine organic and inorganic matter. Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in a straight line through the sample.

4.0 ON-SITE WATER QUALITY TESTING

This section describes the procedures and equipment required to measure the following parameters of an aqueous sample in the field:

- pH
- Specific Conductance
- Temperature
- Dissolved Oxygen (DO)
- Oxidation-Reduction Potential (ORP)
- Turbidity

This section also provides general information for measuring the parameters listed above with instruments and techniques in common use. Since instruments from different manufacturers may vary, review of the manufacturer's literature pertaining to the use of a specific instrument is required before use. Most meters used to measure field parameters require calibration on a daily basis. Refer to SOP-14 regarding equipment calibration.

4.1 Measurement of pH

4.1.1 General

Measurement of pH is one of the most important and frequently used tests in water chemistry. Practically every phase of water supply and wastewater treatment such as acid-base neutralization, water softening, and corrosion control is pH dependent. Likewise, the pH of leachate can be correlated with other

chemical analyses to determine the probable source of contamination. It is therefore important that reasonably accurate pH measurements be taken.

The method for pH measurement is the pH sensor on a water quality meter The response of a pH sensor can be affected to a slight degree by high levels of colloidal or suspended solids, but the effect is usually small and generally of little significance. Consequently, specific methods to overcome this interference are not described.

4.1.2 Principles of Equipment Operation

Use of a pH meter relies on the same principle as other ion-specific electrodes. Measurement relies on establishment of a potential difference across a glass or other type of membrane in response to (in this instance, hydrogen) ion concentration across that membrane. The membrane is conductive to ionic species and, in combination with a standard or reference electrode, a potential difference proportional to the ion concentration is generated and measured.

4.1.3 Equipment

The following equipment is needed for taking pH measurements:

- Stand-alone portable pH meter, or combination meter (e.g., Horiba U-10), or combination meters equipped with an in-line sample chamber (e.g., YSI 600 series and Horiba U-22).
- Combination electrode with polymer body to fit the above meter (alternately a pH electrode and a reference electrode can be used if the pH meter is equipped with suitable electrode inputs).
- Buffer solutions, as specified by the manufacturer.
- Manufacturer's operation manual.

4.1.4 Measurement Techniques for Field Determination of pH

pH Meter

The following procedure is used for measuring pH with a pH meter (meter standardization is according to manufacturer's instructions):

- Inspect the instrument and batteries prior to initiation of the field effort.

- Check the integrity of the buffer solutions used for field calibration. Buffer solutions need to be changed often as a result of degradation upon exposure to the atmosphere.

- If applicable, make sure all electrolyte solutions within the electrode(s) are at their proper levels and that no air bubbles are present within the electrode(s).

- Calibrate on a daily use basis (or as recommended by manufacturer) following manufacturer's instructions. Record calibration data on an equipment calibration log sheet (See SOP-14).

- Immerse the electrode(s) in the sample or body of water. Stabilization may take several seconds to minutes. If the pH continues to drift, the sample temperature may not be stable, a physical reaction (e.g., degassing) may be taking place in the sample, or the meter or electrode may be malfunctioning. This must be clearly noted in the logbook.

- Read and record the pH of the sample. pH shall be recorded to the nearest 0.01 pH unit. Also record the sample temperature.

- Rinse the electrode(s) with deionized water.

- Store the electrode(s) in an appropriate manner when not in use.

Any visual observation of conditions which may interfere with pH measurement, such as oily materials, or turbidity, shall be noted.

4.2 Measurement of Specific Conductance

4.2.1 General

Conductance provides a measure of dissolved ionic species in water and can be used to identify the direction and extent of migration of contaminants in groundwater or surface water. It can also be used as a measure of subsurface biodegradation or to indicate alternate sources of contamination.

Conductivity is a numerical expression of the ability of a water sample to carry an electric current. This value depends on the total concentration of the ionized substances dissolved in the water and the

temperature at which the measurement is made. The mobility of each of the various dissolved ions, their valences, and their actual and relative concentrations affect conductivity.

Most conductivity meters in use today display specific conductance (SC); units of milliSiemens per centimeter, which is the conductivity normalized to temperature @ 25°C. This format (SC) is the required units recorded on the sample log field form.

4.2.2 Principles of Equipment Operation

An aqueous system containing ions will conduct an electric current. In a direct-current field, the positive ions migrate toward the negative electrode, while the negatively charged ions migrate toward the positive electrode. Most inorganic acids, bases and salts (such as hydrochloric acid, sodium carbonate, or sodium chloride, respectively) are relatively good conductors. Conversely, organic compounds such as sucrose or benzene, which do not dissociate in aqueous solution, conduct a current very poorly, if at all.

A conductance cell and a Wheatstone Bridge (for the measurement of potential difference) may be used for measurement of electrical resistance. The ratio of current applied to voltage across the cell may also be used as a measure of conductance. The core element of the apparatus is the conductivity cell containing the solution of interest. Depending on ionic strength of the aqueous solution to be tested, a potential difference is developed across the cell which can be converted directly or indirectly (depending on instrument type) to a measurement of specific conductance.

4.2.3 Equipment

The following equipment is needed for taking specific conductance (SC) measurements:

- Stand alone portable conductivity meter, or combination meter (e.g., Horiba U-10), or combination meters equipped with an in-line sample chamber (e.g., YSI 600 series and Horiba U-22).
- Calibration solution, as specified by the manufacturer.
- Manufacturer's operation manual.

A variety of conductivity meters are available which may also be used to monitor salinity and temperature. Probe types and cable lengths vary, so equipment must be obtained to meet the specific requirement of the sampling program.

4.2.4 Measurement Techniques for Specific Conductance

The steps involved in taking specific conductance measurements are listed below (standardization is according to manufacturer's instructions):

- Check batteries and calibrate instrument before going into the field.
- Calibrate on a daily use basis (or as recommended by manufacturer), according to the manufacturer's instructions and record all pertinent information on an equipment calibration log sheet. Potassium chloride solutions with a SC closest to the values expected in the field shall be used for calibration.
- Rinse the cell with one or more portions of the sample to be tested or with deionized water.
- Immerse the electrode in the water and measure the conductivity.
- Read and record the results in a field logbook or sample log sheet.
- Rinse the electrode with deionized water.

If the specific conductance measurements become erratic, recalibrate the instrument and see the manufacturer's instructions for details.

4.3 Measurement of Temperature

4.3.1 General

In combination with other parameters, temperature can be a useful indicator of the likelihood of biological action in a water sample. It can also be used to trace the flow direction of contamination. Temperature measurements shall be taken in-situ, or as quickly as possible in the field. Collected water samples may rapidly equilibrate with the temperature of their surroundings.

4.3.2 Equipment

Temperature measurements may be taken with alcohol-toluene, mercury filled, dial-type thermometers or combination meters equipped with an in-line sample chamber (e.g., YSI 600 series and Horiba U-22). In addition, various meters such as specific conductance or dissolved oxygen meters, which have temperature measurement capabilities, may also be used. Using such instrumentation along with suitable probes and cables, in-situ measurements of temperature at great depths can be performed.

4.3.3 Measurement Techniques for Water Temperature

If a thermometer is used to determine the temperature for a water sample:

- Immerse the thermometer in the water until temperature equilibrium is obtained (1-3 minutes).
- Record values in a field logbook or sample log sheet.

If a temperature meter or probe is used, the instrument shall be calibrated according to manufacturer's recommendations.

4.4 Measurement of Dissolved Oxygen

4.4.1 General

Dissolved oxygen (DO) levels in natural water and wastewater depend on the physical, chemical and biochemical activities in the water body. Conversely, the growth of many aquatic organisms as well as the rate of corrosivity, are dependent on the dissolved oxygen concentration. Thus, analysis for dissolved oxygen is a key test in water pollution and waste treatment process control. If at all possible, DO measurements shall be taken in-situ, since concentration may show a large change in a short time if the sample is not adequately preserved.

The monitoring method discussed herein is limited to the use of dissolved oxygen meters only. Chemical methods of analysis (i.e., Winkler methods) are available, but require more equipment and greater sample manipulation. Furthermore, DO meters, using a membrane electrode, are suitable for highly polluted waters, because the probe is completely submersible and is not susceptible to interference caused by color, turbidity, colloidal material or suspended matter.

4.4.2 Principles of Equipment Operation

Dissolved oxygen probes are normally electrochemical cells that have two solid metal electrodes of different nobility immersed in an electrolyte. The electrolyte is retained by an oxygen-permeable membrane. The metal of highest nobility (the cathode) is positioned at the membrane. When a suitable potential exists between the two metals, reduction of oxygen to hydroxide ion (OH^-) occurs at the cathode surface. An electrical current is developed that is directly proportional to the rate of arrival of oxygen molecules at the cathode.

Since the current produced in the probe is directly proportional to the rate of arrival of oxygen at the cathode, it is important that a fresh supply of sample always be in contact with the membrane. Otherwise, the oxygen in the aqueous layer along the membrane is quickly depleted and false low readings are obtained. It is therefore necessary to stir the sample (or the probe) constantly to maintain fresh solution near the membrane interface. Stirring, however, shall not be so vigorous that additional oxygen is introduced through the air-water interface at the sample surface. To avoid this possibility, some probes are equipped with stirrers to agitate the solution near the probe, while leaving the surface of the solution undisturbed.

Dissolved oxygen probes are relatively unaffected by interferences. Interferences that can occur are reactions with oxidizing gases (such as chlorine) or with gases such as hydrogen sulfide, which are not easily depolarized from the indicating electrode. If a gaseous interference is suspected, it shall be noted in the field log book and checked if possible. Temperature variations can also cause interference because probes exhibit temperature sensitivity. Automatic temperature compensation is normally provided by the manufacturer.

4.4.3 Equipment

The following equipment is needed to measure dissolved oxygen concentration:

- Stand alone portable dissolved oxygen meter, or combination meter (e.g., Horiba U-10), or combination meters equipped with an in-line sample chamber (e.g., YSI 600 series and Horiba U-22).
- Sufficient cable to allow the probe to contact the sample.
- Manufacturer's operation manual.

4.4.4 Measurement Techniques for Dissolved Oxygen Determination

Probes differ as to specifics of use. Follow the manufacturer's instructions to obtain an accurate reading. The following general steps shall be used to measure the dissolved oxygen concentration:

- The equipment shall be calibrated and have its batteries checked before going to the field.

- The probe shall be conditioned in a water sample for as long a period as practical before use in the field. Long periods of dry storage followed by short periods of use in the field may result in inaccurate readings.

- The instrument shall be calibrated in the field according to manufacturer's recommendations or in a freshly air-saturated water sample of known temperature.
- Record all pertinent information on an equipment calibration sheet.
- Rinse the probe with deionized water.
- Immerse the probe in the water.
- Record the dissolved oxygen content and temperature of the sample in a field logbook or sample log sheet.
- Rinse the probe with deionized water.
- Recalibrate the probe when the membrane is replaced, or as needed. Follow the manufacturer's instructions.

Note that in-situ placement of the probe is preferable, since sample handling is not involved. This however, may not always be practical.

Special care shall be taken during sample collection to avoid turbulence which can lead to increased oxygen solubilization and positive test interferences.

4.5 Measurement of Oxidation-Reduction Potential

4.5.1 General

The oxidation-reduction potential (ORP) provides a measure of the tendency of organic or inorganic compounds to exist in an oxidized state. The ORP parameter therefore provides evidence of the likelihood of anaerobic degradation of biodegradable organics or the ratio of activities of oxidized to reduced species in the sample.

4.5.2 Principles of Equipment Operation

When an inert metal electrode, such as platinum, is immersed in a solution, a potential is developed at that electrode depending on the ions present in the solution. If a reference electrode is placed in the same solution, an ORP electrode pair is established. This electrode pair allows the potential difference

between the two electrodes to be measured and is dependent on the concentration of the ions in solution. By this measurement, the ability to oxidize or reduce species in solution may be determined. Supplemental measurements, such as dissolved oxygen, may be correlated with ORP to provide a knowledge of the quality of the solution, water, or wastewater.

4.5.3 Equipment

The following equipment is needed for measuring the oxidation-reduction potential of a solution:

- Combination meters with an in-line sample chamber (e.g., YSI 600 series and Horiba U-22).
- Reference solution as specified by the manufacturer.
- Manufacturer's operation manual.

4.5.4 Measurement Techniques for Oxidation-Reduction Potential

The following procedure is used for measuring oxidation-reduction potential:

- The equipment shall be checked using the manufacturer's recommended reference solution and have its batteries checked before going to the field.

- Thoroughly rinse the electrode with deionized water.

- If the probe does not respond properly to the recommended reference solution, then verify the sensitivity of the electrodes by noting the change in millivolt reading when the pH of a test solution is altered. The ORP will increase when the pH of a test solution decreases, and the ORP will decrease if the test solution pH is increased. Place the sample in a clean container and agitate the sample. Insert the electrodes and note the ORP drops sharply when the caustic is added (i.e., pH is raised) thus indicating the electrodes are sensitive and operating properly. If the ORP increases sharply when the caustic is added, the polarity is reversed and must be corrected in accordance with the manufacturer's instructions or the probe should be replaced.

- Record all pertinent information on an equipment calibration log sheet.

4.6 Measurement of Turbidity

4.6.1 General

Turbidity is an expression of the optical property that causes light to be scattered and absorbed rather than transmitted in a straight line through the sample. Turbidity in water is caused by suspended matter, such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, and microscopic organisms, including plankton.

It is important to obtain a turbidity reading immediately after taking a sample, since irreversible changes in turbidity may occur if the sample is stored too long.

4.6.2 Principles of Equipment Operation

Turbidity is measured by the Nephelometric Method. This method is based on a comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. The higher the scattered light intensity, the higher the turbidity.

Formazin polymer is used as the reference turbidity standard suspension because of its ease of preparation combined with a higher reproducibility of its light-scattering properties than clay or turbid natural water. The turbidity of a specified concentration of formazin suspension is defined as 40 nephelometric units. This same suspension has an approximate turbidity of 40 Jackson units when measured on the candle turbidmeter. Therefore, nephelometric turbidity units (NTU) based on the formazin preparation will approximate units derived from the candle turbidimeter but will not be identical to them.

4.6.3 Equipment

The following equipment is needed for turbidity measurement:

- Light meter (e.g., LaMotte 2020) which calibrates easily using test cells with standards of 0.0 NTUs, and 10 NTUs, or combination meter (e.g., Horiba U-10), or combination meter equipped with an in-line sample chamber (e.g., YSI 600 series and Horiba U-22).
- Calibration solution, as specified by the manufacturer.
- Manufacturer's operation manual.

4.6.4 Measurement Techniques for Turbidity

The steps involved in taking turbidity measurements utilizing an electrode (e) or light meter (l) are listed below (standardization is according to manufacturer's instructions):

- Check batteries and calibrate instrument before going into the field.
- Check the expiration date (etc.) of the solutions used for field calibration.
- Calibrate on a daily use basis, according to the manufacturer's instructions and record all pertinent information on an equipment calibration log sheet.
- Rinse the electrode with one or more portions of the sample to be tested or with deionized water (applies to "e").
- Fill the light meters glass test cell with ~5 ml of sample, screw on cap, wipe off glass, place test cell in light meter and close the lid (applies to "l").
- Immerse the electrode in the sample and measure the turbidity (applies to "e").
- The reading must be taken immediately as suspended solids will settle over time resulting in a lower, inaccurate turbidity reading.
- Read and record the results in a field logbook or sample log sheet. Include a physical description of the sample, including color, qualitative estimate of turbidity, etc.
- Rinse the electrode or test cell with deionized water.

STANDARD OPERATING PROCEDURE
SOP-07

SEDIMENT SAMPLING

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedure for sediment sampling in streams and other waterways.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

The following field forms and equipment are required for sediment sampling.

Sediment Sample Log Forms: A copy of this form is attached at the end of this SOP.
Writing utensil (preferably black pen with indelible ink)
Indelible marker
Bound field logbook
Disposable plastic trowels
Survey stakes and flagging: Used to mark sampling locations after completion of sampling.
Labeled sample containers: See SOP-02 for sample identification procedures. Sample containers are certified clean by the laboratory supplying the containers.
Sealable polyethylene bags
Shipping containers (containing ice)
Disposable medical-grade gloves (e.g., latex, nitrile)
Chain-of-Custody Form

3.0 SEDIMENT SAMPLE LOCATION SELECTION

Sampling locations for sediment will be chosen along stream channels and gullies where surface water is visibly flowing, if possible. At these locations, sediment samples will be collected from beneath the water surface at the water's edge. If water is not visibly present, then the sediment sample will be collected from an area of deposition where the finest sediment is present and the sediment is moist or wet.

4.0 SEDIMENT SAMPLING PROCEDURES

4.1 The sampler will wear clean, disposable medical-grade gloves. Clear vegetative matter or debris, if present, from the sample location using a disposable sampling trowel or spoon. Use the trowel to dig up and homogenize the sediment in an 18-inch-diameter circular area that is 6 inches deep. Stir the sediment within the circular area; do not move the sediment outside the circle. Also, do not dig or stir sediment that is deeper than 6 inches below the ground surface, until the next depth interval is sampled.

- Use the same trowel to scoop the homogenized sediment into the requisite labeled sample container(s).

4.2 Record the sample time (using military time) on the Sediment Sample Log Form and sample container labels. Record all other information required on the labels as specified by SOP-01.

4.3 Place the labeled sample container into a sealable polyethylene bag and then place the bag holding the sample container into a cooler containing ice.

4.4 Record date, sampling site, site conditions, location map, and other information (e.g., presence and flow rate of water in channel) on the Sediment Collection Log Sheet. Enter the sample information onto the Chain-of-Custody Form in accordance with SOP-03.

4.5 Using an indelible marker, write the sample identification on a survey stake, and drive the stake into the ground at the sample location. Tack a piece of brightly colored flagging to the stake. In addition, tie a piece of flagging to an overhead tree branch or other eye-level object to improve the ability to relocate the sampling site in the future.

5.0 ATTACHMENTS

1. Soil and Sediment Sample Log Sheet

ATTACHMENT 1

SOIL AND SEDIMENT SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

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:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
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):

STANDARD OPERATING PROCEDURE
SOP-08

BOREHOLE ADVANCEMENT AND SOIL CORING USING DIRECT-PUSH TECHNOLOGY AND HAND AUGER TECHNIQUES

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the procedures for collecting surface and subsurface soil cores from unconsolidated overburden materials using direct-push technology (DPT) and hand augering techniques at the NSA Crane facility.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Cut-resistant non-latex Impermeable Gloves
Cotton gloves
Disposable medical-grade gloves (e.g., latex, nitrile)
Writing utensil
Boring log sheets: A copy of this form is included in SOP-09.
DPT Equipment:
- **DPT Probe Rig**
- **Geoprobe® Macrocore Sampler or equivalent**
- **Geoprobe® Sampling Kit or equivalent**
- **Clear acetate liners:** one new liner for each soil core

Hand Auger Equipment:
- **Stainless Steel Auger Buckets**
- **Stainless Steel Extension Rods**
- **Cross Handle**

Required decontamination materials (see SOP-12)
Bentonite pellets

3.0 BOREHOLE ADVANCEMENT AND SOIL SAMPLING USING A DPT

DPT will be employed to collect soil cores. DPT refers to sampling tools and sensors that are driven directly into the ground without the use of conventional rotary drilling equipment. DPT typically utilizes

hydraulic pressure and/or percussion hammers to advance the sampling tools. Geoprobe® is a manufacturer of a hydraulically powered, percussion/probing machine utilizing DPT to collect subsurface environmental samples.

3.1 Clear the area to be sampled of any surface debris (herbaceous vegetation, twigs, rocks, litter, etc.).

3.2 Place a new clear acetate liner in the detachable sampling core barrel, and attach the coring device to the DPT rig.

3.3 Drive the sampler (lined with an acetate sleeve) into the ground to the desired depth using hydraulic pressure.

3.4 Retract the sampler from the borehole, and remove the acetate liner and the soil core from the sampler barrel.

3.5 Attach the metal trough from the sampling kit firmly to a suitable surface.

3.6 Place the acetate liner containing the soil core in the trough.

3.7 While wearing cut-resistant gloves (constructed of non-latex over cotton), cut the acetate liner through its entire length using the double-bladed knife that accompanies the Geoprobe® Sampling Kit. Then remove the strip of acetate from the trough to gain access to the collected soils. **CAUTION:** Do not attempt to cut the acetate liner while holding it in your hand.

3.8 Log the soil core on the Boring Log Sheet (see SOP-09).

3.09 Place the soil core in a stainless-steel mixing bowl, thoroughly homogenize, and collect the remainder of the soil sample aliquots, as described in SOP-10.

3.10 Repeat steps 3.2 through 3.11 for the next depth intervals.

3.11 Upon completion of the boring, backfill the borehole with the soil from the location. If insufficient soil is available to fill the hole to the ground surface, then bentonite pellets mixed with the soil will be used to backfill the hole. If soil materials from the boring are suspected of being contaminated, the soil boring will be backfilled with bentonite pellets up to the ground surface.

The contaminated material will be securely staged until arrangements are made for proper off-site disposal.

3.12 Decontaminate all soil sampling equipment in accordance with SOP-12 before collecting the next sample.

4.0 BOREHOLE ADVANCEMENT AND SOIL SAMPLING USING A HAND AUGER

Hand augers may be employed to collect soil cores when the area is inaccessible by the drill rig. A hand augering system generally consists of a variety of all stainless steel bucket bits (i.e. cylinders 6-1/2" long and 2-3/4", 3-1/4", and 4" in diameter), a series of extension rods (available in 2', 3', 4' and 5' lengths), a cross handle. A larger diameter bucket bit is commonly used to bore a hole to the desired sampling depth and then withdrawn. In turn, the larger diameter bit is replaced with a smaller diameter bit, lowered down the hole, and slowly turned into the soil at the completion depth or refusal. The apparatus is then withdrawn and the soil sample collected.

The hand auger can be used in a wide variety of soil conditions. It can be used to sample soil, both from the surface, or to depths in excess of 12 feet. However, the presence or rock layers and the collapse of the borehole normally contribute to its limiting factors.

4.1 Attach a properly decontaminated bucket bit into a clean extension rod and further attach the cross handle to the extension rod.

4.2 Clear the area to be sampled of any surface debris (vegetation, twigs, rocks, litter, etc.)

4.3 Begin augering to the desired sample depth (periodically removing accumulated soils from the bucket bit into a properly decontaminated stainless steel mixing bowl), and add additional rod extensions as necessary. Discard the top of the core (approximately 1"), which represents any loose material collected by the bucket bit before penetrating the sample material.

4.4 Log the soil core each time soil is placed into the mixing bowl on the Boring Log Sheet (see SOP-09). Also, note (in a field notebook or on standardized data sheets) the changes in the color, texture or odor of the soil.

4.5 After reaching the desired sample depth, slowly and carefully withdraw the apparatus from the borehole.

4.6 Utilizing a properly decontaminated stainless steel trowel or disposable trowel, remove the last of the sample material from the bucket bit and place into the properly decontaminated stainless steel mixing bowl and thoroughly homogenize the sample material prior to filling the sample containers, as described in SOP-10.

4.12 Excess soil core materials will be returned to the hole and tamped. If insufficient soil is available to fill the hole to the ground surface, then bentonite pellets mixed with the soil will be used to backfill the hole.

4.13 If contaminants may be present in the soil materials, then all excess soil core materials will be placed in a plastic bag (or drum if larger quantities). The bag will be tagged identifying the locations and depths from where the soils came from and the date. The bag will then be placed in a 55-gallon drum and stored on site until laboratory analyses of the soil are completed and classification of the soil waste materials can be determined (see SOP-11).

4.14 If soil materials from the boring are suspected of being contaminated, the soil boring will be backfilled with bentonite pellets up to the ground surface.

4.15 Decontaminate all soil sampling equipment in accordance with SOP-12 before collecting the next sample.

STANDARD OPERATING PROCEDURE
SOP-09

SOIL SAMPLE LOGGING

1.0 PURPOSE

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

2.0 FIELD FORMS AND EQUIPMENT

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

3.0 RESPONSIBILITIES

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

4.0 PROCEDURES FOR 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" (S) and "gravel" (G) 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 Color

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 Relative Density and Consistency

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. 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: _____

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	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**

* When rock coring, enter rock brokenness.
** 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-10

SURFACE AND SUBSURFACE SOIL SAMPLING

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the procedures to be used for surface and subsurface soil sampling using direct-push technology (DPT) or hand augers during field activities at the NSA Crane facility.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Writing utensil (preferably black pen with indelible ink)
Disposable medical-grade gloves (i.e. latex, nitrile)
Boring log
Soil sample logsheets
Stainless-steel mixing bowls
Stainless-steel trowel or soup spoon
Disposable trowels
Required sample containers: All sample containers including shipping coolers for analysis by fixed-base laboratories will be supplied and certified clean by the laboratory.
Required decontamination materials
Chain-of-custody records
Required personnel protective equipment (PPE)
Wooden stakes or pin flags
Survey tape
Marking Paint
Sealable polyethylene bags
Heavy-duty cooler
Ice
Razor knife
DPT Probe Rig and sampling equipment
Sample labels

3.0 COLLECTION OF OTHER SOIL SAMPLE ALIQUOTS

When soil cores are collected using DPT, such as Geoprobe®, 2-foot soil intervals will be collected in clear acetate tubes, which can be extracted from the Geoprobe® core barrel upon retrieval at the surface (see SOP-08). Note: A surface soil sample is collected from the 0- to 2-foot depth. Additional subsurface soil samples each consist of 2-foot core segments.

Slit the acetate liner lengthwise with a razor knife, remove a section of the liner, and expose the length of the soil interval (see SOP-08).

3.1 The soil interval will be composited and used to fill the sample containers. Any surface debris (e.g., herbaceous vegetation, twigs, rocks, litter, etc.) should first be removed from the top of the surface soil core. For other core intervals, the top 2 inches of each core should be discarded because it often contains material scraped from the side of the borehole and not fresh material from the bottom of the borehole.

3.2 Slide the remaining core material out of the acetate liner and into a clean, decontaminated stainless-steel mixing bowl. Mix the soil thoroughly with a stainless-steel spoon and remove gravel, large pebbles, and other coarse materials. Fill the required sample containers in the following order:

- Containers for organic analyses (including energetic and perchlorate)
- Container for metals
- Container for pH

3.3 Complete all required information on the sample labels (see SOP-01).

3.4 Fill in all required information on the sample tag and secure the tag to the sample container.

3.5 Place the sample container in a ziplock plastic bag and seal shut. Place the bag in a cooler containing ice and cool to 4°C ± 2°C.

3.6 Record the required information on the Soil Sample Log Sheet and the COC Record form.

4.0 COLLECTION OF SOIL SAMPLES USING A HAND AUGER

4.1 Utilizing a properly decontaminated stainless steel trowel or disposable trowel, remove the sample material from the bucket bit and place into a properly decontaminated stainless steel mixing bowl. Mix the soil thoroughly and remove gravel, large pebbles, and other coarse materials.

4.2 Fill the required sample containers for analysis.

4.3 Complete all required information on the sample labels (see SOP-01).

4.4 Fill in all required information on the sample tag and secure the tag to the sample container.

4.5 Place the sample container in a ziplock plastic bag and seal shut. Place the bag in a cooler containing ice and cool to 4°C ± 2°C.

4.6 Record the required information on the Soil Sample Log Sheet and the COC Record form.

5.0 PACKAGING AND SHIPPING OF SAMPLES

Samples will be packaged and shipped according to SOP-04.

6.0 ATTACHMENTS

1. Soil and Sediment Sample Log Sheet

ATTACHMENT 1

SOIL AND SEDIMENT SAMPLE LOG SHEET

Tetra Tech NUS, Inc.

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:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
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):

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 Naval Support Activity (NSA) Crane. The following types of IDW may be generated during this investigation:

- Soil sampling residues
- Decontamination solutions
- Personal protective equipment (PPE) and clothing
- Miscellaneous trash and incidental items

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Health and safety equipment (with PPE)
Bucket (with collected development/purge water)
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
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 may be generated during the site activities include decontamination solutions from sampling equipment. These wastes will be collected and containerized in a central location at NSA Crane for proper disposal.

3.2 Solid Wastes

Solid wastes that may be generated during site activities include soil and sediment sampling residues. Excess soil core/sampling materials will be returned to the hole and tamped. If insufficient soil is available to fill the hole to the ground surface, then bentonite pellets mixed with the soil will be used to backfill the hole and hydrated with potable water. Excess sediment sampling materials will be returned to the point of collection. The disposition of this materials will be carried out in a manner such as not to contribute further environmental degradation or pose a threat to public health or safety.

If gross contamination is encountered (e.g., any non-soil contaminated material such as free product), the grossly contaminated material that is brought to the surface will not be returned to the excavation but will be segregated from other excavated soil and placed on a plastic liner. The grossly contaminated material will be securely staged until arrangements are made for proper off-site disposal.

3.3 PPE and Incidental Trash

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

STANDARD OPERATING PROCEDURE
SOP-12

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
Isoproponal (optional)
Liqui-Nox® or Alconox® 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 Liqui-Nox® or Aloconox® detergent. Prepare the detergent wash solution in accordance with the instructions on the detergent container. Collect the 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 detergent 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 and 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-11.

STANDARD OPERATING PROCEDURE
SOP-13

GLOBAL POSITIONING SYSTEM

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the field personnel with basic instructions for operating a handheld Global Positioning System (GPS) unit allowing them to set GPS parameters in the receiver, record GPS positions on the field device, and update existing Geographic Information System (GIS) data. This SOP is specific to GIS quality data collection for Trimble®-specific hardware and software.

If possible, the Trimble® GeoXM™ or GeoXH™ operators manual should be downloaded onto the operator's personal computer for reference before or while in the field. The manual can be downloaded at http://trl.trimble.com/docushare/dsweb/Get/Document-311749/TerraSyncReferenceManual.pdf

Unless the operator is proficient in the setup and operation of the GPS unit, the Project Manager (or designee) should have the GPS unit shipped to the project-specific contact listed below in the Pittsburgh, Pennsylvania, office at least five working days prior to field mobilization so project-specific shape files, data points, background images, and correct coordinate systems can be uploaded into the unit.

Tetra Tech NUS, Inc.
Attn: John Wright
661 Anderson Drive, Bldg #7
Pittsburgh, PA 15220

2.0 REQUIRED EQUIPMENT

The following hardware and software should be utilized for locating and establishing GPS points in the field:

2.1 Required GPS Hardware

- Hand-held GPS unit capable of sub-meter accuracy (i.e. Trimble® GeoXM™ or Trimble® GeoXH™). This includes the docking cradle, A/C adapter, stylus, and USB cable for data transfer.
  Optional Accessories:
  - External antenna
  - Range pole
  - Hardware clamp (for mounting GPS unit to range pole)
  - GeoBeacon
- Writing utensil (preferably black pen with indelible ink)
- Non-metallic pin flags for temporary marking of positions

2.2 Required GPS Software

The following software is required to transfer data from the handheld GPS unit to a personal computer:

- Trimble® TerraSync version 2.6 or later (pre-loaded onto GPS unit from vendor)

- Microsoft® ActiveSync® version 4.5 or later. Download to personal computer from: http://www.microsoft.com/windowsmobile/en-us/downloads/microsoft/activesync-download.mspx

- Trimble® Data Transfer Utility (freeware version 2.1 or later). Download to personal computer from: http://www.trimble.com/datatransfer.shtml

3.0 START-UP PROCEDURES

Prior to utilizing the GPS in the field, ensure the unit is fully charged. The unit may come charged from the vendor, but an overnight charge is recommended prior to fieldwork.

The Geo-series GPS units require a docking cradle for both charging and data transfer. The Geo-series GPS unit is docked in the cradle by first inserting the domed end in the top of the cradle, then gently seating the contact end into the latch. The power charger is then connected to the cradle at the back end using the twist-lock connector. Attach a USB cable as needed between the cradle (B end) and the laptop/PC (A end).

It is recommended that the user also be familiar and check various Windows Mobile settings. One critical setting is the Power Options. The backlight should be set as needed to conserve power when not in use.

Start Up:

1) Power on the GPS unit by pushing the small green button located on the lower right front of the unit.

2) Utilizing the stylus that came with the GPS unit, launch **TerraSync** from the Windows Operating System by tapping on the start icon located in the upper left hand corner of the screen and then tap on **TerraSync** from the drop-down list.

3) If the unit does not default to the Setup screen, tap the Main Menu (uppermost left tab, just below the Windows icon) and select Setup.

4) If the unit was previously shipped to the Pittsburgh office for setup, you can skip directly to Section 4.0. However, to confirm or change settings, continue on to Section 3.1.

3.1 Confirm Setup Settings

Use the Setup section to confirm the TerraSync software settings. To open the Setup section, tap the Main Menu and select Setup.

1) Coordinate System
   a. Tap on the Coordinate System.
   b. Verify the project specs are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu. **Note:** It is always best to utilize the Cancel tab rather than the OK tab if no changes are made since configurations are easily changed by mistake.
   c. Tap on the Units.
   d. Verify the user preferences are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu.
   e. Tap Real-time Settings.
   f. Verify the Real-time Settings are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu.
   g. The GPS unit is now configured correctly for your specific project.

4.0 ANTENNA CONNECTION

1) If a connection has been properly made with the internal antenna, a satellite icon along with the number of usable satellites will appear at the top of the screen next to the battery icon. If no connection is made (e.g.: no satellite icon), tap on the GPS tab to connect antenna.
2) At this point the GPS unit is ready to begin collecting data.

5.0 COLLECTING NEW DATA IN THE FIELD

1) From the Main Menu select Data.
2) From the Sub Menu (located below the Data tab) select New which will bring up the New Data File menu.
3) An auto-generated filename appears and should be edited for your specific project. If the integral keyboard does not appear, tap the small keyboard icon at the bottom of the screen.
4) After entering the file name, tap Create to create the new file.
5) Confirm antenna height if screen appears. Antenna height is the height that the GPS unit will be held from the ground surface (Typically 3 to 4 feet).
6) The Choose Feature screen appears.

5.1 Collecting Features

1) If not already open, the Collect Feature screen can be opened by tapping the Main Menu and selecting Data. The Sub Menu should default to Collect.
2) **Do not begin the data logging process until you are at the specific location for which you intend to log the data.**
3) A known reference or two should be shot at the beginning and at the end of each day in which the GPS unit is being used. This allows for greater accuracy during post-processing of the data.
4) Upon arriving at the specific location, tap on Point_generic as the Feature Name.
5) Tap Create to begin data logging.
6) In the Comment Box enter sample ID or location-specific information.
7) Data logging can be confirmed by viewing the writing pencil icon in the upper part of the screen. Also, the logging counter will begin. As a Rule of Thumb, accumulate a minimum of 20 readings on the counter, per point, as indicated by the logging counter before saving the GPS data.
8) Once the counter has reached a minimum number of counts (i.e. 20), tap on OK to save the data point to the GPS unit. Confirm the feature. All data points are automatically saved within the GPS unit.

9) Repeat steps 2 through 8, giving each data point a unique name or number.

Note: If the small satellite icon or the pencil icon is blinking, this is an indication the GPS unit is not collecting data. A possible problem may be too few satellites. While still in data collection mode, tap on Main Menu in upper left hand corner of the screen and select Status. Skyplot will display as the default showing the number of available satellites. To increase productivity (number of usable satellites) use the stylus to move the pointer on the productivity and precision line to the left. This will decrease precision, but increase productivity. The precision and productivity of the GPS unit can be adjusted as the number of usable satellites changes throughout the day. To determine if GPS is correctly recording data, see Section 5.2.

5.2 Viewing Data or Entering Additional Data Points to the Current File

1) To view the stored data points in the current file, tap on the Main Menu and select Map. Stored data points for that particular file will appear. Use the +/- and <-/-> icons in lower left hand corner of screen to zoom in/out and to manipulate current view.
2) To return to data collection, tap on the Main Menu and select Data. You are now ready to continue to collect additional data points.

5.3 Viewing Data or Entering Data Points from an Existing File

1) To view data points from a previous file, tap on Main Menu and select Data, then select File Manager from the Sub Menu.
4) Highlight the file you want to view and select Map from the Main Menu.
5) To add data points to this file, tap on Main Menu and select Data. Continue to collect additional data points.

6.0 NAVIGATION

This section provides instructions on navigating to saved data points in an existing file within the GPS unit.

1) From the Main Menu select Map.
2) Using the Select tool, pick the point on the map to where you want to navigate.
3) The location you select will have a box placed around the point.
4) From the Options menu, choose the Set Nav Target (aka set navigation target).
5) The location will now have double blue flags indicating this point is you navigation target.

6) From the Main Menu select Navigation.
7) The dial and data on this page will indicate what distance and direction you need to travel to reach the desired target.
8) Follow the navigation guide until you reach the point you select.
9) Repeat as needed for any map point by going back to Step 1.

7.0 PULLING IN A BACKGROUND FILE

This section provides instructions on pulling in a pre-loaded background file. These files are helpful in visualizing your current location.

1) From the Main Menu select Map, then tap on Layers, select the background file from drop down list.
2) Select the project-specific background file from the list of available files.
3) Once the selected background file appears, the operator can manipulate the screen utilizing the +/- and <-/-> functions at the bottom of the screen.
4) In operating mode, the operator's location will show up on the background file as a floating "x".

8.0 DATA TRANSFER

This section provides instructions on how to transfer stored data on the handheld GPS unit to a personal computer. Prior to transferring data from the GPS unit to a computer, Microsoft ActiveSync and Trimble Data Transfer Utility software must be downloaded to the computer from the links provided in Section 2.2 (Required GPS Software). If a leased computer is utilized in which the operator cannot download files, see the Note at the end of Section 8.0.

1) See Attachment A at the end of this SOP for instructions on how to transfer data from the GPS to a personal computer.

Note: If you are unable to properly transfer data from the GPS unit to a personal computer, the unit should be shipped to the project-specific contact listed in Section 1.0 where the data will be transferred and the GPS unit then shipped back to the vendor.

9.0 SHUTTING DOWN

This section provides instruction for properly shutting down the GPS unit.

1) When shutting down the GPS unit for the day, first click on the "X" in the upper right hand corner.
2) You will be prompted to ensure you want to exit TerraSync. Select Yes.
3) Power off the GPS unit by pushing the small green button located on the bottom face of the unit.
4) Place the GPS unit in its cradle to recharge the battery overnight. Ensure the green charge light is visible on the charging cradle.

ATTACHMENT A

How to Transfer Trimble GPS Data between Data Collector and PC
original 11/21/06 (5/1/08 update) – John Wright

Remember – Coordinate System, Datum, and Units are critical!!!

Trimble Data Collection Devices:
Standard rental systems include the Trimble® ProXR/XRS backpack and the newer handheld GeoXT™ or GeoXH™ units. Some of the older backpack system may come with either a RECON "PDA-style" or a TSCe or TSC1 alpha-numeric style data collector.

The software on all of the above units should be Trimble® TerraSync (v 2.53 or higher – current version is 3.20) and to the user should basically look and function similar. The newer units and software versions (which should always be requested when renting) include enhancements for data processing, real-time display functions, and other features.

Data Transfer:
Trimble provides a free transfer utility program to aid in the transfer of GIS and field data. The Data Transfer Utility is a standalone program that will run on a standard office PC or laptop.

To connect a field data collector such as a RECON, GeoXM, GeoXT, GeoXH, or ProXH, you must first have Microsoft® ActiveSync® installed to allow the PC and the data collector to talk to one another. A standard USB cable is also needed to connect the two devices.

A CD or USB drive is provided with the data collector for use in data transfer. If needed, these programs are also available without charge via the web at:

• **Trimble Data Transfer Utility** (v 1.38) program to download the RECON or GeoXH field data to your PC: http://www.trimble.com/datatransfer.shtml

• **ActiveSync** from Microsoft to connect the data collector to the PC. The latest version (v4.5) can be found at: http://www.microsoft.com/windowsmobile/en-us/downloads/microsoft/activesync-download.mspx
(see page 2 for data transfer instructions)

To Transfer Data Collected in the Field:

• Install the Data Transfer and ActiveSync software installed on your PC
• Connect the RECON or GeoXH to your PC via an A/B USB cable (blade end and square end type "HP printer" style)
• ActiveSync should auto-detect the connection and recognize the data collector
• Make sure the data file desired is CLOSED in TerraSync prior to transfer
• Connect via ActiveSync as a guest (not a partnership)
• Run the Trimble Data Transfer Utility program on your PC
• Select "***GIS Datalogger on Windows CE***" or similar selection
• Hit the green connect icon to the right - the far right area should say "***Connected to ....***" if successful
• Select the "***Receive***" data tab (under device)
• Select "***Data***" from file types on the right
• Find the file(s) needed for data transfer. You can sort the data files by clicking on the date/time header
• Select or browse to a C-drive folder you can put this file for emailing
• When the file appears on the list, hit the "***Transfer All***"
• Go to your Outlook or other email, send a message to: John.Wright@tetratech.com (or GIS department)
• Attach the file(s) you downloaded from your C-drive. For each TerraSync data file created you should have a packet of multiple data files. All need to be sent as a group – make sure you attach all files (the number of files may vary – examples include: ssf, obx, obs, gix, giw, gis, gip, gic, dd, and car)

To Transfer GIS Data from PC to the Field Device (must be converted in Pathfinder Office):

• Obtain GIS file(s) desired from GIS Department and have converted to Trimble extension
• Contact John Wright (John.Wright@tetratech.com) if needed for file conversion and upload support
• The GIS file(s) can be quickly converted if requested and sent back to the field user in the needed "Trimble xxx.imp" extension via email – then quickly downloaded from Outlook to your PC for transfer
• Install the Data Transfer and ActiveSync software installed on your PC
• Connect the RECON or GeoXH to your PC via an A/B USB cable (blade end and square end type "HP printer" style)
• ActiveSync should auto-detect the connection and recognize the data collector
• Connect via ActiveSync as a guest (not a partnership)
• Run the Trimble Data Transfer Utility program on your PC
• Select "***GIS Datalogger on Windows CE***" or similar selection
• Hit the green connect icon to the right - the far right area should say "***Connected to ....***" if successful
• Select the "**Send**" data tab (under device)
• Select "**Data**" from file types on the right (you can also send background files)
• Browse to the location of the data on your PC (obtain the file from Pathfinder Office or from the person who converted the data for field use)
• Select the options as appropriate for the name and location of the data file to go on the data collector (usually you can choose main memory or a data storage card)
• When the file(s) appears on the list, hit the "***Transfer All***"
• Run TerraSync on the field device and open the existing data files. Your transferred file should appear (make sure you have selected Main Memory, Default, or Storage Card as appropriate)

STANDARD OPERATING PROCEDURE
SOP-14

CALIBRATION AND CARE OF WATER QUALITY METERS

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes the procedures for the calibration and maintenance of field instruments used to measure water quality and for the proper documentation of calibration and maintenance. The YSI 600-Series Environmental Monitoring System or the Horiba U20–Series multi-parameter water quality monitoring system will be used to measure pH, temperature, oxidation-reduction potential (ORP), specific conductance (SC), and dissolved oxygen (DO) in water. A LaMotte turbidity meter will be used in conjunction with the water quality meter to measure turbidity. The multi-parameter water quality meter will have a multiprobe sensor that can be used in conjunction with a flow-through cell attached to a pump discharge tube to measure water-quality parameters in a groundwater discharge or can be immersed in a surface water body such as a stream, pond, or drainage ditch. The LaMotte is a hand held meter that uses a multi-detector optical configuration to assure long term stability and minimize stray light and color interferences. All comparable equipment used in place of the equipment items identified in Section 2.0 below must be comparable in terms of sensitivity, accuracy, and precision.

2.0 FIELD FORMS AND EQUIPMENT LIST

The following logbooks, forms, equipment, and supplies are required:

Site logbook
Equipment calibration log sheet
YSI Model 600 Series and Sonde or Horiba U20 Series, or comparable
LaMotte Turbidity Meter, or comparable
Equipment manual
Calibration kit
Deionized water, paper towels, spray bottle, etc.
Disposable medical-grade gloves (e.g., latex, nitrile)

3.0 PROCEDURES

This section describes the calibration procedures for the YSI Model 600 series and Horiba U20 series multi-parameter water quality meters and the LaMotte turbidity meter. Each meter is supplied with an instruction manual and will be on-site and used as the calibration guidance documents. These procedures will list requirements for frequency of calibration and checks to be performed on the meter.

3.1 YSI Model 600 Series and Horiba U20 Series

The YSI Model 600 series and Sonde and the Horiba U20 series are multi-parameter water quality meters that may be used to measure open water bodies (streams, ponds, springs, etc.) with the probe guard installed. With the flow-through cell attached, the meters have the ability to measure water-quality parameters in groundwater via a pump discharge line. By performing the measurements in the discharge line coming directly from the well, the parameters are measured before the groundwater comes in contact with the atmosphere. The parameters measured by the YSI or Horiba meters for this field effort may include as follows:

- DO
- Specific conductivity
- Temperature
- pH
- Oxidation-reduction potential (ORP)
- Turbidity

3.1.1 Documentation

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 the frequency of calibration, type of standards used, and checks performed on calibration during the course of using the equipment. An Equipment Calibration Log must be maintained for each measuring device that requires calibration. Entries must be made for each day the equipment is used. A blank Equipment Calibration Log form is attached at the end of this SOP.

3.1.2 Calibration

The parameters listed in Section 3.1 (except temperature which is factory calibrated) must be calibrated prior to the start of each field effort. After this initial calibration, the meter will be checked each day that it

is used. If the check shows any out-of-specification readings, the specific probe will be recalibrated. Meter specifications can be found in the equipment manual, starting on page 5-1 (YSI) or page 93 (Horiba). Calibration and calibration checks will be documented in the field logbook and on the Equipment Calibration Log. The name, lot number, and expiration date for all calibration buffers and standards used will be recorded on the Equipment Calibration Log. The meter's model, serial number, and name of the rental company will also be recorded on the equipment calibration form.

3.1.3 Tips for Good Calibration

- The DO calibration is a water-saturated air calibration. Make certain to loosen the calibration cup seal to allow pressure to equilibrate before calibrating.

- For all other parameters, make certain that the applicable sensor is completely submersed in solution, and the parameter readings are stable when calibration values are entered.

- Use a small amount of calibration solution (previously used solution may be used, then discarded for this purpose) to pre-rinse the sonde.

- Fill a bucket with ambient temperature water to rinse the sonde between calibration solutions.

- Make sure to rinse and dry the probe between calibration solutions. This will reduce carry-over contamination and increase the accuracy of the calibration.

3.2 Lamotte Turbidity Meter

The Lamotte turbidity meter is a hand held meter that measures the amount of suspended matter in water using the nephelometric method.

3.2.1 Documentation

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 the frequency of calibration, type of standards used, and checks performed on calibration during the course of using the equipment. An Equipment Calibration Log must be maintained for each measuring device that requires calibration. Entries must be made for each day the equipment is used. A blank Equipment Calibration Log form is attached at the end of this SOP.

3.2.2 Calibration

Turbidity must be calibrated prior to the start of each field effort. After this initial calibration, the LaMotte will be calibrated each day that it is used. If the check shows any out-of-specification readings, the meter will be recalibrated. Meter specifications can be found in the equipment manual. Calibration and calibration checks will be documented in the field logbook and on the Equipment Calibration Log. The name, lot number, and expiration date for all calibration standards used will be recorded on the Equipment Calibration Log. The meter's model, serial number, and name of the rental company will also be recorded on the equipment calibration form.

3.2.3 Tips for Good Calibration

- Thoroughly clean the standard vial with a chem wipe to remove finger prints.
- Make sure that the vial is properly aligned in the meter according the manual recommendations.

4.0 MAINTENANCE

The YSI and/or Horiba Meter and LaMotte will be rented for the duration of each brief field effort. Therefore, little field maintenance will be required. For any maintenance other than the routine cleaning, calibrating, or battery charging, the instrument should be returned to the vendor and a replacement sent immediately to the job site.

4.1 Meter Storage for the YSI and Horiba Meters

For this field effort, the meter storage will be short term, [i.e. overnight or between work shifts (4-day break)]. During these breaks, the meter will be charged. One-half inch of tap water will be placed in the meter calibration cup, and the cup will be threaded onto the sonde. The key for short-term storage of probes is to use a minimal amount of water so the calibration cup will remain at 100 percent humidity. The water level must be low enough so that none of the probes are actually immersed. Proper storage of the sonde between usage will extend its life and will also ensure that the unit is ready for use as quickly as possible for the next application.

Multi-parameter short term storage key points:

- Use enough water to provide humidity but not enough to cover the probe surfaces.
- Make sure the storage vessel is sealed to minimize evaporation.
- Check periodically to make certain that water is still present.

4.2 Probe Cleaning for the YSI and Horiba Meters

- Rinse the probe thoroughly with potable water.
- Wash the probe in a mild solution of Liquinox and water and wipe with paper towels and/or cotton swabs.
- Rinse and soak the probe in deionized water.
- If stronger cleaning is required, consult Section 2.10 on page 89 (YSI) or Section 7.1 on page 86 (Horiba) of the equipment manual.

Note: Reagents that are used to calibrate and check the water quality meter may be hazardous. Review the health and safety plan and Material Safety Data Sheets (MSDSs), all of which are on file in the field trailer.

4.3 Meter Storage for the LaMotte Turbidity Meter

For this field effort, the meter storage will be short term, [i.e. overnight or between work shifts (4-day break)]. Proper storage of the meter between usage will extend its life and will also ensure that the unit is ready for use as quickly as possible for the next application.

Short term storage key points:

- Make sure the storage vessel is moisture free and sealed.

4.4 Sample Vial Cleaning

- Rinse the vial thoroughly with potable water to remove sediments.
- Wipe with chem-wipes or cotton swabs.

5.0 ATTACHMENTS

1. Equipment Calibration Log

ATTACHMENT 1
EQUIPMENT CALIBRATION LOG

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		

APPENDIX B

LABORATORY CERTIFICATION

ANSI-ASQ National Accreditation Board

SCOPE OF DoD-ELAP ACCREDITATION

APPL, Inc.
908 N. Temperance Avenue, Clovis, CA 93611
Diane Anderson Phone: 559-275-2175

TESTING

Valid to: October 23, 2011 Certificate Number: ADE-1410

I. Environmental

MATRIX	SPECIFIC TEST or GROUP of ANALYTES	SPECIFICATION OR STANDARD METHOD (all SW846 unless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Water / Wastewater	Acid Digestion for Metals Analysis	3010A	
Solid / Solid Waste	Acid digestion for Metals Analysis	3050B	
Water / Wastewater	Mercury Digestion and Analysis	245.1 / 7470A	AAS
Solid / Solid Waste	Mercury Digestion and Analysis	7471B	AAS
Water / Wastewater	Microwave assisted Acid Digestion for Metals Analysis	3015	Microwave
Solid / Solid Waste	Microwave assisted Acid Digestion for Metals Analysis	3051A	Microwave
Water / Wastewater	Purge and Trap for Aqueous Samples	5030B / 5030C	
Solid / Solid Waste	Closed-system purge and trap extraction for VOA analysis	5035 / 5035A	
Water / Wastewater	Separatory Funnel Extraction	3510C	
Solid / Solid Waste	Ultrasonic Extraction	3550B	Ultrasonic waterbath
Solid / Solid Waste	Soxhlet Extraction	3540C	Soxhlet Extractors

MATRIX	SPECIFIC TEST or GROUP of ANALYTES	SPECIFICATION OR STANDARD METHOD (all SW846 unless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Water / Wastewater	Liquid-Liquid Extraction	3520C	Liquid-Liquid Extractor
Water / Wastewater / Solid / Solid Waste	Silica gel cleanup	3630C	
Solid / Solid Waste	Incremental sampling	8330B, Appendix A	Puck mill grinder
Water / Wastewater / Solid / Solid Waste	Sulfur cleanup	3660B	
Water / Wastewater / Solid / Solid Waste	Sulfuric acid – permanganate cleanup	3665A	
Water / Wastewater / Solid / Solid Waste	Gel permeation cleanup	3640A	
Solid / Solid Waste	TCLP extraction	1311	Rotary Tumbler
Solid / Solid Waste	SPLP extraction	1312	Rotary Tumbler
Solid / Solid Waste	Waste Extraction Test (WET)	CCR Chapter 11, Article 5, Appendix II	Rotary Tumbler
Water / Wastewater	Total Dissolved Solids	160.1 / 2540C	Gravimetric
Water / Wastewater	Total Suspended Solids	160.2 / 2540D	Gravimetric
Water / Wastewater	Anion analysis	300.0 / 9056 / 9056A	Dionex Ion Chromatography
Solid / Solid Waste	Anion analysis	9056 / 9056A	Dionex Ion Chromatography
Water / Wastewater / Solid / Solid Waste	Perchlorate analysis	314.0	Dionex Ion Chromatography
Water / Wastewater / Solid / Solid Waste	Ammonia	350.1	Lachat Flow Injection Analysis
Water / Wastewater / Solid / Solid Waste	TKN	351.2	Lachat Flow Injection Analysis
Water / Wastewater / Solid / Solid Waste	Nitrate / Nitrite	353.2	Lachat Flow Injection Analysis
Water / Wastewater / Solid / Solid Waste	Sulfide	376.1	Titrimetric
Water	Fluoride	9214	Ion Selective Electrode

MATRIX	SPECIFIC TEST or GROUP of ANALYTES	SPECIFICATION OR STANDARD METHOD (all SW846 unless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Drinking Water / Water / Wastewater / Solid / Solid Waste	PCB Congeners	1668	High Resolution GC/MS
Water / Wastewater / Solid / Solid Waste	Perchlorate	6850	HPLC/Electrospray Ionization/MS
Water / Wastewater	Oil & Grease	1664A	Gravimetric
Water / Wastewater	Oil & Grease	5520B	Gravimetric
Water / Wastewater	TRPH	5520BF	Gravimetric
Water / Wastewater / Solid / Solid Waste	Total Metals	6010B / 6010C	ICP
Water / Wastewater / Solid / Solid Waste	Total Metals	6020 / 6020A	ICP/MS
Water / Wastewater / Solid / Solid Waste	Hexavalent Chromium	7196A	UV/Vis
Solid / Solid Waste	Alkaline digestion of Hexavalent Chromium	3060A	
Water / Wastewater	Hexavalent Chromium	218.6 / 7199	Dionex Ion Chromatography
Water / Wastewater / Solid / Solid Waste	Total Cyanide Distillation	9010B / 9010C	Midi-Distillation unit
Water / Wastewater / Solid / Solid Waste	Total Cyanide Analysis	9014	UV/Vis
Water / Wastewater	Corrosivity - pH	9040B	Ion Selective Electrode
Solid / Solid Waste	Corrosivity - pH	9045C / 9045D	Ion Selective Electrode
Water / Wastewater / Solid / Solid Waste	Chlorinated & Brominated Hydrocarbons	8011	GC/ECD
Water / Wastewater / Solid / Solid Waste	DRO/GRO	8015B/C/D	GC/FID
Water / Wastewater / Solid / Solid Waste	BTEX	8021B	GC/PID
Water / Solid	OP Pesticides	614 / 8141A / 8141B	GC/ECD
Water / Waste Water	OP Pesticides	614	GC/ECD

MATRIX	SPECIFIC TEST or GROUP of ANALYTES	SPECIFICATION OR STANDARD METHOD (all SW846 unless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Water / Waste Water	OCL Pesticides	608	GC/ECD
Water / Wastewater / Solid / Solid Waste	OCL Pesticides	8081A / 8081B	GC/ECD
Water / Waste Water	PCB	608	GC/ECD
Water / Wastewater / Solid / Solid Waste	PCB	8082 / 8082A	GC/ECD
Water / Waste Water	Herbicides	615	GC/ECD
Water / Wastewater / Solid / Solid Waste	Herbicides	8151A	GC/ECD
Water / Wastewater / Solid / Solid Waste	VOA	8260B / 8260C	GC/MS
Water / Wastewater / Solid / Solid Waste	PAH	8270 SIM	GC/MS
Water / Waste Water	Semi-VOA	625	GC/MS
Water / Wastewater / Solid / Solid Waste	Semi-VOA	8270C / 8270D	GC/MS
Water / Wastewater / Solid / Solid Waste	Dioxins	8290	HRGC/HRMS
Water / Wastewater / Solid / Solid Waste	Nitroaromatics & Nitramines & Nitroguanadine	8330A / 8330B / 8321A&B	HPLC
Water / Wastewater / Solid / Solid Waste	Carbamates	8321A / 8321B	HPLC
Solid / Solid Waste	Ignitability	1030	

Notes:

1. ** = As Applicable*
2. *This scope is part of and must be included with the Certificate of Accreditation No. ADE- 1410*

Vice President

ANSI-ASQ National Accreditation Board/ACLASS

January 20, 2010

Diane Anderson / Frances Lediaev
APPL Labs
908 N. Temperance Avenue
Clovis, CA 93611

Dear Diane and Frances,

We have reviewed the materials submitted by your laboratory and can confirm that they have provided sufficient documentation indicating all requirements of the DoD QSM have been met for the new analyte as you have requested. We can therefore recommend that any formal analyte list for method 8330A/8330B pertinent to APPL Labs could be expanded by the addition of propylene glycol dinitrate [PGDN] at this time.

We understand that there is no current commercial PT testing for this analyte, so it will not be in the "DoD-approved PT" listing that we publish, but that does not deny our verification of the competence review that has been favorable for this analyte.

The addition of this analyte to the existing, accredited method falls within the allowable additions to the method and does not require a new method listing in the current scope of accreditation.

Please let us know if we can assist you any further in this matter.

Best wishes.

Bill Hirt, Ph.D.

Bill Hirt, Ph.D.
ANSI/ASQ National Accreditation Board / ACLASS
Director of Accreditation

500 Montgomery St. Suite 625 | Alexandria, VA 22314 | 703-836-0025 | www.aclasscorp.com

DoD ELAP -- PT Performance Summary Review -- WP ALL							
Lab Name :	APPL, Inc.						
City/State :	Clovis, CA						
PT Provider Used :	ERA, Absolute, RTC, APG						
PartName	PartNumber	NELACCode	AnalyteName	EPAmethod#	PT results - Pass/Acceptable Results		
pH	4060	1900	pH	EPA 150.2	Pass		
WP pH @ 25°C	55061	1900	pH	EPA 150.2	Pass		
Solids (Total Solids, TSS, & TDS)	55085	1955	Total Dissolved Solids (TDS)	EPA 160.1	Pass		
WP Minerals #1	55144	1955	Total Dissolved Solids @ 180°C	EPA 160.1	Pass		
Solids	4030	1705	Total Dissolved Solids at 180C	EPA 160.1	Pass		
Solids (Total Solids, TSS, & TDS)	55085	1960	Non-Filterable Residue (TSS)	EPA 160.2	Pass		
Solids	4030	1960	Total Suspended Solids	EPA 160.2	Pass		
Oil & Grease	4120	1860	Oil & Grease	EPA 1664A	Pass		
Oil & Grease - n-Hexadecane & Stearic acid	55084	1860	Oil & Grease	EPA 1664A	Pass		
PCB Congeners in Water	PEO-403	9070	2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9025	2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9040	2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8980	2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8955	2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9050	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9045	2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8985	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9055	2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9005	2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8995	2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9000	2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8936	2,4,4'-Trichlorobiphenyl (PCB 28)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9060	3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9015	3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8965	3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8970	3,4,4',5-Tetrachlorobiphenyl (PCB 81)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9025	PCB (129)+(138)+(163)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9040	PCB (153)+(168)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9046	PCB (156)+(157)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	9070	PCB (180)+(193)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8936	PCB (20)+(28)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8980	PCB (90)+(101)+(113)	EPA 1668	Pass		
PCB Congeners in Water	PEO-403	8870	PCBs, total	EPA 1668	Pass		
Bromide	4850	1540	Bromide	EPA 300.0	Pass		
CWA Anions	55131	1540	Bromide (Br)	EPA 300.0	Pass		
Minerals	4050	1575	Chloride	EPA 300.0	Pass		
WP Minerals #1	55144	1575	Chloride	EPA 300.0	Pass		
Fluoride	4420	1730	Fluoride	EPA 300.0	Pass		
WP Minerals #2	55145	1730	Fluoride	EPA 300.0	Pass		
WP & DMRQA Nutrients	55035	1810	Nitrate as N	EPA 300.0	Pass		
WP Nitrate & Nitrite	55130	1810	Nitrate as N	EPA 300.0	Pass		
Nutrients	4020	1810	Nitrate Nitrogen as N	EPA 300.0	Pass		
Nitrate-Nitrite as N	4770	1820	Nitrate-Nitrite as N	EPA 300.0	Pass		
WP Nitrate & Nitrite	55130	1820	Nitrite + Nitrate as N	EPA 300.0	Pass		
Nitrite as N	4780	1840	Nitrite as N	EPA 300.0	Pass		
WP Nitrate & Nitrite	55130	1840	Nitrite as N	EPA 300.0	Pass		
Nutrients	4020	1870	Orthophosphate as P	EPA 300.0	Pass		
WP & DMRQA Nutrients	55035	1870	Orthophosphate as P	EPA 300.0	Pass		
Minerals	4050	2000	Sulfate	EPA 300.0	Pass		
WP Minerals #2	55145	2000	Sulfate	EPA 300.0	Pass		
Miscellaneous Analytes	PEI-051	1540	Bromide	EPA 300.0	Pass		
Minerals	PEI-051	1575	Chloride	EPA 300.0	Pass		
Minerals	PEI-051	1730	Fluoride	EPA 300.0	Pass		
Nutrients	PEI-051	1805	Nitrate as N	EPA 300.0	Pass		
Nutrients	PEI-051	1820	Nitrate+nitrite as N	EPA 300.0	Pass		
Nutrients	PEI-051	1840	Nitrite as N	EPA 300.0	Pass		
Nutrients	PEI-051	1870	Orthophosphate as P	EPA 300.0	Pass		
Minerals	PEI-051	2000	Sulfate	EPA 300.0	Pass		
WP Perchlorate	55116	1895	Perchlorate	EPA 314.0	Pass		
Fluoride	4420	1730	Fluoride	EPA 340.2	Pass		
WP Minerals #2	55145	1730	Fluoride	EPA 340.2	Pass		
WP & DMRQA Nutrients	55035	1515	Ammonia as N	EPA 350.1	Pass		
Nutrients	4020	1515	Ammonia Nitrogen as N	EPA 350.1	Pass		
Nutrients	4020	1795	Total Kjeldahl Nitrogen	EPA 351.2	Pass		
WP & DMRQA Nutrients #2	55064	1795	Total Kjeldahl Nitrogen	EPA 351.2	Pass		
WP & DMRQA Nutrients	55035	1810	Nitrate as N	EPA 353.2	Pass		
WP Nitrate & Nitrite	55130	1810	Nitrate as N	EPA 353.2	Pass		
Nutrients	4020	1810	Nitrate Nitrogen as N	EPA 353.2	Pass		
Nitrate-Nitrite as N	4770	1820	Nitrate-Nitrite as N	EPA 353.2	Pass		
WP Nitrate & Nitrite	55130	1820	Nitrite + Nitrate as N	EPA 353.2	Pass		
Nitrite as N	4780	1840	Nitrite as N	EPA 353.2	Pass		
WP Nitrate & Nitrite	55130	1840	Nitrite as N	EPA 353.2	Pass		
Sulfide	4900	2005	Sulfide	EPA 376.1	Pass		
Sulphide	55042	2005	Sulphide	EPA 376.1	Pass		
MBAS	4430	2025	MBAS	EPA 425.1	Pass		
Trace Metals	4070	1000	Aluminum	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1000	Aluminum	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1000	Aluminum	EPA 6010B	Pass		
Trace Metals 1	PEI-034-1	1000	Aluminum, Al	EPA 6010B	Pass		
Trace Metals	4070	1005	Antimony	EPA 6010B	Pass		
WP Trace Elements	55025	1005	Antimony	EPA 6010B	Pass		
Trace Metals 2	PEI-034-2	1005	Antimony, Sb	EPA 6010B	Pass		

Trace Metals	4070	1010	Arsenic	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1010	Arsenic	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1010	Arsenic	EPA 6010B	Pass		
Trace Metals 1	PEI-034-1	1010	Arsenic, As	EPA 6010B	Pass		
WP Trace Elements	55025	1015	Barium	EPA 6010B	Pass		
Trace Metals	586	1015	Barium	EPA 6010B	Pass		
Trace Metals	4070	1020	Beryllium	EPA 6010B	Pass		
WP Trace Elements	55025	1020	Beryllium	EPA 6010B	Pass		
Trace Metals 1	PEI-034-1	1020	Beryllium, Be	EPA 6010B	Pass		
Trace Metals	4070	1025	Boron	EPA 6010B	Pass		
WP Trace Elements	55025	1025	Boron	EPA 6010B	Pass		
WP Trace Elements	55025	1025	Boron	EPA 6010B	Pass		
Trace Metals 2	PEI-034-2	1025	Boron, B	EPA 6010B	Pass		
Trace Metals	4070	1030	Cadmium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1030	Cadmium	EPA 6010B	Pass		
WP Minerals #1	55144	1035	Calcium	EPA 6010B	Pass		
WP Minerals #1	55144	1550	Calcium Hardness (CaCO3)	EPA 6010B	Pass		
Trace Metals	4070	1040	Chromium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1040	Chromium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1050	Cobalt	EPA 6010B	Pass		
Trace Metals	586	1050	Cobalt	EPA 6010B	Pass		
Trace Metals	4070	1055	Copper	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1055	Copper	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1055	Copper	EPA 6010B	Pass		
Trace Metals	4070	1070	Iron	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1070	Iron	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1070	Iron	EPA 6010B	Pass		
Trace Metals	4070	1075	Lead	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1075	Lead	EPA 6010B	Pass		
WP Minerals #1	55144	1085	Magnesium	EPA 6010B	Pass		
Trace Metals	4070	1090	Manganese	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1090	Manganese	EPA 6010B	Pass		
Trace Metals 1	PEI-034-1	1090	Manganese, Mn	EPA 6010B	Pass		
Trace Metals	4070	1100	Molybdenum	EPA 6010B	Pass		
WP Trace Elements	55025	1100	Molybdenum	EPA 6010B	Pass		
WP Trace Elements	55025	1100	Molybdenum	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1105	Nickel	EPA 6010B	Pass		
Trace Metals	586	1105	Nickel	EPA 6010B	Pass		
WP Minerals #2	55145	1125	Potassium	EPA 6010B	Pass		
Trace Metals	4070	1140	Selenium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1140	Selenium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1140	Selenium	EPA 6010B	Pass		
Trace Metals 1	PEI-034-1	1140	Selenium, Se	EPA 6010B	Pass		
Trace Metals	4070	1150	Silver	EPA 6010B	Pass		
WP Trace Elements	55025	1150	Silver	EPA 6010B	Pass		
WP Trace Elements	55025	1150	Silver	EPA 6010B	Pass		
Trace Metals 2	PEI-034-2	1150	Silver, Ag	EPA 6010B	Pass		
WP Minerals #2	55145	1155	Sodium	EPA 6010B	Pass		
Trace Metals	4070	1160	Strontium	EPA 6010B	Pass		
WP Trace Elements	55025	1160	Strontium	EPA 6010B	Pass		
WP Trace Elements	55025	1160	Strontium	EPA 6010B	Pass		
Trace Metals 2	PEI-034-2	1160	Strontium, Sr	EPA 6010B	Pass		
Trace Metals	4070	1165	Thallium	EPA 6010B	Pass		
WP Trace Elements	55025	1165	Thallium	EPA 6010B	Pass		
WP Trace Elements	55025	1165	Thallium	EPA 6010B	Pass		
Trace Metals	4070	1175	Tin	EPA 6010B	Pass		
WP Tin	55095	1175	Tin	EPA 6010B	Pass		
Barium & Tin	PEI-034-5	1175	Tin, Sn	EPA 6010B	Pass		
Trace Metals	4070	1180	Titanium	EPA 6010B	Pass		
WP Trace Elements	55025	1180	Titanium	EPA 6010B	Pass		
WP Trace Elements	55025	1180	Titanium	EPA 6010B	Pass		
Trace Metals 2	PEI-034-2	1180	Titanium, Ti	EPA 6010B	Pass		
WP Minerals #1	55144	1755	Total Hardness (CaCO3)	EPA 6010B	Pass		
Trace Metals	4070	1185	Vanadium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1185	Vanadium	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1185	Vanadium	EPA 6010B	Pass		
Trace Metals	4070	1190	Zinc	EPA 6010B	Pass		
WP & DMRQA Trace Elements	55024	1190	Zinc	EPA 6010B	Pass		
Trace Metals	4070	1000	Aluminum	EPA 6020	Pass		
Trace Metals	4070	1005	Antimony	EPA 6020	Pass		
WP Trace Elements	55025	1005	Antimony	EPA 6020	Pass		
Trace Metals	4070	1010	Arsenic	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1010	Arsenic	EPA 6020	Pass		
Trace Metals	4070	1015	Barium	EPA 6020	Pass		
Trace Metals	4070	1020	Beryllium	EPA 6020	Pass		
WP Trace Elements	55025	1020	Beryllium	EPA 6020	Pass		
Trace Metals	4070	1025	Boron	EPA 6020	Pass		
Trace Metals	586	1025	Boron	EPA 6020	Pass		
Trace Metals	PEI-034	1025	Boron, B	EPA 6020	Pass		
Trace Metals	4070	1030	Cadmium	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1030	Cadmium	EPA 6020	Pass		
Trace Metals	4070	1040	Chromium	EPA 6020	Pass		
Trace Metals	4070	1050	Cobalt	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1050	Cobalt	EPA 6020	Pass		
Trace Metals	4070	1055	Copper	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1055	Copper	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1070	Iron	EPA 6020	Pass		
Trace Metals	586	1070	Iron	EPA 6020	Pass		
Trace Metals	4070	1075	Lead	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1075	Lead	EPA 6020	Pass		
Trace Metals	4070	1090	Manganese	EPA 6020	Pass		

WP & DMRQA Trace Elements	55024	1090	Manganese	EPA 6020	Pass		
Trace Metals	4070	1100	Molybdenum	EPA 6020	Pass		
WP Trace Elements	55025	1100	Molybdenum	EPA 6020	Pass		
Trace Metals	4070	1105	Nickel	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1105	Nickel	EPA 6020	Pass		
Trace Metals	4070	1140	Selenium	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1140	Selenium	EPA 6020	Pass		
Trace Metals	4070	1150	Silver	EPA 6020	Pass		
Trace Metals	4070	1160	Strontium	EPA 6020	Pass		
WP Trace Elements	55025	1160	Strontium	EPA 6020	Pass		
Trace Metals	4070	1165	Thallium	EPA 6020	Pass		
WP Trace Elements	55025	1165	Thallium	EPA 6020	Pass		
Trace Metals	4070	1175	Tin	EPA 6020	Pass		
WP Trace Elements	55025	1180	Titanium	EPA 6020	Pass		
Trace Metals	4070	1185	Vanadium	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1185	Vanadium	EPA 6020	Pass		
Trace Metals	4070	1190	Zinc	EPA 6020	Pass		
WP & DMRQA Trace Elements	55024	1190	Zinc	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1000	Aluminum, Al	EPA 6020	Pass		
Trace Metals 2	PEI-034-2	1005	Antimony, Sb	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1010	Arsenic, As	EPA 6020	Pass		
Barium & Tin	PEI-034-5	1015	Barium, Ba	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1020	Beryllium, Be	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1030	Cadmium, Cd	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1040	Chromium, Cr (total)	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1050	Cobalt, Co	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1055	Copper, Cu	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1070	Iron, Fe	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1075	Lead, Pb	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1090	Manganese, Mn	EPA 6020	Pass		
Trace Metals 2	PEI-034-2	1100	Molybdenum, Mo	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1105	Nickel, Ni	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1140	Selenium, Se	EPA 6020	Pass		
Trace Metals 2	PEI-034-2	1150	Silver, Ag	EPA 6020	Pass		
Barium & Tin	PEI-034-5	1175	Tin, Sn	EPA 6020	Pass		
Trace Metals 2	PEI-034-2	1180	Titanium, Ti	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1185	Vanadium, V	EPA 6020	Pass		
Trace Metals 1	PEI-034-1	1190	Zinc, Zn	EPA 6020	Pass		
Pesticides (WP)	4460	7355	4,4'-DDD	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7355	4,4'-DDD	EPA 608	Pass		
Pesticides (WP)	4460	7360	4,4'-DDE	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7360	4,4'-DDE	EPA 608	Pass		
Pesticides (WP)	4460	7365	4,4'-DDT	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7365	4,4'-DDT	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7810	4,4'-Methoxychlor	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7110	a-BHC	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7240	a-Chlordane	EPA 608	Pass		
Pesticides (WP)	4460	7025	Aldrin	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7025	Aldrin	EPA 608	Pass		
Pesticides (NELAC)	4460	7110	alpha-BHC	EPA 608	Pass		
Pesticides (NELAC)	4460	7240	alpha-Chlordane	EPA 608	Pass		
WP PCBs in Water	38091	8880	Aroclor 1016	EPA 608	Pass		
WP PCBs in Water	38094	8880	Aroclor 1016	EPA 608	Pass		
WP PCBs in Water	832S	8880	Aroclor 1016	EPA 608	Pass		
PCBs in Water	4130	8880	Aroclor 1016	EPA 608	Pass		
PCBs in Oil	4140	8880	Aroclor 1016 in Oil	EPA 608	Pass		
PCBs in Water	4130	8880	Aroclor 1016 Sample 1	EPA 608	Pass		
PCBs in Water	4130	8880	Aroclor 1016 Sample 2	EPA 608	Pass		
PCBs in Water	832S	8885	Aroclor 1221	EPA 608	Pass		
WP PCBs in Water	38091	8885	Aroclor 1221	EPA 608	Pass		
WP PCBs in Water	38094	8885	Aroclor 1221	EPA 608	Pass		
PCBs in Water	4130	8885	Aroclor 1221	EPA 608	Pass		
PCBs in Oil	4140	8885	Aroclor 1221 in Oil	EPA 608	Pass		
WP PCBs in Water	38091	8890	Aroclor 1232	EPA 608	Pass		
WP PCBs in Water	38094	8890	Aroclor 1232	EPA 608	Pass		
WP PCBs in Water	832S	8890	Aroclor 1232	EPA 608	Pass		
PCBs in Water	4130	8890	Aroclor 1232	EPA 608	Pass		
PCBs in Oil	4140	8890	Aroclor 1232 in Oil	EPA 608	Pass		
PCBs in Water	4130	8890	Aroclor 1232 Sample 1	EPA 608	Pass		
PCBs in Water	4130	8890	Aroclor 1232 Sample 2	EPA 608	Pass		
WP PCBs in Water	832S	8895	Aroclor 1242	EPA 608	Pass		
WP PCBs in Water	38091	8895	Aroclor 1242	EPA 608	Pass		
WP PCBs in Water	38094	8895	Aroclor 1242	EPA 608	Pass		
PCBs in Water	4130	8895	Aroclor 1242	EPA 608	Pass		
PCBs in Oil	4140	8895	Aroclor 1242 in Oil	EPA 608	Pass		
PCBs in Water	4130	8895	Aroclor 1242 Sample 1	EPA 608	Pass		
PCBs in Water	4130	8895	Aroclor 1242 Sample 2	EPA 608	Pass		
WP PCBs in Water	38091	8900	Aroclor 1248	EPA 608	Pass		
WP PCBs in Water	38094	8900	Aroclor 1248	EPA 608	Pass		
PCBs in Oil	4140	8900	Aroclor 1248 in Oil	EPA 608	Pass		
PCBs in Water	4130	8900	Aroclor 1248 Sample 1	EPA 608	Pass		
PCBs in Water	4130	8900	Aroclor 1248 Sample 2	EPA 608	Pass		
PCBs in Water	832S	8905	Aroclor 1254	EPA 608	Pass		
WP PCBs in Water	38091	8905	Aroclor 1254	EPA 608	Pass		
WP PCBs in Water	38094	8905	Aroclor 1254	EPA 608	Pass		
PCBs in Water	4130	8905	Aroclor 1254	EPA 608	Pass		
PCBs in Oil	4140	8905	Aroclor 1254 in Oil	EPA 608	Pass		
PCBs in Water	4130	8905	Aroclor 1254 Sample 1	EPA 608	Pass		
PCBs in Water	4130	8905	Aroclor 1254 Sample 2	EPA 608	Pass		
WP PCBs in Water	38091	8910	Aroclor 1260	EPA 608	Pass		
WP PCBs in Water	38094	8910	Aroclor 1260	EPA 608	Pass		

WP PCBs in Water	832S	8910	Aroclor 1260	EPA 608	Pass		
PCBs in Water	4130	8910	Aroclor 1260	EPA 608	Pass		
PCBs in Oil	4140	8910	Aroclor 1260 in Oil	EPA 608	Pass		
PCBs in Water	4130	8910	Aroclor 1260 Sample 1	EPA 608	Pass		
PCBs in Water	4130	8910	Aroclor 1260 Sample 2	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7115	b-BHC	EPA 608	Pass		
Pesticides (NELAC)	4460	7115	beta-BHC	EPA 608	Pass		
WP Pesticide Amp 2	38046	7250	Chlordane (total)	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7105	d-BHC	EPA 608	Pass		
Pesticides (NELAC)	4460	7105	delta-BHC	EPA 608	Pass		
Pesticides (WP)	4460	7470	Dieldrin	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7470	Dieldrin	EPA 608	Pass		
Pesticides (NELAC)	4460	7510	Endosulfan I	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7510	Endosulfan I	EPA 608	Pass		
Pesticides (NELAC)	4460	7515	Endosulfan II	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7515	Endosulfan II	EPA 608	Pass		
Pesticides (NELAC)	4460	7520	Endosulfan sulfate	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7520	Endosulfan sulfate	EPA 608	Pass		
Pesticides (NELAC)	4460	7540	Endrin	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7540	Endrin	EPA 608	Pass		
Pesticides (NELAC)	4460	7530	Endrin aldehyde	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7530	Endrin aldehyde	EPA 608	Pass		
Pesticides (NELAC)	4460	7535	Endrin Ketone	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7535	Endrin ketone	EPA 608	Pass		
Pesticides (NELAC)	4460	7120	gamma-BHC (Lindane)	EPA 608	Pass		
Pesticides (NELAC)	4460	7245	gamma-Chlordane	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7120	g-BHC (Lindane)	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7245	g-Chlordane	EPA 608	Pass		
Pesticides (WP)	4460	7685	Heptachlor	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7685	Heptachlor	EPA 608	Pass		
Pesticides (WP)	4460	7690	Heptachlor epoxide	EPA 608	Pass		
WP Organochlorine Pesticides	38122	7690	Heptachlor epoxide	EPA 608	Pass		
Pesticides (NELAC)	4460	7810	Methoxychlor	EPA 608	Pass		
WP PCBs in Transformer Oil	38092	8880	PCB in Oil 1016 or 1242	EPA 608	Pass		
WP PCBs in Water	38094	8880	PCB in Oil 1016 or 1242	EPA 608	Pass		
WP PCBs in Transformer Oil	38092	8905	PCB in Oil 1254	EPA 608	Pass		
WP PCBs in Water	38094	8905	PCB in Oil 1254	EPA 608	Pass		
WP PCBs in Transformer Oil	38092	8910	PCB in Oil 1260	EPA 608	Pass		
WP PCBs in Water	38094	8910	PCB in Oil 1260	EPA 608	Pass		
Total Chlordane	4160	7250	Total Chlordane	EPA 608	Pass		
Toxaphene	4270	8250	Toxaphene	EPA 608	Pass		
WP Acrolein & Acrylonitrile	38123	8250	Toxaphene	EPA 608	Pass		
Herbicides	4440	8655	2,4,5-T	EPA 615	Pass		
WP Herbicide Acid Mix #2	38136	8655	2,4,5-T	EPA 615	Pass		
Herbicides	4440	8650	2,4,5-TP (Silvex)	EPA 615	Pass		
Herbicides	4440	8545	2,4-D	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8545	2,4-D (2,4-Dichlorophenoxyacetic acid)	EPA 615	Pass		
Herbicides	4440	8560	2,4-DB	EPA 615	Pass		
WP Herbicide Acid Mix #2	38136	8560	2,4-DB	EPA 615	Pass		
Herbicides	4440	8600	3,5-Dichlorobenzoic acid	EPA 615	Pass		
WP Herbicide Acid Mix #2	38136	8600	3,5-Dichlorobenzoic acid	EPA 615	Pass		
Herbicides	4440	6500	4-Nitrophenol	EPA 615	Pass		
WP Herbicide Acid Mix #2	38136	6500	4-Nitrophenol	EPA 615	Pass		
Herbicides	4440	8505	Acifluorfen	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8505	Acifluorfen	EPA 615	Pass		
Herbicides	4440	8530	Bentazon	EPA 615	Pass		
WP Herbicide Acid Mix #2	38136	8530	Bentazon	EPA 615	Pass		
Herbicides	4440	8540	Chloramben	EPA 615	Pass		
Herbicides	4440	8550	Dacthal diacid (DCPA)	EPA 615	Pass		
Herbicides	4440	8555	Dalapon	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8555	Dalapon	EPA 615	Pass		
Herbicides	4440	8595	Dicamba	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8595	Dicamba	EPA 615	Pass		
Herbicides	4440	8605	Dichloroprop	EPA 615	Pass		
WP Herbicide Acid Mix #2	38136	8605	Dichloroprop	EPA 615	Pass		
Herbicides	4440	8620	Dinoseb	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8620	Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	EPA 615	Pass		
Herbicides	4440	7775	MCPA	EPA 615	Pass		
Herbicides	4440	7780	MCPP	EPA 615	Pass		
Herbicides	4440	6605	Pentachlorophenol	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	6605	Pentachlorophenol	EPA 615	Pass		
Herbicides	4440	8645	Picloram	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8645	Picloram	EPA 615	Pass		
WP Acrolein & Acrylonitrile	38123	8650	Silvex (2,4,5-TP)	EPA 615	Pass		
Volatiles	4170	5105	1,1,1,2-Tetrachloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5105	1,1,1,2-Tetrachloroethane	EPA 624	Pass		
Volatiles	4170	5160	1,1,1-Trichloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5160	1,1,1-Trichloroethane	EPA 624	Pass		
Volatiles	4170	5110	1,1,2,2-Tetrachloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5110	1,1,2,2-Tetrachloroethane	EPA 624	Pass		
Volatiles	4170	5165	1,1,2-Trichloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5165	1,1,2-Trichloroethane	EPA 624	Pass		
WP Oxygenates	38157	5185	1,1,2-Trichlorotrifluoroethane	EPA 624	Pass		
Volatiles	4170	4630	1,1-Dichloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4630	1,1-Dichloroethane	EPA 624	Pass		
Volatiles	4170	4640	1,1-Dichloroethene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4640	1,1-Dichloroethene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4670	1,1-Dichloropropene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5150	1,2,3-Trichlorobenzene	EPA 624	Pass		
Volatiles	4170	5180	1,2,3-Trichloropropane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5180	1,2,3-Trichloropropane	EPA 624	Pass		

Volatiles in Non-Potable Water	38083	5210	1,2,4-Trimethylbenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4570	1,2-Dibromo-3-chloropropane	EPA 624	Pass		
Volatiles	4170	4585	1,2-Dibromoethane (EDB)	EPA 624	Pass		
Volatile Aromatics	4450	4610	1,2-Dichlorobenzene	EPA 624	Pass		
Volatiles	4170	4610	1,2-Dichlorobenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4610	1,2-Dichlorobenzene	EPA 624	Pass		
Volatiles	4170	4635	1,2-Dichloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4635	1,2-Dichloroethane	EPA 624	Pass		
Volatiles	4170	4655	1,2-Dichloropropane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4655	1,2-Dichloropropane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5215	1,3,5-Trimethylbenzene	EPA 624	Pass		
Volatile Aromatics	4450	4615	1,3-Dichlorobenzene	EPA 624	Pass		
Volatiles	4170	4615	1,3-Dichlorobenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4615	1,3-Dichlorobenzene	EPA 624	Pass		
Volatile Aromatics	4450	4620	1,4-Dichlorobenzene	EPA 624	Pass		
Volatiles	4170	4620	1,4-Dichlorobenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4620	1,4-Dichlorobenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4665	2,2-Dichloropropane	EPA 624	Pass		
Volatiles	4170	4410	2-Buranone (Methyl ethyl ketone)	EPA 624	Pass		
WP Ketones	38134	4410	2-Butanone	EPA 624	Pass		
Volatiles	4170	4500	2-Chloroethyl vinyl ether	EPA 624	Pass		
WP 2-Chloroethyl vinyl ether	38128	4500	2-Chloroethyl vinyl ether	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4535	2-Chlorotoluene	EPA 624	Pass		
Volatiles	4170	4860	2-Hexanone	EPA 624	Pass		
WP Ketones	38134	4860	2-Hexanone	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4540	4-Chlorotoluene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4995	4-Methyl-2-pentanone	EPA 624	Pass		
WP Ketones	38134	4995	4-Methyl-2-pentanone	EPA 624	Pass		
Volatiles	4170	4995	4-Methyl-2-pentanone (MIBK)	EPA 624	Pass		
Volatiles	4170	4315	Acetone	EPA 624	Pass		
WP Ketones	38134	4315	Acetone	EPA 624	Pass		
Volatiles	4170	4325	Acrolein	EPA 624	Pass		
WP Acrolein & Acrylonitrile	38123	4325	Acrolein	EPA 624	Pass		
Volatiles	4170	4340	Acrylonitrile	EPA 624	Pass		
WP Acrolein & Acrylonitrile	38123	4340	Acrylonitrile	EPA 624	Pass		
CWA BTEX & MTBE	38166	4375	Benzene	EPA 624	Pass		
Volatile Aromatics	4450	4375	Benzene	EPA 624	Pass		
Volatiles	4170	4375	Benzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4375	Benzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4385	Bromobenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4390	Bromochloromethane	EPA 624	Pass		
Volatiles	4170	4395	Bromodichloromethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4395	Bromodichloromethane	EPA 624	Pass		
Volatiles	4170	4400	Bromoform	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4400	Bromoform	EPA 624	Pass		
Volatiles	4170	4950	Bromomethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4950	Bromomethane	EPA 624	Pass		
Volatiles	4170	4450	Carbon disulfide	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4450	Carbon disulphide	EPA 624	Pass		
Volatiles	4170	4455	Carbon tetrachloride	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4455	Carbon tetrachloride	EPA 624	Pass		
Volatiles	4170	4475	Chlorobenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4475	Chlorobenzene	EPA 624	Pass		
Volatiles	4170	4485	Chloroethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4485	Chloroethane	EPA 624	Pass		
Volatiles	4170	4505	Chloroform	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4505	Chloroform	EPA 624	Pass		
Volatiles	4170	4960	Chloromethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4960	Chloromethane	EPA 624	Pass		
Volatiles	4170	4645	cis-1,2-Dichloroethene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4645	cis-1,2-Dichloroethene	EPA 624	Pass		
Volatiles	4170	4680	cis-1,3-Dichloropropene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4680	cis-1,3-Dichloropropene	EPA 624	Pass		
Volatiles	4170	4575	Dibromochloromethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4575	Dibromochloromethane	EPA 624	Pass		
Volatiles	4170	4595	Dibromomethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4595	Dibromomethane	EPA 624	Pass		
Volatiles	4170	4625	Dichlorodifluoromethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4625	Dichlorodifluoromethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4765	Ethyl benzene	EPA 624	Pass		
CWA BTEX & MTBE	38166	4765	Ethylbenzene	EPA 624	Pass		
Volatile Aromatics	4450	4765	Ethylbenzene	EPA 624	Pass		
Volatiles	4170	4765	Ethylbenzene	EPA 624	Pass		
Volatiles	4170	4835	Hexachlorobutadiene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4835	Hexachlorobutadiene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4840	Hexachloroethane	EPA 624	Pass		
WP Oxygenates	38157	9375	Isopropyl ether (DIPE)	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4900	Isopropylbenzene	EPA 624	Pass		
CWA BTEX & MTBE	38166	5000	Methyl tert-butyl ether (MTBE)	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5000	Methyl tert-butyl ether (MTBE)	EPA 624	Pass		
WP Oxygenates	38157	5000	Methyl tert-butyl ether (MTBE)	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4975	Methylene chloride	EPA 624	Pass		
Volatiles	4170	4975	Methylene chloride (Dichloromethane)	EPA 624	Pass		
Volatiles	4170	5000	Methyl-t-butylether (MTBE)	EPA 624	Pass		
Volatiles	4170	5005	Naphthalene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5005	Naphthalene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4435	n-Butyl benzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5090	n-Propylbenzene	EPA 624	Pass		
WP Oxygenates	38157	5090	n-Propylbenzene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4910	p-Isopropyl toluene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4440	sec-Butyl benzene	EPA 624	Pass		

Volatiles	4170	5100	Styrene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5100	Styrene	EPA 624	Pass		
WP Oxygenates	38157	4370	tert-Amyl methyl ether (TAME)	EPA 624	Pass		
WP Oxygenates	38157	4420	tert-Butyl alcohol (t-Butanol)	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4445	tert-Butyl benzene	EPA 624	Pass		
WP Oxygenates	38157	4770	tert-Butyl ethyl ether (ETBE)	EPA 624	Pass		
Volatiles	4170	5115	Tetrachloroethene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5115	Tetrachloroethene	EPA 624	Pass		
CWA BTEX & MTBE	38166	5140	Toluene	EPA 624	Pass		
Volatile Aromatics	4450	5140	Toluene	EPA 624	Pass		
Volatiles	4170	5140	Toluene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5140	Toluene	EPA 624	Pass		
CWA BTEX & MTBE	38166	5260	Total Xylenes	EPA 624	Pass		
Volatile Aromatics	4450	5260	Total Xylenes	EPA 624	Pass		
Volatiles	4170	5260	Total Xylenes	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5260	Total Xylenes	EPA 624	Pass		
Volatiles	4170	4700	trans-1,2-Dichloroethene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4700	trans-1,2-Dichloroethene	EPA 624	Pass		
Volatiles	4170	4685	trans-1,3-Dichloropropene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	4685	trans-1,3-Dichloropropene	EPA 624	Pass		
Volatiles	4170	5170	Trichloroethene	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5170	Trichloroethene	EPA 624	Pass		
Volatiles	4170	5175	Trichlorofluoromethane	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5175	Trichlorofluoromethane	EPA 624	Pass		
Volatiles	4170	5225	Vinyl acetate	EPA 624	Pass		
Volatiles	4170	5235	Vinyl Chloride	EPA 624	Pass		
Volatiles in Non-Potable Water	38083	5235	Vinyl chloride	EPA 624	Pass		
Base Neutral Extractables	4200	6715	1,2,4,5-Tetrachlorobenzene	EPA 625	Pass		
Base Neutral Extractables	4200	5155	1,2,4-Trichlorbenzene	EPA 625	Pass		
WP Base/Neutrals	711	5155	1,2,4-Trichlorobenzene	EPA 625	Pass		
Base Neutral Extractables	4200	4610	1,2-Dichlorobenzene	EPA 625	Pass		
WP Base/Neutrals	711	4610	1,2-Dichlorobenzene	EPA 625	Pass		
Base Neutral Extractables	4200	4615	1,3-Dichlorobenzene	EPA 625	Pass		
WP Base/Neutrals	711	4615	1,3-Dichlorobenzene	EPA 625	Pass		
Base Neutral Extractables	4200	4620	1,4-Dichlorobenzene	EPA 625	Pass		
WP Base/Neutrals	711	4620	1,4-Dichlorobenzene	EPA 625	Pass		
Acid Extractables	4190	6735	2,3,4,6-Tetrachlorophenol	EPA 625	Pass		
Acids	712	6735	2,3,4,6-Tetrachlorophenol	EPA 625	Pass		
Acid Extractables	4190	6835	2,4,5-Trichlorophenol	EPA 625	Pass		
Acids	712	6835	2,4,5-Trichlorophenol	EPA 625	Pass		
Acids	712	6840	2,4,6-Trichlorophenol	EPA 625	Pass		
Acid Extractables	4190	6840	2,4,6-Trichlorphenol	EPA 625	Pass		
Acid Extractables	4190	6000	2,4-Dichlorophenol	EPA 625	Pass		
Acids	712	6000	2,4-Dichlorophenol	EPA 625	Pass		
Acid Extractables	4190	6130	2,4-Dimethylphenol	EPA 625	Pass		
Acids	712	6130	2,4-Dimethylphenol	EPA 625	Pass		
Acid Extractables	4190	6175	2,4-Dinitrophenol	EPA 625	Pass		
Acids	712	6175	2,4-Dinitrophenol	EPA 625	Pass		
WP Base/Neutrals	711	6185	2,4-Dinitrotoluene	EPA 625	Pass		
Base Neutral Extractables	4200	6185	2,4-Dinitrotoluene (2,4-DNT)	EPA 625	Pass		
Acid Extractables	4190	6005	2,6-Dichlorophenol	EPA 625	Pass		
Acids	712	6005	2,6-Dichlorophenol	EPA 625	Pass		
WP Base/Neutrals	711	6190	2,6-Dinitrotoluene	EPA 625	Pass		
Base Neutral Extractables	4200	6190	2,6-Dinitrotoluene (2,6-DNT)	EPA 625	Pass		
Base Neutral Extractables	4200	5795	2-Chloronaphthalene	EPA 625	Pass		
WP Base/Neutrals	711	5795	2-Chloronaphthalene	EPA 625	Pass		
Acid Extractables	4190	5800	2-Chlorophenol	EPA 625	Pass		
Acids	712	5800	2-Chlorophenol	EPA 625	Pass		
Acid Extractables	4190	6360	2-Methyl-4,6-Dinitrophenol	EPA 625	Pass		
Base Neutral Extractables	4200	6385	2-Methylnaphthalene	EPA 625	Pass		
WP Base/Neutrals	711	6385	2-Methylnaphthalene	EPA 625	Pass		
Acid Extractables	4190	6400	2-Methylphenol	EPA 625	Pass		
Acids	712	6400	2-Methylphenol	EPA 625	Pass		
WP Base/Neutrals	711	6460	2-Nitroaniline	EPA 625	Pass		
Base Neutral Extractables	4200	6460	2-Nitroaniline	EPA 625	Pass		
Acid Extractables	4190	6490	2-Nitrophenol	EPA 625	Pass		
Acids	712	6490	2-Nitrophenol	EPA 625	Pass		
Acid Extractables	4190	6410	3 & 4-Methylphenol	EPA 625	Pass		
Base Neutral Extractables	4200	5945	3,3'-Dichlorobenzidine	EPA 625	Pass		
WP Base/Neutrals	711	5945	3,3'-Dichlorobenzidine	EPA 625	Pass		
Acid Extractables	4190	6405	3-Methylphenol	EPA 625	Pass		
Base Neutral Extractables	4200	6465	3-Nitroaniline	EPA 625	Pass		
WP Base/Neutrals	711	6465	3-Nitroaniline	EPA 625	Pass		
Acids	712	6360	4,6-Dinitro-2-methylphenol	EPA 625	Pass		
Base Neutral Extractables	4200	5660	4-Bromophenyl phenyl ether	EPA 625	Pass		
WP Base/Neutrals	711	5660	4-Bromophenyl-phenylether	EPA 625	Pass		
Acid Extractables	4190	5700	4-Chloro-3-methylphenol	EPA 625	Pass		
Acids	712	5700	4-Chloro-3-methylphenol	EPA 625	Pass		
Base Neutral Extractables	4200	5745	4-Chloroaniline	EPA 625	Pass		
WP Base/Neutrals	711	5745	4-Chloroaniline	EPA 625	Pass		
Base Neutral Extractables	4200	5825	4-Chlorophenyl-phenylether	EPA 625	Pass		
WP Base/Neutrals	711	5825	4-Chlorophenyl-phenylether	EPA 625	Pass		
Acids	712	6410	4-Methylphenol	EPA 625	Pass		
Base Neutral Extractables	4200	6470	4-Nitroaniline	EPA 625	Pass		
WP Base/Neutrals	711	6470	4-Nitroaniline	EPA 625	Pass		
Acid Extractables	4190	6500	4-Nitrophenol	EPA 625	Pass		
Acids	712	6500	4-Nitrophenol	EPA 625	Pass		
Base Neutral Extractables	4200	5500	Acenaphthene	EPA 625	Pass		
PAH-GC & GCMS	4880	5500	Acenaphthene	EPA 625	Pass		
WP Base/Neutrals	711	5500	Acenaphthene	EPA 625	Pass		
Base Neutral Extractables	4200	5505	Acenaphthylene	EPA 625	Pass		

PAH-GC & GCMS	4880	5505	Acenaphthylene	EPA 625	Pass		
WP Base/Neutrals	711	5505	Acenaphthylene	EPA 625	Pass		
Base Neutral Extractables	4200	5545	Aniline	EPA 625	Pass		
WP Base/Neutrals	711	5545	Aniline	EPA 625	Pass		
Base Neutral Extractables	4200	5555	Anthracene	EPA 625	Pass		
PAH-GC & GCMS	4880	5555	Anthracene	EPA 625	Pass		
WP Base/Neutrals	711	5555	Anthracene	EPA 625	Pass		
Base Neutral Extractables	4200	5595	Benzidine	EPA 625	Pass		
WP Base/Neutrals	711	5595	Benzidine	EPA 625	Pass		
Base Neutral Extractables	4200	5575	Benzo(a)anthracene	EPA 625	Pass		
PAH-GC & GCMS	4880	5575	Benzo(a)anthracene	EPA 625	Pass		
WP Base/Neutrals	711	5575	Benzo(a)anthracene	EPA 625	Pass		
Base Neutral Extractables	4200	5580	Benzo(a)pyrene	EPA 625	Pass		
PAH-GC & GCMS	4880	5580	Benzo(a)pyrene	EPA 625	Pass		
WP Base/Neutrals	711	5580	Benzo(a)pyrene	EPA 625	Pass		
Base Neutral Extractables	4200	5585	Benzo(b)fluoranthene	EPA 625	Pass		
PAH-GC & GCMS	4880	5585	Benzo(b)fluoranthene	EPA 625	Pass		
WP Base/Neutrals	711	5585	Benzo(b)fluoranthene	EPA 625	Pass		
Base Neutral Extractables	4200	5590	Benzo(g,h,i)perylene	EPA 625	Pass		
PAH-GC & GCMS	4880	5590	Benzo(g,h,i)perylene	EPA 625	Pass		
WP Base/Neutrals	711	5590	Benzo(g,h,i)perylene	EPA 625	Pass		
Base Neutral Extractables	4200	5600	Benzo(k)fluoranthene	EPA 625	Pass		
PAH-GC & GCMS	4880	5600	Benzo(k)fluoranthene	EPA 625	Pass		
WP Base/Neutrals	711	5600	Benzo(k)fluoranthene	EPA 625	Pass		
Acid Extractables	4190	5610	Benzoic Acid	EPA 625	Pass		
Acids	712	5610	Benzoic acid	EPA 625	Pass		
Base Neutral Extractables	4200	5630	Benzyl alcohol	EPA 625	Pass		
WP Base/Neutrals	711	5630	Benzyl alcohol	EPA 625	Pass		
Base Neutral Extractables	4200	5670	Benzyl butyl phthalate	EPA 625	Pass		
Base Neutral Extractables	4200	5760	bis(2-Chloroethoxy) methane	EPA 625	Pass		
WP Base/Neutrals	711	5760	bis(2-Chloroethoxy) methane	EPA 625	Pass		
Base Neutral Extractables	4200	5765	bis(2-Chloroethyl) ether	EPA 625	Pass		
WP Base/Neutrals	711	5765	bis(2-Chloroethyl)ether	EPA 625	Pass		
Base Neutrals Extractables	4200	5780	bis(2-Chloroisopropyl) ether	EPA 625	Pass		
WP Base/Neutrals	711	5780	bis(2-Chloroisopropyl) ether	EPA 625	Pass		
Base Neutral Extractables	4200	6255	bis(2-Ethylhexyl) phthalate	EPA 625	Pass		
WP Base/Neutrals	711	6255	bis(2-Ethylhexyl) phthalate	EPA 625	Pass		
WP Base/Neutrals	711	5670	Butylbenzylphthalate	EPA 625	Pass		
Base Neutral Extractables	4200	5680	Carbazole	EPA 625	Pass		
WP Base/Neutrals	711	5680	Carbazole	EPA 625	Pass		
Base Neutral Extractables	4200	5855	Chrysene	EPA 625	Pass		
PAH-GC & GCMS	4880	5855	Chrysene	EPA 625	Pass		
WP Base/Neutrals	711	5855	Chrysene	EPA 625	Pass		
Base Neutrals Extractables	4200	5895	Dibenz(a,h) anthracene	EPA 625	Pass		
PAH-GC & GCMS	4880	5895	Dibenz(a,h) anthracene	EPA 625	Pass		
WP Base/Neutrals	711	5895	Dibenz(a,h) anthracene	EPA 625	Pass		
Base Neutral Extractables	4200	5905	Dibenzofuran	EPA 625	Pass		
WP Base/Neutrals	711	5905	Dibenzofuran	EPA 625	Pass		
Base Neutral Extractables	4200	6070	Diethyl phthalate	EPA 625	Pass		
WP Base/Neutrals	711	6070	Diethylphthalate	EPA 625	Pass		
Base Neutral Extractables	4200	6135	Dimethyl phthalate	EPA 625	Pass		
WP Base/Neutrals	711	6135	Dimethyl phthalate	EPA 625	Pass		
Base Neutral Extractables	4200	5925	Di-n-butylphthalate	EPA 625	Pass		
WP Base/Neutrals	711	5925	Di-n-butylphthalate	EPA 625	Pass		
Base Neutral Extractables	4200	6200	Di-n-octylphthalate	EPA 625	Pass		
WP Base/Neutrals	711	6200	Di-n-octylphthalate	EPA 625	Pass		
Base Neutral Extractables	4200	6265	Fluoranthene	EPA 625	Pass		
PAH-GC & GCMS	4880	6265	Fluoranthene	EPA 625	Pass		
WP Base/Neutrals	711	6265	Fluoranthene	EPA 625	Pass		
Base Neutral Extractables	4200	6270	Fluorene	EPA 625	Pass		
PAH-GC & GCMS	4880	6270	Fluorene	EPA 625	Pass		
WP Base/Neutrals	711	6270	Fluorene	EPA 625	Pass		
Base Neutral Extractables	4200	6275	Hexachlorobenzene	EPA 625	Pass		
WP Base/Neutrals	711	6275	Hexachlorobenzene	EPA 625	Pass		
Base Neutral Extractables	4200	4835	Hexachlorobutadiene	EPA 625	Pass		
WP Base/Neutrals	711	4835	Hexachlorobutadiene	EPA 625	Pass		
Base Neutral Extractables	4200	6285	Hexachlorocyclopentadiene	EPA 625	Pass		
WP Base/Neutrals	711	6285	Hexachlorocyclopentadiene	EPA 625	Pass		
Base Neutral Extractables	4200	4840	Hexachloroethane	EPA 625	Pass		
WP Base/Neutrals	711	4840	Hexachloroethane	EPA 625	Pass		
Base Neutral Extractables	4200	6315	Indeno (1,2,3-cd) pyrene	EPA 625	Pass		
PAH-GC & GCMS	4880	6315	Indeno (1,2,3-cd) pyrene	EPA 625	Pass		
WP Base/Neutrals	711	6315	Indeno (1,2,3-cd) pyrene	EPA 625	Pass		
WP Base/Neutrals	711	6320	Isophorone	EPA 625	Pass		
Base Neutral Extractables	4200	6320	Isophorone	EPA 625	Pass		
Base Neutral Extractables	4200	5005	Naphthalene	EPA 625	Pass		
PAH-GC & GCMS	4880	5005	Naphthalene	EPA 625	Pass		
WP Base/Neutrals	711	5005	Naphthalene	EPA 625	Pass		
WP Base/Neutrals	711	5015	Nitrobenzene	EPA 625	Pass		
Base Neutral Extractables	4200	5015	Nitrobenzene (NB)	EPA 625	Pass		
Base Neutral Extractables	4200	6530	N-nitrosodimethylamine	EPA 625	Pass		
WP Base/Neutrals	711	6530	N-Nitrosodimethylamine	EPA 625	Pass		
Base Neutral Extractables	4200	6545	N-Nitroso-di-n-propylamine	EPA 625	Pass		
WP Base/Neutrals	711	6545	N-Nitroso-di-n-propylamine	EPA 625	Pass		
Base Neutral Extractables	4200	6535	N-nitrosodiphenylamine	EPA 625	Pass		
WP Base/Neutrals	711	6535	N-Nitrosodiphenylamine	EPA 625	Pass		
Acid Extractables	4190	6605	Pentachlorophenol	EPA 625	Pass		
Acids	712	6605	Pentachlorophenol	EPA 625	Pass		
Acid Extractables	4190	6605	Pentachlorphenol	EPA 625	Pass		
Base Neutral Extractables	4200	6615	Phenanthrene	EPA 625	Pass		
PAH-GC & GCMS	4880	6615	Phenanthrene	EPA 625	Pass		

WP Base/Neutrals	711	6615	Phenanthrene	EPA 625	Pass		
Acid Extractables	4190	6625	Phenol	EPA 625	Pass		
Acids	712	6625	Phenol	EPA 625	Pass		
Base Neutral Extractables	4200	6665	Pyrene	EPA 625	Pass		
PAH-GC & GCMS	4880	6665	Pyrene	EPA 625	Pass		
WP Base/Neutrals	711	6665	Pyrene	EPA 625	Pass		
Base Neutral Extractables	4200	5095	Pyridine	EPA 625	Pass		
WP Base/Neutrals	711	5095	Pyridine	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5500	Acenaphthene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5505	Acenaphthylene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5555	Anthracene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5575	Benzo(a)anthracene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5580	Benzo(a)pyrene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5585	Benzo(b)fluoranthene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5601	Benzo(b+k)fluoranthene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5590	Benzo(g,h,i)perylene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5600	Benzo(k)fluoranthene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5855	Chrysene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5895	Dibenz(a,h) anthracene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	6265	Fluoranthene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	6270	Fluorene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	6315	Indeno (1,2,3-cd) pyrene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	5005	Naphthalene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	6615	Phenanthrene	EPA 625	Pass		
Base/Neutrals 1	PEO-121-1	6665	Pyrene	EPA 625	Pass		
WP Perchlorate	55116	1895	Perchlorate	EPA 6850	Pass		
WP Hexavalent Chromium	55096	1045	Chromium VI	EPA 7196A	Pass		
Hexavalent Chromium	4180	1045	Chromium, Hexavalent	EPA 7196A	Pass		
WP Hexavalent Chromium	55096	1045	Chromium VI	EPA 7199	Pass		
Hexavalent Chromium	4180	1045	Chromium, Hexavalent	EPA 7199	Pass		
Trace Metals	4070	1095	Mercury	EPA 7470A	Pass		
WP & DMRQA Trace Elements	55024	1095	Mercury	EPA 7470A	Pass		
Trace Metals 1	PEI-034-1	1095	Mercury, Hg	EPA 7470A	Pass		
PT Diesel Fuel #2 in Water	38114	9369	#2 Fuel Oil (Diesel)	EPA 8015B	Pass		
Diesel Range Organics (DRO)	4830	9369	Diesel Range Organics (DRO)	EPA 8015B	Pass		
Gasoline Range Organics (GRO)	4840	9408	Gasoline Range Organics	EPA 8015B	Pass		
PT Unleaded Gasoline in Water	38116	9408	Unleaded Gasoline 93 Octane	EPA 8015B	Pass		
BTEX	4230	4375	Benzene	EPA 8021B	Pass		
BTEX & MTBE in Water	643	4375	Benzene	EPA 8021B	Pass		
BTEX	4230	4765	Ethylbenzene	EPA 8021B	Pass		
BTEX & MTBE in Water	643	4765	Ethylbenzene	EPA 8021B	Pass		
BTEX	4230	5000	Methyl-t-butylether (MTBE)	EPA 8021B	Pass		
BTEX & MTBE in Water	643	5000	tert-Butyl methyl ether (MTBE)	EPA 8021B	Pass		
BTEX	4230	5140	Toluene	EPA 8021B	Pass		
BTEX & MTBE in Water	643	5140	Toluene	EPA 8021B	Pass		
BTEX	4230	5260	Total Xylenes	EPA 8021B	Pass		
BTEX & MTBE in Water	643	5260	Xylenes, total	EPA 8021B	Pass		
Pesticides (WP)	4460	7355	4,4'-DDD	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7355	4,4'-DDD	EPA 8081A	Pass		
Pesticides (WP)	4460	7360	4,4'-DDE	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7360	4,4'-DDE	EPA 8081A	Pass		
Pesticides (WP)	4460	7365	4,4'-DDT	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7365	4,4'-DDT	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7810	4,4'-Methoxychlor	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7110	a-BHC	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7240	a-Chlordane	EPA 8081A	Pass		
Pesticides (WP)	4460	7025	Aldrin	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7025	Aldrin	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7110	alpha-BHC	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7240	alpha-Chlordane	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7115	b-BHC	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7115	beta-BHC	EPA 8081A	Pass		
WP Pesticide Amp 3	38047	7250	Chlordane (total)	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7105	d-BHC	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7105	delta-BHC	EPA 8081A	Pass		
Pesticides (WP)	4460	7470	Dieldrin	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7470	Dieldrin	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7510	Endosulfan I	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7515	Endosulfan II	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7515	Endosulfan II	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7520	Endosulfan sulfate	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7520	Endosulfan sulfate	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7540	Endrin	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7540	Endrin	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7530	Endrin aldehyde	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7530	Endrin aldehyde	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7535	Endrin Ketone	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7535	Endrin ketone	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7120	gamma-BHC (Lindane)	EPA 8081A	Pass		
Pesticides (NELAC)	4470	7120	gamma-BHC (Lindane)	EPA 8081A	Pass		
Pesticides (NELAC)	4470	7245	gamma-Chlordane	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7245	gamma-Chlordane	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7120	g-BHC (Lindane)	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7245	g-Chlordane	EPA 8081A	Pass		
Pesticides (WP)	4460	7685	Heptachlor	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7685	Heptachlor	EPA 8081A	Pass		
Pesticides (WP)	4460	7690	Heptachlor epoxide	EPA 8081A	Pass		
WP Organochlorine Pesticides	38122	7690	Heptachlor epoxide	EPA 8081A	Pass		
Pesticides (NELAC)	4460	7810	Methoxychlor	EPA 8081A	Pass		
Total Chlordane	4160	7250	Total Chlordane	EPA 8081A	Pass		
Toxaphene	4270	8250	Toxaphene	EPA 8081A	Pass		

WP Acrolein & Acrylonitrile	38123	8250	Toxaphene	EPA 8081A	Pass		
WP PCBs in Water	38091	8880	Aroclor 1016	EPA 8082	Pass		
WP PCBs in Water	38094	8880	Aroclor 1016	EPA 8082	Pass		
WP PCBs in Water	832S	8880	Aroclor 1016	EPA 8082	Pass		
PCBs in Oil	4140	8880	Aroclor 1016 in Oil	EPA 8082	Pass		
PCBs in Water	4130	8880	Aroclor 1016 Sample 1	EPA 8082	Pass		
PCBs in Water	4130	8880	Aroclor 1016 Sample 2	EPA 8082	Pass		
PCBs in Water	PEO-020	8912	Aroclor 1016/1242	EPA 8082	Pass		
PCBs in Water	832S	8885	Aroclor 1221	EPA 8082	Pass		
WP PCBs in Water	38091	8885	Aroclor 1221	EPA 8082	Pass		
WP PCBs in Water	38094	8885	Aroclor 1221	EPA 8082	Pass		
PCBs in Oil	4140	8885	Aroclor 1221 in Oil	EPA 8082	Pass		
WP PCBs in Water	38091	8890	Aroclor 1232	EPA 8082	Pass		
WP PCBs in Water	38094	8890	Aroclor 1232	EPA 8082	Pass		
WP PCBs in Water	832S	8890	Aroclor 1232	EPA 8082	Pass		
PCBs in Oil	4140	8890	Aroclor 1232 in Oil	EPA 8082	Pass		
PCBs in Water	4130	8890	Aroclor 1232 Sample 1	EPA 8082	Pass		
WP PCBs in Water	832S	8895	Aroclor 1242	EPA 8082	Pass		
WP PCBs in Water	38091	8895	Aroclor 1242	EPA 8082	Pass		
WP PCBs in Water	38094	8895	Aroclor 1242	EPA 8082	Pass		
PCBs in Oil	4140	8895	Aroclor 1242 in Oil	EPA 8082	Pass		
PCBs in Water	4130	8895	Aroclor 1242 Sample 1	EPA 8082	Pass		
PCBs in Water	4130	8895	Aroclor 1242 Sample 2	EPA 8082	Pass		
WP PCBs in Water	38091	8900	Aroclor 1248	EPA 8082	Pass		
WP PCBs in Water	38094	8900	Aroclor 1248	EPA 8082	Pass		
PCBs in Oil	4140	8900	Aroclor 1248 in Oil	EPA 8082	Pass		
PCBs in Water	4130	8900	Aroclor 1248 Sample 1	EPA 8082	Pass		
PCBs in Water	4130	8900	Aroclor 1248 Sample 2	EPA 8082	Pass		
WP PCBs in Water	38091	8905	Aroclor 1254	EPA 8082	Pass		
WP PCBs in Water	38094	8905	Aroclor 1254	EPA 8082	Pass		
PCBs in Oil	4140	8905	Aroclor 1254 in Oil	EPA 8082	Pass		
PCBs in Water	4130	8905	Aroclor 1254 Sample 1	EPA 8082	Pass		
PCBs in Water	4130	8905	Aroclor 1254 Sample 2	EPA 8082	Pass		
WP PCBs in Water	38091	8910	Aroclor 1260	EPA 8082	Pass		
WP PCBs in Water	38094	8910	Aroclor 1260	EPA 8082	Pass		
WP PCBs in Water	832S	8910	Aroclor 1260	EPA 8082	Pass		
PCBs in Water	4130	8910	Aroclor 1260 Sample 1	EPA 8082	Pass		
PCBs in Water	4130	8910	Aroclor 1260 Sample 2	EPA 8082	Pass		
PCBs in Water	PEO-020	8880	Aroclor-1016 (PCB-1016)	EPA 8082	Pass		
PCBs in Water	PEO-020	8885	Aroclor-1221 (PCB-1221)	EPA 8082	Pass		
PCBs in Water	PEO-020	8890	Aroclor-1232 (PCB-1232)	EPA 8082	Pass		
PCBs in Water	PEO-020	8895	Aroclor-1242 (PCB-1242)	EPA 8082	Pass		
PCBs in Water	PEO-020	8900	Aroclor-1248 (PCB-1248)	EPA 8082	Pass		
PCBs in Water	PEO-020	8905	Aroclor-1254 (PCB-1254)	EPA 8082	Pass		
PCBs in Water	PEO-020	8910	Aroclor-1260 (PCB-1260)	EPA 8082	Pass		
WP PCBs in Transformer Oil	38092	8880	PCB in Oil 1016 or 1242	EPA 8082	Pass		
WP PCBs in Water	38094	8880	PCB in Oil 1016 or 1242	EPA 8082	Pass		
WP PCBs in Transformer Oil	38092	8905	PCB in Oil 1254	EPA 8082	Pass		
WP PCBs in Water	38094	8905	PCB in Oil 1254	EPA 8082	Pass		
WP PCBs in Transformer Oil	38092	8910	PCB in Oil 1260	EPA 8082	Pass		
WP PCBs in Water	38094	8910	PCB in Oil 1260	EPA 8082	Pass		
OP Pesticides/Herbicides	4810	7075	Azinphos-methyl	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7075	Azinphosmethyl (Guthion)	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7300	Chlorpyrifos	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7390	Demeton O&S	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7390	Demeton, (Mix of isomers O:S [35%:56%])	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7410	Diazinon	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7410	Diazinon	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	8610	Dichlorvos (DDVP)	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7475	Dimethoate	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	8625	Disulfoton	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	8625	Disulfoton	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7565	Ethion	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7565	Ethion	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7570	Ethoprop	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7580	Famphur	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7770	Malathion	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7770	Malathion	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7955	Parathion ethyl	EPA 8141A	Pass		
WP Organophosphorous Pesticides	38135	7825	Parathion methyl	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7955	Parathion, ethyl	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7825	Parathion, methyl	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	7985	Phorate	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	8000	Phosmet	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	8110	Ronnel	EPA 8141A	Pass		
OP Pesticides/Herbicides	4810	8200	Stirophos (Tetrachlorvinphos)	EPA 8141A	Pass		
Herbicides	4440	8655	2,4,5-T	EPA 8151A	Pass		
WP Herbicide Acid Mix #2	38136	8655	2,4,5-T	EPA 8151A	Pass		
Herbicides	4440	8650	2,4,5-TP (Silvex)	EPA 8151A	Pass		
Herbicides	4440	8545	2,4-D	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8545	2,4-D (2,4-Dichlorophenoxyacetic acid)	EPA 8151A	Pass		
Herbicides	4440	8560	2,4-DB	EPA 8151A	Pass		
WP Herbicide Acid Mix #2	38136	8560	2,4-DB	EPA 8151A	Pass		
Herbicides	4440	8600	3,5-Dichlorobenzoic acid	EPA 8151A	Pass		
WP Herbicide Acid Mix #2	38136	8600	3,5-Dichlorobenzoic acid	EPA 8151A	Pass		
Herbicides	4440	6500	4-Nitrophenol	EPA 8151A	Pass		
WP Herbicide Acid Mix #2	38136	6500	4-Nitrophenol	EPA 8151A	Pass		
Herbicides	4440	8505	Acifluorfen	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8505	Acifluorfen	EPA 8151A	Pass		
Herbicides	4440	8530	Bentazon	EPA 8151A	Pass		
WP Herbicide Acid Mix #2	38136	8530	Bentazon	EPA 8151A	Pass		

Herbicides	4440	8540	Chloramben	EPA 8151A	Pass		
Herbicides	4440	8550	Dacthal diacid (DCPA)	EPA 8151A	Pass		
Herbicides	4440	8555	Dalapon	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8555	Dalapon	EPA 8151A	Pass		
Herbicides	4440	8595	Dicamba	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8595	Dicamba	EPA 8151A	Pass		
Herbicides	4440	8605	Dichloroprop	EPA 8151A	Pass		
WP Herbicide Acid Mix #2	38136	8605	Dichloroprop	EPA 8151A	Pass		
Herbicides	4440	8620	Dinoseb	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8620	Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	EPA 8151A	Pass		
Herbicides	4440	7775	MCPA	EPA 8151A	Pass		
Herbicides	4440	7780	MCPP	EPA 8151A	Pass		
Herbicides	4440	6605	Pentachlorophenol	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	6605	Pentachlorophenol	EPA 8151A	Pass		
Herbicides	4440	8645	Picloram	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8645	Picloram	EPA 8151A	Pass		
WP Acrolein & Acrylonitrile	38123	8650	Silvex (2,4,5-TP)	EPA 8151A	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	5105	1,1,1,2-Tetrachloroethane	EPA 8260B	Pass		
Volatiles	4170	5105	1,1,1,2-Tetrachloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5105	1,1,1,2-Tetrachloroethane	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	5160	1,1,1-Trichloroethane	EPA 8260B	Pass		
Volatiles	4170	5160	1,1,1-Trichloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5160	1,1,1-Trichloroethane	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	5110	1,1,2,2-Tetrachloroethane	EPA 8260B	Pass		
Volatiles	4170	5110	1,1,2,2-Tetrachloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5110	1,1,2,2-Tetrachloroethane	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	5165	1,1,2-Trichloroethane	EPA 8260B	Pass		
Volatiles	4170	5165	1,1,2-Trichloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5165	1,1,2-Trichloroethane	EPA 8260B	Pass		
WP Oxygenates	38157	5185	1,1,2-Trichlorotrifluoroethane	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4630	1,1-Dichloroethane	EPA 8260B	Pass		
Volatiles	4170	4630	1,1-Dichloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4630	1,1-Dichloroethane	EPA 8260B	Pass		
Volatiles	4170	4640	1,1-Dichloroethene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4640	1,1-Dichloroethene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4640	1,1-Dichloroethylene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4670	1,1-Dichloropropene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5150	1,2,3-Trichlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	5180	1,2,3-Trichloropropane	EPA 8260B	Pass		
Volatiles	4170	5180	1,2,3-Trichloropropane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5180	1,2,3-Trichloropropane	EPA 8260B	Pass		
Volatiles	4170	5155	1,2,4-Trichlorobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5155	1,2,4-Trichlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5210	1,2,4-Trimethylbenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5210	1,2,4-Trimethylbenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4570	1,2-Dibromo-3-chloropropane	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4570	1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260B	Pass		
Volatiles	4170	4570	1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260B	Pass		
Volatiles	4170	4585	1,2-Dibromoethane (EDB)	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4585	1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260B	Pass		
Volatile Aromatics	4450	4610	1,2-Dichlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	4610	1,2-Dichlorobenzene	EPA 8260B	Pass		
Volatiles	4170	4610	1,2-Dichlorobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4610	1,2-Dichlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4635	1,2-Dichloroethane	EPA 8260B	Pass		
Volatiles	4170	4635	1,2-Dichloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4635	1,2-Dichloroethane	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4655	1,2-Dichloropropane	EPA 8260B	Pass		
Volatiles	4170	4655	1,2-Dichloropropane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4655	1,2-Dichloropropane	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5215	1,3,5-Trimethylbenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5215	1,3,5-Trimethylbenzene	EPA 8260B	Pass		
Volatile Aromatics	4450	4615	1,3-Dichlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	4615	1,3-Dichlorobenzene	EPA 8260B	Pass		
Volatiles	4170	4615	1,3-Dichlorobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4615	1,3-Dichlorobenzene	EPA 8260B	Pass		
Volatile Aromatics	4450	4620	1,4-Dichlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	4620	1,4-Dichlorobenzene	EPA 8260B	Pass		
Volatiles	4170	4620	1,4-Dichlorobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4620	1,4-Dichlorobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4665	2,2-Dichloropropane	EPA 8260B	Pass		
WP Ketones	38134	4410	2-Butanone	EPA 8260B	Pass		
Volatiles	4170	4410	2-Butanone (Methyl ethyl ketone)	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4410	2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4500	2-Chloroethyl vinyl ether	EPA 8260B	Pass		
Volatiles	4170	4500	2-Chloroethyl vinyl ether	EPA 8260B	Pass		
WP 2-Chloroethyl vinyl ether	38128	4500	2-Chloroethyl vinyl ether	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4535	2-Chlorotoluene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4860	2-Hexanone	EPA 8260B	Pass		
Volatiles	4170	4860	2-Hexanone	EPA 8260B	Pass		
WP Ketones	38134	4860	2-Hexanone	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4540	4-Chlorotoluene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4995	4-Methyl-2-pentanone	EPA 8260B	Pass		
WP Ketones	38134	4995	4-Methyl-2-pentanone	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4995	4-Methyl-2-pentanone (MIBK)	EPA 8260B	Pass		
Volatiles	4170	4995	4-Methyl-2-pentanone (MIBK)	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4315	Acetone	EPA 8260B	Pass		
Volatiles	4170	4315	Acetone	EPA 8260B	Pass		
WP Ketones	38134	4315	Acetone	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4320	Acetonitrile	EPA 8260B	Pass		
Volatiles	4170	4325	Acrolein	EPA 8260B	Pass		

WP Acrolein & Acrylonitrile	38123	4325	Acrolein	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4325	Acrolein (Propenal)	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4340	Acrylonitrile	EPA 8260B	Pass		
Volatiles	4170	4340	Acrylonitrile	EPA 8260B	Pass		
WP Acrolein & Acrylonitrile	38123	4340	Acrylonitrile	EPA 8260B	Pass		
CWA BTEX & MTBE	38166	4375	Benzene	EPA 8260B	Pass		
Volatile Aromatics	4450	4375	Benzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	4375	Benzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4375	Benzene	EPA 8260B	Pass		
Volatiles	4170	4375	Beznene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4385	Bromobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4390	Bromochloromethane	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4395	Bromodichloromethane	EPA 8260B	Pass		
Volatiles	4170	4395	Bromodichloromethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4395	Bromodichloromethane	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4400	Bromoform	EPA 8260B	Pass		
Volatiles	4170	4400	Bromoform	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4400	Bromoform	EPA 8260B	Pass		
Volatiles	4170	4950	Bromomethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4950	Bromomethane	EPA 8260B	Pass		
Volatiles	4170	4450	Carbon disulfide	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4450	Carbon disulphide	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4455	Carbon tetrachloride	EPA 8260B	Pass		
Volatiles	4170	4455	Carbon tetrachloride	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4455	Carbon tetrachloride	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4475	Chlorobenzene	EPA 8260B	Pass		
Volatiles	4170	4475	Chlorobenzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4475	Chlorobenzene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4485	Chloroethane	EPA 8260B	Pass		
Volatiles	4170	4485	Chloroethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4485	Chloroethane	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4505	Chloroform	EPA 8260B	Pass		
Volatiles	4170	4505	Chloroform	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4505	Chloroform	EPA 8260B	Pass		
Volatiles	4170	4960	Chloromethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4960	Chloromethane	EPA 8260B	Pass		
Volatiles	4170	4645	cis-1,2-Dichloroethene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4645	cis-1,2-Dichloroethene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4645	cis-1,2-Dichloroethylene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4680	cis-1,3-Dichloropropene	EPA 8260B	Pass		
Volatiles	4170	4680	cis-1,3-Dichloropropene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4680	cis-1,3-Dichloropropene	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4575	Dibromochloromethane	EPA 8260B	Pass		
Volatiles	4170	4575	Dibromochloromethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4575	Dibromochloromethane	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4595	Dibromomethane	EPA 8260B	Pass		
Volatiles	4170	4595	Dibromomethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4595	Dibromomethane	EPA 8260B	Pass		
Volatiles	4170	4625	Dichloridifluoromethane	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	4625	Dichlorodifluoromethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4625	Dichlorodifluoromethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4765	Ethyl benzene	EPA 8260B	Pass		
CWA BTEX & MTBE	38166	4765	Ethylbenzene	EPA 8260B	Pass		
Volatile Aromatics	4450	4765	Ethylbenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	4765	Ethylbenzene	EPA 8260B	Pass		
Volatiles	4170	4765	Ethylbenzene	EPA 8260B	Pass		
Volatiles	4170	4835	Hexachlorobutadiene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4835	Hexachlorobutadiene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4840	Hexachloroethane	EPA 8260B	Pass		
WP Oxygenates	38157	9375	Isopropyl ether (DIPE)	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4900	Isopropylbenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5240	m+p-Xylene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4950	Methyl bromide (Bromomethane)	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4960	Methyl chloride (Chloromethane)	EPA 8260B	Pass		
CWA BTEX & MTBE	38166	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass		
WP Oxygenates	38157	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4975	Methylene chloride	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	4975	Methylene chloride (Dichloromethane)	EPA 8260B	Pass		
Volatiles	4170	4975	Methylene chloride (Dichloromethane)	EPA 8260B	Pass		
Volatiles	4170	5000	Methyl-t-butylether (MTBE)	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5005	Naphthalene	EPA 8260B	Pass		
Volatiles	4170	5005	Naphthalene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5005	Naphthalene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4435	n-Butyl benzene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5090	n-Propylbenzene	EPA 8260B	Pass		
WP Oxygenates	38157	5090	n-Propylbenzene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5250	o-Xylene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4910	p-Isopropyl toluene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4440	sec-Butyl benzene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	5100	Styrene	EPA 8260B	Pass		
Volatiles	4170	5100	Styrene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5100	Styrene	EPA 8260B	Pass		
WP Oxygenates	38157	4370	tert-Amyl methyl ether (TAME)	EPA 8260B	Pass		
WP Oxygenates	38157	4420	tert-Butyl alcohol (t-Butanol)	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4445	tert-Butyl benzene	EPA 8260B	Pass		
WP Oxygenates	38157	4770	tert-Butyl ethyl ether (ETBE)	EPA 8260B	Pass		
Volatiles	4170	5115	Tetrachloroethene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5115	Tetrachloroethene	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	5115	Tetrachloroethylene (Perchloroethylene)	EPA 8260B	Pass		

CWA BTEX & MTBE	38166	5140	Toluene	EPA 8260B	Pass		
Volatile Aromatics	4450	5140	Toluene	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5140	Toluene	EPA 8260B	Pass		
Volatiles	4170	5140	Toluene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5140	Toluene	EPA 8260B	Pass		
CWA BTEX & MTBE	38166	5260	Total Xylenes	EPA 8260B	Pass		
Volatile Aromatics	4450	5260	Total Xylenes	EPA 8260B	Pass		
Volatiles	4170	5260	Total Xylenes	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5260	Total Xylenes	EPA 8260B	Pass		
Volatiles	4170	4700	trans-1,2-Dichloroethene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4700	trans-1,2-Dichloroethene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4700	trans-1,2-Dichloroethylene	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	4685	trans-1,3-Dichloropropene	EPA 8260B	Pass		
Volatiles	4170	4685	trans-1,3-Dichloropropene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	4685	trans-1,3-Dichloropropene	EPA 8260B	Pass		
Volatiles	4170	5170	Trichloroethene	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5170	Trichloroethene	EPA 8260B	Pass		
Volatile Organic Compounds 2	PEO-120-2	5170	Trichloroethene (Trichloroethylene)	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	5175	Trichlorofluoromethane	EPA 8260B	Pass		
Volatiles	4170	5175	Trichlorofluoromethane	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5175	Trichlorofluoromethane	EPA 8260B	Pass		
Volatile Organic Compounds 3B	PEO-120-3B	5225	Vinyl acetate	EPA 8260B	Pass		
Volatiles	4170	5225	Vinyl acetate	EPA 8260B	Pass		
Volatile Organic Compounds 3A	PEO-120-3A	5235	Vinyl chloride	EPA 8260B	Pass		
Volatiles	4170	5235	Vinyl chloride	EPA 8260B	Pass		
Volatiles in Non-Potable Water	38083	5235	Vinyl chloride	EPA 8260B	Pass		
Volatile Organic Compounds 1	PEO-120-1	5260	Xylene, total	EPA 8260B	Pass		
Base Neutral Extractables	4200	6715	1,2,4,5-Tetrachlorobenzene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5155	1,2,4-Trichlorbenzene	EPA 8270C	Pass		
WP Base/Neutrals	711	5155	1,2,4-Trichlorobenzene	EPA 8270C	Pass		
Base Neutral Extractables	4200	4610	1,2-Dichlorobenzene	EPA 8270C	Pass		
WP Base/Neutrals	711	4610	1,2-Dichlorobenzene	EPA 8270C	Pass		
Base Neutral Extractables	4200	4615	1,3-Dichlorobenzene	EPA 8270C	Pass		
WP Base/Neutrals	711	4615	1,3-Dichlorobenzene	EPA 8270C	Pass		
Base Neutral Extractables	4200	4620	1,4-Dichlorobenzene	EPA 8270C	Pass		
WP Base/Neutrals	711	4620	1,4-Dichlorobenzene	EPA 8270C	Pass		
Acid Extractables	4190	6735	2,3,4,6-Tetrachlorophenol	EPA 8270C	Pass		
Acids	712	6735	2,3,4,6-Tetrachlorophenol	EPA 8270C	Pass		
Acid Extractables	4190	6835	2,4,5-Trichlorophenol	EPA 8270C	Pass		
Acids	712	6835	2,4,5-Trichlorophenol	EPA 8270C	Pass		
Acids	712	6840	2,4,6-Trichlorophenol	EPA 8270C	Pass		
Acid Extractables	4190	6840	2,4,6-Trichlorphenol	EPA 8270C	Pass		
Acid Extractables	4190	6000	2,4-Dichlorophenol	EPA 8270C	Pass		
Acids	712	6000	2,4-Dichlorophenol	EPA 8270C	Pass		
Acid Extractables	4190	6130	2,4-Dimethylphenol	EPA 8270C	Pass		
Acids	712	6130	2,4-Dimethylphenol	EPA 8270C	Pass		
Acid Extractables	4190	6175	2,4-Dinitrophenol	EPA 8270C	Pass		
Acids	712	6175	2,4-Dinitrophenol	EPA 8270C	Pass		
WP Base/Neutrals	711	6185	2,4-Dinitrotoluene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6185	2,4-Dinitrotoluene (2,4-DNT)	EPA 8270C	Pass		
Acid Extractables	4190	6005	2,6-Dichlorophenol	EPA 8270C	Pass		
Acids	712	6005	2,6-Dichlorophenol	EPA 8270C	Pass		
WP Base/Neutrals	711	6190	2,6-Dinitrotoluene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6190	2,6-Dinitrotoluene (2,6-DNT)	EPA 8270C	Pass		
Base Neutral Extractables	4200	5795	2-Chloronaphthalene	EPA 8270C	Pass		
WP Base/Neutrals	711	5795	2-Chloronaphthalene	EPA 8270C	Pass		
Acid Extractables	4190	5800	2-Chlorophenol	EPA 8270C	Pass		
Acids	712	5800	2-Chlorophenol	EPA 8270C	Pass		
Acid Extractables	4190	6360	2-Methyl-4,6-Dinitrophenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	6385	2-Methylnaphthalene	EPA 8270C	Pass		
WP Base/Neutrals	711	6385	2-Methylnaphthalene	EPA 8270C	Pass		
Acid Extractables	4190	6400	2-Methylphenol	EPA 8270C	Pass		
Acids	712	6400	2-Methylphenol	EPA 8270C	Pass		
WP Base/Neutrals	711	6460	2-Nitroaniline	EPA 8270C	Pass		
Base Neutral Extractables	4200	6460	2-Nitroaniline	EPA 8270C	Pass		
Acid Extractables	4190	6490	2-Nitrophenol	EPA 8270C	Pass		
Acids	712	6490	2-Nitrophenol	EPA 8270C	Pass		
Acid Extractables	4190	6410	3 & 4-Methylphenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	5945	3,3'-Dichlorobenzidine	EPA 8270C	Pass		
WP Base/Neutrals	711	5945	3,3'-Dichlorobenzidine	EPA 8270C	Pass		
Acid Extractables	4190	6405	3-Methylphenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	6465	3-Nitroaniline	EPA 8270C	Pass		
WP Base/Neutrals	711	6465	3-Nitroaniline	EPA 8270C	Pass		
Acids	712	6360	4,6-Dinitro-2-methylphenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	5660	4-Bromophenyl phenyl ether	EPA 8270C	Pass		
WP Base/Neutrals	711	5660	4-Bromophenyl-phenylether	EPA 8270C	Pass		
Acid Extractables	4190	5700	4-Chloro-3-methylphenol	EPA 8270C	Pass		
Acids	712	5700	4-Chloro-3-methylphenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	5745	4-Chloroaniline	EPA 8270C	Pass		
WP Base/Neutrals	711	5745	4-Chloroaniline	EPA 8270C	Pass		
Base Neutral Extractables	4200	5825	4-Chlorophenyl-phenylether	EPA 8270C	Pass		
WP Base/Neutrals	711	5825	4-Chlorophenyl-phenylether	EPA 8270C	Pass		
Acids	712	6410	4-Methylphenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	6470	4-Nitroaniline	EPA 8270C	Pass		
WP Base/Neutrals	711	6470	4-Nitroaniline	EPA 8270C	Pass		
Acid Extractables	4190	6500	4-Nitrophenol	EPA 8270C	Pass		
Acids	712	6500	4-Nitrophenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	5500	Acenaphthene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5500	Acenaphthene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5500	Acenaphthene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5500	Acenaphthene	EPA 8270C	Pass		

WP Base/Neutrals	711	5500	Acenaphthene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5505	Acenaphthylene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5505	Acenaphthylene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5505	Acenaphthylene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5505	Acenaphthylene	EPA 8270C	Pass		
WP Base/Neutrals	711	5505	Acenaphthylene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5545	Aniline	EPA 8270C	Pass		
WP Base/Neutrals	711	5545	Aniline	EPA 8270C	Pass		
Base Neutral Extractables	4200	5555	Anthracene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5555	Anthracene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5555	Anthracene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5555	Anthracene	EPA 8270C	Pass		
WP Base/Neutrals	711	5555	Anthracene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5595	Benzidine	EPA 8270C	Pass		
WP Base/Neutrals	711	5595	Benzidine	EPA 8270C	Pass		
Base Neutral Extractables	4200	5575	Benzo(a)anthracene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5575	Benzo(a)anthracene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5575	Benzo(a)anthracene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5575	Benzo(a)anthracene	EPA 8270C	Pass		
WP Base/Neutrals	711	5575	Benzo(a)anthracene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5580	Benzo(a)pyrene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5580	Benzo(a)pyrene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5580	Benzo(a)pyrene	EPA 8270C	Pass		
WP Base/Neutrals	711	5580	Benzo(a)pyrene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5585	Benzo(b)fluoranthene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5585	Benzo(b)fluoranthene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5585	Benzo(b)fluoranthene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5585	Benzo(b)fluoranthene	EPA 8270C	Pass		
WP Base/Neutrals	711	5585	Benzo(b)fluoranthene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5601	Benzo(b+k)fluoranthene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass		
WP Base/Neutrals	711	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5600	Benzo(k)fluoranthene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5600	Benzo(k)fluoranthene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5600	Benzo(k)fluoranthene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5600	Benzo(k)fluoranthene	EPA 8270C	Pass		
WP Base/Neutrals	711	5600	Benzo(k)fluoranthene	EPA 8270C	Pass		
Acid Extractables	4190	5610	Benzoic Acid	EPA 8270C	Pass		
Acids	712	5610	Benzoic acid	EPA 8270C	Pass		
Base Neutral Extractables	4200	5630	Benzyl alcohol	EPA 8270C	Pass		
WP Base/Neutrals	711	5630	Benzyl alcohol	EPA 8270C	Pass		
Base Neutral Extractables	4200	5670	Benzyl butyl phthalate	EPA 8270C	Pass		
Base Neutral Extractables	4200	5760	bis(2-Chloroethoxy) methane	EPA 8270C	Pass		
WP Base/Neutrals	711	5760	bis(2-Chloroethoxy) methane	EPA 8270C	Pass		
Base Neutral Extractables	4200	5765	bis(2-Chloroethyl) ether	EPA 8270C	Pass		
WP Base/Neutrals	711	5765	bis(2-Chloroethyl)ether	EPA 8270C	Pass		
Base Neutrals Extractables	4200	5780	bis(2-Chloroisopropyl) ehter	EPA 8270C	Pass		
WP Base/Neutrals	711	5780	bis(2-Chloroisopropyl) ether	EPA 8270C	Pass		
Base Neutral Extractables	4200	6255	bis(2-Ethylhexyl) phthalate	EPA 8270C	Pass		
WP Base/Neutrals	711	6255	bis(2-Ethylhexyl) phthalate	EPA 8270C	Pass		
WP Base/Neutrals	711	5670	Butylbenzylphthalate	EPA 8270C	Pass		
Base Neutral Extractables	4200	5680	Carbazole	EPA 8270C	Pass		
WP Base/Neutrals	711	5680	Carbazole	EPA 8270C	Pass		
Base Neutral Extractables	4200	5855	Chrysene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5855	Chrysene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5855	Chrysene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5855	Chrysene	EPA 8270C	Pass		
WP Base/Neutrals	711	5855	Chrysene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5895	Dibenz(a,h) anthracene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5895	Dibenz(a,h) anthracene	EPA 8270C	Pass		
WP Base/Neutrals	711	5895	Dibenz(a,h) anthracene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5895	Dibenz(a,h) anthracene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5905	Dibenzofuran	EPA 8270C	Pass		
WP Base/Neutrals	711	5905	Dibenzofuran	EPA 8270C	Pass		
Base Neutral Extractables	4200	5895	Dibesz(a,h) anthracene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6070	Diethyl phthalate	EPA 8270C	Pass		
WP Base/Neutrals	711	6070	Diethylphthalate	EPA 8270C	Pass		
Base Neutral Extractables	4200	6135	Dimethyl phthalate	EPA 8270C	Pass		
WP Base/Neutrals	711	6135	Dimethyl phthalate	EPA 8270C	Pass		
Base Neutral Extractables	4200	5925	Di-n-butylphthalate	EPA 8270C	Pass		
WP Base/Neutrals	711	5925	Di-n-butylphthalate	EPA 8270C	Pass		
Base Neutral Extractables	4200	6200	Di-n-octylphthalate	EPA 8270C	Pass		
WP Base/Neutrals	711	6200	Di-n-octylphthalate	EPA 8270C	Pass		
Base Neutral Extractables	4200	6265	Fluoranthene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	6265	Fluoranthene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	6265	Fluoranthene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	6265	Fluoranthene	EPA 8270C	Pass		
WP Base/Neutrals	711	6265	Fluoranthene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6270	Fluorene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	6270	Fluorene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	6270	Fluorene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	6270	Fluorene	EPA 8270C	Pass		
WP Base/Neutrals	711	6270	Fluorene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6275	Hexachlorobenzene	EPA 8270C	Pass		
WP Base/Neutrals	711	6275	Hexachlorobenzene	EPA 8270C	Pass		
Base Neutral Extractables	4200	4835	Hexachlorobutadiene	EPA 8270C	Pass		
WP Base/Neutrals	711	4835	Hexachlorobutadiene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6285	Hexachlorocyclopentadiene	EPA 8270C	Pass		

WP Base/Neutrals	711	6285	Hexachlorocyclopentadiene	EPA 8270C	Pass		
Base Neutral Extractables	4200	4840	Hexachloroethane	EPA 8270C	Pass		
WP Base/Neutrals	711	4840	Hexachloroethane	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	6315	Indeno (1,2,3,cd) pyrene	EPA 8270C	Pass		
Base Neutral Extractables	4200	6315	Indeno (1,2,3-cd) pyrene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	6315	Indeno (1,2,3-cd) pyrene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	6315	Indeno (1,2,3-cd) pyrene	EPA 8270C	Pass		
WP Base/Neutrals	711	6315	Indeno (1,2,3-cd) pyrene	EPA 8270C	Pass		
WP Base/Neutrals	711	6320	Isophorone	EPA 8270C	Pass		
Base Neutral Extractables	4200	6320	Isophorone	EPA 8270C	Pass		
Base Neutral Extractables	4200	5005	Naphthalene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	5005	Naphthalene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	5005	Naphthalene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	5005	Naphthalene	EPA 8270C	Pass		
WP Base/Neutrals	711	5005	Naphthalene	EPA 8270C	Pass		
WP Base/Neutrals	711	5015	Nitrobenzene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5015	Nitrobenzene (NB)	EPA 8270C	Pass		
Base Neutral Extractables	4200	6530	N-nitrosodimethylamine	EPA 8270C	Pass		
WP Base/Neutrals	711	6530	N-Nitrosodimethylamine	EPA 8270C	Pass		
Base Neutral Extractables	4200	6545	N-Nitroso-di-n-propylamine	EPA 8270C	Pass		
WP Base/Neutrals	711	6545	N-Nitroso-di-n-propylamine	EPA 8270C	Pass		
Base Neutral Extractables	4200	6535	N-nitrosodiphenylamine	EPA 8270C	Pass		
WP Base/Neutrals	711	6535	N-Nitrosodiphenylamine	EPA 8270C	Pass		
Acid Extractables	4190	6605	Pentachlorophenol	EPA 8270C	Pass		
Acids	712	6605	Pentachlorophenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	6615	Phenanthrene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	6615	Phenanthrene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	6615	Phenanthrene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	6615	Phenanthrene	EPA 8270C	Pass		
WP Base/Neutrals	711	6615	Phenanthrene	EPA 8270C	Pass		
Acid Extractables	4190	6625	Phenol	EPA 8270C	Pass		
Acids	712	6625	Phenol	EPA 8270C	Pass		
Base Neutral Extractables	4200	6665	Pyrene	EPA 8270C	Pass		
Base/Neutrals 1	PEO-121-1	6665	Pyrene	EPA 8270C	Pass		
CWA Low Level PAH Mix	38010	6665	Pyrene	EPA 8270C	Pass		
PAH-GC & GCMS	4880	6665	Pyrene	EPA 8270C	Pass		
WP Base/Neutrals	711	6665	Pyrene	EPA 8270C	Pass		
Base Neutral Extractables	4200	5095	Pyridine	EPA 8270C	Pass		
WP Base/Neutrals	711	5095	Pyridine	EPA 8270C	Pass		
Base Neutral Extractables	4200	6715	1,2,4,5-Tetrachlorobenzene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5155	1,2,4-Trichlorbenzene	EPA 8270D	Pass		
WP Base/Neutrals	711	5155	1,2,4-Trichlorobenzene	EPA 8270D	Pass		
WP Base/Neutrals	711	4610	1,2-Dichlorobenzene	EPA 8270D	Pass		
Base Neutral Extractables	4200	4610	1,2-Dichlorobenzene	EPA 8270D	Pass		
WP Base/Neutrals	711	4615	1,3-Dichlorobenzene	EPA 8270D	Pass		
Base Neutral Extractables	4200	4615	1,3-Dichlorobenzene	EPA 8270D	Pass		
WP Base/Neutrals	711	4620	1,4-Dichlorobenzene	EPA 8270D	Pass		
Base Neutral Extractables	4200	4620	1,4-Dichlorobenzene	EPA 8270D	Pass		
Acids	712	6735	2,3,4,6-Tetrachlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6735	2,3,4,6-Tetrachlorophenol	EPA 8270D	Pass		
Acids	712	6835	2,4,5-Trichlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6835	2,4,5-Trichlorophenol	EPA 8270D	Pass		
Acids	712	6840	2,4,6-Trichlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6840	2,4,6-Trichlorphenol	EPA 8270D	Pass		
Acids	712	6000	2,4-Dichlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6000	2,4-Dichlorophenol	EPA 8270D	Pass		
Acids	712	6130	2,4-Dimethylphenol	EPA 8270D	Pass		
Acid Extractables	4190	6130	2,4-Dimethylphenol	EPA 8270D	Pass		
Acids	712	6175	2,4-Dinitrophenol	EPA 8270D	Pass		
Acid Extractables	4190	6175	2,4-Dinitrophenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6185	2,4-Dinitrotoluene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6185	2,4-Dinitrotoluene (2,4-DNT)	EPA 8270D	Pass		
Acids	712	6005	2,6-Dichlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6005	2,6-Dichlorophenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6190	2,6-Dinitrotoluene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6190	2,6-Dinitrotoluene (2,6-DNT)	EPA 8270D	Pass		
WP Base/Neutrals	711	5795	2-Chloronaphthalene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5795	2-Chloronaphthalene	EPA 8270D	Pass		
Acids	712	5800	2-Chlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	5800	2-Chlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6360	2-Methyl-4,6-Dinitrophenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6385	2-Methylnaphthalene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6385	2-Methylnaphthalene	EPA 8270D	Pass		
Acids	712	6400	2-Methylphenol	EPA 8270D	Pass		
Acid Extractables	4190	6400	2-Methylphenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6460	2-Nitroaniline	EPA 8270D	Pass		
Base Neutral Extractables	4200	6460	2-Nitroaniline	EPA 8270D	Pass		
Acids	712	6490	2-Nitrophenol	EPA 8270D	Pass		
Acid Extractables	4190	6490	2-Nitrophenol	EPA 8270D	Pass		
WP Base/Neutrals	711	5945	3,3'-Dichlorobenzidine	EPA 8270D	Pass		
Base Neutral Extractables	4200	5945	3,3'-Dichlorobenzidine	EPA 8270D	Pass		
Acid Extractables	4190	6405	3-Methylphenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6465	3-Nitroaniline	EPA 8270D	Pass		
Base Neutral Extractables	4200	6465	3-Nitroaniline	EPA 8270D	Pass		
Acids	712	6360	4,6-Dinitro-2-methylphenol	EPA 8270D	Pass		
Base Neutral Extractables	4200	5660	4-Bromophenyl phenyl ether	EPA 8270D	Pass		
WP Base/Neutrals	711	5660	4-Bromophenyl-phenylether	EPA 8270D	Pass		
Acids	712	5700	4-Chloro-3-methylphenol	EPA 8270D	Pass		
Acid Extractables	4190	5700	4-Chloro-3-methylphenol	EPA 8270D	Pass		
WP Base/Neutrals	711	5745	4-Chloroaniline	EPA 8270D	Pass		
Base Neutral Extractables	4200	5745	4-Chloroaniline	EPA 8270D	Pass		

WP Base/Neutrals	711	5825	4-Chlorophenyl-phenylether	EPA 8270D	Pass		
Base Neutral Extractables	4200	5825	4-Chlorophenyl-phenylether	EPA 8270D	Pass		
Acids	712	6410	4-Methylphenol	EPA 8270D	Pass		
Acid Extractables	4190	6410	4-Methylphenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6470	4-Nitroaniline	EPA 8270D	Pass		
Base Neutral Extractables	4200	6470	4-Nitroaniline	EPA 8270D	Pass		
Acids	712	6500	4-Nitrophenol	EPA 8270D	Pass		
Acid Extractables	4190	6500	4-Nitrophenol	EPA 8270D	Pass		
WP Base/Neutrals	711	5500	Acenaphthene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5500	Acenaphthene	EPA 8270D	Pass		
WP Base/Neutrals	711	5505	Acenaphthylene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5505	Acenaphthylene	EPA 8270D	Pass		
WP Base/Neutrals	711	5545	Aniline	EPA 8270D	Pass		
Base Neutral Extractables	4200	5545	Aniline	EPA 8270D	Pass		
WP Base/Neutrals	711	5555	Anthracene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5555	Anthracene	EPA 8270D	Pass		
WP Base/Neutrals	711	5595	Benzidine	EPA 8270D	Pass		
Base Neutral Extractables	4200	5595	Benzidine	EPA 8270D	Pass		
WP Base/Neutrals	711	5575	Benzo(a)anthracene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5575	Benzo(a)anthracene	EPA 8270D	Pass		
WP Base/Neutrals	711	5580	Benzo(a)pyrene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5580	Benzo(a)pyrene	EPA 8270D	Pass		
WP Base/Neutrals	711	5585	Benzo(b)fluoranthene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5585	Benzo(b)fluoranthene	EPA 8270D	Pass		
WP Base/Neutrals	711	5590	Benzo(g,h,i)perylene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5590	Benzo(g,h,i)perylene	EPA 8270D	Pass		
WP Base/Neutrals	711	5600	Benzo(k)fluoranthene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5600	Benzo(k)fluoranthene	EPA 8270D	Pass		
Acids	712	5610	Benzoic acid	EPA 8270D	Pass		
Acid Extractables	4190	5610	Benzoic Acid	EPA 8270D	Pass		
WP Base/Neutrals	711	5630	Benzyl alcohol	EPA 8270D	Pass		
Base Neutral Extractables	4200	5630	Benzyl alcohol	EPA 8270D	Pass		
Base Neutral Extractables	4200	5670	Benzyl butyl phthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	5760	bis(2-Chloroethoxy) methane	EPA 8270D	Pass		
Base Neutral Extractables	4200	5760	bis(2-Chloroethoxy) methane	EPA 8270D	Pass		
Base Neutral Extractables	4200	5765	bis(2-Chloroethyl) ether	EPA 8270D	Pass		
WP Base/Neutrals	711	5765	bis(2-Chloroethyl)ether	EPA 8270D	Pass		
WP Base/Neutrals	711	5780	bis(2-Chloroisopropyl) ether	EPA 8270D	Pass		
Base Neutral Extractables	4200	5780	bis(2-Chloroisopropyl) ether	EPA 8270D	Pass		
WP Base/Neutrals	711	6255	bis(2-Ethylhexyl) phthalate	EPA 8270D	Pass		
Base Neutral Extractables	4200	6255	bis(2-Ethylhexyl) phthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	5670	Butylbenzylphthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	5680	Carbazole	EPA 8270D	Pass		
Base Neutral Extractables	4200	5680	Carbazole	EPA 8270D	Pass		
WP Base/Neutrals	711	5855	Chrysene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5855	Chrysene	EPA 8270D	Pass		
WP Base/Neutrals	711	5895	Dibenz(a,h) anthracene	EPA 8270D	Pass		
WP Base/Neutrals	711	5905	Dibenzofuran	EPA 8270D	Pass		
Base Neutral Extractables	4200	5905	Dibenzofuran	EPA 8270D	Pass		
Base Neutral Extractables	4200	5895	Dibesz(a,h) anthracene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6070	Diethyl phthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	6070	Diethylphthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	6135	Dimethyl phthalate	EPA 8270D	Pass		
Base Neutral Extractables	4200	6135	Dimethyl phthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	5925	Di-n-butylphthalate	EPA 8270D	Pass		
Base Neutral Extractables	4200	5925	Di-n-butylphthalate	EPA 8270D	Pass		
WP Base/Neutrals	711	6200	Di-n-octylphthalate	EPA 8270D	Pass		
Base Neutral Extractables	4200	6200	Di-n-octylphthalate	EPA 8270D	Pass		
Base Neutral Extractables	4200	6265	Fluoranthene	EPA 8270D	Pass		
WP Base/Neutrals	711	6265	Fluoranthene	EPA 8270D	Pass		
WP Base/Neutrals	711	6270	Fluorene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6270	Fluorene	EPA 8270D	Pass		
WP Base/Neutrals	711	6275	Hexachlorobenzene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6275	Hexachlorobenzene	EPA 8270D	Pass		
WP Base/Neutrals	711	4835	Hexachlorobutadiene	EPA 8270D	Pass		
Base Neutral Extractables	4200	4835	Hexachlorobutadiene	EPA 8270D	Pass		
WP Base/Neutrals	711	6285	Hexachlorocyclopentadiene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6285	Hexachlorocyclopentadiene	EPA 8270D	Pass		
Base Neutral Extractables	4200	4840	Hexachloroethane	EPA 8270D	Pass		
WP Base/Neutrals	711	4840	Hexachloroethane	EPA 8270D	Pass		
WP Base/Neutrals	711	6315	Indeno (1,2,3-cd) pyrene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6315	Indeno (1,2,3-cd) pyrene	EPA 8270D	Pass		
WP Base/Neutrals	711	6320	Isophorone	EPA 8270D	Pass		
Base Neutral Extractables	4200	6320	Isophorone	EPA 8270D	Pass		
WP Base/Neutrals	711	5005	Naphthalene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5005	Naphthalene	EPA 8270D	Pass		
WP Base/Neutrals	711	5015	Nitrobenzene	EPA 8270D	Pass		
Base Neutral Extractables	4200	5015	Nitrobenzene (NB)	EPA 8270D	Pass		
WP Base/Neutrals	711	6530	N-Nitrosodimethylamine	EPA 8270D	Pass		
Base Neutral Extractables	4200	6530	N-nitrosodimethylamine	EPA 8270D	Pass		
WP Base/Neutrals	711	6545	N-Nitroso-di-n-propylamine	EPA 8270D	Pass		
Base Neutral Extractables	4200	6545	N-Nitroso-di-n-propylamine	EPA 8270D	Pass		
WP Base/Neutrals	711	6535	N-Nitrosodiphenylamine	EPA 8270D	Pass		
Base Neutral Extractables	4200	6535	N-nitrosodiphenylamine	EPA 8270D	Pass		
Acids	712	6605	Pentachlorophenol	EPA 8270D	Pass		
Acid Extractables	4190	6605	Pentachlorophenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6615	Phenanthrene	EPA 8270D	Pass		
Base Neutral Extractables	4200	6615	Phenanthrene	EPA 8270D	Pass		
Acids	712	6625	Phenol	EPA 8270D	Pass		
Acid Extractables	4190	6625	Phenol	EPA 8270D	Pass		
WP Base/Neutrals	711	6665	Pyrene	EPA 8270D	Pass		

Base Neutral Extractables	4200	6665	Pyrene	EPA 8270D	Pass		
WP Base/Neutrals	711	5095	Pyridine	EPA 8270D	Pass		
Base Neutral Extractables	4200	5095	Pyridine	EPA 8270D	Pass		
Dioxin	PEO-258	9420	1,2,3,4,6,7,8-Hpcdf	EPA 8290	Pass		
2,3,7,8-Tetrachlorodibenzo-p-dioxin	38186	9618	2,3,7,8-Tetrachlorodibenzo-p-dioxin	EPA 8290	Pass		
WP Carbamates	38156	7205	Carbofuran	EPA 8321A	Pass		
WP Carbamates	38156	7505	Diuron	EPA 8321A	Pass		
WP Carbamates	38156	7750	Methomyl	EPA 8321A	Pass		
WP Carbamates	38156	7940	Oxamyl	EPA 8321A	Pass		
WP Carbamates	38156	8075	Propham	EPA 8321A	Pass		
Herbicides	PEO-094	8620	Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	EPA 8321A	Pass		
CWA Nitroaromatics in Water	38172	6885	1,3,5-Trinitrobenzene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	6160	1,3-Dinitrobenzene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9651	2,4,6-Trinitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	6185	2,4-Dinitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	6190	2,6-Dinitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9303	2-Amino-4,6-dinitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9507	2-Nitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9510	3-Nitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9306	4-Amino-2,6-dinitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9513	4-Nitrotoluene	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9522	HMX	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	9432	RDX	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	6415	Tetryl	EPA 8330	Pass		
CWA Nitroaromatics in Water	38172	6885	1,3,5-Trinitrobenzene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	6885	1,3,5-Trinitrobenzene (1,3,5-TNB)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	6160	1,3-Dinitrobenzene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	6160	1,3-Dinitrobenzene (1,3-DNB)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9651	2,4,6-Trinitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9651	2,4,6-Trinitrotoluene (2,4,6-TNT)	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	6185	2,4-Dinitrotoluene (2,4-DNT)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	6190	2,6-Dinitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	6190	2,6-Dinitrotoluene (2,6-DNT)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9303	2-Amino-4,6-dinitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9303	2-Amino-4,6-dinitrotoluene (2am-dnt)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9507	2-Nitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9507	2-Nitrotoluene	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9510	3-Nitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9510	3-Nitrotoluene	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9306	4-Amino-2,6-dinitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9306	4-Amino-2,6-dinitrotoluene (4-am-dnt)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9513	4-Nitrotoluene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9513	4-Nitrotoluene	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9522	HMX	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9522	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	5015	Nitrobenzene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	5015	Nitrobenzene	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	6485	Nitroglycerin	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	9432	RDX	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	9432	RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	EPA 8330A	Pass		
CWA Nitroaromatics in Water	38172	6415	Tetryl	EPA 8330A	Pass		
Low Level Nit/Nit	PEO-251	6415	Tetryl (Methyl-2,4,6-trinitrophenylnitramine)	EPA 8330A	Pass		
Total Cyanide	4090	1645	Total Cyanide	EPA 9010B	Pass		
Total Cyanide	PEI-031	1645	Total cyanide	EPA 9010B	Pass		
Total Cyanide	4090	1645	Total Cyanide	EPA 9014	Pass		
CWA Anions	55131	1540	Bromide (Br)	EPA 9056	Pass		
WP Minerals #1	55144	1575	Chloride	EPA 9056	Pass		
Fluoride	4420	1730	Fluoride	EPA 9056	Pass		
WP Minerals #2	55145	1730	Fluoride	EPA 9056	Pass		
WP & DMRQA Nutrients	55035	1810	Nitrate as N	EPA 9056	Pass		
Nutrients	4020	1810	Nitrate Nitrogen as N	EPA 9056	Pass		
Nitrate-Nitrite as N	4770	1820	Nitrate-Nitrite as N	EPA 9056	Pass		
Nitrite as N	4780	1840	Nitrite as N	EPA 9056	Pass		
Nutrients	4020	1870	Orthophosphate as P	EPA 9056	Pass		
WP & DMRQA Nutrients	55035	1870	Orthophosphate as P	EPA 9056	Pass		
Miscellaneous Analytes	PEI-051	1540	Bromide	EPA 9056	Pass		
Minerals	PEI-051	1575	Chloride	EPA 9056	Pass		
Minerals	PEI-051	1730	Fluoride	EPA 9056	Pass		
Nutrients	PEI-051	1805	Nitrate as N	EPA 9056	Pass		
Nutrients	PEI-051	1820	Nitrate+nitrite as N	EPA 9056	Pass		
Nutrients	PEI-051	1840	Nitrite as N	EPA 9056	Pass		
Nutrients	PEI-051	1870	Orthophosphate as P	EPA 9056	Pass		
Minerals	PEI-051	2000	Sulfate	EPA 9056	Pass		
Demand	4010	2040	Total organic carbon (TOC)	EPA 9060	Pass		
Demands	PEI-026	2040	Total organic carbon (TOC)	EPA 9060	Pass		
Fluoride	4420	1730	Fluoride	EPA 9214	Pass		
Minerals	4050	1505	Alkalinity as CaCO3	SM 2320B	Pass		
Solids (Total Solids, TSS, & TDS)	55085	1955	Total Dissolved Solids (TDS)	SM 2540C	Pass		
Solids	4030	1705	Total Dissolved Solids at 180C	SM 2540C	Pass		
Solids	4030	1960	Total Suspended Solids	SM 2540D	Pass		
CWA UV 254 Absorbance/ DOC	55088	1710	Dissolved Organic Carbon	SM 5310B	Pass		
Demand	4010	2040	Total Organic Carbon	SM 5310B	Pass		
WP & DMRQA Demands	55055	2040	Total Organic Carbon	SM 5310B	Pass		
Demands	PEI-026	2040	Total organic carbon (TOC)	SM 5310B	Pass		
Oil & Grease	4120	1860	Oil & Grease	SM 5520B	Pass		
MBAS	4430	2025	MBAS	SM 5540C	Pass		
WP MBAS	55083	2025	MBAS	SM 5540C	Pass		

DoD ELAP -- PT Performance Summary Review -- WS ALL

Lab Name :	APPL, Inc.
City/State :	Clovis, CA
PT Provider Used :	ERA, Absolute, RTC, APG

PartName	PartNumber	NELACCode	AnalyteName	EPAmethod#	PT results - Pass/Acceptable Results
WS Chromium VI	55112	1045	Chromium VI	EPA 218.6	Pass
Trace Metals	5070	1095	Mercury	EPA 245.1	Pass
WS Trace Elements	55012	1095	Total Mercury	EPA 245.1	Pass
WS Inorganic Disinfection By-Products	55010	1540	Bromide	EPA 300.0	Pass
Minerals	5080	1575	Chloride	EPA 300.0	Pass
WS Minerals Mix #1	55122	1575	Chloride	EPA 300.0	Pass
Nutrients	5140	1730	Fluoride	EPA 300.0	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1730	Fluoride	EPA 300.0	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1820	Nitrate and Nitrite as N	EPA 300.0	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1810	Nitrate as N	EPA 300.0	Pass
Nutrients	5140	1810	Nitrate Nitrogen as N	EPA 300.0	Pass
Nitrate+Nitrite as N	5860	1820	Nitrate+Nitrite as N	EPA 300.0	Pass
Nutrients	5140	1840	Nitrite as N	EPA 300.0	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1840	Nitrite as N	EPA 300.0	Pass
Nutrients	5140	1870	Orthophosphate as P	EPA 300.0	Pass
Minerals	5080	2000	Sulfate	EPA 300.0	Pass
WS Sulphate/TOC	55070	2000	Sulfate	EPA 300.0	Pass
Perchlorate	5610	1895	Perchlorate	EPA 314.0	Pass
WS Perchlorate	55099	1895	Perchlorate	EPA 314.0	Pass
Nutrients	5140	1730	Fluoride	EPA 340.2	Pass
SDWA Nutrients	55165	1515	Ammonia as N	EPA 350.1	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1820	Nitrate and Nitrite as N	EPA 353.2	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1810	Nitrate as N	EPA 353.2	Pass
Nutrients	5140	1810	Nitrate Nitrogen as N	EPA 353.2	Pass
Nitrate+Nitrite as N	5860	1820	Nitrate+Nitrite as N	EPA 353.2	Pass
Nutrients	5140	1840	Nitrite as N	EPA 353.2	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1840	Nitrite as N	EPA 353.2	Pass
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1870	Orthophosphate as P	EPA 353.2	Pass
Nutrients	5140	1870	Orthophosphate as P	EPA 353.2	Pass
SDWA Nutrients	55165	1910	Total Phosphorus	EPA 365.2	Pass
MBAS	5470	2025	MBAS	EPA 425.1	Pass
Perchlorate	5610	1895	Perchlorate	EPA 6850	Pass
WS Perchlorate	55099	1895	Perchlorate	EPA 6850	Pass
pH	5060	1900	pH	EPA 9040B	Pass
UV 254/DOC	5480	1710	Dissolved Organic Carbon (DOC)	EPA 9060	Pass
Total Organic Carbon (TOC)	5250	2040	Total Organic Carbon	EPA 9060	Pass
Nutrients	5140	1730	Fluoride	EPA 9214	Pass
Minerals	5080	1505	Alkalinity	SM 2320B	Pass
Minerals	5080	1955	Total Dissolved Solids	SM 2540C	Pass
SDWA Solids (Total Solids, TSS, & TDS)	55161	1955	Total Dissolved Solids	SM 2540C	Pass
Solids	5150	1705	Total Dissolved Solids	SM 2540C	Pass
SDWA Solids (Total Solids, TSS, & TDS)	55161	1960	Non-Filterable Residue (TSS)	SM 2540D	Pass
Solids	5150	1960	Total Suspended Solids	SM 2540D	Pass
MBAS	5470	2025	MBAS	SM 5540C	Pass
WS MBAS	55108	2025	MBAS	SM 5540C	Pass

DoD ELAP -- PT Performance Summary Review -- SOIL					
Lab Name :	APPL, Inc.				
City/State :	Clovis, CA				
PT Provider Used :	ERA, RTC, Absolute, APG				
PartName	PartNumber	NELACCode	AnalyteName	EPAmethod#	PT results - Pass/Acceptable Results
Oil & Grease - n-Hexadecane & Stearic acid	55084	1860	Oil & Grease	EPA 1664A	Pass
PCB Congeners in Soil	SPE-068	9070	2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9025	2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9040	2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8980	2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8955	2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9050	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9045	2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8985	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9055	2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9005	2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8995	2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9000	2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8936	2,4,4'-Trichlorobiphenyl (PCB 28)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9060	3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9015	3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8965	3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8970	3,4,4',5-Tetrachlorobiphenyl (PCB 81)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9025	PCB (129)+(138)+(163)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9040	PCB (153)+(168)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9046	PCB (156)+(157)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	9070	PCB (180)+(193)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8936	PCB (20)+(28)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8980	PCB (90)+(101)+(113)	EPA 1668	Pass
PCB Congeners in Soil	SPE-068	8870	PCBs, total	EPA 1668	Pass
RCRA Anions	55141	1540	Bromide	EPA 300.0	Pass
RCRA Anions	55141	1575	Chloride	EPA 300.0	Pass
RCRA Anions	55141	1730	Fluoride	EPA 300.0	Pass
RCRA Anions	55141	1810	Nitrate as N	EPA 300.0	Pass
RCRA Anions	55141	1870	Phosphate as P	EPA 300.0	Pass
RCRA Anions	55141	2000	Sulfate	EPA 300.0	Pass
RCRA Hexavalent Chromium	55104	1045	Chromium IV	EPA 3060A	Pass
Hexavalent Chromium in Soil	4120	1045	Chromium, Hexavalent	EPA 3060A	Pass
RCRA Perchlorate	38151	1885	Perchlorate	EPA 314.0	Pass
RCRA Nutrients	55142	1515	Ammonia as N	EPA 350.1	Pass
Nutrients in Soil	4170	1515	Ammonia Nitrogen as N	EPA 350.1	Pass
Nutrients in Soil	4170	1795	Total Kjeldahl Nitrogen	EPA 351.2	Pass
RCRA Nutrients	55142	1795	Total Kjeldhal Nitrogen	EPA 351.2	Pass
RCRA Metals in Soil #2	55103	1000	Aluminum	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1005	Antimony	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1005	Antimony	EPA 6010B	Pass
TCLP Metals in Soil	4180	1005	Antimony, Sb	EPA 6010B	Pass
TCLP Metals in Soil - CA WET	SPE-006	1005	Antimony, Sb	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1010	Arsenic	EPA 6010B	Pass
TCLP Metals in Soil	4180	1010	Arsenic, As	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1015	Barium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1015	Barium	EPA 6010B	Pass
TCLP Metals in Soil	4180	1015	Barium, Ba	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1020	Beryllium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1020	Beryllium	EPA 6010B	Pass
TCLP Metals in Soil - CA WET	SPE-006	1020	Beryllium, Be	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1025	Boron	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1030	Cadmium	EPA 6010B	Pass
TCLP Metals in Soil	4180	1030	Cadmium, Cd	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1030	Cadmiun	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1035	Calcium	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1035	Calcium	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1040	Chromium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1040	Chromium	EPA 6010B	Pass
TCLP Metals in Soil	4180	1040	Chromium, Cr (total)	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1050	Cobalt	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1055	Copper	EPA 6010B	Pass
TCLP Metals in Soil - CA WET	SPE-006	1055	Copper, Cu	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1070	Iron	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1075	Lead	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1075	Lead	EPA 6010B	Pass
TCLP Metals in Soil	4180	1075	Lead, Pb	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1085	Magnesium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1090	Manganese	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1100	Molybdenum	EPA 6010B	Pass
TCLP Metals in Soil - CA WET	SPE-006	1100	Molybdenum, Mo	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1105	Nickel	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1105	Nickel	EPA 6010B	Pass
TCLP Metals in Soil	4180	1105	Nickel, Ni	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1125	Potassium	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1140	Selenium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1140	Selenium	EPA 6010B	Pass
TCLP Metals in Soil	4180	1140	Selenium, Se	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1150	Silver	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1150	Silver	EPA 6010B	Pass
TCLP Metals in Soil	4180	1150	Silver, Ag	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1155	Sodium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1160	Strontium	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1165	Thallium	EPA 6010B	Pass
TCLP Metals in Soil - CA WET	SPE-006	1165	Thallium, Tl	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1175	Tin	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1180	Titanium	EPA 6010B	Pass
RCRA Nutrients	55142	1910	Total Phosphorus	EPA 6010B	Pass
Nutrients in Soil	4170	1910	Total Phosphorus as P	EPA 6010B	Pass

RCRA Metals in Soil #1	55102	1185	Vanadium	EPA 6010B	Pass
TCLP Metals in Soil - CA WET	SPE-006	1185	Vanadium, V	EPA 6010B	Pass
TCLP Metals	PT-TCLPMET-SOIL	1190	Zinc	EPA 6010B	Pass
RCRA Metals in Soil #1	55102	1190	Zinc	EPA 6010B	Pass
TCLP Metals in Soil	4180	1190	Zinc, Zn	EPA 6010B	Pass
RCRA Metals in Soil #2	55103	1000	Aluminum	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1005	Antimony	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1015	Barium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1020	Beryllium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1025	Boron	EPA 6020	Pass
RCRA Metals in Soil #2	55103	1035	Calcium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1040	Chromium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1050	Cobalt	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1055	Copper	EPA 6020	Pass
RCRA Metals in Soil #2	55103	1070	Iron	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1075	Lead	EPA 6020	Pass
RCRA Metals in Soil #2	55103	1085	Magnesium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1090	Manganese	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1100	Molybdenum	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1105	Nickel	EPA 6020	Pass
RCRA Metals in Soil #2	55103	1125	Potassium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1140	Selenium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1150	Silver	EPA 6020	Pass
RCRA Metals in Soil #2	55103	1155	Sodium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1160	Strontium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1165	Thallium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1175	Tin	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1180	Titanium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1185	Vanadium	EPA 6020	Pass
RCRA Metals in Soil #1	55102	1190	Zinc	EPA 6020	Pass
RCRA Perchlorate	55143	1895	Perchlorate	EPA 6850	Pass
RCRA Hexavalent Chromium	55104	1045	Chromium VI	EPA 7196A	Pass
Hexavalent Chromium in Soil	4120	1045	Chromium, Hexavalent	EPA 7196A	Pass
RCRA Hexavalent Chromium	55104	1045	Chromium VI	EPA 7199	Pass
Hexavalent Chromium in Soil	4120	1045	Chromium, Hexavalent	EPA 7199	Pass
TCLP Metals	PT-TCLPMET-SOIL	1095	Mercury	EPA 7470A	Pass
TCLP Metals in Soil	4180	1095	Mercury	EPA 7470A	Pass
RCRA Metals in Soil #1	55102	1095	Mercury	EPA 7471A	Pass
RCRA Metals in Soil #1	55102	1095	Mercury	EPA 7471B	Pass
Diesel Fuel #2 in Soil	38115	9369	#2 Fuel Oil (Diesel)	EPA 8015B	Pass
PT Diesel Fuel #2 in Water	38114	9369	#2 Fuel Oil (Diesel)	EPA 8015B	Pass
93 Octane Gasoline in Soil	38117	9408	93 Octane Gasoline in Soil	EPA 8015B	Pass
PT Unleaded Gasoline in Water	38116	9408	Unleaded Gasoline 93 Octane	EPA 8015B	Pass
RCRA BTEX & MTBE	38161	4375	Benzene	EPA 8021B	Pass
RCRA BTEX & MTBE	38161	4765	Ethyl benzene	EPA 8021B	Pass
RCRA BTEX & MTBE	38161	5000	Methyl tert-butyl ether (MTBE)	EPA 8021B	Pass
RCRA BTEX & MTBE	38161	5140	Toluene	EPA 8021B	Pass
RCRA BTEX & MTBE	38161	5260	Total Xylenes	EPA 8021B	Pass
Chlorinated Pesticides in Soil	38101	7355	4,4'-DDD	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7360	4,4'-DDE	EPA 8081A	Pass
Pesticides in Soil	14221	7360	4,4'-DDE	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7365	4,4'-DDT	EPA 8081A	Pass
Pesticides in Soil	14222	7365	4,4'-DDT	EPA 8081A	Pass
Pesticides in Soil	14220	7355	4,4'-DDD	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7110	a-BHC	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7240	a-Chlordane	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7025	Aldrin	EPA 8081A	Pass
Pesticides in Soil	14223	7025	Aldrin	EPA 8081A	Pass
Pesticides in Soil	14224	7110	alpha-BHC	EPA 8081A	Pass
Pesticides in Soil	14225	7240	alpha-Chlordane	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7115	b-BHC	EPA 8081A	Pass
Pesticides in Soil	14226	7115	beta-BHC	EPA 8081A	Pass
Chlordane in Soil	38141	7250	Chlordane	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7105	d-BHC	EPA 8081A	Pass
Pesticides in Soil	14227	7105	delat-BHC	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7470	Dieldrin	EPA 8081A	Pass
Pesticides in Soil	14228	7470	Dieldrin	EPA 8081A	Pass
Pesticides in Soil	14229	7510	Endosulfan I	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7515	Endosulfan II	EPA 8081A	Pass
Pesticides in Soil	14230	7515	Endosulfan II	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7520	Endosulfan sulfate	EPA 8081A	Pass
Pesticides in Soil	14231	7520	Endosulfan sulfate	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7540	Endrin	EPA 8081A	Pass
Pesticides in Soil	14232	7540	Endrin	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7530	Endrin aldehyde	EPA 8081A	Pass
Pesticides in Soil	14233	7530	Endrin aldehyde	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7535	Endrin ketone	EPA 8081A	Pass
Pesticides in Soil	14234	7535	Endrin Ketone	EPA 8081A	Pass
Pesticides in Soil	14235	7120	gamma-BHC (Lindane)	EPA 8081A	Pass
Pesticides in Soil	14236	7245	gamma-Chlordane	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7120	g-BHC (Lindane)	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7685	Heptachlor	EPA 8081A	Pass
Pesticides in Soil	14237	7685	Heptachlor	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7690	Heptachlor epoxide	EPA 8081A	Pass
Pesticides in Soil	14238	7690	Heptachlor epoxide	EPA 8081A	Pass
Chlorinated Pesticides in Soil	38101	7810	Methoxychlor	EPA 8081A	Pass
Pesticides in Soil	14239	7810	Methoxychlor	EPA 8081A	Pass
Total Chlordane in Soil	4240	7250	Total Chlordane	EPA 8081A	Pass
Toxaphene in Soil	38066	8250	Toxaphene	EPA 8081A	Pass
Toxaphene in Soil	4230	8250	Toxaphene	EPA 8081A	Pass
Aroclor in Soil	38142	8880	Aroclor 1016	EPA 8082	Pass
WP PCBs in Water	38091	8880	Aroclor 1016	EPA 8082	Pass
WP PCBs in Water	38094	8880	Aroclor 1016	EPA 8082	Pass
Aroclor in Soil	38142	8885	Aroclor 1221	EPA 8082	Pass
WP PCBs in Water	38091	8885	Aroclor 1221	EPA 8082	Pass
WP PCBs in Water	38094	8885	Aroclor 1221	EPA 8082	Pass
Aroclor in Soil	38142	8890	Aroclor 1232	EPA 8082	Pass
WP PCBs in Water	38091	8890	Aroclor 1232	EPA 8082	Pass

WP PCBs in Water	38094	8890	Aroclor 1232	EPA 8082	Pass
Aroclor in Soil	38142	8895	Aroclor 1242	EPA 8082	Pass
WP PCBs in Water	38091	8895	Aroclor 1242	EPA 8082	Pass
WP PCBs in Water	38094	8895	Aroclor 1242	EPA 8082	Pass
Aroclor in Soil	38142	8900	Aroclor 1248	EPA 8082	Pass
WP PCBs in Water	38091	8900	Aroclor 1248	EPA 8082	Pass
WP PCBs in Water	38094	8900	Aroclor 1248	EPA 8082	Pass
Aroclor in Soil	38142	8905	Aroclor 1254	EPA 8082	Pass
WP PCBs in Water	38091	8905	Aroclor 1254	EPA 8082	Pass
WP PCBs in Water	38094	8905	Aroclor 1254	EPA 8082	Pass
Aroclor in Soil	38142	8910	Aroclor 1260	EPA 8082	Pass
WP PCBs in Water	38091	8910	Aroclor 1260	EPA 8082	Pass
WP PCBs in Water	38094	8910	Aroclor 1260	EPA 8082	Pass
PCB in Soil	SPE-010	8912	Aroclor 1016/1242	EPA 8082	Pass
PCB in Soil	SPE-010	8880	Aroclor-1016 (PCB-1016)	EPA 8082	Pass
PCB in Soil	SPE-010	8885	Aroclor-1221 (PCB-1221)	EPA 8082	Pass
PCB in Soil	SPE-010	8890	Aroclor-1232 (PCB-1232)	EPA 8082	Pass
PCB in Soil	SPE-010	8895	Aroclor-1242 (PCB-1242)	EPA 8082	Pass
PCB in Soil	SPE-010	8900	Aroclor-1248 (PCB-1248)	EPA 8082	Pass
PCB in Soil	SPE-010	8905	Aroclor-1254 (PCB-1254)	EPA 8082	Pass
PCB in Soil	SPE-010	8910	Aroclor-1260 (PCB-1260)	EPA 8082	Pass
OrganoPhosphorus Pesticides	38151	7075	Azinphosmethyl	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7075	Azinphos-methyl	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7300	Chloropyrifos	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7390	Demeton O&S	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	7390	Demeton, (Mix of Isomers O:S)	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7410	Diazinon	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	7410	Diazinon	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	8610	Dichlorvos (DDVP)	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	8625	Disulfoton	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	8625	Disulfoton	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	8110	Fenchlorphos (Ronnel)	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7770	Malathion	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	7770	Malathion	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	7825	Parathion methyl	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7955	Parathion, ethyl	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	7825	Parathion, methyl	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	7985	Phorate	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	8110	Ronnel	EPA 8141A	Pass
OP/NP Pesticides in Soil	4280	8200	Stirophos (Tetrachlorvinphos)	EPA 8141A	Pass
OrganoPhosphorus Pesticides	38151	8200	Tetrachlorvinphos (Stirophos)	EPA 8141A	Pass
Herbicide Acids in Soil	38146	8655	2,4,5-T	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8650	2,4,5-TP	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8545	2,4-D	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8560	2,4-DB	EPA 8151A	Pass
Herbicides in Soil	4250	8500	3,5-Dichlorobenzoic acid	EPA 8151A	Pass
Herbicides in Soil	4250	8505	Acifluorfen	EPA 8151A	Pass
Herbicides in Soil	4250	8530	Bentazon	EPA 8151A	Pass
Herbicides in Soil	4250	8540	Chloramben	EPA 8151A	Pass
Herbicides in Soil	4250	8550	Dacthal diacid (DCPA)	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8555	Dalapon	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8595	Dicamba	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8620	Dinoseb	EPA 8151A	Pass
Herbicide Acids in Soil	38146	8605	Pentachlorophenol	EPA 8151A	Pass
Herbicides in Soil	4250	8605	Pentachlorophenol	EPA 8151A	Pass
Herbicides in Soil	4250	8645	Picloram	EPA 8151A	Pass
RCRA Medium Level Volatiles in Soil	38199	5105	1,1,1,2-Tetrachloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5105	1,1,1,2-Tetrachloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	5105	1,1,1,2-Tetrachloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5160	1,1,1-Trichloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5160	1,1,1-Trichloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	5160	1,1,1-Trichloroethane	EPA 8260B	Pass
Volatiles in Soil	4200	5160	1,1,1-Trichloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5110	1,1,2,2-Tetrachloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5110	1,1,2,2-Tetrachloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	5110	1,1,2,2-Tetrachloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5165	1,1,2-Trichloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5165	1,1,2-Trichloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	5165	1,1,2-Trichloroethane	EPA 8260B	Pass
Volatiles in Soil	4200	5165	1,1,2-Trichloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4630	1,1-Dichloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4630	1,1-Dichloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	4630	1,1-Dichloroethane	EPA 8260B	Pass
Volatiles in Soil	4200	4630	1,1-Dichloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4640	1,1-Dichloroethene	EPA 8260B	Pass
Volatiles in Soil	38084	4640	1,1-Dichloroethene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4640	1,1-Dichloroethylene	EPA 8260B	Pass
Volatiles in Soil	38084	4670	1,1-Dichloropropene	EPA 8260B	Pass
Volatiles in Soil	38084	5150	1,2,3-Trichlorobenzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5180	1,2,3-Trichloropropane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5180	1,2,3-Trichloropropane	EPA 8260B	Pass
Volatiles in Soil	38084	5180	1,2,3-Trichloropropane	EPA 8260B	Pass
Volatiles in Soil	4200	5180	1,2,3-Trichloropropane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5155	1,2,4-Trichlorobenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5155	1,2,4-Trichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	4200	5155	1,2,4-Trichlorobenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5210	1,2,4-Trimethylbenzene	EPA 8260B	Pass
Volatiles in Soil	38084	5210	1,2,4-Trimethylbenzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4570	1,2-Dibromo-3-chloropropane	EPA 8260B	Pass
Volatiles in Soil	38084	4570	1,2-Dibromo-3-chloropropane	EPA 8260B	Pass
Volatiles in Soil	4200	4570	1,2-Dibromo-3-chloropropane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4570	1,2-Dibromo-3-chloropropane (DBCP)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4585	1,2-Dibromoethane	EPA 8260B	Pass
Volatiles in Soil	38084	4585	1,2-Dibromoethane	EPA 8260B	Pass
Volatiles in Soil	4200	4585	1,2-Dibromoethane (EDB)	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4585	1,2-Dibromoethane (EDB, Ethylene dibromide)	EPA 8260B	Pass
Volatiles in Soil	4200	4655	1,2-Dicahloropropane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4610	1,2-Dichlorobenzene	EPA 8260B	Pass

VOAs in Soil - Medium Level	SPE-002-H	4610	1,2-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4610	1,2-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4610	1,2-Dichlorobenzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4635	1,2-Dichloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4635	1,2-Dichloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	4635	1,2-Dichloroethane	EPA 8260B	Pass
Volatiles in Soil	4200	4635	1,2-Dichloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4655	1,2-Dichloropropane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4655	1,2-Dichloropropane	EPA 8260B	Pass
Volatiles in Soil	38084	4655	1,2-Dichloropropane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5215	1,3,5-Trimethylbenzene	EPA 8260B	Pass
Volatiles in Soil	38084	5215	1,3,5-Trimethylbenzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4615	1,3-Dichlorobenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4615	1,3-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4615	1,3-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4615	1,3-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4660	1,3-Dichloropropane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4620	1,4-Dichlorobenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4620	1,4-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4620	1,4-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4620	1,4-Dichlorobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4665	2,2-Dichloropropane	EPA 8260B	Pass
RCRA Ketones in Soil	38167	4410	2-Butanone (Methyl ethyl ketone)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4410	2-Butanone (Methyl ethyl ketone)	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4410	2-Butanone (Methyl ethyl ketone, MEK)	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4500	2-Chloroethyl vinyl ether	EPA 8260B	Pass
Volatiles in Soil	4200	4500	2-Chloroethylvinylether	EPA 8260B	Pass
Volatiles in Soil	38084	4535	2-Chlorotoluene	EPA 8260B	Pass
RCRA Ketones in Soil	38167	4860	2-Hexanone	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4860	2-Hexanone	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4860	2-Hexanone	EPA 8260B	Pass
Volatiles in Soil	4200	4860	2-Hexanone	EPA 8260B	Pass
Volatiles in Soil	38084	4540	4-Chlorotoluene	EPA 8260B	Pass
RCRA Ketones in Soil	38167	4995	4-Methyl-2-pentanone	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4995	4-Methyl-2-pentanone	EPA 8260B	Pass
Volatiles in Soil	38084	4995	4-Methyl-2-pentanone	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4995	4-Methyl-2-pentanone (MIBK)	EPA 8260B	Pass
Volatiles in Soil	4200	4995	4-Methyl-2-pentanone (MIBK)	EPA 8260B	Pass
RCRA Ketones in Soil	38167	4315	Acetone	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4315	Acetone	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4315	Acetone	EPA 8260B	Pass
Volatiles in Soil	4200	4320	Acetonitrile	EPA 8260B	Pass
Volatiles in Soil	4200	4325	Acrolein	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4325	Acrolein (Propenal)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4375	Benzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4375	Benzene	EPA 8260B	Pass
Volatiles in Soil	38084	4375	Benzene	EPA 8260B	Pass
Volatiles in Soil	4200	4375	Benzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4385	Bromobenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4385	Bromobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4385	Bromobenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4385	Bromobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4390	Bromochloromethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4395	Bromodichloromethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4395	Bromodichloromethane	EPA 8260B	Pass
Volatiles in Soil	38084	4395	Bromodichloromethane	EPA 8260B	Pass
Volatiles in Soil	4200	4395	Bromodichloromethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4400	Bromoform	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4400	Bromoform	EPA 8260B	Pass
Volatiles in Soil	38084	4400	Bromoform	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	49504	Bromomethane	EPA 8260B	Pass
Volatiles in Soil	38084	4950	Bromomethane	EPA 8260B	Pass
Volatiles in Soil	4200	4950	Bromomethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4450	Carbon disulfide	EPA 8260B	Pass
Volatiles in Soil	4200	4450	Carbon disulfide	EPA 8260B	Pass
Volatiles in Soil	38084	4450	Carbon disulphide	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4455	Carbon tetrachloride	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4455	Carbon tetrachloride	EPA 8260B	Pass
Volatiles in Soil	38084	4455	Carbon tetrachloride	EPA 8260B	Pass
Volatiles in Soil	4200	4455	Carbon tetrachloride	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4475	Chlorobenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4475	Chlorobenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4475	Chlorobenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4475	Chlorobenzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4485	Chloroethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4485	Chloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	4485	Chloroethane	EPA 8260B	Pass
Volatiles in Soil	4200	4485	Chloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4505	Chloroform	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4505	Chloroform	EPA 8260B	Pass
Volatiles in Soil	38084	4505	Chloroform	EPA 8260B	Pass
Volatiles in Soil	4200	4505	Chloroform	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4960	Chloromethane	EPA 8260B	Pass
Volatiles in Soil	38084	4960	Chloromethane	EPA 8260B	Pass
Volatiles in Soil	4200	4960	Chloromethane	EPA 8260B	Pass
Volatiles in Soil	4200	4645	cis-1,2-Dichloroethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4645	cis-1,2-Dichloroethene	EPA 8260B	Pass
Volatiles in Soil	38084	4645	cis-1,2-Dichloroethene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4645	cis-1,2-Dichloroethylene	EPA 8260B	Pass
Volatiles in Soil	4200	4680	cis-1,2-Dichloropropene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4680	cis-1,3-Dichloropropene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4680	cis-1,3-Dichloropropene	EPA 8260B	Pass
Volatiles in Soil	38084	4680	cis-1,3-Dichloropropene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4575	Dibromochloromethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4575	Dibromochloromethane	EPA 8260B	Pass
Volatiles in Soil	38084	4575	Dibromochloromethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4595	Dibromomethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4595	Dibromomethane	EPA 8260B	Pass

Volatiles in Soil	38084	4595	Dibromomethane	EPA 8260B	Pass
Volatiles in Soil	4200	4595	Dibromomethane	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4625	Dichlorodifluoromethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4625	Dichlorodifluoromethane	EPA 8260B	Pass
Volatiles in Soil	38084	4625	Dichlorodifluoromethane	EPA 8260B	Pass
Volatiles in Soil	4200	4625	Dichlorodifluoromethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	9375	Di-isopropylether (DIPE)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4765	Ethyl benzene	EPA 8260B	Pass
Volatiles in Soil	38084	4765	Ethyl benzene	EPA 8260B	Pass
RCRA Oxygenates	38169	4770	Ethyl tert-butyl ether	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4765	Ethylbenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4765	Ethylbenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4835	Hexachlorobutadiene	EPA 8260B	Pass
Volatiles in Soil	4200	4835	Hexachlorobutadiene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4840	Hexachloroethane	EPA 8260B	Pass
Volatiles in Soil	38084	4840	Hexachloroethane	EPA 8260B	Pass
RCRA Oxygenates	38169	9375	Isopropyl ether	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4900	Isopropylbenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4900	Isopropylbenzene	EPA 8260B	Pass
Volatiles in Soil	38084	4900	Isopropylbenzene	EPA 8260B	Pass
Volatiles in Soil	4200	4900	Isopropylbenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5240	m+p-Xylene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4950	Methyl bromide (Bromomethane)	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4960	Methyl chloride (Chloromethane)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass
RCRA Oxygenates	38169	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass
Volatiles in Soil	38084	5000	Methyl tert-butyl ether (MTBE)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4975	Methylene chloride	EPA 8260B	Pass
Volatiles in Soil	38084	4975	Methylene chloride	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4975	Methylene chloride (Dichloromethane)	EPA 8260B	Pass
Volatiles in Soil	4200	4975	Methylene chloride (Dichloromethane)	EPA 8260B	Pass
Volatiles in Soil	4200	5000	Methyl-t-butylether (MTBE)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5005	Naphthalene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5005	Naphthalene	EPA 8260B	Pass
Volatiles in Soil	38084	5005	Naphthalene	EPA 8260B	Pass
Volatiles in Soil	38084	4435	n-Butyl benzene	EPA 8260B	Pass
RCRA Oxygenates	38169	5090	n-Propylbenzene	EPA 8260B	Pass
Volatiles in Soil	38084	5090	n-Propylbenzene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5250	o-Xylene	EPA 8260B	Pass
Volatiles in Soil	38084	4910	p-Isopropyl toluene	EPA 8260B	Pass
Volatiles in Soil	38084	4440	sec-Butyl benzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5100	Styrene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5100	Styrene	EPA 8260B	Pass
Volatiles in Soil	38084	5100	Styrene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4370	T-amylmethylether (TAME)	EPA 8260B	Pass
RCRA Oxygenates	38169	4370	tert-Amyl methyl ether	EPA 8260B	Pass
RCRA Oxygenates	38169	4420	tert-Butyl alcohol (t-Butanol)	EPA 8260B	Pass
Volatiles in Soil	38084	4445	tert-Butyl benzene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5115	Tetrachloroethene	EPA 8260B	Pass
Volatiles in Soil	38084	5115	Tetrachloroethene	EPA 8260B	Pass
Volatiles in Soil	4200	5115	Tetrachloroethene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5115	Tetrachloroethylene (Perchloroethylene)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5140	Toluene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5140	Toluene	EPA 8260B	Pass
Volatiles in Soil	38084	5140	Toluene	EPA 8260B	Pass
Volatiles in Soil	4200	5140	Toluene	EPA 8260B	Pass
Volatiles in Soil	4200	4260	Total Xylenes	EPA 8260B	Pass
Volatiles in Soil	38084	5260	Total Xylenes	EPA 8260B	Pass
Volatiles in Soil	4200	5260	Total Xylenes	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4700	trans-1,2-Dichloroethene	EPA 8260B	Pass
Volatiles in Soil	38084	4700	trans-1,2-Dichloroethene	EPA 8260B	Pass
Volatiles in Soil	4200	4700	trans-1,2-Dichloroethene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4700	trans-1,2-Dichloroethylene	EPA 8260B	Pass
Volatiles in Soil	4200	4685	trans-1,3,-Dichloropropene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	4685	trans-1,3-Dichloropropene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	4685	trans-1,3-Dichloropropene	EPA 8260B	Pass
Volatiles in Soil	38084	4685	trans-1,3-Dichloropropene	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5170	Trichloroethene	EPA 8260B	Pass
Volatiles in Soil	38084	5170	Trichloroethene	EPA 8260B	Pass
Volatiles in Soil	4200	5170	Trichloroethene	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5170	Trichloroethene (Trichloroethylene)	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5175	Trichlorofluoromethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5175	Trichlorofluoromethane	EPA 8260B	Pass
Volatiles in Soil	38084	5175	Trichlorofluoromethane	EPA 8260B	Pass
Volatiles in Soil	4200	5175	Trichlorofluoromethane	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5225	Vinyl acetate	EPA 8260B	Pass
Volatiles in Soil	4200	5225	Vinyl acetate	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5235	Vinyl chloride	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5235	Vinyl chloride	EPA 8260B	Pass
Volatiles in Soil	38084	5235	Vinyl chloride	EPA 8260B	Pass
Volatiles in Soil	4200	5235	Vinyl Chloride	EPA 8260B	Pass
VOAs in Soil - Medium Level	SPE-002-H	5260	Xylene, total	EPA 8260B	Pass
RCRA Medium Level Volatiles in Soil	38199	5260	Xylenes, total	EPA 8260B	Pass
RCRA Semi-Volatiles in Soil	38068	5155	1,2,4-Trichlorobenzene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	4610	1,2-Dichlorobenzene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	4610	1,2-Dichlorobenzene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	4615	1,3-Dichlorobenzene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	4615	1,3-Dichlorobenzene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	4620	1,4-Dichlorobenzene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	4620	1,4-Dichlorobenzene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6735	2,3,4,6-Tetrachlorophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6835	2,4,5-Trichlorophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6835	2,4,5-Trichlorophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6840	2,4,6-Trichlorophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6840	2,4,6-Trichlorophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6000	2,4-Dichlorophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6000	2,4-Dichlorophenol	EPA 8270C	Pass

Base Neutrals and Acids in Soil	4260	6130	2,4-Dimethylphenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6130	2,4-Dimethylphenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6175	2,4-Dinitrophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6175	2,4-Dinitrophenol	EPA 8270C	Pass
RCRA PAH's	38171	6185	2,4-Dinitrotoluene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6185	2,4-Dinitrotoluene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6185	2,4-Dinitrotoluene (2,4-DNT)	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6005	2,6-Dichlorophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6005	2,6-Dichlorophenol	EPA 8270C	Pass
RCRA PAH's	38171	6190	2,6-Dinitrotoluene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6190	2,6-Dinitrotoluene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5795	2-Chloronaphthalene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5800	2-Chlorophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5800	2-Chlorophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6360	2-Methyl-4,6-Dinitrophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6385	2-Methylnaphthalene	EPA 8270C	Pass
RCRA PAH's	38171	6385	2-Methylnaphthalene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6385	2-Methylnaphthalene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6400	2-Methylphenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6460	2-Nitroaniline	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6490	2-Nitrophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6490	2-Nitrophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5945	3,3'-Dichlorobenzidine	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5945	3,3'-Dichlorobenzidine	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6405	3-Methylphenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6465	3-Nitroaniline	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6465	3-Nitroaniline	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6360	4,6-Dinitro-2-methylphenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5660	4-Bromophenyl phenyl ether	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5660	4-Bromophenyl phenyl ether	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5700	4-Chloro-3-methylphenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5700	4-Chloro-3-methylphenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5745	4-Chloroaniline	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5745	4-Chloroaniline	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5825	4-Chlorophenyl phenyl ether	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5825	4-Chlorophenyl-phenylether	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6410	4-Methylphenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6470	4-Nitroaniline	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6470	4-Nitroaniline	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6500	4-Nitrophenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6500	4-Nitrophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5500	Acenaphthene	EPA 8270C	Pass
RCRA PAH's	38171	5500	Acenaphthene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5500	Acenaphthene	EPA 8270C	Pass
Acenaphthylene in Soils	SPE-003	5505	Acenaphthylene	EPA 8270C	Pass
RCRA PAH's	38171	5505	Acenaphthylene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5505	Acenaphthylene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5545	Aniline	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5555	Anthracene	EPA 8270C	Pass
RCRA PAH's	38171	5555	Anthracene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5555	Anthracene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5575	Benzo(a)anthracene	EPA 8270C	Pass
RCRA PAH's	38171	5575	Benzo(a)anthracene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5575	Benzo(a)anthracene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5580	Benzo(a)pyrene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5585	Benzo(b)fluoranthene	EPA 8270C	Pass
RCRA PAH's	38171	5585	Benzo(b)fluoranthene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5585	Benzo(b)fluoranthene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass
RCRA PAH's	38171	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5600	Benzo(k)fluoranthene	EPA 8270C	Pass
RCRA PAH's	38171	5600	Benzo(k)fluoranthene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5600	Benzo(k)fluoranthene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5610	Benzoic Acid	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5630	Benzyl alcohol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5630	Benzyl alcohol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5670	Benzyl butyl phthalate	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5670	Benzyl butyl phthalate	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5760	bis(2-Chloroethoxy) methane	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5760	bis(2-Chloroethoxy) methane	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5765	bis(2-Chloroethyl) ether	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5765	bis(2-Chloroethyl) ether	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5780	bis(2-Chloroisopropyl) ether	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5780	bis(2-Chloroisopropyl) ether	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6255	bis(2-Ethylhexyl) phthalate	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6065	bis(2-Ethylhexyl) phthalate	EPA 8270C	Pass
Base Neutrals and Acids in Soil	14260	5680	Carbazole	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5680	Carbazole	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5855	Chrysene	EPA 8270C	Pass
RCRA PAH's	38171	5855	Chrysene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5855	Chrysene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5895	Dibenz(a,h) anthracene	EPA 8270C	Pass
RCRA PAH's	38171	5895	Dibenzo(a,h)anthracene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5895	Dibenzo(a,h)anthracene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5905	Dibenzofuran	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5905	Dibenzofuran	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6070	Diethyl phthalate	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6070	Diethyl phthalate	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6135	Dimethyl phthalate	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6135	Dimethyl phthalate	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5925	Di-n-butyl phthalate	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5925	Di-n-butylphthalate	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6200	Di-n-octyl phthalate	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6200	Di-n-octylphthalate	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6265	Fluoranthene	EPA 8270C	Pass
RCRA PAH's	38171	6265	Fluoranthene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6265	Fluoranthene	EPA 8270C	Pass

Base Neutrals and Acids in Soil	4260	6270	Fluorene	EPA 8270C	Pass
RCRA PAH's	38171	6270	Fluorene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6270	Fluorene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6275	Hexachlorobenzene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	4835	Hexachlorobutadiene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	4835	Hexachlorobutadiene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6285	Hexachlorocyclopentadiene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6285	Hexachlorocyclopentadiene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	4840	Hexachloroethane	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	4840	Hexachloroethane	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6315	Indeno (1,2,3-cd) pyrene	EPA 8270C	Pass
RCRA PAH's	38171	6315	Indeno(1,2,3-cd)pyrene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6315	Indeno(1,2,3-cd)pyrene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6320	Isophorone	EPA 8270C	Pass
RCRA PAH's	38171	6320	Isophorone	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6320	Isophorone	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6410	m/p-Cresol	EPA 8270C	Pass
RCRA PAH's	38171	5005	Naphthalene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5005	Naphthalene	EPA 8270C	Pass
RCRA PAH's	38171	5015	Nitrobenzene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5015	Nitrobenzene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	5015	Nitrobenzene (NB)	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6530	N-nitrosodimethylamine	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6530	N-Nitrosodimethylamine	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6545	N-nitrosodi-n-propylamine	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6545	N-Nitrosodi-n-propylamine	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6535	N-nitrosodiphenylamine	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6535	N-Nitrosodiphenylamine	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6400	o-Cresol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6605	Pentachlorophenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6615	Phenanthrene	EPA 8270C	Pass
RCRA PAH's	38171	6615	Phenanthrene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6615	Phenanthrene	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6625	Phenol	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6625	Phenol	EPA 8270C	Pass
Base Neutrals and Acids in Soil	4260	6665	Pyrene	EPA 8270C	Pass
RCRA PAH's	38171	6665	Pyrene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	6665	Pyrene	EPA 8270C	Pass
RCRA Semi-Volatiles in Soil	38068	5095	Pyridine	EPA 8270C	Pass
BNAs in Soil	SPE-003	5155	1,2,4-Trichlorobenzene	EPA 8270C	Pass
BNAs in Soil	SPE-003	4610	1,2-Dichlorobenzene	EPA 8270C	Pass
BNAs in Soil	SPE-003	4615	1,3-Dichlorobenzene	EPA 8270C	Pass
BNAs in Soil	SPE-003	4620	1,4-Dichlorobenzene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6835	2,4,5-Trichlorophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6840	2,4,6-Trichlorophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6000	2,4-Dichlorophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6130	2,4-Dimethylphenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6175	2,4-Dinitrophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6185	2,4-Dinitrotoluene (2,4-DNT)	EPA 8270C	Pass
BNAs in Soil	SPE-003	6005	2,6-Dichlorophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6190	2,6-Dinitrotoluene (2,6-DNT)	EPA 8270C	Pass
BNAs in Soil	SPE-003	5795	2-Chloronaphthalene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5800	2-Chlorophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6360	2-Methyl-4,6-dinitrophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6385	2-Methylnaphthalene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6400	2-Methylphenol (o-Cresol)	EPA 8270C	Pass
BNAs in Soil	SPE-003	6460	2-Nitroaniline	EPA 8270C	Pass
BNAs in Soil	SPE-003	6490	2-Nitrophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	5945	3,3'-Dichlorobenzidine	EPA 8270C	Pass
BNAs in Soil	SPE-003	6410	3+4-Methylphenol (m+p-Cresol)	EPA 8270C	Pass
BNAs in Soil	SPE-003	6405	3-Methylphenol (m-Cresol)	EPA 8270C	Pass
BNAs in Soil	SPE-003	6465	3-Nitroaniline	EPA 8270C	Pass
BNAs in Soil	SPE-003	5660	4-Bromophenyl phenyl ether	EPA 8270C	Pass
BNAs in Soil	SPE-003	5700	4-Chloro-3-methylphenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	5745	4-Chloroaniline	EPA 8270C	Pass
BNAs in Soil	SPE-003	5825	4-Chlorophenyl phenylether	EPA 8270C	Pass
BNAs in Soil	SPE-003	6410	4-Methylphenol (p-Cresol)	EPA 8270C	Pass
BNAs in Soil	SPE-003	6470	4-Nitroaniline	EPA 8270C	Pass
BNAs in Soil	SPE-003	6500	4-Nitrophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	5500	Acenaphthene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5505	Acenaphthylene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5545	Aniline	EPA 8270C	Pass
BNAs in Soil	SPE-003	5555	Anthracene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5595	Benzidine	EPA 8270C	Pass
BNAs in Soil	SPE-003	5575	Benzo(a)anthracene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5580	Benzo(a)pyrene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5585	Benzo(b)fluoranthene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5590	Benzo(g,h,i)perylene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5600	Benzo(k)fluoranthene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5610	Benzoic acid	EPA 8270C	Pass
BNAs in Soil	SPE-003	5630	Benzyl alcohol	EPA 8270C	Pass
BNAs in Soil	SPE-003	5760	bis(2-Chloroethoxy)methane	EPA 8270C	Pass
BNAs in Soil	SPE-003	5765	bis(2-Chloroethyl) ether	EPA 8270C	Pass
BNAs in Soil	SPE-003	5780	bis(2-Chloroisopropyl) ether	EPA 8270C	Pass
BNAs in Soil	SPE-003	6255	bis(2-Ethylhexyl) phthalate (DEHP)	EPA 8270C	Pass
BNAs in Soil	SPE-003	5670	Butyl benzyl phthalate	EPA 8270C	Pass
BNAs in Soil	SPE-003	5680	Carbazole	EPA 8270C	Pass
BNAs in Soil	SPE-003	5855	Chrysene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5895	Dibenz(a,h) anthracene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5905	Dibenzofuran	EPA 8270C	Pass
BNAs in Soil	SPE-003	6070	Diethyl phthalate	EPA 8270C	Pass
BNAs in Soil	SPE-003	6135	Dimethyl phthalate	EPA 8270C	Pass
BNAs in Soil	SPE-003	5925	Di-n-butyl phthalate	EPA 8270C	Pass
BNAs in Soil	SPE-003	6200	Di-n-octyl phthalate	EPA 8270C	Pass
BNAs in Soil	SPE-003	6265	Fluoranthene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6270	Fluorene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6275	Hexachlorobenzene	EPA 8270C	Pass
BNAs in Soil	SPE-003	4835	Hexachlorobutadiene	EPA 8270C	Pass

BNAs in Soil	SPE-003	6285	Hexachlorocyclopentadiene	EPA 8270C	Pass
BNAs in Soil	SPE-003	4840	Hexachloroethane	EPA 8270C	Pass
BNAs in Soil	SPE-003	6315	Indeno(1,2,3-cd) pyrene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6320	Isophorone	EPA 8270C	Pass
BNAs in Soil	SPE-003	5005	Naphthalene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5015	Nitrobenzene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6530	n-Nitrosodimethylamine	EPA 8270C	Pass
BNAs in Soil	SPE-003	6545	n-Nitroso-di-n-propylamine	EPA 8270C	Pass
BNAs in Soil	SPE-003	6535	n-Nitrosodiphenylamine	EPA 8270C	Pass
BNAs in Soil	SPE-003	6605	Pentachlorophenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6615	Phenanthrene	EPA 8270C	Pass
BNAs in Soil	SPE-003	6625	Phenol	EPA 8270C	Pass
BNAs in Soil	SPE-003	6665	Pyrene	EPA 8270C	Pass
BNAs in Soil	SPE-003	5095	Pyridine	EPA 8270C	Pass
Base/Neutrals and Acids in Soil	727	5155	1,2,4-Trichlorobenzene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	4610	1,2-Dichlorobenzene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	4615	1,3-Dichlorobenzene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	4620	1,4-Dichlorobenzene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6835	2,4,5-Trichlorophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6840	2,4,6-Trichlorophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6000	2,4-Dichlorophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6130	2,4-Dimethylphenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6175	2,4-Dinitrophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6185	2,4-Dinitrotoluene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6005	2,6-Dichlorophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6190	2,6-Dinitrotoluene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5795	2-Chloronaphthalene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5800	2-Chlorophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6385	2-Methylnaphthalene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6400	2-Methylphenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6460	2-Nitroaniline	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6490	2-Nitrophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6410	3&4-Methylphenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5945	3,3'-Dichlorobenzidine	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6465	3-Nitroaniline	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6360	4,6-Dinitro-2-methylphenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5660	4-Bromophenyl-phenylether	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5700	4-Chloro-3-methylphenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5745	4-Chloroaniline	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5625	4-Chlorophenyl-phenylether	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6470	4-Nitroaniline	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6500	4-Nitrophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5500	Acenaphthene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5505	Acenaphthylene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5545	Aniline	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5555	Anthracene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5575	Benzo(a)anthracene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5580	Benzo(a)pyrene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5585	Benzo(b)fluoranthene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5590	Benzo(g,h,i)perylene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5600	Benzo(k)fluoranthene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5610	Benzoic acid	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5630	Benzyl alcohol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5760	bis(2-Chloroethoxy)methane	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5765	bis(2-Chloroethyl)ether	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5780	bis(2-Chloroisopropyl)ether	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6255	bis(2-Ethylhexyl)phthalate	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5670	Butylbenzylphthalate	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5855	Chrysene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5895	Dibenz(a,h)anthracene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5905	Dibenzofuran	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6070	Diethylphthalate	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6135	Dimethylphthalate	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5925	Di-n-butylphthalate	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6200	Di-n-octylphthalate	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6265	Fluoranthene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6270	Fluorene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6275	Hexachlorobenzene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	4835	Hexachlorobutadiene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6285	Hexachlorocyclopentadiene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	4840	Hexachloroethane	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6315	Indeno(1,2,3-cd)pyrene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6320	Isophorone	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5005	Naphthalene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5015	Nitrobenzene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6530	N-Nitrosodimethylamine	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6545	N-Nitroso-di-n-propylamine	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6535	N-Nitrosodiphenylamine	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6605	Pentachlorophenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6615	Phenanthrene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6625	Phenol	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	6665	Pyrene	EPA 8270D	Pass
Base/Neutrals and Acids in Soil	727	5095	Pyridine	EPA 8270D	Pass
Low-Level PAHs in Soil	722	5500	Acenaphthene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5505	Acenaphthylene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5555	Anthracene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5575	Benzo(a)anthracene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5580	Benzo(a)pyrene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5585	Benzo(b)fluoranthene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5590	Benzo(g,h,i)perylene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5600	Benzo(k)fluoranthene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5855	Chrysene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5895	Dibenz(a,h)anthracene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	6265	Fluoranthene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	6270	Fluorene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	6315	Indeno(1,2,3-cd)pyrene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	5005	Naphthalene	EPA 8270DSIM	Pass
Low-Level PAHs in Soil	722	6615	Phenanthrene	EPA 8270DSIM	Pass

Low-Level PAHs in Soil	722	6665	Pyrene	EPA 8270DSIM	Pass
Dioxin	SPE-016	9519	1,2,3,4,6,7,8,9-OCDD	EPA 8290	Pass
Dioxin	SPE-016	9516	1,2,3,4,6,7,8,9-OCDF	EPA 8290	Pass
Dioxin	SPE-016	9426	1,2,3,4,6,7,8-Hpcdd	EPA 8290	Pass
Dioxin	SPE-016	9420	1,2,3,4,6,7,8-Hpcdf	EPA 8290	Pass
Dioxin	SPE-016	9423	1,2,3,4,7,8,9-Hpcdf	EPA 8290	Pass
Dioxin	SPE-016	9453	1,2,3,4,7,8-Hxcdd	EPA 8290	Pass
Dioxin	SPE-016	9471	1,2,3,4,7,8-Hxcdf	EPA 8290	Pass
Dioxin	SPE-016	9456	1,2,3,6,7,8-Hxcdd	EPA 8290	Pass
Dioxin	SPE-016	9474	1,2,3,6,7,8-Hxcdf	EPA 8290	Pass
Dioxin	SPE-016	9459	1,2,3,7,8,9-Hxcdd	EPA 8290	Pass
Dioxin	SPE-016	9477	1,2,3,7,8,9-Hxcdf	EPA 8290	Pass
Dioxin	SPE-016	9549	2,3,4,7,8-Pecdf	EPA 8290	Pass
Dioxin	SPE-016	9606	2,3,7,8-TCDD	EPA 8290	Pass
Dioxin	SPE-016	9612	2,3,7,8-TCDF	EPA 8290	Pass
Dioxin	SPE-016	9444	Hpcdf, total	EPA 8290	Pass
Dioxin	SPE-016	9483	Hxcdf, total	EPA 8290	Pass
Dioxin	SPE-016	9606	PCDD + PCDF, total	EPA 8290	Pass
Dioxin	SPE-016	9993	PCDF, total	EPA 8290	Pass
Dioxin	SPE-016	9555	Pecdd, total	EPA 8290	Pass
Dioxin	SPE-016	9552	Pecdf, total	EPA 8290	Pass
Dioxin	SPE-016	9615	TCDD, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9540	1,2,3,7,8-Pecdd	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9543	1,2,3,7,8-Pecdf	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9480	2,3,4,6,7,8-Hxcdf	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9438	Hpcdd, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9444	Hpcdf, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9468	Hxcdd, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9483	Hxcdf, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9992	PCDD + PCDF, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9991	PCDD, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9993	PCDF, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9555	Pecdd, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9552	Pecdf, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9989	TCDD, total	EPA 8290	Pass
Dioxins and Furans in Soil	SPE-016	9615	TCDF, total	EPA 8290	Pass
Herbicides in Soil	4250	8655	2,4,5-T	EPA 8321A	Pass
Herbicides in Soil	4250	8650	2,4,5-TP (silvex)	EPA 8321A	Pass
Herbicides in Soil	4250	8545	2,4-D	EPA 8321A	Pass
Herbicides in Soil	4250	8560	2,4-DB	EPA 8321A	Pass
RCRA Carbamates	38158	7710	3-Hydroxycarbofuran	EPA 8321A	Pass
RCRA Carbamates	38158	7015	Aldicarb sulfone	EPA 8321A	Pass
RCRA Carbamates	38158	7020	Aldicarb sulfoxide	EPA 8321A	Pass
RCRA Carbamates	38158	8080	Baygon (Propoxur)	EPA 8321A	Pass
RCRA Carbamates	38158	7195	Carbaryl	EPA 8321A	Pass
RCRA Carbamates	38158	7205	Carbofuran	EPA 8321A	Pass
Herbicides in Soil	4250	8555	Dalapon	EPA 8321A	Pass
Herbicides in Soil	4250	8595	Dicamba	EPA 8321A	Pass
Herbicides in Soil	4250	8605	Dichloroprop	EPA 8321A	Pass
Herbicides in Soil	4250	8620	Dinoseb	EPA 8321A	Pass
RCRA Carbamates	38158	9384	Dioxacarb	EPA 8321A	Pass
RCRA Carbamates	38158	7505	Diuron	EPA 8321A	Pass
Herbicides in Soil	4250	7775	MCPA	EPA 8321A	Pass
Herbicides in Soil	4250	7780	MCPP	EPA 8321A	Pass
RCRA Carbamates	38158	7800	Methiocarb	EPA 8321A	Pass
RCRA Carbamates	38158	8025	Promecarb	EPA 8321A	Pass
Nitroaromatics/Nitroamines in Soil	4420	6885	1,3,5-Trinitrotoulene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	9651	2,4,6-Trinitrotoulene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	6185	2,4-Dinitrotoulene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	6190	2,6-Dinitrotoulene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	9306	4-Amino-2,6-dinitrotoulene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	9513	4-Nitrotoulene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	3740	HMX	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	6900	Nitrobenzene	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	3630	RDX	EPA 8330	Pass
Nitroaromatics/Nitroamines in Soil	4420	6415	Tetryl	EPA 8330	Pass
RCRA Nitroaromatics in Soil	38155	6885	1,3,5-Trinitrobenzene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	6160	1,3-Dinitrobenzene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9651	2,4,6-Trinitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	6185	2,4-Dinitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	6190	2,6-Dinitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9303	2-Amino-4,6-dinitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9507	2-Nitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9510	3-Nitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9306	4-Amino-2,6-dinitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9513	4-Nitrotoluene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9522	HMX	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	5015	Nitrobenzene	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	9432	RDX	EPA 8330A	Pass
RCRA Nitroaromatics in Soil	38155	6415	Tetryl	EPA 8330A	Pass
Nitroaromatics in Soil	38155	6885	1,3,5-Trinitrobenzene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	6160	1,3-Dinitrobenzene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9651	2,4,6-Trinitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9185	2,4-Dinitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	6190	2,6-Dinitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9303	2-Amino-4,6-dinitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9507	2-Nitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9510	3-Nitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9306	4-Amino-2,6-dinitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9513	4-Nitrotoluene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9522	HMX	EPA 8330B	Pass
Nitroaromatics in Soil	38155	5015	Nitrobenzene	EPA 8330B	Pass
Nitroaromatics in Soil	38155	9432	RDX	EPA 8330B	Pass
Nitroaromatics in Soil	38155	6415	Tetryl	EPA 8330B	Pass
RCRA Cyanide	55105	1645	Cyanide	EPA 9010B	Pass
Cyanide in Soil	4130	1645	Total Cyanide	EPA 9010B	Pass
RCRA Cyanide	55105	1645	Cyanide	EPA 9014	Pass
Cyanide in Soil	4130	1645	Total Cyanide	EPA 9014	Pass

RCRA Corrosivity - pH Determination	55127	1625	Corrosivity	EPA 9045C	Pass
pH/Corrosivity in Soil	4140	1625	Corrosivity (pH)	EPA 9045C	Pass
RCRA Corrosivity - pH Determination	55127	1625	Corrosivity	EPA 9045D	Pass
Anions in Soil	4160	1540	Bromide	EPA 9056	Pass
RCRA Anions	55141	1540	Bromide (Br)	EPA 9056	Pass
Anions in Soil	4160	1575	Chloride	EPA 9056	Pass
RCRA Anions	55141	1575	Chloride (Cl)	EPA 9056	Pass
Anions in Soil	4160	1730	Fluoride	EPA 9056	Pass
RCRA Anions	55141	1730	Fluoride (F)	EPA 9056	Pass
RCRA Anions	55141	1810	Nitrate as N (NO3- as N)	EPA 9056	Pass
Anions in Soil	4160	1810	Nitrate Nitrogen as N	EPA 9056	Pass
Anions in Soil	4160	1870	Orthophosphate as P	EPA 9056	Pass
RCRA Anions	55141	1870	Phosphate as P (PO43- as P)	EPA 9056	Pass
Anions in Soil	4160	2000	Sulfate	EPA 9056	Pass
RCRA Anions	55141	2000	Sulfate (SO42-)	EPA 9056	Pass
Anions in Soil	SPE-013	1540	Bromide	EPA 9056A	Pass
Anions in Soil	SPE-013	1575	Chloride	EPA 9056A	Pass
Anions in Soil	SPE-013	1730	Fluoride	EPA 9056A	Pass
Anions in Soil	SPE-013	1810	Nitrate as N	EPA 9056A	Pass
Anions in Soil	SPE-013	1820	Nitrate+nitrite as N	EPA 9056A	Pass
Anions in Soil	SPE-013	1840	Nitrite as N	EPA 9056A	Pass
Anions in Soil	SPE-013	1870	Orthophosphate as P	EPA 9056A	Pass
Anions in Soil	SPE-013	2000	Sulfate	EPA 9056A	Pass

APPENDIX C

DATA QUALITY OBJECTIVES SCOPING MEETING MINUTES

NAVAL SUPPORT ACTIVITY (NSA) CRANE
DATA QUALITY OBJECTIVE (DQO) SCOPING MEETING SUMMARY
SWMU 22

Meeting Date: May 12, 2010
Meeting Time: 8:30 a.m.
Meeting Place: NSA Crane, Crane, Indiana
Building 3245 Conference Room

	Name	Organization
Attendance:	Doug Griffin	Indiana Department of Environmental Management (IDEM)
	Peter Ramanauskas	United States Environmental Protection Agency (USEPA) Region 5
	Tom Brent	United States Department of the Navy (Navy)
	Ralph Basinski	Tetra Tech Nus, Inc. (Tetra Tech)
	Tim Evans	Tetra Tech
	Tom Johnston	Tetra Tech
	Mark Traxler	Tetra Tech

Meet/Introductions

SWMU 22 Site History and Status Summary

Tim Evans, Tetra Tech Project Manager (PM), provided handouts and presented a summary of SWMU 22 features and a history of previous investigations. An overview of SWMU 22 was intended to provide meeting attendees with the basic Conceptual Site Model (CSM) information available that is needed to support the decision-making process during the DQO Scoping Meeting.

DQO Meeting

Mark Traxler, serving as the DQO Facilitator for the DQO Scoping Meeting, provided an overview of the process that is followed to develop a Uniform Federal Policy-Sampling and Analysis Plan (UFP-SAP) using a Team-based approach. The UFP-SAP captures and documents the Project Team's project goals, objectives, pertinent site issues, schedule, and identifies the resources needed for success.

One of the first steps in the development of the UFP-SAP is to create or update the CSM. Tim Evans supplied existing site-specific data for this purpose. Mark Traxler also provided a handout to assist in the DQO development process that was designed specifically for NSA Crane - SWMU 22. However, due to time constraints and the fact that the Project Team was familiar with both the site history and the DQO Process, this handout was not needed in the meeting.

This Project Team DQO Scoping Meeting gives interested stakeholders from the Navy and regulatory agencies (IDEM, USEPA Region 5) the opportunity to provide input needed by the contractor (Tetra Tech) to complete and populate the 37 Worksheets and implement the UFP-SAP.

The following notes summarize the discussions and the consensus reached for each of the seven DQO steps.

Step 1 - Problem Statement

The Strawman Problem Statement was defined as:
"It is unknown whether site-related contaminants were released and, if released, persist at levels that could pose an unacceptable level of human health or environmental risk. Therefore, the site must be investigated to determine whether unacceptable environmental conditions are present and corrective action or additional investigation is necessary. To efficiently and cost effectively use resources, it may be necessary to investigate the site in phases; therefore, phases following the initial investigation only occur as necessary based on information acquired."

Step 2 - Study Goals

In Phase I, Tetra Tech will determine whether SWMU 22 site-related contaminant levels are greater than conservative, risk-based Project Screening Levels (PSLs). If results are less than the PSLs, no further action (NFA) will be recommended. If any PSLs are exceeded, the Project Team will reconvene to evaluate the Phase I data and determine the appropriate path of action, which may include an additional investigation.

In Phase II, the nature and extent of contaminants, groundwater sampling and analysis, and the risk to human health and ecological receptors may be considered appropriate tasks to perform and would be documented in a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report.

Step 3 - Information Inputs

The following physical and chemical data are needed to attain project objectives:

Chemical Data – Surface soil, subsurface soil, sediment, and surface water data will be collected to determine if target analytes are present at levels that exceed risk-based screening criteria. The list of target analytes will include:

- RCRA Metals (SW-846 Methods 6020A/7470A/7471A) - Lead will be the driver based on the CSM, but chromium may need to be speciated if results are elevated above the IDEM soil-to-groundwater criteria of 38 milligrams per kilogram (mg/kg). Also, use Background soil data for metals PSLs, as necessary.

- Explosives (Full list by SW-846 Method 8330A) - RDX will be the driver based on the CSM, but tetryl, TNT and breakdown compounds, and PETN may also be present based on the site history.

- Perchlorate (SW-846 Method 6850) – 55 mg/kg for soil (USEPA Residential Direct Contact criteria) and 15 micrograms per liter (ug/L) for surface water (USEPA Health Advisory criteria).

- pH – Run pH on a few soil samples next to the pond and next to sumps.

- TOC – Run TOC on sediment samples to support site-specific risk determinations.

PSLs - The chemical data will be compared to current USEPA and IDEM residential surface soil, subsurface soil, sediment, surface water, and groundwater (if necessary) risk-based screening criteria. A comprehensive list of the relevant environmental and medium-specific risk-based screening levels for the target analytes was determined (for the 8 RCRA metals; the 14 explosives listed in SW-846 Method 8330A, and perchlorate). The risk and regulatory criteria applicable to SWMU 22 include the IDEM Risk Integrated System of Closure (RISC) Default Closure Tables, Residential and Industrial Closure Levels; USEPA Regions 3, 6, and 9 Residential Regional Screening Levels (R-RSLs) and risk-based migration-to-groundwater Soil

Screening Levels (SSLs) for human health risk screening and for use in a Human Health Risk Assessment (HHRA) during the RFI, if necessary; and appropriate surface soil, sediment, and surface water ecological benchmarks for ecological risk screening, which include in hierarchical order of use: USEPA Ecological Soil Screening Levels (Eco SSLs), USEPA Region 5 RCRA Ecological Screening Levels (R5 ESL), USEPA Region 3 Biological Technical Assistance Group (R3 BTAG) Freshwater Sediment Screening Benchmarks, and National Oceanographic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQuiRTs), Soil and Sediment Benchmarks.

During the meeting, it was identified that the ABG permit (groundwater only) and the MMRP (perchlorate) have site-specific criteria that have been identified as appropriate at NSA Crane.

Survey data – A Global Positioning System (GPS) unit will be used to identify each sample location with sub-meter accuracy.

Step 4 - Study Boundaries

Surface soil samples will be collected from 0- to 2-feet below ground surface (bgs). Subsurface soil samples will be collected from the targeted region of 3- to 4-feet bgs near the wastewater sumps and near the former Lead Azide retention pond, because it is believed that these depths would be the most significantly impacted, if contaminants leaked from the pipes and/or the pond.

Sediment samples will be collected from 0- to 6-inches bgs. The locations of sediment samples, including a determination whether the drainage area below the former retention pond area should be considered a wetland area and if it contains sediment or surface soil will be determined based on recommendations by the Tetra Tech Ecological Risk Assessor.

Surface water samples will be collected from the two drainage ditches to the headwater to Turkey Creek and from the headwater to Turkey Creek – including upgradient and downgradient locations in each waterway. If metals PSLs are exceeded, historical upgradient data at Crane may be useful in determining the significance of any metals exceedance.

Groundwater samples – will be collected during Phase II, if deemed necessary based on Phase I results.

Summer or Fall 2010 (as soon as practicable) is the preferred sampling time for Phase I.

Step 5 - Analytic Approach / Decision Rules

Triggers that will drive the Phase I investigation to a Phase II:

- USEPA R-RSLs and IDEM RISC R-DCLs.
- If SSLs are exceeded, Eco will be of concern for leaching to groundwater.
- For example, Lead SSL – 81 mg/kg (IDEM RISC).
- Human Health PSLs will include soil-to-groundwater migration, with a dilution attenuation factor of 20.
- For laboratory detection limits (DLs), use the best values that the laboratory can obtain following SW-846 Methods 8330A (energetic), 6020 (metals), and 6850 (perchlorate).

If there are no exceedances of any PSLs within any environmental medium, then NFA for that medium.

If Risk-based numbers only are triggered, then evaluate the data. If there is only one exceedance, or if a minimal number of samples exceed the PSLs, then the first step of Phase II will be an evaluation of the data by the Project Team to determine the significance of the data based on multiple lines of evidence, including:

- Frequency
- Magnitude
- Distribution
- Media

If Phase II is needed, a SAP Addendum will be needed to document Phase II activities and goals. Phase I and Phase II data will be included in an RFI Report, which will include one or more of the following:

- Data Evaluation
- Nature and Extent of Contamination
- Human Health Risk Assessment
- Ecological Risk Assessment

Step 6 - Performance or Acceptance Criteria

The proposed sample quantities and locations were provided on figures to the Project Team members during the meeting, and the exact locations and rationale for all samples were discussed. The Project Team agreed that the proposed sample quantities and locations were appropriate and sufficient to meet the project objectives for Phase I.

- Fifteen (15) surface soil samples from biased sampling locations were proposed. One additional soil boring near Building 2860 was agreed to during the meeting. The 16 surface soil samples will be sufficient to meet the project objectives.
- Thirteen (13) subsurface soil samples from biased sampling locations were proposed. One additional soil boring near Building 2860 was agreed to during the meeting. The 14 subsurface soil samples will be sufficient to meet the project objectives.
- Nine (9) sediment samples from biased sampling locations were proposed, assuming that sediment is deposited in or near the identified areas of interest. It was agreed to during the meeting that the Tetra Tech Ecological Risk Assessor would determine if proposed sample SD1 should be considered to be surface soil or sediment. The nine sediment samples will be sufficient to meet the project objectives. If sediment does not exist on or near the proposed sample locations, then less samples will be collected and the lack of sediment will be documented in the final report.
- Nine (9) surface water samples from biased sampling locations were proposed and will be sufficient to meet the project objectives. If surface water does not exist on or near the proposed sample locations, then less samples will be collected and the lack of surface water will be documented in the final report.

Step 7 - Optimize the Sample Design

Sampling will be biased toward higher probability areas. Extra samples will be taken at the discretion of the Tetra Tech Field Operations Leader (FOL) in areas that can be visually identified as containing contamination. This flexibility to collect step-out samples extends both horizontally and vertically.

Soil, sediment, and surface water samples will be tested for RCRA Metals, Energetics, and Perchlorate; a few surface soil samples will also be collected for pH; and sediment samples will also be tested for Total Organic Carbon (TOC).

No groundwater samples will be collected during Phase I.

Action Items

1. Tetra Tech will confer with Human Health and Ecological Risk Assessors to ensure that the correct criteria are selected for the UFP-SAP and are used in the Phase I investigation so the data will be acceptable for risk assessments, if they are needed later.

2. Tetra Tech will consider the applicability of the ABG permit (groundwater only) and the MMRP (perchlorate) site-specific criteria, as well as the Background soil data (for metals) and any historical upgradient surface water sample results from previous sampling events at NSA Crane, for use at SWMU 22.

3. The Tetra Tech Ecological Risk Assessor will evaluate site photographs and other information to determine the appropriate course of action regarding sediment/surface soil samples in the drainage area near the former retention pond and will make a preliminary judgment regarding the potential for this area to be classified as a wetland.

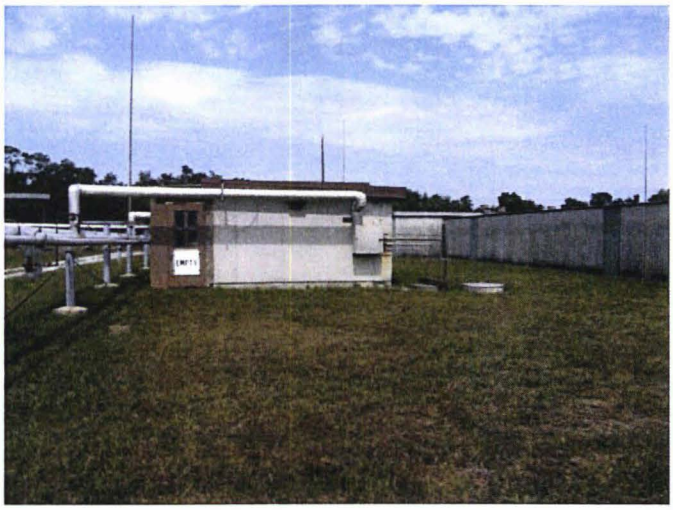
4. Tetra Tech will complete the UFP-SAP based on the outcome of the DQO Scoping Meeting.

APPENDIX D

SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

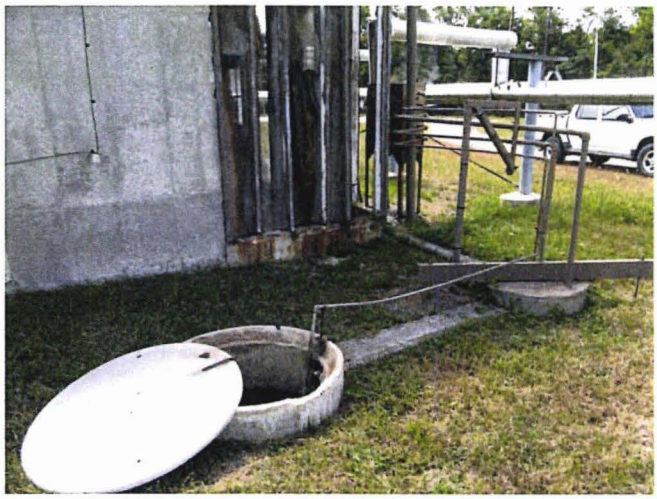
Photograph No. 1



Date:	View:	Site:
9/3/09	N	SWMU 22 / NSA Crane

Building 2857 - Covered walkway visible in right of photo and steam lines visible in left of photo. Stainless steel sump pit and concrete settling pit off southeast corner of building.

Photograph No. 2



Date:	View:	Site:
9/3/09	SW	SWMU 22 / NSA Crane

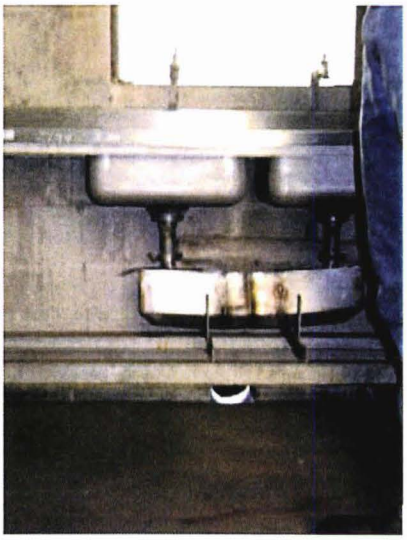
Building 2860 - stainless steel sump pit (right center) and concrete settling tank (foreground).

Photograph No. 3

Date:	View:	Site:
9/3/09	E	SWMU 22 / NSA Crane

Building 2860 - Interior of concrete settling tank. Overflow pipe visible.

Photograph No. 4



Date:	View:	Site:
9/3/09	N	SWMU 22 / NSA Crane

Building 2905 – wash basin and floor drain.

TETRA TECH

SITE PHOTOGRAPHS

Photograph No. 5

Date:	**View:**	**Site:**
9/3/09	SE	SWMU 22 / NSA Crane

Building 2905 – Sumps and settling basin.

Photograph No. 6

Date:	**View:**	**Site:**
9/3/09	SW	SWMU 22 / NSA Crane

Low area in Backline area along walkway between Buildings 136 and 2520.

Photograph No. 7

Date:	**View:**	**Site:**
9/3/09	SW	SWMU 22 / NSA Crane

Approximate location of former Lead Azide Pond (center of photo).

Photograph No. 8

Date:	**View:**	**Site:**
9/3/09	E	SWMU 22 / NSA Crane

Drainage ditch below former Lead Azide Pond.

TETRA TECH

SITE PHOTOGRAPHS

Photograph No. 9

Date:	View:	Site:
9/3/09	SE	SWMU 22 / NSA Crane

Stormwater runoff to eastern hillslope from culvert pipe from former Lead Azide Pond area.

Photograph No. 10

Date:	View:	Site:
9/3/09	E	SWMU 22 / NSA Crane

Former Lead Azide Pond area. Former reaction tank/lift station in right foreground.

Photograph No. 11

Date:	View:	Site:
9/3/09	W	SWMU 22 / NSA Crane

Southern side of Building 2803 (rocket motor testing building).

Photograph No. 12

Date:	View:	Site:
9/3/09	E	SWMU 22 / NSA Crane

Drainage ditch on northern portion of SWMU 22 (across from Building 2520). Flows to Outfall 028 at Highway 330.

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APPENDIX E

PROJECT SCREENING LEVEL SUPPORT DOCUMENTATION

SURFACE SOIL SCREENING CRITERIA

Analyte	CAS Number	USEPA RSL[1]		IDEM Default Closure Level[4]		Ecological Soil Screening Level	
		Residential Soil[2] (mg/kg)	Risk-Based SSL[3] (mg/kg)	Residential Soil Direct (mg/kg)	Migration to Groundwater (mg/kg)	Value (mg/kg)	Source
Explosives							
1,3,5-Trinitrobenzene	99-35-4	220 N	78	NA	NA	0.376	Reg 5 ESL
1,3-Dinitrobenzene	99-65-0	0.61 N	0.066	NA	NA	0.655	Reg 5 ESL
2,4,6-Trinitrotoluene (TNT)	118-96-7	19 C	0.26	NA	NA	6	Sunahara, et al., 2009
2,4-Dinitrotoluene	121-14-2	1.6 C	0.0058	NA	NA	1.28	Reg 5 ESL
2,6-Dinitrotoluene	606-20-2	6.1 N	1	NA	NA	0.0328	Reg 5 ESL
HMX	2691-41-0	380 N	46	NA	NA	600	Sunahara, et al., 2009
3-Nitrotoluene	99-08-1	0.61 N	0.068	NA	NA	NA	
2-Nitrotoluene	88-72-2	2.9 C	0.0058	NA	NA	NA	
4-Nitrotoluene	99-99-0	30 C	0.078	NA	NA	NA	
4-Amino-2,6-Dinitrotoluene	19406-51-0	15 N	1.1	NA	NA	NA	
2-Amino-4,6-Dinitrotoluene	35572-78-2	15 N	1.1	NA	NA	80	Los Alamos, 2009
Tetryl	479-45-8	24 N	28	NA	NA	25	Los Alamos, 2009
Nitrobenzene	98-95-3	4.8 C	0.16	91 N	0.028 N	1.31	Reg 5 ESL
RDX	121-82-4	5.5 C	0.0046	NA	NA	98	Sunahara, et al., 2009
Perchlorate	14797-73-0	5.5 N	NA	NA	NA	NA	
Metals							
Arsenic	7440-38-2	0.39 C	0.026	3.9 N	5.8 MCL	18	Eco SSL
Barium	7440-39-3	1,500 N	6,000	63,000 N	1,600 MCL	330	Eco SSL
Cadmium	7440-43-9	7 N	28	12 N	7.5 MCL	0.36	Eco SSL
Chromium III	16065-83-1	12,000 N	2,000,000,000	520,000 N	1,000,000 MCL	26	Eco SSL
Chromium VI	18540-29-9	0.29 C	0.017	430 C	38 MCL	130	Eco SSL
Total Chromium	7440-47-3	NA	NA	NA	NA	26	Eco SSL
Lead	7439-92-1	400	NA	400	81 MCL	11	Eco SSL
Mercury	7439-97-6	0.56 N	0.6	100 N	2.1 MCL	0.1	Reg 5 ESL
Selenium	7782-49-2	39 N	19	1,700 N	5.2 MCL	0.52	Eco SSL
Silver	7440-22-4	39 N	32	1,700 N	31 N	4.2	Eco SSL

Notes:
1 - USEPA Regions 3, 6, and 9. Regional Screening Levels for Chemical Contaminants at Superfund Sites. December 2009.
2 - The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1.
Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).
3 - The risk-based SSLs are based on a dilution attenuation factor (DAF) of 20.
4 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC), January 31, 2006, Revised May 1, 2009).
5 - The chromium screening levels do not differentiate between the different forms of chromium.
Reg 5 ESL - USEPA Region 5 Ecological Screening Level (USEPA, 2003).
Eco SSL - USEPA Ecological Soil Screening Level (USEPA, 2005 - 2008).
Sunahara, et al., 2009 - Ecotoxicity of Explosives (Sunahara et al., 2009).
Los Alamos, 2009 - Los Alamos National Laboratory (LANL) ECORISK Database (Release 2.4) (LANL, 2009).
NA - Not available.
MCL = Maximum contaminant level.

SUBSURFACE SOIL SCREENING CRITERIA

Analyte	CAS Number	USEPA RSL[1]		IDEM Default Closure Level[4]	
		Residential[2] Soil (mg/kg)	Risk-Based SSL[3] (mg/kg)	Residential Soil Direct (mg/kg)	Migration to Groundwater (mg/kg)
Explosives					
1,3,5-Trinitrobenzene	99-35-4	220 N	78	NA	NA
1,3-Dinitrobenzene	99-65-0	0.61 N	0.066	NA	NA
2,4,6-Trinitrotoluene (TNT)	118-96-7	19 C	0.26	NA	NA
2,4-Dinitrotoluene	121-14-2	1.6 C	0.0058	NA	NA
2,6-Dinitrotoluene	606-20-2	6.1 N	1	NA	NA
HMX	2691-41-0	380 N	46	NA	NA
3-Nitrotoluene	99-08-1	0.61 N	0.068	NA	NA
2-Nitrotoluene	88-72-2	2.9 C	0.0058	NA	NA
4-Nitrotoluene	99-99-0	30 C	0.078	NA	NA
4-Amino-2,6-Dinitrotoluene	19406-51-0	15 N	1.1	NA	NA
2-Amino-4,6-Dinitrotoluene	35572-78-2	15 N	1.1	NA	NA
Tetryl	479-45-8	24 N	28	NA	NA
Nitrobenzene	98-95-3	4.8 C	0.0016	91 N	0.028 N
RDX	121-82-4	5.5 C	0.0046	NA	NA
Perchlorate	14797-73-0	5.5 N		NA	NA
Metals					
Arsenic	7440-38-2	0.39 C	0.026	3.9 N	5.8 MCL
Barium	7440-39-3	1,500 N	6,000	63,000 N	1,600 MCL
Cadmium	7440-43-9	7 N	28	12 N	7.5 MCL
Chromium III	16065-83-1	12,000 N	2,000,000,000	520,000 N	1,000,000 MCL
Chromium VI	18540-29-9	0.29 C	0.017	430 C	38 MCL
Total Chromium	7440-47-3	NA	NA	NA	NA
Lead	7439-92-1	400	NA	400	81 MCL
Mercury	7439-97-6	0.56 N	0.6	100 N	2.1 MCL
Selenium	7782-49-2	39 N	19	1700 N	5.2 MCL
Silver	7440-22-4	39 N	32	1700 N	31 N

Notes:

1 - USEPA Regions 3, 6, and 9. Regional Screening Levels for Chemical Contaminants at Superfund Sites. December 2009.

2 - The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).

3 - The risk-based SSLs are based on a dilution attenuation factor (DAF) of 20.

4 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC), January 31, 2006, Revised May 1, 2009).

NA - Not available.

MCL = Maximum contaminant level.

SEDIMENT SCREENING CRITEIA

Analyte	CAS Number	USEPA RSL[1] Residential Soil[2] (mg/kg)	IDEM Default Closure Level[3] Residential Soil (mg/kg)	Ecological Sediment Screening Level	
				Value (mg/kg)	Source
Explosives					
1,3,5-Trinitrobenzene	99-35-4	220 N	NA	8	Sunahara, et al., 2009
1,3-Dinitrobenzene	99-65-0	0.61 N	NA	0.00861	Reg 5 ESL
2,4,6-Trinitrotoluene (TNT)	118-96-7	19 C	NA	4	Sunahara, et al., 2009
2,4-Dinitrotoluene	121-14-2	1.6 C	NA	0.0144	Reg 5 ESL
2,6-Dinitrotoluene	606-20-2	6.1 N	NA	0.0398	Reg 5 ESL
HMX	2691-41-0	380 N	NA	126	Sunahara, et al., 2009
3-Nitrotoluene	99-08-1	0.61 N	NA	NA	
2-Nitrotoluene	88-72-2	2.9 C	NA	NA	
4-Nitrotoluene	99-99-0	30 C	NA	4.06	Region 3 BTAG
4-Amino-2,6-Dinitrotoluene	19406-51-0	15 N	NA	NA	
2-Amino-4,6-Dinitrotoluene	35572-78-2	15 N	NA	NA	
Tetryl	479-45-8	24 N	NA	0.1	Sunahara, et al., 2009
Nitrobenzene	98-95-3	4.8 C	91 N	0.145	Reg 5 ESL
RDX	121-82-4	5.5 C	NA	102	Sunahara, et al., 2009
Perchlorate	14797-73-0	5.5 N	NA	NA	
Metals					
Arsenic	7440-38-2	0.39 C	3.9 N	9.79	Reg 5 ESL
Barium	7440-39-3	1,500 N	63,000 N	NA	
Cadmium	7440-43-9	7 N	12 N	0.99	Reg 5 ESL
Chromium III	16065-83-1	12,000 N	520,000 N	43.4	Reg 5 ESL
Chromium VI	18540-29-9	0.29 C	430 C	26	Reg 5 ESL
Total Chromium	7440-47-3	NA	NA	43.4	Reg 5 ESL
Lead	7439-92-1	400	400	35.8	Reg 5 ESL
Mercury	7439-97-6	0.56 N	100 N	0.174	Reg 5 ESL
Selenium	7782-49-2	39 N	1,700 N	2	Region 3 BTAG
Silver	7440-22-4	39 N	1,700 N	0.5	Reg 5 ESL

Notes:

1 - USEPA Regions 3, 6, and 9. Regional Screening Levels for Chemical Contaminants at Superfund Sites. December 2009.

2 - The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).

3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC), January 31, 2006, Revised May 1, 2009).

Reg 5 ESL - USEPA Region 5 Ecological Screening Level (USEPA, 2003).

Region 3 BTAG - USEPA Region 3 Biological Technical Assistance Group Freshwater Sediment Screening Benchmarks (USEPA, 2006).

Sunahara, et al., 2009 - Ecotoxicity of Explosives (Sunahara et al., 2009).

NA - Not available.

SURFACE WATER SCREENING CRITERIA

Analyte	CAS Number	USEPA RSL[1] Tap Water[2] (ug/L)	IDEM Default Closure Level[3] Groundwater Residential (ug/L)	Ecological Surface Water Screening Level	
				Value (ug/L)	Source
Explosives					
1,3,5-Trinitrobenzene	99-35-4	110 N	NA	10	Talmage
1,3-Dinitrobenzene	99-65-0	0.37 N	NA	22	Region 5 ESL
2,4,6-Trinitrotoluene (TNT)	118-96-7	2.2 C	NA	100	Region 3 BTAG
2,4-Dinitrotoluene	121-14-2	0.22 C	NA	44	Region 5 ESL
2,6-Dinitrotoluene	606-20-2	3.7 N	NA	81	Region 5 ESL
HMX	2691-41-0	180 N	NA	150	Region 3 BTAG
3-Nitrotoluene	99-08-1	0.37 N	NA	750	Region 3 BTAG
2-Nitrotoluene	88-72-2	0.31 C	NA	750[4]	Region 3 BTAG
4-Nitrotoluene	99-99-0	4.2 C	NA	1,900	Region 3 BTAG
4-Amino-2,6-Dinitrotoluene	19406-51-0	7.3 N	NA	1,480[5]	Region 3 BTAG
2-Amino-4,6-Dinitrotoluene	35572-78-2	7.3 N	NA	1,480	Region 3 BTAG
Tetryl	479-45-8	15 N	NA	NA	
Nitrobenzene	98-95-3	0.12 C	4.3 N	220	Region 5 ESL
RDX	121-82-4	0.61 C	NA	360	Region 3 BTAG
Perchlorate	14797-73-0	2.6 N	NA	NA	
Metals					
Antimony	7440-36-0	1.5 N	15 N	80	Region 5 ESL
Arsenic	7440-38-2	0.045 C	0.57 C	148	Region 5 ESL
Barium	7440-39-3	730 N	7,300 N	220	Region 5 ESL
Cadmium	7440-43-9	1.8 N	18 N	0.15	Region 5 ESL
Chromium III	16065-83-1	5,500 N	55,000 N	42	Region 5 ESL
Chromium VI	18540-29-9	0.043 C	110 N	42	Region 5 ESL
Total Chromium	7440-47-3	NA	NA	42	Region 5 ESL
Lead	7439-92-1	NA	15	1.17	Region 5 ESL
Mercury	7439-97-6	0.057 N	11 N	0.0013	Region 5 ESL
Selenium	7782-49-2	18 N	180 N	5	Region 5 ESL
Silver	7440-22-4	18 N	NA	0.12	Region 5 ESL

Notes:
1 - USEPA Regions 3, 6, and 9. Regional Screening Levels for Chemical Contaminants at Superfund Sites. December 2009.
2 - The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).
3 - Indiana Department of Environmental Management (IDEM), Risk Integrated System of Closure (RISC), January 31, 2006, Revised May 1, 2009).
4 - Used 3-nitrotoluene as a surrogate.
5 - Used 2-amino-4,6-dinitrotoluene as a surrogate.
Reg 5 ESL - USEPA Region 5 Ecological Screening Level (USEPA, 2003).
Region 3 BTAG - USEPA Region 3 Biological Technical Assistance Group Freshwater Surface Water Screening Benchmarks (USEPA, 2006).
Talmage - Nitroaromatic Munition Compounds: Environmental Effects and Screening Values (Talmage et al., 1999).
NA - Not available.