Naval Facilities Engineering Command, Southwest
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, California 92132-5190

FINAL

SITE INSPECTION
WORK PLAN
April 6, 2007

NAVAL WEAPONS STATION SEAL BEACH
DETACHMENT FALLBROOK
MUNITIONS RESPONSE PROGRAM
SITE UXO5
SALVAGE YARD LANDFILL
FALLBROOK, CALIFORNIA

Naval Facilities Engineering Command, Southwest
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1220 Pacific Highway, Building 127, Room 112
San Diego, CA 92132-5190

CONTRACT NO. N62473-06-D-2201
CTO NO. 0014

FINAL

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SITE UXO5
SALVAGE YARD LANDFILL
FALLBROOK, CALIFORNIA

DCN: ECSD-RACIV-07-0880

Prepared by:

TETRA TECH EC, INC.

1230 Columbia Street, Suite 750
San Diego, CA 92101-8536

Kent Weingardt
Project Manager

APPENDIX A

SAMPLING AND ANALYSIS PLAN

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Naval Facilities Engineering Command, Southwest
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San Diego, CA 92132-5190

CONTRACT NO. N62473-06-D-2201
CTO NO. 0014

APPENDIX A

FINAL

SAMPLING AND ANALYSIS PLAN
(Field Sampling Plan and Quality Assurance Project Plan)
April 6, 2007

NAVAL WEAPONS STATION SEAL BEACH
DETACHMENT FALLBROOK
MUNITIONS RESPONSE PROGRAM
SITE UXO5
SALVAGE YARD LANDFILL
FALLBROOK, CALIFORNIA

DCN: ECSD-RACIV-07-0880

TETRA TECH EC, INC.
1230 Columbia Street, Suite 750
San Diego, CA 92101-8536
(619) 234-8696

Lisa A. Bienkowski
Program Chemist

03/26/07
Date

Narciso A. Ancog
NAVFAC SW Quality Assurance Officer

4/3/2007
Date

ELEMENTS OF THE UFP-QAPP IN RELATION TO THIS SAP

UFP-QAPP Worksheet	EPA QA/R-5	This SAP	Variance from UFP-QAPP
#1 Title and Approval Page	A1. Title and Approval Sheet	Title and Approval Page	None
#2 QAPP Identifying Information	N/A	Section 1.3 and 3.1, Table A.1-1 and A.2-1, Work Plan Section 2.0 and 3.0	None
#3 Distribution List	A3. Distribution List	Table A.1-1	None
#4 Project Personnel Sign-off Sheet	N/A	Table A.2-3	None
#5 Project Organization Chart	A4. Project Task/Organization	Figure A.2-1	None
#6 Communication Pathways	N/A	Table A.2-2	None
#7 Personnel Responsibilities and Qualifications Table	A4. Project/Task Organization	Table A.2-1	None
#8 Special Personnel Training Requirements Table	A8. Special Training/Certification	Table A.2-4	None
#9 Project Scoping Sessions Participants Sheet	N/A	N/A	Sign-in sheets and meeting minutes of scoping sessions are maintained in the DON project file
#10 Problem Definition	A5. Problem Definition/Background A6. Project/Task Description	Sections 1.0 and 3.1 and Step 1 of Table A.3-1	None
#11 Project Quality Objectives/Systematic Planning Process Statements	A7. Quality Objectives and Criteria	Sections 1.1, 1.2, 2.2, 5.0, 6.3, 7.2, 8.0 and Tables A.5-1, A.7-1, A.7-2, A.8-1, and A.8-2	None
#12 Measurement Performance Criteria Table	B5. Quality Control	Table A.7-3	None
#13 Secondary Data Criteria and Limitations Table	N/A	None	Secondary data will not be used in conjunction with this project.
#14 Summary of Project Tasks	A6. Project/Task Description	Sections 4.0, 5.0, 6.3, 7.0, 8.0, and 9.0	None

ELEMENTS OF THE UFP-QAPP IN RELATION TO THIS SAP

UFP-QAPP Worksheet	EPA QA/R-5	This SAP	Variance from UFP-QAPP
#15 Reference Limits and Evaluation Table	N/A	Table A.7-1	None
#16 Project Schedule/Timeline Table	N/A	Figure 3-2 of the Work Plan	None
#17 Sampling Design and Rationale	B1. Sample Process Design	Table A.3-1 and Section 5.0	None
#18 Sampling Locations and Methods/SOP Requirement Table	N/A	Table A.5-1	None
#19 Analytical SOP Requirement Table	N/A	Table A.6-2	None
#20 Field Quality Control Sample Summary Table	B5. Quality Control	Table A.7-4	None
#21 Project Sampling SOP Reference Table	B2. Sampling Methods	Section 6.3	None
#22 Field Equipment Calibration, Maintenance, Testing, and Inspection Table	B6. Instrument/Equipment Testing, Inspection, and Maintenance B7. Instrument/Equipment Calibration and Frequency	Table A.6-1	None
#23 Analytical SOP Reference Table	B4. Analytical Methods	Not included	Information will be provided with lab data package.
#24 Analytical Instrument Calibration Table	N/A	Section 7.1.4.1	None
#25 Analytical Instrument and Equipment, Maintenance, Testing, and Inspection Table	N/A	Not included	Information on analytical instruments will be in accordance with laboratories' QA plan as described in Section 7.1.4.9.
#26 Sampling Handling System	B3. Sample Handling and Custody	Section 6.5	None
#27 Sample Custody Requirements	B3. Sample Handling and Custody	Section 4.1.4 and 7.1.2	None
#28 QC Samples Table	B5. Quality Control	Section 7.1.4	None
#29 Project Documents and Records Table	A9. Project Documents and Records	Table A.4-1	None
#30 Analytical Services Table	N/A	Not included	Analytical data package turnaround time is identified in Section 8.1.2.

ELEMENTS OF THE UFP-QAPP IN RELATION TO THIS SAP

UFP-QAPP Worksheet	EPA QA/R-5	This SAP	Variance from UFP-QAPP
#31 Planned Project Assessment Table	C1. Assessment and Response Actions	Table A.9-1	None
#32 Assessment Findings and Response Actions	C1. Assessment and Response Actions	Table A.9-2	None
#33 QA Management Reports Table	C2. Reports to Management	Table A.9-3	None
#34 Sampling and Analysis Verification (Step 1) Process Table	D1. Data Review, Verification, and Validation D2. Verification and Validation Methods	Table A.8-1	None
#35 Sampling and Analysis Validation (Steps 2a and 2b) Process Table	D1. Data Review, Verification, and Validation	Table A.8-2	None
#36 Sampling and Analysis Validation (Steps 2a and 2b) Summary Table	D1. Data Review, Verification, and Validation	Section 8.2	None
#37 Data Usability Assessment	D3. Reconciliation with User Requirements	Sections 8.2 and 8.3, Tables A.7-1, A.7-3, and A.7-4	None

I certify that this SAP is in compliance with the latest version of the UFP-QAPP and the EPA QA/R-5.

Lisa A. Bienkowski	Lisa A. Bienkowski	03/26/07
PRINT NAME (Program Chemist)	SIGNATURE	DATE

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ATTACHMENTS

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ABBREVIATIONS AND ACRONYMS

%R	percent recovery
bgs	below ground surface
CCR	California Code of Regulations
CCV	continuing calibration verification
CFR	Code of Federal Regulations
COC	chain-of-custody
CTO	Contract Task Order
DGPS	differential global positioning system
DOD	Department of Defense
DON	Department of the Navy
DQO	data quality objective
EDD	electronic data deliverable
EOD	explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
FCR	Field Change Request
GC/MS	gas chromatograph/mass spectrometer
ICAL	initial calibration
ICP-AES	inductively coupled plasma-atomic emission spectrometer
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MC	munitions constituents
MCB	Marine Corps Base
MDL	method detection limit
MEC	munitions and explosives of concern
mm	millimeter
MP	Malcolm Pirnie, Inc.
MPPEH	material potentially presenting an explosive hazard
MRP Site UXO5	Munitions Response Program Site UXO5
MS	matrix spike
MSD	matrix spike duplicate
NAVFAC SW	Naval Facilities Engineering Command, Southwest
NEDD	Navy electronic data deliverable
NFESC	Naval Facilities Engineering Service Center

ABBREVIATIONS AND ACRONYMS

(Continued)

OSHA	Occupational Safety and Health Administration
PA	preliminary assessment
PARCC	precision, accuracy, representativeness, completeness, and comparability
PjM	Project Manager
PPE	personal protective equipment
PQCM	Project Quality Control Manager
PRG	Preliminary Remediation Goal
QA	quality assurance
QAO	Quality Assurance Officer
QC	quality control
QCM	Quality Control Program Manager
QL	quantitation limit
QSM	Quality Systems Manual
RPD	relative percent difference
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SDG	sample delivery group
SI	site inspection
SOP	Standard Operating Procedure
SSL	soil screening level
SWDIV	Southwest Division Naval Facilities Engineering Command
TtEC	Tetra Tech EC, Inc.
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plans
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance

1.0 INTRODUCTION

This project-specific Sampling and Analysis Plan (SAP) has been prepared by Tetra Tech EC, Inc. (TtEC) on behalf of the Department of the Navy's (DON's) Naval Facilities Engineering Command, Southwest (NAVFAC SW). This project will be conducted under Remedial Action Contract No. N62473-06-D-2201, Contract Task Order (CTO) No. 14.

The purpose of this SAP is to provide guidance on sampling, analysis, and quality assurance (QA) in conjunction with the site inspection surface survey for materials potentially presenting an explosive hazard (MPPEH) at Munitions Response Program Site UXO5 (MRP Site UXO5), located at Naval Weapons Station Seal Beach Detachment Fallbrook (NAVWPNSTA Seal Beach Detachment Fallbrook), in Fallbrook, California. The scope of work is to complete a MPPEH site inspection at MRP Site UXO5. Findings of the site inspection will be incorporated into a Site Inspection Report for MRP Site UXO5, which will determine if additional characterization, remedial response, or other further action is warranted. Field work includes a visual surface sweep for MPPEH, surface soil sampling for explosive munitions constituents (MC) including perchlorate, and California Code of Regulations (CCR) Title 22 metals, potential vegetation clearance (based on site conditions), a geophysical survey to determine the physical limits of the landfill, vegetation removal, and the installation of semi-permanent fencing surrounding the perimeter extent of MPPEH contamination.

This SAP will be used as a reference document by all field and laboratory personnel engaged in the sampling and analysis for this project. This document will be provided to individuals listed in Table A.1-1. Included in this SAP are data quality objectives (DQOs), field sampling procedures, QA/quality control (QC) requirements, and data gathering methods that will be used during this project. This SAP is prepared in accordance with the requirements of the *Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP)* (U.S. Environmental Protection Agency [EPA], 2005) and *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS* (EPA, 2006b).

1.1 OBJECTIVES

The objectives of this SAP are to: (1) provide guidance for the field sampling activities; (2) describe and establish consistent field sampling procedures; (3) establish data gathering, handling, and documentation methods; and (4) define QA/QC measures to ensure consistency and confidence in the data obtained.

The specific sampling objectives for this project are to collect and analyze soil samples from the Salvage Yard Landfill in MRP Site UXO5 to refine the boundaries or area(s) containing MPPEH and then reclassify these areas into one of three levels of munitions and explosives of concern (MEC) presence (known, suspected, and not suspected to contain MEC).

1.2 ACTION LEVELS

Samples collected for this project are part of the site inspection (SI), and the results will be used in conjunction with a screening level ecological risk assessment as well as a screening level human health risk assessment to be documented in the SI report. The results of the risk assessments will be evaluated by the DON to determine if additional characterization, remedial response, or other further action is warranted.

For the purposes of the risk assessment, the EPA Region 9 Preliminary Remediation Goals (PRGs) for human health comparison as well as the soil screening levels (SSLs) for ecological risk comparison (EPA, 1997) will be used. The proposed ecological soil screening values (EPA, 1997) are compiled from multiple sources. For metals, the primary values from the SSLs will be used. Secondary sources, which included values from the Oak Ridge National Laboratories Ecological Risk Division, are very conservative numbers and only for screening purposes. They are based upon conservative exposure assessments that assume full-time exposure and 100 percent bioavailability. For a few components, published ecological SSLs do not exist. In these situations, PRGs will be used. If the analytical laboratory is unable to report to the selected SSL or PRG, then the laboratory's quantitation limit will be utilized as the screening level.

1.3 REGULATORY OVERSIGHT

Under Executive Order 12580, the DON is the lead agency responsible for the SI effort, and the California Regional Water Quality Control Board (RWQCB) and Department of Toxic Substances Control (DTSC) are the lead state regulatory agencies.

TABLE A.1-1

DISTRIBUTION LIST

(UFP-QAPP Worksheet #3)

This document will be distributed to the project participants listed below once all approval signatures have been received.

SAP Recipients	Title	Organization	Telephone Number	Email Address
Mr. Si Le	Remedial Project Manager	NAVFAC SW	(619) 532-2295	si.t.le@navy.mil
Ms. Diane Silva	Administrative Record Manager	NAVFAC SW	(619) 532-3676	diane.silva@navy.mil
Mr. Narciso Ancog	Quality Assurance Officer	NAVFAC SW	(619) 532-3046	narciso.ancog@navy.mil
Ms. Pei-Fen Tamashiro	Installation Point of Contact	NAVWPNSTA Seal Beach	(562) 626-7897	pei-fen.tamashiro@navy.mil
Mr. Jim Oliver	Explosive Safety Officer	NAVWPNSTA Seal Beach Detachment Fallbrook	(760) 731-3612	oliver.james.m@navy.mil
Ms. Beatrice Griffey	Water Resource Control Engineer	San Diego RWQCB	(858) 467-2952	bgriffey@waterboard.ca.gov
Ms. Daniel Cordero	Environmental Engineer	California DTSC	(714) 484-5446	dcordero@dtsc.ca.gov
Catherine T. Zeeman, Ph.D.	Assistant Field Supervisor	U.S. Fish and Wildlife Service	(760) 431-9440	katie_zeeman@fws.gov
Mr. Kent Weingardt	Project Manager	TtEC	(619) 471-3532	kent.weingardt@tteci.com
Ms. Mary Schneider	Quality Control Program Manager	TtEC	(949) 756-7586	mary.schneider@tteci.com
Ms. Lisa Bienkowski	Program Chemist	TtEC	(949) 756-7592	lisa.bienkowski@tteci.com

Abbreviations and Acronyms:

DTSC – Department of Toxic Substances Control
NAVFAC SW – Naval Facilities Engineering Command, Southwest
RWQCB – Regional Water Quality Control Board
SAP – Sampling and Analysis Plan
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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2.0 PROJECT ORGANIZATION AND TRAINING REQUIREMENTS

This section describes project organization, communication pathways that will be used, and general and specialized training requirements.

2.1 PROJECT ORGANIZATION

Key personnel from DON and TtEC who are responsible for the oversight and/or implementation of the proposed field activities include the Naval Facilities Engineering Command, Southwest (NAVFAC SW) Quality Assurance Officer (QAO), Remedial Project Manager (RPM), Installation Point of Contact, Project Manager (PjM), Quality Control Program Manager (QCM), Program Chemist, Project Chemist, and Data Manager. The project organization chart shown in Figure A.2-1 provides lines of responsibility and communication. In addition, responsibilities of each of the key personnel are listed in Table A.2-1.

Table A.2-2 describes the communication pathways and modes of communication that will be used during the project. These pathways include obtaining approval between project personnel, subcontractors, and the DON.

2.2 TRAINING REQUIREMENT

Project personnel are required to meet the Occupational Safety and Health Administration (OSHA) training requirements defined in Title 29 Code of Federal Regulations (29 CFR, Part 1910.120[e]). These requirements include 40 hours of formal off-site instruction; a minimum of 3 days of actual on-site field experience under the supervision of a trained and experienced field supervisor; and 8 hours of annual refresher training.

Before work begins, project personnel will receive site-specific training that thoroughly covers the following areas:

- Names of personnel and alternates responsible for health and safety at the project site
- Health and safety hazards present on site
- Selection of the appropriate personal protection levels
- Correct use of personal protective equipment (PPE)
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate over-exposure to hazardous substances

Copies of health and safety training records, including course completion certifications for the initial and refresher health and safety training, specialized supervisor training, and first aid and cardiopulmonary resuscitation training, are to be maintained in the project files.

In addition to the health and safety training, the samplers will be provided with the following training:

- Soil or water sampling as applicable to the project
- Sample handling, packaging, and shipping
- Use of related field equipment

All training will be documented, and training records will be maintained in the project file. Sampling personnel will be required to read and understand the SAP prior to any sample collection activities. The Project Personnel Sign-off Sheet (Table A.2-3) will be signed by any on-site personnel conducting sampling to indicate that they have read the SAP and will perform the tasks as described. The sign-off sheet will be maintained in the project file.

2.2.1 Specialized Training

In addition to the general training described above, the sampler(s) must receive general awareness training for MPPEH prior to any field activities and other specialized training as listed in Table A.2-4.

TABLE A.2-1

PERSONNEL RESPONSIBILITIES AND QUALIFICATIONS

(UFP-QAPP Worksheet #7)

Name	Title	Organizational Affiliation	Responsibilities
Narciso Ancog	Quality Assurance Officer	NAVFAC SW	Reviewing and approving this SAP Providing the DON oversight of TtEC's Quality Assurance Program Providing technical and administrative oversight of TtEC's surveillance audit activities Acting as Point of Contact for matters concerning quality assurance and the DON's Laboratory Quality Assurance Program Coordinating training on matters pertaining to generation and maintenance of quality of data Authorizing the suspension of project execution if quality assurance requirements are not adequately followed
Si Le	Remedial Project Manager	NAVFAC SW	Performing project management for the DON Ensuring that the project scope of work requirements are fulfilled Overseeing the project cost and schedule Providing formal technical direction to the TtEC project team, as needed Acting as lead interface with agencies
Pei-Fen Tamashiro	Installation Point of Contact	NAVWPNSTA Seal Beach	Responsible for coordinating field activities Ensuring that operations conducted on the site are in compliance with Detachment Fallbrook specific rules and regulations Interacting with the regulatory agencies and community members
Kent Weingardt	Project Manager	TtEC	Coordinating work activities of subcontractors and TtEC personnel, and ensuring that all personnel adhere to the administrative and technical requirements of the project Monitoring and reporting the progress of work, and ensuring that the project deliverables are completed on time and within project budget Monitoring the budget and schedule, and notifying the client and the RPM of any changes that may require administration actions Ensuring adherence to the quality requirements of the contract, project scope of work, and the QC Plans Ensuring that all work meets the requirements of the technical specifications and complies with applicable codes and regulations

TABLE A.2-1

PERSONNEL RESPONSIBILITIES AND QUALIFICATIONS

(UFP-QAPP Worksheet #7)

Name	Title	Organizational Affiliation	Responsibilities
			Ensuring that all work activities are conducted in a safe manner in accordance with the Site-specific Health and Safety Plan, USACE's *Safety and Health Requirements* (EM-385-1-1), and all applicable OSHA regulations Serving as the primary contact between the DON and TtEC for actions and information related to the work and including appropriate TtEC technical personnel in the decision-making Coordinating satisfactory resolution and completion of evaluation and acceptance report for nonconformance reports
Anthony Crino	Senior UXO Supervisor	TtEC	Overseeing all aspects of explosive safety on this project Identifying personnel and equipment requirements Documenting site conditions and photographing UXO recovery and disposal operations Ensuring that all fieldwork is conducted in accordance with the Work Plan, SAP, and QC plans Providing direction to field staff and subcontractors Ensuring that all work is conducted in accordance with the Work Plan
Mary Schneider	Quality Control Program Manager	TtEC	Establishing and maintaining the Quality Program Overseeing program QC, including construction and chemical data acquisition Working directly with the PjM and the DON to ensure implementation of the Program QC Plans Acting as a focal point for coordination for quality matters across all projects and resolving quality issues Suspending project activities if quality standards are not maintained Interfacing with the DON, including NAVFAC SW QAO, on quality-related items Conducting field QC audits to ensure project plans are being followed Performing reviews of audit and surveillance reports conducted by others Implementing the DON technical direction letters related to quality topics

TABLE A.2-1

PERSONNEL RESPONSIBILITIES AND QUALIFICATIONS

(UFP-QAPP Worksheet #7)

Name	Title	Organizational Affiliation	Responsibilities
Lisa Bienkowski	Program Chemist	TtEC	Implementing contract requirements for chemical data collection Supporting projects as the technical lead for chemical data collection and analysis Ensuring Project Chemist has adequate training in sample collection and analytical methods Monitoring performance of subcontract laboratory and data validator
Nick Weinberger	Project Chemist	TtEC	Developing the SAP Ensuring that sampling personnel have documented training on sampling procedures for specific project requirements Evaluating and selecting a qualified subcontract laboratory Performing audit of sample collection activities Reviewing laboratory data prior to use against requirements in this SAP Evaluating and selecting a qualified data validation subcontractor Reviewing data validation reports Preparing data quality assessment report to ensure the quality of the data meets the intended use of the data
Jonathan Karnath	Data Manager	TtEC	Uploading field information and laboratory data into the database Checking all data for completeness (e.g., all required fields are entered) and providing output to the project team as requested in the format requested Submitting NEDD formatted data to the DON in accordance with the requirements set forth in *Environmental Work Instruction EVR.6, Environmental Data Management and Required Electronic Delivery Standards* (SWDIV, 2005)

Abbreviations and Acronyms:

DON – Department of the Navy
NEDD – Navy Electronic Data Deliverable
NAVFAC SW – Naval Facilities Engineering Command, Southwest
OSHA – Occupational Safety and Health Administration
PjM – Project Manager
QAO – Quality Assurance Officer
QC – quality control
RPM – Remedial Project Manager
SAP – Sampling and Analysis Plan
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans
USACE – U.S. Army Corps of Engineers
UXO – unexploded ordnance

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TABLE A.2-2

COMMUNICATION PATHWAYS

(UFP-QAPP Worksheet #6)

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
SAP approval	NAVFAC SW QAO	Narciso Ancog	(619) 532-3046	NAVFAC SW QAO will review and approve SAP. Field sampling will not begin without approved SAP.
Project management	Project Manager	Kent Weingardt	(619) 471-3532	If changes are necessary, the project manager is responsible for communicating the changes via phone and/or e-mail to the project staffs and is authorized to stop work if necessary.
SAP review	Program Chemist	Lisa Bienkowski	(949) 756-7592	SAP will be reviewed by the Program Chemist or QC Program Manager prior to submittal to the NAVFAC SW QAO.
UXO oversight	Senior UXO Supervisor	Anthony Crino	(619) 206-3344	Communication of relevant technical information to project manager and field team.
Coordination and communication of fieldwork activities related to sampling	Project Engineer	Lisa Bercik	(619) 471-3538	Project Engineer will communicate relevant field information to the Project Manager and Project Chemist.
Coordination of laboratory supplies for field activities	Project Chemist	Nick Weinberger	(949) 756-7588	Project Chemist will contact the laboratory to provide all necessary sample containers and appropriate shipping materials (such as coolers and bubble wrap) to be delivered on site prior to commencement of field sampling activities and throughout the course of the project.
Submittal of samples to the laboratory	Sampling Personnel	TBD	TBD	Sampling personnel will package and ship samples in accordance with this SAP.
Daily COC reports and shipping documentation	Sampling Personnel	TBD	TBD	COCs and shipping documentation will be submitted via fax or email to the Project Chemist at the end of each day that samples are collected.
Reporting laboratory data quality issues	Laboratory Project Manager	Mike Baxter	(206) 957-2422	All QA/QC issues will be reported by the Laboratory Project Manager to the Project Chemist in writing within 2 business days.

TABLE A.2-2

COMMUNICATION PATHWAYS

(UFP-QAPP Worksheet #6)

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
Field and analytical corrective actions	Project Chemist	Nick Weinberger	(949) 756-7588	The Project Chemist will immediately notify the PQCM, QCM, and Program Chemist in writing of any field or analytical procedures that were not performed in accordance with this SAP. The Project Chemist, in coordination with the PQCM, will complete documentation of the non-conformance and corrective actions to be taken. The Project Chemist will verify that corrective actions have been implemented.
Release of analytical data	Project Chemist	Nick Weinberger	(949) 756-7588	The Project Chemist will review faxed/e-mailed data to verify that data quality is met as described in this SAP prior to releasing the data. Analytical data will be released to the Project Manager (or their designee) after the Project Chemist has verified the data is in accordance with the SAP requirements.
SAP procedure revision during field activities	Project Chemist	Nick Weinberger	(949) 756-7588	The Project Chemist will prepare an FCR for any changes in sampling procedures that occur due to conditions in the field.

TABLE A.2-2

COMMUNICATION PATHWAYS

(UFP-QAPP Worksheet #6)

Communication Drivers	Responsible Entity	Name	Phone Number	Procedure
SAP amendments	Project Chemist	Nick Weinberger	(949) 756-7588	Any changes to the SAP will require that the Project Chemist prepare an addendum, which will be approved by NAVFAC SW prior to any field activities.

Abbreviations and Acronyms:

COC – chain-of-custody
FCR – Field Change Request
NAVFAC SW – Naval Facilities Engineering Command, Southwest
PQCM – Project Quality Control Manager
QA – quality assurance
QAO – Quality Assurance Officer
QC – quality control
QCM – Quality Control Program Manager
SAP – Sampling and Analysis Plan
TBD – to be determined
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans
UXO – unexploded ordnance

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TABLE A.2-3

PROJECT PERSONNEL SIGN-OFF SHEET

(UFP-QAPP Worksheet #4)

I have read and understand this SAP and will perform the tasks as described.

Project Personnel	Organization	Title	Signature	Date SAP Reviewed

Abbreviations and Acronyms:

SAP – Sampling and Analysis Plan
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.2-4

SPECIAL PERSONNEL TRAINING REQUIREMENTS

(UFP-QAPP Worksheet #8)

Project Function	Specialized Training – Description of Course	Training Provider	Training Date	Personnel/ Groups Receiving Training	Personnel Titles/ Organizational Affiliation	Location of Training Records and Certificates
Sample Collection	MPPEH briefing	SUXOS	Prior to field work	Sampling personnel	Sampling Technician/TtEC	Project File
Field screening kit testing	On-site demonstration of test kit	Project Chemist or their designee	First day of sampling activity	Sampling personnel	Sampling Technician/TtEC	Project File
Sample handling, packaging, and documentation	On-site demonstration of sampling technique	Project Chemist or their designee	First day of sampling activity	Sampling personnel	Sampling Technician/TtEC	Project File

Abbreviations and Acronyms:

MPPEH – materials potentially presenting an explosive hazard
SUXOS – Site Unexploded Ordnance Supervisor
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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3.0 PROJECT OVERVIEW

This section describes the project background, scope, and DQOs for this project.

3.1 FACILITY BACKGROUND

MRP Site UXO5, also the site of the Salvage Yard Landfill, covers approximately 13 acres and is located in the northeast corner of NAVWPNSTA Seal Beach Detachment Fallbrook, approximately 900 feet from the western corner of the installation. MRP Site UXO5 was a burial area for munitions and dunnage (Malcolm Pirnie, Inc. [MP], 2006). From 1952 through 1960, the 2-acre area located northeast of Building 307 was used to dispose inert materials. On historical maps, the area is labeled as a storage yard starting in the 1950s and ending in the late 1960s. Records indicate that expended cartridges, primers, live projectiles, and inert anti-tank projectiles were buried in the area (MP, 2006). In the mid-1960s, two pounds of five partially filled cans of smokeless powder were reportedly deposited at the site. In the late 1980s, an on-site survey was performed and revealed other materials in the disposal area, including electronic parts, inert missile parts, rubber missile shipping rings, missile test stands, practice shapes electronic test equipment, empty powder cans, metal banding, and tires. In February 2002, a brush fire exposed buried munitions in the area. An explosive ordnance disposal (EOD) report from that same month described an incident in which EOD technicians from Marine Corps Base (MCB) Camp Pendleton were called to the site to handle suspected 20-millimeter (mm) and 40-mm rounds and blasting caps found on the ground surface.

In 2004 and 2005, visual surveys were conducted at the site as part of the preliminary assessment (PA). The surveys consisted of walking the perimeter and several transects of the site. The munitions observed during the survey activities included a 25-pound bomb, a 3-pound pyrotechnic bomb, an MK 76 practice bomb, a 2.36-inch anti-tank high explosive (HE) rocket, a 5-pound practice bomb, 20-mm rounds, other projectiles, several smokeless powder cans and lids, and other munitions scrap (MP, 2006). Currently, MRP Site UXO5 is not in use, and the area is not completely fenced.

3.2 DATA QUALITY OBJECTIVES

The DQOs specify the project objectives, the data collection boundaries and limitations, the most appropriate type of data to collect, and the level of decision error that will be acceptable for the decision. The quality and quantity of data required to implement environmental remedial action are also defined. The scope, level of detail, and verification for the design and planning documents may vary from project to project, depending on the project-specific conditions and the nature and complexity of the proposed activities. The project-specific DQOs, as defined through the seven-step process (EPA, 2006a), are as follows:

1. State the problem

2. Identify the goals of the study
3. Identify information inputs
4. Define the boundaries of the study
5. Develop the analytic approach
6. Specify performance or acceptance criteria
7. Develop the plan for obtaining data

The DQOs are presented in Table A.3-1.

TABLE A.3-1

SUMMARY OF DATA QUALITY OBJECTIVES

State the Problem	Identify the Goals of the Study	Identify Information Inputs	Define the Boundaries of the Study	Develop the Analytic Approach	Specify Performance or Acceptance Criteria	Develop the Plan for Obtaining Data
STEP 1	**STEP 2**	**STEP 3**	**STEP 4**	**STEP 5**	**STEP 6**	**STEP 7**
The Salvage Yard Landfill (MRP Site UXO5) contains MPPEH and may contain explosives, perchlorate, and metal contamination in the soil. Further site inspection is needed to determine where and at what concentrations explosives, perchlorate, and metals are present. The PA identified Site UXO5 as an MRP site. The PA conducted in 2005 summarized the history of munitions use at the site. MEC was observed during two visual surveys performed in 2004 and 2005. The PA recommended a site inspection. No sampling has reportedly been performed at the site. The objectives are to identify the MPPEH and classify the areas sampled as MEC presence known, suspected, or not suspected.	1. Have MPPEH been encountered during the visual survey of the site? 2. Do the visual survey and soil analytical results confirm the presence or detection of MEC? 3. Are the soil analytical results above the ecological screening levels, residential PRGs, or industrial PRGs listed in Table A.7-1?	SI surface survey to identify MPPEH Grab soil samples collected from zero to 9 inches bgs The following methods will be used for this project for soil samples: • EPA Method 8330 • EPA Method 314 (with positive detections confirmed by LC/MS) • EPA Method 6010B/6020/7471A/7470A	MRP Site UXO5 is the focus of this SI. The proposed sampling is designed to investigate areas that contain or are believed to contain MPPEH, and to gather information as to the extent of explosives, perchlorate, or metal contamination in the soil. Figure A.5-1 illustrates the proposed sampling locations for one area known to contain MPPEH. Other areas will be identified for sampling during SI surface surveys. All samples will be collected from zero to 9 inches bgs. Figure 3-2 of the Work Plan illustrates the project schedule.	1. If MPPEH are identified during the visual survey, then the items will be identified, georeferenced (with a DGPS), documented in an MPPEH log (to be developed on site), photographed, and left as-found, undisturbed. Otherwise, the area will be considered cleared of MPPEH. 2. If the visual survey and soil analytical results confirm the presence or detection of MEC, then the area will be reclassified as “Known MEC.” Otherwise, the area will be classified as suspected or not suspected depending on the results of the visual survey and soil sampling. The analytical results will be used to determine if additional characterization, remedial response, or other further action is warranted. 3a. If the soil analytical results are above the ecological screening levels, then a screening level ecological risk assessment will be conducted to evaluate exposure to the chemical constituents of concern. The results will be presented in the site investigation report for this project. 3b. If the soil analytical results are above the residential or industrial PRGs, then a screening level human health risk assessment will be conducted to evaluate exposure to the chemical constituents of concern. The results will be presented in the site investigation report for this project. 3c. If the soil analytical results are below the ecological screening levels, residential PRGs, or industrial PRGs, then the results will be presented in the site investigation report. The risk assessments would not be based on chemical exposure, but only explosive hazards as a result of MPPEH items.	To limit decision errors, analytical method requirements and project-specific DQOs were established. Published analytical methods and requirements in the QSM (DOD, 2006) are the primary determinants of DQOs by establishing limits for precision and accuracy. Field crews will review the SAP before collection of samples and sign-off on Table A.2-4. A copy of the SAP will be given to laboratories solicited during procurement to ensure that the laboratory can meet all SAP requirements. Third-party data validation will be performed on all samples. Sample collection and analysis methods were chosen to minimize sampling errors.	Soil samples will be collected and analyzed for explosives, perchlorate, and metals: (1) in relation to the locations where MPPEH items are found during the SI visual surface survey; (2) at locations where eroded soil has apparently re-deposited; and (3) at areas of stressed or no vegetation which may also indicate the presence of MPPEH contamination. The number of soil samples has been estimated (29) based on currently available information as shown in Section 5.1.

Abbreviations and Acronyms:

bgs – below ground surface
DGPS – differential global positioning system
DOD – Department of Defense
DQO – data quality objective
EPA – U.S. Environmental Protection Agency
LC/MS – liquid chromatography/mass spectrometry
MEC – munitions and explosives of concern
MRP – Munitions Response Program
MPPEH – materials potentially presenting an explosive hazard
PA – preliminary assessment
PRG – Preliminary Remediation Goal
QSM – Quality Systems Manual
SAP – Sampling and Analysis Plan
SI – site inspection

TABLE A.3-1

SUMMARY OF DATA QUALITY OBJECTIVES

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4.0 DOCUMENTATION AND RECORDS

This section discusses the types of documentation and records required for this project, and Table A.4-1 lists where the documentation and records will be maintained.

4.1 FIELD DOCUMENTATION

Field documentation associated with sampling activities includes logbooks, field forms, sample labels, chains-of-custody (COCs), supplies certification, field surveillance and nonconformance reports, and Field Change Request (FCR) forms. These types are described in the following sections.

4.1.1 Logbooks

A permanently bound field logbook with consecutively numbered pages, used for sampling activities only, will be assigned to this project. All entries will be recorded in indelible black or blue ink. At the end of each workday, the logbook pages will be signed by the responsible sampler and any unused portions of the logbook pages will be crossed out, signed, and dated. If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used and the person receiving the logbook will sign and date the next page to be used. At a minimum, the logbook will contain the following information:

- Project name and site location
- Date and time
- Personnel in attendance
- General weather information
- Work performed
- Field observations
- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments
- Descriptions of deviations from this SAP
- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
- Any other events that may affect the samples

4.1.2 Field Forms

Field forms required for this project will include COC forms described in Section 4.1.4. A sample COC form can also be found in Attachment 1.

4.1.3 Sample Labels

Sample labels will be filled out in indelible black or blue ink and affixed to sample containers at the time of sample collection. An example sample label is provided in Attachment 1. Each sample label will be covered with clear tape. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock) from the start of sampling
- Sampler's initials
- Analyses required
- Preservative (if any)

4.1.4 Chain-of-Custody

An overriding consideration for data resulting from laboratory analyses is the ability to demonstrate that the data are legally defensible, i.e., that the samples were obtained from the locations stated and that they reached the laboratory without alteration. To accomplish this, evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal will be documented through the COC record.

A sample is considered to be in custody if the following conditions have been observed:

- In actual possession or in view of the person who collected the samples
- Locked in a secure area
- Placed in an area restricted to authorized personnel
- Placed in a container and secured with an official seal, such that the sample cannot be reached without breaking the seal

Attachment 1 presents an example of the COC record. The COC record lists each sample and the individuals performing the sample collection, shipment, and receipt. Attachment 1 also presents an example of a custody seal that will seal samples and the cooler during transportation to the laboratory.

The COC record will be the controlling document to ensure that the sample custody is maintained. Sampling personnel upon collecting a sample will initiate the COC record in the field. Each time the sample custody is transferred, the former custodian will sign the COC on the "Relinquished By" line, and the new custodian will sign the COC on the "Received By" line. The date, time, and the name of their project or company affiliation will accompany each signature. The waybill number and courier name will be recorded on the COC when a commercial carrier is used. The shipping container will be secured with

two custody seals, thereby allowing for custody to be maintained by the shipping personnel until receipt of the laboratory.

Sample custody will be the responsibility of sampling personnel from the time of sample collection until the samples are accepted by the laboratory via courier or FedEx®. Thereafter, the laboratory performing the analysis will maintain custody. Laboratory sample custody is described in Section 7.1.2.

In addition to providing a custody exchange record for the samples, the COC record serves as a formal request for sample analyses. The COC records will be completed, signed, and distributed as follows:

- White and pink copies sent to the analytical laboratory with the sample shipment
- Yellow copy retained on site for inclusion in the project files
- A copy faxed/e-mailed to the Project Chemist on a daily basis to allow tracking of samples during shipment and to be used to confirm laboratory receipt of samples
- Manila copy sent to the Project Chemist

4.1.5 Supplies Certification

Certificates from the supplier demonstrating that containers for sampling, tubing for well purging, deionized water for decontamination, and laboratory-grade water for rinsate samples are analyte-free will be provided for each lot. In addition, a certificate will accompany calibration gases for field screening instruments to ensure that gases are the manufacturer's specified grade. Certificates will be placed in the project files.

4.1.6 Sample Shipping Records

Samples will be transported to the laboratory via courier or FedEx®. For samples received by a courier, the courier will sign the COC and accept the samples. For samples shipped via FedEx®, the COC will be packaged within the cooler and the sender's copy of the airbill will serve as custody documentation and will be maintained on-site in the project file. Sample shipping procedures are detailed in Section 6.6.

4.1.7 Field Surveillance Reports

On-site field inspections will be performed by the Project Chemist at a frequency of once at the beginning of field sampling activities for project duration less than 6 months. For projects longer than 6 months, twice per year inspections will be conducted. The Project Chemist will use the surveillance checklist during inspection. Surveillance reports will be prepared and provided to the PjM and QCM.

4.1.8 Field Change Request

An FCR will be prepared by the Project Chemist, or a designee, if a change to the SAP occurs during sampling activities. These changes will be minor and not result in a change in scope and/or DQOs for this project. The FCR must be approved prior to field implementation. Major changes to work scope affecting the original DQOs or meeting criteria described in *EWI #2, 3EVR.2, Review, Approval, Revision, and*

Amendment of Sampling and Analysis Plans (SAPs) (NAVFAC SW, 2006) will require preparation of a SAP addendum. The SAP addendum must be approved by NAVFAC SW QAO prior to conducting sampling and analysis.

4.2 LABORATORY DOCUMENTATION

Laboratory records associated with project samples analyzed include the following at a minimum:

- Sample receipt and login
- Laboratory internal COC
- Instrument calibration logs
- Sample preparation logs
- Sample analysis/run logs
- Sample results case narrative
- Sample disposal records
- Nonconformance reports including corrective actions

The laboratory will prepare analytical data packages comprised of the above documentation for each sample delivery group (SDG) and provide them to TtEC. Laboratory deliverables will include two copies of the hard-copy data package, submitted as either EPA Level III- or IV-equivalent packages as specified on the COC. Detailed information on the requirement of hard-copy data packages is provided below. The report pages will be sequentially numbered. The report will contain a table of contents referencing individual sections in the data package, the original, white copy of COC records, a copy of all corrective action reports, and a narrative documenting the resolution of all corrective actions and non-conformances. All samples will be cross-referenced to the associated QC samples. The packages will be assembled in the following sequence:

- Cover page (with laboratory name, address, phone number, contact person, and SDG number, as well as the project name and project number)
- Table of contents
- Case narrative
- Sample management records, including the original, white copy of COC records (including cooler temperature and sample condition), shipping documents, and laboratory sample receipt forms
- Cross-reference table
- Analytical results and QA/QC information by test as follows:
    - Organic raw data sequence
        - Sample result forms, including method blanks
        - Sample raw data after each result form (EPA Level IV only)
        - Surrogate summaries (surrogate results may appear on the sample result forms)

  - QC summaries
  - Tune data (gas chromatograph/mass spectrometer [GC/MS] only)
  - Initial calibration (ICAL)
  - Daily calibration checks, including related continuing calibration verification (CCV)
  - Resolution check standards (GC/MS and pesticides), if applicable
  - QC (laboratory control sample (LCS), matrix spike/matrix spike duplicate (MS/MSD) raw data (EPA Level IV only)
  - Instrument run log
  - Sample preparation log
- Inorganic raw data sequence
  - Sample results forms, including method blanks
  - Sample raw data (EPA Level IV only)
  - QC summaries
  - ICAL
  - Daily calibration checks, including all related CCV
  - Calibration blanks, including all related continuing calibration blanks
  - Interference check standards A and B for inductively coupled plasma-atomic emission spectrometer (ICP-AES) only
  - QC raw data (EPA Level IV only)
  - Post-digestion spike results
  - Analytical spike results
  - Method of standard additions
  - ICP-AES serial dilutions
  - Instrument run log
  - Sample preparation log

All relevant laboratory raw data and documentation including, but not limited to, logbook, data sheets, electronic files, and reports, will be maintained by the laboratory for at least 7 years. TtEC must be notified 30 days before disposal of any relevant records.

In addition to the hard-copy data, an electronic data deliverable (EDD) will be submitted in ASCII format. The EDD will be compatible with the Navy electronic data deliverable (NEDD) standard. Both the EDD and the hard-copy report will present results to two or three significant figures. For organic results, two significant figures will be used for all results. For inorganic results, two significant figures will be used for results less than 10, and three significant figures will be used for results greater than 10. Results for QC analyses (method blanks, MS/MSD, LCS, and duplicates) will be reported up to three significant figures.

When revisions to data reports are required, the revised pages (an original and copy) will be stamped with the notation “amended or revised report.” If revisions affect the EDD, a revised EDD will then be sent along with the revised hard-copy pages. In addition, a hard-copy or electronic copy of items submitted to the validator (as discussed in Section 4.3) by the laboratory will also be submitted to the Project Chemist.

4.3 DATA VALIDATION REPORTS

All analytical data generated from laboratories will be validated by an independent data validation company. The validator shall provide one original and one copy of the data validation reports, which includes analytical result pages with appropriate qualifiers and the data validation findings worksheets. The original and copy reports will be submitted in separate sets. The reports will be arranged in increasing SDG numbers and grouped by the type of analysis; i.e., a group of reports will consist of SDGs with the same analysis arranged in increasing numerical order. Each SDG will be submitted as a separate data validation report. Reports covering multiple SDGs are not acceptable.

The validation reports will contain the following information:

- Title page, that includes project name, sample collection date, validator subcontractor name, report date, type of analysis, laboratory, SDG, sample identifications (including MS/MSD, duplicate, reanalysis, or dilution samples), sample matrix (e.g., soil, water), and validation level (EPA Level III or IV)
- Introduction page that includes the number of samples per matrix, analytical method reference, validation guideline reference, section references to summary qualification flags, and denotes QC samples. Statements regarding flag classification (protocol/advisory) and whether raw data check was performed will also be included.
- Section headings for each analytical method will include the following:
  - Technical holding times
  - GC/MS instrument performance check (Tune) if applicable
  - Calibration
    a. ICAL
    b. Initial calibration verification (second source standard)
    c. CCV
  - Laboratory blanks
  - Accuracy and precision data
    a. Surrogate spike recoveries
    b. MS/MSD
    c. LCS/LCSD
    d. Internal standards
  - Target compound identification
  - System performance checks
  - Analyte quantitation and quantitation limits (QLs)
  - Field QC samples (if not applicable, report will note)
  - Overall assessment of data
  - Assessment of compliance with Statement of Work requirements
- QC deviation summaries, which will include in a tabular format the following:
  - Unique identification of QC run (e.g., date/time, etc.)
  - Associated project and sample numbers (not the laboratory internal sample IDs)

  - Associated constituents
  - Actual value for noted deviation
  - Applicable QC criteria
  - Applicable qualifiers
  - Qualifier classifications (advisory or protocol)
- Copy of analytical result pages that will be flagged with the appropriate changes in results/qualifiers based on the data validation findings. Each analytical result page with changes will be initialed and dated. If there are no changes in results/qualifiers, the analytical result pages should still be included.
- Validation findings worksheets
- Qualifier classification

The following format will be used when preparing and submitting revised data validation reports and analytical result pages:

- The cover letter and revised text pages will clearly identify the revision number (i.e., **Revision 1**) typed in the upper-right hand corner of the page.
- A statement in the cover letter will be included indicating that an asterisk will be placed in the margin to the left of any revised item in the text.
- Every revised page in the text will have the following statement placed at the bottom of the page:

  ***Indicates revision based on report review.**
- The summary table will have an asterisk placed to the left of every revised item and a statement at the bottom of the page as follows:

  ***Indicates change as a result of report review.**
- The analytical result pages will be stamped:

  ***Indicates change as a result of report review.**

Revisions will be submitted within 1 week of receiving the review comments from the Project Chemist. Report revision submittal packages will include an original and copy of the cover page, revised pages, and revised analytical result pages.

The data validation subcontractor will maintain validation records for at least 7 years. TtEC will be notified 30 days before disposal of any records.

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TABLE A.4-1

PROJECT DOCUMENTS AND RECORDS

(UFP-QAPP Worksheet #29)

Document	Where Maintained
Field logbook	Project file
Sample labels	Laboratory
Chain-of-custody	Project file and laboratory
Supplies certification	Project file
Shipping records	Project file
Field audit and nonconformance reports	Project file
Laboratory data package including: Sample receipt and login Laboratory internal COC Instrument calibration logs Sample preparation logs Sample analysis/run logs Nonconformance reports including corrective actions	Laboratory and project file; project file copy will subsequently be sent to NAVFAC SW Administrative Record
Data validation report	Validator and project file; project file copy will subsequently be sent to NAVFAC SW Administrative Record

Abbreviations and Acronyms:

COC – chain-of-custody
NAVFAC SW – Naval Facilities Engineering Command, Southwest
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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5.0 SAMPLING STRATEGY

This section provides a brief description of the approach that will be used to collect samples. Table A.5-1 provides a summary of the sampling locations, matrix, depths, and analytical requirements. The analytical methods used for this project will be in conjunction with the *Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846*, Third Edition (EPA, 1986).

5.1 SALVAGE YARD LANDFILL SOIL SAMPLING

MC including RDX, HMX, TNT, and perchlorate associated with older buried ordnance is likely to be present at depleted levels due to biological and chemical degradation/depletion by natural infiltration and dispersion over the years. The highest MC concentrations in soil are expected to be found in and near areas where multiple MEC items are located.

During sampling, biological avoidance and minimization measures will be followed as described in Section 5.3 of the Work Plan. An unexploded ordnance (UXO) technician will escort the sampler during the collection of soil samples, which will be collected from zero to 9 inches below ground surface (bgs). Sample locations will be chosen based on a random selection of points in areas known to contain MPPEH. Additional samples will also be collected in areas found to contain MPPEH during the surface survey of the site. A differential global positioning system (DGPS) will be used to locate each sample point, and a UXO technician will use a hand-held magnetometer to scan the sample area. Magnetometers are capable of detecting a 20mm round (the smallest MEC item) at 9 inches bgs and larger anomalies up to 10 feet. The main purpose of the magnetometer is to investigate locations that will be intrusively sampled to ensure that buried MEC (or any anomalies) are not encountered (for safety reasons). Any findings during the magnetometer work will be thoroughly documented through detailed notes, photographs, DGPS location information, and scale as will all sampling locations and surface findings. If the selected location is found to be free of metal to 9 inches bgs, the sample will be collected. If metal is detected, an alternate, metal-free collection point will be selected adjacent to the original site.

Soil samples will be collected and analyzed for explosives, perchlorate, and CCR Title 22 metals in relation to the locations where MPPEH items are found during the SI visual surface survey; at locations where eroded soil has apparently redeposited; and at areas of stressed or no vegetation, which may also indicate the presence of MPPEH contamination. The number of soil samples collected for this project cannot be precisely known prior to performing the visual surface survey, but has been estimated based on currently available information as shown below.

In addition, samples may be screened in the field using test kits for explosives at the discretion of the UXO technician (based on his visual inspection of the material sampled). This will ensure that samples are not sent off-site to a laboratory containing high concentrations of explosives. If test kits confirm presence of explosives, then an alternate location will be sampled. EXPRAY Explosives

Detection/Identification Field Test Kit will be used for this purpose. EXPRAY is an aerosol-based field test kit for the detection and identification of Group A explosives (TNT), Group B explosives (RDX) and compounds containing inorganic nitrates. The test kits will be used in accordance with the manufacturer's instructions. Sample locations with confirmed concentrations of explosives will be thoroughly documented by detailed notes, photographs, DGPS location information, and scale as will sample locations confirmed not to contain explosives.

ANTICIPATED SAMPLE COLLECTION POINTS

Area	Number of Samples	Sample Location Details
Known MEC Area, identified in the PA and shown in Figure A.5-1	8	Four samples will be collected around the perimeter of the area, and four samples will be collected from random locations within the area.
Two additional larger *Known MEC Areas*, to be identified during the SI visual surface survey	8	From each newly identified *Known MEC Area*, a total of four samples will be collected: two randomly located samples along the perimeter and two randomly located samples from the interior.
Three additional smaller *Known MEC Areas*, to be identified during the SI visual surface survey	6	From each newly identified *Known MEC Area*, a total of six samples will be collected: two randomly located samples from the interior and/or around the perimeter.
Two erosion / re-deposition locations	2	From each identified erosion/redeposition area, one randomly located sample will be collected.
Two background / reference locations	2	From each identified background location, one randomly located sample will be collected.

All samples will be collected as described in Section 6.3.1.

5.2 WASTE CHARACTERIZATION SAMPLING

Wastes generated during the field activities will include personal protective equipment (PPE) and potentially decontamination water. Wastes will be stored in appropriate containers on site. PPE will not be sampled for waste characterization, but will be characterized based on knowledge of the process generating the waste and the results of the sampling associated with this work.

Solid waste will not be generated for this project since sampling is being conducted at a shallow depth (9 inches bgs).

TABLE A.5-1

SAMPLING LOCATIONS, SAMPLE DEPTH, SAMPLE ANALYSES, AND SAMPLING PROCEDURES

(UFP-QAPP Worksheet #18)

Sampling Location	Matrix	Depth (inches)	Analytical Group	Sampling Section Reference
SIS-001	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-002	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-003	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-004	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-005	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-006	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-007	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-008	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-009	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-010	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-010 (FD)	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-011	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-012	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-013	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-014	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-015	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-016	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-017	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-018	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-019	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-020	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-020 (FD)	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1

TABLE A.5-1

SAMPLING LOCATIONS, SAMPLE DEPTH, SAMPLE ANALYSES, AND SAMPLING PROCEDURES

(UFP-QAPP Worksheet #18)

Sampling Location	Matrix	Depth (inches)	Analytical Group	Sampling Section Reference
SIS-021	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-022	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-023	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-024	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-025	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-026	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1
SIS-026 (FD)	Soil	9	Explosives, Perchlorate, CCR Title 22 Metals	SAP Section 6.3.1

Abbreviations and Acronyms:

CCR – California Code of Regulations
FD – field duplicate
SAP – Sampling and Analysis Plan
SIS – site inspection sample
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

6.0 SAMPLING PROCEDURES

The following section describes the field instrument calibration and maintenance procedures, inspection of supplies and consumables, and sample collection procedures.

6.1 FIELD INSTRUMENTATION

Field equipment for this project will include a magnetometer, which will be used to detect for metal prior to sampling at any location.

Field equipment will be maintained in accordance with manufacturer's manual specifications. A check of the field equipment will be performed before field activities begin, and any potential spare parts (e.g. batteries, connectors, etc.) and maintenance tools will be brought on site to minimize equipment downtime during field activities. Visual checks of the equipment will be conducted on a daily basis.

A magnetometer (e.g., Schonstedt, Vallon, White, etc.) test grid will be established and seeded with a pre-determined amount of 20-mm target practice rounds (or equivalent surrogate items) buried at various depths not to exceed 9 inches. (Other items may also be installed in the test grid.) Prior to commencing daily excavation activities, the UXO technicians will pass their magnetometers over the test grid to ensure the equipment is functional. All of the buried rounds must be detected for the equipment to be used on the project. The PQCM will record the results of the magnetometer functionality tests on a daily basis.

Table A.6-1 lists the field equipment calibration, maintenance, testing, and inspection frequency, acceptance criteria, and corrective action.

6.2 SUPPLIES AND CONSUMABLES

Supplies and consumables necessary for field activities will be obtained through the appropriate commercial markets and will meet any supply-specific requirements outlined in this section. All supplies and consumables will be inspected by field sampling personnel prior to use. Any supplies and consumables that do not meet requirements will be discarded or returned to the supplier.

Supply-specific requirements include the following:

- Sample bottle containers will meet all guidelines specified in *Specification and Guidance for Obtaining Contaminant-Free Sample Containers,* EPA 540/R-93/051 and OSWER Directive 9240.0-05A (EPA, 1992). Certifications from the supplier will be retained in the project files.
- Field screening EXPRAY test kits for explosives. Certifications from the supplier will be retained in the project files and manufacturer instructions will accompany each kit used.

Supplies and consumables will be stored, as necessary, in a designated area on the site. The storage area will be protected from adverse conditions (e.g., weather, heat, fuels, etc.) to protect the supplies/consumables from possible outside contamination and breakage.

6.3 SAMPLING PROCEDURES

The following section provides the sampling procedures and sample handling protocols to be used for this project. Table A.6-2 lists the sample containers, preservatives, and holding time requirements for each analytical method.

6.3.1 Soil Sampling Procedures

The following procedures will be used to collect soil samples:

1. Sampling personnel will don a new pair of disposable nitrile gloves immediately before collecting soil samples at each location.
2. During sampling, biological avoidance and minimization measures will be followed as described in Section 5.3 of the Work Plan.
3. A UXO technician will examine the sampling location with a magnetometer to determine if there is any metal in the top nine inches of soil.
    a. If there is no metal detected, continue with Step 3.
    b. If there is metal, a 1-foot step-out will be performed, and the soil will be re-examined.
    c. Repeat Step 2 until metal is not detected.
4. Using a new, individually packaged, disposable plastic scoop or equivalent, the first 9 inches of soil will be removed at each location and placed into containers listed in Table A.6-2. Multiple containers may be used to collect all the soil from zero to 9 inches bgs. If the soil is too compacted to use a scoop, a hand auger, trowel, or shovel will be used. Equipment will be decontaminated prior to use as described in Section 6.4.
5. Each container(s) will be labeled and clear packing tape will be placed over the label to secure it.
6. Samples will be custody sealed and packaged in accordance with Section 6.6 of this SAP.
7. After packaging, samples will be stored in a cooler with sufficient ice (cooler will be approximately half full of wet ice that is below and above sample containers).
8. Field documentation including field logbooks and COCs will be filled out during sample collection in accordance with Section 4.0. It will be noted on the COCs that all the containers for each sample will be homogenized by the laboratory prior to analysis.
9. Once the sample is collected, a DGPS will be used to locate the samples coordinates, which will be recorded in the field logbook.
10. Non-disposable sampling equipment such as a shovel will be decontaminated per Section 6.4 between each sample acquisition, and an equipment rinsate sample will be collected from the equipment at a frequency of one per day.
11. Samples may be screened in the field using EXPRAY test kits for explosives at the discretion of the UXO technician (based on his visual inspection of the material sampled). This will ensure that samples are not sent off-site to a laboratory containing high concentrations of explosives. If test kits confirm presence of explosives, then an alternate location will be sampled. Manufacturers' instructions will be followed in the use of test kits.

6.4 DECONTAMINATION PROCEDURES

Decontamination of a shovel if used for soil sampling will be performed to prevent the introduction of extraneous material into samples, and to prevent cross-contamination between samples. All sampling equipment will be decontaminated by washing with a nonphosphate detergent such as Liquinox™ as follows:

1. Dilute the nonphosphate detergent with potable water in a bucket as directed by the manufacturer. Wash the equipment with the nonphosphate detergent and potable water solution.
2. Use second bucket with potable water to rinse the equipment.
3. Use third bucket with potable water to rinse the equipment again.
4. Use fourth bucket with deionized water as a final rinse for the equipment. (Certificates from the supplier demonstrating that the deionized water is analyte-free will be kept in the project files for each lot.)

6.5 SAMPLE NUMBER

Samples will be uniquely designated using a numbering system that identifies the CTO number and a sequential number (i.e., 14-001).

The sample number will be recorded in the field logbook, on the labels, and COC record at the time of sample collection. A complete description of the sample and sampling conditions will be recorded in the field logbook and referenced using the unique sample identification number.

6.6 SAMPLE PACKAGING AND SHIPMENT

Sample packaging and shipment procedures for this project will conform to Department of Transportation/International Air Transport Association procedures as applicable for packaging.

Immediately after sample labeling, custody seals will be affixed to each sample container. Sample containers will be placed in double-resealable plastic bags to protect the sample from moisture and prevent breakage and potential cross-contamination during transportation to the laboratory. All glass sample containers will first be protected with bubble wrap if transported by a commercial carrier.

Each cooler will be shipped with a temperature blank. A temperature blank is a vial filled with tap water and stored in the cooler during sample collection and transportation. The temperature of the cooler will be recorded by the laboratory on the COC record immediately upon receipt of the samples.

Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage.

Samples transported by a laboratory-assigned courier will be packed in a sample cooler with sufficient ice (cooler will be approximately half full of wet ice that is below and above sample containers). Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. The COC

record will be completed and signed by the courier. The cooler and the top two copies (white and pink) of the COC record will then be released to the courier for transportation to the laboratory.

Samples to be shipped by commercial carrier will be packed in a sample cooler lined with a plastic bag. Ice will be double-bagged and placed at the bottom of the cooler, one layer of sample containers will be placed on the ice, and more double-bagged ice will be placed on top of the containers. This will be repeated until the cooler is filled with ice as the top layer in the cooler. The COC record will include the airbill number, and the "Received By" box will be labeled with the commercial courier's name. The top two copies of the COC record will be sealed in a double-resealable bag and then taped to the inside of the sample cooler lid. The cooler will be taped shut with strapping tape. Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. Clear tape will be applied to the custody seals to prevent accidental breakage during shipment. The pouch for the airbill will be placed on the cooler and secured with clear tape. The airbill will be completed for priority overnight delivery and placed in the pouch. If multiple coolers are being shipped, the original airbill will be placed on the cooler with the COC record, and copies of the airbill will be placed on the other coolers. The number of packages should be included on each airbill (1 of 2, 2 of 2). Saturday deliveries should be coordinated with the laboratory in advance, and field sampling personnel or their designee must ensure that Saturday delivery stickers are placed on each cooler by the commercial courier. Dangerous goods declarations will also be completed as applicable.

TABLE A.6-1

FIELD EQUIPMENT CALIBRATION, MAINTENANCE, TESTING, AND INSPECTION

(UFP-QAPP Worksheet #22)

Field Equipment	Calibration Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SAP Reference [b]
Magnetometer	Functionality test[a]	Daily	Pass/Fail	If test fails, magnetometer will be inspected and not used until test is passed.	UXO Technician	Section 6.1

Notes:

[a] As described in Section 6.1, a function check is performed on the equipment to ensure that the instrument is working prior to use.
[b] SAP section that describes the calibration/maintenance/testing/inspection procedures.

Abbreviations and Acronyms:

SAP – Sampling and Analysis Plan
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans
UXO – unexploded ordnance

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TABLE A.6-2

ANALYTICAL METHODS, CONTAINERS, PRESERVATIVES, AND HOLDING TIME REQUIREMENTS

(UFP-QAPP Worksheet #19)

Matrix	Analytical Group	Analytical and Preparation Method	Container (number, size, type)	Preservation Requirements (chemical, temperature, etc.)	Maximum Holding Time (preparation/analysis)
Soil	Explosives	EPA Method 8330 [a]	One 8-ounce glass jar [b]	4±2°C	14 days/40 days
Soil	Perchlorate	EPA Method 314 [a] (with positive detections confirmed by LC/MS)			28 days
Soil	CCR Title 22 Metals	EPA Method 3050B/6010B/6020			6 months
Soil	Mercury	EPA Method 7471A [a]			28 days
Water [c]	Explosives	EPA Method 8330 [a]	Two 1-L amber bottles	4±2°C	7 days/40 days
Water [c]	Perchlorate	EPA Method 314 [a] (with positive detections confirmed by LC/MS)	Two 125-mL glass bottles	4±2°C	28 days
Water [c]	CCR Title 22 Metals	EPA Method 3010A/6010B/6020	One 500-mL Poly bottle	pH ≤ 2 w/HNO_3	6 months
Water [c]	Mercury	EPA Method 7470A [a]			28 days

Notes:

[a] EPA Methods 8330, 314, and 7471A/7470A do not require a separate preparation method.

[b] Additional 8-ounce jars may be collected based on volume of soil required for collection of soil from zero to 9 inches.

[c] Water samples are applicable only to the collection of equipment rinsate samples.

***Abbreviations and Acronyms*:**

°C – degrees Celsius
CCR – California Code of Regulations
EPA – U.S. Environmental Protection Agency
HNO_3 – nitric actid
L – liter
LC/MS – liquid chromatography/mass spectrometry
mL – milliliter
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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7.0 ANALYTICAL DATA QUALITY OBJECTIVES

This section identifies the laboratory quality objectives, data quality indicators, and field quality objectives.

7.1 LABORATORY QUALITY OBJECTIVES

The following sections describe analytical laboratory requirements, including qualifications, sample custody, and QC procedures.

7.1.1 Laboratory Qualifications

The laboratory that will provide analytical services for this project will be a Department of Health Services Environmental Laboratory Accreditation Program (ELAP)-certified analytical laboratory. (Perchlorate analysis by LC/MS is not currently evaluated under the ELAP program.) All environmental analytical laboratories will have successfully completed the Naval Facilities Engineering Service Center (NFESC) Laboratory Evaluation Program. Any deviations from these requirements will require approval by the QA Officer.

The laboratory must be capable of meeting all the requirements listed in this SAP including turnaround time (to be determined), QLs, QC criteria, data deliverables, and requirements in the *Navy Installation Restoration Chemical Data Quality (IR CDQM) Manual* (NFESC, 1999) and the *Quality Systems Manual (QSM) for Environmental Laboratories* (Department of Defense [DOD], 2006).

7.1.2 Laboratory Sample Custody and Documentation

The integrity and traceability of samples from the time they are collected through the time data are reported is essential in any sampling and analysis program. The handling of the samples and transferring of custody must be well-documented given the evidentiary nature of the analytical data.

The sample custodian will sign the COC from the courier or FedEx®, inventory each shipment, and note on the original COC record any discrepancy in the sample custody, temperature of the cooler, or broken samples. The laboratory will note discrepancies on the sample receipt form. The laboratory project manager will immediately notify the Project Chemist who in consultation with the project team will provide instructions in writing to the laboratory.

The laboratory will have a system for tracking samples that is consistent with Section 5.8 of the QSM (DOD, 2006). The laboratory will archive the samples and maintain their custody up to 90 calendar days after sample collection, at which time the laboratory will dispose of the samples.

7.1.3 Laboratory Quality Control Requirements

The analytical laboratory will have written Standard Operating Procedures (SOPs) defining the instrument operation and maintenance, tuning, calibration, method detection limit (MDL) determination, QC acceptance criteria, blank requirements, and stepwise procedures for each analytical method. At a minimum, SOPs will be written for procedures and methods including sample receipt/control/disposal, sample preparation/extraction, sample analysis, result calculation, database management, health and safety, and corrective action. The SOPs, and all revisions, will be available to the analysts in the laboratory. The SOPs must meet the requirements of the analytical methods and the IR CDQM (NFESC, 1999). In addition, Tables B-2 and B-6 of the QSM (DOD, 2006) define the frequency, acceptance criteria, and corrective action for the following QC checks for each project-specific method.

<u>Explosives (EPA Method 8330):</u>

- Demonstrate acceptable analyst capability
- MDL study
- Retention time window width calculated for each analyte and surrogate
- Minimum five-point initial calibration
- Second source calibration verification
- Retention time window position establishment for each analyte and surrogate
- Retention time window verification for each analyte and surrogate
- Calibration verification (initial and continuing calibration)
- Method blank
- LCS
- MS/MSD
- Surrogate spike

<u>Perchlorate (EPA Method 314 with LC/MS confirmation):</u>

- Demonstrate acceptable analyst capability
- MDL study
- Tuning (LC/MS only)
- Retention time window width calculated for analyte (LC/MS only)
- Minimum five-point initial calibration
- Second source calibration verification
- Calibration verification (initial and continuing calibration)
- Limit of detection verification (LC/MS only)
- Interference check sample (LC/MS only)

- Method blank
- Calibration blank
- LCS
- MS/MSD
- Isotope Ratio ($^{35}Cl/^{37}Cl$) (LC/MS only)
- Internal standard (LC/MS only)

CCR Title 22 Metals (EPA Method 6010B/6020/7471A/7470A):

- Initial calibration for all analytes (minimum one high standard and calibration blank for inductively coupled plasma [ICP] and minimum five standards and calibration blank for cold vapor atomic absorption)
- Second source calibration verification
- Continuing calibration verifications
- Low-level calibration check standard (ICP only)
- Method blank
- Calibration blank
- Interference check solutions (ICP only)
- LCS
- Dilution test
- Post-digestion spike addition (ICP only)
- Method of standard additions or internal standard calibration
- MS/MSD

The laboratory must also maintain written records of all activities that have an impact on the quality of the laboratory results.

Any portion of the method that is subcontracted by the laboratory to another laboratory or sent to another facility of the same network of laboratories must have the prior approval of the Project Chemist.

7.1.4 Laboratory Quality Control Checks

The following subsections describe in detail the laboratory QC checks required by this project.

7.1.4.1 Calibration

All instruments will be calibrated and the calibration acceptance criteria met before samples are analyzed. Calibration standards will be prepared with National Institute for Standards and Testing (NIST)-traceable standards and analyzed per method requirements. Initial calibration (ICAL) acceptance criteria documented in the laboratory SOPs will meet those of applicable guidance documents. The ICAL will meet the following requirements:

- The lowest concentration of the calibration standard is less than or equal to the Quantitation Limit based on the final volume of extract or sample.

- For each target analyte, at least one of the calibration standards will be at or below the regulatory limit (action level), as defined by the DQOs.
- Before samples are analyzed, ICAL will be verified with a second source standard prepared at the mid-point of the calibration curve. ICAL verification will meet the acceptance criteria expressed in the laboratory SOPs.
- Daily calibration verification will be conducted at the method-prescribed frequencies and will meet the acceptance criteria of applicable guidance documents. Daily calibration verification will not be used for quantitation of target analytes.
- Calibration data (calibration tables, chromatograms, instrument printouts, and laboratory logbooks) will be clearly labeled to identify the source and preparation of the calibration standard and therefore be traceable to the standard preparation records.

7.1.4.2 Instrument Blanks

An instrument blank is used to monitor the cleanliness of the instrument system during sample analysis. Instrument blanks are solvent or acid solutions of the standard used to calibrate the instrument. During metals analyses, one instrument blank is usually analyzed for every ten samples. For gas chromatograph/mass spectrometer (GC/MS) analysis, instrument blanks are analyzed on an as-needed basis for troubleshooting and chromatography column carryover determination.

7.1.4.3 Method Blanks

Method blanks are prepared in the same manner as the samples, using the same reagents and glassware used for samples. The purpose of the method blank is to ensure that the equipment and reagents used in preparing the samples are free of contaminants that could interfere with the analysis. The method blank must be prepared and analyzed for each batch of 20 project samples or less per matrix (aqueous and solid) type.

The method blank must not exhibit analytes at concentrations greater than half the required QLs. If contaminants are found that either contribute to the apparent concentration of a particular target analyte or interfere with the analysis, the analysis must be stopped, the source of contamination identified and corrected, and the analysis repeated. Contamination in the method blank above half the QLs will require that the entire associated batch of extracts or digestates be reprepared and reanalyzed. Hence, it is very important to make sure that no such contamination is present.

Some methods of inorganic analysis do not have a distinctive preparation step. For these tests, an instrument blank, which contains all reagents used with samples, is considered to be the method blank.

7.1.4.4 Laboratory Control Samples

Laboratory control samples are matrix-equivalent QC check samples (analyte-free water, laboratory sand, or sodium sulfate) spiked with a known quantity of specific analytes carried through the entire sample preparation and analysis process. The spiking solution used for LCS/LCSD preparation is of a source different from the stock used to prepare calibration standards.

The LCS is prepared and run at a frequency of one per 20 project samples per matrix with the associated samples, using the same reagents and volumes. If insufficient quantity of sample is available for the MS/MSD, the LCS will be prepared and analyzed in duplicates.

7.1.4.5 Laboratory Duplicates

For laboratory sample duplicate analyses, a sample is prepared and analyzed twice. Laboratory sample duplicates are prepared and analyzed with each batch of samples for most inorganic analyses.

7.1.4.6 Matrix Spikes

MSs are QC check samples that measure matrix-specific method performance. MSs are only applicable to the off-site laboratory. An MS sample is prepared by adding a known quantity of target analytes to a sample prior to sample digestion or extraction. In general, for organic compound and metal analyses, an MS/MSD pair is prepared and analyzed with each preparation batch or for every 20 samples. For inorganic compound analysis, a single MS and a laboratory sample duplicate are often prepared and analyzed with each batch. The MS results allow verifying the presence of matrix effects.

7.1.4.7 Surrogate Standards

Organic compound analyses include the addition, quantitation, and recovery calculation of surrogate standards. Compounds selected to serve as surrogate standards must meet all of the following requirements:

- Are not the target analytes
- Do not interfere with the determination of target analytes
- Are not naturally occurring, yet are chemically similar to the target analytes
- Are compounds exhibiting similar response to target analytes

Surrogate standards are added to every analytical and QC check sample at the beginning of the sample preparation. The surrogate standard recovery is used to monitor matrix effects and losses during sample preparation. Surrogate standard control criteria are applied to all analytical and QC check samples, and if surrogate criteria are not met, re-extraction and reanalysis may be performed.

7.1.4.8 Post-digestion Spikes and the Method of Standard Addition

A post-digestion spike is used during metal analysis to assess analytical interferences that may be caused by general matrix effects or high concentrations of analytes present in the sample. A digested sample is spiked with the analyte of interest at a known concentration, and the spike recovery is used to estimate the presence and the magnitude of interferences.

If a post-digestion spike recovery fails to meet acceptance criteria, the Method of Standard Addition (MSA) will be used to quantify the sample result. The MSA technique compensates for a sample

constituent that enhances or depresses the analyte signal. To perform the MSA, known amounts of a standard at different concentrations are added to aliquots of digested sample, and each spiked sample and the original unspiked sample are analyzed. The absorbance is then plotted against the concentration, and the resulting line is extrapolated to zero absorbance. The point of interception with the concentration axis is the indigenous concentration of the analyte in the sample.

7.1.4.9 Preventative Maintenance

All instruments must be maintained in accordance with the manufacturers' recommended procedures. The laboratory must define in its QA plan the frequency and type of maintenance for each instrument. The laboratory must also record all maintenance activities in an instrument logbook. The laboratory must maintain the instruments in working condition required by the methods specified for the analyses. Sufficient redundancy in equipment must be available in the laboratory to handle downtime situations. Method substitution because of instrumental failure will not be permitted without approval from the Project Chemist.

In addition to preventive maintenance, the laboratory must keep a sufficient supply of replacement parts on hand for those parts known to require frequent changes due to wear and tear or contamination. Whenever preventive or corrective maintenance is applied to an instrument, the laboratory must demonstrate the instrument's return to operating conditions and must recalibrate the instrument prior to resumption of sample analyses.

7.2 DATA QUALITY INDICATORS

In order to meet project DQOs, the QLs listed in Tables A.7-1 (soil) and A.7-2 (water) were established below action levels, and the QC criteria presented in Table A.7-2 are in accordance with the QSM (DOD, 2006).

Analytical DQOs will be assessed through application of precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters discussed in this section.

7.2.1 Precision

Precision is the measure of the reproducibility of a set of replicate results or the agreement among repeat observations made under the same conditions. Analytical precision is the measurement of the variability associated with duplicate or replicate analyses. Field duplicate, laboratory duplicate, MSD, and LCSD (if analyzed) samples will be used to assess field and analytical precision. The precision measurement will be determined using the relative percent difference (RPD) between the duplicate sample results as follows:

$$RPD = 100 \times 2 \times (result - duplicate\ result)/(result + duplicate\ result)$$

The RPD limits for laboratory duplicate, MSD, and LCSD are presented in Table A.7-2, and the field duplicate limits are listed in Table A.7-3. Associated samples that do not meet the criteria will be evaluated by the validator as described in Section 8.2.

7.2.2 Accuracy

Accuracy is defined as the nearness of a result or the mean of a set of results to the true or accepted value. Analytical accuracy is measured by comparing the percent recovery (%R) of analytes spiked into a sample against a control limit. Spiked samples include MS, MSD, and LCS that are analyzed for every batch of up to 20 samples. They serve as a measure of analytical accuracy and surrogate standards that are added to all samples, blanks, MS, MSD, and LCS analyzed for organic contaminants to evaluate the method's accuracy and help to determine matrix interferences. %R is calculated as follows:

%R = 100 x (spiked sample result - unspiked sample result)/amount of spike added

The laboratory will review the QC samples and surrogate standard recoveries for each analysis to ensure that the %R lies within the control limits listed in Table A.7-2. Otherwise, data will be flagged as discussed in Section 8.2.

7.2.3 Representativeness

Unlike precision and accuracy, which can be expressed in quantitative terms, representativeness is a qualitative parameter. Representativeness is the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. It is a qualitative parameter that depends on proper design of the sampling program.

Field personnel will be responsible for ensuring that samples are representative of field conditions by collecting and handling samples according to the procedures in this SAP. Errors in sample collection, packaging, preservation, or COC procedures may result in samples being judged non-representative and may form a basis for rejecting the data.

7.2.4 Completeness

Completeness is the percentage of measurements made that is judged to be valid. The completeness goal is to generate a sufficient amount of valid data to meet project needs. Completeness is calculated and reported for each method, matrix, and analyte combination. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. For completeness requirements, valid results are all results not qualified with a rejected (R) flag. The requirement of completeness is 95 percent for samples and is determined using the following equation:

% completeness = 100 x (number of valid analyte results/number of possible results)

7.2.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another, whether it was generated by a single laboratory or during interlaboratory studies. The use of standardized field and analytical procedures ensures comparability of analytical data.

Sample collection and handling procedures will adhere to EPA-approved protocols. Laboratory procedures will follow standard analytical protocols, use standard units, use standardized report formats, follow the calculations as referenced in approved analytical methods, and use a standard statistical approach for QC measurements.

7.3 FIELD QUALITY CONTROL SAMPLES

Field QC samples will be collected and analyzed during the project to assess the consistency and performance of the sampling program. Field QC samples are necessary for establishing data comparability, determining the total measurement error (the overall precision of the measurement system from sample collection to analysis), and for QA during sample handling and shipment. Field QC samples may include field duplicates, equipment rinsates, source blanks, trip blanks, and temperature blanks. Measurement performance criteria for field QC samples are listed in Table A.7-3, and field QC sample frequency is listed in Table A.7-4.

7.3.1 Field Duplicates

Field duplicates consist of two distinct samples (an original and a duplicate) of the same matrix collected at the same time and location to the extent possible and using the same sampling techniques. The purpose of field duplicates is to measure the consistency of field sampling. Field duplicates will be collected at a frequency of 1 for every 10 samples and analyzed for the same parameters as the original samples. Field duplicates are uniquely identified so that the identity of the field duplicates is blind to the analytical laboratory. Exact locations of field duplicate samples and their identifications will be recorded in the field logbook.

7.3.2 Equipment Rinsate Samples

Equipment rinsate is a sample of analyte-free, reagent-grade water collected from a final rinse of sampling equipment after the decontamination procedure has been performed. Rinsate samples will be collected directly from the sampling equipment, placed in appropriate pre-cleaned containers supplied by the analytical laboratory, and analyzed for the same analytes as the field samples under the same analytical conditions. Equipment rinsate samples, collected at a frequency of one per each day of sampling, will help determine the effectiveness of the decontamination procedure and potential for cross-contamination during sampling events.

7.3.3 Source Blank Samples

A source blank consists of analyte-free, reagent-grade water provided by the laboratory to be used for the collection of equipment rinsate samples as described in Section 7.3.2. Source blank water will be provided by the laboratory since equipment rinsate samples may be collected for this project.

In order to ensure the source blank is free of contamination, one of two courses of action will be followed before the source blank water is used. First, the laboratory will be asked to provide a certificate of analysis that the water provided for the equipment rinsate samples does not contain analytes above the project QLs. If the laboratory cannot provide a certificate of analysis, a sample of the laboratory water will then be collected for each lot of water provided by the laboratory and analyzed to verify that the results are not above the project QLs.

7.3.4 Trip Blanks

Trip blanks are hydrochloric acid-preserved, analyte-free, deionized water prepared by the laboratory in 40-milliliter volatile organic analysis vials that will be carried to the field, stored with water samples collected for volatile analysis, and returned to the laboratory for volatile analysis. Trip blanks will not be collected for this project because volatile analysis is not required.

7.3.5 Temperature Blanks

A temperature blank is a container of tap water that is shipped in each cooler containing field samples and ice. Laboratory personnel will use the temperature blank to measure the temperature of the cooler upon arrival at the laboratory.

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TABLE A.7-1

REFERENCE LIMITS FOR SOIL SAMPLES

(UFP-QAPP Worksheet #15)

Analytical Group/Method	Analyte	CAS Number	Ecological Soil Screening Level [a]	Residential PRG [a]	Industrial PRG [a]	Project Quantitation Limit [b]	Analytical Method MDLs [c]	Analytical Method QLs [c]	Units
Explosives/8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	50 [e]	3,100	31,000	0.2	0.013	0.2	mg/kg
	Hexahydro-1,3,5-trinitro-1,3,5-trazine (RDX)	121-82-4	15 [e]	4.4	16	0.2	0.021	0.2	mg/kg
	1,3,5-Trinitrobenzene (1,3,5-TNB)	99-35-4	1.38 [e]	1,800	18,000	0.2	0.0057	0.2	mg/kg
	1,3-Dinitrobenzene (1,3-DNB)	99-65-0	0.41 [e]	6.1	62	0.2	0.0081	0.2	mg/kg
	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	479-45-8	25 [e]	610	6,200	0.2	0.024	0.2	mg/kg
	Nitrobenzene (NB)	98-95-3	226 [f]	20	100	0.2	0.014	0.2	mg/kg
	2,4,6-Trinitrotoluene (2,4,6-TNT)	118-96-7	30 [e]	16	57	0.2	0.013	0.2	mg/kg
	4-Amino-2,6-dinitrotoluene (4-Am-DNT)	19406-51-0	80 [e]	12	120	0.2	0.022	0.2	mg/kg
	2-Amino-4,6-dinitrotoluene (24-Am-DNT)	35572-78-2	80 [e]	12	120	0.2	0.01	0.2	mg/kg
	2,4-Dinitrotoluene (2,4-DNT)	121-14-2	3.2 [g]	120	1,200	0.2	0.0054	0.2	mg/kg
	2,6-Dinitrotoluene (2,6-DNT)	606-20-2	3.2 [g]	61	620	0.2	0.012	0.2	mg/kg
	2-Nitrotoluene	88-72-2	N/A	0.88	2.2	0.2	0.012	0.2	mg/kg
	3-Nitrotoluene	99-08-1	N/A	730	1,000	0.2	0.014	0.2	mg/kg
	4-Nitrotoluene	99-99-0	N/A	12	30	1.0	0.023	1.0	mg/kg
Perchlorate/314 (with positive detections confirmed by LC/MS)	Perchlorate	7601-90-3	10 [g]	7.8	100	0.01	0.0054	0.01	µg/kg

TABLE A.7-1

REFERENCE LIMITS FOR SOIL SAMPLES

(UFP-QAPP Worksheet #15)

Analytical Group/Method	Analyte	CAS Number	Ecological Soil Screening Level [a]	Residential PRG [a]	Industrial PRG [a]	Project Quantitation Limit [b]	Analytical Method MDLs [c]	Analytical Method QLs [c]	Units
CCR Title 22 Metals/6010B/6020/ 7471A	Antimony	7440-36-0	0.29 [h]	31	410	0.5 [d]	0.025 [d]	0.5 [d]	mg/kg
	Arsenic	7440-38-2	18 [h]	0.062	0.25	0.5 [d]	0.025 [d]	0.5 [d]	mg/kg
	Barium	7440-39-3	330 [h]	5,400	67,000	20	0.165	20	mg/kg
	Beryllium	7440-41-7	36 [h]	150	1,900	0.5	0.0508	0.5	mg/kg
	Cadmium	7440-43-9	0.38 [h]	37	450	0.5 [d]	0.039 [d]	0.5 [d]	mg/kg
	Chromium	7440-47-3	26 [h]	210	450	1	0.0444	1	mg/kg
	Cobalt	7440-48-4	13 [h]	900	1,900	5	0.0678	5	mg/kg
	Copper	7440-50-8	28 [h]	3,100	41,000	2.5	0.0306	2.5	mg/kg
	Lead	7439-92-1	16 [h]	150	800	1	0.227	1	mg/kg
	Mercury	7439-97-6	0.00051 [i]	23	310	0.1	0.0055	0.1	mg/kg
	Molybdenum	7439-98-7	2 [i]	390	5,100	0.5 [d]	0.039 [d]	0.5 [d]	mg/kg
	Nickel	7440-02-0	30 [i]	1,600	20,000	4	0.0825	4	mg/kg
	Selenium	7782-49-2	0.21 [i]	310	3,100	0.5 [d]	0.086 [d]	0.5 [d]	mg/kg
	Silver	7440-22-4	2 [i]	390	5,100	1	0.04	1	mg/kg
	Thallium	7440-28-9	1 [i]	5.2	67	0.5 [d]	0.013 [d]	0.5 [d]	mg/kg
	Vanadium	7440-62-2	7.8 [h]	78	1,000	5	0.0422	5	mg/kg
	Zinc	7440-66-6	8.5 [i]	23,000	100,000	4	0.26	4	mg/kg

TABLE A.7-1

REFERENCE LIMITS FOR SOIL SAMPLES

(UFP-QAPP Worksheet #15)

Notes:

[a] Samples collected for this project are part of the site inspection, and the results will be used in conjunction with a screening level ecological risk assessment (SSLs) as well as a screening level human health risk assessment (PRGs) to be documented in the site inspection report. The results of the risk assessments will be evaluated by the DON to determine if additional characterization, remedial response, or other further action is warranted. If the analytical laboratory is unable to report to the selected SSL or PRG, then the laboratory's quantitation limit will be utilized as the screening level.
[b] Values listed at the lowest achievable laboratory quantitation limits for the analytical method.
[c] Values listed are from validated analytical methods.
[d] EPA Method 6020 applies to these values.
[e] Listed value is from the following reference: Talmage, S.S., D.M. Opresko, C.J. Maxwell, C.J.E. Welsh, F.M. Cretella, P.H. Reno and F. B. Daniel. 1999. Nitroaromatic Munition Compounds: Environmental Effects and Screening Values. Rev. Environ. Contam. Toxicol. 161:1-156.
[f] Listed value is from the following reference: Neuhauser, E.F., P.R. Durkin, M.R. Malecki and M. Anatra. 1986. Comparative Toxicity of Ten Organic Chemicals to Four Earthworm Species. Comp. Biochem. Physiol. C. 83(1):197-200. ECOTOX Database.
[g] Listed value is from the following reference: Adema, D.M.M. and L. Henzen. 1989. A Comparison of Plant Toxicities of Some Industrial Chemicals in Soil Culture and Soilless Culture. Ecotoxicol. Environ. Saf. (18(2): 219-229. ECOTOX Database.
[h] Listed value is from the following reference: USEPA Eco SSL - http://www.epa.gov/ecotox/ecossl/.
[i] Listed value is from the following reference: Efroymson, R.A., G.W. Suter, II, B.E. Sample and D.S. Jones. 1997. Preliminary Remediation Goals for Ecological Endpoints.. Oak Ridge National Laboratories, Oak Ridge, TN ES/ER/TM-162/R2.

Abbreviations and Acronyms:

CAS – Chemical Abstract Service
CCR – California Code of Regulations
DON – Department of the Navy
EPA – U.S. Environmental Protection Agency
LC/MS – liquid chromatography/mass chromatography
MDL – method detection limit
mg/kg – milligrams per kilogram
NA – not applicable
QL – quantitation limit
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.7-2

REFERENCE LIMITS FOR WATER SAMPLES

(UFP-QAPP Worksheet #15)

Analytical Group/Method	Analyte	CAS Number	Project Action Limit [a]	Project Quantitation Limit	Analytical Method MDLs [b]	Analytical Method QLs [b]	Units
Explosives/8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	N/A	0.5	0.075	0.5	µg/L
	Hexahydro-1,3,5-trinitro-1,3,5-trazine (RDX)	121-82-4	N/A	0.5	0.039	0.5	µg/L
	1,3,5-Trinitrobenzene (1,3,5-TNB)	99-35-4	N/A	0.5	0.063	0.5	µg/L
	1,3-Dinitrobenzene (1,3-DNB)	99-65-0	N/A	0.5	0.05	0.5	µg/L
	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	479-45-8	N/A	0.5	0.067	0.5	µg/L
	Nitrobenzene (NB)	98-95-3	N/A	0.5	0.051	0.5	µg/L
	2,4,6-Trinitrotoluene (2,4,6-TNT)	118-96-7	N/A	0.5	0.063	0.5	µg/L
	4-Amino-2,6-dinitrotoluene (4-Am-DNT)	19406-51-0	N/A	0.5	0.073	0.5	µg/L
	2-Amino-4,6-dinitrotoluene (24-Am-DNT)	35572-78-2	N/A	0.5	0.047	0.5	µg/L
	2,4-Dinitrotoluene (2,4-DNT)	121-14-2	N/A	0.5	0.043	0.5	µg/L
	2,6-Dinitrotoluene (2,6-DNT)	606-20-2	N/A	0.5	0.066	0.5	µg/L
	2-Nitrotoluene	88-72-2	N/A	0.5	0.023	0.5	µg/L
	3-Nitrotoluene	99-08-1	N/A	0.5	0.053	0.5	µg/L
	4-Nitrotoluene	99-99-0	N/A	0.5	0.036	0.5	µg/L
Perchlorate/314 (with positive detections confirmed by LC/MS)	Perchlorate	7601-90-3	N/A	1	0.14	1	µg/L

TABLE A.7-2

REFERENCE LIMITS FOR WATER SAMPLES

(UFP-QAPP Worksheet #15)

Analytical Group/Method	Analyte	CAS Number	Project Action Limit [a]	Project Quantitation Limit	Analytical Method MDLs [b]	Analytical Method QLs [b]	Units
CCR Title 22 Metals/6010B/6020/7470A	Antimony	7440-36-0	N/A	1 [c]	0.056 [c]	1 [c]	µg/L
	Arsenic	7440-38-2	N/A	1 [c]	0.1 [c]	1 [c]	µg/L
	Barium	7440-39-3	N/A	200	0.845	200	µg/L
	Beryllium	7440-41-7	N/A	5	0.513	5	µg/L
	Cadmium	7440-43-9	N/A	1 [c]	0.094 [c]	1 [c]	µg/L
	Chromium	7440-47-3	N/A	10	0.306	10	µg/L
	Cobalt	7440-48-4	N/A	50	0.356	50	µg/L
	Copper	7440-50-8	N/A	25	0.535	25	µg/L
	Lead	7439-92-1	N/A	10	1.78	10	µg/L
	Mercury	7439-97-6	N/A	0.2	0.018	0.2	µg/L
	Molybdenum	7439-98-7	N/A	1 [c]	0.56 [c]	1 [c]	µg/L
	Nickel	7440-02-0	N/A	40	1.2	40	µg/L
	Selenium	7782-49-2	N/A	1 [c]	0.11 [c]	1 [c]	µg/L
	Silver	7440-22-4	N/A	10	0.422	10	µg/L
	Thallium	7440-28-9	N/A	1 [c]	0.044 [c]	1 [c]	µg/L
	Vanadium	7440-62-2	N/A	50	0.47	50	µg/L
	Zinc	7440-66-6	N/A	40	6.65	40	µg/L

TABLE A.7-2

REFERENCE LIMITS FOR WATER SAMPLES

(UFP-QAPP Worksheet #15)

Notes:

[a] Action levels are not applicable since water samples will only include equipment rinsates and source blank samples.
[b] Values listed are from validated analytical methods.
[c] EPA Method 6020 applies to these values.

Abbreviations and Acronyms:

µg/L – micrograms per liter
CAS – Chemical Abstract Service
CCR – California Code of Regulations
EPA – U.S. Environmental Protection Agency
LC/MS – liquid chromatography/mass spectrometry
MDL – method detection limit
QL – quantitation limit
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.7-3

QUALITY CONTROL ACCEPTANCE CRITERIA

Method	Analyte	CAS Number	Accuracy Soil (%R) [a]	Precision Soil (RPD) [b]	Accuracy Water (%R) [a]	Precision Water (RPD) [b]
EPA Method 8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	75-125	≤ 30	80-115	≤ 30
	Hexahydro-1,3,5-trinitro-1,3,5-trazine (RDX)	121-82-4	70-135	≤ 30	50-160	≤ 30
	1,3,5-Trinitrobenzene (1,3,5-TNB)	99-35-4	75-125	≤ 30	65 -140	≤ 30
	1,3-Dinitrobenzene (1,3-DNB)	99-65-0	80-120	≤ 30	45-160	≤ 30
	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	479-45-8	10-150	≤ 30	20-175	≤ 30
	Nitrobenzene (NB)	98-95-3	75-125	≤ 30	50-140	≤ 30
	2,4,6-Trinitrotoluene (2,4,6-TNT)	118-96-7	55-140	≤ 30	50-145	≤ 30
	4-Amino-2,6-dinitrotoluene (4-Am-DNT)	19406-51-0	80-125	≤ 30	55-155	≤ 30
	2-Amino-4,6-dinitrotoluene (24-Am-DNT)	35572-78-2	80-125	≤ 30	50-155	≤ 30
	2,4-Dinitrotoluene (2,4-DNT)	121-14-2	80-125	≤ 30	60-135	≤ 30
	2,6-Dinitrotoluene (2,6-DNT)	606-20-2	80-120	≤ 30	60-135	≤ 30
	2-Nitrotoluene (2-NT)	88-72-2	80-125	≤ 30	45-135	≤ 30
	3-Nitrotoluene (3-NT)	99-08-1	75-120	≤ 30	50-130	≤ 30
	4-Nitrotoluene (4-NT)	99-99-0	75-125	≤ 30	50-130	≤ 30
	Surrogate:					
	1,2-Dinitrobenzene (1,2-DNB)	528-29-0	70-130	N/A	70-130	N/A
EPA Method 314 (with positive detections confirmed by LC/MS)	Perchlorate	7601-90-3	75-125	≤ 20	75-125	≤ 20

TABLE A.7-3

QUALITY CONTROL ACCEPTANCE CRITERIA

Method	Analyte	CAS Number	Accuracy Soil (%R) [a]	Precision Soil (RPD) [b]	Accuracy Water (%R) [a]	Precision Water (RPD) [b]
EPA Method 6010B/6020/7471A/7470A	Antimony	7440-36-0	80-120	≤ 20	80-120	≤ 20
	Arsenic	7440-38-2	80-120	≤ 20	80-120	≤ 20
	Barium	7440-39-3	80-120	≤ 20	80-120	≤ 20
	Beryllium	7440-41-7	80-120	≤ 20	80-120	≤ 20
	Cadmium	7440-43-9	80-120	≤ 20	80-120	≤ 20
	Chromium	7440-47-3	80-120	≤ 20	80-120	≤ 20
	Cobalt	7440-48-4	80-120	≤ 20	80-120	≤ 20
	Copper	7440-50-8	80-120	≤ 20	80-120	≤ 20
	Lead	7439-92-1	80-120	≤ 20	80-120	≤ 20
	Mercury	7439-97-6	80-120	≤ 20	80-120	≤ 20
	Molybdenum	7439-98-7	80-120	≤ 20	80-120	≤ 20
	Nickel	7740-02-0	80-120	≤ 20	80-120	≤ 20
	Selenium	7782-49-2	80-120	≤ 20	80-120	≤ 20
	Silver	7440-22-4	75-120	≤ 20	75-120	≤ 20
	Thallium	7440-28-9	80-120	≤ 20	80-120	≤ 20
	Vanadium	7440-62-2	80-120	≤ 20	80-120	≤ 20
	Zinc	7440-66-6	80-120	≤ 20	80-120	≤ 20

Notes:

[a] %R limits listed are for LCS/LCSD and MS/MSD. (LCSD is required if sufficient volume is not available for an MSD.)

[b] RPD limits listed are for LCS/LCSD and MS/MSD for all tests. (LCSD is required if sufficient volume is not available for an MSD.)

Abbreviations and Acronyms:

%R – percent recovery
EPA –U.S. Environmental Protection Agency
CAS – Chemical Abstract Service
LC/MS – liquid chromatography/mass spectrometry
LCS – laboratory controlled sample
LCSD – laboratory control sample duplicate
MS – matrix spike
MSD – matrix spike duplicate
RPD – relative percent difference

TABLE A.7-4

MEASUREMENT PERFORMANCE CRITERIA – FIELD QC SAMPLES

(UFP-QAPP Worksheet #12)

QC Sample	Analytical Group	Frequency	Data Quality Indicators	Measurement Performance Criteria	QC Sample Assesses Error for Sampling (S), Analytical (A), or both (S&A)
Equipment rinsate	Explosives, Perchlorate, CCR Title 22 Metals	1 per sampling equipment per day	Accuracy	No analyte > QL	S&A
Source blank	Explosives, Perchlorate, CCR Title 22 Metals	1 per lot of water	Accuracy	No analyte > QL	S&A
Field duplicate	Explosives, Perchlorate, CCR Title 22 Metals	10% of soil samples	Precision	RPD <50% for soil	S

Abbreviations and Acronyms:

CCR – California Code of Regulations
QC – quality control
QL – quantitation limit
RPD – relative percent difference
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.7-5

FIELD QUALITY CONTROL SAMPLE SUMMARY

(UFP-QAPP Worksheet #20)

Matrix	Analytical Group	Analytical and Preparation SAP Reference	# of Primary Sampling Locations	# of Field Duplicates	# MS/MSD	# of Source Blanks	# of Equipment Rinsates	# of Trip Blanks	Total # of Samples to Lab
Soil Samples [a]									
Soil	Explosives	SAP Section 5.1	26	3	2	1 per lot	1 per day	N/A	TBD
Soil	Perchlorate	SAP Section 5.1	26	3	2	1 per lot	1 per day	N/A	TBD
Soil	CCR Title 22 Metals	SAP Section 5.1	26	3	2	1 per lot	1 per day	N/A	TBD

Notes:

[a] The number of primary sampling locations will be at least 26; although, this number may increase based on professional judgment and site inspection results.

Abbreviations and Acronyms:

CCR – California Code of Regulations
MS – matrix spike
MSD – matrix spike duplicate
N/A – not applicable
SAP – Sampling and Analysis Plan
TBD – to be determined
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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8.0 DATA MANAGEMENT

This section discusses the data management procedures for samples collected for this project, tracing the path of the field and laboratory data from generation, review, and verification to storage and final use. The quality of the data collection process will be assessed through reviews of all documentation and measurements performed and verification that information recorded is accurate and complete. Project documentation that will be generated is presented in Table A.4-1.

8.1 DATA GENERATION

Two types of data will be generated: field data and laboratory data. These types are described in the following sections.

8.1.1 Field Data

Field sampling data, including field logbooks and field forms, will be maintained. The logbooks will be numbered sequentially on the cover by the Project Quality Control Manager (PQCM) and that number will be entered into a logsheet maintained by the PQCM for the project. Field logbooks and forms will be reviewed by the PQCM and verified as described in Table A.8-1. A copy of all field forms containing information pertaining to sample collection (such as calibration forms) will be forwarded to the Project Chemist.

A copy of the COCs will be faxed/e-mailed to the Project Chemist on a daily basis for review and communication with the laboratory. The COCs will be reviewed by the Project Chemist for completeness daily. The manila copy of the COC form will be mailed to the Project Chemist. The Project Chemist will maintain field documents and forward them to the main project file in San Diego, California, at the completion of the project.

8.1.2 Laboratory Data

The laboratory will report data to TtEC by submitting data packages as described in Section 4.2. For this project, 90 percent of the data will be submitted in an EPA Level III-equivalent data package and 10 percent submitted in an EPA Level IV-equivalent data package as described in Section 4.2. All data reported by the laboratory will be verified as described in Table A.8-1 and validated as described in Table A.8-2.

As described in Section 7.1.2, the laboratory will verify sample receipt and document in a sample receipt form. In addition, samples will be assigned a unique number and recorded in the laboratory internal COC.

All data reported by the analyst must be reviewed by a peer analyst who is qualified to perform the method and a supervisor prior to reporting the data to TtEC. In addition, the laboratory QA manager must review 10 percent of the data reported for each section, annually. The laboratory QA manager review may be conducted after the data have been reported to TtEC.

All data will be reported to TtEC on or before the designated turnaround time by fax/email. The Project Chemist will review the data upon receipt prior to releasing to project personnel to verify that the sampling procedures and analytical results were obtained following the protocols in this SAP and are of sufficient quality to satisfy DQOs.

On or before 21 days from sample receipt, the laboratory will submit hardcopy data with associated QC information, as described in Section 4.2, along with an electronic format of the data to TtEC as described in Section 8.1.3.

Hard copy data will be submitted to the DON administrative record concurrently with reports submitted to the DON discussing that applicable data set.

8.1.3 Electronic

Field data from the COCs (date and time collected, sample identification, etc.) will be entered into the TtEC database by the Project Chemist. Survey data will be recorded by a field surveyor and also entered into the database. All sample locations will be surveyed in accordance with *Environmental Work Instruction (EWI) EVR.6, Environmental Data Management and Required Electronic Delivery Standards* (Southwest Division, Naval Facilities Engineering Command [SWDIV], 2005). Horizontal control information will be captured in the State Plane Coordinate System (North American Datum 83) in feet, and vertical control standards will be in mean sea level (North American Vertical Datum 88) in feet. All manual entries into the database will be 100 percent verified by the Project Chemist by checking the manual entry against the hard-copy information.

The EDD from the laboratory, which will be compatible with NEDD requirements, will be uploaded into the TtEC database. The data will be checked for required values and project-specific requirements by the database. Any discrepancies in the EDD will either be corrected by TtEC, or the laboratory will be notified to make corrections. Ten percent of the data will be checked by the Project Chemist against the hardcopy data package. If errors are found in the electronic data, the Project Chemist will contact the laboratory for correction.

The Data Manager will conduct weekly backup of the database and maintain the backup file for 3 months.

8.2 DATA VALIDATION

The following documents will be used as guidance for validating all data: Contract Laboratory Program *National Functional Guidelines for Organic Data Review, EPA 540/R-99-008* (EPA, 1999), Contract Laboratory Program *National Functional Guidelines for Inorganic Data Review, EPA 540-R-04-004*

(EPA, 2004), *EWI #1, 3EN2.1, Chemical Data Validation* (SWDIV, 2001), and the QC criteria specified in this SAP.

Data validation will be performed by an independent data validation company. For this project, 90 percent of the data will require EPA Level III-equivalent data validation and 10 percent EPA Level IV-equivalent data validation. Data may be qualified as protocol or advisory. Protocol violations are when the laboratory deviates from the referenced analytical methods or the project-specific QLs, QC limits, or QC criteria.

Field QC samples will be discussed in the validation reports as follows:

- **Field Duplicates** – Field duplicate identifications will be provided on the COC form for each SDG by TtEC. A section showing RPD values will be included to demonstrate field duplicate precision. If the results cannot be calculated, this will be noted in the report.
- **Field Blanks** – Identifications for field blanks, including trip blanks, equipment rinsates, and source blanks, will be provided on the COC forms by TtEC. Any analyte detected in field blanks will be discussed in this section of the report.

Data validation reports will be submitted to TtEC as described in Section 4.3. The validator reports will be filed with the respective analytical data package.

8.3 DATA QUALITY ASSESSMENT

After data are validated, the Project Chemist will review and assess field and laboratory quality control. The PARCC parameters will be determined as described in Section 7.2. The Project Chemist will review the data validation reports for any deviations and qualify data. The following data qualifiers will be used:

J – Result is estimated
U – Analyte is not detected at or above the stated QL
R – Data are rejected
UJ – Analyte is not detected, but there is an uncertainty about the QL

Data qualifiers are used to indicate uncertainties associated with the data. The assigned qualifiers will be entered into the validation code field in the database. In addition, data will be assessed through the evaluation of the PARCC parameters.

The Project Chemist will prepare a data quality assessment report that will summarize the findings of the data assessment and discuss usability of the data to be included in the report.

Data will be reported in tabular format to be included in the report. The electronic data in NEDD format will be submitted to the DON as described in *EWI EVR.6, Environmental Data Management and Required Electronic Delivery Standards* (SWDIV, 2005). An e-mail confirmation received by TtEC will be forwarded to the project file.

TABLE A.8-1

VERIFICATION PROCESS

(UFP-QAPP Worksheet #34)

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Field logbook	Field logbooks will be reviewed weekly and verified that the information is complete in accordance with requirements in Section 4.1.1. The inspection will be documented in daily QC reports.	I	PQCM, TtEC
COC forms	COC forms will be reviewed daily upon their completion and verified for completeness.	I	PQCM, TtEC
Sample receipt	For samples shipped via courier or FedEx®, the Project Chemist will verify receipt of samples by the laboratory the day following shipment.	I	Project Chemist, TtEC
Sample logins	Sample login information will be reviewed and verified for completeness in accordance with the COC forms.	I E	Project Chemist, TtEC Laboratory Project Manager, Laucks
Laboratory data prior to release	Laboratory data will be reviewed and verified for completeness against analyses requested on the COC forms.	E	Laboratory Project Manager, Laucks
Laboratory data due at turnaround time listed on COC	Laboratory data will be verified that the analyses reported are consistent with the analyses requested on the COC forms.	I	Project Chemist, TtEC
Laboratory data packages	All laboratory data packages will be verified by the laboratory performing the work for completeness. Data packages will then be reviewed by the Project Chemist for completeness in accordance with the data package requirements described in Section 4.5.	E I E	Laboratory, Laucks Project Chemist, TtEC Third-party data validators, TBD
Field and electronic data	One hundred percent of manual entries will be reviewed against the hard-copy information and 10 percent of electronic uploads will be checked against the hard-copy.	I	Project Chemist, TtEC

Abbreviations and Acronyms:

COC – chain-of-custody
PQCM – Project Quality Control Manager
QC – quality control
TBD – to be determined
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.8-2

VALIDATION STEPS (IIA AND IIB) PROCESS

(UFP-QAPP Worksheet #35)

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	Field logbook	Field logbooks will be reviewed weekly for accuracy associated with each sampling event. The inspection will be documented in daily QC reports.	PQCM, TtEC
IIa	COC forms	COC forms will be reviewed daily to ensure that project information, sample analyses requested, number of field QC samples collected, and percent level III or IV validation chosen is accurate and in accordance with the requirements in this SAP.	Project Chemist, TtEC
IIa	Sample receipt	The sample cooler will be checked for compliance with temperature and packaging requirements listed in Section 6.5 of this SAP.	Laboratory sample custodian, Laucks
IIa	Sample logins	Sample login will be reviewed for accuracy against the COC form.	Project Chemist, TtEC Laboratory Project Manager, Laucks
IIa	Laboratory data prior to release	Laboratory data will be reviewed to ensure that the data is accurate and meets the requirements in this SAP. Prior to release, data will be validated as follows:	Laboratory Project Manager, Laucks
		100 percent of the data comply with the method- and project-specific requirements and that any deviations or failure to meet criteria are documented for the project file.	Laboratory Analyst, Laucks
		100 percent of manual entries are free of transcription errors and manual calculations are accurate; computer calculations are spot-checked to verify program validity; data reported are compliant with method- and project-specific QC requirements; raw data and supporting materials are complete; spectral assignments are confirmed; descriptions of deviations from method or project requirements are documented; significant figures and rounding have been appropriately used; reported values include dilution factors; and results are reasonable.	Laboratory Peer Analyst, Laucks
		Data reported are compliant with method- and project-specific QC requirements; the reported information is complete; the information in the report narrative is complete and accurate; and results are reasonable.	Laboratory Supervisor, Laucks
		Data reported are compliant with method- and project-specific QC; analytical methods are performed in compliance with approved SOPs. This review may be conducted after release of data since they are done only on 10 percent of the data.	Laboratory Quality Assurance Manager, Laucks

TABLE A.8-2

VALIDATION STEPS (IIA AND IIB) PROCESS

(UFP-QAPP Worksheet #35)

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	Laboratory data due at turnaround time listed on COC	Laboratory data will be reviewed to ensure that the data reported met the analyte list and limits listed in Tables A.7-1 and A.7-2.	Project Chemist, TtEC
IIa	Laboratory data packages	All laboratory data packages will be validated by the laboratory performing the work for technical accuracy prior to submittal.	Laboratory Project Manager, Laucks
		Data packages will then be reviewed for accuracy against the laboratory data that was faxed/e-mailed at the turnaround time listed on the COC.	Project Chemist, TtEC
		Data packages will be evaluated externally by undergoing data validation as described in Section 8.2.	Third-party data validator, TBD
IIb	Data validation reports	Data validation reports will be reviewed in conjunction with the project DQOs and data quality indicators (listed in Section 7.2).	Project Chemist, TtEC

Abbreviations and Acronyms:

COC – chain-of-custody
DQO – data quality objective
PQCM – Project Quality Control Manager
QC – quality control
SAP – Sampling and Analysis Plan
SOP – Standard Operating Procedure
TBD – to be determined
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

9.0 QUALITY ASSURANCE OVERSIGHT

QA oversight for this project will include surveillance of field activities and the laboratories performing analysis. Planned project assessments, assessment findings and corrective action responses, and QA management reports are included in Tables A.9-1, A.9-2, and A.9-3, respectively.

9.1 FIELD SURVEILLANCE

NAVFAC SW QA Officer and TtEC QCM may schedule surveillance of field activities at any time to evaluate the execution of sample collection, identification, and control in the field. TtEC QC Program Manager will conduct surveillance of field activities at a minimum of once for project duration less than 6 month and once every 6 months for project duration longer than 6 months. The surveillance will also include observations of COC procedures, field documentation, instrument calibrations, and field measurements.

Field documents and COC records will be reviewed to ensure that all entries are printed or written in indelible black or blue ink, dated, and signed. Sampling operations will be reviewed and compared to this SAP and other applicable SOPs. Use of proper sample containers, proper handling of samples, and adequate documentation of the sampling operation will be verified.

Field measurements will be reviewed by random spot-checking to determine that the instrument is within calibration, the calibration is done at the appropriate frequency, and the sensitivity range of the instrument is appropriate for the project.

9.1.1 Corrective Action

Findings identified during the field surveillance will be recorded on a surveillance checklist. A surveillance report will be prepared and provided to the PjM. The PjM shall assign an individual to identify and implement corrective actions.

The TtEC QCM will monitor corrective action documentation, verify implementation of the corrective action, track and analyze the corrective action, and close-out corrective action documentation upon completion of the corrective action.

9.2 LABORATORY ASSESSMENT

The laboratory to be used for this project will have the qualifications described in Section 7.1.1. TtEC will only conduct a laboratory assessment if warranted during the project. The scope of the laboratory assessment by TtEC will be determined based on quality issues encountered.

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TABLE A.9-1

PLANNED PROJECT ASSESSMENTS

(UFP-QAPP Worksheet #31)

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 Actions (Title and Organizational Affiliation)
Operational Readiness Review	Prior to mobilization of the project and prior to initiating major phases of work	Internal	TtEC	Project Manager, TtEC	Project Manager, TtEC	Project Manager, TtEC	Project QC Manager, TtEC
Field Sampling Surveillance	Once prior to field work (preparatory phase) Once at the beginning of field sampling activities (initial phase) Once during field sampling activities (follow-up)	Internal	TtEC	Project QC Manager, TtEC	Project Manager, TtEC	Project Manager, TtEC	Project QC Manager, TtEC
Data Review Surveillance	Once for project duration less than six months	Internal	TtEC	Program Chemist, TtEC	Project Chemist, TtEC	Program Chemist, TtEC	QC Program Manager, TtEC
Management Review	Once	Internal	TtEC	QC Program Manager, TtEC	Project Manager, TtEC	Project Manager, TtEC	Project QC Manager, TtEC

Abbreviations and Acronyms:

QC – quality control
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.9-2

ASSESSMENT FINDINGS AND CORRECTIVE ACTION RESPONSES

(UFP-QAPP Worksheet #32)

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, Org.)	Timeframe for Response
Field Sampling Surveillance	Surveillance Report	Project Manager, TtEC	7 days after completion of the inspection	Corrective Action Report	Project Manager and QC Program Manager, TtEC	5 days after notification
Data Review Surveillance	Surveillance Report	Project Manager, TtEC	7 days after completion of the inspection	Corrective Action Report	Project Manager and QC Program Manager, TtEC	14 days after notification
Management Review	Surveillance Report	Project Manager, TtEC	7 days after completion of the inspection	Corrective Action Report	QC Program Manager, TtEC	14 days after notification

Abbreviations and Acronyms:

QC – quality control
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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TABLE A.9-3

QA MANAGEMENT REPORTS

(UFP-QAPP Worksheet #33)

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)
Field Sampling Surveillance Report	One at start up of sampling	TBD	Project Chemist, TtEC	Project Manager, Program Chemist, QC Program Manager, TtEC
Data Review Surveillance Report	One after all data generated and reviewed	TBD	Program Chemist, TtEC	Project Manager, Program Chemist, QC Program Manager, TtEC
Management Review Report	One after management review is completed	TBD	QC Program Manager, TtEC	Project Manager, Program Manager, TtEC

Abbreviations and Acronyms:

QC – quality control
TBD – to be determined
TtEC – Tetra Tech EC, Inc.
UFP-QAPP – Uniform Federal Policy for Quality Assurance Project Plans

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10.0 SAP REVISION OR AMENDMENT

Significant change in work scope affecting the original project DQOs will require this SAP to be amended. Any changes to this SAP will be documented prior to sampling and analysis activities. Minor changes will be documented by completing an FCR form. The FCR must be approved prior to field implementation. Major changes to work scope affecting the original DQOs or meeting criteria described in *EWI #2, 3EVR.2, Review, Approval, Revision, and Amendment of Sampling and Analysis Plans (SAPs)* (NAVFAC SW, 2006) will require preparation of a SAP addendum. The SAP addendum must be approved by NAVFAC SW QAO prior to conducting sampling and analysis.

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11.0 REFERENCES

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Southwest Division Naval Facilities Engineering Command (SWDIV). 2001. *Environmental Work Instruction (EWI) #1, 3EN2.1, Chemical Data Validation.* November.

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_____. 1992. *Specification and Guidance for Obtaining Contaminant-Free Sample Containers*, EPA 540/R-93/051 and OSWER Directive 9240.0-05A.

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_____. 1999. *National Functional Guidelines for Organic Data Review, EPA 540/R-99/008*. Contract Laboratory Program. October.

_____. 2004. *National Functional Guidelines for Inorganic Data Review, EPA 540/R-04/004.* Contract Laboratory Program. October.

_____. 2005. *Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP).* March.

_____. 2006a. *Guidance on Systematic Planning using the Data Quality Objectives Process, EPA QA/G-4, QAMS*. February.

_____. 2006b. *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, QAMS*. May.

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FIGURES

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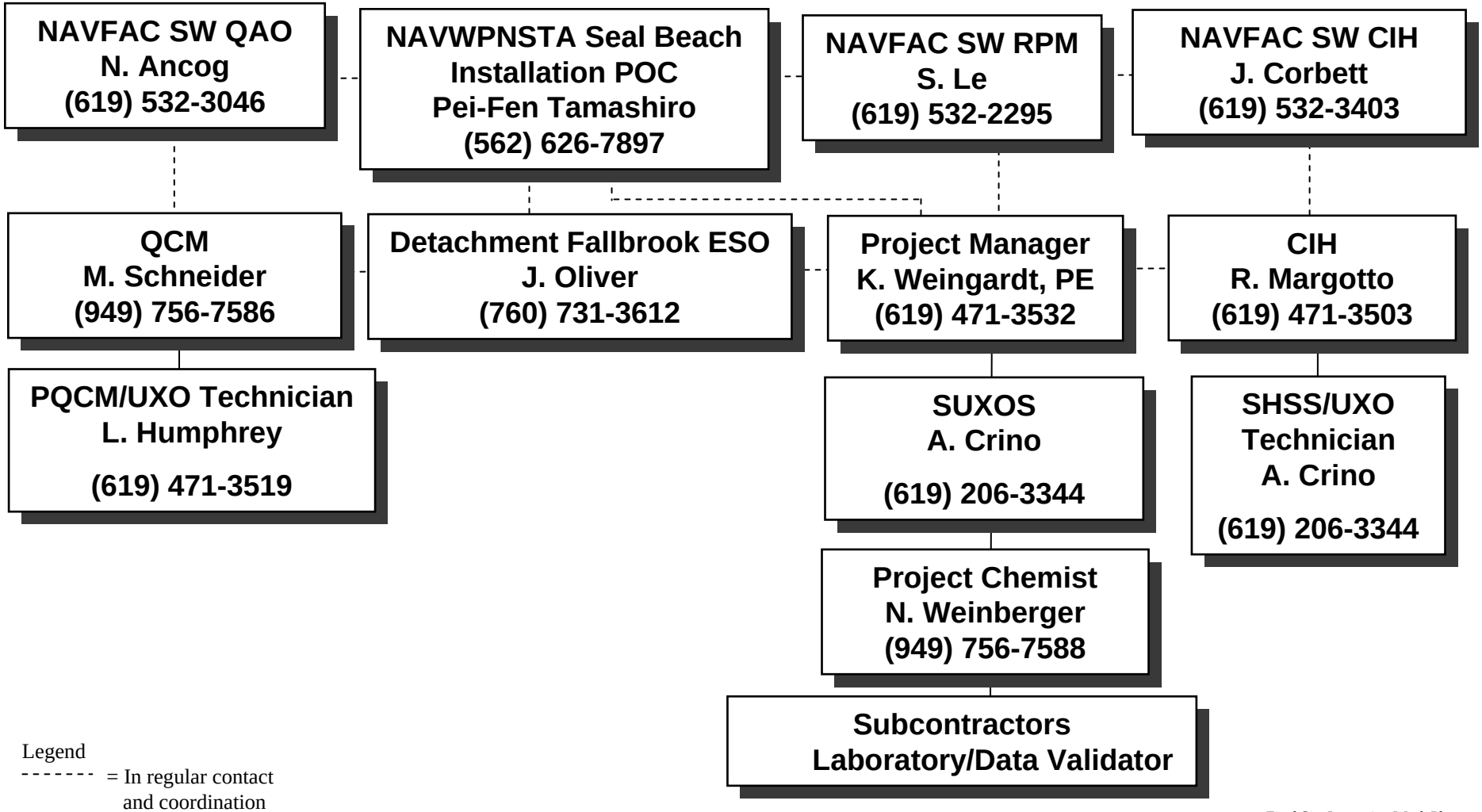
Figure A.2-1

Project Organization Chart



LEGEND

- SIS-001 — SITE INSPECTION SAMPLE
- ROAD/PAVED SURFACE
- STREAMS
- BUILDING
- SUSPECT MEC PRESENCE
- KNOWN MEC PRESENCE
- MRP SITE UXO5

NOTES:

MEC - MUNITIONS AND EXPLOSIVES OF CONCERN

MRP - MUNITIONS RESPONSE PROGRAM

NAVWPNSTA - NAVAL WEAPONS STATION

SIS - SITE INSPECTION SAMPLE

UXO - UNEXPLODED ORDNANCE

MEC PRESENCE WAS DETERMINED IN PRELIMINARY ASSESSMENT REPORT (MALCOLM PIRNIE INC., 2005) THROUGH REVIEW OF HISTORICAL DOCUMENTATION, INTERVIEWS, AND VISUAL SURVEY.

SOURCE:

SAMPLE LOCATIONS PLACED BY RANDOM POINT GENERATOR (c) 2002 DR. M.SAWADA

100 0 100 200 Feet

Scale: 1" = 200'

N

NAVAL FACILITIES ENGINEERING COMMAND, SOUTHWEST
SAN DIEGO, CA

SITE INSPECTION WORK PLAN

FIGURE A.5-1

MRP SITE UXO5 SAMPLE LOCATIONS

NAVWPNSTA SEAL BEACH
DETACHMENT FALLBROOK, CALIFORNIA

REVISION: 0
AUTHOR: GFG
FILE NUMBER: 070010L1281.mxd

TETRA TECH EC, INC.

ATTACHMENT 1

EXAMPLE OF SAMPLE LABEL, CUSTODY SEAL, AND CHAIN-OF-CUSTODY

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TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-8696

NUMBER 21700

CHAIN-OF-CUSTODY RECORD

PROJECT NAME	PURCHASE ORDER NO.	ANALYSES REQUIRED	LABORATORY NAME	Project Information Section Do not submit to Laboratory
PROJECT LOCATION	PROJECT NO.			
SAMPLER NAME	AIRBILL NUMBER		LABORATORY ID (FOR LABORATORY)	
PROJECT CONTACT	PROJECT CONTACT PHONE NUMBER			

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL 3	LEVEL 4	TYPE	TAT	COMMENTS	LOCATION	DEPTH START	DEPTH END	QC

RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	LABORATORY INSTRUCTIONS/COMMENTS	SAMPLING COMMENT:
COMPANY	TIME	COMPANY		
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	COMPOSITE DESCRIPTION	
COMPANY	TIME	COMPANY		
RELINQUISHED BY (Signature)	DATE	RECEIVED BY (Signature)	SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)	
COMPANY	TIME	COMPANY	TEMPERATURE: _____ SAMPLE CONDITION: ☐ INTACT ☐ BROKEN COOLER SEAL: ☐ INTACT ☐ BROKEN	

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

SAMPLE LABEL (EXAMPLE)

SAMPLE NO.:_____
PROJECT:_____
DATE:_____/_____/_____ **TIME:**_____**HRS**_____
MEDIUM: WATER_____ **SOIL**_____ **SEDIMENT**_____
OTHER_____**(Specify)**
TYPE: GRAB_____ **COMPOSITE**_____ **OTHER**_____
PRESERVATION:_____
ANALYSIS:_____
SAMPLED BY:_____
REMARKS:_____
_____

CUSTODY SEAL (EXAMPLE)

CUSTODY SEAL

Person Collecting Sample**:**_____ Sample No**.:**_____
(Signature)
Date Collected:_____ Time_____
_____

APPENDIX B

CONCEPTUAL SITE MODEL

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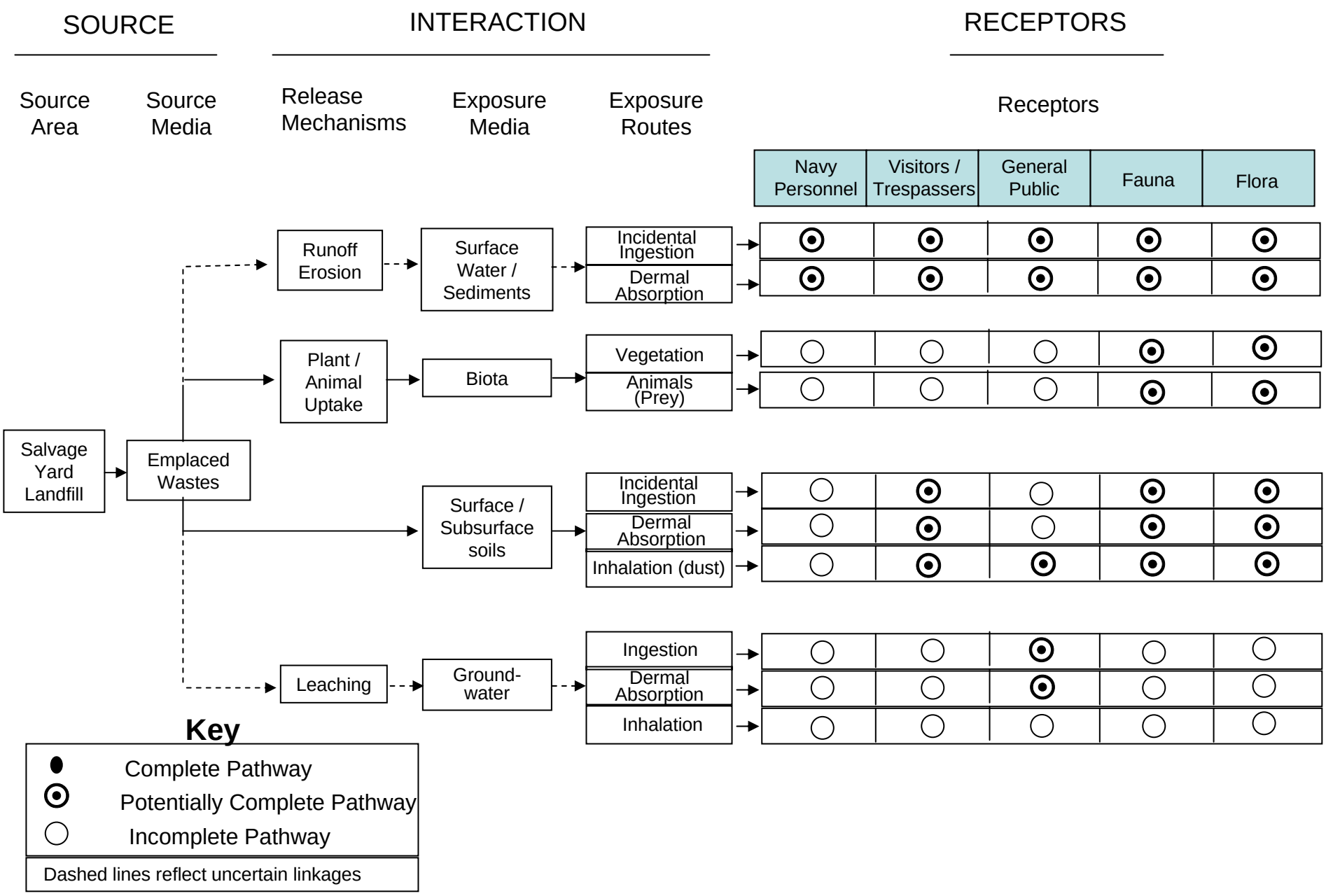
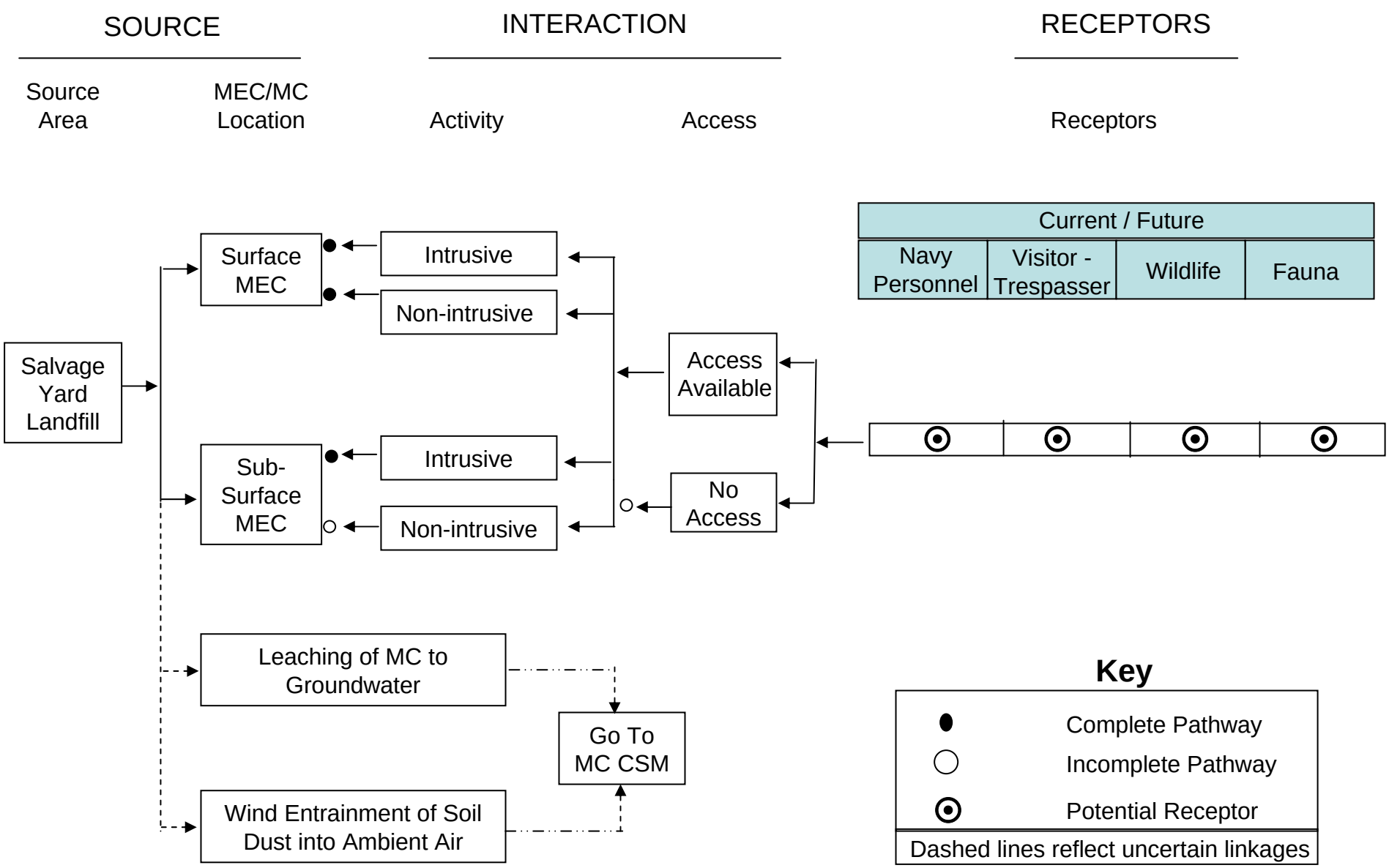
Salvage Yard Landfill MC Conceptual Site Model
MRP Site UXO5 (Salvage Yard Landfill)



Salvage Yard Landfill MEC Conceptual Site Model
MRP Site UXO5 (Salvage Yard Landfill)



MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

FACILITY PROFILE	
Installation Name	Naval Weapons Station Seal Beach Detachment Fallbrook (Detachment Fallbrook)
Installation Location	Detachment Fallbrook is located immediately to the west of the City of Fallbrook, CA, which is located approximately 53 miles north of San Diego, CA.
Site Name	Munitions and Explosives of Concern (MEC) MRP Site UXO5 (also referred to as the Salvage Yard Landfill [SYL])
Site Location	MRP Site UXO5 is located in the northeastern corner of Detachment Fallbrook, approximately 900 feet from the western corner of the installation housing area. Figures 1-1 and 1-2 in the Site Inspection Work Plan show the location of Detachment Fallbrook within the State of California, and the location of MRP Site UXO5 relative to Detachment Fallbrook.
Site Ownership	U.S. Federal Government (Department of the Navy)
Installation Security	MRP Site UXO5 is located within the confines of Detachment Fallbrook, which is completely fenced and patrolled by a dedicated security force. Access onto the installation is very closely controlled. Once on the installation, access to MRP Site UXO5 is not restricted. The site is not completely fenced.
Physical Boundaries	MRP Site UXO5 is approximately 13 acres in size and is bordered by the following: To the North – Undeveloped land containing live oak woodlands and Coastal Sage Scrub grasslands To the East – Building 365, its parking area, and Coastal Sage Scrub grasslands To the South – Sparrow Road To the West – Building 307 and its parking area
Site Structures and Utilities	There are no buildings or man-made structures within MRP Site UXO5, other than a retaining wall located on the western side of the landfill. Building 307 is located west of the site, and Building 365 is located to the east. Buried water lines pass through the central portion of the landfill, sewer lines run through the southern portion of the site, and telephone lines run along the eastern portion of the former landfill. Additional buried utilities are located on the installation approximately 0.4 miles southwest of MRP Site UXO5.
Ordnance Area Type(s)	Burial pits / landfill. The entire site was known to have been used as a landfill for over 10 years.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

FACILITY PROFILE	
Storage and Waste Disposal History	MRP Site UXO5, the former SYL, was used as a disposal area for munitions, inert ordnance, munitions constituents (e.g., missile parts, electronics) and dunnage (the materials used in containers and the holds of ships to protect goods from moisture, contamination, and mechanical damage) from 1952 to approximately 1960. MRP Site UXO5 also was used as a disposal area and storage yard from the early 1950s to the late 1960s. Blasting caps, 20mm and 40mm rounds were found on the ground surface after a brush fire went through the area in 2002. Visual surveys conducted during a Preliminary Assessment of the site discovered practice bombs of varying sizes, a 2.36-inch rocket, a pyrotechnic bomb, and various artillery rounds. The site was never used as a target or impact area. The site is currently no longer actively used for disposal.
Physical Indications of a Potential Source Area	Eroded areas along the retaining wall on the western portion of the site appear to contain ordnance.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

PHYSICAL PROFILE	
Topography	Low hills and natural ravines are the dominant topographic features of the site. The highest point in MRP Site UXO5 is approximately 725 feet above mean sea level (MSL) in the south central portion of the site. The elevation of the remainder of the site varies from 700 feet to 725 feet above MSL.
Natural Barriers	None
Vegetation	Coastal Sage Scrub and non-native Mixed Grassland are the predominant vegetation types within MRP Site UXO5. Common species include coastal sagebrush, flat-topped buckwheat, laurel sumac, sage, goldenbush, and a variety of grasses. MRP Site UXO5 is covered by vegetation over essentially all of its area.
Extent of the Site	Building 307 and its parking lot are located on the western boundary of the site, and Sparrow Road delineates the southern border. Undeveloped grasslands, Coastal Sage Scrub, and live oak wood land is located on the northern site boundary, and Coastal Sage Scrub and Building 365 are east of the site. The boundaries of the site and the buildings adjacent to it are shown in Figure 2-1 in the Site Inspection Work Plan. The depth of the debris buried there is unknown**.**
Surface Water Features and Drainage Pathways	There are no permanent bodies of water within MRP Site UXO5. An intermittent, seasonal stream is located in the northern portion of the site. The stream drains to the Santa Margarita River, which forms the northern boundary of the site and has a watershed area of over 750 square miles. There are no wetlands on the site.
Surface and Subsurface Geology	Detachment Fallbrook is underlain by igneous and metamorphic rocks of the Peninsular Ranges physiomorphic province. Site-specific information about MRP Site UXO5 was not available.
Meteorological Data	The average annual temperature at Detachment Fallbrook is 63°F with summer temperatures ranging from 61° to 90° at night, and winter temperatures varying from 33° at night to 67° during the day. The climate is considered to be Dry Summer Subtropical, also known as Mediterranean. It is characterized by mild winters, cool summers, and infrequent rainfall. January is the wettest month of the year and July is the most arid. The average annual precipitation range is 13.7 to 17.1 inches. The installation experiences the Santa Ana winds in the summer.
Natural Processes Affecting Fate and Transport	Erosion of soil via water run-off and wind, and possible leaching.
Geophysical Data	None available.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

PHYSICAL PROFILE	
Hydrogeological Data	MRP Site UXO5 is located within *Deluze* Hydrologic area in the Santa Margarita watershed. There is no groundwater depth data available for the landfill area. Groundwater flow in the northern portion of the site travels in a northwest direction in stream beds that eventually drain into the Santa Margarita River. Groundwater from the eastern and southern areas on the site flow west-southwest into a stream bed on the western side of Sparrow Road, which also drains into the Santa Margarita River.
Soil Boring or Well Log Information	The moderately drained soil is classified as a sandy loam of granitic origin.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

RELEASE PROFILE	
Munitions Types	Historical records of MRP Site UXO5 list expended cartridges, primers, live projectiles, and inert anti-tank projectiles as items buried in the SYL. U.S. Marine Corps EOD personnel from MCB Camp Pendleton submitted an EOD incident report in 2002 for their response to 20mm and 40mm rounds found on the ground surface, as well as some blasting caps. The following types of MPPEH were encountered during a site characterization in 2004 and 2005: an MK 76, a 5-pound and a 25-pound practice bomb; a 3-pound pyrotechnic bomb; a 2.36-inch helium (HE) filled anti-tank rocket; 20mm rounds; other projectiles; several smokeless powder cans; and munitions scrap.
MEC Density	Indicated to vary across the landfill. Some portions of MRP Site UXO5 may not have any MEC.
Determination of Contaminant Movement from Source Areas	Ordnance items and related debris were buried or emplaced within the landfill. It has not been determined if MEC/MC has migrated to any locations (on or off site) from the point of their placement. Complete gun rounds were observed in an eroded area adjacent to the retaining wall, but none of them were observed down-gradient from that site.
Migration Routes and Mechanisms	Water runoff, soil erosion, and wind-entrained soil dust are all potential migration mechanisms for material potentially presenting an explosive hazard (MPPEH)/MEC/munitions constituents (MC). The leaching of buried MC through the soils to groundwater is another potential migration route. There is no current intrusive activity at the site that may cause or enhance migration, such as intrusive site maintenance, plowing, tilling, or re-grading. Future remediation and/or maintenance activities within MRP Site UXO5 that involve excavation or construction create potential release mechanisms and/or migration routes. The ordnance items and debris associated with the site are generally small enough to be lifted and carried by an individual child or adult.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

RELEASE PROFILE	
Munitions Constituents and Media of Potential Concern	MC of concern associated with potential MEC include: • Explosives PBX, RDX and MX (HE filled projectiles) • Titanium tetrachloride (25 pound bombs) • Smokeless powder (powder cans) • Explosives TNT and PETN (bazooka rounds) • Potassium perchlorate, powdered aluminum, black powder, smoke mixture, and lead (pyrotechnic bombs) • White phosphorus, lithium hydride, magnesium, RDX, lead styphnate, lead azide, barium, and strontium (pyrotechnics and blasting caps) • Lead, arsenic, copper, chromium, cadmium, nickel, and zinc (small arms rounds) These MC are primarily of potential concern relative to the site soils. Inter-media contaminant transfer is a possibility from the soil to the groundwater and from the soil into the ambient air via soil dust entrainment.
Impact of Chemical Mixtures and Co-located Waste	These constituents tend to be relatively stable in the soil, and tend to remain close to where they are released into the environment. A number of the constituents can be soluble in water, depending on the form in which they exist, and may leach into the groundwater. The solubility of many metals is influenced by the pH of the soil system. The organic compounds may degrade in the environment under certain conditions, which may be affected by sunlight, the presence of oxygen and nutrients, and moisture.
Locations and Delineation of Confirmed Releases	The locations of MPPEH recovered during the visual surveys noted earlier are annotated on Figure 4-2 in the project Work Plan.
Modeling Results	None available.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

LAND USE AND EXPOSURE PROFILE	
Current Land Use	MRP Site UXO5 is closed and is currently not in use. Livestock grazing on the site has been discontinued.
Future Land Use	Same as current use. No significant re-use or redevelopment is planned for the future due to the restrictions associated with the Explosive Safety Quantity Distance (ESQD) arcs (see below).
Zoning	ESQD arcs associated with on-installation explosives storage magazines located near MRP Site UXO5 restrict the amount and type of activities that can be performed at the site.
Demographics	Detachment Fallbrook employs 72 military, 191 civilian, and 102 contractor personnel. There are also 9 military, 126 civilians, and 90 contractor tenant personnel. Fallbrook, the nearest city to the installation, has a population of 29,100 (census year 2000), while San Diego County has a population of 2,933,462 (U.S. Census Bureau 2005 estimate).
Receptors Associated with Current and Future Land Use	People potentially exposed to ordnance or munitions constituents at MRP Site UXO5 include Navy personnel, Navy-authorized visitors (including contractors), and non-authorized visitors (trespassers). The leaching of MC through soils into the groundwater is another potential exposure pathway that could bring contaminants into contact with the general public, as is the entrainment of soil dust into the open air.
Types of Current or Future Activities at the Facility	MRP Site UXO5 is currently not in use, and is not planned for any significant use in the future due to the ESQD arcs. Environmental and ecological surveys may be conducted on the site in the future. No mowing takes place on site; and the retaining wall on the western side of the site is not maintained. Repair to the underground utilities may occur in the future, if required.
Natural Resources	No information is available for the depth of groundwater beneath MRP Site UXO5; however, the depth of water in sampling wells near buildings 230 and 232 on Ammunition Road ranged from 50 to 60 feet in 2003. There are no delineated wetlands or other unique natural features at MRP Site UXO5.
Cultural Resources	Cultural resources consisting of six prehistoric sites, a milling site and one 1930s cattle trough are located on or near MRP Site UXO5. The information about the sites and their locations can be found in the Final Cultural Resources Inventory and Survey Report prepared by Mooney & Associates in May 2000. The information has not been released to the public to protect the integrity of the site.
Resource Utilization	No groundwater wells are located within MRP Site UXO5. Potable water for Detachment Fallbrook is purchased from the San Diego County Water Authority through water lines owned by the Fallbrook Utility District. No hiking trails or other features may preferentially draw individuals to the site where they may be exposed.
Sensitive Receptor Subpopulations	There are no on-installation schools, hospitals, or day care centers. A recreational facility is located 4,700 feet southeast of MRP Site UXO5.

MRP SITE UXO5 CONCEPTUAL SITE MODEL INFORMATION PROFILES

ECOLOGICAL PROFILE	
Description of the Property and Habitat	MRP Site UXO5 is a 13-acre former landfill site located in the northeastern portion of Detachment Fallbrook. The site is comprised of low hills and natural ravines and is predominantly vegetated with Coastal Sage Shrub, Mixed Grassland, and live oak woodlands that provide habitat for sensitive species that include the Stephens' kangaroo rat, the Coastal California gnatcatcher, and the Least Bell's vireo.
Primary Use of the Property and Degree of Disturbance	No current or future activities are planned at MRP Site UXO5. In the future, ecological and environmental surveys may be performed that may disturb portions of the local habitat. Possible future maintenance of the buried utilities also may disturb the local habitat in selected locations near the utilities. Otherwise, the site experiences relatively little disturbance.
Identification of Ecological Receptors in Relation to Habitat Type	Known or potentially present receptors include mammals (kangaroo rats, voles, deer, mice, ground squirrels, opossum, rabbits, and coyotes); amphibians (tree frogs); reptiles (orange-throated whiptails, rattlesnakes, horned lizards); and birds (burrowing owls, kites, quails, sparrows, kingbirds, and hawks). The river and its estuary support seven federal- or state-listed endangered species.
Federal Endangered Species	Stephen's kangaroo rat, Least Bell's vireo, Arroyo Toad, and Quino checkerspot butterfly
Federal Threatened Species	Coastal California gnatcatcher and Thread-leaved Brodiaea
State Endangered Species	Least Bell's vireo and Thread-leaved Brodiaea
State Threatened Species	Stephen's kangaroo rat
State Species of Special Concern	Coastal California gnatcatcher, Golden eagle, Southern California Rofous-crowned Sparrow, Cooper's Hawk, and Arroyo Toad
Migrating Species	No migrating species are known to use MRP Site UXO5.
Relationship of any MEC/MC Releases to Habitat Areas	MC that has been incorporated into the food web through uptake by vegetation and bioaccumulated in food and prey may come into contact with the terrestrial wildlife present at the site. The potential also exists for a complete exposure pathway to the public by the leaching of MC into the groundwater system or by migration off site by out-flow and erosion during significant rain events. Surface runoff and groundwater may be communicating with the river and the aquatic habitats near the site.

APPENDIX C

QUALITY CONTROL FORMS

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CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE		
CONTRACT NO **N62473-06-D-2201**	TITLE AND LOCATION	REPORT NO
CONTRACTOR TETRA TECH EC, INC.	SUPERINTENDENT	
AM WEATHER	PM WEATHER	MAX TEMP (F) / MIN TEMP (F)

WORK PERFORMED TODAY

WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE? (If YES attach copy of the meeting minutes)	☐ YES	☐ NO	TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO	CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)	☐ YES	☐ NO		
WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)	☐ YES	☐ NO	TOTAL WORK HOURS FROM START OF CONSTRUCTION	

LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED ☐ SAFETY REQUIREMENTS HAVE BEEN MET.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Owner	Description of Construction Equipment Used Today (incl Make and Model)	Arrival	Off Rent Date	Actual Demob Date	Hours Idle	Hours Used	Reason for Idle

REMARKS

CONTRACTOR/SUPERINTENDENT _____ DATE _____

TETRA TECH EC, INC.

FIELD CHANGE REQUEST FORM

Contract No.	CTO No.	Field Change Request Form No.
N62473-06-D-2201		FCRF-
Location		Date

RE: Drawing No. _____ Title _____

Specification Section _____ Title _____

Other _____

Description (items involved, submit sketch, if applicable)

Reason for Change

Recommended Disposition (submit sketch, if applicable)

TETRA TECH EC, INC.

FIELD CHANGE REQUEST FORM

Contract No.	CTO No.	Field Change Request Form No.
N62473-06-D-2201		FCRF-

Additional Details

Will this change result in a contract cost or time change? ☐ Yes ☐ No

Estimate of contract cost or time charge (if any) _____

Preparer (signature)	Date	Preparer's Title	Site Superintendent (Signature)	Date

Disposition

☐ Approved.

☐ Not approved (give reason). _____

TtEC Engineer (signature) (if engineering related) ☐ Comments (attached) ☐ No Comments	Date	TtEC Project Manager (signature) ☐ Comments (attached) ☐ No Comments	Date
TtEC PESM (signature) ☐ Comments (attached) ☐ No Comments	Date	TtEC Scientist (signature) (if science related) ☐ Comments (attached) ☐ No Comments	Date
TtEC QC Program Manager (signature) ☐ Comments (attached) ☐ No Comments	Date		

Distribution: Original to Project File, Copy to Site File,
Project Manager, DON RPM, DON ROICC, PQCM, QCM, Site Superintendent

INITIAL PHASE CHECKLIST

		SPEC SECTION	DATE
CONTRACT NO **N62473-06-D-2201** **CTO No.**	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

PROCEDURE COMPLIANCE

IDENTIFIY FULL COMPLIANCE WITH PROCEDURES IDENTIFIED AT PREPARATORY. COORDINATE PLANS, SPECIFICATIONS, AND SUBMITTALS.

COMMENTS: _____

PRELIMINARY WORK

ENSURE PRELIMINARY WORK IS COMPLETE AND CORRECT. IF NOT, WHAT ACTION IS TAKEN?

WORKMANSHIP

ESTABLISH LEVEL OF WORKMANSHIP.

WHERE IS WORK LOCATED? _____

IS SAMPLE PANEL REQUIRED? YES ☐ NO ☐

WILL THE INIITAL WORK BE CONSIDERED AS A SAMPLE? YES ☐ NO ☐

(IF YES, MAINTAIN IN PRESENT CONDITION AS LONG AS POSSIBLE AND DESCRIBE LOCATION OF SAMPLE) _____

RESOLUTION

RESOLVE ANY DIFFERENCES.

COMMENTS: _____

CHECK SAFETY

REVIEW JOB CONDITIONS USING EM 385-1-1 AND JOB HAZARD ANALYSIS

COMMENTS: _____

OTHER

OTHER ITEMS OR REMARKS

_____
PQCM DATE

NONCONFORMANCE REPORT

	Report No.
Client or Project:	Drawing No./Spec. No.
Supplier, Construction QC or Contractor	P.O. No.
Description of Component, Part or System	

I. Description of Nonconformance *(Items involved, specification, code or standard to which items do not comply, submit sketch if applicable)*

Name and Signature of Person Reporting Nonconformance	Title/Company	Date

II. Recommended Disposition *(Submit sketch, if applicable)*

Name and Signature of Person Recommending Disposition	Title/Company	Date

III. Evaluation of Disposition by Tetra Tech FW, Reason for Disposition

IV. Corrective Action ☐ Required ☐ Not Required

V. ☐ Engineering	☐ QA/QC	☐ Construction	☐ Other
Name *(Signature)*	Name *(Signature)*	Name *(Signature)*	Name *(Signature)*
Date	Date	Date	Date
☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments	☐ Accepted ☐ Rejected ☐ Accepted with Comments

VI. Verification of Disposition ☐ Required ☐ Not Required

By	Signature	Title	Date

NONCONFORMANCE REPORT LOG

PROJECT TITLE: _____

PROJECT LOCATION: _____

CONTRACTOR: _____

NCR NO.	HOLD TAG NO.	DESCRIPTION OF CONDITIONS/ ITEM AFFECTED	LOCATION	DATE					REMARKS
				VALIDATION	DISPOSITION/ APPROVAL	RE-INSPECTION	CLOSURE	HOLD TAG REMOVAL	

PREPARATORY PHASE CHECKLIST

(CONTINUED ON SECOND PAGE)

SPEC SECTION	DATE

CONTRACT NO	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #
N62473-06-D-2201 **CTO No.**			

PERSONNEL PRESENT

GOVERNMENT REP NOTIFIED _____ HOURS IN ADVANCE: YES ☐ NO ☐

NAME	POSITION	COMPANY/GOVERNMENT

SUBMITTALS

REVIEW SUBMITTALS AND/OR SUBMITTAL REGISTER. HAVE ALL SUBMITTALS BEEN APPROVED? YES ☐ NO ☐

IF NO, WHAT ITEMS HAVE NOT BEEN SUBMITTED?

ARE ALL MATERIALS ON HAND? YES ☐ NO ☐

IF NO, WHAT ITEMS ARE MISSING?

CHECK APPROVED SUBMITTALS AGAINST DELIVERED MATERIAL. (THIS SHOULD BE DONE AS MATERIAL ARRIVES.)

COMMENTS:

MATERIAL STORAGE

ARE MATERIALS STORED PROPERLY? YES ☐ NO ☐

IF NO, WHAT ACTION IS TAKEN?

SPECIFICATIONS

REVIEW EACH PARAGRAPH OF SPECIFICATIONS.

DISCUSS PROCEDURE FOR ACCOMPLISHING THE WORK.

CLARIFY ANY DIFFERENCES.

PRELIMINARY WORK & PERMITS

ENSURE PRELIMINARY WORK IS CORRECT AND PERMITS ARE ON FILE.

IF NOT, WHAT ACTION IS TAKEN?

PREPARATORY PHASE CHECKLIST

(CONTINUED ON SECOND PAGE)

		SPEC SECTION	DATE
CONTRACT NO **N68711-98-D-5713** **CTO No.**	DEFINABLE FEATURE OF WORK	SCHEDULE ACT NO.	INDEX #

TESTING

IDENTIFY TEST TO BE PERFORMED, FREQUENCY, AND BY WHOM.

WHEN REQUIRED?

WHERE REQUIRED?

REVIEW TESTING PLAN.

HAS TEST FACILITIES BEEN APPROVED?

SAFETY

ACTIVITY HAZARD ANALYSIS APPROVED? YES ☐ NO ☐

REVIEW APPLICABLE PORTION OF EM 385-1-1.

MEETING COMMENTS

NAVY/ROICC COMMENTS DURING MEETING.

OTHER ITEMS OR REMARKS

OTHER ITEMS OR REMARKS:

PQCM DATE

CONTRACTOR PRODUCTION REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE: Enter Date (DD/MMM/YY)

CONTRACT NO	TITLE AND LOCATION	REPORT NO
N62473-06-D-2201	Enter Title and Location of Construction Contract Here	Enter Report # Here

CONTRACTOR	SUPERINTENDENT
Tetra Tech EC, Inc.	Enter Superintendent's Name Here

AM WEATHER	PM WEATHER	MAX TEMP (F)	MIN TEMP (F)
Enter AM Weather Data Here	Enter PM Weather Data Here	Enter Max Temp Here	Enter Min Temp Here

WORK PERFORMED TODAY

Schedule Activity No.	WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

JOB SAFETY

WAS A JOB SAFETY MEETING HELD THIS DATE? (If YES attach copy of the meeting minutes)	☐ YES	☐ NO
WERE THERE ANY LOST TIME ACCIDENTS THIS DATE? (If YES attach copy of completed OSHA report)	☐ YES	☐ NO
WAS CRANE/MANLIFT/TRENCHING/SCAFFOLD/HV ELEC/HIGH WORK/ HAZMAT WORK DONE? (If YES attach statement or checklist showing inspection performed.)	☐ YES	☐ NO
WAS HAZARDOUS MATERIAL/WASTE RELEASED INTO THE ENVIRONMENT? (If YES attach description of incident and proposed action.)	☐ YES	☐ NO

TOTAL WORK HOURS ON JOB SITE, THIS DATE, INCL CON'T SHEETS	
CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT	
TOTAL WORK HOURS FROM START OF CONSTRUCTION	

Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED ☐ SAFETY REQUIREMENTS HAVE BEEN MET.

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Schedule Activity No.	Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)	Hours Used

Schedule Activity No.	REMARKS

CONTRACTOR/SUPERINTENDENT _____ DATE

CONTRACTOR PRODUCTION REPORT

(CONTINUATION SHEET)

DATE: Enter Date (DD/MMM/YY)

CONTRACT NO: N62473-06-D-2201

TITLE AND LOCATION: Enter Title and Location of Construction Contract Here

REPORT NO: Enter Report # Here

WORK PERFORMED TODAY

Schedule Activity No.	WORK LOCATION AND DESCRIPTION	EMPLOYER	NUMBER	TRADE	HRS

Schedule Activity No.	LIST SAFETY ACTIONS TAKEN TODAY/SAFETY INSPECTIONS CONDUCTED

EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB (INDICATE SCHEDULE ACTIVITY NUMBER)

Schedule Activity No.	Submittal #	Description of Equipment/Material Received

CONSTRUCTION AND PLANT EQUIPMENT ON JOB SITE TODAY. INDICATE HOURS USED AND SCHEDULE ACTIVITY NUMBER.

Schedule Activity No.	Owner	Description of Construction Equipment Used Today (incl Make and Model)	Hours Used

Schedule Activity No.	REMARKS

INCLUDE ALL PERSONNEL WORK HOURS IN THE WORK PERFORMED SECTION ON THIS SHEET
INTO THE FRONT CONTRACTOR PRODUCTION REPORT

CONTRACTOR QUALITY CONTROL REPORT

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE: Enter (DD/MMM/YY)

REPORT NO: Enter Rpt # Here

PHASE | CONTRACT NO: N62473-06-D-2201 | CONTRACT TITLE: Enter Title and Location of Construction Contract Here

PREPARATORY

WAS PREPARATORY PHASE WORK PREFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL PREPARATORY PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

INITIAL

WAS INITIAL PHASE WORK PREFORMED TODAY? YES ☐ NO ☐

IF YES, FILL OUT AND ATTACH SUPPLEMENTAL INITIAL PHASE CHECKLIST.

Schedule Activity No.	Definable Feature of Work	Index #

FOLLOW-UP

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐

WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REWORK ITEMS IDENTIFIED TODAY (NOT CORRECTED BY CLOSE OF BUSINESS)

Schedule Activity No.	Description

REWORK ITEMS CORRECTED TODAY (FROM REWORK ITEMS LIST)

Schedule Activity No.	Description

REMARKS (Also Explain Any Follow-Up Phase Checklist Item From Above That Was Answered "NO"), Manuf. Rep On-Site, etc.

Schedule Activity No.	Description

On behalf of the contractor, I certify that this report is complete and correct and equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

AUTHORIZED QC MANAGER AT SITE DATE

GOVERNMENT QUALITY ASSURANCE REPORT

DATE

QUALITY ASSURANCE REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THE REPORT

Schedule Activity No.	Description

GOVERNMENT QUALITY ASSURANCE MANAGER DATE

CONTRACTOR QUALITY CONTROL REPORT

(CONTINUATION SHEET)
(ATTACH ADDITIONAL SHEETS IF NECESSARY)

DATE: Date (DD/MMM/YY)
REPORT NO.: Enter Rpt # Here

PHASE	CONTRACT NO	N62473-06-D-2201	CONTRACT TITLE	Enter Title and Location of Construction Contract Here

FOLLOW-UP

WORK COMPLIES WITH CONTRACT AS APPROVED DURING INITIAL PHASE? YES ☐ NO ☐

WORK COMPLIES WITH SAFETY REQUIREMENTS? YES ☐ NO ☐

Schedule Activity No.	Description of Work, Testing Performed & By Whom, Definable Feature of Work, Specification Section, Location and List of Personnel Present

REMARKS (Also Explain Any Checklist Item From Above That Was Answered "NO"), Manuf. Rep. On-Site, etc.

Schedule Activity No.	Description

MONTHLY REWORK ITEMS LIST

Contract No. **N62473-06-D-2201** CTO No. Project :

Contractor: Tetra Tech EC, Inc. Date:

NUMBER	DATE IDENTIFIED	DESCRIPTION	CONTRACT REQUIREMENT (Spec. Section and Par. No., Drawing No. and Detail No., etc.)	ACTION TAKEN BY QC MANAGER	RESOLUTION	DATE COMPLETED

APPENDIX D

EXPLOSIVES SAFETY SUBMISSION WAIVER

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DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SAFETY & SECURITY ACTIVITY
FARRAGUT HALL BLDG D-323
23 STRAUSS AVENUE
INDIAN HEAD MD 20640-5555

8020
Ser N539/1562
27 Sep 06

From: Commanding Officer, Naval Ordnance Safety and Security Activity
To: Commander, Naval Facilities Engineering Command Pacific

Subj: DETERMINATION THAT AN EXPLOSIVES SAFETY SUBMISSION IS NOT REQUIRED FOR SALVAGE YARD LANDFILL, NWS SEAL BEACH DETACHMENT FALLBROOK, FALLBROOK, CALIFORNIA

Ref: (a) E-mail Tetra Tech EC Mr. L. Humphrey/NOSSA (N539) Mr. D. Murray of 11 Sep 06 (w/encl)
(b) NOSSAINST 8020.15, Military Munitions Response Program Oversight, of 8 Mar 04
(c) NAVSEA OP 5, Revision 7

1. The Naval Ordnance Safety and Security Activity (NOSSA) reviewed the reference (a) e-mail and its enclosed request for a NOSSA determination that an Explosives Safety Submission (ESS) not be required for a Site Inspection (SI) of the Salvage Yard Landfill, Naval Weapons Station Seal Beach Detachment Fallbrook, Fallbrook, California. Based on the information presented in reference (a), and on the ESS criteria in references (b) and (c), NOSSA determines that an ESS is not required.

2. NOSSA understands that the scope of work calls for an SI of the landfill by contractor unexploded ordnance (UXO) technicians using a Geonics EM-31 MK II ground conductivity meter. NOSSA is also given to understand that other proposed work includes: mowing the site; collecting approximately 30 soil samples, with samples taken from a 9-inch depth; and installing a 6-ft high chain-link fence approximately 20 ft outside the landfill boundaries. UXO technicians will use anomaly avoidance techniques ahead of the mower, and while collecting soil samples and installing fence posts.

3. Neither the UXO technicians nor other personnel are authorized to make any intentional physical contact with Munitions and Explosives of Concern (MEC) during the operations described. Should MEC be discovered, UXO personnel will notify the nearest military Explosive Ordnance Disposal (EOD) unit and request they respond.

Subj: DETERMINATION THAT AN EXPLOSIVES SAFETY SUBMISSION IS NOT REQUIRED FOR SALVAGE YARD LANDFILL, NWS SEAL BEACH DETACHMENT FALLBROOK, FALLBROOK, CALIFORNIA

4. The NOSSA point of contact for this ESS determination is Mr. Douglas Murray, who can be contacted at DSN 354-4450 or commercial at 301-744-4450.

Pamela G. Clements
PAMELA G. CLEMENTS
By direction

Copy to:
CNO (N411; N45C)
NAVFAC HQ (ENV)
NOSSA ESSOPAC (N5P)

APPENDIX E

REGULATORY AGENCY WORK PLAN REVIEW COMMENTS, RESOLUTION, AND ACCEPTANCE

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AGENCY COMMENTS TO WORK PLAN

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California Regional Water Quality Control Board

San Diego Region

Over 50 Years Serving San Diego, Orange, and Riverside Counties

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Secretary for Environmental Protection

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Governor

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http:// www.waterboards.ca.gov/sandiego

December 18, 2006

Department of the Navy
Naval Weapons Station Seal Beach
Attn: Ms. Pei-Fen Tamashiro, IR Coordinator
800 Seal Beach Blvd.
Seal Beach, California 90740-5000

In reply refer to:
SMC: 30-0096.05:grifb

Dear Ms. Tamashiro:

SUBJECT: DRAFT SITE INSPECTION WORK PLAN, NAVAL WEAPONS STATION SEAL BEACH, DETACHMENT FALLBROOK, MUNITIONS RESPONSE PROGRAM, SITE UXO5, SALVAGE YARD LANDFILL, FALLBROOK, CALIFORNIA (DOCUMENT REFERENCE NUMBER 5090 SER N45W/0259).

The California Regional Water Quality Control Board, San Diego Region (RWQCB) reviewed the "Draft Site Inspection Work Plan, Naval Weapons Station Seal Beach, Detachment Fallbrook, Munitions Response Program, Site UXO5, Salvage Yard Landfill, Fallbrook, California" prepared by Tetra Tech EC, Inc., dated November 15, 2006 (Draft SIWP). The Draft SIWP presents proposed activities to determine if additional environmental activities are warranted to address munitions related waste encountered at the Site; reclassify areas of the Site as either known, suspected, or not suspected to contain munitions and explosives of concern; refine Site boundaries; and restrict access to the Site. The proposed activities include the following:

- systematic visual and magnetometer surveys of the entire Site;
- focused magnetometer survey of possible sampling locations;
- soil sample collection and analysis for munitions constituents; and
- vegetation clearing, geophysical survey, and installation of semi-permanent fence along the perimeter of the Site.

Whereas the RWQCB has no objections to implementing activities presented in the Draft SIWP, following are issues with the proposed activities that should be addressed prior to commencing field activities. The RWQCB comments are categorized as Activity Specific Comments or Draft SIWP Subsection Specific Comments.

radius or diameter of detection. Such information may be provided in the magnetometer's manufacturer specifications. If not available, a determination of this distance should be conducted as part of the magnetometer quality control activities outlined in Draft SIWP Subsection 4.4.6

Field Documentation of Expray Screening Activities
All collected soil samples will be field screened with an Expray Test Kit to ensure that samples with high concentrations of explosives are not sent off-site. A comprehensive and detailed log of these activities, including scaled photographs, and the findings is required. The inclusion of an "Expray Field Log Report" or some other field log in the RTC would allow the RWQCB to review and identify any additional information that should be noted during the fieldwork and may be beneficial to the investigation.

Lateral Extent of Site Waste in the Vicinity of Buildings 307 and 365
In the RTC please indicate and provide copies of the source(s) of information that was used to define the Site boundary in the vicinity of Buildings 307 and 365, refer to Draft SIWP Figure 2-1. If not already researched, a possible useful resource to address this issue is historical aerial photographs that may illustrate the temporal and spatial relationships between the Site and Buildings. This issue is of significance and needs to be investigated because the extent of waste in the vicinity of the Buildings currently is unknown. If it is determined that the waste extends outward from the Buildings then the proposed activities along the Site perimeter would have to be expanded to achieve investigation objectives.

Capability of Geonics EM-31 MKII to Detect Buried Waste
A Geonics EM-31 MKII ground conductivity meter will be used to refine the Site boundary. In the RTC please provide the maximum and optimal depth of detection for the Geonics EM-31 MKII. This information is necessary to evaluate the capability of the proposed instrument to detect waste buried within pits.

Subsurface Utility Survey Prior to Fence Installation
As part of an interim response, the proposed activities include the installation of a semi-permanent fence around the Site. Prior to installing the proposed fence, a utility survey should be conducted in areas that are known to have or that one could reasonably anticipate may have buried utilities. The review of as-built drawings for Buildings 307 and 365 and Base utility maps may provide useful information and assist with this effort.

DRAFT SIWP SUBSECTION SPECIFIC COMMENTS

Subsection 4.4.2 and 5.3.3
There is a discrepancy in the area proposed for vegetation clearance. According to Draft SIWP Subsection 4.4.2 vegetation clearance is to be performed around the perimeter of the Site to support the geophysical survey. Yet according to Subsection

Cc:

Department of the Navy
Naval Facilities Engineering Command
Southwest Division (SWDIV)
Attn: Mr. Si Le, Code 5NEN.SL
1220 Pacific Highway
San Diego, CA 92132-5190

Tetra Tech EC, Inc.
Attn: Mr. Kent Weingardt
1230 Columbia Street, Suite 750
San Diego, California 92101-8536

Department of Toxic Substances Control

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

Rec'd
12/20/06
mm
PPT

December 20, 2006

Ms. Pei-Fen Tamashiro
NAVWPNSTA Seal Beach
Code N45W, Building 110
800 Seal Beach Boulevard
Seal Beach, California 70740-5000

DRAFT SITE INSPECTION WORK PLAN, SITE UXO5, NAVAL WEAPONS STATION SEAL BEACH, FALLBROOK, CALIFORNIA.

Dear Ms. Tamashiro:

The Department of Toxic Substances Control has reviewed the above referenced document dated November 15, 2006 and received on November 17, 2006. The Work Plan is for the Site Inspection (SI) of Site UXO5 to determine if further action is warranted. The SI entails a surface visual inspection, soil sampling and geophysical determination of the site boundaries. Please review the following comments and respond accordingly.

General comment

At similar sites where Munitions and Explosives of Concern (MEC) have already been found, the determination to recommend the site for a Remedial Investigation/Feasibility Study (RI/FS) is already made. The SI is then used to generate information to support the RI/FS recommendation. Since MEC has been found at site UXO5 the site should be moved forward to the RI/FS stage.

Specific Comment

Section 4.4.3 Munitions Constituents Sampling and Analysis, Page 4-6, Three levels of MEC presence. An SI with surface visual inspection and limited soil sampling does not allow for a determination of "Areas Not Suspected to Contain MEC". Only the first two determinations can be made; Known MEC areas or Suspected MEC Areas.

Section 4.4.3 Munitions Constituents Sampling and Analysis, Page 4-6, Last paragraph, fourth sentence. "An initial estimate of the presence of MEC at MRP Site UXO5 will be established through a selective surface and near-surface soil sampling program (at 9 inches bgs), which will supplement the findings of the MPPEH visual surface survey.."

This sentence implies that soil samples will be collected at two depths (surface and near-surface) for analysis. However, the soil sampling procedures (Appendix A, Sampling and Analysis Plan, Section 6.3.1, Soil Sampling Procedures, Step 4) states that the first 9 inches of soil will be removed from a sample location before a sample is collected. The collection of surface soil samples are not proposed in the Site Inspection Work Plan. Additionally, the rationale for selecting the 9-inch sampling depth is not discussed.

Since the munitions constituents can exist at any depth within the landfill, it would be prudent to collect discrete samples at multiple depths or collect homogenized surface soil samples. For homogenized samples, the soil sample collected at each sample location would be the soil column from surface to 9 inches (or agreed upon depth) below ground surface, minus any layer of organic material such as vegetation or plant roots. The soil column can be placed in a zip-lock type plastic bag. The bag can then be sealed and then shaken or kneaded to homogenize the soil. The homogenized soil can be poured into the sample container and the remaining portion poured back into the sample location hole.

Appendix A, section 1.2, Action Levels, page A.1-2 States that no action levels will be used and that the Navy will determine if further action is warranted. Since MEC has already been found at this landfill, this site should be moved forward to the RI/FS stage. Action levels for explosives are available and have been used at other MEC sites during the SI stage. Metals should be compared to site specific background samples taken in undisturbed native soil.

Please contact me to set up a site inspection for the beginning of January 2007, Should you have any questions or issues to discuss, please contact me at (714) 484-5428.

Sincerely,

Daniel Cordero Jr.
Project Manager
Federal Facilities Unit "B"
Office of Military Facilities

cc: Mr. Si Le
Remedial Project Manager
SWDIV Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5190

Ms. Beatrice Griffey
Engineering Geologist
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4353

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

DEC 15 2006

In Reply Refer To:
FWS-SD-4030.3

Pei-Fen Tamashiro
Installation Restoration Coordinator
Naval Weapons Station Seal Beach
800 Seal Beach Boulevard
Seal Beach, California 90740-5000

Subject: Munitions Response Program Site UXO5 Work Plan, Naval Weapons Station Seal Beach, Detachment Fallbrook, San Diego County, California

Dear Ms. Tamashiro:

We, the U.S. Fish and Wildlife Service (Service), have reviewed the provided draft Site Inspection (SI) Work Plan for Munitions Response Program (MRP) Site UXO5 (also known as Installation Restoration Program [IRP] Site 33), Naval Weapons Station Seal Beach, Detachment Fallbrook, San Diego County, California (Contract # N62473-06-D-2201). We received the November 15, 2006, work plan and cover letter (5090 Ser N45W/0261) on November 17, 2006. With this letter, we are providing comments regarding two concerns. Activities associated with the SI have the potential to impact two species listed under the Endangered Species Act of 1973, as amended, as well as critical habitat, and we provide our determination of not likely to adversely affect. The listed species known to occur onsite include Stephens' kangaroo rat (*Dipodomys stephensi*; "SKR") and coastal California gnatcatcher (*Polioptila californica californica*; "gnatcatcher"). The proposed activities are within designated and proposed critical habit for the gnatcatcher. Additionally, we provide comments and recommendations regarding the contaminant-related issues addressed in the Sampling and Analysis Plan (SAP; Appendix A in the work plan).

We have worked with Detachment Fallbrook regarding listed species at this site before. Previously, we concurred with not likely to adversely affect determinations at this site for geophysical surveys using ground-penetrating radar and related vegetation clearing (FWS-SD-4030.1, June 2, 2004) and for fencing the perimeter of the site (among others) as part of the Detachment Fallbrook's grazing program (FWS-SD-4030.2, October 10, 2006).

The proposed work plan is for a SI of the Salvage Yard Landfill MRP Site UXO5. Results of the SI will be used to determine if additional characterization, remedial response, or other function is warranted. Proposed field work includes a visual surface sweep, surface soil sampling for explosive munitions constituents and metals, geophysical surveys to determine physical limits of the landfill, vegetation removal, and installation of 6-foot chain-link fencing around

contaminated areas[1]. Based on the site description, it appears that the contaminants most likely to be present in site soils are munitions and related compounds, and metals. Service trust resources potentially exposed to contaminants from the site may include ground-feeding birds and small mammals, burrowing mammals (such as SKR), and other wildlife that rely on vegetation or ground-dwelling animals for food. Aquatic species are of concern if site-related contaminants are migrating via groundwater discharge (if it occurs) or surface run-off into the creek that drains the northwest corner of the site.

Listed Species

Section 5.1 of the work plan states only that SKR has the *potential* to occur; however, through our previous involvement, we are aware that Mr. Robert Knight captured two SKR within the project site boundary during a four-day trapping session in May 2004 (letter dated June 4, 2004, 5090 Ser N45WK/0096). Also during that trapping session 18 non-listed Dulzura kangaroo rats (*D. simulans*; "DKR") were captured on the site. Because SKR were captured at proportionally and absolutely low numbers, and because the two SKR were observed to return to burrows outside of the IRP Site 33 boundary, it was Detachment Fallbrook's determination that this site was occupied by SKR, but at "trace levels". Apparently, no new SKR surveys have been conducted.

Other than a likely increase in sage scrub vegetation since the area burned in 2002, the information available suggests little has changed in the SKR habitat onsite. It is possible the increase in vegetation may have actually reduced the habitat quality for SKR. Proposed ground disturbing activities (*e.g.*, sampling may create holes in the ground, though these will be filled the same day [section 5.3.5]) are not clearly quantified in the work plan; however, we anticipate the impacts to be very small (measured in square feet). Suitable SKR habitat onsite will be mapped and burrows will be marked and avoided and a biomonitor will supervise the mowing activities to provide direction. Based on the limited number of SKR and the avoidance and minimization measures incorporated into the project description, we have determined that the activities are not likely to adversely affect SKR.

For gnatcatchers, Detachment Fallbrook, in 2004, characterized the site as not containing "sufficient constituent elements to constitute a use-area visited with any frequency" (5090 Ser N45WK/0096). In the current work plan, Detachment Fallbrook characterizes Site UXO5 as containing "insufficient [gnatcatcher] habitat to represent an occupied range." However, the site vicinity has apparently seen an increase in the number of gnatcatchers since the greater area burned in 2002. As reported in the work plan, focused surveys in 2006 detected at least two pairs with fledglings within 250 feet of Site UXO5 boundary (see also 5090 Ser N45W/0206, August 30, 2006; Dodd 2006) with some, but apparently limited, use of the site itself.

Any impacts to the vegetation (mowing, digging, *etc.*) are anticipated to be temporary and relatively small in area (an unspecified portion of the 13-acre site is anticipated to need mowing). By comparison, the proposed and designated gnatcatcher critical habitat units that encompass

[1] It is unclear if or how the chain link fence in the current project relates to the barbed wire fence proposed for the grazing program.

Detachment Fallbrook are 8,690 acres in size. Additionally, all activities will be done outside of the gnatcatcher nesting season; therefore, we do not expect any eggs or young to be destroyed. Further, we expect any adults onsite will be able to move out of the way of any project actions and, thus, will not be killed or injured. Based on the distribution of gnatcatchers on Site UXO5, the quality of the habitat onsite, the temporary nature of the impacts, and the avoidance of the nesting season, we have determined that the activities are not likely to adversely affect the gnatcatcher or its designated or proposed critical habitat.

Environmental Contaminants

Efforts being taken at Site UXO5 to identify contaminant-related risks to ecological receptors in general and to reduce those risks, if necessary, are appreciated and encouraged. The following are requested to help ensure that contaminant-related ecological risks are addressed by the SI:

1. According to the SAP, sampling results will be evaluated by the Department of the Navy (DON) rather than using specific action levels to determine if there is a need for further consideration. Given that results of the SI may be used to make a determination of no further action (NFA), we recommend that concentration levels be evaluated using screening levels such as those used by DON at Marine Corps Air Station, El Toro (Earth Tech, Inc. 2001). The screening levels will help ensure that residual levels of contaminants left in soils following a NFA determination pose minimal risk to ecological receptors.

2. Fauna may be exposed to certain contaminants through ingestion of soil invertebrates. The soil-to-diet pathway is considered complete for herbivores in the site conceptual model (Appendix B in the SAP). Ideally, the pathway for carnivores will be considered potentially complete as well.

3. If not already in the plan, please include samples in locations that address questions about off-site migration of contaminants via surface run-off.

We recommend that initial studies follow U.S. Environmental Protection Agency (EPA) guidelines (EPA 1997) for screening-level assessments. These guidelines take intentionally conservative (protective) approaches to minimize the chances for a false negative determination (*i.e.*, incorrectly determining that contaminants pose negligible risk). If the study is a pre-screening level assessment, the process should be even more conservative. Because listed SKR occur onsite, including potentially burrowing into subsurface soils, we recommend that decisions rely on data, exposure factors, and "no-effect" levels to better protect *individuals* rather than relying on effect levels and/or potential for population-level impacts. Given the potential receptor is a federally endangered species, we recommend an added level of conservatism is warranted.

We thank you for your continued coordination and communication with us on Detachment Fallbrook projects that may affect federally listed species or relate to environmental contaminants. If you have any questions regarding this letter, please contact Gjon Hazard at

(760) 431-9440 extension 287 for endangered species, and Katie Zeeman at extension 291 for environmental contaminants.

Sincerely,

for

Karen A. Goebel
Assistant Field Supervisor

cc.
Christy Wolf (Naval Weapons Station Seal Beach, Detachment Fallbrook, 700 Ammunition Road, Fallbrook, California 92028-3187)

References Cited

Dodd, Shana. 2006. 45-day report (TE 796271-4) for California gnatcatcher surveys performed on Naval Weapons Station Fallbrook Detachment in 2006. Unpublished report. September 5, 2006. [CFWO Record ID #7934]

Earth Tech, Incorporated. November 2001. Final Work Plan - Phase II Remedial Investigation, IRP Site 1, Explosive Ordnance Disposal Range, Marine Corps Air Station, El Toro California. Prepared by Earth Tech, Inc. for U.S. Department of the Navy.

[EPA] U. S. Environmental protection Agency. 1997. Ecological risk assessment guidance for Superfund. Process for designing and conducting ecological risk assessments, Interim Final. EPA 540-R-97-006. EPA, Office of Solid Waste and Emergency Response, Washington, D.C.

RESPONSE TO NAVY'S COMMENTS

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RESPONSE TO NAVY'S COMMENTS ON
DRAFT SITE INSPECTION WORK PLAN
November 15, 2006
NAVAL WEAPONS STATION SEAL BEACH DETACHMENT FALLBROOK
MUNITIONS RESPONSE PROGRAM SITE UXO5
SALVAGE YARD LANDFILL
FALLBROOK, CALIFORNIA

DCN: ECSD-RACIV-07-0010

Comments by:	Responses by:
Ms. Beatrice Griffey, M.Sc., PG Associate Engineering Geologist Site Mitigation and Cleanup Unit California Regional Water Quality Control Board San Diego Region	Tetra Tech EC, Inc. 1230 Columbia Street, Suite 750 San Diego, CA 92101-8536
Comments: December 18, 2006	Response: December 22, 2006 (Updated January 31, 2007)
Comment 1. Ability of Proposed Magnetometer to Detect Buried Site Waste. One of the objectives of the investigation is to recategorize areas of Site 33 as either known, suspected, or not suspected to contain munitions and explosives of concern (MEC). This objective will be accomplished by conducting a systematic visual surface survey by having UXO technicians form a line that is perpendicular to the path of advance and conducting numerous traverses until the entire Site is searched. Each technician will use a metal detector (Schonstedt or other suitable device, refer to Draft SIWP Subsection 4.4.1) to provide data regarding the presence of buried metal materials. Historical activities conducted at the Site involved the disposal of MEC and munitions debris in pits with currently unknown dimensions. Of particular concern with regards to this investigation is the pit depth and the ability of the metal detector to detect buried waste. If the Department of the Navy (DoN) intends to address buried waste during this investigation, the response to comments (RTC) needs to provide 1.) either information regarding the ability of the proposed instrument to detect buried waste, or revise the proposed activities to include an instrument or an approach that will achieve this goal; 2.) revised Magnetometer Quality Control activities (Draft SIWP, Subsection 4.4.6) to ensure the instrument is adequately functional; and 3.) revised proposed soil sampling plan that will allow field	**Response 1.** The overall objective of this Site Inspection (SI) is to begin the characterization process at the site for decision-making purposes. It is recognized that based on the results of this SI further investigation/characterization needs will likely be identified. The overall approach for characterization and/or remedial action is a step-wise approach, with this SI being an early step in the overall process (which may include further remedial investigation). It is anticipated that through this SI, information will be gathered to guide the future work at the site; however, it is not intended to be a final characterization step. That being said, the DON had chosen the techniques to be employed in this SI to fulfill this preliminary objective. While the DON is not specifically addressing buried waste at the site during this investigation, they are employing techniques (surface sweep, sampling, and limited geophysical investigation) that will give good indication whether further intrusive actions need to be taken to characterize buried waste at the site. The main purpose of the magnetometer is to investigate locations that will be intrusively sampled to ensure that buried MEC (or any anomalies) are not encountered (for safety reasons). Any findings during the magnetometer work will be thoroughly documented (including GPS location information) as will all sampling locations and surface findings. We will clarify this in the SAP while describing our sampling procedures (Section 5.1) as well as in the Work Plan (Section 4.4.3). We feel, based on experience, that the QC

staff to determine appropriate sample collection depths on a location specific basis that will allow investigation objectives to be achieved. If DoN does not intend to address buried waste during this investigation, then the RTC needs to provide DoN's plans, including a time frame, to address this potentially significant source of pollution to waters of the State. Until buried waste is investigated, it does not seem that any portion of the Site can be categorized as not suspected to contain MEC with an acceptable level of confidence, except for areas of the Site that consist of exposed bedrock.	testing procedure outlined in Section 4.4.6 is adequate for daily testing to ensure that instruments are operating properly in the environment in which they are being used. Also, see response to comment number 5 below. Sampling is not proposed at depth (only 9 inches, which represents the ability of a magnetometer to find a 20 mm round) during this SI. As stated in the work plan (4.4.1) the UXO technicians will employ a metal detector during the surface sweep. This is simply intended to give the UXO technicians an audible backup to the visual search (as stated). This surface sweep is not intended to investigate materials at depth. The SI report is targeted to be issued as a Draft document in July 2007 (see schedule Figure 3.2). Based on the results, findings, and recommendations that will be included in that report, a schedule for further site characterization (as appropriate) will be included in the SI report.
Comment 2. **Lateral Radius/Diameter of Magnetometer Detection Zone.** Efforts to recategorize areas of the Site also include the collection and analysis (field screening test kit and a fixed lab) of the soil samples. Based on the nature of site waste, the proposed soil sample collection activities include surveying all possible sample locations with a magnetometer prior to collecting a sample. If metal is detected, a step-out distance of one foot will be used until a metal free alternate sample location is identified (Draft SIWP, Appendix A, Subsection 6.3.1). Such an approach requires that staff take detailed, comprehensive, and thorough field notes, and take photographs, including scale, during sampling activities to document and illustrate spatial relationships between waste and actual sample locations. This information is necessary to evaluate the representativeness of soil analytical data. Whereas	**Response 2.** We will revise text in the SAP and in the Work Plan (WP) to include the requirement for detailed notes, including photographs, GPS location, and scale, for any situations where anomalies are detected and avoided during the sampling activities. We concur that such a step-out approach will give a potentially lower concentration than at a source location. But such information is still useful to indicate potential migration and presence of contaminants of concern. Again, such findings would point to the need for further characterization during the next step of the project, which is not unlikely. Lateral radius of detection of the magnetometer is not generally an issue. The magnetometer will be moved about over a specific area that is desired to be cleared for sampling (e.g,. 2 ft x 2 ft). The complete area within that lateral box will be fully covered by the magnetometer and we will not rely on lateral accuracy of the magnetometer outside of the area that was fully surveyed. As a corollary, the magnetometers are capable of

the RWQCB understands the necessity for conducting activities to ensure the safety of field staff, the acquired soil analytical data represents the condition of soil at some lateral distance from the contaminant source and hence may not be the highest contaminant concentration at the location. Additionally, please provide the magnetometer's lateral radius or diameter of detection. Such information may be provided in the magnetometer's manufacturer specifications. If not available, a determination of this distance should be conducted as part of the magnetometer quality control activities outlined in Draft SIWP Subsection 4.4.6	detecting a 20 mm round at 9 inches bgs and larger anomalies at 10 ft or more. This will be clarified in the SAP under our sampling procedures Section 5.1.
Comment 3. Field Documentation of Expray Screening Activities All collected soil samples will be field screened with an Expray Test Kit to ensure that samples with high concentrations of explosives are not sent off-site. A comprehensive and detailed log of these activities, including scaled photographs, and the findings is required. The inclusion of an "Expray Field Log Report" or some other field log in the RTC would allow the RWQCB to review and identify any additional information that should be noted during the fieldwork and may be beneficial to the investigation.	**Response 3.** Not all samples will be screened with the EXPRAY test kit. This test was only included as a precaution to make sure that high explosive media was not sent off site for testing. The EXPRAY test kit will only be used at the discretion of the UXO Technician based on visual inspection of the sample media (if the soil has the appearance that it could be heavily contaminated with explosive compound). In any event, all sampling activities will be thoroughly documented in the Sampling Log, Field Log, etc. We are using GPS on all sampling locations as well, and photodocumentation of such situations is standard. Finding locations of noted high concentrations of explosives as well as any MEC is considered a very important finding in this SI and will be fully documented, GPS located, photodocumented, logged and ultimately reported in the SI. We will include more details such as stated above when describing the use of EXPRAY as well as stressing the requirements for detailed notes for sample location and actions taken in Section 5.1 of the SAP as well as in Section 4.4.3 of the Work Plan.
Comment 4. Lateral Extent of Site Waste in the Vicinity of Buildings 307 and 365. In the RTC please indicate and provide copies of the source(s) of information that was used to define the Site boundary in the vicinity of Buildings 307 and 365, refer to Draft SIWP Figure 2-1. If not already researched, a possible useful resource to address this issue is historical aerial	**Response 4.** The proposed boundary for this SI was based on findings and recommendations of the Final Preliminary Assessment for the MRP, NAVWPNSTA Seal Beach Detachment Fallbrook (Malcolm Pirnie, Inc, 2006). As part of this SI, a limited geophysical survey around these proposed site boundaries will be performed to further refine the extent of buried waste (in particular metallic anomalies that could

photographs that may illustrate the temporal and spatial relationships between the Site and Buildings. This issue is of significance and needs to be investigated because the extent of waste in the vicinity of the Buildings currently is unknown. If it is determined that the waste extends outward from the Buildings then the proposed activities along the Site perimeter would have to be expanded to achieve investigation objectives.	represent the contaminants of concern MPPEH or MEC or associated components) associated with the site. The result of this SI may be differing site boundaries (smaller or larger), which will be documented in the SI Report.
Comment 5. Capability of Geonics EM-31 MKII to Detect Buried Waste. A Geonics EM-31 MKII ground conductivity meter will be used to refine the Site boundary. In the RTC please provide the maximum and optimal depth of detection for the Geonics EM-31 MKII. This information is necessary to evaluate the capability of the proposed instrument to detect waste buried within pits.	**Response 5.** The maximum range of the EM 31 is 18' (for a drum-sized object) and 5' - 8' is the optimal range (depth – again for a drum-like object) depending on the conductivity of the soil. The instrument is most sensitive and receives the maximum response for metallic objects at the optimal depth. If the soil in the area being surveyed is highly conductive, these depths will decrease. The key in defining the site boundary is looking for large masses of metallic debris (indicative of a contiguous landfill) – the EM 31 has proven quite effective in these types of situations in virtually all soil types at depths generally up to 10 feet and sometimes deeper. We will include this capability information in Section 4.4.4 of the Work Plan.
Comment 6. Subsurface Utility Survey Prior to Fence Installation. As part of an interim response, the proposed activities include the installation of a semi-permanent fence around the Site. Prior to installing the proposed fence, a utility survey should be conducted in areas that are known to have or that one could reasonably anticipate may have buried utilities. The review of as-built drawings for Buildings 307 and 365 and Base utility maps may provide useful information and assist with this effort.	**Response 6.** Concur. The contractor (TtEC) will review available utility drawings prior to performance of the geophysical survey. The geophysical survey will serve as a subsurface utility search within the area that the fence will be installed.
Comment 7. Subsection 4.4.2 and 5.3.3. There is a discrepancy in the area proposed for vegetation clearance. According to Draft SIWP Subsection 4.4.2 vegetation clearance is to be performed around the perimeter of the Site to support the geophysical survey. Yet according to Subsection 5.3.3,	**Response 7.** This discrepancy will be corrected. It is intended that mowing will only be performed around the perimeter to accommodate fencing installation. We left this statement in to cover any potential that vegetation clearance within the interior would be needed to complete our SI activities; however, we see this as being very unlikely, so we

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vegetation clearance is required for the surface sweep of the entire Site. In the RTC either provide clarification or revised text, whichever is appropriate.	will correct this in the WP. (See Sections 4.4.2 and 5.3.3).
Comment 8. Subsection 4.4.3 The proposed soil sampling plan includes the collection and analysis of two background samples, refer to Draft SIWP Table 4-1. In the RTC please indicate the objective(s) of this activity and a discussion, including calculation(s) and regulatory guidance document citation(s), supporting the proposed number of samples to achieve the desired objective(s).	**Response 8**. As described in our sampling strategy, we are targeting most of our sampling in areas of known or discovered MEC (in other words, sampling in areas where there is evidence of deposits of MPPEH, MEC or MEC-related debris). The background samples are simply selected in areas where there is not such evidence to give us some comparison and see if detected contaminants are isolated to areas of MEC or more dispersed site-wide. We did not utilize a rigorous statistical technique to determine the number of samples selected for this SI. The quantity was determined through management judgment to balance overall cost and schedule vs. the size of the site and what we know from the PA. Our strategy is focused on determining if contamination appears to be isolated or more widespread. Depending on the result of this sampling in accordance with that strategy, a more rigorous statistical sampling approach may be warranted and proposed for future investigation for the site.
Comment 9. Subsection 5.3.5, Third Bullet. Based on the nature of site related waste, it seems that vehicle access routes should be screened for surface and buried MPPEH prior to allowing vehicular access.	**Response 9.** Agreed. We will add this requirement to the WP.
Comment 10. Section 7.0. Report(s) of unauthorized releases of oil and/or hazardous substances during the field activities need to include estimates of the duration of the release.	**Response 10.** Agreed. We will add this requirement as a bullet to Section 7.0 of the WP.

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FALLBROOK, CALIFORNIA

DCN: ECSD-RACIV-07-0010

Comments by: Ms. Karen A. Goebel Assistant Field Supervisor United States Department of the Interior Fish and Wildlife Service Ecological Services, Carlsbad fish and Wildlife Office Comments: December 15, 2006	Responses by: Tetra Tech EC, Inc. 1230 Columbia Street, Suite 750 San Diego, CA 92101-8536 Responses: December 22, 2006 (Updated January 31, 2007)
Comment 1. It is unclear if or how the chain link fence in the current project relates to the barbed wire fence proposed for the grazing program.	**Response 1.** As stated in the Navy's letter dated 30 August 2006 (Ser N45W/0206), the Salvage Yard Landfill will be fenced with 6-foot chain link fence due to its proximity to Navy family housing. The chain link fence proposed in this work plan is the same chain link fence that was proposed for the grazing program. The fence will be constructed under the Munitions Response Program since it also served as an interim protective measure for potential risk receptors.
Comment 2. Section 5.1 of the work plan states only that SKR has the *potential* to occur; however, through our previous involvement, we are aware that Mr. Robert Knight captured two SKR within the project site boundary during a four-day trapping session in May 2004 (letter dated June 4, 2004, 5090 Ser N45WK/0096). Also during that trapping session 18 non-listed Dulzura kangaroo rats (DKR) were captured on the site. Because SKR were captured at proportionally and absolutely low numbers, and because the two SKR were observed to return to burrows outside of the IRP Site 33 boundary, it was Detachment Fallbrook's determination that this site was occupied by SKR, but at "trace levels". Apparently, no new SKR surveys have been conducted.	**Response 2**. We will revise the SI background information on SKR to include the results of Mr. Knight's findings as described here.

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Comment 3. Proposed ground disturbing activities (e.g., sampling may create holes in the ground, thought these will be filled the same day [section 5.3.5]) are not clearly quantified in the work plan; however, we anticipate the impacts to be very small (measured in square feet).	**Response 3**. We will track all ground-disturbing activities and document the results of them in the SI Report. Ground disturbing activities during this project are anticipated to be very small as stated.
Comment 4. For gnatcatchers, Detachment Fallbrook, in 2004, characterized the site as not containing "sufficient constituent elements to constitute a use-area visited with any frequency" (5090 ser N45WK/0096). In the current work plan, Detachment Fallbrook characterizes Site UXO5 as containing "insufficient [gnatcatcher] habitat to represent an occupied range." However, the site vicinity has apparently seen an increase in the number of gnatcatchers since the greater area burned in 2002. As reported in the work plan, focused surveys in 2006 detected at least two pairs with fledglings within 250 feet of Site Uxo5 boundary (see also 5090 Ser N45W/0206, August 30, 2006; Dodd 2006) with some, but apparently limited, use of the site itself.	**Response 4.** The wording in the WP regarding "insufficient gnatcatcher habitat" will be removed. The results of the focused surveys will be reported as noted.
Comment 5. According to the SAP, sampling results will be evaluated by the DON rather than using specific action levels to determine if there is a need for further consideration. Given that results of the SI may be used to make a determination of no further action (NFA), we recommend that concentration levels be evaluated using screening levels such as those used by DON at Marine Corps Air Station, El Toro (Earth Tech, Inc. 2001). The screening levels will help ensure that residual levels of contaminants left in soils following a NFA determination pose minimal risk to ecological receptors.	**Response 5**. The DON plans to evaluate all data gathered from this SI to determine the need for further investigation. In the SI report, the DON will document the data and information that was gathered and the evaluation of this data in determining the need and type of further actions. This first stage of the investigation is intended to be very preliminary in order to better direct any further investigation at the site. The USFWS will have an opportunity to review the SI report and to provide input. As to the EPA guidelines referenced, we believe you are referring to Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997). A screening level ecological risk assessment as well as a screening level human health risk assessment will be performed and documented in the

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We recommend that initial studies follow U.S. Environmental Protection Agency (EPA) guidelines (EPA 1997) for screening-level assessments. These guidelines take intentionally conservative (protective) approaches to minimize the chances for a false negative determination. If the study is a pre-screening level assessment, the process should be even more conservative. Because listed SKR occur onsite, including potentially burrowing into subsurface soils, we recommend that decisions rely on data, exposure factors, and "no-effect" levels to better protect individuals rather than relying on effect levels and/or potential for population-level impacts. Given the potential receptor is a federally endangered species; we recommend an added level of conservatism.	SI report. We will include EPA Region 9 PRGs for human health comparison as well as soil screening levels for ecological risk comparison. The proposed ecological soil screening values are compiled from multiple sources. The primary values used were the USEPA Eco SSLs for the metals with corresponding values. Secondary sources included sources from the Oak Ridge National Laboratories Ecological Risk Division. They are very conservative numbers and are only for screening purposes. They are based upon conservative exposure assessments that assume full time exposure and 100% bioavailability. For a few components, published ecological screening values do not exist. In these situation we will defer to the PRGs. In some cases, our laboratories cannot report to the selected screening level concentration. In these cases the reporting limit will be utilized as the screening level. The proposed screening values are attached to these RTCs.
Comment 6. Fauna may be exposed to certain contaminants through ingestion of soil invertabrates. The soil-to-diet pathway is considered complete for herbivores in the site conceptual model (Appendix B). Ideally, the pathway for carnivores will be considered potentially complete as well.	**Response 6**. The site conceptual model will be updated to reflect a potentially complete pathway for carnivores as well as herbivores.
Comment 7. If not already in the plan, please include samples in location that address questions about off-site migration of contaminants via surface run-off.	**Response 7.** The results of the SI should indicate if contaminants could be present at the site which could migrate off site. At this point, it is not determined if such contaminants are present in such quantities that could pose a risk. Investigation for off-site migration potential would be a task for future investigation if the SI reveals that such contaminants are present.

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DCN: ECSD-RACIV-07-0010

Comments by: Mr. Daniel Cordero Jr. Project Manager Department of Toxic Substances Control Office of Military Facilities Comments: December 20, 2006	Responses by: Tetra Tech EC, Inc. 1230 Columbia Street, Suite 750 San Diego, CA 92101-8536 Responses: December 22, 2006 (Updated January 31, 2007) (Modified March 8, 2007)
Comment 1. General Comment. At similar sites where Munitions and Explosives of Concern (MEC) have already been found, the determination to recommend the site for a Remedial Investigation/Feasibility Study (RI/FS) is already made. The SI is then used to generate information to support the RI/FS recommendation. Since MEC has been found at site UXO5 the site should be moved forward to the RI/FS stage.	**Response 1.** The Navy has selected to perform a Site Investigation at this time based on the minimal knowledge that exists from the site. Only a PA has been performed and no soil sampling was conducted. The Navy is not prepared to move forward with an RI/FS until more information about the site is obtained. This additional information is needed to properly develop the scope and breadth (and ultimately the budget for funding purposes) of an RI/FS (or other paths forward). Once the SI is completed, recommendations as to the next step in the process will be proposed in the SI Report which will be submitted to the agencies for review and comment.
Comment 2. Specific Comment. Section 4.4.3. Munitions Constituents Sampling and Analysis, Page 4-6, Three levels of MEC presence. An SI with surface visual inspection and limited soil sampling does not allow for a determination of "Areas Not Suspected to Contain MEC ». Only the first two determinations can be made; Known MEC areas or Suspected MEC Areas. **Section 4.4.3 Munitions Constituents Sampling and Analysis, Page 4-6, Last paragraph, fourth sentence.** "An initial estimate of the presence of MEC at MRP Site UXO5 will be established through a selective surface and near-surface soil sampling program (at 9 inches bgs), which will supplement the findings of the MPPEH visual surface survey…" This sentence implies that soil samples will be collected at two depths	**Response 2**. In response to the first part of this comment: We have revised our approach to include a full site geophysical survey, covering the entire site in 10-ft transects. This, coupled with a thorough surface sweep visual inspection (covering the entire site in 5-ft transects), should give a very high degree of confidence that some areas are "not suspected to contain MEC." Sampling will also be conducted in these areas to verify that MC constituents are not present in the shallow soils. We feel that areas that do not present an indication of subsurface anomalies (geophysical survey) and have no indication of surface MEC (visual surface sweep) can, with a high level of confidence, be considered non-suspect for MEC. The soil sampling will help raise this level of confidence even higher. Essentially we agree with your comment and accept the suggestion to use a homogenized

(surface and near-surface) for analysis. However, the soil sampling procedures (Appendix A, Sampling and Analysis Plan, Section 6.3.1, Soil Sampling Procedures, Step 4) states that the first 9 inches of soil will be removed from a sample location before a sample is collected. The collection of surface soil samples are not proposed in the Site Inspection Work Plan. Additionally, the rationale for selecting the 9-inch sampling depth is not discussed. Since the munitions constituents can exist at any depth within the landfill, it would be prudent to collect discrete samples at multiple depths or collect homogenized surface soil samples. For homogenized samples, the soil sample collected at each sample location would be the soil column from surface to 9 inches (or agreed upon depth) below ground surface, minus any layer of organic material such as vegetation or plant roots. The soil column can be placed in a zip-lock type plastic bag. The bag can then be sealed and then shaken or kneaded to homogenize the soil. The homogenized soil can be poured into the sample container and the remaining portion poured back into the sample location hole.	mixture of soil from surface to 9-inch bgs. We will revise this sampling approach accordingly in the SAP. As to the basis for 9-inches, it was selected because 9-inches is the depth that our UXO detection devices can detect subsurface anomalies that would represent the smallest MEC item (a single 20 mm round). If we were to sample deeper, a more involved clearance effort would be required which was not deemed to be necessary at this stage of investigation. We will include the homogenization procedure in Section 6.3.1 of the SAP and also include the above stated basis for utilizing 9-inches bgs.

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FALLBROOK, CALIFORNIA

DCN: ECSD-RACIV-07-0010

Comment 3. **Appendix A, section 1.2, Action Levels, page A.1-2 states that no action levels will be used and that the Navy will determine if further action is warranted.** Since MEC has already been found at this landfill, this site should be moved forward to the RI/FS stage. Action levels for explosives are available and have been used at other MEC sites during the SI stage. Metals should be compared to site specific background samples taken in undisturbed native soil.	**Response 3**. See response to DTSC Comment #1. The Navy feels it is in the best interest to move forward with the SI at this stage to collect further information to assist in overall project development. DTSC as well as other appropriate agencies will be kept involved with the overall project development, including review of the SI report, findings and recommendations. Action levels are not appropriate at this stage of the investigation. We will include EPA Region 9 PRGs for comparison as well as Ecological Soil Screening Levels. The proposed ecological soil screening values are compiled from multiple sources. The primary values used were the USEPA Eco SSLs for the metals with corresponding values. Secondary sources included sources from the Oak Ridge National Laboratories Ecological Risk Division. They are very conservative numbers and are only for screening purposes. They are based upon conservative exposure assessments that assume full time exposure and 100% bioavailability. For a few components, published ecological screening values do not exist. In these situation we will defer to the PRGs. IN some instances, our laboratories cannot report to the screening levels prescribed. In these few cases, the reporting limit will be utilized as the screening level. The proposed screening values are attached to these RTCs.

					Region 9 PRG and "CAL-Modified PRG"	
		LAB #1	LAB #2	Ecological Soil Screening	Residential	Industrial
	Units	RL	RL	Value	Soil	Soil
CAS No.		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
99-65-0	1,3-Dinitrobenzene	0.2	0.1	0.41	6.1	62
121-14-2	2,4-Dinitrotoluene	0.2	0.2	3.2	120	1200
606-20-2	2,6-Dinitrotoluene	0.2	0.2	3.2	61	620
98-95-3	Nitrobenzene	0.2	0.2	226	20	100
99-35-4	1,3,5-Trinitrobenzene	0.2	0.1	1.38	1800	18000
118-96-7	2,4,6-Trinitrotoluene	0.2	0.2	30	16	57
2691-41-0	HMX	0.2	0.2	50	3100	31000
121-82-4	RDX	0.2	0.2	15	4.4	16
479-45-8	Tetryl	0.2	0.2	25	610	6200
88-72-2	2-Nitrotoluene	0.2	0.4	NA	0.88	2.2
99-08-1	3-Nitrotoluene	0.2	0.4	NA	730	1000
99-99-0	4-Nitrotoluene	0.2	0.4	NA	12	30
19406-51-0	4-Amino-4,6-dinitrotoluene [a]	0.2	0.2	80	12	120
35572-78-2	2-Amino-4,6-dinitrotoluene	0.2	0.2	80	12	120
7601-90-3	Perchlorate	0.01	0.01	10	7.8	100
7440-36-0	Antimony	6 (0.5)	6 (1)	0.29	31	410
7440-38-2	Arsenic	2 (0.5)	30 (1)	18	**0.062**	**0.25**
7440-39-3	Barium	20	2	330	5400	67000
7440-41-7	Beryllium	0.5	0.5	36	150	1900
7440-43-9	Cadmium	1 (0.5)	0.5 (1)	0.38	37	450
7440-47-3	Chromium	1	1	26	210*	450*
7440-48-4	Cobalt	5	5	13	900	1900
7440-50-8	Copper	2.5	2	28	3100	41000
7439-92-1	Lead	1	10	16	**150**	800
7439-98-7	Molybdenum	2 (0.5)	10 (1)	2	390	5100
7440-02-0	Nickel	4	4	30	1600	20000
7782-49-2	Selenium	1 (0.5)	30 (2.5)	0.21	310	3100
7440-22-4	Silver	1	1	2	390	5100
7440-28-9	Thallium	2 (0.5)	30 (1)	1	5.2	67
7440-62-2	Vanadium	5	5	7.8	78	1000
7440-66-6	Zinc	4	2	8.5	23000	100000
7439-97-6	Mercury	0.1000	0.0200	0.00051	23	310

Comments

methods 6010B and 6020 cannot achieve 0.29 limit
methods 6010B and 6020 cannot achieve 0.062 limit

methods 6010B and 6020 cannot achieve 0.38 limit

2 limit can be achieved by method 6020

methods 6010B and 6020 cannot achieve 0.21 limit

1 limit can be achieved by method 6020

method 7471A cannot achieve limit of 0.00051

AGENCY ACCEPTANCE OF RTCs

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From: Beatrice Griffey [mailto:BGriffey@waterboards.ca.gov]
Sent: Wednesday, February 07, 2007 9:46
To: dcordero@dtsc.ca.gov; KLeibel@dtsc.ca.gov; Jill_Terp@fws.gov; katie_zeeman@fws.gov; Tamashiro, Pei-Fen CIV NWSSB, N45WCW
Cc: Le, Si T CIV NAVFAC SW
Subject: Re: FW: Fallbrook Response to Comments

Pei-Fen: All the RWQCB comments on the Draft Site Inspection Work Plan have been adequately addressed.
Thanks for your time and efforts,

Beatrice Griffey, M.Sc., PG
Engineering Geologist
San Diego Regional Water Quality Control Board Site Mitigation and Cleanup Unit
9174 Sky Park Court, Suite 100
San Diego, California 92123
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Phone: (858) 467-2728
Fax: (858) 571-6972

From: Daniel Cordero [mailto:dcordero@dtsc.ca.gov]
Sent: Friday, March 16, 2007 9:00
To: Tamashiro, Pei-Fen CIV NWSSB, N45WCW
Cc: Shelia Lowe
Subject: RE: FW: Fallbrook Response to Comments

Pei-fen, Please move forward with the Site Investigation. The responses given are adequate, but I still have reservations. I am reviewing the response to comments from home without the workplan in front of me. While a full geophysical survey will certainly help, unless the landfill and its cover are within the the equipments capabilities then a statement of area not suspected to contain MEC can be made. Please ensure that Geophysical proveout is done with the types of MEC suspected in like soils before commencing. DTSC will comment on the SI report.

From: Katie_Zeeman@fws.gov [mailto:Katie_Zeeman@fws.gov]
Sent: Friday, March 09, 2007 10:35
To: Tamashiro, Pei-Fen CIV NWSSB, N45WCW
Cc: BGriffey@waterboards.ca.gov; dcordero@dtsc.ca.gov; Jill Terp; Katherine Leibel; Le, Si T CIV NAVFAC SW
Subject: Re: FW: Fallbrook Response to Comments

Pei-Fen,

I reviewed your responses to the contaminant-related comments. The responses are satisfactory. But, I do ask that, when developed, the report will provide the specific sources of the ecological screening levels used for each of the analytes.

Thank you,

Katie

Catherine T. Zeeman, Ph.D.
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Carlsbad Fish & Wildlife Office
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Carlsbad, CA 92011