Approved Final

Removal Work Plan
HWMU, Parcel 3

Fort Wingate Depot Activity
McKinley County, New Mexico

February 19, 2013

Contract No. W912QR-04-D-0025
Delivery Order No. DM01

Prepared for:

U.S. Department of the Army
Corps of Engineers –

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14. ABSTRACT
The document presents the organization structure, personnel responsibilities, communication, technical procedures for implementing the removal action at the HWMU. Document includes quality control procedures, plan for explosives management, and environmental protection, sampling and analysis plan for environmental sampling.

15. SUBJECT TERMS

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RE: APPROVAL WITH MODIFICATIONS
FINAL REMOVAL WORKPLAN, HWMU, PARCEL 3, REVISION 1
DECEMBER 19, 2012
FORT WINGATE DEPOT ACTIVITY, NEW MEXICO
EPA ID# NM6213820974
HWB-FWDA-11-013

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) has received Fort Wingate Depot Activity's (Permittee) *Final Removal Work Plan, HWMU, Parcel 3, Revision 1, December 19, 2012,* (Work Plan) dated December 2012 and received on December 21, 2012. NMED reviewed the Work Plan and hereby issues this Approval with Modifications. The comments below reference NMED's August 16, 2012 *Disapproval* (NOD).

Comments

1. **NOD Comment 4**
The Permittee updated the Soil Screening Level values in Table 3-2, but did not change the footnote referencing NMED 2009 Soil Screening Levels to which Comment 4

referred. Correct the footnote and submit a replacement page referencing the NMED 2012 Soil Screening Levels.

2. **NOD Comment 6**
The Permittee did not spell out the abbreviations or acronyms referenced in this comment upon first use or add them to the list of abbreviations in the work plan. The Permittee must spell out the abbreviation or acronym at first use and update the list in the work plan to include missing abbreviations or acronyms. Submit replacement pages in order to correct this issue in the Work Plan.

3. **NOD Comment 32**
The Permittee must provide NMED copies of all documents detailing procedures used to accomplish work under this Work Plan, including, but not limited to, DoDI4140.62 and EM1110-1-4009, Chapter 14.

4. **NOD Comment 39**
In the revised Section 3.16.1, Confirmation Soil Sampling Method, the Permittee states, "The remainder of the site will be divided into grids approximately 150 feet by 150 feet and a composite sample will be collected from within each grid." The grid size for the remainder of the site must be no larger than 100 feet by 100 feet. This grid spacing will approximate a quarter acre and provide 4 composite samples per acre. Submit replacement pages for text and figures to correct this issue.

5. **NOD Comment 55**
In order to maintain continuity and completeness within one document, the Permittee must insert a statement in Section 6.2 detailing the inclusion of the Wetlands Delineation Report as a reference document to the Removal Report. Provide a replacement page or pages to correct this issue.

The Permittee must address all comments in this Approval with Modifications and submit the required replacement pages. The replacement pages must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. In addition, an electronic version of the entire revised Work Plan incorporating the replacement pages must be submitted. The response letter, replacement pages, and electronic version of the complete final plan must be submitted to NMED no later than **February 28, 2013**.

If you have any questions regarding this letter, please contact Ben Wear of my staff at (505) 476-6041.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
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File: FWDA 2013 and Reading
FWDA-11-13

Approved Final

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HWMU, Parcel 3

Fort Wingate Depot Activity
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Notes:
BIA = Bureau of Indian Affairs
BIA-NR = Bureau of Indian Affairs – Navajo representative
BIA-Z = Bureau of Indian Affairs – Zuni representative
BRACD = U. S. Army Base Realignment and Closure Division
DOI/BLM = Department of Interior Bureau of Land Management
EPA 6 = U. S. Environmental Protection Agency Region 6
FWDA ARM = Fort Wingate Depot Activity Administrative Records Manager
FWDA BEC = Fort Wingate Depot Activity Base Realignment and Closure Environmental Coordinator
FWDA EIMS = Fort Wingate Depot Activity Environmental Information Management System
NMED HWB = New Mexico Environment Department Hazardous Waste Bureau
NN = Navajo Nation
POZ = Pueblo of Zuni
USACE SPA = U. S. Army Corps of Engineers – Albuquerque District
USACE SPK = U. S. Army Corps of Engineers – Sacramento District
USACE SWF = U. S. Army Corps of Engineers – Fort Worth District
USAEC = U. S. Army Environmental Command

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List of Abbreviations and Acronyms

°F	Degrees Fahrenheit
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
APPL	Agricultural Priority Pollutants Laboratory, Inc.
AR	Army Regulation
ASR	Archive Search Report
ATF	Bureau of Alcohol, Tobacco, Firearms, and Explosives
BEM	Buried Explosion Module
bgs	below ground surface
BIA	Bureau of Indian Affairs
BIP	Blow-in-place
BLU-	Bomb Live Unit
BMP	Best Management Practice
BRAC	Base Realignment and Closure
BRACD	BRAC Division
BSP	Blind Seeding Program
CAMU	Corrective Action Management Unit
CBU	Cluster Bomb Unit
CDC	Current Detonation Craters
CE	Conditional Exemption
CEC	Cation Exchange Capacity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
cm	centimeter
CoC	Chain of Custody
COR	Contracting Officer's Representative
CRMP	Cultural Resources Management Plan
CRP	Current Residue Piles
CSM	CSM Environmental, Inc.
CWM	Chemical Warfare Material
DA	Department of the Army
DD	Department of Defense
DDESB	Department of Defense Explosives Safety Board
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munitions
DID	Data Item Description

List of Abbreviations and Acronyms

DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
DQCR	Daily Quality Control Report
DQO	Data Quality Objective
DRO	Diesel Range Organics
DSR	Daily Site Report
ECM	Earth Covered Magazine
EM	Engineering Manual
EMCX	Environmental and Munitions Center of Expertise
EMP	Explosives Management Plan
EOD	Explosive Ordnance Disposal
EP	Engineering Pamphlet
EPP	Environmental Protection Plan
ESS	Explosives Safety Submission
FCR	Field Change Request
FFP	Firm Fixed Price
ft	feet
FWDA	Fort Wingate Depot Activity
GIS	Geographic Information System
gpm	gallons per minute
GPO	Geophysical Prove-out
GPS	Global Positioning System
GSV	Geophysical System Verification
HMX	Cyclotetramethylene-tetranitramine
HTRW	Hazardous Toxic Radioactive Waste
HWMU	Hazardous Waste Management Unit
Hz	Hertz
ICM	Improved Conventional Munitions
ID	Identification
IDW	Investigation-derived Waste
ISO	Industry Standard Objective
ITR	Independent Technical Review
IVS	Instrument Verification Strip
MC	Munitions Constituents
MC SAP	Munitions Constituents Sampling and Analysis Plan
MD	Munitions Debris
MDAS	Material Documented as Safe

List of Abbreviations and Acronyms

MEC	Munitions and Explosives of Concern
mg/m^3	milligrams per cubic meter
mm	millimeter
MMBTU	Million British Thermal Units
MM-CX	Military Munitions Center of Expertise
MMRP	Military Munitions Response Program
mph	miles per hour
MPPEH	Material Potentially Presenting an Explosive Hazard
MPS	Man-portable System
MR	Munitions Response
MR QPM	Munitions Response Quality Program Manager
MR SPM	Munitions Response Safety Program Manager
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSD	Minimum Separation Distance
MSDS	Material Safety Data Sheet
msl	mean sea level
mV	millivolt
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NCR	Nonconformance Report
NEW	Net Explosive Weight
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OB/OD	Open Burn/Open Detonation
OBDA	Open Burning and Detonation Area
OESS	Ordinance and Explosives Safety Specialist
ORO	Oil Range Organics
PBC	Performance Based Contract
PCB	Polychlorinated Biphenyls
PDA	Personal Digital Assistant
PDT	Project Delivery Team
PM	Project Manager
PMC	Program Management Company
PMP	Project Management Plan

List of Abbreviations and Acronyms

PPE	Personal Protective Equipment
PQL	Practical Quantitation Limit
PVC	Polyvinyl Chloride
PWS	Performance Work Statement
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QASP	Quality Assurance Surveillance Plan
QC	Quality Control
QCP	Quality Control Plan
RCRA	Resource Conservation Recovery Act
RDX	Cyclotrimethylene-trinitramine
RRD	Range-related Debris
RSL	Regional Screening Level
RTK	Real Time Kinetic
SMS	Safety Management Standard
SOP	Standard Operating Procedure
SSHO	Site Safety and Health Officer
SSHP	Site-Specific Safety and Health Plan
SSL	Soil Screening Level
SUXOS	Senior Unexploded Ordinance Supervisor
SVOC	Semi-volatile Organic Compound
SWPPP	Storm Water Pollution Prevention Plan
T&E	Threatened and Endangered
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TEAD	Toole Army Depot
TM	Technical Manual
TNT	Tinitrotoluene
TOC	Total Organic Carbon
TP	Technical Paper
TPH	Total Petroleum Hydrocarbons
TPMC	TerranearPMC
U.S.	United States
UFP	Uniform Federal Policy
URS	URS Group, Inc.
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

List of Abbreviations and Acronyms

USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance
UXOQC	Unexploded Ordnance Quality Control
UXOQCS	Unexploded Ordinance Quality Control Specialist
UXOSO	Unexploded Ordinance Safety Officer
VOC	Volatile Organic Compound
WP	Work Plan
WSMR	White Sands Missile Range
ZCRE	Zuni Cultural Resource Enterprise

1.1 PROJECT AUTHORIZATION

This Work Plan (WP) has been prepared in support of the Removal Action at the Hazardous Waste Management Unit (HWMU) (Open Burning/Open Detonation [OB/OD] Unit) (FTWG-002-R-01), here after referred to as the HWMU, at Fort Wingate Depot Activity (FWDA), McKinley County, New Mexico. This WP is being performed pursuant to the FWDA Resource Conservation Recovery Act (RCRA) Permit Number NM6213820974.

URS Group, Inc. (URS) has been contracted by the United States Army Corps of Engineers (USACE) Albuquerque District under Contract No. W912QR-04-D-0025 Deliver Order DM01, to conduct a Firm Fixed Price (FFP) Performance Based Contract (PBC) task order at FWDA. This WP has been prepared in general accordance with Data Item Description (DID) Military Munitions Response Program (MMRP)-09-001, Work Plans (USACE 2009a) and the Performance Work Statement (PWS), included in Appendix A, Task Order Scope of Work.

1.2 PROJECT PURPOSE AND SCOPE

The objective of the FFP PBC is to achieve the required performance objectives by the required dates as per the performance standards in the PWS. Tasks included in this removal action include:

- Pre-Project Environmental Resources Inventory and Nationwide 38 Permitting
- Topographic Land Survey
- Mobilization and Site Setup
- Surface Clearance
- Vegetation Removal
- Debris and Incidental Soils Removal
- Debris and Soils Processing
- Stockpile Management and Characterization Sampling
- Munitions Debris (MD) Flashing
- Munitions and Explosives of Concern (MEC) Disposal
- Material Documented as Safe (MDAS) Disposal
- Post-excavation Digital Geophysical Mapping (DGM)
- Confirmation Soil Sampling
- Site Restoration

1.3 WORK PLAN ORGANIZATION

This WP is organized in accordance with the DID MMRP-09-001. (USACE 2009a) Descriptions of the document sections and appendices are provided below.

Section 1: Introduction. Describes the project authorization, project purpose and scope, site location and setting, historical background, and current and future land uses. Previous investigation results are also presented in Section 1.

Section 2: Technical Management Plan. Identifies the project objectives, organization schedule and deliverables, reporting and public relations support, and identifies key project personnel and their roles.

Section 3: HWMU Removal Work Plan. Describes the methodology and procedures to be followed for the HWMU field activities.

Section 4: Quality Control Plan (QCP). Provides the details, methods, and operational procedures to perform quality control (QC) during the removal action.

Section 5: Explosives Management Plan (EMP). Provides the details for management of explosives-related operations conducted at the HWMU.

Section 6: Environmental Protection Plan (EPP). Provides the approach, methods, and operational procedures to be employed to protect the natural environment during removal action activities.

Section 7: References. Provides a list of references used to develop this WP.

Appendix A: Task Order Scope of Work. Provides copies of the PWS issued for the removal action.

Appendix B: Site Maps.

Appendix C: Points of Contact. Identifies points of contact.

Appendix D: Accident Prevention Plan (APP). Describes the procedures that will be followed during field activities to prevent accidents and promote health and safety. Additionally, this appendix provides contractor Safety Management Standards (SMSs) applicable to the field activities, safety forms that will be used during the field activities, Material Safety Data Sheets (MSDS) for chemicals that will be brought on-site during the removal action, and Activity Hazard Analysis (AHA) for field activities. This document was submitted under separate cover.

Appendix E: Munitions Constituents Sampling and Analysis Plan (MC SAP). Describes the methodologies that will be used during the field activities for munitions constituent (MC) sampling and a MC SAP prepared in accordance with the Uniform Federal Policy (UFP) for a Quality Assurance Project Plan (QAPP).

Appendix F: Contractor Forms. Provides copies of the health and safety, QC, site visitor, inspection, daily report, and explosives accountability forms that will be used during the removal action.

Appendix G: Explosives Safety Submission (ESS). Presents the Department of Defense Explosives Safety Board (DDESB)-approved ESS developed for the WP, which provides safety criteria for planning and siting explosives operations. This document was submitted under separate cover.

Appendix H: Contractor Personnel Qualifications Certification Letter. Includes the letter certifying key contractor project personnel and personnel filling core labor categories meet the training and experience requirements and provides resumes for the key personnel.

Appendix I: Field Standard Operating Procedures (SOPs). Provides SOPs for field and analytical activities.

Appendix J: Project Schedule. Provides detailed project schedule.

Appendix K: Response to Tribal Comments. Includes the comment response table addressing all comments made by tribes.

1.4 PROJECT LOCATION

FWDA is located in northwestern New Mexico in McKinley County, approximately 8 miles east of Gallup, New Mexico. FWDA currently occupies approximately 24 square miles (15,273 acres) of land with facilities formerly used to operate a reserve storage facility providing for the care, preservation, and minor maintenance of assigned commodities–primarily conventional military munitions.

1.5 INSTALLATION DESCRIPTION AND HISTORY

FWDA is an inactive United State (U.S.) Army Depot whose active mission was to store, ship, and receive material and dispose of obsolete or deteriorated explosives and military munitions. FWDA operated from the mid 1940s to 1993, at which time the active mission ceased and the installation closed.

The installation was established as Fort Wingate in 1860. In 1941, Fort Wingate underwent major construction and expansion for the administration and igloo area. In 1971, the depot was placed in reserve status and renamed Fort Wingate Depot Activity (MKM Engineers, Inc 2008). In 1975, the installation was placed under the administrative command of Tooele Army Depot (TEAD), located near Salt Lake City, Utah. The active mission of FWDA ceased and the installation closed in January 1993, as a result of the Defense Authorization Amendments and Base Realignment and Closure (BRAC) Act of 1988. In 2002, the Army reassigned many functions at FWDA to the BRAC Division (BRACD), including property disposal, caretaker duties, management of caretaker staff, and performance of environmental restoration and compliance activities. TEAD retained command and control responsibilities, and continued to provide support services to FWDA until January 31, 2008. On January 31, 2008, command and control and support functions were transferred to White Sands Missile Range (WSMR); however, the BRAC office is conducting and administering the cleanup. (TerranearPMC [TPMC] 2008b)

FWDA is almost entirely surrounded by federally owned or administered lands, including both national forest and tribal lands. North and west of FWDA are Navajo tribal trust and allotted lands. The Bureau of Indian Affairs (BIA) administers the land east and south of Parcel 3 (Parcel 1). The land to the west is mostly undeveloped and is tribal trust and allotment land administered by the BIA, Navajo Nation, and individual Native American allottees. (MKM Engineers, Inc. 2008)

1.6 SITE DESCRIPTION AND BACKGROUND

1.6.1 Open Burning and Detonation Areas

The historic OB/OD activities at the FWDA were conducted primarily within a designated area of the installation; the Open Burning and Detonation Area (OBDA). The OBDA is located in the west-central portion of the installation and encompasses the Current and Closed OB/OD Areas. The Closed OB/OD Area was used from 1948 to 1955. Beginning in the mid-1940s, burning and detonation operations at the installation were performed within the Current OB/OD Area which includes the HWMU. In 1980, these operations were permitted and regulated under RCRA Interim Status. (ERM 1995) Operations within the HWMU were listed on the FWDA RCRA Part A Permit Application dated August 1980. In 2002, the pathway for environmental restoration of the HWMU was determined to be a RCRA Permit. The Permit was finalized in 2005. **Figure 1-2** shows the location of the OB/OD Areas relative to the HWMU.

1.6.1.1 HWMU

The HWMU, as identified in Attachment 12 of the FWDA RCRA Permit and shown in **Figure 1-2,** is the focus of this project. The HWMU is within the Current OB/OD Area which is within Parcel 3.

The HWMU consists of the burning ground, 10 areas identified as Current Residue Piles (CRP) 1 through 10, and 12 OD craters identified as Current Detonation Craters (CDC) 1 through 12. After OB/OD operations were completed within the detonation craters, residual material and wastes were placed around the HWMU, typically pushed onto or over the arroyo bank.

Demilitarization of unserviceable, obsolete, or waste explosives, propellants, munitions, and munitions components was accomplished at the HWMU. Propellants, small arms, and bulk explosives were burned as a means of disposal. Explosively filled munitions were disposed of by detonation. Disposals by detonation were conducted within detonation craters that may have been tamped with an earthen cover to minimize fragmentation dispersal.

OB/OD operations were conducted on the ground surface within the HWMU, and residual materials appear have been placed around the HWMU via a variety of mechanisms, including earthmoving (e.g., piles of residuals were pushed onto/over arroyo banks using earthmoving equipment during FWDA operations), erosion (e.g., surface runoff has transported residual materials from the piles where they were initially placed down arroyo banks and into/along the arroyo bottoms), and explosions (e.g., detonations have forced fragments and/or MEC beneath the ground surface). (TPMC 2008b)

1.7 SURFACE TOPOGRAPHY

FWDA is located in McKinley County which is bisected by the Great Continental Divide. The county encompasses the scenic Chuska and Zuni Mountains with peaks ranging up to an elevation of 8,969 feet above mean sea level (msl) at the summit of Cerros de Alejandro. FWDA is located within the Zuni Mountains.

Topographically, the FWDA may be divided into three areas: 1) the rugged north-to-south trending ridge (the Hogback) along the western and the southwestern boundaries; 2) the northern hill slopes of the Zuni Mountain Range in the southern portion of the installation; and 3) the alluvial plains marked by bedrock remnants in the northern portion of the installation. The elevation at FWDA ranges from 6,500 feet above msl to 8,250 feet above msl. Main drainages flow from south to north and discharge to the South Fork of the Rio Puerco. Because of the nature of precipitation in this arid region, the surface drainage is relatively shallow near headwaters. Downward erosion intensifies as the stream moves downstream, resulting in a system of well-developed, steep-walled arroyos. Arroyos form because of the erosion of localized areas of silt-and clay-rich bedrock. (ERM 1995)

1.8 CLIMATE

FWDA lies within the semiarid continental climatic region and has long, hot summers and mild winters. The average seasonal temperatures for the area vary with elevation and topographic features. The average annual summer temperature is 70 degrees Fahrenheit (°F) with high temperatures in the low 90s. The average annual winter temperature is 27°F with daily temperatures fluctuating 50 to 70 degrees. During the spring, the area experiences strong winds from the west and southwest, with an average wind speed of 12 miles per hour (mph). Strong winds, high temperatures, and low relative humidity in the area contribute to high evaporation rates. (ERM 1995)

Most precipitation occurs from May through October as localized and brief summer storms. Mean annual rainfall for the area ranges between 10 and 16 inches, while the recorded average annual precipitation for the FWDA is 11 inches. Most of the precipitation occurs as rain or hail in summer thunderstorms, and the remainder results from light winter snow accumulations. Spring and fall droughts are common in this area.

1.9 SOILS

The soils found on the installation are similar to those occurring in cool plateau and mountain regions of New Mexico. The thickness of these soil types varies widely over the installation, with alluvial accumulations deepest along canyon floors and in the Rio Puerco Valley. Bedrock exposures are common throughout the area. Generally, the soils are loamy or loam/clay mixtures, and contain varying amounts of silt, sand, gravel, and rock fragments. All of these soils are fragile. Wind and water cause extensive soil erosion, especially where vegetative cover is absent.

TPMC included a Natural Resources Conservation Service (NRCS) soils mapping for Parcel 3 which is included in Appendix A of the Closure Plan Phase I Work Plan (TPMC 2008a). Parcel 3 site-specific soils classification data collected during previous environmental investigations, including grain size/classification, cation exchange capacity (CEC), and total organic carbon (TOC) data, are also included.

1.10 GEOLOGY

FWDA is located in an erosional basin within the Navajo section of the Colorado Plateau Physiographic Province. In the northern part of the installation, where the Administration, Workshop, and Magazine/Igloo areas are located, the surface is covered by either remnants of the Chinle Group or alluvial deposits. The majority of the installation is underlain by the Chinle Group and dissected by arroyos. This Group consists primarily of calcareous mudstone, with minor amounts of fine-grained calcareous sandstone. The Group consists of four formations ascending in order – Shinarump, Bluewater Creek, Petrified Forest (the Blue Mesa, Sonsela, and Painted Desert Members), and Owl Rock Formations. The sandstone is relatively weather-resistant and forms the cap rock of the remnant bedrock exposures in the northern portion of FWDA. The softer mudstone is easily eroded to form badlands or arroyos on hillslopes and in eroded valleys. (TPMC 2008a)

Alluvial deposits are also present along intermittent streams draining the Hogback and Zuni Mountains which flow through the northern part of the installation. The grain size of the alluvium ranges from clay to gravel, typical of braided stream deposits. Information obtained from records of previously-installed wells indicates that the alluvial deposits are thickest near major drainages, ranging from 30 feet - thick to 150 feet thick just northwest of the installation near the South Fork of the Rio Puerco. (TPMC 2008a

The Hogback, the prominent feature along the western and southwestern edge of the installation, is thought to represent a monocline fold, where westerly dipping Mesozoic bedrock is exposed to form a long, sharp-crested ridge trending north to south. (TPMC 2008a)

1.11 HYDROGEOLOGY

1.11.1 Installation Hydrogeology

Groundwater is present in several of the rock units underlying FWDA. The only formations at FWDA capable of yielding more than a few gallons per minute (gpm) are the Quatowam Alluvium (Quaternary) and the San Andres Limestone and Glorieta Sandstone (Permian). However, minor amounts of groundwater are present within the Chinle Formation (Triassic) and underlying rock units. Water-bearing formations of Jurassic and Cretaceous ages, capable of yielding 100 gpm or more, are present 4 to 6 miles to the west of FWDA, but not within installation boundaries. (TPMC 2008a)

The alluvial aquifer, deposits made up of gravel, sand, silt, and clay, are primarily recharged from surface runoff, although some deposits in the southern part of the installation are recharged by springs from underlying bedrock aquifers. Recharge of groundwater within the alluvium occurs mainly during the wet seasons of the year, specifically with the snowmelt in the spring. At FWDA, the general flow direction is from the Zuni Mountain Range, at the southern boundary of FWDA, to areas of lower elevation such as the Rio Puerco Valley, north of FWDA. The saturated thickness of the alluvium varies greatly and tends to increase as it nears drainage channels. The direction of groundwater flow in the alluvium is generally toward the north and northwest. (TPMC 2008a)

Several older bedrock units are associated with the Hogback. These units are recharged partially within the installation boundaries by precipitation. These rocks dip steeply to the west and yield very little water within installation boundaries; however, they do serve as water sources for much of the area west of the boundary. (TPMC 2008a)

The San Andres-Glorieta aquifer, which constitutes the primary groundwater source for FWDA, outcrops south of the installation and dips to the north. The recharge zone is located southeast of FWDA. Snowmelt and precipitation furnish much of the recharge water to the aquifer, approximately 1 inch per year. Groundwater flow in the San Andres-Glorieta aquifer is in a northwesterly direction. The top of the San Andres-Glorieta aquifer lies about 1,100 feet (ft) below land surface, near the Administration Area. At this location, the aquifer is about 200 ft thick and under artesian pressure. Local variations in aquifer permeability are reportedly large and unpredictable. (TPMC 2008a)

The region around Gallup, including FWDA, was declared an underground water basin in 1980 by the State of New Mexico. This action prohibits any major new groundwater withdrawals without the approval of the State Engineer. The basin covers 1,439 square miles and includes the communities of Gallup, FWDA, Camerco, Mariano Lake, Navajo Wingate Village, and Rehoboth. (TPMC 2008a)

1.11.2 Parcel 3 Hydrogeology

The Parcel 3 groundwater system has been separated into three distinct subsystems below for discussion purposes only. These subsystems include: (1) the saturated Quaternary Alluvium in the Current OB/OD Area which includes the HWMU, (2) the shallow north-northwest dipping water-bearing formation east of the fault zone, and (3) the steep, westerly dipping water-bearing formations west of the fault zone. It should be noted that all three of these groundwater systems may be interconnected in the region of the fault zone. The intense structural deformation associated with formation of the Hogback makes correlation of water-bearing intervals in the Painted Desert Member across the fault zone difficult and arguably infeasible. This lack of correlation precludes identification of the groundwater flow paths within the fault zone at the present time. (TPMC 2008a)

1.12 HYDROLOGY

The FWDA lies between the South Fork of the Rio Puerco to the north and the northern foothills of the Zuni Mountain Range to the south. All drainages in this area are intermittent with flow occurring only during, and after, heavy rainfall events or during snowmelt. Drainages are fed by washes in the Zuni Mountain Range and the Hogback. The drainages generally flow toward the north until the South Fork of the Rio Puerco is encountered. Major drainage systems are divided by either bedrock ridges or bedrock remnants.

An arroyo bisects each of the OB/OD areas including the HWMU. These drainages flow generally northward and surface water flow is intermittent. (ERM 1995)

1.13 HABITAT

An ecological habitat survey was completed for the Current OB/OD Area including the HWMU in 1999 (Program Management Company [PMC] 1999). Although the area has been widely disturbed until late 1992, a substantial amount of revegetation has occurred. Vegetation includes plants that are indicative of a grassland and sagebrush community, surrounded by Pinion Pine/Juniper woodland communities. A deep arroyo bisects the Current OB/OD Area and HWMU and creates a variety of favorable wildlife habitats, as well as providing an “edge” effect (i.e., where two habitat types come into contact), which is preferred by many species. Wet periods of the year may result in stream-like conditions in the arroyo; however, these periods appear to be temporary. During dry weather, the bottom of the arroyo, although appearing dry, contains water close to the surface throughout most of its length within the HWMU. Periodically, areas containing small water holes were heavily visited by wildlife, as evidenced by the presence of many tracks. However, during geologic investigations spanning 1996 through 1999, water was not observed in these two water holes during dry weather. (TPMC 2008b)

The water present close to the ground surface also supports wetland vegetation in the majority of the arroyo (only the northern-most portion of the arroyo does not support these wetland plants). The wetland vegetation form two communities; a sedge meadow community and a coyote willow community. Both wetland communities are important to wildlife. The sedge meadows provide a food source for herbivores, and the willows, which form dense stands of low trees, provide shade and refuge areas as well as ambush sites for predators. In several areas the deer bone remains of mountain lion kills were observed as well as recent mountain lion tracks and coyote tracks. (TPMC 2008b)

Based on the preliminary site reconnaissance, the existence of an aquatic community is unlikely or limited to highly seasonal species. The Current OB/OD Area which includes the HWMU, was identified as having plant species that are dependent on wet soils growing in the bottom of the arroyo as well as several small water holes. These water holes have been seen on several site visits but only at wet times of the year (during snowmelt and during the rainy season). Based upon their small size and the large evaporation rate, the observed water holes are believed to be completely dry during the arid portions of the year. Based on these observations, it has been assumed that there are no perennial aquatic ecosystems in the OB/OD Areas, and the existence of even a seasonal aquatic ecosystem is highly unlikely due to the extremely intermittent presence of water and water holes. (TPMC 2008b)

A wetlands survey identified wetland habitat within the arroyo that bisects the HWMU. Both scrub shrub (coyote willows) and emergent (sedge meadows) wetlands were observed within this arroyo. Both the coyote willow thicket and the sedge meadows in the Current OB/OD and HWMU are unique for the entire length of the arroyo. The remainder of the arroyo in the upland area is shallow; the channel is not well defined and has a sparsely vegetated bottom.

1.14 PREVIOUS INVESTIGATIONS

Several munitions response actions have been completed within the HWMU and adjacent kick out area. Since the mid 1990s, both surface clearance and subsurface clearances have been completed, primarily to support investigations and security fence construction. Resulting from these response actions, over 600 MEC items have been recovered and destroyed and over 45,000 pounds of munitions related material have been collected.

Currently the site, which has been declared an improved conventional munitions (ICM) area, is unused, secured with fencing, with access highly restricted.

1.14.1 1992-1993 UXO Survey

Munitions response activities were initiated at FWDA in 1992 (ERM 1994). These activities consisted of surveys conducted by UXB International to support the planned environmental investigation activities at areas that had been identified as potentially impacted by MEC, including in and around the HWMU. The survey activities were limited in natured and did not constitute comprehensive and fully documented clearance and removal efforts. Within the defined OB/OD Area, approximately 10,223 ordnance items were identified and recovered (live and non-live) and approximately 874 blow-in-place (BIP) items were marked for destruction in-place. In addition, the ground coverage resulting from the visual unexploded ordnance (UXO) survey identified residue/refuse areas along the length of the arroyo. These areas were marked on figures of the OB/OD Area and incorporated into the field screening program implemented as part of the RCRA Interim Status Closure of the OB/OD Areas. A visual - surface/subsurface - 0 to six inches survey was performed radially out to a distance of the furthest extent of observed UXO from the OB/OD facilities. The consolidated UXO items were treated using three existing detonation craters within the Current OB/OD Area. (ERM 1994)

1.14.2 1995 Archive Search Report

Under the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for Army remediation of munitions response sites, and Archive Search Report (ASR) was prepared for FWDA (USACE 1995a The investigation centered on identifying the exact location of potential environmental contamination from the past demilitarization activities occurring on FWDA. The HWMU was identified to include approximately 1,200 acres surrounding the OD/OB grounds called the “UXO kickout area.”

Previous investigations before 1992 are included in the ASR, concerning installation operations and decisions leading to closure.

1.14.3 1996-1998 Facility-Wide Removal Activities

Removal actions at various sites facility-wide were completed by CSM Environmental, Inc. (CSM) from 1996 through 1998 (CSM 1998). MEC activities conducted in and around the HWMU during this time period included clearance along five seismic survey lines, clearance along a survey line for a proposed southern fence line, and clearance of a suspected kick-out area outside the eastern fence line designated the OB/OD Area Buffer Zone. Approximately 262 MEC items were removed from the areas, including 20 millimeter (mm), 37 mm, and 40 mm projectiles; M20 boosters; Bomb Live Unit (BLU)-2, BLU-3, and BLU-4 bomblets; and various fuzes.

1.14.4 1996 Phase IA – Characterization and Assessment of Site Conditions for the Soils/Solid Matrix

The implementation of the RCRA Closure Field Program work plans in 1996 included excavation of investigation trenches through previously identified geophysical anomalies, MEC-related debris/residue areas, and detonation craters to characterize the environmental impacts of historic disposal activities.

In 1996, Project Management Company (PMC) completed investigation activities to characterize conditions in the 10 CRPs and in 5 of the 12 CDCs (PMC 1999). The objective of the investigation was to characterize the types of waste present and confirm the lateral and vertical extent of waste. Seventy trenches (4,567 linear feet) were excavated through the CRPs and

CDCs and 44,740 cubic yards of waste removed. Soil samples were collected within the wastes and analyzed for metals and explosives. Soil samples were also collected from the bottom and sides of trenches to determine the impacts the wastes had on underlying and adjacent soils.

CRP1 through CRP3 were small isolated areas at the southern end of the HWMU created by disposal of demilitarization waste generated elsewhere. The waste included fuze cans, fuze pieces, slag, metal, banding, and ash. CRP4 through CRP9 represent essentially one continuous area of debris/residue disposal that appear to have been pushed off the flat working area onto the eastern bank of the main arroyo. Waste included detonator assemblies, 20 mm, 37 mm, 40 mm, 57 mm, and 75 mm projectiles, fragmentation bomb windings, M83 butterfly bomblets, and wood debris. CRP10 is a single isolated debris/residue pile situated in the main arroyo channel at the northern limit of the formerly active HWMU.

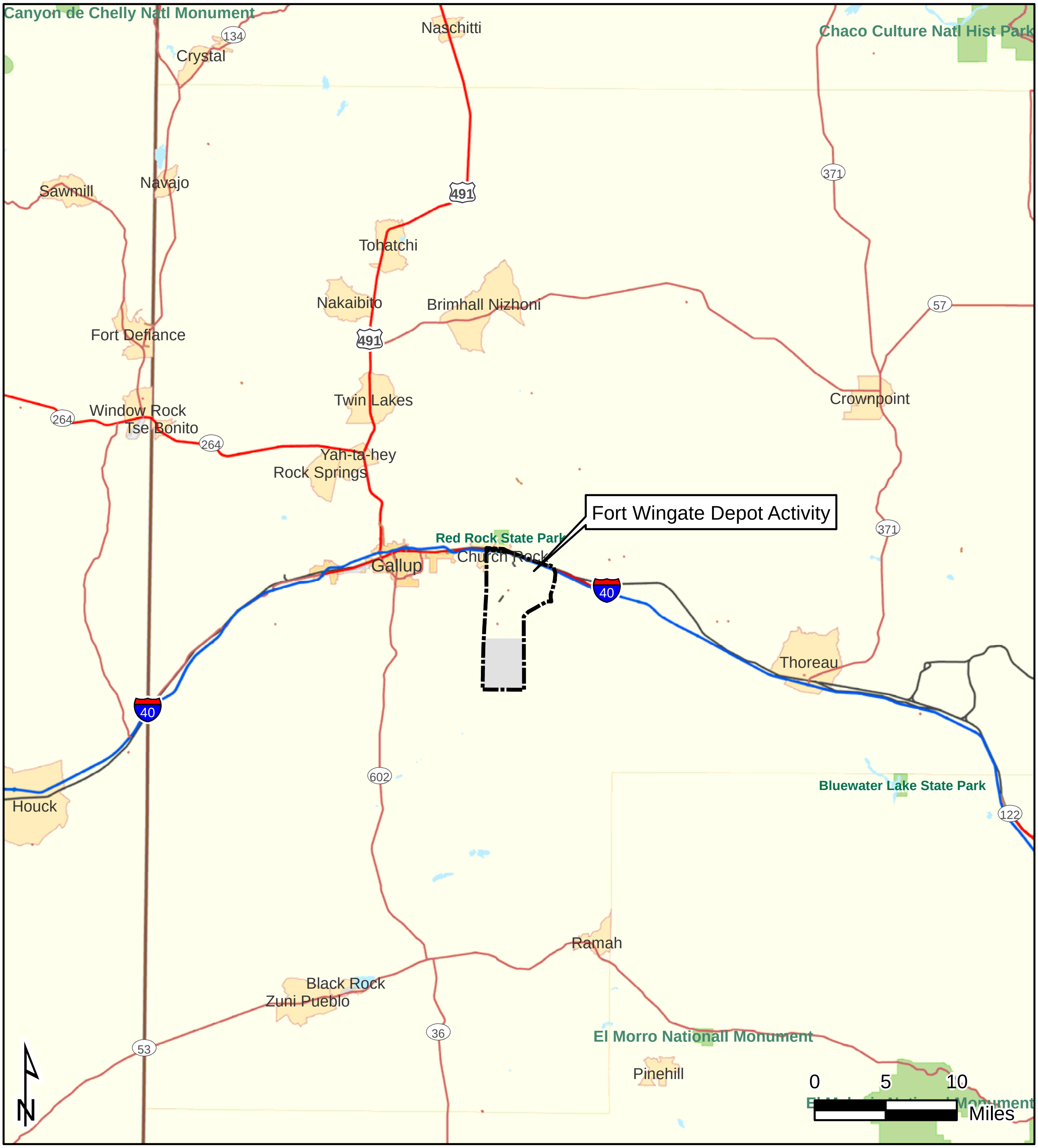
The trenching operations at the five detonation craters (CDC02, CDC04, CDC06, CDC-8, and CDC10) identified scattered ordnance fragments, projectiles, ash, dark stained soil, rock fragments, metal banding, and packaging materials.

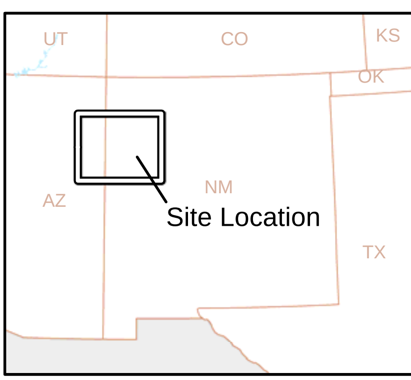
An ecological habitat survey/wetland evaluation was also completed. Further data was included above in Section 1.13.

1.15 MEC ENCOUNTERED AT PARCEL 3 AND THE HWMU

The MEC database identifies those MEC items that have been discovered throughout FWDA. Types of MEC that have been discovered in Parcel 3, including the HWMU included: 20mm, 37mm, 40mm, 57mm, 75mm, 90mm, 105mm, and 155mm projectiles, fragmentation bombs, boosters, fuzes, mortars, rocket motors, detonators, propellant, and chunk high explosives.

In addition, cluster bomb units (CBUs) containing BLU-3 and BLU-4 submunitions were treated in the HWMU (TPMC 2008b, App C). More than 100 BLU-3 and more than 250 BLU-4 submunitions have been encountered and BIP in and around the HWMU to date (TPMC 2008b, App. G). In addition, more than 500 M83 “butterfly” bomblets have been encountered and BIP in and around the HWMU. (TPMC 2008b)



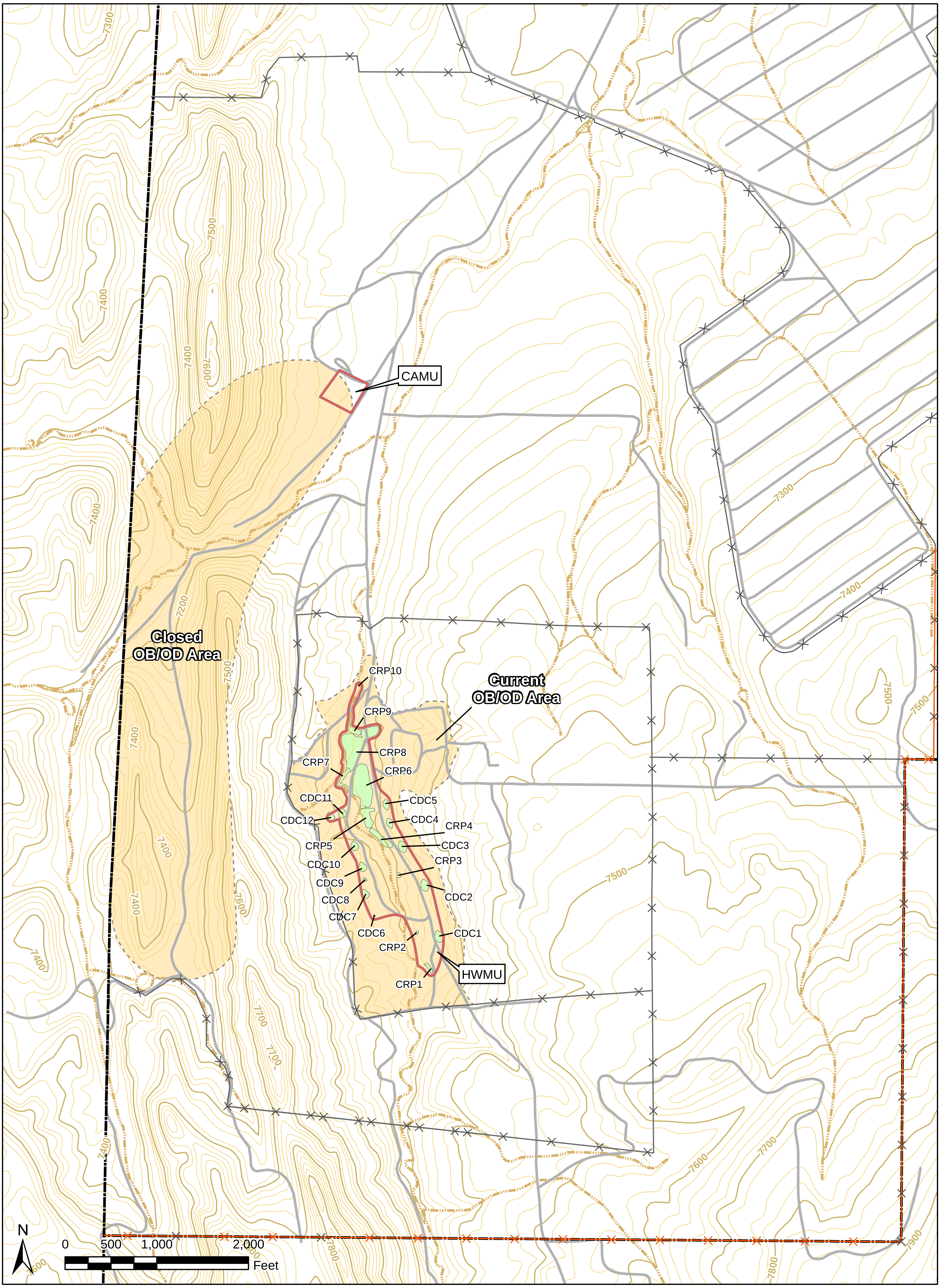


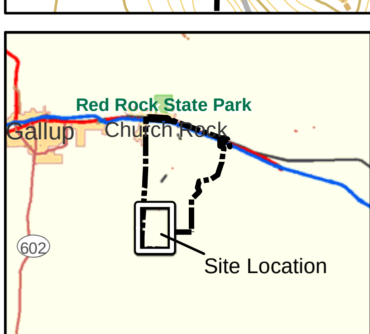
Legend

Installation Boundary

Regional Map
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 1-1**
Checked By: SM	Project No: 16170613	





Legend

Installation Boundary	Fence	Road
Site Boundary	Replacement Fence	Arroyo
Extent of Subsurface Waste	20' Topographic Contour	
OB/OD Area	100' Topographic Contour	

HWMU and CAMU Location
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 1-2**
Checked By: BP	Project No: 16170613	

2.1 PROJECT OBJECTIVES

The objective of the project is to remove hazardous wastes and hazardous waste residues from the HWMU. The specific objectives of this project are to:

- Remove debris, MEC, and incidental soils from the HWMU
- Characterize incidental soils removed from the HWMU for future reuse or disposal
- Characterize soils remaining in excavations for potential future action
- Dispose of removed MEC, MDAS, and hazardous wastes

2.2 PROJECT ORGANIZATION

This removal action will be completed by URS using subcontractors, as needed, with overall project oversight provided by the USACE. Project team organization charts, illustrating the relationships of key project personnel for the project, are shown on **Figure 2-1**. This Technical Management Plan presents the coordination between the USACE and its contractor.

2.3 CONTRACTOR PERSONNEL

The contractor project team will consist of personnel experienced in MEC and MC removal actions. Key contractor program management personnel include the Project Manager (PM), the Munitions Response Safety Program Manager (MR SPM), the Munitions Response Quality Program Manager (MR QPM), Program Safety and Health Manager, and the Debris Processing Manager. Key field management personnel include the Debris Removal Site Manager, Senior UXO Supervisor (SUXOS), UXO Safety Officer (UXOSO), UXO QC Specialist (UXOQCS), and Field Manager. Key project team members also include the UXO Team Leaders, UXO technicians, the Project Geophysicist, geophysics data processors, geophysics QC lead, MC sampling personnel, chemists, and risk assessors. Authorization documentation for UXO personnel will be available at the site for inspection or verification, as required.

2.3.1 Program Manager

The contractor Program Manager will be responsible for monitoring the overall progress of the project, reviewing monthly progress reports, and verifying that necessary resources are available to the PM. The Program Manager will also maintain close communication with the USACE to assess their satisfaction during performance on this task order.

2.3.2 Project Manager

The contractor PM is the primary point-of-contact with the USACE, and is responsible for implementing the project such that technical, financial, and scheduling objectives are successfully completed. The PM has the authority to commit the resources necessary to meet project objectives and requirements. The PM will be responsible for the following:

- Serving as the single point-of-contact for management and technical direction of task order execution
- Reviewing and approving major project deliverables
- Competitively selecting, supervising, and overseeing task order subcontractors
- Coordinating between the Certified Industrial Hygienist (CIH) and Site Safety and Health Officer (SSHO) to ensure that site activities are performed in a safe manner
- Coordinating daily work and verifying technical quality of activities
- Maintaining consistency in technical approach and deliverables
- Preparing and submitting weekly and/or monthly progress and detail cost reports and other project deliverables including variance notifications

The PM will have authority to do the following:

- Assign key personnel and take corrective action for unacceptable performance
- Stop, amend, or curtail work for quality, health and safety, regulatory, or operational deficiencies

2.3.3 Munitions Response Safety Program Manager

The munitions response (MR) SPM does not report directly to the PM, but rather provides an independent assessment of safety procedures employed during the MEC removal. The MR SPM will be responsible for the following:

- Overseeing MR health and safety program and personnel, establishing policies and standards, and providing guidance
- Developing and approving the APP and the Site-Specific Safety and Health Plan (SSHP) in conjunction with the Program Safety and Health Manager
- Reviewing MEC-related work plans and deliverables
- Overseeing APP and SSHP implementation and compliance
- Approving selection of the project UXOSO
- Verifying that the APP, SSHP, and other health and safety plans are followed by site personnel, to include subcontractors
- Implementing health and safety training
- Issuing a stop work order for unsafe conditions

2.3.4 Munitions Response Quality Program Manager

The MR QPM does not report directly to the PM, but rather provides an independent assessment of QC procedures employed during the MEC removal. The MR QPM will be responsible for the following:

- Overseeing MR quality program and personnel, establishing policies and standards, and providing guidance
- Developing and approving the QCP
- Reviewing MEC-related work plans and deliverables
- Overseeing QCP and work plan implementation and compliance
- Approving selection of project unexploded ordnance quality control (UXOQC) personnel
- Verifying the QCP and other quality plans and associated standards are followed by site personnel, to include subcontractors
- Issuing a stop work order for major quality nonconforming conditions
- Verifying compliance with MMRP-related Department of Defense (DoD) publications, USACE documents, as well as local, state, and federal statutes and codes

2.3.5 Program Safety and Health Manager

The Program Safety and Health Manager does not report directly to the PM, but rather provides an independent assessment of safety procedures employed during the MEC removal. The Program Safety and Health Manager will be responsible for the following:

- Overseeing health and safety program and personnel, establishing policies and standards, and providing guidance
- Developing and approving the APP and the SSHP in conjunction with the MR SPM
- Overseeing APP and SSHP implementation and compliance
- Verifying that the APP, SSHP, and other health and safety plans are followed by site personnel, to include subcontractors
- Implementing health and safety training and medical surveillance monitoring
- Issuing a stop work order for unsafe conditions

2.3.6 Debris Processing Manager

The Debris Processing Manager works with the PM to oversee the setup and operation of the sifting plant and removal operations. The Debris Processing Manager will be responsible for the following:

- Procuring all necessary equipment to complete the removal action

- Overseeing setup of the sifting plant
- Ensuring appropriate armoring has been installed on construction equipment

2.3.7 Senior Unexploded Ordnance Supervisor

The SUXOS will meet applicable requirements of DDESB Technical Paper (TP), Minimum Qualifications for UXO Technicians and Personnel 18 (DDESB 2004). The SUXOS reports directly to the PM and will confirm that field personnel conduct MEC operations at the site in accordance with the HWMU WP and in a systematic manner using proven operating methods and techniques. Typical responsibilities include:

- Planning, coordinating, and supervising explosives operations
- Certifying munitions/range debris as ready for turn-in or disposal
- Coordinating on-site field activities to minimize impacts to productivity and to confirm compliance with the APP
- Directly interfacing with and relaying safety and health concerns to the PM
- Managing on-site manpower and equipment necessary to safely conduct the tasks associated with the removal action
- Preparing and submitting a detailed daily accounting of activities performed each workday
- Performing a final inspection of material potentially presenting an explosive hazard (MPPEH) and certifying it to be free of any explosive hazard

2.3.8 Debris Removal Site Manager

The Debris Removal Site Manager will report directly to the Debris Processing Manager and will be responsible for daily operations at the processing plant. The Debris Removal Site Manager will also oversee excavation and transport of material from the HWMU to the processing plant. Typical responsibilities include:

- Planning, coordinating, and supervising debris removal and processing
- Coordinating on-site field activities to minimize impacts to productivity and to confirm compliance with the APP
- Directly interfacing with and relaying safety and health concerns to the SUXOS, PM, and Debris Processing Manager
- Managing on-site manpower and equipment necessary to safely conduct the tasks associated with the removal action
- Preparing and submitting a detailed daily accounting of activities performed each workday

2.3.9 Field Manager

The Field Manager will report to the PM and provide oversight and direction of field activities in conjunction with the SUXOS and Debris Removal Site Manager. Typical responsibilities include:

- Planning, coordinating, and supervising removal action operations in conjunction with the SUXOS and Debris Removal Site Manager
- Coordinating on-site field activities to minimize impacts to productivity and to confirm compliance with the WP
- Directly interfacing with and relaying safety and health concerns to the PM
- Overseeing soil characterization and MC sampling
- Preparing and submitting a detailed daily accounting of activities performed each workday

2.3.10 Unexploded Ordnance Safety Officer

The UXOSO will meet applicable requirements of DDESB TP18 (DDESB 2004) and will be approved for the project by the USACE. The UXOSO is responsible for implementing and enforcing the safety and health requirements listed in the APP (Appendix D). The UXOSO reports to the MR SPM and responsibilities include, but are not limited to:

- Evaluating MEC and explosives operational risks, hazards, and safety requirements
- Conducting the UXO safety briefings for project and visiting personnel
- Conducting and documenting daily safety inspections and weekly safety audits
- Developing and implementing corrective action plans to eliminate or mitigate hazards
- Monitoring compliance with the safety measures contained in the APP and associated documents during field activities
- Confirming the proper use of personal protective equipment (PPE) in accordance with the requirements of the APP
- Establishing and verifying compliance with site-specific safety requirements
- Investigating and documenting injuries, illnesses, accidents, incidents, and near-misses
- Establishing and maintaining minimum separation distances (MSDs) during field operations in accordance with the DDESB-approved ESS
- Stopping work if health and/or safety are jeopardized or compromised

2.3.11 Unexploded Ordnance Quality Control Specialist

The UXOQCS will meet applicable requirements of DDESB TP18 (DDESB 2004). The UXOQCS is responsible for implementing and enforcing the QCP and verifying elements of this WP. The UXOQCS reports to the MR QPM and responsibilities include, but are not limited to:

- Implementing a three-phase control process for each definable feature of work to include preparatory, initial, and follow-up inspections
- Conducting QC final acceptance sampling inspections
- Checking for defective or damaged equipment
- Verifying appropriate personnel are being utilized during field investigation activities
- Maintaining inspection and surveillance documentation (e.g., QC reports, equipment standardization results and equipment maintenance results, and nonconformance and corrective action documents)
- Performing and documenting daily inspections/surveillances of job site activities on a Daily Quality Control Report (DQCR) form
- Verifying that required equipment tests and checks have been performed and that inspection and standardization results comply with specifications
- Issuing a stop work order for unsafe or for any major quality nonconforming conditions

2.3.12 Project Geophysicist

The Project Geophysicist has overall responsibility for design, implementation, and management of geophysical investigations required for the work effort, but may not be on-site full time. The Project Geophysicist will report directly to the PM. The Project Geophysicist will assist in providing solutions to geophysical problems encountered in the field in order to meet the required geophysical objectives of the project.

The specific responsibilities of the Project Geophysicist include:

- Coordinating field teams and support personnel to verify consistency of performance and meet established schedules.
- Providing technical leadership in the disciplines of geophysics, statistics, and quality of the geophysical data. Using experienced personnel to process and assess the quality of the global positioning system (GPS) data.
- Coordinating delivery of quality geophysical data for QC and Government inspections.
- Establishing a list of equipment, computers, materials, and supplies necessary to perform the tasks.
- Monitoring technical performance of team members.

- Performing technical reviews of deliverables.
- Approving contributions to technical deliverables for work elements.

2.3.13 QC Geophysicist

Specific responsibilities of the QC Geophysicist include:

- Verify the validity of measurement methods, data consistency, and reproducibility.
- Check raw and processed data for quality issues.

2.3.14 Natural Resources Manager

Specific responsibilities of the Natural Resource Manager include:

- Manage wetland and threatened and endangered (T&E) species surveys.
- Manage compliance with Environmental Protection Plan.

2.3.15 Other Agencies

Other agencies that will be providing technical or regulatory oversight of wetland and T&E species surveys and site restoration include:

- United States Fish and Wildlife Service
- NMED Water Quality Bureau
- USACE Albuquerque District
- McKinley County Extension Office

2.4 PROJECT COMMUNICATION AND REPORTING

The operational and administrative lines of communication for the HWMU WP are identified in **Figure 3-1** of the Project Management Plan (PMP) (URS 2010). To confirm consistency throughout the project, the contractor PM will be the primary point-of-contact between the stakeholders and project personnel. The PM will provide the USACE with monthly project status reports to communicate activities completed during the month, difficulties encountered, corrective actions taken, activities planned for the next month, and updates to the project schedule. Point of contact information for the WP is included in Appendix C.

2.5 PROJECT DELIVERABLES

Army Draft versions of all documents will be submitted for Army review. Tribal Draft versions will be submitted to the Pueblo of Zuni, Navajo Nation, Bureau of Indian Affairs, and Army for review and comment. Final versions will be submitted to the New Mexico Environment Department (NMED) for review and approval.

2.6 PROJECT SCHEDULE

The project schedule is presented in Appendix J. The project schedule will be updated each month and will reflect schedule changes in monthly progress reports submitted to the USACE PM throughout the project duration.

2.7 PERIODIC REPORTING

2.7.1 Progress Reports

Monthly progress reports will be submitted to the Army.

2.7.2 Daily Site Reports

For each day of field work, the contractor will complete Daily Site Reports (DSRs) that will present contract information (i.e., Agency, Project Manager, Contract Number, Delivery Order Number, etc.), site weather conditions, duration on-site, list of contractor personnel, list of subcontractor personnel, a log of visitors to the site, a description of work completed, materials received, job safety, and quality assurance/quality control (QA/QC) information pertaining to field activities. DSRs will be maintained, signed, and dated by the SUXOS. DSRs will be submitted with the HWMU Project Report. A copy of the DSR form can be found in Appendix F of this document.

DSRs will be submitted weekly, via email, to the USACE PM and USACE Ordnance and Explosives Safety Specialist (OESS). DSRs will be included in the HWMU Report. A DSR form is included in Appendix F.

2.8 DAILY QUALITY CONTROL REPORTS

A QCP has been developed for this project and is included as Section 4 of this WP. During each day of field work, a DQCR will be completed that includes the following information:

- Contract information (e.g., Agency, PM, Contract Number, Task Order Number, etc.)
- A description of the definable feature work completed
- What phase of control that definable feature of work is in
- UXOQCS inspections conducted (if applicable)
- Site weather conditions
- List of subcontractor work performed (if applicable)

- A description of any visitors to the site
- Materials received
- Quality management information pertaining to field activities
- DQCRs will be submitted weekly, via email, to the USACE PM and USACE OESS. DQCRs will be included in the HWMU Report. A DQCR form is included in Appendix F.

2.9 SUBCONTRACTOR MANAGEMENT

It is anticipated that subcontractors and vendors will be enlisted for the following services:

- Analytical laboratory
- Providing donor explosives for MEC demolition
- Thermal Treatment for MD
- Digital Geophysical Mapping
- Cultural Oversight and Support
- Transport and disposal of hazardous waste
- Landfill services
- Surveyor

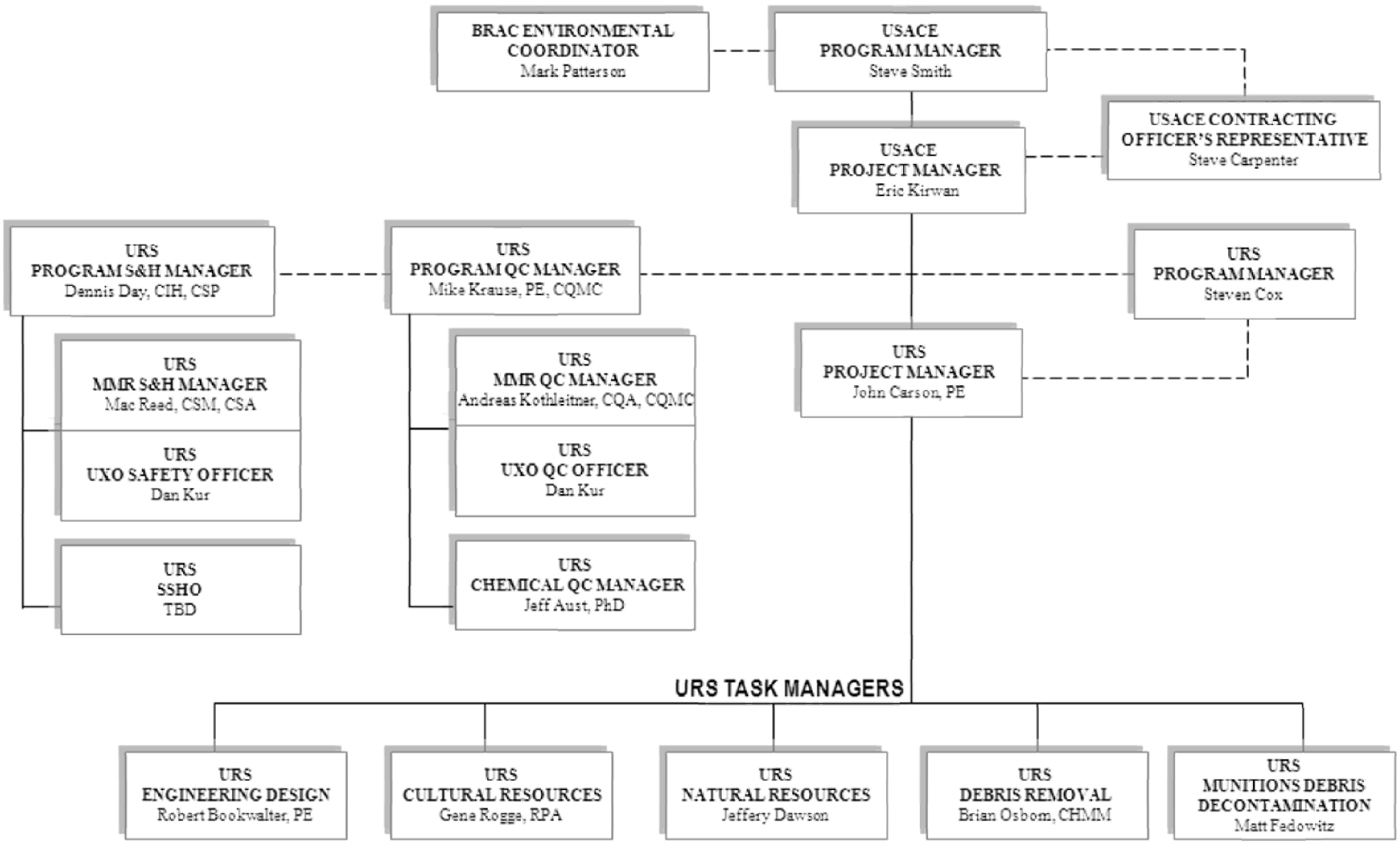
Prior to subcontract work being performed, subcontracts will be prepared that will identify the scope of services and details necessary and appropriate terms and conditions. Subcontractor procurement will follow Federal Acquisition Regulation requirements. Once the subcontract is executed, URS will perform periodic reviews to verify that contractual requirements and milestones are being met. The URS PM will manage unresolved issues or conflicts that may impact the schedule or budget.

The Contracts/Procurement Manager will report problems, conflicts, or any other issues to the URS PM. Unresolved issues or conflicts that will impact the schedule or budget will be managed by the URS PM.

2.10 MANAGEMENT OF FIELD OPERATIONS

Prior to beginning field activities, the contractor PM will coordinate with the FWDA caretaker installation support with the FWDA. This will include providing access to the HWMU, identifying haul routes and evacuation routes, identifying a field office and equipment staging area, and providing utility locates.

Section 3 of this WP describes the field activities that will be completed as part of this project. All field activities will be completed under the direct oversight of URS personnel.



Project Orginizational Chart
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 2-1**
Checked By: JC	Project No: 16170613	

3.1 OVERALL APPROACH TO REMOVAL ACTIVITIES

This section includes a description of the overall WP approach for the removal activities and establishes removal objectives and cleanup standards.

3.1.1 Removal Objectives

The overall goal for closure of the HWMU is to, in accordance with the Section III of the RCRA Permit, remove hazardous wastes, hazardous waste residues, and remove or decontaminate soils contaminated above cleanup levels (NMED 2005). The objective of this project is to remove debris, MEC and incidental buried metal from within the HWMU down to a size of 5/8 inch, and defines the level of remaining soils contamination so that additional remedies can be selected and implemented, if necessary. Under this project, soils remaining in the HWMU, after removal activities are complete will be sampled and analyzed for the constituents identified in Section III of the FWDA RCRA Permit (NMED 2005). Soil remaining in the bottom of the excavation after debris, MEC, and metal are removed may have contaminant concentrations higher than the cleanup levels. These areas will be surveyed and identified for future action which will be performed on a future project.

3.1.2 Technical Scope

The HWMU Removal will be completed with the procedures outlined in the DDESB-approved ESS. The general overview of the work is:

- Complete an environmental resources inventory of the HWMU
- Complete a boundary and topographic survey of the HWMU
- Prepare access, haul, and evacuation routes
- Setup the processing plant, including vegetation removal, environmental protection measures, and storm water protection controls
- Complete a MEC surface and subsurface removal within the footprint of the processing plant
- Perform excavation of debris and incidental soil from within HWMU, including vegetation removal
- Process excavated soils to remove metallic debris
- Stockpile processed material for characterization sampling
- Characterize stockpiles and site soils
- Complete MPPEH inspection and MD certification and verification
- Dispose of MEC
- Operate CAMU
- Complete post-excavation DGM

- Restore site
- Manage wastes generated during the removal

3.1.3 Data Quality Objectives

The following paragraphs contain the statements used in the Data Quality Objectives (DQO) Process for the HWMU Removal.

3.1.3.1 Problem Statement

Historical site activities at FWDA have resulted in the presence of MEC and associated MC contamination of soil at the current OB/OD unit. Demilitarization of unserviceable, obsolete, or waste explosives, propellants, munitions, and munitions components was completed at the OB/OD unit. Propellants, small arms and bulk explosives were burned as a means of disposal. Explosives filled munitions were disposed of by detonation. Disposals by detonation were conducted within detonation craters that may have been tamped with an earthen cover to minimize fragmentation dispersal. Characterization soil samples will be collected during removal activities to determine if soil processed through the debris removal system can be returned to the excavation as fill. Confirmation soil samples will be collected from surface soils and the walls and the floors of the excavations to assess remaining DoD-related contamination levels after excavation.

3.1.3.2 Decision Statement

For this project, information inputs to the decision-making process will include the collection and chemical analysis of soil and the collection of geophysical data. Detected analytes in soil will be compared to NMED soil screening levels or United States Environmental Protection Agency (USEPA) Region Screening Levels (RSLs) when NMED screening levels are not available to document those on site soils that are contaminated above screening levels to be addressed under another project. Geophysical data will be processed and interpreted to demonstrate that debris, including MEC has been removed from the HWMU.

3.1.3.3 Required Inputs

The following actions will be taken at the HWMU:

- Collect soil data from the excavations that meet the practical quantitation limit (PQL) requirements required to compare the screening criteria listed in Worksheet # 15 of the QAPP
- Collect soil data from the stockpiles that meet the PQL requirements required to compare the screening criteria listed in Worksheet # 15 of the QAPP
- Collect geophysical data the meets the requirements to demonstrate that debris, including MEC has been removed

3.1.3.4 Study Boundaries

The location of the HWMU is shown on **Figure 3-1**.

3.2 ENVIRONMENTAL RESOURCES INVENTORY

Prior to starting field activities, an environmental resources inventory of the HWMU will be completed. The inventory will be completed by a qualified biologist to identify and locate environmental resources, including threatened and endangered species and sensitive habitats. The inventory will also verify the presence of jurisdictional wetlands. Wetland delineation will be completed in accordance with the 1987 USACE Wetlands Delineation Manual (USACE 1987). The results of the inventory will be used to revise the EPP.

3.3 HWMU BOUNDARY AND TOPOGRAPHIC LAND SURVEY

The boundaries of the 32-acre parcel will be clearly demarcated by survey. The HWMU boundary as shown on Attachment 12 of the RCRA Permit will be surveyed to establish the limits of the work. In addition to surveying the boundary, two benchmarks will be established at the north and south ends of the HWMU to improve positional accuracy during geophysical mapping of the area. Surveyors will also establish a grid system to assist with MEC accountability and soils sampling and will complete flyover stereo photography and generate a topographic survey of the HWMU before fieldwork begins and after the removal has been completed.

The civil surveying required for this effort will be performed by a New Mexico-licensed professional land surveyor. While on-site, each person on the surveying team will be escorted by a UXO technician implementing MEC and anomaly avoidance in accordance with USACE Engineer Pamphlet (EP) 75-1-2 (USACE 2004). All targets will be reported in North American Datum of 1983 (NAD83), State Plane, New Mexico West, U.S. Survey feet.

New vertical stereo aerial photography will be collected from the HWMU to establish a topographic contour map. Up to eight ground control points (aerial targets) will be placed around the HWMU. Aerial flyover will be completed when weather, sun angle, and ground conditions are optimal. Data will be presented in one-foot contours in North American Vertical Datum of 1988 (NAVD 88). The flyover stereo photography and topographic surveys will be included in an appendix in the Removal Report.

3.4 MOBILIZATION AND SITE SETUP

As part of the mobilization for this project, the following activities will be completed:

- Pre-Mobilization Activities
- Establish Roads/Haul Routes

- Processing Plan Setup
- Construct Storm Water Pollution and Environmental Protection Controls

Qualified UXO personnel will be present during all site preparation tasks.

3.4.1 Pre-mobilization Activities

During initial mobilization the following activities will be completed.

- Identify and establish office space and communications requirements
- Contact local fire, police, and other emergency services
- Contact local vendors and suppliers
- Site-specific training including equipment operation, review of the APP, ESS and this WP
- Identify and obtain the required permits/notifications to complete the work (National Pollutant Discharge Elimination System [NPDES], Air Notice of Intent [NOI], etc.)

3.4.2 Establish Roads/Haul Routes

Initial haul routes will be established into the HWMU. The access route will be located such that only roads and bridges capable of supporting heavy equipment will be used. The haul and evacuation routes will be clearly marked with signage at a frequency that ensures a consistent route is used. Road repairs and maintenance will include the following:

- Asphalt cold patch for potholes in paved surfaces
- Additional road base/gravel for low spots in unimproved surfaces
- Grading to remove wash boarding
- Tree or brush removal where necessary
- Establish site access and evacuation route signage

The location of the anticipated access and evacuation routes are shown on **Figure 3-1**.

3.4.3 Construct Storm Water Pollution and Environmental Protection Controls

Storm water pollution prevention controls will be implemented prior to starting ground disturbing activities. The controls will be in accordance with the Storm Water Pollution Prevention Plan (SWPPP) for construction sites prepared for the project (URS 2011a).

Environmental protection controls will be implemented as described in the EPP (Section 6).

3.4.4 Processing Plant Setup

The processing plant will be constructed in an area located at the south end of the HWMU, between CDC 1 and CDC 2 (**Figure 3-2 and 3-3**). The final location of the plant will be coordinated and based on-site specific features such as topography, available space, location of haul routes etc.

A surface and subsurface removal action of the screening plant and stockpile footprint will be completed prior to excavation or earthwork activities. The removal actions will be completed with UXO personnel qualified in accordance with DDESB TP-18 (20 Dec 2004). The footprint of the screening plant and stockpile will be divided into grids. UXO teams will walk line abreast within each grid and remove surface material potentially presenting and explosive hazard (MPPEH). Once the surface removal action is complete, vegetation removal will be conducted in support of collecting quality DGM data. DGM data will be collected over the footprint area, as described in Section 3.14, to identify subsurface target anomalies potentially representing MEC. Either UXO technicians will excavate and resolve selected target anomalies or up to 1.5 feet of soil will be excavated and stockpiled as described in Section 3.7. Once the surface removal is complete, DGM will be collected over the excavated areas, as described in Section 3.15, to identify single point anomalies, the limits of the CRPs and CDCs, and other areas of deeper debris. Deeper excavations will be completed to remove subsurface metal debris, as described in Section 3.7. MEC findings data will be collected and be entered into a project database.

CDC 1 and CDC 2 will be excavated as described in Section 3.7. The debris and incidental soil excavated will be stockpiled in the proposed raw feed stockpile area for processing once plant setup is complete. The open excavations will be digitally geophysically mapped as described in Section 3.15 to document that the debris has been removed. Soil samples will be collected as described in Section 3.16 from the bottom and sidewalls of CDC1 and CDC 2.

The plant and stockpile footprint will be balance graded as necessary to provide a level area. CDC 1 and CDC 2 and other deeper excavations will be filled with cut bank material from within the cleared area to provide a level surface for plant construction. If additional fill is required, it will be obtained from an Army-approved source on FWDA. Four to six inches of dense grade aggregate, or other appropriate base material, will be placed over the plant footprint and leveled to delineate the working area and prevent any cross contamination of the area beneath the plant where the debris removal has been completed.

Once the footprint pad has been cleared of debris, graded, and base material placed, the processing plant will be constructed.

3.5 SURFACE CLEARANCE

A detector-aided surface clearance of the HWMU will be completed prior to excavation or earthwork activities. Surface clearance activities will be conducted as prescribed in the approved APP and SSHP (Appendix D).

Handheld Schonstedt magnetometers and/or White's metal detectors, or equivalent, will be used to assist in detecting metallic items in areas where the ground surface is not in plain view. The HWMU will be divided into 100-foot-by-100-foot grids. Each grid will be divided into 20 five-foot wide search lanes to ensure complete coverage of each grid. During clearance activities, a SUXOS, UXOSO, and UXOQCS will be on-site. UXO technicians will walk line-abreast clearing the search lane of MPPEH. MEC encountered will be flagged and its GPS coordinates recorded. Discovered MEC will be disposed of as described in Section 3.12.

3.6 VEGETATION REMOVAL

Prior to commencement of excavation activities, vegetation removal may be conducted to reduce the potential of clogging screening plant components. Vegetation removal will be non-intrusive and will be conducted by raking with a track loader equipped with a four-in-one bucket. UXO technicians will oversee the vegetation removal operation.

As the vegetation is removed, UXO technicians will observe and inspect the vegetation for MEC and MD. If MEC or MD is identified in the vegetation or root mass, the vegetation will be segregated and further inspected as described in Section 3.11. The vegetation will be stockpiled within the HWMU footprint and allowed to decompose. Any future disposal of the vegetation will be completed under additional corrective action.

3.7 DEBRIS AND INCIDENTAL SOILS EXCAVATION

A three-dimensional model of the anticipated excavation depths was developed based on the available trench logs and historical information. The model was used in conjunction with the available geophysical data and soil borings to develop the anticipated excavation areas shown in **Figure 3-4**.

3.7.1 Excavation Sequence

Soils and debris will be excavated from the areas shown on **Figure 3-4**. The excavation depths (bottom of the debris) and the total in-place quantity of debris and soils excavated is provided in **Table 3-1**.

The shallow surface of the entire HWMU is saturated with debris resulting from past OB/OD operations; therefore, shallow soils will be excavated to remove the majority of the shallow debris. The objective of this process is to remove MPPEH that would interfere with attaining high-quality geophysical data. The areas will be excavated to a depth of up to 1.5 feet below ground surface. Once the surface removal is complete, DGM will be collected over the excavated areas, as described in Section 3.15, to identify single point target anomalies, the limits of the CRPs and CDCs, and areas other of deeper debris.

Deeper excavations will focus on the CRPs and CDCs as well other areas of subsurface debris identified during DGM. Excavations will be completed to the bottom of the visible waste as determined from the three-dimensional model and/or visual inspections. The sides of each excavation will be sloped or benched, as appropriate for the soil type, to facilitate DGM and confirmation soil sampling.

Materials with high clay content and moisture can interfere with processing; therefore, soil with high clay and moisture content will be excavated and spread on the surface at a uniform depth and allowed to air dry.

3.7.2 Excavation Method

Debris and incidental soils will be excavated using a large remote controlled excavator. The excavator provides a reach that will allow access to the full area of the side slopes of the arroyo. A GPS indicator device will be installed on the excavator that will allow the operator to determine the depth of the bucket relative to the designed bottom of the excavation areas determined from the three-dimensional model. Materials will be removed to the anticipated depths, loaded directly into armored 40-ton rock trucks and transported and stockpiled adjacent to the processing plant feeder.

Removal of debris and incidental soils from CRPs and CDCs will progress in lifts. A remote controlled excavator with a six cubic yard bucket (66 inches wide) will be utilized. The remote excavator operator will be located inside an armored operating station, positioned beyond the K18 distance in accordance with the DDESB-approved ESS. Additionally, the operator will don the PPE required in accordance with the ESS. The armored operator station will be constructed in the bed of a heavy duty pick-up truck to allow the clearest line of sight and visibility to the excavator and the excavation face, as well as providing greater mobility during the course of the excavation activities.

The excavator will start at the edge of an excavation area and excavate lifts of soil from an area approximately 15 feet to 20 feet wide and extending 10 feet to 15 feet out from the front of the excavator. Once a single lift has been completed, the excavator will remove the next lift. This will progress until the modeled excavation depth for the CRP or CDC has been reached. As the soils and debris are removed, the excavator will place the soils and debris into an armored truck for transport.

Excavation operations will generally be completed working from upstream to downstream (south to north) of the arroyo to prevent re-contamination of the areas where excavation work has been performed. Transport trucks will utilize common haul roads to and from the processing plant. By using common haul roads, the area for potential recontamination will be limited to these common roads. Upon completion of the excavation and hauling activities, UXO technicians will complete a "mag and dig" operation of the common road areas. A DGM survey of the haul roads will be completed to document that target anomalies have been resolved.

When the limits of the HWMU (as established in Section 3.3) have been reached, the sides of excavations will be visually surveyed for debris. These sections of the edge of the HWMU that have visual debris remaining will be captured with a GPS for future work. Steep excavation side slopes will be sloped to minimize slope instability.

When the modeled limits of an excavation have been reached, UXO technicians will complete an instrument aided visual inspection of each excavation to verify that debris has been removed prior to collecting DGM on the excavation. The visual inspection will be completed by a UXO technician equipped with handheld detectors such as a Schonstedt GA-52CX magnetic locator or a White's or Minelab's all metal detector. The UXO technician will visually inspect the surface and use the detector to identify any area that may have a high density of subsurface anomalies and require additional removal. If visual or detector evidence of debris is not identified, the area will be considered ready for DGM collection. Completed excavations will be mapped with DGM equipment to verify and document that the debris has been removed (Section 3.15). If the DGM results indicate that additional target anomalies remain in the excavation, the target anomalies will be removed and additional DGM will be collected. If it appears that the debris has been removed before reaching the modeled limits of excavation, the area will be visually inspected by UXO technicians and mapped with DGM as described above. Excavation safety measures will be followed as described in the APP and SSHP.

3.7.3 Transportation

Transporting the debris and soils to the screening plant for processing will be completed using armored rock trucks. Initially, two empty rock trucks will be staged near the excavator. Soils from the excavation will be loaded directly into one of the trucks by the excavator while the driver is staged in the armored excavator operating station. Once the loading is complete, the operation will stop and the driver will board the loaded truck and transport the load to the processing plant. The excavator will load the second truck while the driver is completing the hauling circuit and is beyond the required MSD in accordance with the ESS.

The excavation operation will stop while the driver stages and exits the empty truck and enters the loaded rock truck for transport. Once the loaded truck is outside of the required MSD from the excavator, the excavation and loading process will commence. The transport circuit will continue during excavation activities.

3.7.4 Discovery of MEC during Excavation

MEC items discovered during the removal activities will be documented. Item attributes recorded will include standard nomenclature, general location (e.g., southwest quadrant of grid xyz), and condition. A digital photograph of identifiable MEC will be taken.

The final explosive safety status determination for each MEC item discovered will be made by the SUXOS and UXOSO. MEC determined to be acceptable to move will be transported to either the Corrective Action Management Unit (CAMU) for disposal, or one of the earth covered magazines (ECMs) in Explosive Storage Block B for storage until destruction at a later scheduled time.

MEC determined unacceptable to move will be BIP as described in Section 3.12.

3.8 DEBRIS AND SOILS PROCESSING

The debris and soil processing will be completed using a closed-loop screening and separation plant. The process will separate material 5/8-inch or larger from soils. The process consists of multiple magnets and screens coupled with an eddy current non-ferrous metal separator.

The multi-stage materials screening plant will be erected to receive and process materials. Armoring for the protection of personnel will be in accordance with the DDESB-approved ESS. The plant will be operated from a remote control tower, armored in accordance with the DDESB-approved ESS. The screen plant operator will be able to observe and control the conveyors, screens, hammer mill, and electromagnets. The screen plant operator will remain in constant contact with the loader operator, UXO technicians, and site supervision. In addition, all manned inspection locations and the remote control tower will be equipped with an emergency kill switch.

Figure 3-5 presents a schematic of the screening plant process. The successive processes in the screening sequence include;

- Grizzly Feeder and Screen
- Initial Overhead Magnet and Inspection Line
- Triple Deck Screen
- Second Overhead Magnet and Inspection Line
- Final Overhead Magnet
- Size Reduction
- Eddy-Current Non-Ferrous Metal Removal
- Radial Stacker

3.8.1 Grizzly Feeder and Screen

Excavated soils and debris will be stockpiled at the grizzly feeder. For this “low input” operation, a remote operated front-end loader will be used to feed materials into the grizzly feeder. The grizzly will have spacing bars with an opening at least 6 inches. The resulting oversize material that does not fall between the grizzly bars will transition across the grizzly to an "oversize" pile. The material that falls between the grizzly bars will feed onto a conveyor to the initial overhead magnet.

During scheduled periods of each day, the oversize materials will be visually inspected by UXO technicians. This material may be re-fed into the grizzly if it is discovered that "blanketing" of material over the grizzly occurred, thus not allowing smaller material to fall through. "Blanketing" occurs when larger rocks or debris become lodged in the grizzly bars or cover the grizzly bars to the point that it creates a blanket over an area of the bars and does not allow smaller (less than 6-inch) material to pass through. If this occurs and less than 6-inch material is found in the "oversize" pile, UXO technicians will clear the grizzly of lodged materials when the plant is shut down. The smaller material located in the "oversize" pile will be picked up by a remote front-end loader and re-run over the grizzly. MPPEH will be inspected in accordance with Section 3.11. The oversize native material, such as rock, will be staged separately for potential use as backfill.

3.8.2 Initial Overhead Magnet and Inspection-Line

Materials will be conveyed on a 36-inch wide conveyor beneath a 4-foot wide overhead electromagnet that will remove ferrous material. The electromagnet will deposit the ferrous items to an inspection-line conveyor. The majority of the larger sized metallic material will be removed at this station. The inspection-line is manned by UXO Technicians II and above, an inspection-line UXOSO, and an inspection-line Supervisor who meets SUXOS qualifications in accordance with DDESB TP18 (DDESB 2004). The inspection-line conveyor will be approximately 100 feet in length and equipped with a kill switch, and will move at a slow, adjustable speed to provide a sufficient amount of time for the inspection-line UXO technicians to conduct a thorough inspection as described in Section 3.11. The inspection-line will have radio contact with the plant operator and the loader operator at all times.

Inspection of all material on the conveyor will be completed as describe in MPPEH Section 3.11. Material that has been subjected to the MPPEH inspection process and classified as other debris will be removed from the conveyor by the UXO technicians at the inspection line locations. Material that has been subjected to the MPPEH inspection process at the inspection lines and classified as MD will remain on the conveyor to be deposited into a roll-off or similar container.

MEC items determined to be acceptable to move by the inspection-line UXOSO and Supervisor will be removed from the conveyor and transported to either the CAMU for disposal or one of the ECMs in Explosive Storage Block B for storage.

MEC items determined unacceptable to move by the inspection-line UXOSO and Supervisor will be diverted to the MEC detention area and fed onto a bed of sand by a separate transfer chute. This area is an ECO block structure configured to conduct BIP operations as described in Section 3.13.

The conveyor will be protected with screens to prevent injury from moving parts and the inspection-line will have armored shielding to provide frontal, side, and overhead protection in accordance with the DDESB-approved ESS. QC inspections will be conducted on a daily basis of the other debris removed and MD in the containers at the inspection lines to verify that the material was properly classified and the effectiveness of the process. The MD will be flashed as described in Section 3.10.

3.8.3 Triple Deck Screen

Material not re-directed by the initial overhead magnet will pass over a triple deck screen. The triple deck screen is comprised of a series of vibrating screens with varied sized openings to restrict the large deposits and allow soils to pass through, free of most other materials. The top "reliever" screen will be a 3-inch square metal mesh designed to trap large material and protect the bottom screen. The middle screen will be a 1 1/2-inch square mesh screen that will provide additional relief to the bottom deck screen. The bottom deck screen will be either a Trellez Sta-Clean L Series with a 5/8-inch opening, or a square mesh screen with 5/8-inch openings. The bottom screen design will be dependent upon the field conditions and geology encountered. Materials larger than the bottom screen size opening will be conveyed to a second overhead electromagnet.

The screens will be visually inspected at least daily to verify no adverse wear or damage has occurred that would compromise the integrity of the output. The UXOQCS will also conduct, at a minimum, a daily inspection of all screens.

3.8.4 Second Overhead Magnet and Inspection Line

Material collected on the triple deck screen will be deposited onto a 48-inch wide conveyor that permits the material greater than 5/8 inch to be spread out in a thinner layer. The material will pass beneath an electromagnet identical in construction and operation to the initial magnet. The ferrous material will be diverted onto another inspection-line, which will be constructed, shielded, manned, and operated in the same manner as described in Section 3.8.2.

Material that passes through the 5/8-inch bottom screen of the Triple Deck Screen will be deposited onto a flat 20-foot long, 6-foot wide conveyor. The screened material will be spread into a thin layer on this conveyor and subjected to a "polishing" exposure of a post-screen overhead electromagnet. Ferrous material that is picked-up by the overhead magnet will be deposited into a metallic debris collection bin staged adjacent to the conveyor and magnet. This "polishing" exposure is a final quality step prior to being deposited onto the radial stacker for stockpiling.

3.8.5 Final Overhead Magnet

As an additional control, material passing through the second overhead magnet will be subjected to one additional exposure to an overhead electromagnet. The electromagnet will be positioned directly over the material as it cascades onto a conveyor and will be constructed and operated the same as the magnet described in Section 3.8.2. Any ferrous material removed by this final magnet will be deposited onto a conveyor and returned to the inspection-line described in

Section 3.8.4. It is anticipated that the amount of ferrous debris removed from this magnet will be very small compared to the initial and second electromagnets. The remaining material will be conveyed to the hammer mill for size reduction

3.8.6 Size Reduction

The final step in the processing plant is to reduce oversize material. Oversize material primarily consisting of sandstone, small rocks, soil, or other debris will be passed through the hammer mill. The purpose of the mill is to downsize all rocks and oversized debris to allow passage through the screens.

Material will be fed into the top of the hammer mill chamber and reduced in size. Reduced material exiting the hammer mill will be deposited onto a conveyor and returned to the triple deck screen. Materials that have been reduced to less than 5/8 inch in the smallest dimension will now pass the bottom screen. Materials still greater than 5/8 inch will remain in the closed loop circuit and be subjected to processing until reduced in size or collected off the conveyors during periodic shut down times. The potential for a high order detonation within the 2-inch thick hardened steel hammer mill is unlikely. Prior to entering the hammer mill, ferrous materials will have been removed by one of the three overhead electromagnets. Essential personnel will be protected by the requisite shielding and distance in accordance with the DDESB-approved ESS if an unanticipated detonation should occur.

Non-ferrous materials that accumulate on the plant conveyors during operation will be inspected by UXO technicians, removed, and appropriately stockpiled.

3.8.7 Eddy Current Non-Ferrous Metal Removal

The processed stockpile will be subjected to an eddy current non-ferrous metal separator. The individual stockpiles from the radial stacker will be loaded into feeder hoppers that will transport the material to the eddy current non-ferrous metal separator.

The separator will induce an eddy current field to the material. As the material passes the conductor, non-ferrous metal will be separated from the remaining material. The non-ferrous metal will be conveyed to a collection container. The remaining material will be conveyed to a radial stacker and stockpiled as described Section 3.8.8.

The entire contents of the non-ferrous waste collected from the eddy-current process will be transported to the CAMU and burned in accordance with the SOP No. 14 (Appendix I) and NMED Air Quality Bureau requirements. The material will undergo a post-burn inspection to verify the completeness of the disposal process. An MPPEH inspection will be completed on the post-burn residues as described in Section 3.11. Ash generated from the burn will be containerized for disposal in accordance with its waste profile.

3.8.8 Radial Stacker

The processed material will be conveyed to a radial stacker where the material will be segregated into 250 cubic yard (approximately 375 ton) piles for characterization sampling.

3.9 STOCKPILE MANAGEMENT AND CHARACTERIZATION SAMPLING

The processed soils will be separated into 250 cubic yard stockpiles for characterization sampling. The processed soils will be placed on a minimum 6-mil poly liner. Each stockpile will be given a unique numeric identifier so that when analytical results are received and validated, the results can be correlated with a specific stockpile to ensure proper management. Each stockpile identifier will be a four digit number, ascending sequentially, for example, SKPL-0001, SKPL-0002, and SKPL-0003.

A sign will be placed at the base of each pile with the pile identification number. GPS coordinates of each pile location will be collected. The analytical sample number will incorporate the stockpile identifier. A database will be maintained that will include the following information; stockpile number, date started, date sampled, date sample was received, and final disposition of pile.

Each processed stockpile will be sampled for the constituents listed in Section III.A.4 of the FWDA RCRA Permit (NMED 2005). The purpose of the stockpile sampling is to identify and segregate those processed stockpiles that have constituents that meet the cleanup criteria stipulated in Attachment 7 the RCRA Permit from those that do not. Those soils meeting cleanup criteria will be retained on-site for future use as backfill in the HWMU. Screening values will include values from the NMED-approved Soil Background Study and Data Evaluation Report (Shaw 2010) and NMED soil screening levels (SSLs) for a residential land use scenario. If an NMED residential SSL is not available for an analyte, the USEPA residential screening level (RSL) will be used. When background concentrations of a constituent exceed the NMED residential screening value, then the background concentration for that constituent will be used as the screening value. A written background determination will be obtained from NMED to use background values as cleanup levels.

The analytical results will be compared to the proposed screening criteria listed and respective screening values presented in **Table 3-2**. Based upon the analytical results of each stockpile, three soil management areas will be established to manage the processed soils.

If the analytical results indicate that the material meets the cleanup levels in **Table 3-2**, the material will be consolidated into a clean stockpile and retained on-site for use a backfill in the HWMU, if approved by NMED. If the analytical results indicate that the materials are contaminated above the NMED residential SSLs, further evaluation will be completed. Results will be compared to the contaminants listed in 40 Code of Federal Regulations (CFR) 261.20-24 as being characteristically toxic to determine if the potential exists for the soil to be considered hazardous. Contaminants that exceed the NMED residential SSLs will be compared to 20 times the toxicity characteristic leaching procedure (TCLP) concentration (20X rule) and if the results do not exceed this value, they will be considered non-hazardous and be consolidated into a contaminated soils stockpile and retained on-site for future treatment or disposal under another project.

Processed soils that have contaminants above the 20X rule will be further sampled before determining final disposition. A TCLP sample will be collected for those contaminants that exceed the 20X rule. The results of the samples will be compared to concentrations listed in 40 CFR 261.31-33 to determine if the waste is hazardous. Material that does not exhibit a hazardous characteristic will be consolidated into the contaminated soils stockpile and retained on-site for future treatment or disposal. Waste characterized as hazardous will be stockpiled separately from other materials, placed on a minimum 6-mil liner and covered. Hazardous waste will transported for disposal within 90 days of identification. Hazardous waste management is further described in Section 3.19.

3.9.1 Stockpile Sampling Method

One sample will be collected from each 250 cubic yard stockpile and submitted to Agricultural Priority Pollutants Laboratory (APPL) for chemical analysis of volatile organic compounds (VOCs), metals, semi-volatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCB) aroclors, nitrate, cyanide, dioxins, furans, and perchlorate as stipulated in Section III of the FWDA RCRA Permit. One discrete soil sample for VOCs will be collected using Terra Core® sampler as detailed in SOP No. 5 (Appendix I). One composite sample will be collected from 10 subsample locations within each 250-cubic yard stockpile. Five subsample locations will be collected from the first 125 cubic yards of material deposited from the conveyor and five subsamples will be collected from the second 125 cubic yards deposited from the conveyor. The subsamples will be collected one to two feet below the surface of the stockpile. The sample will be analyzed for metals, SVOCs, explosives, PCBs aroclors, nitrate, cyanide, dioxins, furans, and perchlorate. QC samples will be collected at a frequency of 10 percent. Samples will be collected and handled in accordance with SOP Nos. 2 and 4 (Appendix I).

3.10 MD FLASHING

All MD that is generated during the separation process will be flashed. The flashing will utilize a convective heating process to decontaminate the debris of potential explosives residues.

3.10.1 Flashing Unit

The flashing unit is a propane fueled, trailer-mounted carbottom furnace with a 6 million british thermal units (MMBTU) dual burner. The unit has a minimum capacity of 2,000 pounds per cycle. The unit has a maximum operating temperature of approximately 1,000°F and is controlled with automated thermostatic modulation for achieving target temperature range. The unit is controlled remotely and utilizes a logger to record operating parameters.

The unit will be staged at a location outside the HWMU. If necessary, the area will be graded and a pad of crushed rock will be placed to level the unit and stage the MD.

3.10.2 Staging and Segregation of MD

MD generated from the screening process, that has been certified MDAS as described in Section 3.11, will be flashed. MD awaiting flashing will be kept secure in lockable containers (e.g. conex or roll off) staged near the flashing unit. MD that has been flashed will be stored in designated lockable containers staged near the flashing unit. To ensure that the MD that is awaiting flashing does not become intermingled with MD that has been flashed, the storage containers will be staged in separate locations and the areas will be clearly marked as to their contents.

3.10.3 Flashing Process

Flashing will be performed in a sealed, propane fueled unit. The convective heat produced by a propane burner unit will be used to develop temperatures required for thermal decomposition of explosives.

Unflashed MD will be removed from secure storage placed in a “basket”. The basket will be placed onto the unit’s carbottom tray with a forklift and the unit is closed. The flashing cycle is started remotely. The remote control capabilities include:

- Display/Record cycle Start and Stop Time
- Display cycle time indicator
- Display Flash Unit box temperature
- Display Cycle completion notification (visual indicator with audible alarm)
- Ability to open Flash Unit door
- Ability to Emergency Stop the Flash Unit treatment cycle

The furnace will be controlled with automated thermostatic modulation for achieving the target load temperature. The cycle time will be approximately 1 hour, which provides time for achieving the target temperature, a soak time of 10 minutes at 650° F, and cool down period. A logger will record time of operation and operating temperature.

Once the cycle is complete, the unit is opened, the” basket” is removed with a forklift and staged near the near the secured storage container for flashed MD. Once completely cool, the flashed MD will be placed in secure storage to await shipment to a scrap recycler.

Test coupons will be placed in the initial loads to verify that the target load temperature is reached. Once it has been demonstrated that the target temperature is being reached, monthly performance verifications will be completed, using test coupons.

3.10.4 Wastes and Emissions

MD that will be flashed will have been certified MDAS, meaning that there are no energetics present. The flashing process is not a burn, and therefore residual wastes are expected to be minimal. However, if any wastes are generated, they will be containerized in 55-gallon drums. A characterization sample will be collected from the waste to establish a profile for the waste stream. Chemical analysis will include TCLP and totals analysis for barium, cadmium, chromium, lead, mercury, 2,4-dinitrotoluene, TCLP SVOCs, dioxins, furans, and target analyte list (TAL) metals.

The remediation activities will address three high explosive materials, including trinitrotoluene (TNT), cyclotrimethylene-trinitramine (RDX), and cyclotetramethylene-tetranitramine (HMX). All three of these materials consist of the following four elements: carbon, nitrogen, hydrogen, and oxygen. No halogens (such as chlorine, fluorine or bromine) or metals (such as sodium or phosphorous) are used in the manufacture of these explosives. Consequently, the only products of combustion would be carbon monoxide/dioxide, nitrogen oxides, or water. The NMED Air Quality Bureau concurs that the operation of the flashing unit qualifies for an exemption under 20 New Mexico Administrative Code (NMAC), Chapter 2, Part 72, Section 72.202.A(5).

3.11 MPPEH INSPECTION PROCESS

MPPEH procedures will be in accordance with Department of Defense Instruction (DoDI) 4140.62 and EM1110-1-4009. MPPEH will be assessed and its explosives safety status determined and documented prior to transfer within the DoD or release from DoD control. Prior to release to the public, the SUXOS will ensure that MPPEH has been documented by authorized and technically qualified personnel as MDAS after a 100 percent inspection and an independent 100 percent re-inspection to determine that it is safe from an explosives safety perspective. Details of the MPPEH inspection process, including individual responsibilities are included below.

MPPEH located during field activities will be initially 100 percent inspected by a UXO Technician II qualified in accordance with DDESB TP 18.

The UXO Technician II will:

- Make an initial assessment on the explosive safety status of located MPPEH.
- Determine whether the item is UXO, discarded military munitions (DMM), MD, or range-related debris (RRD).

The UXO Technician III will:

- Perform a 100 percent re-inspection of all recovered items to determine if free of explosives hazards or other dangerous fillers
- Supervises MEC disposal operations

- Supervise the consolidation of MPPEH for containerization and sealing. MD and RRD will be segregated.

The UXOQCS will conduct daily audits of the procedure used by the UXO teams and individuals for processing MPPEH. The UXOQCS will also conduct and document random sampling inspections of all MPPEH collected from the various teams to verify the explosive safety status determination. The UXOSO will ensure the specific procedures and responsibilities for processing MPPEH for certification as MDAS are being followed.

The SUXOS will:

- Ensuring work and QC plans specify the procedures and responsibilities for processing MPPEH for final disposition as munitions debris or range-related debris.
- Ensure a requisition and turn-in document, Department of Defense (DD) Form 1348-1A is completed for all MD and RRD to be transferred for final disposition.
- Perform random checks to satisfy that the MD and RRD is free from explosive hazards necessary to complete the Form, DD 1348-1A.
- Certify all MD and RRD as free of explosive hazards, engine fluids, illuminating dials, and other visible liquid hazardous toxic radioactive waste (HTRW) materials.
- Be responsible for ensuring that inspected debris is secured in a closed, labeled and sealed container and documented as follows:
  1. The container will be closed and clearly labeled on the outside with the following information: The first container will be labeled with a unique identification that will start with USACE/Installation Name/Contractor's Name/0001/Seal's unique identification and continue sequentially.

  2. The container will be closed in such a manner that a seal must be broken in order to open the container. A seal will bear the same unique identification number as the container or the container will be clearly marked with the seal's identification if different from the container.

  3. A documented description of the container will be provided by the contractor with the following information for each container; contents, weight of container; location where munitions or range related debris was obtained; name of contractor, names of certifying and verifying individuals; unique container identification; and seal identification, if required. The contractor in a separate section of the final report will also provide these documents.

Munitions that are encountered that have been determined to be unacceptable to move by the SUXOS and UXOSO will be detonated in place. Munitions that have been determined acceptable to move by the SUXOS and UXOSO may be relocated to one of the ECMs in Explosive Storage Block B for later disposal.

MD will be flashed. MD will be transported to a secure ECM in the Block B awaiting flashing. Prior to public release, the SUXOS will certify and the USACE OESS will verify that the debris is free of explosive hazards. This process will be documented on DD Form 1348-1 as follows: “This certifies and verifies that the material documented as safe (MDAS) listed has been 100-percent properly inspected and, to the best of our knowledge and belief, is free of explosive hazards.”

3.12 MEC DISPOSITION

MEC disposal operations will be supervised by the SUXOS and coordinated with the on-site OESS. All explosive operations will follow the procedures outlined in Engineering Manual (EM) 385-1-1 (USACE 2008a), EM 385-1-97 (USACE 2008b) Technical Manual (TM) 60A-1-1-31 (DA 2008). Transportation of explosives will be conducted in accordance with applicable sections of 49 CFR Part 397. The SUXOS will make all appropriate notifications prior to MEC disposal operations. Contact information is provided in Appendix C.

Munitions that are encountered that have been determined to be unacceptable to move by the SUXOS and UXOSO will be BIP. Single item intentional detonations that require engineering controls to mitigate the effects of blast and fragmentation to reduce the intentional MSD will be conducted in accordance with *Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions* (HNC-ED-CS-S-, August 1998), Military Munitions Center of Expertise (MM-CX) safety advisory (USACE, 12 July 2010), *Clarifications Regarding Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions* (DDESB Memorandum 29 November 2010), or TP-16 Chapter 6 “Buried Explosion Module (BEM) Procedures” (DDESB 2009). Copies of these documents will be available on site.

Donor explosives will be initiated by a radio-firing device, non-electric shock tube detonators, or electric blasting caps. Donor explosives, consisting of jet perforators or pentolite boosters, will be obtained from an explosives vendor and stored in two ECMs located on Explosive Storage Block B. In order to ensure that storage space for donor explosives is available, the contents of the ECMs will be managed in accordance with DoD 6055.09-9M V7.E5.3 Requirements for Storage of Waste Military Munitions under Conditional Exemption and the DDESB-approved ESS.

After MEC disposal operations have been completed, the UXO team will conduct an inspection of the disposal area in accordance with SOP No. 8 to confirm all explosives were consumed and to conduct an MPPEH inspection on any remaining material.

Chemical warfare material (CWM) is not suspected at the site; however, if any is encountered during the work, associated field activities will cease immediately and field personnel will retreat upwind and secure the area until relieved by the Army. The Army will be notified immediately and Army emergency response personnel will be responsible for the response actions associated with CWM.

3.13 CAMU OPERATION

A CAMU will be constructed in the location shown on **Figure 3-6**. The CAMU will be used to destroy MEC that is acceptable to move in a controlled environment by either burning or by detonation. The CAMU will be constructed and operated in accordance with the Class 3 RCRA Permit Modification (NMED 2010). After construction is complete, baseline soil samples will be collected from the CAMU and analyzed for metals, explosives, perchlorate, total petroleum hydrocarbons (TPH), VOCs, SVOCs, nitrate, cyanide, PBCs, dioxins, furans, diesel range organics (DRO), oil range organics (ORO), and TAL metals in accordance with IX.L of the FWDA RCRA Permit Modification dated June 27, 2011.

The schedule for operating the CAMU will be based on the discovery rate of MEC, however it is anticipated that the operations at the CAMU will be conducted one day per week. In accordance with the Class 3 RCRA Permit Modification, the throughput of the CAMU will not exceed 200 pounds during any treatment event, 1,000 pounds net explosive weight (NEW) per week, or 52,000 pounds NEW, annually.

Only those wastes permitted in Section IX.C and IX.D of the Class 3 RCRA Permit Modification will be treated at the CAMU. Wastes will be treated as described in SOP Nos. 8 through 15 (Appendix I) and Section IX.G of the Permit.

Discovered MEC determined to be acceptable to move and suitable for storage in the ECM will initially be documented in the MEC Accountability Log. Once the item is placed in the ECM, a Magazine Data Card will be populated with the information required by 6055.09-M-V7. The means and date of disposition will be documented in the MEC Accountability Log. Waste military munitions will not be shipped off site. Recordkeeping during operation of the CAMU will comply with Section IX.M of the FWDA RCRA Permit. A logbook will be maintained documenting the following information after each open burn or demolition shot; volume and type of munitions destroyed, method of destruction, type and volume of ignition source, estimated volume of any incidental solid waste destroyed and reason it could not be separated from the WMM, and date and time of the operation. The logbook will also include descriptions of any maintenance activities completed at the CAMU.

Wastes generated during CAMU operations will be characterize prior to disposal. Waste requiring characterization will include ash from burn activities and soils that may have been impacted during CAMU operation. A sample will be collected to develop a profile for each waste stream. Once the profile is established for that waste stream, additional sampling will not be completed unless the waste stream characteristics change. Chemical analysis will include TCLP and totals analysis will be collected for barium, cadmium, chromium, lead, mercury, 2,4-dinitrotoluene, TCLP SVOCs, dioxins, furans, and TAL metals.

3.14 GEOPHYSICAL SYSTEM VERIFICATION

A geophysical system verification (GSV) process (Nelson, Kaye, and Andrews 2009) will be used to determine background noise levels and confirm the geophysical detection system is operating properly. The GSV is generally intended to streamline daily QC checks and to replace the empirical geophysical prove-out (GPO) commonly used to test performance of the geophysical detection systems under controlled conditions near the work site for previous MMRP projects. The GSV is comprised of two main elements: an Instrument Verification Strip (IVS) and a Blind Seeding Program (BSP). The IVS includes an initial instrument demonstration, identification of background noise levels, and twice daily QC checks. The BSP is part of an overall QC approach to validate the DGM and intrusive investigations onsite.

3.14.1 Instrument Verification Strip

The objectives of the initial instrument demonstration and daily QC checks in the IVS are to verify the geophysical detection system is operating as designed, to capture levels of background noise due to site conditions on a daily basis, and to streamline daily QC checks. The IVS will be composed of two linear tracks 35 meters in length. Six industry standard objectives (ISOs) or inert munitions simulants with known characteristic responses will be aligned and buried in the first track, no closer than 5 meters apart and with seed items aligned so that each sensor of a three-coil towed array will each pass over three seed items. A single track of the IVS can be utilized for a man-portable, single coil. No seed items will be emplaced in the second track, and it will be separated from the first track by at least 4 meters. The second track will be used to quantify background noise levels. The IVS tracks will be scanned prior to emplacement of the seed items to confirm that no anomalies are present beneath either track.

3.14.1.1 Data Collection Procedures

An initial IVS location will be identified prior to the beginning of DGM activities and will be located adjacent to the site. The IVS location will be chosen to represent typical terrain, geology, and vegetation at the site. A background survey will be performed at the location to verify the area chosen is free of anomalies. If the IVS location is cluttered with buried metal items, another location will be selected for the background IVS survey. Once the IVS background data are determined to be suitable for constructing the IVS, the ISOs will be buried and their depth and location recorded to a precision of plus or minus two centimeters (cm). A second background track adjacent to the ISO items will also be cleared.

After the ISO items have been emplaced, the IVS will be mapped by each geophysical system prior to that system performing any DGM. This will be completed in accordance with the six-line test procedures, with each track mapped in both directions at a slow, normal, and fast pace. Additional tracks at the IVS will be mapped with 0.5-meter offsets on either side from the original track so that a minimum expected response for seed items can also be verified.

For ongoing production, the survey crew will be required to survey the test strip at the beginning and end of each day, in each direction at the normal data acquisition pace of approximately 2 mph. Continuous noise monitoring throughout the collection of production data will be conducted to monitor system operations. Changes in the noise level could indicate whether issues or malfunctions with the detection system may be present or developing that would impact the detection of items of interest. If a change is recognized, an analysis of the cause (environmental or internal electronics) will be conducted as soon as possible and a solution of how to resolve the issue will be made accordingly.

3.14.2 Blind Seeding Program

A blind seeding program (BSP) will be conducted with the main purpose being to provide ongoing confirmation that targets of interest can be detected by the geophysical sensor and operator, targeted by the data processor, and recovered during the intrusive investigation process. The BSP will be developed and implemented by the QC Geophysicist and UXOQCS. ISOs will be used as blind seeds and will be placed at surveyed locations that are blind to the data collection, processing, and MEC dig teams. Blind seeds will be placed at a rate of at least one per acre and ISOs will be used for all blind seed items.

The ISOs will be emplaced in a way that they are within the expected detectable range of sensors, so failure to detect any seed will be a meaningful indication there is a quality failure. The planned locations for seeds will be flexible so that they may be emplaced safely. Anomaly avoidance will be practiced in the burying of seeds, and procedures will be in compliance with relevant safety guidelines. The depth for ISOs will be from three to seven times their diameter. Seed locations will be recorded to a horizontal accuracy of ± 2 cm, to the center of mass of the ISO.

To verify the anomaly resolution criteria and procedures during the BSP, the seeds will be placed on the dig list and intrusively investigated like any other detected object. After the targeted anomaly associated with the seed has been dug, the QC Geophysicist will verify that the seed item was recovered and the dig result appropriately documented. ISOs will be selected from small, medium, and large options to represent the MEC anticipated at the site. As such, these ISOs are expected to have similar responses to the anticipated MEC at the site.

3.14.3 Geophysical System Verification Results

Results of the GSV are intended to check the operation and performance of the detection system, and the performance of the sensor positioning. The first objective is to monitor the Geonics, LTD EM61 for proper operation and response. The measured anomaly amplitude in the four channels of the EM61 will be compared to predicted response established for the instrument using Response Calculator. The standard deviation from the mean during the IVS will also be identified. This analysis will provide the following information:

- The DGM system is performing as expected

- The data are being collected according to accepted procedures and are within specifications
- The background noise levels and the overall signal-to-noise ratio are characteristic of the site

If the sensor performance is within performance criteria in the morning and not in the evening, the data will be examined by the QC geophysicist in consensus with USACE to determine what, if any of the data are not usable and if a repeat of some data collection is necessary. The results of these twice-daily performance confirmation surveys will be reported in a continually-updated set of plots showing the downtrack position error and amplitude variation for each target. Deviations outside of the data objectives of more than 20 percent variation from the expected peak response will require additional analysis.

The second objective is to monitor the performance of the sensor positioning system. This is accomplished by finding the position of the peak signal for each object (or in the case of targets oriented along track, the center of the double-peaked response) and comparing this to the known locations of the targets. The location accuracy will be limited by how carefully the sensor operator positions the center of the coil directly over the line of items in the IVS. If the deviations are larger than the objective of 25 cm, corrective action may be required, depending on the cause.

For each anomaly that meets the target selection criteria, the data analyst will report at a minimum the peak signal strength, the horizontal coordinates, and the target identification numbers. The QC evaluation team will:

- Determine whether seeds are included on that target list.
- If seeds are on that target list, it will be determined whether the signal strength is within expected bounds. The signal strength will be compared to the predicted response. The team will also determine whether other required anomaly parameters are appropriate and the positional accuracy is within specifications.
- If seeds are not detected, it will be determined whether there is a signal that should have been picked. The strength and coordinates of this signal will be evaluated to determine why it was not selected and a root cause analysis may be initiated.
- If no appropriate candidate target can be identified in the data, then a root cause analysis will be initiated.

The failure to detect a seed target will allow the project team to recognize that problems exist and provide a means to identify root causes and to undertake corrective action while still in the field.

3.15 POST-EXCAVATION DIGITAL GEOPHYSICAL MAPPING

The following section provides details of the approach, methods, and operational procedures to be employed during performance of DGM. This includes, either by inclusion or by reference, the GSV and justification for using the proposed geophysical system(s) and related methodologies. The plan also explains how the proposed methods and procedures will be tailored to anticipated site conditions, technical requirements, applicable safety and security regulations, and strategies.

After 1.5 feet of soil within the HWMU has been removed and stockpiled for soil processing, the 32-acre site will undergo 100 percent DGM to identify where additional debris removal is still required. Large areas of contamination will be subject to additional remote mechanical excavation, while single point target anomalies will be resolved by UXO personnel. Following excavation or resolution of single point target anomalies within each area (i.e. grid, acre), additional DGM will be completed to verify that anomalies have been resolved.

3.15.1 Geophysical Investigation Approach

This section addresses the proposed survey types, equipment, general procedures, personnel and site-specific data acquisition parameters that will be used for the geophysical investigations at the HWMU.

3.15.1.1 100 Percent Digital Geophysical Mapping

The 32-acre HMWU will be divided into square grids of approximately 200-foot-by-200-foot (60 meters by 60 meters, or 0.94 acre) to simplify tracking of DGM completion and areas requiring further remediation. Consideration will be given to grids of different dimensions if site conditions or findings call for grids different from 200-foot-by-200-foot squares. The grid-based survey will be conducted through deployment of a fixed line pattern with approximately 2-foot (0.6 meter) line spacing, resulting in consistent data density throughout the survey area. Prior to conducting the survey, grid corner coordinates will be exported from the geographical information system (GIS) for location in the field. Grid-based data will be reviewed in GIS and overlain on the survey grid layout.

3.15.1.2 Geophysical Equipment Electromagnetic System

The Geonics, Ltd., EM61 MK2 is a time-domain electromagnetic system and will be the primary DGM system used during the removal. The EM61 sensors detect electrically conductive and magnetically susceptible objects. A current pulse within the transmitter coil creates the primary electromagnetic field. Changes in this primary field set up eddy currents in the nearby conductive objects. The changing eddy currents produce a secondary or induced electromagnetic field emanating from the object. This induced electromagnetic field is associated with the decay of eddy currents in metal objects near the sensor and is measured by the receiver coil, the output signal being proportional to the rate of change of the electromagnetic flux through the receiver coil. The receiver is timed to measure the signal within four time gates (216, 336, 660, and 1,266 microseconds) after the primary electro-magnetic field within the ground has dissipated. An anomalous secondary electromagnetic field implies a metal object is present, and the signal strength of the secondary field can be used to estimate its size. The EM61 can record up to 16 records per second with four time gates per record, typical operations often record 10 records per second with four time gates per record. Two EM61 configurations are anticipated to be utilized at FWDA; a single, man-portable 1.0 by 0.5 meter coil and a three-coil vehicle-towed array. All EM61 coils utilized in the survey will contain both a transmitter and receiver and will be located no higher than 42 cm above the ground surface.

3.15.1.3 Navigation and Positioning Equipment Real-Time Kinematic Global Positioning System

Where practical, real-time kinematic (RTK) GPS will be used to determine the location of the EM61 sensors. This system consists of a rover and base station and provides centimeter level accuracy. The RTK GPS base station will be set up based over known benchmarks in close proximity to the HMWU. An RTK Rover will be mounted over the EM61 coil(s) and interfaced with the data logger to record positional data coincident with instrument readings. Correction data will be radio transmitted from the base station to the rover. The RTK GPS readings will be recorded at a minimum rate of 1 Hertz (Hz). The positional information will be logged in the projected coordinate system; NAD83, State Plane New Mexico, U.S. Survey feet.

3.15.1.4 General Field Procedures

DGM data acquisition will be performed in accordance with the Digital Geophysical Mapping SOP No. 6 (Appendix I).

Data will be collected using either a single coil, wheeled, man-portable system (MPS) or a towed array of more than one coil. The multiple coil towed array will have a synchronization cable between the instrument electronics to allow the sensors (i.e., coils) to operate independently without any significant interference. The coils of the EM61 will be oriented with the long axis perpendicular to the direction of travel. The average velocity of the man-portable data collection system will be 2 mph, and the average velocity of the towed array data collection system will be 2 mph. Using a collection rate of 10 Hz, the MPS sampling interval will be at least one reading per 10 cm.

3.15.2 Data Processing, Corrections, and Analysis

DGM data processing, corrections, and analysis will be performed in accordance with the Digital Geophysical Mapping SOP No. 6 (Appendix I).

3.15.2.1 Standard Data Processing and Target Selection

The most common, standard approach used to select anomalies is referred to as "threshold picking." The standard approach for target selection at the HWMU will be applied to data using the following steps:

- Isolated electromagnetic anomalies will be selected from the gridded data (filtered summation channel) utilizing a peak-picking algorithm (Blakely test or equivalent).

- A grid value cutoff level (threshold) will be determined in agreement with specific requirements as indicated from the GSV process.
- Data will be reviewed visually by the processor, and any anomalies that may have been missed by the peak-picking algorithm but with peak value above the threshold, or areas masked by larger adjacent anomalies, will be manually selected, and any overlapping or duplicate anomalies will be manually removed.
- Anomalies selected will be summarized in an anomaly table which will include entries for optional columns used in making the dig sheet.

3.15.2.2 Dig Sheet Development

An intrusive investigation target list will be developed based on the various criteria mentioned above. The methodology for final detection and selection of anomalies will be documented and available for review. Anomaly, dig selection, and intrusive results tables will be submitted digitally in accordance with DID MMRP-09-004, Geophysics (USACE 2009c). The dig sheet will include all anomalies which have peak responses above the required threshold as well as those manually picked using analysis of both the footprint and shape of the anomaly. Each target list will include:

- Title information
- Project number
- Location of the survey (grid number)
- Target information
- Unique identification number
- Easting and northing positional data
- Grid value (millivolt [mV] reading and channel information)
- Dig results
- Reacquired instrument response
- Dig team
- Anomaly description
- Anomaly type (MEC, MD, range-related debris [RRD])
- Offset distance
- Offset direction
- Depth to top
- Weight

- Length
- Multiple (number of pieces)
- Date and time
- Post-dig target anomaly resolution verification
- Post dig target anomaly resolution verification check
- Verifiers initials
- Date
- UXOQCS target anomaly resolution inspection results (where applicable)

All targets will be reported in NAD83, State Plane, New Mexico West, U.S. Survey feet.

3.15.3 Anomaly Reacquisition

The purpose of anomaly reacquisition is to verify that detected and selected anomalies are marked for excavation. The anomaly reacquisition team will reacquire the geophysical anomalies identified for excavation on the dig sheets using the same type of instrument as the original digital survey (i.e., EM61). Each reacquisition team will complete a static background test followed by a cable shake and operator test at the beginning of each day to record instrument background readings, measure electronic drift, locate potential interference spikes, and confirm that cable connections and operators are not a significant noise source. These tests will be performed if equipment malfunctions and every time equipment is replaced. The morning test will include: 1) a static background collection after a 15-minute instrument warm-up, 2) a cable shake test, and 3) each operator approaching and stepping away from the instrument. An ISO item will then be reacquired in the IVS and the location and instrument response noted in the team log. Additional information on QC tests is summarized in the QCP (Chapter 4).

The anomaly reacquisition will be conducted operations using the following general sequence and procedures:

1. Target lists will be generated with unique identification numbers, easting and northing positional data, peak value, and target file name. All selected targets will be reported in NAD83, State Plane New Mexico, U.S. Survey feet, and submitted for internal review and approval.
2. Geophysical and navigational instruments will be set up.
3. After warming up of equipment, opening QC tests will be conducted.
4. The results of QC tests will be written on daily QC forms.
5. If the results of the IVS are within the predicted bounds identified in the initial IVS testing results, the operator may begin reacquisition.

6. The target lists will be given to the intrusive teams, who will relocate the targets using RTK GPS and mark the location with a polyvinyl chloride (PVC) pinflag and high-visibility paint.
7. After relocation, the team will use the EM61 to locate the peak of the response. They will pass over the anomaly in two perpendicular directions in order to locate the response peak as accurately as possible.
8. Finally, the distance between the flag and position of the recovered material will be recorded on the dig sheets.
9. At the completion of data collection, both the closing QC tests and IVS will be performed.
10. Results will be written on the QC form.
11. At the end of the day, instruments and cables will be visually checked, and batteries will be recharged.
12. Data will be downloaded, backed up, and sent to the data manager. Field logs and documentation will be prepared, signed, and sent.

The anomaly reacquisition team will also document anomalies that cannot be reacquired (false positives) for follow-up by the QC Team.

3.15.4 Data Formats

All data formats will conform to the requirements described in DID MMRP-09-004 (USACE 2009c). All geophysical data will be accompanied by metadata in the form of a "read-me" file and database or spreadsheet table documenting the field activities associated with the data, processing performed, and correlation of data file names to grid names used by other project personnel. Metadata will be generated for each logical grouping of data. The metadata will fully describe all measurements recorded in each data file, and will include information necessary to successfully associate geophysical system requirements to their correct geographical location. Naming and reporting conventions used to deliver information associated with geophysical activities such as function test results, QC assessment information and results, anomaly characteristics, dig lists, reacquisition information, and intrusive investigation results will conform to the requirements described in DID MMRP-09-004 (USACE 2009c).

3.15.4.1 Raw Geophysical Field Data Format and Storage

Raw geophysical field data will be stored in a logical file directory (folder) structure by team and date to facilitate its management and dissemination to project delivery team (PDT) members. Raw field data are defined as all digital data generated from the geophysical system, and includes geophysical, positioning, heading, tilt, and other peripheral or instrument measurements collected or recorded during data acquisition. All raw field data will have a time stamp associated with each measurement event. At the discretion of the PDT, raw field data may include geophysical system data that has been checked, corrected, and processed into ASCII files, either individually by instrument or merged with positioning data. Metadata for raw geophysical data will include instructions for generating ASCII formatted data from all raw data for use in computer processing systems.

3.15.4.2 Final Processed Data Format and Storage

Final processed data will be produced and presented in ASCII formatted files and native Geosoft format (.gdb). Final processed data will have all corrections applied that are needed to correct for positioning offsets, instrument bias (including instrument latency), and instrument drift. Advanced processed data are defined as final processed data that has been subjected to additional advanced processing techniques and is used in anomaly selection. All corrections and processing steps will be documented. Metadata for final processed and advanced processed data will include coordinates and units, and will have a time stamp. Data file size will be limited to 100 megabytes or less, and the file length will be limited to 600,000 lines or less. Each data file will be logically and sequentially named so the file name can be easily correlated with the project-specific naming conventions.

3.15.5 Map Formats

For submittals, all maps will be provided in editable Geosoft (.map) and ArcGIS, as applicable, form and all map images will be provided in an image format for viewing. Maps will include all the following basic map features, described below, in addition to other necessary site information. All selected anomalies and known features will be marked with symbols on the map. Map scales will be even multiples of the base units presented in the map. Map sizes will be designed to fit standard printer or plotter sizes. Grid ticks or grid lines will be visible and labeled.

The title block will include the figure number, map title, and sub-title and the location of the information being presented. All objects/symbols shown on the map will be identified in a legend. A map scale bar, coordinate system and north arrow will be included. Color scale bars will use a color scheme that clearly differentiates between anomalies and background readings. Background values will be plotted in white or gray. A classic “cold to hot” color scale will be used with negative values plotted in blue and high positive values plotted in red or pink. The range of values will be “fixed” so the same color scale is utilized across the site.

Additional project information provided in boxes will include at a minimum:

- Client
- Project
- Contractor
- Map approver
- Date created

3.16 CONFIRMATION SOIL SAMPLING

In accordance with Section III.A.4 of the Class 3 Permit Modification, soil samples will be collected from the limits of the remedial excavations to characterize the soils remaining for future action(s). In accordance with paragraph 7.3 of Attachment 7 of the RCRA Permit, the Army may elect to propose an alternate land use scenario and associated cleanup goals for the site. The locations of the samples will be based upon the final size and orientation of each excavation; however, an anticipated sampling plan is included as **Figure 3-7**.

Each excavation or grid will be sampled for the constituents listed in Section III.A.4 of the FWDA RCRA Permit (NMED 2005). The purpose of the sampling is to identify those areas that have constituents that exceed the cleanup criteria stipulated in Attachment 7 the RCRA Permit. Those areas that exceed the cleanup criteria may require future remedial action under another contract. Screening values will include values from the NMED approved Soil Background Study and Data Evaluation Report (Shaw 2010) and NMED SSLs for a residential land use scenario. If an NMED residential SSL is not available for an analyte, the USEPA residential RSL will be used. When background concentrations of a constituent exceed the NMED residential screening value, then the background concentration for that constituent will be used as the screening value. A written background determination will be obtained from NMED to use background values as cleanup levels. The analytical results will be compared to the proposed screening criteria listed and respective screening values presented in **Table 3-2**.

3.16.1 Confirmation Soil Sampling Method

Samples will be collected from bottom and sidewalls of each excavation of CDC and CRP. Each excavation will likely vary significantly in shape and size; therefore, a composite sample will be collected from at least every 100 linear feet of sidewall. The total length of excavation sidewall will be measured and rounded up to the nearest 100 feet to determine the number of composite samples to be collected from the excavation (e.g. an excavation with 347 feet of sidewall will have four samples). The sample locations will be spaced equally along the sidewall (e.g. an excavation with 347 feet of sidewall will have four composite samples collected, one from each 86 foot segment of sidewall). For excavations having less than 200 feet of sidewall, three composite samples, spaced equally, will be collected from the sidewalls (e.g. an excavation with 180 feet of sidewall will have a composite sample collected from each 60 foot segment of sidewall).

If an excavation is deeper than 20 feet, a composite sample will be collected for every ten feet of depth every 100 feet of sidewall. Please see Figure 3-7 for the anticipated sidewall sampling program.

A composite sample will be collected from the bottom of each excavation that is less than 100 feet by 100 feet (10,000 square feet). For excavations larger than 100 feet by 100 feet (10,000 square feet), a composite sample will be collected for every 10,000 square feet of bottom area. The total area of excavation bottom will be estimated and rounded up to the nearest 10,000 feet to determine the number of samples to be collected from the excavation (e.g. an excavation with 13,000 square feet of bottom area will have two composite samples).

Each sample area will consist of one discrete soil sample for VOCs and one composite sample collected and analyzed for TAL metals, SVOC, explosives, PCB aroclors, nitrate, cyanide, dioxins, furans, and perchlorate as described in SOP 4 (Appendix I) and stipulated in Section III of the FWDA RCRA Permit. Each composite sample will be comprised of nine subsamples randomly collected from within each sampling area. Soil will be collected from each of the nine locations as described in Section 3.16.1.1. Each sample will be submitted to APPL for chemical analysis. QC samples will be collected at a frequency of 10 percent. Sample analyses are discussed in detail in the MC Sampling and Analysis Plan (Appendix E).

The remainder of the site will be divided into grids approximately 100 feet by 100 feet and a composite sample will be collected from within each grid. Each sample grid will consist of one discrete soil sample for VOCs and one composite sample collected and analyzed for TAL metals, SVOC, explosives, PCB aroclors, nitrate, cyanide, dioxins, furans, and perchlorate. See Figure 3-7 for the anticipated composite sample layout.

3.16.1.1 Sampling Procedures

Sampling Equipment

Soil will be collected using a stainless steel spoon or trowel or disposable sampling equipment. Certified, pre-cleaned sample containers obtained from the laboratory shall be used to store the samples prior to laboratory analyses. Sample volumes, container types, and preservation requirements shall be followed per specific method requirements in accordance with EPA SWA 846.

Sample Identification

Samples collected during site activities will have discrete sample identification numbers. These numbers are necessary to identify and track each of the many samples collected for analysis during the life of this project. In addition, the sample identification numbers will be used in the database to identify and retrieve the analytical results received from the laboratory. Each sample is identified by a unique code that indicates the parcel number, site identifier, matrix, sample location identifier, and sample number. The sample locations will be numbered sequentially starting at number 001. The sample parcel number is P3 site identifier is HWMU. Source of samples IDs will incorporate matrix IDs, include the following:

- CRP - Current Residue Pile
- CDC - Current Detonation Crater
- SW - Side Wall
- EB - Excavation Bottom

- Grid - Surface soil sample collected from soils in the remainder of the site

An example of the sample identification (ID) code for the first soil sample collected from the bottom of current detonation crater 10 would be P3HWMU-CRP10-EB-001. Matrix spikes/matrix spike duplicates (MS/MSD) samples are given the same sample ID as the analytical sample, but have “MS/MSD" written on the label. Field Duplicate samples are blind samples to the laboratory and are given a unique sample ID. Soil samples will add 100 to the sample number to signify it is a duplicate location.

Field Decontamination

Disposable sampling equipment (e.g., plastic spoons and disposable buckets) does not require decontamination. If non-disposable soil sampling devices are used (e.g., stainless steel spoons), the devices shall be decontaminated prior to each use. The reusable devices shall be decontaminated by the following procedure:

1. Brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;
2. Rinse with potable tap water;
3. Wash with nonphosphate detergent or other detergent approved by NMED followed by a tap water rinse;
4. Rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap water rinse;
5. Rinse with methanol (to remove organic compounds, if necessary) followed by a tap water rinse;
6. Rinse with potable tap water; and
7. Double rinse with deionized water.

Decontamination water and waste generated during decontamination shall be containerized for disposal as investigation derived waste (IDW). If decontamination water has no detected contaminant levels (other than naturally occurring metals) the water will be placed in the evaporation tank behind Former Building 542.

Soil Sample Collection

The following procedure should be used to collect surface excavation soil samples:

1. Decontaminate sampling equipment according to Section 5.2.2.
2. Record the sample grid location in the field logbook.
3. Don a clean pair of nitrile gloves.
4. Using a decontaminated spoon or trowel, remove soil from separate one square foot areas of each mini-grid until the sampling depth of 0.5 feet is reached.

5. Collect the discrete soil for VOCs using the Terra Core® sampler from the center mini-grid. Fill 40 milliliter VOAs with 5 gram plugs.
6. Collect a composite soil sample for all other parameters using a decontaminated stainless-steel sampling spoon from all mini-grids into a decontaminated stainless steel bowl.
7. Composite the soil by thoroughly mixing the soil in the decontaminated stainless-steel bowl with the sampling spoon. Fill the jar for the specified analysis (Table 3-1).
8. Label, store and document sample
9. Record applicable information on the Sample Collection Field Sheet.

Sample Preservation and Storage

In the field, each sample container shall be marked with the sample identification number, sampling location, date, time of sample collection and the sampler's initials. Sample containers for chemical analysis shall be placed in ice-filled coolers immediately following collection, and stored at 4° Celsius prior to and during shipment. Sample containers shall be packaged to avoid breakage during transportation. Chain-of-Custody (CoC) shall be followed in accordance with EPA SW-846.

For each sample to be submitted to the analytical laboratory for analysis, an entry shall be made on a CoC form supplied by the laboratory. One CoC form shall be completed for each cooler for each day of sampling. The information recorded on the CoC form includes the sampling date and time, sample identification number, requested analyses and methods, and sampler's name.

CoC forms shall be placed in a sealed plastic bag and placed inside of the cooler with the samples. Upon receipt of the sample cooler, the laboratory will verify custody and condition of the samples. Non-conformances in sample receipt (e.g., broken sample containers, samples received out of temperature) shall be documented on the sample receipt form and communicated to the project team immediately.

Quality Assurance/Quality Control

Field QA/QC samples are designed to help identify potential sources of external sample contamination and to evaluate potential error introduced by sample collection and handling. All QA/QC samples are labeled with QA/QC identification numbers and sent to the laboratory with the other samples for analyses.

Duplicate Samples

Duplicate samples are samples collected to assess precision of sampling and analysis. A duplicate sample will be collected at the same time as the initial sample from ten percent of the total sample locations. The initial sample containers for a particular parameter or set of parameters will be filled first then the duplicate sample containers for the same parameter(s), and so on until all necessary sample bottles for both the initial sample and the duplicate sample have been filled. The duplicate soil containers will be handled in the same manner as the primary sample. The duplicate sample will be assigned a QA/QC identification number, stored in an iced cooler, and shipped to the laboratory on the day it is collected. Duplicate samples will be collected for all parameters. The soil will be divided evenly and then homogenized separately. Duplicate samples will be blind to the laboratory.

Matrix Spikes and Matrix Spike Duplicates

MS/MSDs are used to assess the potential for matrix effects. Samples will be designated for MS/MSD analysis on the chain of custody form and on the bottles. It may be necessary to increase the sample volume for samples where this designation is to be made. MS/MSD samples will be collected from five percent of the total sample locations.

3.17 GROUNDWATER MONITORING WELL ABANDONMENT

Nine groundwater monitoring wells located within and outside the HWMU will be abandoned if they are compromised as a result of flooding or site activities. **Figure 3-8** shows the location of each groundwater monitoring well. Each well will be abandoned in accordance with New Mexico Office of the State Engineer requirements for Well Driller Licensing, Construction, Repair and Plugging of Wells (19.27.4 New Mexico Administrative Code). A plan to plug the wells will be filed with and approved by the State Engineer prior to beginning plugging activities. A plugging record will be kept for each well plugged and submitted to the State Engineer no later than 20 days after well plugging activities have been completed. Well plugging records will be included in an appendix to the Removal Report. Plugged monitoring wells may be replaced as part of the groundwater investigation in accordance with Section VI of the Permit beginning after closure of the HWMU under Permit Section III.A. Well replacement will occur in approximately 2019.

Groundwater monitoring wells may be covered with sediments that potentially contain MEC. A “mag and dig” process will be completed to clear access to each well location, an area around each well, and to expose the well heads. The access route and a sufficient area around each well will be cleared of any surface hazards and subsurface anomalies potentially representing MEC in support of well abandonment activities by UXO technicians.

3.18 SITE RESTORATION

Upon completion of the removal work, the site will be restored. Restoration activities will include backfilling those open excavations that present a safety hazard to humans or wildlife, minor drainage grading to mitigate ponding, and vegetation establishment. Newly discovered areas impacted by OB/OD activities that lie beyond the marked boundary of the HWMU will remain in place and be addressed during follow on activities. Excavation side scopes at the HWMU boundary will be graded and stabilized as described in Sections 3.18.1 and 3.18.2.

3.18.1 Grading

After the removal is complete, soils that have met the cleanup criteria will be retained for later use as backfill. Excavations where slope stability or the safety of human or wildlife is at risk will be resloped by backfilling with the site soils that meet cleanup criteria. The sidewall of each excavation will be graded to meet sloping requirements for the soil type(s). Excavations that do not pose a safety hazard will not be backfilled. The remainder of the site will be graded to remove ruts and establish positive drainage.

3.18.2 Vegetation

Once any backfill has been placed, the site will be graded to provide positive drainage and contouring. A seed mixture, consisting of drought tolerant species such as blue grama and buffalo grass native to northwest New Mexico will be placed in areas disturbed by the removal activities. Areas completed in the summer will be reseeded in the fall and areas completed in early winter will be seeded the following spring. Prior to revegetation, coordination with McKinley County Extension Office will be completed to verify the most appropriate reseeding times. The newly cast seed will be watered to promote establishment.

Any wetland areas identified during the environmental resources inventory will undergo wetland mitigation in accordance with the wetlands mitigation plan and the USACE 404 permit requirements.

3.18.3 Final Topographic Survey

Once site restoration is complete a flyover stereo photography will be completed and a topographic survey of the final contours of the HWMU will be generated. Up to eight ground control points (aerial targets) will be placed around the HWMU. Aerial flyover will be completed when weather, sun angle, and ground conditions are optimal. Data will be presented in one foot contours in NAVD 88.

3.19 WASTE MANAGEMENT

3.19.1 Solid Waste

Solid waste generated as a result of removal activities will be containerized and transported to the Northwest New Mexico Regional Solid Waste Authority Landfill in Thoreau, New Mexico for disposal.

3.19.2 IDW

In general, IDW will be collected in 55-gallon drums or tanks. The IDW drums will be stored at a designated location inside the HWMU until the end of field activities, at which time it will be transported to the appropriate disposal facility. Each container will be labeled with:

- Installation Name
- Site name
- Type of IDW (e.g., water, soil)
- Date(s) of accumulation
- Name and phone number of site contact

The generation of soil IDW is anticipated to be very minimal. Excess soil from shallow soil samples will be returned to the sample location. Additional IDW containerization and disposal will be based upon analytical results of the soil samples. URS will be responsible for handling and coordinating the disposal of IDW at an approved disposal facility.

Liquid IDW will consist of decontamination water. Decontamination water will be containerized in drums or tanks, sealed, and labeled. A characterization sample will be collected from each container and sent to APPL for chemical analysis of those constituents required by the disposal facility and SVOCs, explosives, PCB, dioxins, furans, and RCRA 8 metals. Once the liquid waste is characterized, it will be properly labeled, transported, and disposed in accordance with all federal, state, and local laws. Further details related to the handling of IDW can be found in SOP No. 3 (Appendix I).

3.19.3 Recyclable Material

In general, two types of recyclable material will be generated: MD and non munition-related metals. MD will have been flashed for potential explosives residues and will have been inspected and certified MDAS in accordance with Section 3.11. MD will be stored in a secured container until a sufficient quantity is generated to transport to a recycling facility. The voluntary flashing process is not considered treatment and therefore no wastes requiring management are anticipated from the flashing process. All treatment will be performed in the CAMU. Non munitions-related metals will be stored on-site and sent to a local recycling facility.

3.19.4 Hazardous Waste Plan

Waste characterized as hazardous will be stockpiled separately from other materials, placed on a minimum 6-mil liner and covered. Hazardous waste will transported for disposal within 90 days of identification. The waste will be transported in accordance with federal, state, and local laws to Clean Harbors or other facility permitted to accept and treat hazardous waste. All required hazardous waste manifests will be prepared by an appropriately trained and certified shipping agent or specialist and signed by the Army as the generator. Waste disposal documentation (e.g., waste manifests) will be kept on file at the FWDA information repository and will be included as an appendix to the Removal Report.

3.20 CULTURAL RESOURCES MONITORING

Cultural resources monitoring will occur during the scheduled plant downtimes and when other opportunities become available as a result of unscheduled maintenance. Monitoring will be completed in accordance with the Cultural Resources Management Plan (CRMP) that is currently in development. The CRMP will detail the methods and procedures for completing the monitoring as well as dealing with discoveries, reporting, and curation.

The Zuni Cultural Resource Enterprise (ZCRE) will provide periodic monitoring in accordance with the Programmatic Agreement. UXO technicians will escort ZCRE archaeologists during the monitoring efforts. The monitoring will consist of inspecting stockpile materials for cultural artifacts or other items. In addition, the ZCRE will provide the UXO technicians and equipment operators specific training to aid in identification of a potential discovery during the excavation and transportation process.

If a discovery of a potential cultural resource is made, the contractor will notify the Army and the ZCRE so a coordinated effort can be made to assess the discovery and determine and apply mitigation in accordance with the Programmatic Agreement.

TABLE 3-1
ANTICIPATED QUANTITIES AND EXCAVATION DEPTHS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Area	Excavation Volume (bank cubic yards)	Excavation Depth (feet)
Other Area of Potential Subsurface Debris 1	13,597	4
Other Area of Potential Subsurface Debris 2	879	4
Other Area of Potential Subsurface Debris 3	121	4
Other Area of Potential Subsurface Debris 4	4,428	4
Area of Shallow Debris	38,650	1.5
Arroyo	15,793	1.5
CDC1	1,635	5
CDC2	1,635	5
CDC3	1,635	5
CDC4	777	5
CDC5	777	5
CDC6	37	4
CDC7	1,213	5
CDC8	366	6
CDC9	1,213	5
CDC10	1,213	5
DCD11	1,213	5
CDC12	1,213	5
CRP1	641	6
CRP2	106	3
CRP3	605	8
CRP5	3,957	11
CRP6	12,169	9
CRP7	1,930	9
CRP8	11,752	8
CRP9	2,242	8
CRP10	32	2
Total	**119,829**	

Notes:

CDC - Current Detonation Crator

CRP - Current Residue Pile

CRP 4 is anticpated to have shallow debris only and the volume is included in the Area of Shallow Debris.

TABLE 3-2
CONFIRMATION AND CHARACTERIZATION SOIL SCREENING LEVELS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
Acenaphthene	3.44E+03	3.67E+04	NMED
Acenaphthylene	1.72E+03	1.83E+04	NMED
Acetone	6.66E+04	8.68E+05	NMED
Aluminum	7.80E+04	1.13E+06	NMED
4-Amino-2,6-dinitrotoluene	1.50E+02	1.90E+03	RSL
2-Amino-4,6-dinitrotoluene	1.50E+02	2.00E+03	RSL
Anthracene	1.72E+04	1.83E+05	NMED
Antimony	3.13E+01	4.54E+02	NMED
Arsenic	3.90E+00	1.77E+01	NMED
Barium	1.56E+04	2.23E+05	NMED
Benzene	1.54E+01	8.47E+01	NMED
Benzoic Acid	2.40E+05	2.50E+06	RSL
Benzo(a)anthracene	1.48E+00	2.34E+01	NMED
Benzo(a)pyrene	1.48E-01	2.34E+00	NMED
Benzo(b)fluoranthene	1.48E+00	2.34E+01	NMED
Benzo(g,h,i)perylene	1.72E+03	1.83E+04	NMED
Benzo(k)fluoranthene	1.48E+01	2.34E+02	NMED
Benzyl alcohol	6.10E+03	6.20E+04	RSL
Beryllium	1.56E+02	2.26E+03	NMED
Bis-(2-chloroethoxy)methane	1.80E+02	1.80E+03	RSL
Bis(2-chloroethyl) ether	2.68E+00	1.42E+01	NMED
Bis(2-chloroisopropyl) ether	9.15E+01	4.54E+02	NMED
Bis(2-ethylhexyl) phthalate	3.47E+02	1.37E+03	NMED
Bromobenzene	3.00E+02	1.80E+03	RSL
Bromochloromethane	1.60E+02	6.80E+02	RSL
Bromodichloromethane	5.41E+00	3.01E+01	NMED
Bromomethane	1.65E+01	8.65E+01	NMED

TABLE 3-2
CONFIRMATION AND CHARACTERIZATION SOIL SCREENING LEVELS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
4-Bromophenyl phenyl ether	NA	NA	
2-Butanone (Methyl ethyl ketone, MEK)	3.71E+04	3.75E+05	NMED
n-Butylbenzene	3.90E+03	5.10E+04	RSL
sec-Butylbenzene	3.90E+03	5.10E+04	RSL
tert-Butylbenzene	3.90E+03	5.10E+04	RSL
Butylbenzyl phthalate	2.60E+03	9.10E+03	RSL
tert-Butyl methyl ether (MTBE)	9.01E+02	4.89E+03	NMED
Cadmium	7.03E+01	8.97E+02	NMED
Calcium	NA	NA	
Carbazole	NA	NA	
Carbon disulfide	1.53E+03	8.33E+03	NMED
Carbon tetrachloride	1.08E+01	5.98E+01	NMED
2-Chlorophenol	3.91+02	5.68+03	NMED
4-Chloroaniline (p-chloroaniline)	2.40E+01	8.60E+01	RSLc
4-Chloro-3-methylphenol (p-chloro-m-cresol)	6.10E+03	6.20E+04	RSL
4-Chlorophenyl phenyl ether	NA	NA	
Chlorobenzene	3.76E+02	2.12E+03	NMED
Chloroform	5.86E+00	3.27E+01	NMED
Chloromethane	2.75E+02	1.29E+03	NMED
o-Chlorotoluene (2-Chlorotoluene)	1.56E+03	2.27E+04	NMED
4-Chlorotoluene (p-Chlorotoluene)	1.60E+03	2.00E+04	RSL
b-Chloronaphthalene (2-Chloronaphthalene)	6.26E+03	9.08E+04	NMED
Bromoform (Tribromomethane)	6.16E+02	2.42E+03	NMED
Chromium III	1.17E+05	1.70E+06	NMED
Chrysene	1.48E+02	2.34E+03	NMED
Cobalt	2.30E+01	3.00E+02	RSL
Copper	3.13E+03	4.54E+04	NMED

TABLE 3-2
CONFIRMATION AND CHARACTERIZATION SOIL SCREENING LEVELS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
Cumene (isopropylbenzene)	2.34E+03	1.45E+04	NMED
Cyanide	4.69E+01	6.81E+02	NMED
Dibenz(a,h)anthracene	1.48E-01	2.34E+00	NMED
Dibenzofuran	7.80E+01	1.00E+03	RSL
Dibromochloromethane	1.21E+01	6.24E+01	NMED
1,2-Dibromo-3-chloropropane	1.86E+00	1.08E+00	NMED
1,2-Dibromoethane	5.88E-01	3.22E+00	NMED
1,2-Dichlorobenzene	2.31E+03	1.40E+04	NMED
1,3-Dichlorobenzene	3.17E+01	1.77E+02	NMED
1,4-Dichlorobenzene	3.17E+01	1.77E+02	NMED
3,3'-Dichlorobenzidine	1.08+01	4.26+01	NMED
Dichlorodifluoromethane	1.68E+02	7.98E+02	NMED
1,1-Dichloroethane	6.45E+01	3.59E+02	NMED
1,2-Dichloroethane	7.89E+00	4.35E+01	NMED
cis -1,2-Dichloroethene	1.56E+02	2.27E+03	NMED
trans -1,2-Dichloroethene	2.70E+02	1.44E+03	NMED
1,1-Dichloroethene	4.49E+02	2.29E+03	NMED
2,4-Dichlorophenol	1.83E+02	2.05E+03	NMED
1,2-Dichloropropane	1.52E+01	8.44E+01	NMED
1,3-Dichloropropane	1.60E+03	2.00E+04	RSL
2,2-Dichloropropane	1.52E+01	8.44E+01	NMED
1,1-Dichloropropene	3.37E+01	1.77E+02	NMED
1,3-Dichloropropene	3.37E+01	1.77E+02	NMED
cis -1,3-Dichloropropene	3.37E+01	1.77E+02	NMED
trans -1,3-Dichloropropene	3.37E+01	1.77E+02	NMED
Diethyl phthalate	4.89E+04	5.47E+05	NMED
Dimethyl phthalate	6.11E+05	6.84E+06	NMED

TABLE 3-2
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FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
Di-n-butyl phthalate (Dibutyl phthalate)	6.11E+03	6.84E+04	NMED
Di-n-octyl phthalate	3.47E+02	1.37E+03	NMED
2,4-Dimethylphenol	1.22E+03	1.37E+04	NMED
1,3-Dinitrobenzene	6.10E+00	6.20E+01	RSL
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)	4.89E+00	5.47E+01	NMED
2,4-Dinitrophenol	1.22E+02	1.37E+03	NMED
2,4-Dinitrotoluene	1.57E+01	1.03E+02	NMED
2,6-Dinitrotoluene	6.11E+01	6.84E+02	NMED
Ethylbenzene	6.84E+01	3.78E+02	NMED
Ethyl chloride (chloroethane)	2.98E+04	1.41E+05	NMED
Fluoranthene	2.29E+03	2.44E+04	NMED
Fluorene	2.29E+03	2.44E+04	NMED
2-Hexanone	2.10E+02	1.40E+03	RSL
Hexachlorobenzene	3.04E+00	1.20E+01	NMED
Hexachloro-1,3-butadiene (Hexachlorobutadiene)	6.11E+01	2.46E+02	NMED
Hexachloroethane	4.28E+01	4.79E+02	NMED
HMX	3.91E+03	5.68E+04	NMED
Indeno(1,2,3-c,d)pyrene	1.48E+00	2.34E+01	NMED
Iron	5.48E+04	7.95E+05	NMED
Isophorone	5.12E+03	1.37E+05	NMED
p-Isopropyltoluene (Cymene)	2.34E+03	1.45E+04	NMED
Lead	4.00E+02	8.00E+02	NMED
Magnesium	NA	NA	
Manganese	1.86E+03	2.67E+04	NMED
Mercury (elemental)	1.56E+01	7.36E+01	NMED
2-Methylnaphthalene	2.30E+02	2.20E+03	RSL
2-Methylphenol (cresol)	3.10E+03	3.10E+04	RSL

TABLE 3-2
CONFIRMATION AND CHARACTERIZATION SOIL SCREENING LEVELS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
Methylene bromide (Dibromomethane)	5.16E+01	2.54E+02	NMED
Methylene chloride	4.09E+02	4.70E+03	NMED
4-Methyl-2-pentanone (MIBK)	5.30E+03	5.30E+04	RSL
Naphthalene	4.30E+01	2.41E+02	NMED
Nickel	1.56E+03	2.25E+04	NMED
Nitrate	1.25E+05	1.82E+06	NMED
2-Nitroaniline	6.10E+02	6.00E+03	RSL
3-Nitroaniline	2.40E+02	8.60E+02	RSLc
4-Nitroaniline	2.40E+02	8.60E+02	RSLc
Nitrobenzene	5.35E+01	3.00E+02	NMED
2-Nitrophenol	NA	NA	
4-Nitrophenol	NA	NA	
N-Nitrosodimethylamine	2.26E-02	3.76E-01	NMED
N-Nitrosodiphenylamine	9.93E+02	3.91E+03	NMED
N-Nitrosodi-n-propylamine	6.90E-01	2.50E+00	RSLc
m-Nitrotoluene(3)	7.82E+00	1.14E+02	NMED
o-Nitrotoluene (2)	2.91E+01	1.02E+03	NMED
p-Nitrotoluene (4)	2.44E+02	2.74E+03	NMED
Pentachlorophenol	8.94E+00	3.00E+01	NMED
Perchlorate	5.48E+01	7.95E+02	NMED
Phenanthrene	1.83E+03	2.05E+04	NMED
Phenol	1.83E+04	2.05E+05	NMED
Polychlorinatedbiphenyls (PCBs)			
Aroclor 1016	3.93E+00	4.13E+01	NMED
Aroclor 1221	1.49E+00	6.24E+00	NMED
Aroclor 1232	1.49E+00	6.24E+00	NMED
Aroclor 1242	2.22E+00	8.26E+00	NMED

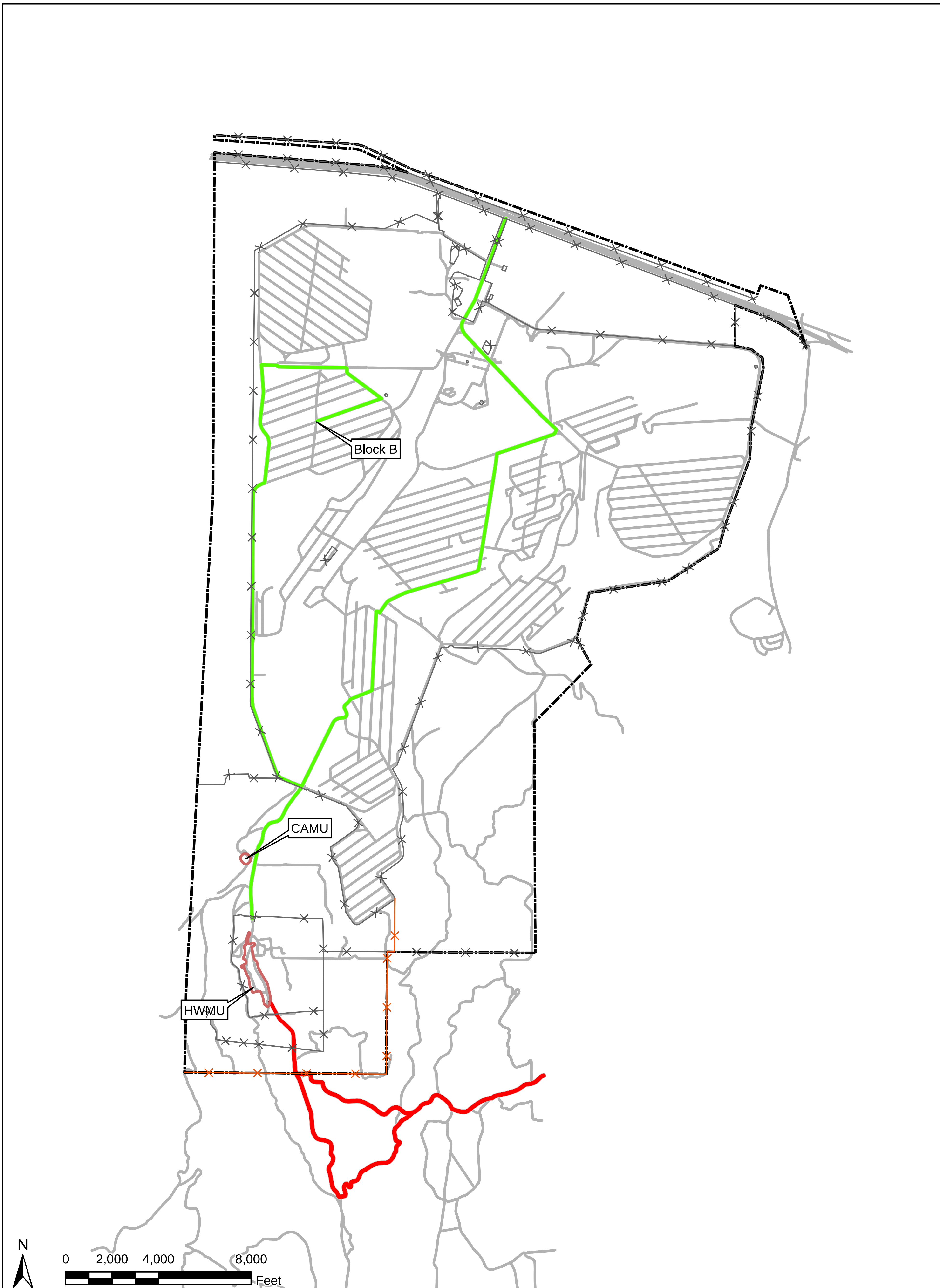
TABLE 3-2
CONFIRMATION AND CHARACTERIZATION SOIL SCREENING LEVELS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
Aroclor 1248	2.22E+00	8.26E+00	NMED
Aroclor 1254	1.12E+00	8.26E+00	NMED
Aroclor 1260	2.22E+00	8.26E+00	NMED
Potassium	NA	NA	
n-Propylbenzene	3.40E+03	2.10E+04	RSL
Pyrene	1.72E+03	1.83E+04	NMED
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	5.82E+01	3.41E+03	NMED
Selenium	3.91E+02	5.68E+03	NMED
Silver	3.91E+02	5.68E+03	NMED
Sodium	NA	NA	
Styrene	7.28E+03	5.00E+04	NMED
2,3,7,8-TCDD	4.50E-05	2.04E-04	NMED
2,3,7,8-TCDF	4.50E-04	2.04E-03	NMED
1,1,1,2-Tetrachloroethane	2.91E+01	1.61E+01	NMED
1,1,2,2-Tetrachloroethane	8.02E+00	4.35E+01	NMED
Tetrachloroethene	7.02E+00	3.66E+01	NMED
Tetryl (Trinitrophenylmethylnitramine)	2.44E+02	2.74E+03	NMED
Thallium	7.82E-01	1.14E+01	NMED
Toluene	5.27E+03	5.77E+04	NMED
Tribromomethane (Bromoform)	6.16E+02	2.42E+03	NMED
1,2,3-Trichlorobenzene	4.90E+01	4.90E+02	RSL
1,2,4-Trichlorobenzene	7.30E+01	3.67E+02	NMED
1,1,1-Trichloroethane	1.56E+04	7.89E+04	NMED
1,1,2-Trichloroethane	2.81E+00	1.33E+01	NMED
Trichloroethene	8.77E+00	4.13E+01	NMED
Trichlorofluoromethane	1.41E+03	6.94E+03	NMED
2,4,5-Trichlorophenol	6.11E+03	6.84E+04	NMED
2,4,6-Trichlorophenol	6.11E+01	6.84E+02	NMED
1,2,3-Trichloropropane	4.97E-02	3.76E+01	NMED

TABLE 3-2
CONFIRMATION AND CHARACTERIZATION SOIL SCREENING LEVELS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Chemical	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Source
1,2,4-Trimethylbenzene	6.20E+01	2.60E+02	RSL
1,3,5-Trimethylbenzene	7.80E+02	1.00E+04	RSL
1,3,5-Trinitrobenzene	2.20E+03	2.70E+04	RSL
2,4,6-Trinitrotoluene	3.91E+01	5.68E+02	NMED
Vanadium	3.91E+02	5.68E+03	NMED
Vinyl chloride	7.28E-01	2.61E+01	NMED
m-Xylene	7.74E+02	3.78E+03	NMED
o-Xylene	8.98E+02	4.41E+03	NMED
Zinc	2.35E+04	3.41E+05	NMED

Notes:
mg/kg - milligram per kilogram
NA - Not Applicable. These chemicals do not have USEPA-established toxicity factors; therefore no screening values can be calculated.
NMED - New Mexico Environment Department
RSL - Residential Screening Level
RSLc - Residential Screening Level Carcinogenic
The analyte list is based on the Department of Defense Quality Systems Manual Version 3 Final -Appendix DOD-C-Target Analyte List.
NMED = New Mexico Environment Department Soil Screening Levels (NMED 2012, June Update)
RSL = Regional Screening Level (USEPA 2012, November Update). RSL for carcinogens (RSLc) modified by a factor of 10 to risk of 10-5 per NMEI
Aroclors 1262 and 1268 values were calculated using NMED equations and methology.
Bis-2-(ethylhexyl) phthalate was used as a surrogate for Di-n-octyl phthalate.
1-4-Dichlorobenzene was used as a surrogate for 1,3-dichlorobenzene.
2,4-Dichlorophenol was used as a surrogate for 2,6-dichlorophenol.
1,2-Dichloropropane was used as a surrogate for 2,2-dichloropropane.
1,3-Dichloropropene was used for 1,1-dichloropropene and cis- and trans- 1,3-dichloropropene.
Isopropyl benzene was used as a surrogate for p-isopropyl toluene.
4-Nitroaniline was used as surrogate for 3-nitroaniline.
n-butylbenzene was used as a surrogate for sec-butylbenzene and tert-butylbenzene.
Pyrene was used as a surrogate for noncarcinogenic PAHs without toxicity factors.
2,3,7,8-TCDD screening values will be used for all dioxins.
2,3,7,8-TCDF screening values will be used for all furans.



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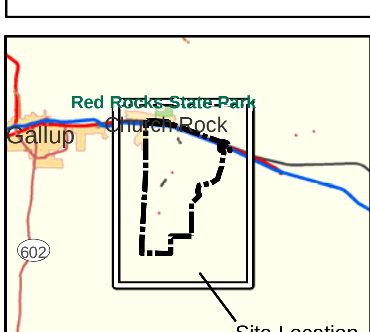

Installation Boundary	Evacuation Route
HWMU Boundary	Haul Route
CAMU Buffer	Road
Fence	
Replacement Fence	

Anticipated Haul and Evacuation Routes
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 3-1**
Checked By: BP	Project No: 16170613	

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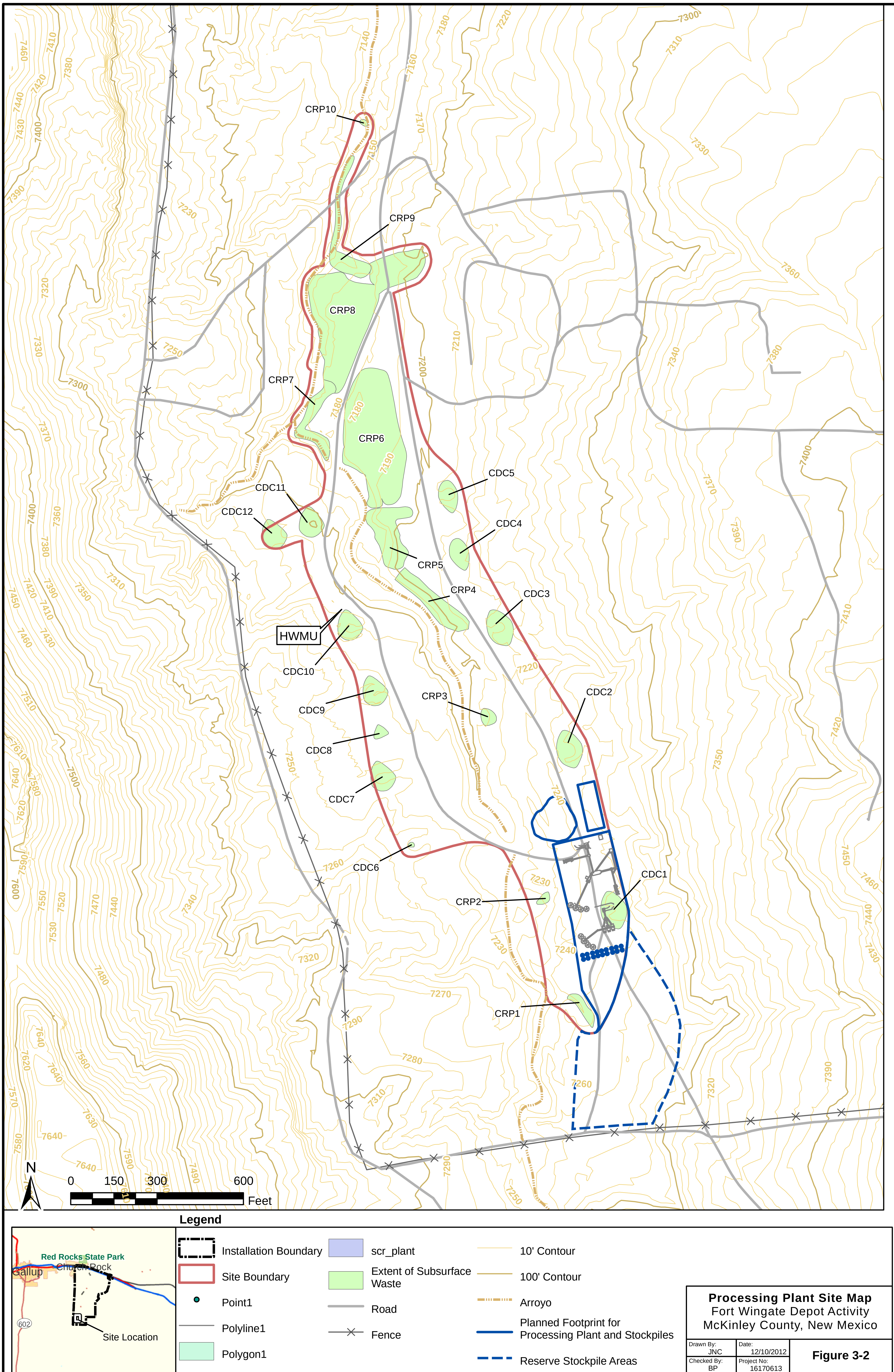

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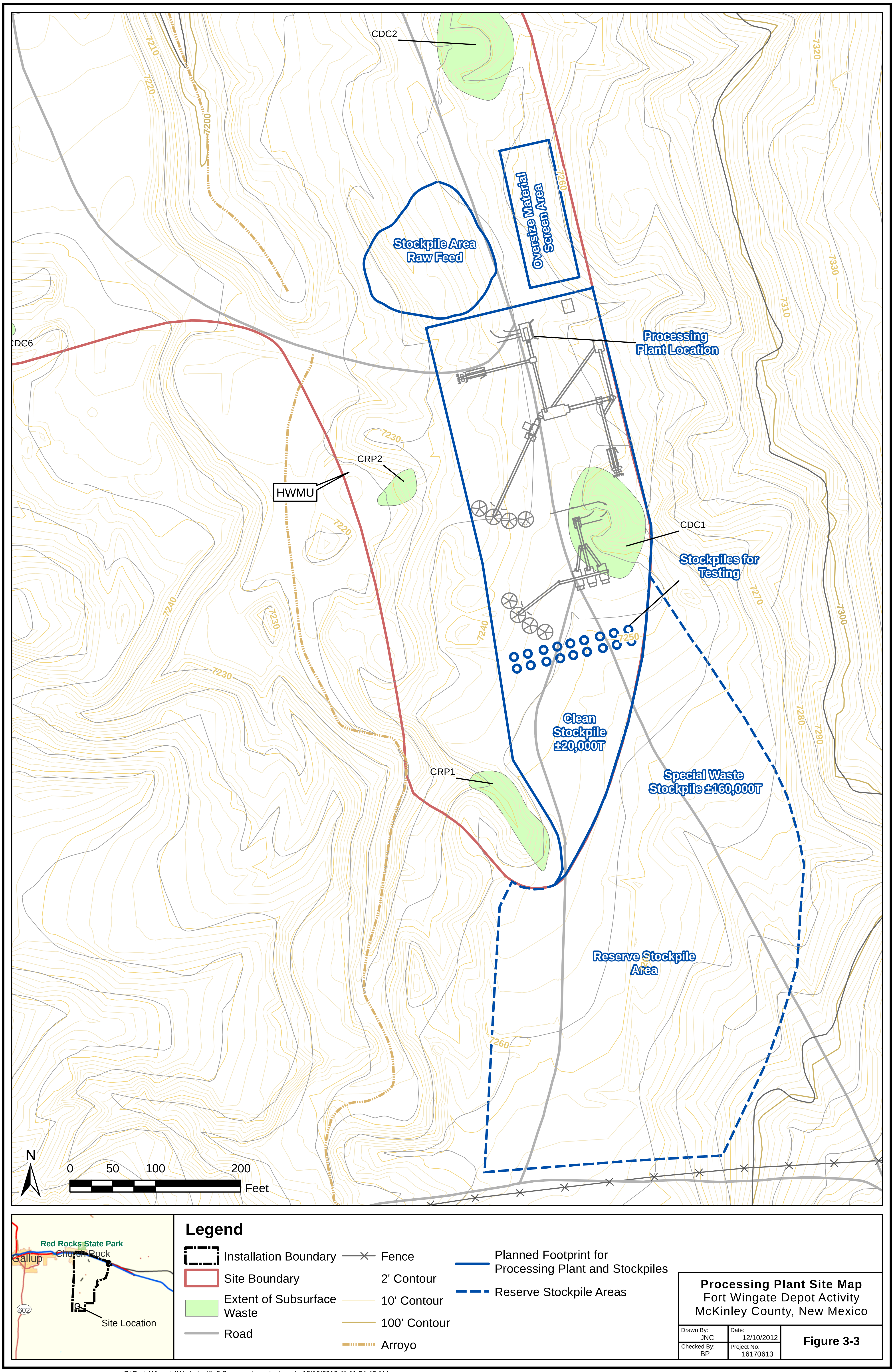

Processing Plant Site Map
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	Figure 3-3
Checked By: BP	Project No: 16170613	

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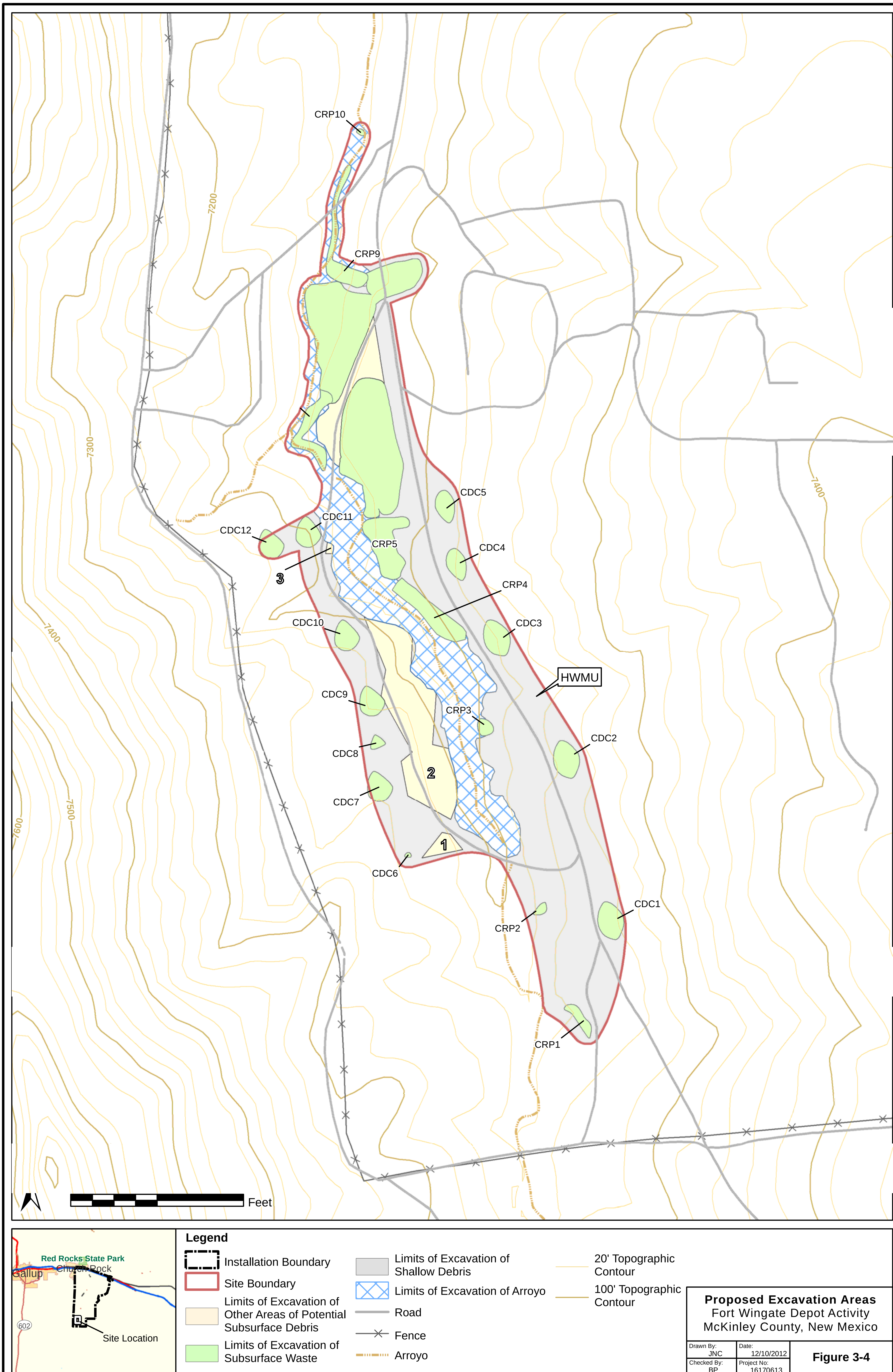

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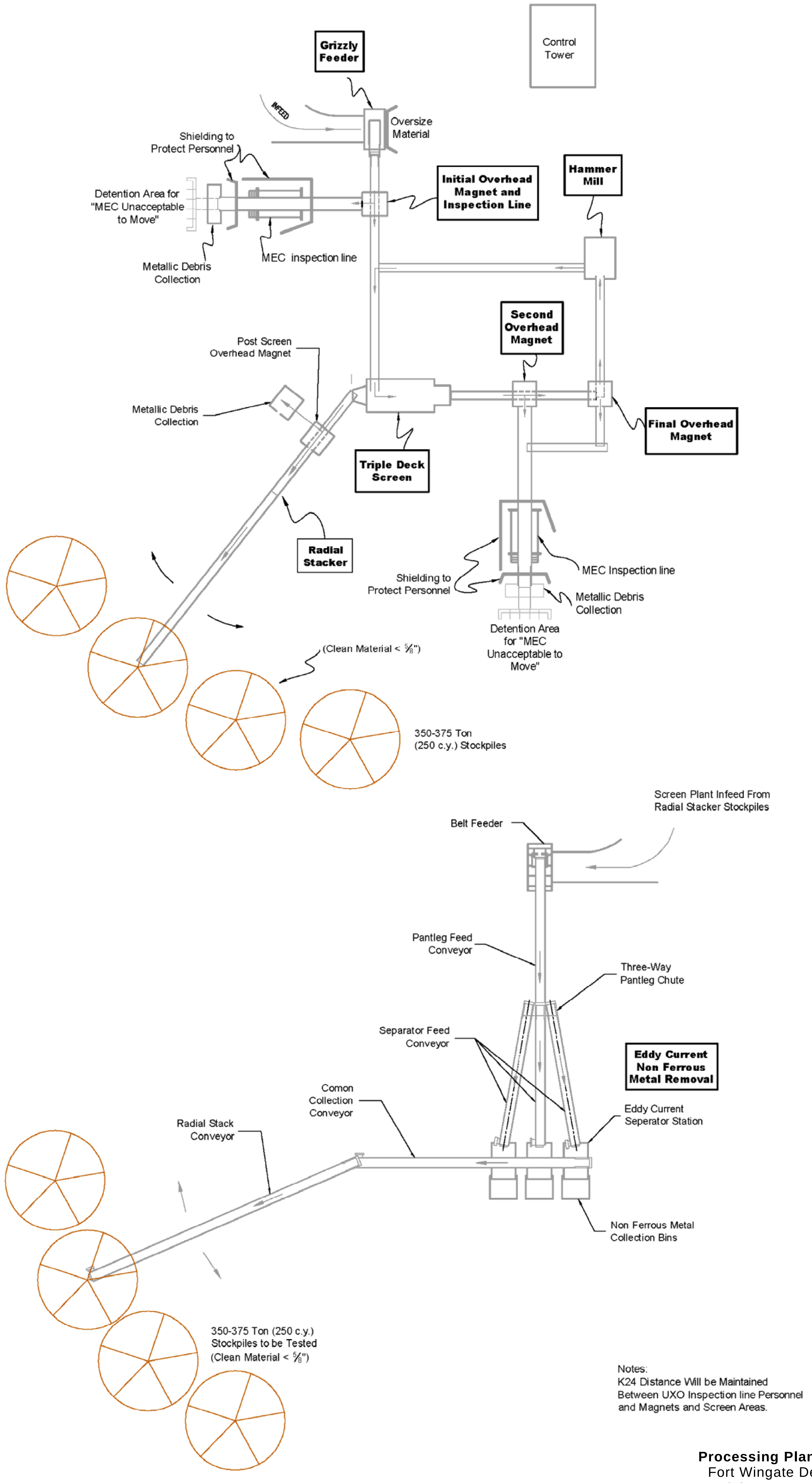

Notes:
K24 Distance Will be Maintained Between UXO Inspection line Personnel and Magnets and Screen Areas.

Processing Plant Schematic
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: DPG	Date: 12/10/2012	**Figure 3-5**
Checked By: JC	Project No: 16170613	

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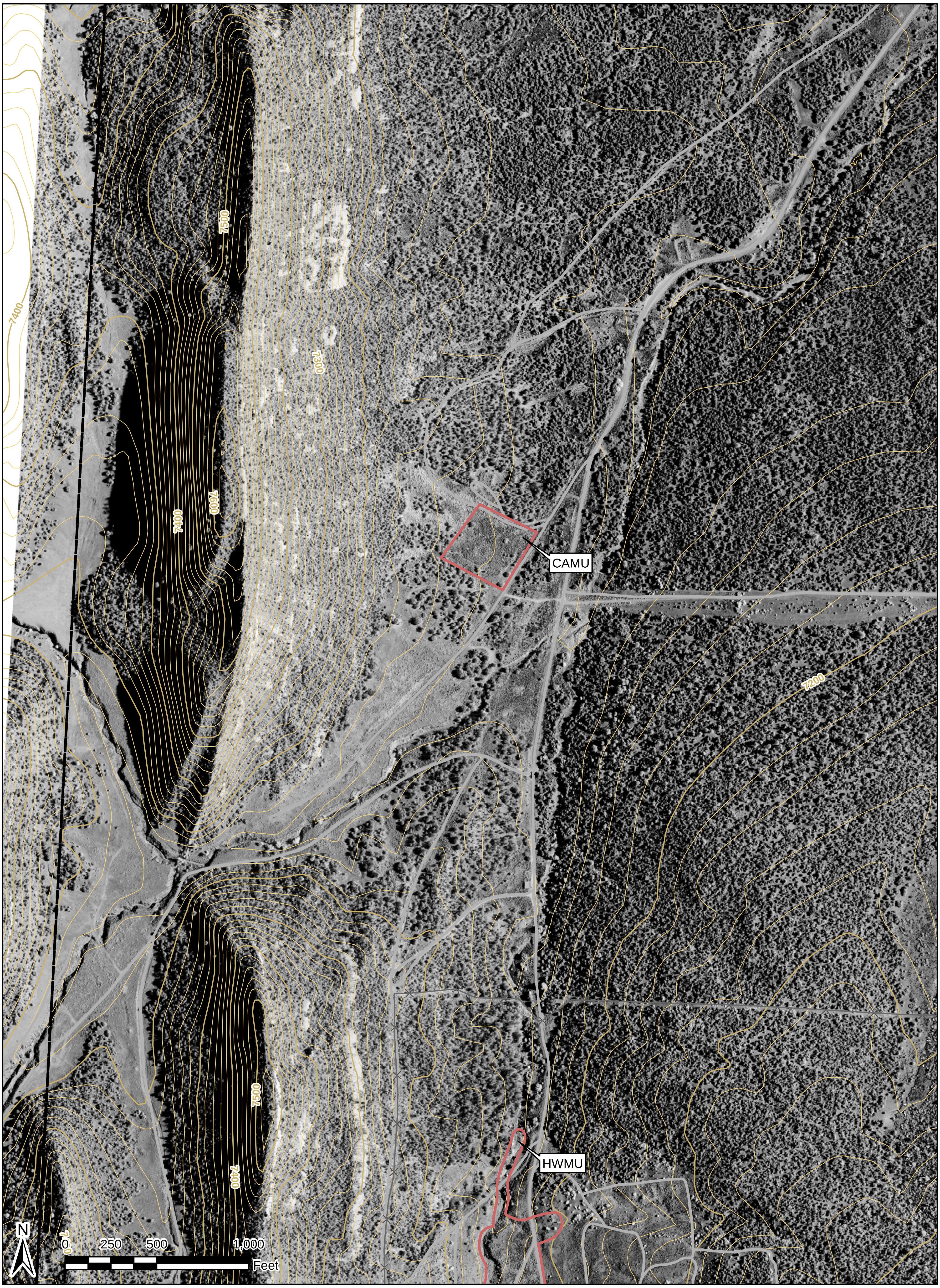
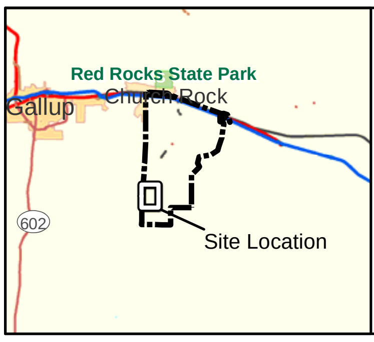


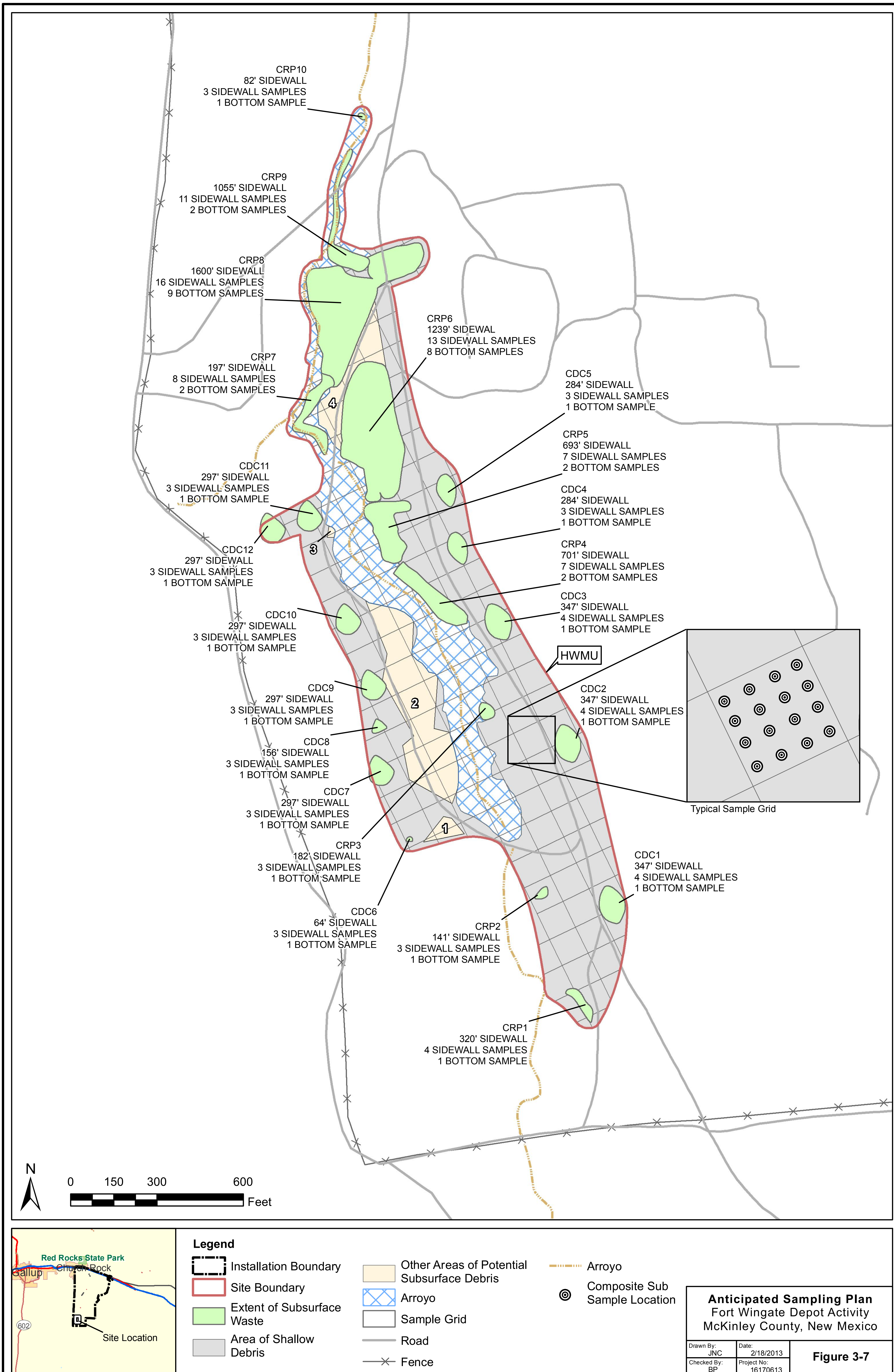


Legend

- Installation Boundary
- Site Boundary
- Road
- Fence
- 20' Topographic Contour
- 100' Topographic Contour

CAMU Location
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 3-6**
Checked By: BP	Project No: 16170613	



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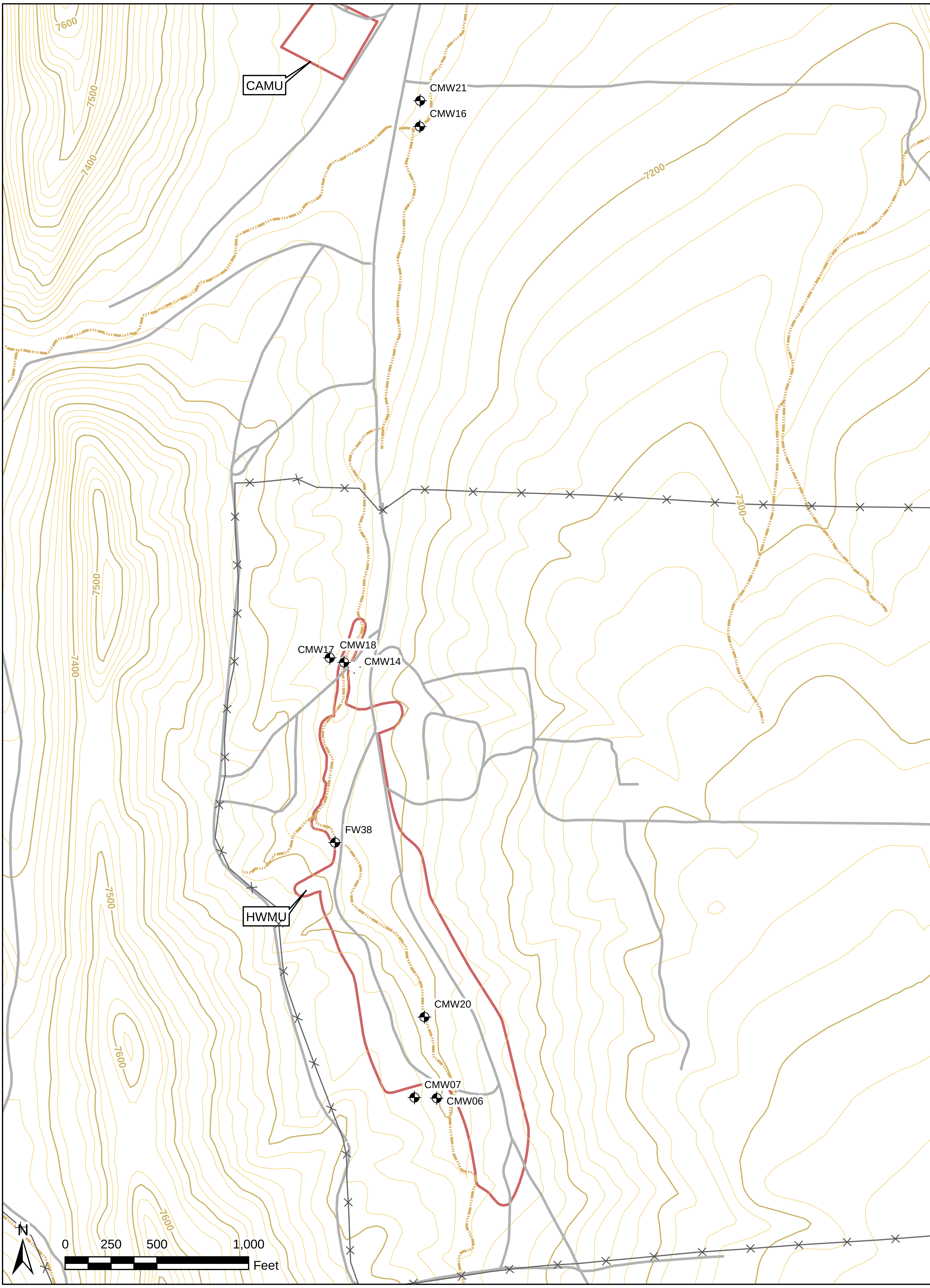

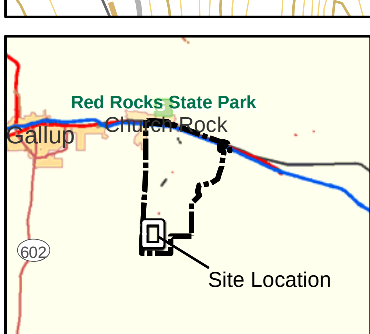

Legend

- Installation Boundary
- Site Boundary
- Road
- Fence
- Arroyo
- 20' Topographic Contour
- 100' Topographic Contour
- Wells to be Abandoned

Groundwater Monitoring Well Locations
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 3-8**
Checked By: BP	Project No: 16170613	

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The QCP presented in this section addresses the QC procedures to be followed during the completion of MEC-related removal activities for this project. This QCP summarizes the project QC program, including report submittals, field activity control, field changes, equipment maintenance, audits, deficiencies and noncompliance, corrective actions, and associated documentation and recordkeeping. The QCP applies to work performed by the contractor and its subcontractors and adheres to the requirements specified in MMRP industry standard guidance documents published by DoD, Department of the Army, DDESB, and USACE. The project QC procedures associated with MC sampling are presented in the UFP-QAPP (Appendix E).

4.1 INTRODUCTION

The overall objectives of this QCP are to describe the specific operating requirements of the removal activities and to establish procedures such that the quality of the work performed is in compliance with the requirements of the project. Specifically, this plan:

- Identifies the specific project QC objectives for the associated WP project elements
- Identifies the WP QC organization and defines each individual's respective authority, responsibilities, and qualifications
- Defines WP communication, documentation, and recordkeeping procedures
- Establishes WP QC procedures, including the necessary supervision and inspections to confirm the work is completed in compliance with specifications
- Describes procedures for the management of deficiencies, nonconforming conditions, and field change requests (FCRs)
- Defines procedures for WP submittals

4.2 QUALITY ASSURANCE

Quality assurance (QA) will be monitored by the USACE in accordance with the Quality Assurance Surveillance Plan (QASP) (URS 2010d). USACE will evaluate field activities to verify the approved HWMU WP is being followed and the project data quality objectives (DQOs) are being met. QA audits and inspections will be performed in accordance with established USACE guidelines and the project QASP.

4.3 QUALITY CONTROL PERSONNEL

QC is the function that provides independent review and assessment for the contractor PM, senior management, field personnel, and stakeholders. QC personnel work with the MR QPM, PM, and other project personnel to ensure the project QCP is implemented, to identify project activities that could benefit from improvement, and verify the implementation of improvements or corrective actions. This project will have a UXOQCS capable of implementing the three-phase control process, conducting surveillance activities, performing acceptance sampling inspections, and meeting or exceeding the UXOQCS requirements of TP 18 (DDESB 2004). The QC program will also include a QC Geophysicist who will be responsible for the quality of geophysical data delivered to the USACE and a Chemical QC Manager who will review the quality of chemical analytical data. These QC personnel will report directly to the MR QPM. Project roles and responsibilities are described in Section 2.3 of this document.

4.4 PROJECT PERSONNEL QUALIFICATIONS

UXO personnel will be qualified to perform their assigned jobs in accordance with DDESB TP 18 (DDESB 2004). The UXOQCS will verify UXO personnel have the required certifications to complete their assigned role on the project. UXO personnel minimum qualifications include:

- SUXOS – This individual will be a graduate of a military explosive ordnance disposal (EOD) School of the U.S., Canada, Great Britain, Germany, or Australia; a formal training course of instruction (see DDESB TP 18 Chapter 3 for detailed requirements); or an EOD assistant course. This individual will have a minimum of 10 years of EOD/UXO experience combined, possess significant experience in each aspect of MR actions or range clearance activities, and have a minimum of 5 years experience in supervisory positions.
- UXOSO – This individual will be a graduate of a military EOD School of the U.S., Canada, Great Britain, Germany, or Australia; a formal training course of instruction (see DDESB TP 18 Chapter 3 for detailed requirements); or an EOD assistant course. This individual will have a minimum of 8 years of EOD/UXO experience combined, possess experience in each phase of MR actions or range clearance activities, and applicable safety standards.
- UXOQCS – This individual will be a graduate of a military EOD School of the U.S., Canada, Great Britain, Germany, or Australia; a formal training course of instruction (see DDESB TP 18 Chapter 3 for detailed requirements); or an EOD assistant course. This individual will have a minimum of 8 years of EOD/UXO experience combined, possess experience in each phase of MR actions or range clearance activities, and the handling and storage of munitions and commercial explosives.
- UXO Technician III – This individual will be a graduate of a military EOD School of the U.S., Canada, Great Britain, Germany, or Australia; a formal training course of instruction (see DDESB TP 18 Chapter 3 for detailed requirements); or an EOD assistant course. This individual will have a minimum of 8 years of EOD/UXO experience combined, and have prior military EOD and/or commercial UXO experience in MR actions or range clearance activities.
- UXO Technician II – This individual will be a graduate of a military EOD School of the U.S., Canada, Great Britain, Germany, or Australia; a formal training course of instruction (see DDESB TP 18 Chapter 3 for detailed requirements); or an EOD assistant course. If this individual is a graduate of one of the military EOD Schools listed above, the minimum years of EOD/UXO experience is not applicable, but the individual is required to have had prior military EOD experience. If this individual is a graduate of a formal training course of

instruction or EOD assistant, a minimum of 3 years of experience in MR actions or range clearance activities, and specific project/explosives safety training is required.

- UXO Technician I – This individual will be a graduate of a formal training course of instruction (see DDESB TP 18 Chapter 3 for detailed requirements) or an EOD assistant course. This individual will have successfully completed formal course instruction appropriate to this skill level.

4.4.1 Unexploded Ordnance Certifications and Training Requirements

The UXOQCS will be responsible for reviewing certifications and verifying the UXOSO has a monitoring program in place to identify when project personnel require refresher training. UXO certifications will be maintained on-site by the UXOSO. Project UXO personnel training qualifications and requirements are discussed in greater detail in the APP (Appendix D). Per DID MMRP-09-012, Personnel Qualifications Certification Letter (USACE 2009e) a Personnel Qualification Certification Letter is included in Appendix H.

4.4.2 Health and Safety Training Certifications

Health and safety requirements for project personnel have been established in accordance with the Occupational Safety and Health Administration (29 CFR 1910.120) requirements for hazardous waste site works and URS policies and procedures. Training certifications for field project personnel will be maintained on-site by the UXOSO. Project personnel training requirements are discussed in greater detail in the APP (Appendix D).

4.5 VISITOR DOCUMENTATION

Authorized visitors are defined as DoD, Department of the Army (DA), USACE, or other personnel (Environmental and Munitions Center of Expertise [EM CX], DDESB, headquarters Safety, etc.) conducting project or mission related functions, such as QA representatives, safety and quality inspectors (including geophysicists performing QA functions), and project management, the NMED, and USEPA. Authorized visitors must be escorted while in the exclusion zone and be approved for entry into the exclusion zone in accordance with EM 385-1-97 (USACE 2008b). No more than two authorized visitors will be permitted in the exclusion zone at any given time. Visitors on-site during MEC activities will be required to log in and out of the site. The UXOQCS will verify visitors to the site have received a briefing by the UXOSO and/or SUXOS of the site activities scheduled the day of the visit, the health and safety issues associated with those activities, areas of the site that are off-limits, whether visitors have the required PPE, and that visitors are briefed and understand the established danger warning system used on-site by project personnel. The UXOSO will document the visitor briefing and maintain the documentation onsite for the duration of the project.

4.6 QUALITY PROGRAM

4.6.1 Preparation, Review, and Approval of Project Procedures

The Project Procedures will be reviewed by the UXOQCS, MR QPM and MR SPM, SUXOS, QC Geophysicist, Project Geophysicist, and the PM. Periodic changes to the procedures can be issued through the implementation of FCR forms. An example FCR form is included in Appendix F. The FCR changes will be incorporated into the operating procedures and be managed by a PM-appointed document control person to confirm the superseded procedure is removed from service. Each relevant supervisor/manager receiving the FCR will review the requirements with their staff.

4.6.2 Field Change Request Form Process

An FCR form will be completed to initiate changes to an approved, documented process. Field team members assigned to perform or supervise a task that recognizes the necessity for a change in the task procedures are responsible for initiating, completing, and submitting the FCR for review and approval of appropriate field changes. The FCR process includes review and approval of the recommended change by the site's Senior UXO staff, QC Geophysicist, MR QPM, MR SPM, PM, and appropriate Contracting Officer's Representative (COR) prior to process alteration in the field and incorporation into a revised work plan element. The USACE may ask the FCR be reviewed by appropriate regulatory personnel. When an FCR is approved, changes to procedures will be reviewed with project personnel during the morning meeting/safety briefing prior to implementation. FCRs will be numbered sequentially and will be maintained in the project files on-site. FCRs should be approved or disapproved in no more than one week.

4.6.3 Definable Features of Work

The definable features of work are the major categories of work to be performed and form the framework for the QC approach for the project. The definable features of work are listed in **Table 4-1** with the associated inspection points, QC actions, and acceptance criteria. Responsibility for confirming that these QC actions have been performed lies with the UXOQCS and QC Geophysicist.

4.7 THREE-PHASE CONTROL PROCESS

The UXOQCS and QC Geophysicist will verify compliance with project requirements through implementation of the three-phase control process (Engineer Regulation, 1180-1-6, Contracts-Construction Quality Management [USACE 1995b] and Engineer Pamphlet, 715-1-2 A Guide to Effective Contractor Quality Control [USACE 1990]). This process confirms that project activities comply with the approved plans and procedures.

Elements of the three-phase control process are: (1) preparatory phase, (2) initial phase, and (3) follow-up phase. Each control phase is important for obtaining a quality product. However, the preparatory and initial phases are particularly valuable in preventing problems. Production work is not to be performed on a definable feature of work until successful preparatory and initial phase inspections have been completed and documented. The specific QC monitoring requirements for the definable features of work are listed in **Table 4-1**. The DQCR (Appendix F) will be used to document the three-phase control process.

4.7.1 Preparatory Phase

Preparatory phase inspections are performed prior to beginning a definable feature of work. The purpose of the inspection is to review contracts, plans, specifications, SOPs, and other applicable documents and to verify that necessary resources (e.g., equipment and personnel), conditions, and controls are in place before work starts. This inspection phase is conducted with the people responsible for performing each definable feature of work to include managers, supervisors, and applicable subcontractors checking that personnel know what is expected and understand their roles. The U.S. Army is invited to attend but is not required. The PM is responsible for verifying that:

- Appropriate plans and procedures are developed, coordinated, and approved
- Personnel required for the activity are identified and positions filled
- Training has been identified and completed
- Preliminary work and coordination have been completed
- Equipment and materials required to perform the activity have been identified and are available
- Reviews have been performed

The UXOQCS and QC Geophysicist are responsible for assisting the PM in conducting preparatory phase inspections and verifying the following conditions:

- Appropriate plans and procedures have been developed, approved, and reviewed and are available
- Personnel identified are available and meet the requirements/qualifications for the position or waivers have been obtained
- Required training has been performed, documented, and acknowledged
- Preliminary work and coordination have been completed

Deficiencies identified during preparatory phase inspections will be documented and corrective action taken prior to beginning work. The UXOQCS or QC Geophysicist will verify that corrective action has been completed and is appropriate before production work begins.

4.7.2 Initial Phase

Initial phase inspections are performed when a work process begins for each crew or team performing a definable feature of work. The purpose of the inspection is to:

- Verify the work to be performed will be in compliance with procedures and contract specifications
- Verify equipment and personnel on-site meet the requirements established during the preparatory phase
- Review acceptable level of workmanship for site personnel who will be conducting the definable feature of work
- Review the preparatory phase inspection report
- Resolve any differences of interpretation

The initial phase is the first documented UXOQC field compliance inspection for a definable feature of work. Initial phase inspections may be repeated when acceptable levels of quality are not demonstrated or at the discretion of the UXOQCS or QC Geophysicist for geophysical-related efforts.

The UXOQCS and onsite QC Geophysicist are responsible for conducting initial phase inspections and verifying:

- Equipment is on-hand, functional, in specification, and appropriate for the job
- Required personnel resources are on-site and properly qualified to perform the definable feature of work in accordance with the preparatory phase
- Material and supplies are on-hand and meet contract specifications
- The level of quality expected is understood by workers
- Compliance with procedures and specifications
- An acceptable level of workmanship is being performed
- Corrective action taken during the preparatory phase inspection has resolved the deficiency and prevents recurrence
- Quality issues and any differences of interpretation by workers are resolved
- Briefing on the process improvement program and FCR process has been completed

Deficiencies identified during initial phase inspections will be documented and corrective action taken. The UXOQCS or QC Geophysicist will verify that corrective action has been completed and is appropriate to prevent recurrence of the condition. When corrective action cannot be completed in a timely manner or the root cause is not known, immediate corrective action that fixes the deficiency may be taken and verified, and work may be continued pending root cause analysis and more appropriate corrective action.

4.7.3 Follow-up Phase

Follow-up phase inspections are performed after a work process has begun and periodically throughout the work process. The purpose of the inspection is to evaluate whether the process is being completed in accordance with agreed upon standards and to evaluate whether the level of quality meets QC acceptance criteria. The UXOQCS and QC Geophysicist are responsible for monitoring work processes and verifying continued compliance with the HWMU WP and QC criteria requirements. Follow-up phase inspections are excellent opportunities to observe work processes and identify possible process improvements (Section 4.15).

Deficiencies identified during follow-up phase inspections will be documented and corrective action taken. The UXOQCS or QC Geophysicist will verify that corrective action has been completed and is appropriate to prevent recurrence of the condition. When corrective action cannot be completed in a timely manner or the root cause is not known, immediate corrective action that fixes the deficiency may be taken and verified, and work continued pending root cause analysis and more appropriate corrective action.

4.8 DOCUMENT CONTROL

A Quality Management System that conforms to the International Organization for Standardization 9001 quality standard extends to all personnel and subcontractors engaged in project work, and applies to all project phases from planning through completion.

4.8.1 Document Preparation, Review, and Approval

The project will implement the following requirements:

- Each document will have a primary author, who verifies the document control procedures are adhered to.
- Each deliverable will undergo a detail check for correctness, completeness, and technical adequacy by a qualified project team member.
- Each deliverable will undergo an Independent Technical Review (ITR) to verify and validate assumptions, plans, results, and conclusions, as well as ensure the deliverable meets contractors' and the USACE's professional standards.
- Detail checks and ITRs are completed by personnel who are:
    - Responsible for implementation
    - Qualified by experience, education, or training to provide a critical review

- Responsible for checking that the document does not contain information or direction that conflicts with documents of superior authority or other documents that relate to the same work or subject
- Participants in the original review and approval, unless designated otherwise

4.8.2 Document Distribution and Retrieval

The most current revisions of documents that prescribe technical, management, and quality requirements are internally and externally distributed to USACE, Tribal, and regulatory personnel.

Documents that prescribe obsolete technical and quality requirements will be clearly marked as obsolete and the assigned project document control representative will be informed upon completion of this process. The recipients are responsible to confirm the revised document has replaced the obsolete one for affected documents.

Project document control will track changes and confirm official notification has been received by the appropriate personnel. Additionally, the UXOQCS or QC Geophysicist will conduct random surveillance of documents in the field and for field office use to validate the most current documents are in place and being implemented.

4.8.3 Field Records Management

Records (e.g., field data forms, field note copies, personal digital assistant [PDA] files) will be maintained in the on-site project office and if applicable, downloaded into the project's main database on a daily basis. Records will be stored according to the date they were created, the team who created them, and location identification (ID). Field forms not in a PDA system will also be scanned for digital delivery, if required. The UXOQCS, QC Geophysicist, and/or MR QPM will conduct random inspections of database records for consistency, accuracy, and quality.

4.9 SURVEILLANCE

QC is an appropriate evaluation performed on contractually defined products, to confirm those products fully meet the prescribed requirements and comply with applicable laws, regulations, and sound technical practices.

QC surveillance is an ongoing process that will take place throughout the project on a daily basis. Surveillance is the process of monitoring and verifying the status of procedures, methods, conditions, products, processes, and services, and the analysis of records in relation to requirements to confirm that the requirements for quality are met. Surveillance will be conducted on a scheduled or unscheduled basis and is conducted as part of the follow-up inspection process of the three-phase control system. **Table 4-1** presents the project's definable features of work with associated QC actions for project activities including the frequency of the inspection and the party responsible for performing the activity. The UXOQCS and/or QC Geophysicist will conduct surveillance to collect objective evidence to document and report conditions observed. Daily QC surveillance of program activities and processes will be performed to evaluate completion of required activities and their effectiveness. QC surveillance activities will be documented on the DQCR and will be part of the project record.

4.10 INSPECTION SAMPLING

An inspection is an activity that involves measuring, examining, testing, and gauging one or more characteristics of an entity and comparing the results with specified requirements in order to establish whether conformance is achieved for each characteristic. QC field inspections/surveys required will be performed with the same type of instrument that was used by Operations to conduct the activity.

MEC removal operations that do not meet acceptance criteria will be controlled as a nonconforming condition and documented in accordance with the process described in the Material or Activity Nonconformances section of SOP No. 7 (Appendix I). Field work data and database information that do not meet the acceptance criteria will not be released to the client until corrected and the verification of corrective action, final inspection, and acceptance has been completed by QC. Inspection sampling elements and criteria are identified in **Table 4-l**.

4.10.1 Inspection Methodology

The primary purpose of a QC program is to validate tasks, procedures, and processes to verify that work performed complies with project, work plan, and industry specifications and applicable regulations. This will be accomplished through implementation of inspection and surveillance procedures previously discussed. MMRP QC industry standards practices will be applied to provide additional confidence and risk reduction. The QC program will implement control procedures that include surveillances, three-phase control inspections, and final acceptance sampling inspections.

4.10.2 Quality Control Program

QC seed items will be used at the MRS grid survey areas as a QC control measure to check that geophysicists, geophysical equipment, and UXO intrusive teams are operating in compliance with plans and procedures. The method involves burying QC seeds ISOs within areas where geophysical surveys will be performed. The items will be placed at depths and orientations that, when surveyed effectively, will cause instrument responses that indicate the presence of a buried metallic item. At least one ISO item per acre of DGM will be placed for the MRS.

If an ISO item was not selected by the processing geophysicists or not recovered by the UXO intrusive teams, the UXOQCS and QC Geophysicist will report this result to the PM, SUXOS, Project Geophysicist, and MR QPM. An analysis will be conducted by Operations with the support of QC to determine why the ISO item was not located and/or recovered. The result of not locating and/or recovering an ISO item may result in a nonconformance report and QC non-acceptance requiring some level of rework to reestablish product confidence.

4.11 EQUIPMENT MAINTENANCE, TEST, AND CHECKS

Tools, instruments, and equipment deployed to the project site will be properly maintained and calibrated (as necessary) in accordance with the instrument manufacturer specifications, standard industry practice, or SOPs. This applies to equipment used in the field for activities that have an impact on quality, including geophysical instruments, communications equipment, vehicles/machinery, environmental monitoring equipment, and PPE. Equipment will be visually checked for damage prior to use. Preventative maintenance on equipment will be performed on a regular basis according to the manufacturers operating instructions or recommendations. Critical spare parts will be kept on hand to minimize downtime, particularly batteries for GPS, radio, and geophysical equipment. Maintenance will be recorded in field logbooks.

The quality of geophysical data sets is dependent on the operational capabilities of the equipment used. By manufacturer's design, these instruments are calibrated at the time of manufacture and do not require field calibration. Manufacturer's manuals will be maintained on-site for reference.

To check that equipment is fully capable and will perform in accordance with the manufacturer's specifications, pre-operational and post-operational checks will be performed daily. Following these checks, equipment that is found unsuitable will be immediately removed from service. These checks will provide QC data indicating the proper functionality of the instruments. The UXOQCS or QC Geophysicist will verify these actions using the three-phase control process and QC surveillance.

4.12 GEOPHYSICAL QUALITY CONTROL

The QC plan for the DGM survey was developed in accordance with DID MMRP- 09-004 (USACE 2009c) and Chapter 9 of EM 1110-1-4009 (USACE 2007a). The geophysical investigation will follow a multi-step process to verify high-quality data capture, processing, and interpretation and execution of good-quality workmanship. These steps are intended to: 1) verify positional accuracy and precision of collected data; 2) observe and verify good field practices are employed; 3) verify equipment is operating and that data are representative and repeatable; 4) confirm adequate data coverage, completeness of data, and sufficient contrast between target and background response to identify significant geophysical anomalies; 5) evaluate the data to determine if discovered subsurface sources are representative of the geophysical anomaly that led to their detection and mapping; and 6) verify the project DQOs are met.

QC inspections/surveillance points performed during establishment of the IVS include area selection, seed item placement and survey, repeat data, anomaly reacquisition, and static position test QC checks. All IVS establishment QC actions will be performed or confirmed by the QC Geophysicist.

QC inspections/surveillance points performed as part of the DGM surveys include equipment maintenance, daily IVS checks, instrument standardizations checks, battery strength checks, positioning accuracy test, warm-up test, null instrument check, personnel check, cable shake test, static test, standard instrument response test, static system relaxation test, latency test, and repeatability test. These DGM QC actions will be performed by the geophysical team and reviewed by the UXOQCS and/or QC Geophysicist. Data download checks will be performed by the geophysical team/Processing Geophysicist and reviewed by the QC Geophysicist. Field record checks will be performed and reviewed by the QC Geophysicist.

QC inspections/surveillance points performed as part of the digital geophysical data processing include data quality checks, office review of field forms, instrument standardization checks, data sample spacing checks, and instrument drift checks. These QC actions or processes will be performed by the Processing Geophysicist and reviewed by the QC Geophysicist. Processed data checks will be performed by the Processing Geophysicist or Project Geophysicist and reviewed by the QC Geophysicist. Data deliverable checks will be performed by the Processing Geophysicist or Project Geophysicist and reviewed by the QC Geophysicist.

Operations verification includes verifying that the UXO team resolved the target anomalies. Verification of the target anomaly resolution will be performed by the intrusive teams and reviewed by the Project Geophysicist/SUXOS prior to turning over the product for QC inspection. QC acceptance sampling inspections of the target anomaly resolution process includes the UXOQCS performing inspections of a sample of completed target anomaly investigation locations that have been turned over by the UXO team.

4.12.1 Geophysical Investigation Equipment Quality Control

The following QC procedures will be performed and documented during both the IVS and production data collection process and reviewed by a qualified geophysicist on a daily basis. The geophysical equipment QC checks to be performed at the start of the project and on a daily basis are described in the following sections.

4.12.1.1 Initial Geophysical Equipment QC Checks

The following checks will be completed at least once at the beginning of the DGM activities. These tests will be performed at the initial IVS location.

- Six Line Test. This test will be performed on the IVS. The test line will be marked to facilitate data collection over the exact same line each time the test is performed. Each track in the IVS will be mapped each direction, at a slow, normal, and fast pace. Repeatability of response amplitude, positional accuracy, and latency will be evaluated. The acceptance criteria are ±20 percent for repeatability of amplitude response and ±25 cm for positional accuracy. Comparison of noise levels between the three acquisition speeds will also be performed.

- Pull Away Test. This test demonstrates the effects of navigational equipment and/or vehicles used to tow sensors or arrays. With the instrument collecting data in a static (background) test, navigational equipment and/or vehicles are positioned as they would be in the field survey and pulled slowly away from the sensor to gauge any differences in response. This must be performed twice: once with the navigational equipment (and/or vehicle) power off, the second with the equipment power on. A simple response shift may be observed when the equipment is in normal operating position, compared to values when it is distant; however, this is easily removed from the data. If excessive noise is noted, steps will be taken to identify the source and correct the problem.

4.12.1.2 Daily Geophysical Instrument QC Checks

The following daily QC checks will be performed at locations in which an IVS has been installed. The location of the IVS used will depend on the details of that day's data collection activities, and will be chosen based on convenience and efficiency.

- Positional Accuracy. This test will be conducted to verify the proper set-up and functioning of the RTK GPS base station. Prior to data collection, coordinates are measured at an established control point to record any offset. Acceptance criteria are ±20 cm from the established coordinates for the point.

- Equipment/Electronics Warm-Up. Equipment/electronics warm-up will be conducted at power-up to minimize sensor drift due to thermal stabilization. The manufacturer's instructions for equipment startup will be followed and at least 15 minutes of warm-up will be performed for the EM61. If instrument readings fail to stabilize within the recommended warm-up period, an additional five minutes will be added. If instrument readings fail to stabilize after the additional five minutes, troubleshooting procedures will be initiated.

- Null Instrument. The instrument will be nulled at the start of each day's activities following equipment warm-up and prior to data collection. Nulling the instrument corrects for previous instrument drift and normalizing background values by adjusting the signal response for each time gate to 0 mV.

- Static Background Test. This test will be performed to quantify instrument background readings or electronic drift and locate potential interference spikes in the time-domain. A minimum of three minutes of static background data will be collected after instrument warm up. The instrument operator will monitor readings to confirm stability. Acceptance criteria are 2 mV on the first reported timegate (Channel 1) for the static background test.

- Personnel Test. This test will be conducted on survey personnel to confirm that potential interference sources (e.g., pocketknives, pens, buckles, steel-toed boots, cell phones, and portable radios) have been removed from their bodies. Personnel who will be performing the surveys or who will be coming in close proximity to the survey equipment will approach the sensor and have the instrument operator monitor and record the results. An acceptance criterion of 2 mV on Channel 1 will be used.

- Vibration Test (Cable Shake). This test, also known as a cable shake, will be used to identify shorting cables and problematic connectors. Cables will be shaken for a minimum of 5 seconds with the instrument held in a static position. If shorts are found, the associated cables and/or connectors will be replaced immediately. The vibration test will be repeated once repairs are complete. Acceptance criteria include an absence of data spikes in the data profile during the test. If data spikes persist, troubleshooting procedures will be initiated. If the data spike cannot be resolved, the equipment will be replaced.
- IVS Test. This test will be performed to determine impulse response and repeatability of the instrument to three ISO items, the ability to locate these items accurately, and also verify consistency in background noise levels during mapping. Each IVS track, background and seeded, will be mapped in each direction at the normal data collection pace. Acceptance criteria for data repeatability include ±20 percent for response amplitude of ISO items and ±25 cm for positional accuracy.

4.12.2 Data Quality Checks

During the processing of field data, the Site Geophysicist will review the individual data profiles to identify abnormal spikes in the measured data for larger than usual fluctuations in the background noise level. The Project Geophysicist will review QC issues and will determine whether the data are useable or the grid/area should be resurveyed. They will also assess the root cause of the problem and make recommendations for corrective actions.

4.13 NONCONFORMANCE/CORRECTIVE ACTION

Nonconformances will be addressed via corrective action in a manner described in this section and the Material or Activity Nonconformances section of SOP No. 7 (Appendix I).

4.13.1 Nonconformance Identification

Circumstances that prevent a work process to deliver a product that is compliant with work plan requirements will be promptly identified, documented as a nonconforming condition, investigated, and corrected appropriately. Project personnel have the responsibility, as part of their normal work duties, to promptly identify and report conditions adverse to quality. The methodology for the nonconformance report (NCR) process is described in the Material or Activity Nonconformances section of SOP No. 7 (Appendix I). The status of NCRs will be maintained in a log and progress of their resolutions will be documented and reviewed to confirm prompt attention to their conclusion.

4.13.2 Resolution, Corrective Action, and Verification

The appropriate level of operations management will evaluate the cause of a NCR and recommend solutions for correcting the nonconforming condition identified. Actions and technical justifications for an action proposed to resolve the NCR will be reviewed and approved by personnel responsible for the technical aspect of the work.

Corrective action is the specific action or actions taken to correct the immediate nonconforming condition and to reduce or prevent the likelihood of future occurrences. Examples of corrective action for the immediate situation include rerunning a portion of a test/operation that was not conducted in accordance with procedures, reworking a specific activity or portion thereof, or rerunning the required tests. QC personnel will verify and monitor implementation of corrective action, monitoring the effectiveness of preventive action to prevent recurrence and document results/findings on the NCR form.

The UXOQCS will maintain an NCR log. The NCR log will be used to track and control each nonconforming condition. At a minimum the log will contain the date each nonconforming condition was discovered, NCR tracking number, a brief description of the condition, the location, department/manager responsible for disposition, recommended disposition, NCR closure date, and status of NCRs. The NCR log will be maintained in the project files and available on-site. Copies of the NCR log will be included as an appendix to the Removal Report.

4.13.3 Materials and Equipment Nonconformance

QC personnel verify the following requirements are implemented:

- Nonconforming products (ie. geophysical data, grids, databases, etc.) are not released to the client.
- Materials and/or equipment that do not conform to prescribed technical and/or quality requirements are tagged or otherwise identified, documented, and reported as nonconforming. The documentation will include:
    - Identification of the technical and quality requirement(s) with which the item is not in compliance.
    - Identification of the current status of the item (i.e., whether the item is on hold or whether its use is conditional).
- Nonconforming materials and equipment are segregated, when possible, from conforming materials and/or equipment to the extent necessary to preclude their inadvertent use and comingling.
- The status of nonconforming products, material, and/or equipment and the progress of their resolution are documented and routinely reviewed to confirm prompt attention to conclusion.

4.13.4 Deficiency Reporting

Deficiencies and nonconforming conditions are very similar and are conditions that, once identified, will be resolved or corrected prior to acceptance of an item or product. A deficiency is a condition that can be corrected quickly by standard methods during the normal course of work. A deficiency usually is not systemic in nature.

It will be the responsibility of project personnel to identify deficiencies and notify their supervisor or manager as soon as the conditions are identified. Determination of deficiencies will be supported with objective evidence. Deficiencies will be evaluated, documented, resolved, or corrected and may be considered as opportunities to improve the deficient process (Section 4.15).

4.13.5 Preventative Action

Preventive action is the specific action or actions taken to prevent or reduce the likelihood of future occurrences of nonconformance. Examples of preventive actions are clarifying or refining procedures, allowing for additional training, and/or enhancing monitoring.

Preventive action measures will be selected to prevent or reduce the likelihood of future occurrences and will address root causes to the extent identifiable. Selected measures will be appropriate in relation to the seriousness of the nonconformance and will be realistic in terms of the resources required to implement them. Preventive action measures will be communicated with affected staff, and a record of preventive action taken will be documented as part of the NCR and maintained for the project record.

4.13.6 Trend and Root Cause Analysis

The trend analysis of QC and/or QA audits, subcontractor/supplier surveillance reports, and nonconformance will include the following information:

- Total number of audit findings and observations, surveillance reports, and NCRs for each area of the QCP
- A summary of the root causes for the nonconformance consolidated for each area of the QCP
- Trends that are developing or that have developed

As necessary, the PM or designee, will perform a project trend analysis as a part of a periodic assessment. QC personnel will verify the implementation of preventive actions resulting from the trend analysis. The method for conducting root cause analysis of severity level 1 nonconformities identified by NCRs is presented in the Root Cause and Trend Analysis section of SOP No. 7 (Appendix I). This procedure also establishes the methodology to conduct trend analysis of nonconformities identified through NCRs, corrective actions, quality surveillance reports, and internal audit results.

This management assessment will propose and initiate measures necessary to deal with problems requiring preventive action. When preventive action necessitates a revision to the project procedures, the PM (or designee) will issue an administrative FCR describing the necessary change. QC personnel will verify implementation of the preventive action.

4.13.7 Lessons Learned

During the course of field activities, data or information may be discovered that could eliminate or reduce challenges and/or offer opportunities for quality and productivity improvements through value engineering. Lessons learned will be documented and communicated as soon as possible to allow access by project personnel. Lessons learned are considered valuable tools in updating plans and procedures for subsequent field activities. Lessons learned will be reviewed and distributed by the MR QPM.

4.14 STOP WORK AUTHORITY

When a condition is identified that is adverse to quality, the UXOQCS and/or QC Geophysicist have the authority to stop work until the condition is resolved. A stop work request may be issued for a portion of a process, which would allow as much work as possible to continue, thus limiting the impact of the stop work request on areas not affected by the condition. The UXOQCS will immediately notify the SUXOS, PM, MR SPM, and MR QPM, as appropriate, to determine resolution to the potential condition. Work will not resume until the identified condition has been resolved by the PM, MR QPM, and MR SPM.

4.15 PROCESS IMPROVEMENT PROGRAM

The process improvement program is designed to capture ways of improving processes. The program is based on the following principles:

- Quality has to be caused not controlled
- Creation of an environment that encourages participation and involvement
- Team members have valuable input into improving their processes
- By working together processes may be improved
- Teamwork is essential for effective and efficient project completion

QC personnel will brief the process improvement program to new personnel during initial training and during the preparatory phase of the three-phase control process. The briefing will emphasize the importance of employee participation in improving processes.

4.16 FIELD PROCESS COMPLIANCE AUDITS

Internal or external audits may be performed at selected project milestones to verify proper implementation of planned processes.

4.16.1 Internal Compliance Audits

An internal compliance audit may be performed at the direction of the PM, or at the discretion of the MR QPM as a result of the U.S. Army's request or repeated poor performance. In the case of an internal audit, pre- and post-audit briefings will be conducted to inform project management and the audited organizations of the planned audit scope or to communicate audit results, including concerns and findings. Daily briefings will be conducted as necessary to inform the audited organizations of the progress of the audit and potential findings or concerns.

4.16.1.1 Internal Compliance Audit Responsibilities

The MR QPM and MR SPM or designee may conduct internal audits on any MEC field activities and/or project activities. These audits will verify that established procedures and plans are in compliance with plan and procedure requirements and that the QCP has been effectively implemented.

4.16.1.2 Internal Compliance Audit Procedures

Internal audits will include examination of field equipment performance records used for MEC activities including operating and maintenance records, equipment testing records, equipment QC checks, result corrections, compliance with established MEC procedures and investigative plans, MEC activity documentation, overall safety and PPE implementation, and electronic data files on-site.

4.16.2 External Field Audits

The USACE OESS or designee may conduct external audits of MEC activities per the project QASP.

4.16.2.1 External Field Audit Frequency

External field audits may be conducted any time during the field operations. These audits may or may not be announced and are at the discretion of the USACE.

4.16.2.2 External Field Audit Process

External field audits will be conducted according to the field activity information presented in this Removal WP. The external field audit includes processes described in the project QASP.

4.16.3 Audit Records

If an audit is completed, the original records generated will be retained within the project files. Records will include audit reports, written replies, record of completion of corrective actions, and documents associated with the conduct of audits which support audit findings and corrective actions as appropriate.

TABLE 4-1
DEFINABLE FEATURES OF WORK AND QC ACTIONS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Definable Feature of Work	Inspection / Surveillance Point	Attribute	QC Action (performed or confirmed by)	Sampling Frequency	Acceptance Criteria
Prepare Plans	Army Draft/Tribal Draft/Final	N/A	Internal independent technical review (technical staff)	N/A	N/A
Pre-Mobilization Team Call	Readiness Review	Capture lessons learned and preparedness for field mobilization	Three-phase control (QC Geophysicist/UXOQCS/MR QPM)	N/A	N/A
Mobilization	Post Mobilization	All project resources to include personnel and equipment on site as planned	Three-phase control	N/A	N/A
Site Delineation (survey of boundary, grid, and control points)	Throughout	Survey accuracy	Three-phase control (UXOQCS)		In compliance with SOW
Surface Clearance	Grids being worked on by Operations	Verify removal of MPPEH from grids in accordance with WP procedures and criteria	Three-phase control (UXOQCS) to include random follow-up sampling inspections	Daily until completion	MPPEH removed
	Grids completed and turned over by operations	QC grid acceptance verifying that removal of MPPEH from grid(s) was completed by Operations in compliance with WP objectives and criteria	Final grid acceptance sampling inspections (UXOQCS) on a minimum of 10% of each grid completed by Operations	As grids are completed and turned over by Operations	MPPEH removed
Vegetation Removal	Throughout	Accommodate mechanical soil removal and safe and quality DGM	Three-phase control (UXOQCS/QC Geophysicist)	Daily until completion	Conducted in accordance with SOW provided and in accordance with WP requirements

TABLE 4-1
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FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Definable Feature of Work	Inspection / Surveillance Point	Attribute	QC Action (performed or confirmed by)	Sampling Frequency	Acceptance Criteria
Excavate Soil and Debris	Excavation of up to 1.5 feet of soil/debris from HWMU footprint	Remove MPPEH that would interfere with attaining high quality geophysical data	Three-phase control (UXOQCS/QC Geophysicist)	Daily until completion	Conducted in accordance with SOW provided and in accordance with WP requirements
	Excavation of deeper soil/debris at CDCs, CRPs, and other locations	Removal of debris from deep excavations	Three-phase control and final acceptance sampling on a minimum of 10% of the number of target anomaly locations excavated by Operations.	As deep excavation locations are completed and turned over by Operations	The sample of target anomaly locations selected for inspection are resolved below project threshold
Soil Screening	Screening plant equipment (i.e. screens, magnets, conveyors, and moving parts)	Moving parts of screening plant are operating safely and as designed	Three-phase control (UXOQCS)	Daily until completion of screening operations	Screening plant equipment is operating to meet soil sifting requirements in accordance with the WP
	After soil is processed through the screening plant	Removal of material greater than 5/8-inch in size	Three-phase control and final acceptance sampling of stockpiled soil (UXOQCS)	Throughout day during scheduled downtimes until completion screening	No metallic items greater than 5/8-inch and no MEC in processed material
	Inspection Line locations	Verify inspection line personnel are operating in accordance with WP requirements	Three-phase control and random sampling inspection of material classified as other debris and MD (UXOQCS)	Daily until screening operation is complete	Proper classification of materials
		Soil screened of metal down to smallest target object	Three-phase control and sampling of processed soil (UXOQCS)	One sample per 250 cubic yards of soil	No metallic objects larger than 5/8 inch

TABLE 4-1
DEFINABLE FEATURES OF WORK AND QC ACTIONS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Definable Feature of Work	Inspection / Surveillance Point	Attribute	QC Action (performed or confirmed by)	Sampling Frequency	Acceptance Criteria
IVS Establishment	Area selection	Minimal background noise	Review pre-seed survey (QC Geophysicist)	Pre-survey	Low background readings
	Seed item placement survey	Survey accuracy	Review survey data (QC Geophysicist)	All items in IVS	x, y = 2 cm z = 5 cm
	Repeat data	Amplitude and positional accuracy	Review data (QC Geophysicist)	Once for all equipment in field	±20% response amplitude ±25 cm positional accuracy
DGM	Static noise levels, cable shake and personnel tests	Background noise	Review static responses (QC Geophysicist)	Twice Daily	Background: Peak to peak variation ≤ 2 mV on CH1 requires review of data for noise
	IVS	Response to known ISO, location of known ISO	Review Results (QC Geophysicist)	Twice Daily	±20% of the standard ISO response, and ≤ 25 cm peak position
	Anomaly selection	Anomalies chosen by data interpreter	Identify target anomalies (QC Geophysicist)	10% of data to be reanalyzed	No more than 5% anomaly selection differences at or above the minimum response threshold
	Along line measurement spacing	Distance between data points	Measure data density (QC Geophysicist)	By data set	98% ≤ 25 cm along line
	Across line measurement spacing	Distance between transects	Measure data density (QC Geophysicist)	By area	90% ≤ 0.6 m across line, 98% ≤ 0.8 m across line, 100% ≤ 1 m across line
	Velocity	Average and top data acquisition speed	Measure acquisition system velocity (QC Geophysicist)	By area	98% ≤ 2.5 mph, or as determined in IVS
	Reasonable and representative	Data are within the expected response	Measure noise between samples and between timegates within samples (QC Geophysicist)	By data set and area	To be determined during survey of the IVS

TABLE 4-1
DEFINABLE FEATURES OF WORK AND QC ACTIONS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Definable Feature of Work	Inspection / Surveillance Point	Attribute	QC Action (performed or confirmed by)	Sampling Frequency	Acceptance Criteria
DGM (cont.)	Leveling	Leveling of data does not mask anomalies from target selection	Review leveled data for leveling errors (QC Geophysicist)	By area	Leveling accurately preserves peak to trough amounts and accurately levels to background
	Target list complete	All anomalies meeting target selection criteria are selected	Review target list (QC Geophysicist)	By area	Visual inspection of 100% of data, any unselected targets added manually, additional QC targets no more than 5% of target list
Anomaly Reacquisition	Anomaly reacquisition	Reacquire anomaly within critical radius	Review reacquire data (QC Geophysicist)	All selected anomalies	90% of all items within 1 m Peak offset radius £ 60 cm
	IVS	Response to a known ISO item within the IVS	Review Results (UXOQCS, QC Geophysicist)	Twice Daily	±20% of the standard ISO response
	Positional Test	Location of known control point	Review Results (UXOQCS, QC Geophysicist)	Beginning of day	Measured RTK GPS point within 25 cm of know control point
Intrusive Investigation	Target anomaly verification performed by operations	Verify for 100% of excavation locations that the geophysical target anomaly was resolved	Conduct verification (Field Geophysicist/ UXO Technician)	As operational excavations are completed	Target anomaly location is resolved below the project threshold
	Target anomaly excavation locations completed by Operations	Sample a minimum of 10% of the number of target anomaly locations excavated by Operations	Three-phase control and final acceptance sampling (UXOQCS)	As operational target anomaly excavations are completed	The sample of target anomaly locations selected are resolved below project threshold
	QC seed items (ISOs)	At least one ISO per 60 m by 60 m area intrusively investigated	Bury ISO items (UXOQCS)	Throughout, after mechanical removal is initially considered complete	ISOs are identified and selected in the data as target anomalies by Project Geophysicist and removed by the UXO intrusive teams

TABLE 4-1
DEFINABLE FEATURES OF WORK AND QC ACTIONS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Definable Feature of Work	Inspection / Surveillance Point	Attribute	QC Action (performed or confirmed by)	Sampling Frequency	Acceptance Criteria
MPPEH Inspection and Process	Throughout	Documentation of explosives safety status prior to release	Three-phase control to include a final random sampling inspection of MDAS prior to release (UXOQCS)	Continuous	MPPEH inspection process is in accordance with DoDI 4140.62 and USACE EM 385-1-97
Thermal Treatment of MD	Following thermal treatment of the MD	Verify the test results for the presence of explosives contamination using colorimetric agents	Three-phase control to include a final random sampling inspection of thermally treated material (UXOQCS)	After batches of MD have been thermally treated	Thermally treated material passes the colorimetric test
Data Management	Data backup and storage	Verify files to be backed-up are present on backup media	Verification reviews (technical staff)	Daily for the first week of the project, then once a week	All new files must be present on backup media and media must be readable
	Data transfer with PDA	Verify target files to be downloaded are present prior to going into the field. Verify that intrusive investigation data files are present for each of the targets prosecuted and data forms are completely filled out after completion of daily intrusive investigation activities	Verification review (technical staff)	Daily for the first week of the project, then once a week	Successful data transfer
MEC Disposal and/or Burn Operations	Pre and post MEC disposal and/or burn operations	Safety and quality of MEC disposal and/or burn operations.	Three-phase control to include final QC acceptance inspections at each MEC disposal/burn location (UXOQCS/SO)	Before and after every MEC detonation and/or burn operation	No MEC/explosive hazards remain at disposal and/or burn location

TABLE 4-1
DEFINABLE FEATURES OF WORK AND QC ACTIONS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Definable Feature of Work	Inspection / Surveillance Point	Attribute	QC Action (performed or confirmed by)	Sampling Frequency	Acceptance Criteria
Site Restoration	Site Grading	Verify positive drainage	Verification inspection (site staff)	After grading is complete	
	Wetland Mitigation	Verify wetlands have been reconstructed	Verification inspection (site staff)	After wetland mitigation is complete	Wetland mitigation done in accordance with Wetland Mitigation Plan
	Vegetation Establishment	Verify vegetation is sown and growing	Verification inspection (site staff or SWPPP Inspector)	Monthly for 6 months and annually for 2 years	Vegetation of similar density to adjoining land established on 70% of area
Demobilization	Post demobilization	All projects resources to include personnel and equipment are demobilized and lessons learned captured	Three-phase control (QC Geophysicist/ UXOQCS/MR QPM)	N/A	N/A
Final Report	Army Draft/Tribal Draft/Final	N/A	Internal Independent Technical Review (technical staff)	N/A	N/A

Notes:
cm = centimeter
DGM = Digital Geophysical Mapping
DoDI = Department of Defense Instruction
GPS = Global Positioning System
ISO = Industry Standard Object
IVS = Instrument Verification Strip
m = meter
MD = Munitions Debris
MDAS = Material Documented as Safe
MEC = Munitions and Explosives of Concern
mph = miles per hour
MPPEH = Material Potentially Presenting an Explosive Hazard
MR QPM = Munitions Response Quality Program Manager
mV = millivolt
N/A = Not Applicable
PDA = Personal Digital Assistant
QC = Quality Control
SOW = Scope of Work
SP = Safety Officer
UXO = Unexploded Ordnance
UXOQCS = Unexploded Ordnance Quality Control Specialist
WP = Work Plan

An EMP has been prepared in accordance with DID MMRP-09-002, Explosives Management Plan (USACE 2009b) describing the procedures that will be followed in obtaining, handling, and storing donor explosives for the disposal of MEC items. Donor explosives will be maintained at FWDA. A copy of the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) Type 33 License/User Permit will be maintained on-site at all times. This License/User Permit will be made available to any local, state, or federal authority who may request it.

5.1 EXPLOSIVES ACQUISITION

The services of a licensed commercial explosives vendor will be utilized to support the project.

5.1.1 Acquisition Source

The SUXOS will be the only person authorized to request and receive donor explosives from Dyna Energetics, Austin, Texas. The point of contact at Dyna Energetics is Ed Zinsmeyer, 512-327-2043. The SUXOS and UXO site personnel will be named as employee possessors on the URS ATF Type 33 Users Permit. Western Explosives System Company, Midvale, Utah will be an optional provider of explosives.

5.1.2 Proposed Explosives and Quantities

The quantity of donor explosives required will be determined. An inventory of explosives for use during the project will be maintained. The following types of donor explosives that URS intends to store to conduct MEC disposal operations include:

- jet perforators
- pentolite boosters
- detonation cord
- electric and/or shock tube blasting caps

5.2 INITIAL RECEIPT

The services of Dyna Energetics or Western Explosives System Company will support the project for the supply of donor explosives. Dyna Energetics and Western Explosives System Company are responsible for permits and documentation required by federal, state, and local regulations regarding the transportation of explosives to the location where the contractor will take custody of the explosives. Only the SUXOS may sign for explosives received.

5.2.1 Initial Receipt Procedure

The SUXOS maintains documentation concerning the receipt of explosives. The SUXOS will conduct a thorough inventory prior to assuming accountability for the material. The SUXOS will check and record the type, quantity, and lot number of each explosive item against the manifest. Copies of records will be maintained on-site by the SUXOS and available for inspection by authorized agencies. Lot numbers will be used to track explosive items until the item is expended.

5.2.1.1 Explosives Shipped and Received Discrepancy

In the event that a discrepancy occurs between the quantities of explosives shipped and received, the SUXOS will immediately contact Dyna Energetics or Western Explosives System Company and the MR SPM. It will be the responsibility of Dyna Energetics or Western Explosives System Company to rectify the shipment discrepancy. Dyna Energetics or Western Explosives System Company will be responsible for providing copies of revised shipping documents. Only the actual quantity of explosives received will be signed for on the bill of lading at the time of delivery.

5.3 STORAGE

Donor explosives will be stored in DDESB sited ATF Type I ECMs at the Explosives Storage Area B. These ECM's operate under a Conditional Exemption (CE) IAW Department of Defense Manual (DoDM) 6055.09-M-V7 (DoD 2008a) (**Figure 5-1**). The two ECMs have physical security and lightning protection; the magazines are configured and equipped in accordance with all applicable directives. The total NEW stored in the magazine will not exceed the posted NEW for the individual Type I ECM. The ATF Type I ECMs are located inside a secure perimeter fence with approved access only. Commercial explosives will be assigned a DoD hazard classification and storage compatibility group. The compatibility and storage of explosives as defined in DoDM. 6055.09-M, will be followed. MEC will not be stored with commercial donor explosives.

5.4 TRANSPORTATION

Transportation of explosives and MEC will be conducted in accordance with applicable sections of 49 CFR Parts 172-397, as well as state and local regulations. For transportation of explosives and MEC on-site, URS will comply with the following:

- The load will be well braced and covered with a fire-resistant tarpaulin.
- Vehicles transporting explosives will be inspected daily using the Explosive Vehicle Inspection Sheet and will be properly placarded.
- Explosives will be transported in closed vehicles whenever possible. When using an open vehicle, explosives will be covered with a flame-resistant tarpaulin (except when loading/unloading).
- Vehicle engine will not be running when loading/unloading explosives.
- Beds of vehicles will have a wooden bed liner, chocking material, or sandbags to protect the explosives from contact with the metal bed and fittings.

- Vehicles transporting explosives will have a first aid kit, two 10-pound B C-rated fire extinguishers, and communications capability.
- Initiating explosives, such as blasting caps, will remain separated at all times. Blasting caps may be transported in the same vehicle as long as they are in a separate container and secured away from other items.
- Compatibility requirements will be observed.
- Only UXO Technicians II and above will transport explosive materials.
- Operators transporting explosives will have a valid driver's license.
- Drivers will comply with posted speed limits. Vehicles transporting explosives off-road will not exceed 25 mph.
- Personnel will not ride in the cargo compartment with explosives.

Vehicle operators will be licensed, trained, and informed of the explosive hazards involved with the cargo. Prior to movement, the driver will visually inspect the explosive-laden vehicle to confirm the load is properly secured and safe to move; the SUXOS or UXOSO will provide oversight during loading. The cargo will be checked to confirm containers are loaded, blocked, braced, tied down, or otherwise secured to the vehicle body to prevent movement. If using a vehicle with an open body, a closed container to contain the explosives will be secured to the bed of the vehicle.

The UXOSO will verify the following general safety precautions are observed during transport operations:

- Explosives will not be transported in the passenger compartment of a vehicle
- Explosive-laden vehicles will not be left unattended
- Personnel will not be permitted to ride on or in the cargo compartment
- Smoking in and around vehicles transporting explosives is prohibited
- Refueling of vehicles will be conducted without the explosive cargo loaded

5.5 RECEIPT PROCEDURES

The services of Dyna Energetics or Western Explosives System Company will support the project for the supply of donor explosives (see Section 5.1.1). Explosives received will be inventoried by the SUXOS. The SUXOS will enter the type, quantity and lot numbers into the Explosives Accountability Log (Appendix F). The Explosive Accountability Log certifies the explosives were expended as intended in the MEC disposal process. The Explosive Accountability Log will document each disposal process, and will be maintained by the SUXOS.

5.6 EXPLOSIVES INVENTORY

Inventory accounting will be conducted upon initial receipt (see Section 5.2.1). The SUXOS will draw the explosives needed for MEC disposal. The SUXOS will assume accountability for the material.

5.7 INSPECTION OF MAGAZINES

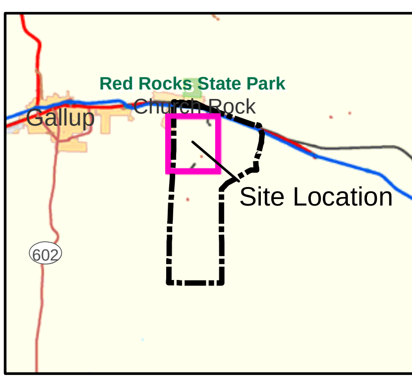
Six storage magazines are located in Block B on FWDA, two of which will be for the purposes of storing donor explosives. On 22 November 2010, a quarterly ECM inspection was completed of all six ECMs for compliance with, DoDM. 6055.09-M, Army Regulation (AR) 385-64, EP 1110-1-18 and SOP for Storage of Waste Military Munitions under the Conditional Exemption for the Military Munitions Rule FWDA (Appendix I). Inspections will be completed every 90 days and in compliance with the SOP.

5.8 EXPLOSIVES THEFT

If it is confirmed that explosives are missing, the SUXOS will notify the MR SPM who will notify ATF and immediately begin an investigation. The COR will be notified by telephone immediately. A written report will be submitted within 24 hours.

5.9 RETURN OF EXPLOSIVES

Donor explosives drawn for daily disposal operations will be expended or returned to the ECMs.



Legend

- Installation Boundary
- Earth Covered Magazine
- Road

ECMs at Storage Area B Fort Wingate Depot Activity McKinley County, New Mexico	
Drawn By: JNC	Date: 12/10/2012
Checked By: SM	Project No: 16170613

Figure 5-1

This EPP has been developed to describe the approach, methods, and procedures that will be employed to reduce adverse impacts to the natural environment during field activities. Potential site resources and possible mitigation measures that can be used to avoid or lessen the adverse impacts from project activities are identified below.

6.1 POTENTIAL SITE RESOURCES

Pre-project environmental inventories will be completed within the HWMU. The environmental survey will identify sensitive resources and provide mitigation measures to protect any identified resources. The survey will include the identification and location of threatened and endangered species and their habitat, wetlands, and other resources that may be affected by the removal action. Historical information regarding environmental and cultural resources is provided below.

6.1.1 Land Resources

FWDA is located among the red rocks east of Gallup, NM and next to the reservations of the Navajo Nation and the Zuni Pueblo Tribe in New Mexico. The land in and around FWDA is mostly privately held or owned by the U.S. Government. The principal drainage in the region is the South Fork Rio Puerco, an ephemeral, east-west flowing stream, located immediately north of the installation boundary. FWDA is bounded on the west by the Hogback, a ridge of steeply dipping sedimentary rocks; on the south by the Zuni Mountains; on the east by a small valley terminating at the base of the Zuni Mountains; and on the north by the South Fork Rio Puerco. Elevations range from 6,700 feet above msl at the northern boundary to 8,200 feet above msl at the southern boundary. (U.S. Army 1991)

6.1.2 Threatened and Endangered Species

According to the United States Fish and Wildlife Service's (USFWS's) online database, four federal listed T&E species have the potential to occur in McKinley County. The species are listed in **Table 6-1**. The table also shows the status of these species with the New Mexico Department of Game and Fish (NMDGF). USFWS and NMDGF protocols will be referred to when scheduling surveys for T&E species. When practicable, the surveys will be completed at optimal times.

The Zuni bluehead sucker is a subspecies of bluehead sucker, Catostomus discobolus. It is likely that Catostomus (Pantosteus) species historically occurred in most permanently watered reaches of the Little Colorado River drainage. Zuni bluehead sucker occurred historically in at least the Zuni River system upstream of the Arizona-New Mexico border. Definitive habitat associations for Zuni bluehead sucker have not been determined. However, Zuni bluehead sucker habitat is generally largely shaded, pool and riffle habitats with coarse substrates. Stream depth is about 12 inches to 20 inches deep with water velocity less than 4 inches per second. In general, Zuni bluehead sucker are rare or absent in reaches where the substrate was dominated by silt or sand. Emergent aquatic plants often edged pool and pool-run habitats (NMDGF 2004).

Arctic peregrine falcons (Falco peregrinus tundrius) are very similar to the American peregrine falcon except that it is slightly smaller and paler. The Arctic peregrine falcon breeds on the Arctic tundra. In winter, it inhabits coastlines and mountains from Florida to South America. The Arctic peregrine falcon breeds on the North American tundra and winters along the Gulf Coast from Florida west to eastern Mexico. It is also found in winter in Baja California, and south to Chile and Argentina. In Oklahoma, it is found statewide during spring and fall migration only. (USFWS 2001)

Bald eagles (*Haliaeetus leucocephalus*) are found throughout most of North America, from Alaska and Canada to northern Mexico. They are nearly always found near water, along rivers, lakes, or the sea coast and coastal marshes, reservoirs, and large lakes. They also pass over mountains and plains during migration. Bald eagles prefer fish, but they will eat other animals such as ducks, muskrats, and sometimes turtles. They will also eat carrion. On June 28, 2007 the Interior Department took the bald eagle off the Endangered Species List. The bald eagle is still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. (Smithsonian Institute 2010) If a Bald Eagle is present within 0.25 mile upstream or downstream of the active construction site in the morning before activity starts, or is present following breaks in project activity, the contractor would be required to suspend all activity until the bird leaves of its own volition; or a Corps biologist, in consultation with the USFWS, would determine that the potential for harassment is minimal. However, if a Bald Eagle arrives during construction activities or if an eagle is greater than 0.25 mile away, construction need not be interrupted.

Costa's hummingbird (Calypte costae) is a desert scrub species of the southwestern United States and northern Mexico, with only a limited and irregular presence in southern New Mexico. It is reliant on nectar-producing native vegetation along the interface of desert and foothill/montane shrub habitats. Costa's hummingbird is resident in much of southern California and all of Baja California, and portions of southwest Arizona and northwest Sonora. Breeding populations extend farther north and east to southern Nevada and southwest Utah, central Arizona, and southwest New Mexico. The winter range extends south to Sinaloa and Nayarit along the Pacific coast and adjacent inland areas. In New Mexico, Costa's hummingbird is an uncommon and sporadic breeder in the southwest and south-central mountains. It occurs most regularly in Guadalupe Canyon and in side canyons along the lower Gila River from Cliff south. It may be irregular in other small desert ranges, especially in the San Andres Mountains in Dona Ana County. At the eastern limit of its breeding range in New Mexico, it occupies more characteristic Chihuahuan Desert Shrub and foothill/montane shrub habitats. Costa's hummingbird appears to have limited adaptability to non-native vegetation and hummingbird feeders. (NM Avian Conservation Partners 2011)

The gray vireo (Vireo vicinior) is strongly associated with pinyon-juniper and scrub-oak habitat across its small breeding range in the southwestern United States and northern Mexico. In New Mexico, the species occurs in chaparral-juniper, pinyon-juniper, and pinyon-madrone associations. It also occurs in mid-elevation montane shrub habitats with rocky slopes and scattered conifers. In northwest New Mexico, gray vireos are found in broad-bottomed, flat or gently sloped canyons, in areas with rock outcroppings, or near ridgetops. In New Mexico, gray vireos are locally distributed across the western two-thirds of the state. They may be found in the Guadalupe and southern Sacramento mountains; the Organ and San Andres mountains; the southern Peloncillo mountains; the Silver City area; in the foothills of the Magdalena, Manzanita, and Sandia mountains; western Santa Fe county; a few canyons in the western Zuni mountains; and in San Juan and Rio Arriba counties in appropriate habitat. The species may be more widespread within the state than is currently known. Gray vireos breed in mid-elevation woodland and scrubland habitats of the southwestern United States and northern Mexico. Most the species' range falls within the states of Utah, Colorado, Arizona, and New Mexico. (NM Avian Conservation Partners 2011)

The least tern (Sterna antillarum athalassos) is a broadly distributed bird species along coastal flats and river sandbars. Least Terns nest colonially on bare or sparsely vegetated sand or dried mudflats, on coasts, rivers, or emergent wetland areas. As open beaches and river sandbars have been impacted by human activities, agricultural fields, parking lots, and bare land areas have provided occasional alternative nesting habitats. The species shows a high degree of colony site tenacity and fidelity, but small colonies tend to be less stable than larger ones. Successful colonies require an open area largely free of vegetation, above high water levels, and safe from ground predators; thus islands are commonly favored where available. Most least terns begin breeding in their third year and continue to attempt breeding every year thereafter. Sand is typically the dominant nesting substrate. (NM Avian Conservation Partners 2011)

Mexican spotted owls (*Strix occidentalis lucida*) are residents of old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Canyons with riparian or conifer communities are also important components. In southern Arizona and New Mexico, the mixed conifer, Madrean pine-oak, Arizona cypress, encinal oak woodlands, and associate riparian forests provide habitat in the small mountain ranges (Sky Islands) distributed across the landscape. Owls feed on small mammals, particularly mice, voles, and woodrats; and will also take birds, bats, reptiles and arthropods. (USFWS 2010b)

Mountain plovers (*Charadrius montanus*) are endemic to the Great Plains and are associated with short-grass prairie dominated by blue grama (*Bouteloua gracilis*). Mountain plovers have been found in taller grasses at sites that were heavily grazed or associated with prairie-dog colonies. They nest in sparsely vegetated habitats such as short-grass prairies, sage brush, and semi-desert but also on fallow and recently plowed ground. Historically, the mountain plover bred throughout short-grass prairies of the western Great Plains from Montana to New Mexico and Texas. Mountain plovers disperse widely during the winter months. (USFWS 2010d)

Peregrine falcons (Falco peregrinus anatum) have a worldwide distribution encompassing large parts of both the northern and southern hemispheres. In New Mexico, peregrine falcons breed locally in mountains and river canyons of western New Mexico east to the Sangre de Cristo, Sandia/Manzano, and Sacramento mountains. The species is a rare winter visitor in lowlands statewide. Across its huge range this species occupies many different biomes. In the western United States, peregrines generally occupy mountain and canyon habitats, including high elevation areas above 10,000 feet. Breeding areas are usually associated with water. Peregrine falcons pass through the state on migration from March through May, and July through November. Most breeding activity takes place from April through June. (NM Avian Conservation Partners 2011)

Southwestern willow flycatchers (*Empidonax traillii extimus*) require dense riparian habitats with microclimatic conditions dictated by the local surroundings for nesting. Saturated soils, standing water, or nearby streams, pools, or cienegas are a component of nesting habitat that also influence the microclimate and density of the vegetation component. Habitat not suitable for nesting may be used for migration and foraging. (USFWS 2010c)

Black-footed ferrets (Mustela nigripes) are one of North America’s most endangered mammals. Black-footed ferrets are highly specialized predators that depend on prairie dogs for food and shelter. More than 90 percent of the ferrets’ diet is made up of prairie dogs. Ferrets and prairie dogs live in prairie dog towns in underground tunnels called burrows. Prairie dogs use prairie and grassland habitat ranging from the mid-west to the western United States. Seventeen black-footed ferret reintroduction sites exist throughout the western United States and Mexico. All sites are located on prairie dog colonies. (Arizona Game and Fish Department 2011) Although part of its historical range, current USFWS distribution maps from the Southwest Region indicated that the black-footed ferret is absent from the state of New Mexico. (USFWS 2011b)

Zuni fleabane (*Erigeron rhizomatus*) is an herbaceous perennial with creeping rhizomes. The plant grows primarily in nearly barren detrital clay hillsides with soils derived from shales of the Chinle or Baca formations (often seleniferous); most often on north or east-facing slopes in open piñon-juniper woodlands at 7,300 to 8,000 feet above msl. (New Mexico Rare Plant List 2010)

6.1.3 Wetlands

Wetlands are a sensitive and unique habitat-type which can provide valuable cover and water for wildlife. Wetland identification was completed as part of a preliminary site reconnaissance in July 1995. One wetland area was identified in the arroyo that bisects the HWMU (PMC 1999). This wetland included both scrub shrub and emergent wetland vegetation. The wetland is shown on **Figure 6-1**.

6.1.4 Vegetation

Vegetation on FWDA ranges from grasslands and sagebrush scrublands to pinyon-juniper and ponderosa pine woodlands. Desert scrub is most commonly found at lower elevations where temperature fluctuations and extremes are great and sandy soil is present. Woodlands are found at mid-elevations where soil moisture is higher and the minimum temperature is lower. True conifer forests are limited to the highest elevations where temperatures are low, soil moisture is high, and pines and other conifers are dominant. (U.S. Army 1995)

The HWMU was in regular use until late 1992, and was disturbed on a regular basis. After closure of the site, plants began to re-establish an ecological community, even in highly disturbed areas such as craters. The current vegetation is indicative of a grassland and sagebrush community surrounded by a pinyon pine-juniper woodland community. (PMC 1999)

6.1.5 Water Resources

6.1.5.1 Surface Water

The FWDA lies between the South Fork Rio Puerco and the northern foothills of the Zuni Mountain Range. All drainages in this area are intermittent with flow occurring only during, and after, heavy rainfall events or during snowmelt. (PMC 1999)

Two major drainage systems are located within FWDA: Milk Ranch Canyon and Fenced-Up Horse Canyon. Bread Springs Wash is a minor drainage system. The southeastern corner of the installation is drained to the east by several small parallel washes feeding into Milk Ranch Canyon. The surface drainage from the remaining eastern portion of the installation flows to the northeast and also drains into Milk Ranch Canyon. The western portion of the installation is drained by a network of washes into Fenced-Up Horse Canyon, which flows north into the South Fork of the Puerto River. Bread Springs Wash drains the extreme southwestern corner of FWDA. All flow from Bread Springs Wash is diverted to the west side of the Hogback and eventually empties into the South Fork Rio Puerco west of Gallup. (U.S. Army 1995)

6.1.5.2 Parcel 3 Geology/Hydrogeology

Parcel 3 is underlain by an extremely complex hydrogeologic regime that includes several water-bearing rock formations in both the Closed and Current OB/OD Areas, and minor amounts of saturated unconsolidated sediments in the Current OB/OD Area. In general, the Nutria Monocline Fault Zone ("fault zone"), rock fracture system, and the dips of the sedimentary rocks present in Parcel 3 structurally control the flow of ground water. The fault zone bisects the Current OB/OD Area and the eastern portion of the Closed OB/OD Area as. This fault zone consists of a complex series of steeply dipping, roughly north-south trending faults.

The Parcel 3 ground water system has been separated into three distinct subsystems: (1) the saturated Quaternary Alluvium in the Current OB/OD Area, (2) the shallow north-northwest dipping water-bearing formations east of the fault zone, and (3) the steep, westerly dipping water-bearing formations west of the fault zone. Depth to ground water measurements were collected in association with each ground water sampling event. Based upon the ground water elevation data, ground water flow within the first and second water-bearing intervals is generally toward the north.

Saturated Quaternary Alluvium in the Current OB/OD Area

Within the Current OB/OD Area, a thin veneer of Quaternary Alluvium is present overlying a thick sequence of interbedded claystone, siltstone, and discontinuous sandstone units belonging to the Painted Desert Member of the Petrified Forest Formation. Discontinuous water table conditions are present only within the Quaternary Alluvium and are first encountered around 30 feet below ground surface (bgs).

Water Bearing Formations East of the Nutria Monocline Fault Zone

Ground water flow within the weathered and competent siltstone, claystone, and lenticular sandstone beds of the Painted Desert Member, located east of the fault zone, is dominated by secondary permeability characteristics. It is considered likely that the Sonsela Sandstone Member subcrops beneath the unconsolidated materials and fractured Painted Desert Member located just east of the fault zone in and near the arroyo in the Current OB/OD Area. The Sonsela Sandstone Member, north of the Current OB/OD Area and east of the fault zone, is generally located at depths greater than 75 feet bgs. Extensive mudstone units of the underlying Blue Mesa Member of the Petrified Forest Formation, being of inherently lower apparent permeability, will inhibit vertical movement of ground water to underlying potable aquifer units, such as the San Andreas/Glorieta aquifer.

Water-Bearing Formations West of the Nutria Monocline Fault Zone

Ground water flow within the predominantly fine-grained water-bearing formations located west of the fault zone in both the Closed and Current OB/OD Areas is dominated by secondary permeability characteristics. These fine-grained formations include the Painted Desert Member of the Petrified Forest Formation located east of the Hogback, and the Mancos Shale, which is located west of the Hogback. Ground water flow within the coarse-grained water-bearing formations that outcrop west of the fault zone in the Closed OB/OD Area include both primary and secondary permeability characteristics. The coarse-grained water-bearing formations that outcrop in the Closed OB/OD Area include the Entrada Sandstone, Zuni Sandstone, and the Dakota Sandstone.

6.1.6 Air Quality

McKinley County, New Mexico is an attainment area for all U.S. Environmental Protection Agency (USEPA) Air Quality Criteria (USEPA 2010). Therefore, small short-term increases are allowable without a permit.

6.1.7 Cultural and Archeological Resources

The cultural resources within the boundaries of the FWDA have been the subject of a number of studies. Based on those studies, over 750 cultural and historical sites have been identified on FWDA. Greater densities of sites occur on upland surfaces and gentle slopes, while fewer sites occur on the alluvial flats. The lower elevation-sites tend to be Lithic scatter sites. The Fenced-Up-Horse Canyon contains the highest frequency of pueblo sites. (NMDGF 1998)

A Programmatic Agreement among the U.S. Army, the Navajo Nation, the Pueblo of Zuni, and the New Mexico State Historic Preservation Officer was signed in 2008 and is currently in force at FWDA for actions related to the closure and post-closure care at the OB/OD Area.

6.1.8 Native American Resources

Based on the 1991 EIS completed for BRAC, identified sacred sites near FWDA were limited to Church Rock considered sacred to the Navajo; and Bear Springs and McGaffey, considered sacred to the Zuni. At that time, none of the identified sacred sites was located within FWDA. However, given the historic use of the FWDA area by the Zunis and Navajos, various sacred sites may be present within FWDA. These might include areas traditionally used for procuring plants, ceremonial materials, or minerals; gravesites; ceremonial sites; sweathouses; homesites; or certain archeological sites. (U.S. Army 1991)

6.2 MITIGATION PROCEDURES

Action will be taken during the field activities to minimize or mitigate any adverse impact to the environment. These actions are listed below.

- All excavation activities will be limited to the known lateral extent of the HWMU and a small area for the sifter operations. This will limit the potential for disturbance and impacts to the land resources near the HWMU.
- Prior to beginning activities, an environmental resources inventory to identify sensitive environmental resources, including T&E species or their critical habitat will be conducted. Environmental resources inventory will be completed by a biologist(s) familiar with New Mexico ecosystems and species. If any threatened or endangered species or their habitat is located within the inventory area, the Army with their contractor will work with the USFWS, and the NMGF to devise a plan to avoid or minimize adverse effects on these resources. The inventory will detail the identification and location of T&E species, including any that have not been previously identified on FWDA, such as the Zuni fleabane. The inventory will also include a specific plan for avoidance and minimization of potential impacts to T&E species. Additionally, a biologist familiar with the ecosystems of northwest New Mexico will train field personnel on T&E species prior to beginning any field activities. The environmental resources inventory is further discussed in Section 3.2.
- Prior to beginning activities, a wetlands delineation of the project area will be completed. If soil sampling is completed as part of the delineation, the effort will be coordinated with the onsite OESS. The wetland delineation would be conducted in accordance with the Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the most current Arid West Region Supplement (USACE 2008c) and identify and delineate jurisdictional wetlands within the project area. The delineation report would include a mitigation plan, which will detail avoidance and minimization measures related to jurisdictional wetlands. The Wetland Delineation Report will be included as an appendix to the Removal Report. New Mexico does not currently have wetlands bank to use for mitigation of direct impacts. Therefore, it is anticipated that any mitigation would occur on-site. The wetland delineation is further discussed in Section 3.2.

- Application for a Nationwide Permit No. 38 – Cleanup of Hazardous and Toxic Waste with the USACE will be completed. The wetlands mitigation plan will be submitted as part of the USACE permit application.
- Some vegetation removal is anticipated to remove scrub vegetation and open areas for DGM and to reduce the potential for vegetation to clog screening plant components. Vegetation removal will be completed by raking out the weeds with an armored track loader with a four in one bucket. Necessary precautions to protect and prevent damage to vegetation not identified for removal will be taken. Vegetation removal is also discussed in Section 3.6.
- A seed mixture, consisting of drought tolerant species native to northwest New Mexico, will be placed in areas disturbed by the removal activities to prevent erosion and restore the site. Post-excavation, the area will be graded to allow for positive drainage and holes which are considered to be unsafe will be filled. Site restoration is discussed in detail in Section 3.19.
- A National Pollutant Discharge Elimination System (NPDES) permit will be required for this project. As part of the NPDES permitting process, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared. The plan will be prepared in accordance with the permit process and will identify the pollution prevention controls and procedures to be implemented during the removal action and screening process as well as the inspection and maintenance required to ensure the measures remain protective of water resources.
- Prior to beginning any activities, a CRMP will be prepared. The CRMP will identify the goals of the cultural resources oversight, and briefly summarize relevant prior studies. The CRMP will define methods and procedures for conducting cultural resources monitoring in a safe manner during project activities. The cultural resource monitoring is detailed in Section 3.20.
- A Zuni Tribal member will provide on-site cultural resource training prior to the beginning of any field activities. The training will be detailed in CRMP.
- Procedures for evaluating and treating any discoveries of archaeological resources or human remains and associated funerary items, sacred items, or items of cultural patrimony will be laid out in the CRMP.
- Potential impacts to Native American sacred sites in the vicinity of FWDA and steps to avoid or minimize any potential impacts to these sites will be identified in the CRMP.
- MEC items disposition is detailed in Section 3.12.
- MD and other metallic debris disposition are detailed in Sections 3.12 and 3.19.3.
- Solid waste (i.e., non-metallic debris) generated during field activities will be collected and placed in a proper trash receptacle staged at approved areas on FWDA. Solid waste will be removed from the site by the local solid waste contractor on a regular basis through the project. PPE used during field activities (including latex or nitrile gloves, Tyvek, paper towels, etc.), will be bagged and disposed of as municipal waste. Pin flags, wooden stakes, and other materials used to mark locations will be removed when they are no longer needed. Section 3.20 further details the handling of solid waste.

- The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.
- No fueling shall occur within existing arroyos or waterways.
- Hazardous waste, including excavated soils, will be handled and stored as detailed in Section 3.9 and 3.19. Excavated soil will be characterized as either clean (i.e., below NMED residential standards), above NMED residential standards, and hazardous. Once characterized, the soils will be placed in three different stockpiles based on their characterization. Non-hazardous stockpiled soils will be covered and hazardous soils will be placed on liner and covered or placed in a lined roll-off until disposal.
- IDW generated during the FWDA field activities will be disposed of as described in Section 3.19.
- Vegetation removed as part of surface clearance and excavation activities and other surface debris will be stockpiled inside the HWMU.
- It is anticipated that planned activities will generate fugitive dust emissions as well as vehicle emissions associated with equipment. Area ambient air will be periodically monitored in real time at the nearest downwind receptor or at the parcel boundary by visual assessment, or using a MSE pDR-100 (or equivalent). If measurements exceed 1.0 milligrams per cubic meter (mg/m^3) at the monitoring point then dust control measures will be implemented at the source to limit the generation of dust to the extent possible. Source implementation measures include wetting down roads or equipment. Haul roads within the work area will be maintained to reduce dust generation.
- Except for open excavations, disturbed areas will be graded to provide positive drainage and minimize the potential for ponded water.
- Grading and excavating completed within the arroyo will be completed so as not to restrict the channel and create the potential for upstream flooding. The arroyo channel will remain open and clear.
- Vehicle emissions will be controlled through proper maintenance and the use of mufflers in accordance with federal, state, and local rules, laws, and regulations.
- Minimal amounts of chemicals will be brought on-site during the field activities. Field equipment refueling will be completed primarily via a fuel-truck at the HWMU. If necessary, a fuel tank would be located next to the sifter operation. The tank would be located within a secondary containment, such as a berm. A spill kit will be available during all refueling operations for field equipment. Field procedures will focus on minimizing or preventing spills during field activities; however, if a fuel spill were to occur in such quantity as may with reasonable probability injure or be detrimental to human health or the environment, the operating contractor will contain the spill and contact the COR. The owner, operator, or person-in-charge of FWDA will report the spill to the NMED by calling (866)

428-6235 in non-emergencies or calling (505) 827-9329 for emergencies. Contaminated soils would be removed, characterized, and disposed of according to federal, state, and local regulations.

- MC sample preservatives, if used, will be provided in sample containers by the laboratory to minimize the on-site handling of acids or other chemicals.
- Whenever possible, on-site storage areas will be located in such a manner to minimally affect site resources. All storage locations will be approved by the COR before their use and will be removed and restored once field activities have been completed.
- MEC and donor explosives will be stored in six previously identified ECMs. The ESS and Section 5 detail the storage of MEC and donor explosives.
- Roadways (dirt or paved) will be established to the extent possible to gain access to the HWMU and CAMU. Field personnel will strive to confine motorized traffic to established access routes to reduce potential impacts to surface topography and vegetation.
- If new site access routes are required, URS with USACE concurrence will establish them so as to minimize their impact on surrounding resources and will return the disturbed areas to their previous conditions.
- If the potential exists for encountering surface water within work areas, either naturally occurring or man-made, appropriate precautions will be used to control water run-on and run-off during completion of the work. This may include the use of silt fencing or other Best Management Practices (BMPs) as appropriate. The SWPPP will detail the BMPs.
- All signs of temporary facilities such as work areas, fencing, stakes, or any other signs of investigation within the work, storage, and access areas will be removed at project completion.

6.3 PERSONNEL

The personnel experienced in ensuring this EPP is implemented and adhered to as well as training the environmental protection personnel include the Natural Resources Task Manager supported by a Wetlands Biologist.

The Natural Resources Task Manager (Jeffrey Dawson) will be responsible for ensuring adherence to the EPP, completing required training of on site environmental protection personnel. The Natural Resources Task Manager will be supported locally by a wetlands biologist located in the URS Albuquerque office.

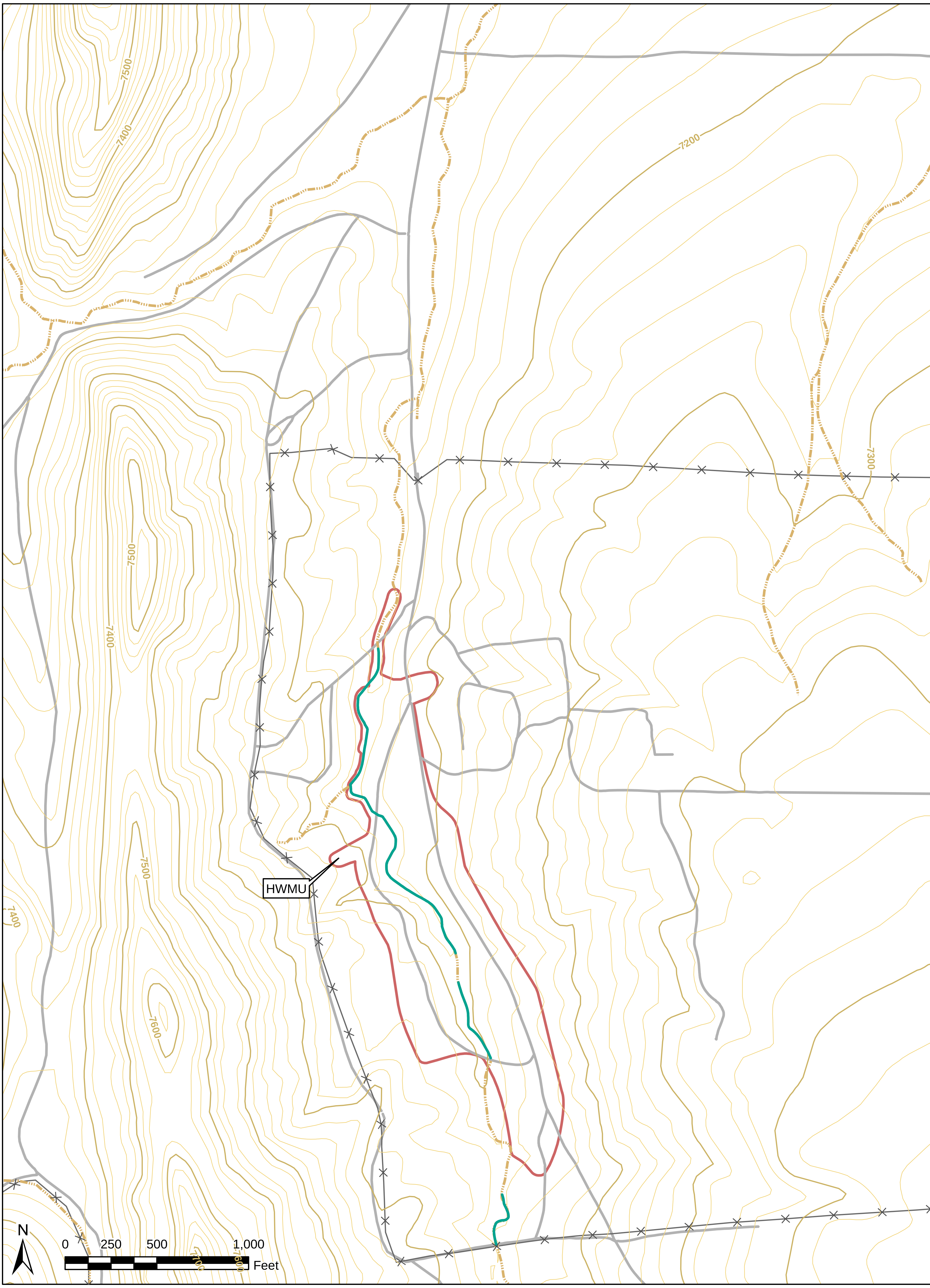
TABLE 6-1
THREATENED AND ENDANDERED SPECIES FOR MCKINLEY COUNTY
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

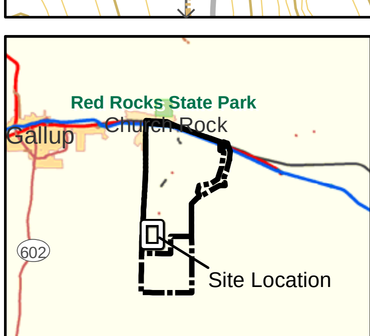
Common Name	Scientific Name	Species	Federal Status	State Status
Zuni bluehead sucker	*Catostomus discobolus yarrowi*	Fish	Candidate	Endangered
Arctic peregrine falcon	*Falco peregrinus tundrius*	Bird	NA	Threatened
Bald eagle	*Haliaeetus leucocephalus*	Bird	Delisted, Monitored	Threatened
Costa's hummingbird	*Calypte costae*	Bird	NA	Threatened
Gray vireo	*Vireo vicinior*	Bird	NA	Threatened
Least tern	*Sterunula antillarum*	Bird	Endangered	Endangered
Mexican spotted owl	*Strix occidentalis lucida*	Bird	Threatened	NA
Mountain plover	*Charadrius montanus*	Bird	Proposed Threatened	NA
Peregrine falcon	*Falco peregrinus*	Bird	NA	Threatened
Southwestern willow flycatcher	*Empidonax traillii extimus*	Bird	Endangered	Endangered
Black-footed ferret	*Mustela nigripes*	Mammal	Endangered; Experimental, Non-essential	NA
Zuni fleabane	*Erigeron rhizomatus*	Plant	Threatened	Endangered

Notes:

Sources: USFWS 2011, NMDGF 2011.

NA - Not Applicable





Legend

- Installation Boundary
- HWMU Boundary
- Road
- Fence
- Identified Wetland
- 20' Topographic Contour
- 100' Topographic Contour
- Arroyo

Identified Wetlands
Fort Wingate Depot Activity
McKinley County, New Mexico

Drawn By: JNC	Date: 12/10/2012	**Figure 6-1**
Checked By: BP	Project No: 16170613	

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APPENDIX A — Task Order Scope of Work

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE 1 OF PAGES 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0008	10/06/2010		

6. ISSUED BY CODE	7. ADMINISTERED BY *(If other than Item 6)* CODE
U.S. ARMY ENGINEER DISTRICT, ALBUQUERQUE CORPS OF ENGINEERS 4101 JEFFERSON PLAZA, N.E. ALBUQUERQUE, NEW MEXICO 87109-3435	**Legally Reviewed** **By:** DBrunner **Date:** 6 Oct 10

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*

CODE | FACILITY CODE

(X) 9A. AMENDMENT OF SOLICITATION NO.

[X] W912PP-10-R-0011

9B. DATED *(SEE ITEM 11)*

[ ] 10A. MODIFICATION OF CONTRACT/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [X] is extended, [ ] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning ____________ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
[ ]	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
[ ]	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
[ ]	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
[ ]	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor [X] is not, [ ] is required to sign this document and return ________ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

PROJECT: Hazardous Waste Management Unit (HWMU) Work Plan and Removal, Fort Wingate Depot Activity, McKinley County, New Mexico.

1. This is Amendment No. 0008 to Solicitation No. W912PP-10-R-0011; 19 February 2010. The following PWS document shall replace the PWS issued in Amendment No. 0004 and all previous Performance Work Statements in the solicitation package. The attached CLIN structure shall replace the CLIN structure issued in Amendment No. 0004 and all previous CLIN structures in the solicitation package. The Programmatic Agreement (PA) and the letter from the Navajo Nation shall be added to the solicitation package.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	16C. DATE SIGNED

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Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA FAR (48 CFR) 53.243

2. PERFORMANCE WORK STATEMENT (PWS): REPLACE THE REVISED PWS ISSUED IN AMENDMENT NO. 0004 AND ALL PREVIOUS PERFORMANCE WORK STATEMENTS IN THE SOLICITATION PACKAGE WITH THE ATTACHED PWS.

3. CLIN STRUCTURE: REPLACE THE REVISED CLIN STRUCUTRE ISSUED IN AMENDMENT NO. 0004 AND ALL PREVIOUS CLIN STRUCTURES IN THE SOLICITAION PACKAGE WITH THE ATTACHED CLIN STRUCTURE.

4. PROGRAMMATIC AGREEMENT (PA): THE PA SHALL BE ADDED TO THE SOLICITAION PACKAGE.

5. THE NAVAJO NATION LETTER: THE NAVAJO NATION LETTER SHALL BE ADDED TO THE SOLICITATION PACKAGE.

//////////////////////////////////LAST ITEM//////////////////////////////

PERFORMANCE WORK STATEMENT

Contract No.
Task Order No.

Hazardous Waste Management Unit (HWMU) Work Plan and Removal Fort Wingate Depot Activity (FWDA), McKinley County, New Mexico

6 October 2010

1.0 Project Overview The Contractor shall furnish all services, materials, supplies, plant, labor, equipment, investigations, studies, superintendence, and travel, as required; to obtain State approval for the removal of all forms of debris, hazardous soil, and characterization of the remaining soil. The contractor shall prepare a Work Plan for Army review, Tribal review and NMED approval. The Work Plan shall include the methodology to remove all MEC, debris, munitions debris, hazardous materials, and hazardous soil encountered in the 32 acre HWMU. It shall also contain the soil sampling plan as detailed herein. A Closure Plan, as defined in the FWDA Resource Conservation Recovery Act (RCRA) Permit NM6213820974 (Permit), shall not be prepared under this contract due to the unknowns dealing with potential soil contamination below the debris. The contractor shall excavate soil mixed in with the debris, metal, MEC, etc to a point where there is no longer any debris, metal, MEC, etc left in the HWMU. The contractor shall verify all debris; MEC, (metal) is removed, and then perform soil characterization of the soil remaining in the excavation. The contractor shall not remove soil from the excavation once it is determined free of debris. The contractor shall also characterize soil removed along with the debris and stockpile the soil in the HWMU if NMED or their delegated New Mexico regulator approves. Soil shall be prepared for erosion control per Environmental Protection Plan and Storm water Pollution Prevention Plan. The contractor shall operate the Corrective Action Management Unit (CAMU) and manage six the Earth Covered Magazines (ECM) operating under a Conditional Exemption (CE) for storage of Waste munitions to include Material Potentially Presenting an Explosive Hazard (MPPEH). MPPEH shall be processed (IAW) DoD 4140.62 before recycling. Contractor shall write a Project Report detailing all actions taken and obtain NMED approval. The HWMU is a separate and unique unit inside Parcel 3 defined as the HWMU-OB/OD Unit in Attachment 12 of the FWDA Permit. Parcel 3 has been designated an Improved Conventional Munitions (ICM) area due the presence of Bomb Live Units 3 and 4 (BLU 3 and 4).

1.1 Funding and Period of Performance. The period of performance for the base shall be through 31 December 2013 and will be **extended if/when the options are funded**. The Government reserves the right to not exercise any options under this contract. The project site will have a winter shut down (due to snow cover) which typically occurs between December and March. Fort Wingate hours of operations are from 0645 to 1700 Monday thru Friday.

1.2 History FWDA is an inactive U. S. Army Depot whose former mission was to store, ship and receive material and to dispose of obsolete or deteriorated explosives and military munitions. Fort Wingate was originally established in 1860. In 1941, the Fort underwent major construction and expansion for the administration and igloo area. In 1971, the depot was placed in reserve status and renamed FWDA. In 1975, the installation went under the administrative command of the Tooele Army Depot in Tooele, Utah. The Depot is now under the garrison command of White Sands Missile Range however the BRAC Office is conducting and administering the cleanup. The HWMU was operational from the mid 1940's through 1992. The active mission of FWDA ceased and the installation closed in January 1993, as a result of the Defense Authorization Amendments and BRAC of 1988. The installation is almost entirely surrounded by federally owned or administered lands, including both national forest and tribal lands. North and west of FWDA are Navajo tribal trust and allotted lands. The Bureau of Indian Affairs administers the land east and south of Parcel 3 (Parcel 1). The land to the west is mostly undeveloped and is tribal trust and allotment land administered by the Bureau of Indian Affairs (BIA), Navajo Nation, and individual Native American allottees. FWDA currently occupies approximately 24 square miles (15,273 acres) of land with facilities formerly used to operate a reserve storage activity providing for the care, preservation, and minor maintenance of assigned commodities, primarily conventional military munitions.

In 1995, UXB International, Inc. (for United States Army Corps of Engineers Huntsville, report dated July 1995) conducted a MEC clearance to a depth of 1 foot in 512 grids each measuring 100' x 200' along 6,600 feet of the western boundary (a portion of the proposed fence corridor) of Parcel 3 and disposed of 69 live items ranging from tracers to a 90mm projectile. The majority of the items were found on the surface or near surface. Ten of the items found required blow-in-place procedures. Five of the items disposed of were the M83 fragmentation 'Butterfly' bomblets.

From November 1998 to May 1999, Environmental Hazards Specialists International (EHSI), Inc (for United States Army Corps of Engineers Huntsville, report dated 11 September 2000) performed MEC location and removal actions at FWDA. EHSI conducted a surface clearance of eighty-two 200' x 200' grids and subsurface clearance to 4' of eighty-eight grids which varied from 200' x 200' to irregular shape. A total of 337 items were recovered ranging from fuses to 75mm projectiles.

In 2001, USA Environmental Inc., (for United States Army Corps of Engineers Huntsville, report dated January 11, 2002) performed MEC fence line construction support at FWDA which included locating, identifying, and disposing of items.

In 2008, Pika International performed a MEC investigation to delineate the boundary of the OB/OD Units' Kick out.

1.3 Background

Do to the large amounts of background information the contractors are asked to send an external hard drive to the Fort Worth district. Information about Wingate, its activities, and work that's been performed as part of it's closure over the years will be loaded and the drive will be returned. There is also a web site which can be accessed for information, www.ftwingate.org.

1.3.1 Chemical Warfare Materiel (CWM). This site is not suspected of containing CWM. However, during conventional MEC operations, if the Contractor identifies or suspects unknown liquid filled munitions, the Contractor shall immediately withdraw upwind from the work area and contact the contracting officer and the appropriate point of contact in their Work Plan (WP)/Accident Prevention Plan (APP). The Contractor shall secure the area and provide two personnel located upwind of the suspect CWM to secure the site until relieved by the Department of the Army emergency response personnel. Additional support may be required by the emergency response personnel, e.g., construction of blast mitigation controls. Additional reporting instructions are contained in CEMP-CE Memorandum, Notification Procedures for Discovery of Recovered Chemical Warfare Materiel (RCWM) During US Army Corps of Engineers (USACE) Projects, http://www.hnd.usace.army.mil/oew/policy/IntGuidRegs/RCWM%20Notification%20memo_w_encl23%20April%2004.pdf.

1.3.2 Improved Conventional Munitions (ICM) The site is confirmed to contain ICM. A Certificate of Risk Acceptance (CORA) must be approved prior to field implementation. FWDA has an ICM Waiver that expired in March 2009. The sub-munitions are the Bomb Live Unit (BLU) -3 and BLU-

4 bomblets several have been found and disposed of as recently as this fall. In addition to the M-83's, other munitions found at Parcel 3 include projectiles ranging from 20 to 240 mm, bombs 3 to 10000 lbs, and assorted rockets, mortars, missiles, land mines, grenades, flares, and bulk explosives.

2.0 Quality Control.

2.1 Task Order Quality Management: The Contractor shall implement quality control (QC) processes as defined in a Quality Control Plan (QCP). The Contractor is responsible for ensuring that all work under the contract is of the quality that meets or exceeds contract requirements. The QCP shall be detailed and comprehensive and shall cover all aspects of the task order activities impacting quality of deliverables and services. The Contractors QCP shall be included in the WP. The Contractor shall ensure that QC documentation is maintained and provided in the Site Specific Final Report.

2.2 Quality Assurance: The Government will perform quality assurance (QA) of the Contractor's performance under this task order using the method of surveillance specified in the Quality Assurance Surveillance Plan (QASP). The specific surveillance tasks performed under the surveillance plan will be defined following acceptance of the QCP. The Government reserves the right to modify the surveillance tasks in the QASP at any time. The Government reserves the right to perform QA inspections at any time. QA failure can be defined as workmanship or work products not complying with the WP, Performance Work Statement (PWS), or not meeting project needs and/or objectives. Failure can also be defined as workmanship not complying with basic safety concepts and other industry safety practices. If any government QA review identifies a process failure or a work product failure, the Contractor will be issued a Corrective Action Request (CAR). The Contractor shall provide full documentation detailing the root cause of the failure, why it was not detected in the Contractor's QC Program, and how the problem was corrected.

2.3 Re-Performance: Any service or submittal performed that does not meet task order requirements shall be corrected or re-performed by the Contractor at no additional cost to the Government. If the Contractor performs any task unsatisfactorily and all defects are not corrected, the Government reserves the right to terminate the PWS for default. In addition, the Government reserves its rights under FAR clause 52.246-4, Inspection of Services – Fixed Price, for further remedies concerning a Contractor's failure to perform in conformance with contract requirements.

2.4 General Conditions.

a. The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has assessed and satisfied itself as to the general and local conditions, which can affect the work or its cost, including but not limited to:

1) the character, quality, and quantity of surface and subsurface anomalies, materials and obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all previous exploratory work done by and for the Government as well as from the exploratory work that the Government allowed the contractor to performed during the site assessment.

2) Conditions bearing upon transportation, disposal, handling, and storage of materials, explosives, or munitions debris and range related debris;

(3) The availability of labor, facilities, water, electric power, communications, and roads;

(4) The uncertainties of weather, river stages, or similar physical conditions at the site;

(5) The conformation and conditions of the ground, soil, geology, and vegetation (type, height, density), the distribution of each, and the seasonal effects on each;

(6) The character of equipment and facilities needed preliminary to and during work performance;

(7) Personal Protective Equipment (PPE) requirements including all effects on cost or production due to the requirement to use PPE;

(8) Exclusion zone requirements including all effects and costs of implementing and enforcing exclusion zones. The Contractor is responsible for evaluating, identifying the requirements of, and implementing/complying with all exclusion zones;

(9) Responsibility for understanding and implementing the required safety and access control requirements and factoring them into its approach and price;

(10) The availability or cost of qualified labor, material, and/or equipment;

(11) The availability or cost of lodging for on-site personnel;

(12) The availability or location of explosives storage.

b. The Government has provided the Contractor with access to the site, which allowed the Contractor to become confident in its independent understanding of the site conditions. The Government strongly encourages prospective contractors to use this time to perform the requisite site assessments necessary to ascertain the site conditions to a reasonable degree of accuracy. The Contractor attests that the quantity and distribution of surface and subsurface anomalies, MEC, MPPEH, cultural debris, hot rocks, vegetation, terrain, soil condition, weather and other similar cost drivers are reasonably ascertainable from the Contractor's research and assessment of the site in conjunction with the Government provided data and the Contractor's field verification of that data. Contractors are strongly encouraged to perform this site assessment and use their experienced judgment and reasoned interpolation and extrapolation of all the available site information to assess the general and local conditions, which can affect the work or its cost. Contractors who do not perform a site assessment assume the risks associated with the decision to forgo this important source of information about the site. The Contractor is expected to apply due diligence in the research and development of its proposal and to know or reasonably estimate the conditions to be encountered that will affect the cost, quality, or schedule of the work included in this task order. The Government expects the Contractor to assess the risk and factor this risk into its proposal. The act of signing this task order signifies that the Contractor has been given ample opportunity to assess the conditions under which the work will be performed and the Contractor fully understands those conditions. The Contractor accepts full and sole responsibility for identifying and considering all factors that may affect the cost to execute the work. The Contractor attests that it has been provided the opportunity to make an independent assessment of the site, has gathered the information necessary to fully understand the conditions it will encounter during execution of this task order, and has used any data provided by the Government at the its own risk.

c. Government acceptance of the proposed technical approach and/or price does not relieve the Contractor from full responsibility for the viability, productivity, and efficiency of the approach used to perform the work and for meeting the performance requirements of the PWS at the price proposed.

d. The Contractor has been provided data during the proposal process including but not limited to site data included in previous project documents. Specifically, the Contractor has been provided with reports that documents conditions at the site as gathered and interpreted by others. The actual conditions that the Contractor experiences during a removal action will differ from the conditions reported in previous reports. For example, the site was not cleared of vegetation; therefore this hampered the survey efforts which most likely resulted in an under reporting of surface and sub-surface anomaly counts. Also, the speed at which the surveyor moved across the site and the fact that no QA followed will inherently result in an underestimation of the anomalies to be encountered in an actual removal action. These and other factors will cause the report to underestimate the conditions at the site.

e. Use of the data provided as the basis of estimate for an accurate price proposal requires an experienced understanding of how the data of this type is collected, analyzed, interpreted, and presented. The Contractor is responsible for interpreting the data provided in the context of the conditions under which the data was collected and analyzed. The Contractor is responsible for recognizing the limitations of the data provided for assessments of this type. The Contractor is strongly encouraged to use the pre-proposal site visit to field verify its interpretation of the data and assumptions made during preparation of the proposal. The Government expects that contractors will promptly notify the Contracting Officer if they have not been given adequate opportunity to assess the site conditions.

f. The Contractor attests that it has had sufficient opportunity to assess the conditions of the work and has used its experienced judgment and reasoned interpolation and extrapolation of all the available site information to assess the general and local conditions, which can affect the work or its cost. The Contractor attests that any exceptions to any of the conditions of this PWS were clearly marked in the proposal in bold type as "Exception to the RFP". The Contractor certifies that its proposal is not qualified or contingent upon the site conditions.

3.0 Task # 1 HWMU Work Plan this is a Firm Fixed Price task. The Contractor shall submit a HWMU Work Plan IAW this Performance Work Statement (PWS), the FWDA RCRA Permit dated December 2005, the base contract, and applicable Army guidance including but not limited to the most recent Data Item Descriptions (DID) in Preliminary Draft, Tribal Draft, and Final versions. A revised Final may be required; however, revisions should be very minimal. Each draft plan shall be reviewed and accepted by the Government prior to proceeding with the next version. The Contractor shall prepare written responses to address comments received by the various reviewers. Once approved, the Contractor shall make changes and submit the corrected versions of the plan. The Final version requires NMED approval.

The Permit is the critical guidance under this project. Applicable sections of the Permit include: I.H, I.I.8, I.L.2, II.A, II.B, II.C.2, II.C.3, II.G, III.A.1, III.A.2, III.A.4 (first paragraph only), III.A.5 (except the parts discussing soil removal), VIII.B.1, and Attachment 7.2 (relating only to Residential Cleanup Levels).

The Permit is currently undergoing a Class III modification to add the construction of a CAMU which will consist of up to five detonation craters and some type of thermal treatment system to be located in SWMU-14 inside Parcel 3. The government will provide the contractor any updates received from NMED. The contractor shall use the CAMU and the six CE igloos under this project located in B-Block.

The Contractor shall include in the Work Plan the methods of cultural resource monitoring with the Zuni Cultural Resource experts in accordance with the Programmatic Agreement. The Contractor shall contract with the Zuni Tribe for all cultural monitoring. The Navajo Nation Historic Preservation Department stated no Navajo Nation cultural monitoring is required for this project. The Contractor may elect to request to NMED an "Area of Contamination" designation to temporarily store (10+/- days depending on what NMED approves) MEC items within the HWMU. See bid package for examples.

Performance Objective & Payment Performance objectives of Section 2.0 include government acceptance of the Preliminary Draft and Tribal Draft, and NMED approval of the Final Work Plan. Payments will be made upon acceptance/approval of the above versions.

3.1 Accident Prevention Plan (APP) The contractor shall write an Accident Prevention Plan (APP) to be included with the Final Version of the Work Plan. The APP shall be site specific and shall address procedures to implement all of the activities described in the Work Plan including but not limited to entering pits, trenching, detonations, operating heavy equipment, etc., address other hazards that may be present at Parcel 3. The APP shall be submitted to the Project Manager for acceptance prior to starting field work.

Performance Objective & Payment Performance objective of Section 3.1 includes government acceptance of the APP. Payment will be made upon acceptance.

3.2 Explosive Safety Submission (ESS) The contractor shall submit a Draft and Final ESS to the PM for acceptance and forwarding to the approving officials. All communications for comments and questions should be directed to the USACE personnel for clarification. The ESS shall be provided to the government as a standalone document.

Performance Objective & Payment Performance objective of Section 3.2 includes government approval of the ESS. Payment will be made upon approval

3.3 A Certificate of Risk Assessment (CORA). The contractor shall submit draft and final Certificate of Risk Assessment IAW AR 385-63, Para 3-9.d using the information (including performance standards) that was in the expired ICM waiver. The contractor shall submit a Draft and Final Certificate of Risk Assessment the USACE for acceptance and forwarding to the approving officials. All communications for comments and questions shall be directed to the USACE personnel for clarification. **Performance Objective & Payment Performance objective** of Section 3.3 includes government approval of the CORA. Payment will be made upon approval

3.4 Environmental Protection Plan

The Contractor shall write an Environmental Protection Plan (EPP) to be included with the Work Plan. The purpose of the EPP is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the EPP as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the EPP, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial EPP; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The EPP shall be current and maintained onsite by the Contractor.

Some of the Work Area includes wetland habitat. Therefore, work within these wetlands shall follow all applicable regulations in the Work Plan (approved by NMED), per RCRA, and a plan for mitigation of these wetlands per Section 404 of the Clean Water Act. As part of the EPP, the Contractor shall propose methods for following these regulations in relation to wetlands during construction.

The EPP shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

c. A biological resources and wetlands plan that defines procedures for identifying and protecting biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

The EPP shall be submitted in a separate document if required by the regulatory agency.

The areas disturbed by project activities shall be restored with native vegetation. The perimeter of the excavation shall be stabilized or sloped to minimize erosion. If additional debris/waste is encountered at the perimeter, the Contractor shall stabilize the perimeter to prevent movement of debris/waste. The debris/waste beyond the perimeter will be addressed on a separate contract under RCRA Corrective Action.

Performance Objective & Payment Performance objective of Section 3.4 includes government approval of the EPP. Payment will be made upon approval

3.5 Storm Water Pollution Prevention Plan (SWPPP) The Contractor shall prepare and implement a SWPPP with the Work Plan. The SWPPP shall be prepared in accordance with NPDES General Permit for Storm water Discharges From Construction Activities (latest version in effect) with emphasis on Part 10.D NMR100000. The SWPPP shall be submitted in a separate document if required by the regulatory agency. The EPA Region VI is the regulatory agency for the SWPPP on the project. The FWDA POC is Mr. Chuck Hendrickson at 214/665-2196. He will supply the appropriate SWPPP POC.

Performance Objective & Payment Performance objective of Section 3.5 includes government approval of the SWPPP. Payment will be made upon approval

3.6 Project Management Plan The Contractor shall develop and maintain a detailed Project Management Plan (PMP). The draft PMP shall be due within 30 calendar days of contract award and shall include a payment milestone plan. The final PMP shall be due within 30 calendar days of receipt of USACE comments on the draft PMP. The draft PMP, proposed payment milestones, and subsequent revisions shall be subject to Army review and approval, through the PM. A payment milestone plan shall be established for Army approval of the final PMP through the PM. As part of the PMP, the contractor shall identify a means for providing monthly status reports to the Army PM. The government will supply the overall project bid schedule and the contractor shall use this as a basis for developing the payment milestone plan.

Performance Objective & Payment Performance objective of Section 3.6 includes government approval of the PMP. Payment will be made upon approval

3.7 Project Schedule - As part of the PMP, the Contractor shall develop and maintain an Activity-Based Schedule that fully supports the technical approach and outlines activities and milestones defined at the appropriate detail level and logically sequenced to support and manage completion of the performance objectives in this Task Order. It is the Army's intent to make all payments after verification of milestone completion in accordance with this schedule. The schedule shall incorporate the schedule information in Section 8.

3.8 Cultural Resource Management Plan- As part of the HWMU Work Plan the contractor shall include a cultural resource management plan. The Navajo Nation Historic Preservation Department stated no Navajo Nation cultural monitoring is required for this project.

Performance Objective & Payment Performance objective of Section 3.8 includes government approval of the Cultural Resource Management Plan. Payment will be made upon approval

3.9 Sampling and Analysis Plan (SAP). The Contractor shall prepare a Sampling and Analysis Plan as part of the Work Plan and IAW the RCRA Permit. The Contractor shall collect confirmatory soil samples and IDW samples (as necessary per the Work Plan and Landfill requirements) in accordance with the latest standard Environmental Protection Agency (EPA) procedures for the collection of environmental samples. The Contractor shall use laboratories that are accredited in accordance with the NELAP National Environmental Laboratory Accreditation Program (ELAP). The DoD ELAP will provide a means for laboratories to demonstrate conformance to the DoD Quality Systems Manual for Environmental laboratories (DoD QSM) as authorized by DoD Instruction 4715.15, Environmental Quality Systems, December 2006 (or most recent date) and as required by the DoD Policy and Guidelines for Acquisitions Involving Environmental Sampling or Testing, December, 2007. The DoD QSM is based on the National Environmental Laboratory Accreditation Conference (NELAC) Quality Systems standard (Chapter 5). The Contractor shall use the latest accreditation procedures in effect when samples are taken.

Sample ID's shall consist of a combination of Parcel, Site identifier, source of sample, increment number for sub sample identification if necessary, type of sample, and matrix and shall be limited to about 20 characters. Contractor must select a laboratory capable of processing and analyzing all planned methods. Contractor shall use the most current test methods at the time sampling occurs. Quality control samples shall be collected at the frequency of 10%.

The SAP shall contain the Contractor's proposed sampling scheme (to include but not limited to sampling rate for hazardous and non-hazardous waste and soil, air monitoring if necessary, confirmation sample grid, layout of discrete and/or multi-increment sample approach, and test parameters). The SAP shall also propose what to do if a confirmation sample exceeds cleanup levels.
Performance Objective & Payment Performance objective of Section 3.9 includes government approval of the SAP. Payment will be made upon approval

4.0 Task # 2 Construct CAMU Fixed Unit Price. . The contractor shall construct the CAMU IAW the permit modification application. The Army anticipates NMED comments on the application some time between November 2009 and January 2010. Two different options are anticipated in the payment schedule.

Performance Objective & Payment Performance objective of this section includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

5.0 Task # 3 Remove and Properly Dispose of Munitions on Signs and Fence Post. This is a FIRM FIXED PRICE

There are approximately 15 munitions ranging from 57mm to 90mm on signs and fence post used as decorative items at the front gate and in the administrative area. The contractor shall remove and properly dispose of all munitions from the signs and fence post.

Performance Objective & Payment Performance objective of Section 5.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

6.0 Task # 4: Removal of surface debris from revetments and removal of Day storage boxes: This is a firm fixed price. The contractor shall remove all surface debris from the revetments (AOC89) and demolish and remove the 2 day storage boxes adjacent to Parcel 3 entry road. The 2 day storage boxes located in the northern portion of parcel 3 (one east side of the road just south of the Quonset hut and the other just south of the 1st on the west side of the road) shall be demolished, to include the earth covering. All debris shall be removed.(appendix 2). Contractor shall remove all surface debris from the revetment (2nd revetment west side of the road) also located at the northern end of parcel 3 (appendix 3).

Performance Objective & Payment Performance objective of Section 6.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

7.0 Task # 5: Management of ECM under CE Control this is a FIRM FIXED PRICE task. The contractor shall take control of the ECMs and operate 6 of the 8 Conditional Exemption (CE) Igloos IAW DOD 6055-09 STD chapter 14 and the existing ECM SOP (Existing ECM SOP can be modified with USACE approval appendix 4). The contractor shall maintain all 8 of the WMM ECM's this maintenance shall include but is not limited to mowing, lighting protection testing, fence maintenance, etc. The contractor, at their discretion, can use one or more of these ECMs for counter charge storage but shall be responsible for any additional cost such as security requirements. The contractor shall be required to recycle/dispose of all material in the ECM before returning control to the government at the end of the field effort. Contractor shall coordinate control with the onsite government representatives.

Performance Objective & Payment Performance objective of Section 7.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

8.0 Task # 6 Maintenance of roads this is a FIRM FIXED PRICE task

8.1 Maintenance The contractor shall prepare the road for the field work required in the Work Plan to include maintenance of a reinforced concrete low water crossing(being constructed under 9.0) in Parcel 3. Crossing location will be identified at the bidder's meeting. The crossing and roads shall be maintained throughout all field operations. Maintenance includes structural integrity and sediment removal. Sediment may contain MEC(ICM). Contractor shall maintain haul route from parcel 3 to Interstate 40 throughout all field operations. Haul route shall be maintained IAW EM 385-1-1.

Performance Objective & Payment Performance objective of Section 8.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

8.2 Emergency Evacuation Route There will be an emergency evacuation route leading south out of Parcel 3 into Parcel 1 (now under BIA management). See map in bidder's package. The Army will provide the contractor the entry permissions into parcel 1. Contractor shall create a simple 'ranch gate' through the barb wire fence if no gate exists. Maintenance is required for only the portion in Parcel 3 for this route.

Performance Objective & Payment Performance objective of Section 8.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

9.0 Task # 7 Construct a low water crossing *FIRM* FIXED PRICE task

Contractor shall construct a low water crossing north of the HWMU as identified during the site visit. The crossing shall be constructed at a level that makes the crossing viable and sustainable. The contractor shall remove the built up sediment, possibly containing MEC, above the proposed low water crossing point and the sediment from the adjacent arroyo Appendix 5. The contractor should consider testing and retaining sediment for future use as fill.

Performance Objective & Payment Performance objective of Section 9.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

<u>10.0 Task #8 Clean debris and sediment from culverts FIRM FIXED PRICE task</u>

Remove all debris and sediment, possibly containing MEC, from the culverts and adjacent arroyo crossing under the west patrol road north of Parcel 3 and repair the fence. (See Appendix 6).

Remove all debris and sediment, possibly containing MEC, from the culverts and adjacent arroyo crossing under the HWMU access road north of the HWMU and south of the proposed low water crossing to include repairing the fence just south of the culvert. (See appendix 7)

Performance Objective & Payment Performance objective of Section 10.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

<u>11.0 Task # 9 Construct a fence along the south and east sides of Parcel 3 FIRM FIXED PRICE task. (see Appendix # 8)</u>

Replace and remove the existing barb wired fence on the south and east side of Parcel 3 as diagramed in appendix 8. Fence shall be constructed IAW Permit Section II.C.2 and II.C.3. The northern part of the eastern side will be a new fence installation. All fencing shall comply with the specification and signage outlined in appendix 8. There is approximately 15,000 linear feet of existing barb wire fencing. However, some portions of the existing fence lies in areas too steep to safely replace it with chain link so do not replace fence in these areas. Additional fence installation is required near an arroyo on the west Parcel 3 boundaries and directly south of the HWMU. A gate providing 12 foot of clearance and a low water crossing is required at the southern fence directly south of the HWMU and contractors shall maintain the HWMU fence for the life of the contract. Contractor shall avoid culturally sensitive sites, if any, in consultation with Zuni monitors

Performance Objective & Payment Performance objective of Section 11.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

<u>12.0 Task # 10 Contingency Plan. This is a FIRM FIXED PRICE</u> The contractor shall update and maintain the contingency plan for both the Open Burning/Open Detonation (OB/OD) (Appendix 10) Unit and the CAMU at Fort Wingate Depot Activity (FWDA). This plan is intended to satisfy the requirements of a Hazardous Waste Contingency Plan (HWCP) in support of the Resource Conservation and Recovery Act (RCRA) Permit for FWDA.

Performance Objective & Payment Performance objective of Section 12.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

<u>13.0 Task # 11 Close the hazardous waste storage site at Bldg 5 and establish a <90 day hazardous waste storage site at ECM # B1007, . This is a FIRM FIXED PRICE</u>

Contractor shall close the HWS located in Building 5 after establishing a new HWS in ECM # B1007,. Contractors shall comply with all federal and state regulations for the permitting of a HWS. In addition to meeting all the state and federal regulations the contractor shall pressure wash and then thick epoxy the floor and walls up to 4 feet. An anti-skid additive (grit) shall be applied to the floor for traction. All outfalls on the headwalls shall be plugged with mortar and containment shall be built in front of the ECM doors; preferably a trench/sump structure with grill that is flush with floor. Entrance must be in good shape and provide solid, level access to interior. The contractor shall prepare, prime, and paint all metal (door/frame). All other 90 day requirements must be met including signs, fire extinguisher, inspection logs, management plan, etc. Storage and all haz waste management must meet large quantity generator (LQG) requirements at all times since Wingate is episodic LQG. This less than 90 day Hazardous waste storage site will be under the control of Wingate caretakers but contractors may use it with caretaker oversight.

Performance Objective & Payment Performance objective of Section 13.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

<u>14.0 Task # 12 Arroyo Sweep North of the HWMU 2011 FRIM FIXED PRICE</u>

MEC Removal in Arroyo exiting Parcel 3
The Army will provide a WP and an approved ESS. The contractor shall be responsible for contractor desired changes to the Army provided WP or ESS. The contractor shall provide an Accident Prevention Plan and Site Safety and Health Plan for for Army review and acceptance only in order to perform a MEC Removal in the arroyo exiting Parcel 3 (near 209 gate) extending 3 miles down stream. This task is meant to be a maintenance procedure until all MEC has been removed from the arroyos in Parcel 3. The Army anticipates this action occurring each year of the task order duration following the rainy season. This maintenance procedure was last performed in 2007.

Performance Objective & Payment Performance objective of Section 14.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

<u>15.0 OPTIONAL TASKS:</u>

<u>OPTIONAL TASK # 1</u> Removal of MEC and Debris from the HWMU. This is the FIRM FIXED task price.

The Contractor shall remove all MEC and debris from the HWMU regardless of depth. Contractors should use the government provided information to determine the required excavation depth and removal volume. The excavation site and any soils removed incidental with MEC, debris, metal shall be characterized (to include MC) for future remediation, backfill, and or disposal. Debris should be considered for recycling. The Contractor shall also implement the other Plans mentioned in Section 2 of this PWS. Electronic versions of all of the documents and letters referenced in this statement of work will be offered to the contractor.

Performance Objective & Payment Performance objective of Section 15.0 includes government approval of the work performed in accordance with the approved work plans. Payment will be made as a fix unit price agreed on in the payment schedule.

Cultural Resources Oversight Cultural monitoring shall be performed to monitor and/or avoid archeological, historic, sacred sites and Traditional Cultural Properties (TCPs). The contractor shall hire persons or a firm that has 1) extensive experience at FWDA with Zuni archeological, historic, sacred sites and Traditional Cultural Properties, 2) extensive experience in identification and assessment of the significance of Zuni TCPs and religious sites at FWDA, and 3) that has approval of the Zuni Tribe. The contractor shall provide cultural monitoring as specified in the Programmatic Agreement (PA). It is understood that safety comes first and that cultural monitoring will be constrained by safety measures. All cultural concerns shall be addressed per the PA and Native American Graves Protection and Repatriation Act (NAGPRA) regulations. The Navajo Nation Historic Preservation Department stated no Navajo Nation cultural monitoring is required for this project.

Performance Objective & Payment The total level of effort is unknown, thus to attempt to quantify the effort the government will fund a base bid level of effort in firm-fixed unit prices. The performance objective is to allow the Tribe to monitor excavation efforts and record findings as long as all safety protocols and restrictions are met. Safety protocols are enforced by the Contractor SUXOS and Army OESS.

Survey The Contractor shall perform any surveys delineating clearance utilizing the services of a New Mexico licensed professional surveyor when required. Survey data shall also include coordinates supplied in appropriate UTM and State Plane formats. All MEC items found on the surface shall be GPS surveyed to within 1' accuracy.

Performance Objective & Payment Performance objective of Section 4.2 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a Firm Fixed Price.

MEC Disposal The Contractor shall be responsible for the destruction of all MEC and MPPEH encountered during project activities per the Permit and all MEC and MPPEH currently in the ECM's being maintained under the CE (Appendix 1). MEC disposal includes all disfiguring, heating, smelting, or other methods as approved in the Work Plan.

Performance Objective & Payment Performance objective of Section 4.3 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

MEC Accountability: The Contractor shall maintain a detailed accounting of all MEC items/components encountered. This accounting shall include the amounts of MEC, nomenclature and condition (i.e., UXO, DMM, and explosive MC), general location (ie SW quadrant of grid xyz) and depth (if determinable), and disposition. The accounting system shall also account for all demolition materials utilized to detonate MEC on site. The Contractor shall take digital photographs of identifiable MEC found during the investigation. This accounting shall be a part of an appendix to the report.

Performance Objective & Payment Performance objective of Section 4.4 includes government approval of the work performed. Payment will be made as a firm fix price.

Hazardous & Non-Hazardous Soil and Waste Transport and Disposal The Contractor shall excavate, process (i.e. sift, or other means), sample, remove, transport, and dispose of all non-hazardous waste to include debris in accordance with all local, state, and federal regulations. Non-hazardous soil mixed in with and excavated along with the debris and MEC shall be stockpiled in the HWMU. The only case where soil shall be placed back in the excavation is when slope stability and/or safety of humans and wildlife are at risk due to steep slopes and holes. Any soil placed back in the excavation shall have concentrations below the Residential Cleanup standards AND is approved by NMED or their delegated regulator. Stockpiled soil shall be managed in accordance with the EPP and SWPPP. The contractor shall remove and transport and dispose off of Depot all hazardous soils, waste, and materials in accordance with all local, state, and federal regulations. Debris will include recyclable metals, thus the Contractor shall consider this in the proposal.

Performance Objective & Payment Performance objective of Section 4.5 includes government approval of the work performed. Payment will be made as a fix unit price agreed on in the payment schedule.

Investigation Derived Waste The Contractor shall stage the field work so that any investigation derived waste (IDW) generated shall be characterized and disposed of in accordance with all local, state, and federal regulations. The contractor shall manage all waste and prepare all associated documentation. The Army shall sign all waste shipping papers as the generator. All IDW shall be disposed of before the Contractor leaves FWDA.

Performance Objective & Payment Performance objective of Section 4.6 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

Quality Assurance and Control The Contractor shall implement quality assurance (QA) processes as defined in a Quality Control Plan (QCP). The Contractor is responsible for ensuring that all work under the contract is of the quality that meets or exceeds contract requirements. The QCP shall be detailed and comprehensive and shall cover all aspects of the task order activities impacting quality of deliverables and services. The Contractors QCP shall be included in the HWMU WORK PLAN. The Contractor shall ensure that QC documentation is maintained and provided in the Site Specific Final Report.

The Contractor shall develop a proposed Quality Assurance Surveillance Plan (QASP) for use by the Army. A Draft QASP using the template provided in Attachment A shall be submitted with the PMP deliverables within thirty (30) days of award. The Final QASP will be prepared by the Army.

The QASP should highlight key quality control activities or events that the COR will use to determine when Army (COR or Contracting Officer (KO)) inspections can be conducted to assess progress toward and/or completion of milestones. Activities identified in the QASP should be appropriately coded in the project schedule to allow for planning of QA inspections. The Government will perform quality assurance (QA) of the Contractor's performance under this task order using the method of surveillance specified in the Quality Assurance Surveillance Plan (QASP). The specific surveillance tasks performed under the surveillance plan will be defined following acceptance of the QCP. The Government reserves the right to modify the surveillance tasks in the QASP at any time. The Government reserves the right to perform QA inspections at any time. QA failure can be defined as workmanship or work products not complying with the HWMU WORK PLAN, Statement of Work, or not meeting project needs and/or objectives. Failure can also be defined as workmanship not complying with basic safety concepts and other industry safety practices. If any government QA review identifies a process failure or a work product failure, the Contractor will be issued a Corrective Action Request (CAR). The Contractor shall provide full documentation detailing the root cause of the failure, why it was not detected in the Contractor's QC Program, and how the problem was corrected.

Performance Objective & Payment Performance objective of Section 4.7 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

Soil Sampling The Contractor shall collect confirmatory soil samples, waste characterization samples, and IDW samples as necessary per the Work Plan, transportation, and landfill requirements. The Work Plan shall contain the sampling and analysis plan. The contractor shall remove or remediate additional soil or waste if test results exceed cleanup levels. The Contractor shall propose the area and volume to remove when exceedances occur. Soil removal is further addressed in Options 1 and 2.

Performance Objective & Payment Performance objective of Section 4.8 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

Digital Geophysical Mapping Per permit section III.A.5 DGM will be performed over the HWMU to confirm all debris, MEC, and MPPEH have been removed. The Contractor shall remove and dispose in a manner described above all debris, MEC, and MPPEH detected during DGM. A Geophysical test plot is already in place and is available for the contractor. The contractor is required to demonstrate their equipments capability on the test plot prior to implementing DGM of the HWMU area.

Performance Objective & Payment Performance objective of Section 4.9 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

Revisions to the Military Map's Table Per Permit section I.L.2, the Contractor shall supply the Project Manger an updated table (provided by the government in the bid package) showing all MEC items found during the calendar year in which field work occurred. Provide this information on or before December 10 of each year or within 10 days after de-mobilization.

Performance Objective & Payment Performance objective of Section 4.10 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

Coordination of Field Changes to Work Plan. The contractor shall coordinate with the Project Manger all field changes to the Work Plan. The PM will make attempts to contact NMED and resolve the proposed change immediately in the field. Contractor shall document all changes in the Project Report.

Performance Objective & Payment Performance objective of Section 4.11 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

OPTIONAL TASK #2 Operation of the CAMU This is a firm fixed price task. The contractor shall operate the CAMU IAW the permit modification application. The CAMU Permit mod application is under NMED review. It is expected that NMED comments will not be available before proposal submission. In brief, operation shall include detonations and burning as determined by the nature of the waste. Burning shall be limited to items too dangerous to remove off Depot as determined by the Corps OESS and contractor SUXO. The solicitation will be amended to supply bidders the comments if they become available before the proposal submittal date. The contractor shall operate the CAMU and shall be responsible for all management and maintenance of the unit until the completion of the work on the HWMU. In addition to MEC/MPPEH/MD items being treated from the HWMU the contractor may be tasked to treat MEC/MPPEH/MD found on other Parcels of Fort Wingate by USACE or other contractors.

Performance Objective & Payment Performance objective of Section 5.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

OPTIONAL TASK # 3 Monitoring Well Abandonment FIRM FIXED PRICE task. During the course of HWMU closure, existing monitoring wells will require abandonment. The contractor shall abandon monitoring wells that are within the boundaries of the HWMU. A Table is presented in appendix 9 of this PWS that contains monitoring well specifications (i.e. well depth, diameter, etc). Each monitoring well was constructed with schedule 40 PVC, 2-inch diameter, casing, and screen. The contractor can assume the boreholes are 8-inch. Depths of each monitoring well are in appendix 9.

Three monitoring wells, CMW06, CMW16, and CMW20 were buried by flood events. These wells shall be located and excavated before they are abandoned. The coordinates for their locations are also presented in appendix 9. Coordinates are in New Mexico State Plane, 1983 North American Datum, U.S. Survey Feet. Monitoring wells have metal casing protection and metal pipe bollards filled with concrete; therefore, they can be location with a metal detector.

The monitoring wells requiring abandonment were constructed as above grade completions, with an approximate 2-foot stick-up. A metal casing with a pad locked cover protects each monitoring well stick-up. Each monitoring well has a 4x4 concrete pad approximately 4 inches thick.

Monitoring wells shall be abandoned in accordance with New Mexico well abandonment requirements. Regulations governing the installation and abandonment of wells can be found in the New Mexico Administrative Code (NMAC). Specifically, the contractor must adhere to the following for the abandonment of wells: New Mexico Office of the State Engineer requirements for Well Driller Licensing; Construction, Repair and Plugging of Wells (19.27.4. NMAC). All permits and forms required for well abandonment are the responsibility of the contractor. The contractor shall also submit copies of all permits and forms to the COR.

Additionally, the contractor shall remove and dispose of all debris associated with the abandonment of monitoring wells IAW all local state and federal regulations.

Performance Objective & Payment Performance objective of Section 12.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

OPTIONAL TASK # 4 Well abandonment of well CMW 14 Fixed Unit Price Per Optional Task 3 and appendix 9

OPTIONAL TASK # 5 Well abandonment of well CMW 17 Fixed Unit Price Per Optional Task 3and appendix 9

OPTIONAL TASK # 6 Well abandonment of well CMW 18 Fixed Unit Price Per Optional Task 3and appendix 9

OPTIONAL TASK # 7 Well abandonment of well CMW 21 Fixed Unit Price Per Optional Task 3 and appendix 9

OPTIONAL TASK # 8 Well abandonment of well FW 38 Fixed Unit Price Per Optional Task 3 and appendix 9

OPTIONAL TASK # 9 Well abandonment of well CMW 07 Fixed Unit Price Per Optional Task 3 and appendix 9

OPTIONAL TASK # 10 One year of SWPPP and EPP field maintenance.
Performance Objective & Payment Performance objective of Section 4.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

OPTIONAL TASK # 11 Arroyo Sweep North of the HWMU 2012 FRIM FIXED PRICE

MEC Removal in Arroyo exiting Parcel 3
The Army will provide a WP and an approved ESS. The contractor shall be responsible for contractor desired changes to the Army provided WP or ESS. The contractor shall provide an Accident Prevention Plan and Site Safety and Health Plan for Army review and acceptance only in order to perform a MEC Removal in the arroyo exiting Parcel 3 (near 209 gate) extending 3 miles downstream. This task is meant to be a maintenance procedure until all MEC has been removed from the arroyos in Parcel 3. The Army anticipates this action occurring each year of the task order duration following the rainy season. This maintenance procedure was last performed in 2007

OPTIONAL TASK # 12 Arroyo Sweep North of the HWMU 2013 FRIM FIXED PRICE

MEC Removal in Arroyo exiting Parcel 3
The Army will provide a WP and an approved ESS. The contractor shall be responsible for contractor desired changes to the Army provided WP or ESS. The contractor shall provide an Accident Prevention Plan and Site Safety and Health Plan for Army review and acceptance only in order to perform a MEC Removal in the arroyo exiting Parcel 3 (near 209 gate) extending 3 miles downstream. This task is meant to be a maintenance procedure until all MEC has been removed from the arroyos in Parcel 3. The Army anticipates this action occurring each year of the task order duration following the rainy season. This maintenance procedure was last performed in 2007

OPTIONAL TASK # 13 Arroyo Sweep North of the HWMU 2014 FRIM FIXED PRICE

MEC Removal in Arroyo exiting Parcel 3
The Army will provide a WP and an approved ESS. The contractor shall be responsible for contractor desired changes to the Army provided WP or ESS. The contractor shall provide an Accident Prevention Plan and Site Safety and Health Plan for Army review and acceptance only in order to perform a MEC Removal in the arroyo exiting Parcel 3 (near 209 gate) extending 3 miles downstream. This task is meant to be a maintenance procedure until all MEC has been removed from the arroyos in Parcel 3. The Army anticipates this action occurring each year of the task order duration following the rainy season. This maintenance procedure was last performed in 2007.

OPTIONAL TASK # 14 Arroyo Sweep North of the HWMU 2015 FRIM FIXED PRICE

MEC Removal in Arroyo exiting Parcel 3
The Army will provide a WP and an approved ESS. The contractor shall be responsible for contractor desired changes to the Army provided WP or ESS. The contractor shall provide an Accident Prevention Plan and Site Safety and Health Plan for Army review and acceptance only in order to perform a MEC Removal in the arroyo exiting Parcel 3 (near 209gate) extending 3 miles down stream. This task is meant to be a maintenance procedure until all MEC has been removed from the arroyos in Parcel 3. The Army anticipates this action occurring each year of the task order duration following the rainy season. This maintenance procedure was last performed in 2007.

Performance Objective & Payment Performance objective of this section includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

OPTIONAL TASK # 15 Project Report this is a FIRM FIXED price task. The Contractor shall submit a Report to summarize the results of the removal as required by the FWDA RCRA Permit Section III.A.6. The Report shall include, but not be limited to, background information, a summary of the actual activities conducted, descriptions of the methods and procedures used, photographs, summaries of the results of all field measurements and laboratory analyses, maps depicting relevant features including investigation locations and the locations of detected contaminants, document field changes to the work plan, summary tables of the results of field measurements and chemical analyses in NMED required format, summaries of QA/QC data, data quality exceptions, data review documentation, comparison to the cleanup levels approved in the Work Plan, and final contract laboratory reports. The contractor shall also provide a yearly update report summarizing each year's field work.

Performance Objective & Payment Performance objective of Section 13.0 includes government approval of the work performed in accordance with the approved Work plan. Payment will be made as a fix unit price agreed on in the payment schedule.

Review Comments: The Contractor shall submit the Investigation Report in Preliminary Draft, Tribal Draft, and Final versions. Tribal Drafts shall be conducted IAW Permit section VIII.B.1. A revised Final may be required; however, revisions should be very minimal. Each draft report shall be reviewed and approved by the Government prior to proceeding with the next version. The Contractor shall prepare written responses to address comments received by the various reviewers. Once approved, the Contractor shall make changes and submit the corrected versions of the reports. The Contractor shall comply with review comments in the development of data and reports for the next milestone.

Ultimate Performance Objective & Final Payment: The ultimate performance objective of the contract is the NMED approved Project Report. Final payment will be made upon receipt of the NMED approval letter for the Project Report. No payments will be made for the Preliminary and Tribal Drafts.

16.0 Deliverables, Copies, and Schedule The Work Plan and Project Report shall be submitted in Preliminary Draft, Tribal Draft, and Final versions. See attached "Document Distribution List" for names and number of required copies. The APP shall be submitted in Draft and Final versions.

Work Item	Work Description	Calendar Days
1	Award Task Order	On or before March 1, 2010
2	Project Management Plan, Schedule, Payment Milestone Plan, QASP	NLT 30 days after award
3a	Preliminary HWMU Work Plan, Army review	NLT 90 days after award
3b	Auxiliary Tasks Work Plan(ie, for Construction, well abandonment, and other auxiliary task), ESS, Certificate of Risk Assessment, APP, EPP, SWPPP for Army review only	NLT 90 days after award
4	Army Review, comments incorporated, Tribal Draft HWMU Work Plan (Tribes have 60 days)	45 days
5	Incorporate tribal comments all plans, Final HWMU Work Plan, NMED Review (up to 1 year)	30 days
6	Prepare Response to NMED Comments and Resolution	Date set in NMED letter (usually 60 days)
7	Field Work Begins	NLT 60 days after approved work plan
8	Preliminary Draft Project Report	NLT 90 days after field work
9	Army Review, comments incorporated, Tribal Draft Project Report (Tribes have 90 days)	30 days
10	Incorporate tribal comments, Final Investigation Report, NMED Review (up to 1 year)	30 days
11	Prepare Response to NMED Comments and Resolution. May include revised report pages	Date set in NMED letter (usually 60 days)

17.0 Report Formatting in accordance with the Fort Wingate Deliverables Formatting Guidelinnes Version 1.0

17.1 Hard Copy Format Deliverables shall be typed on standard size of 8-1/2 inch by 11-inch white paper and placed in 3-inch binders. Preliminary Draft, Tribal Draft and Draft versions of reports shall have line numbers on all pages for easy reference during the comment phases.

The Contractor shall complete the Government Standard Form 298, 'Report Documentation Form' and place it immediately following the cover page. Reports shall follow the FWDA Document Format Guidelines found in the bidder's package.

17.2 Computer Files All text files generated by the Contractor shall be furnished in Microsoft Word 6.0 or higher software. Spreadsheets shall be in Microsoft Excel Spreadsheet version 98 or higher format. All DGM data shall be delivered in formats compatible with ESRI (Arcview/Arcinfo) system and Geosoft Oasis Montaj.

17.3 PDF Deliverables In addition to the paper and digital copies of deliverables, the final version of all reports shall be submitted, uncompressed in a searchable PDF format along with a linked table of contents, linked tables, linked photographs, linked figures, as applicable, all of which shall be suitable for viewing on the Internet.

18.0 Project Management

18.1 Contractor Project Manager The Contractor shall appoint a Project Manager to serve as a single point of contact and liaison between the Contractor and the Contracting Officer and/or his representative(s) during the execution of the task order. The Contractor's Project Manager shall be responsible for coordinating the work performed under this task order and ensuring work shall be accomplished with technical accuracy and minimal conflicts, errors, and omissions. The Contractor shall immediately furnish the name of the designated individual in writing to the Government's PM upon award of the task order.

18.2 Progress Reports The Contractor shall prepare brief Monthly Progress Reports for the duration of the project. During field operations the OESS will require a daily report from the contractor, and the PM will require a weekly progress report from the contractor. The Monthly Progress Report shall include:

1) Brief description of the project
2) Status of the work performed
3) Description of current problems that may impede performance in accomplishing planned activities outlined in the PWS and suggested corrective actions.
4) Discussion of work to be performed during the next month.
5) Percentage of work completed for Task Order.
6) Spreadsheet showing project tasks, original budget and amount billed against each task, percentage complete for each task and remaining budget.

18.3 Field Work Coordination The NMED must be notified at least 30 days prior to field mobilization therefore, the Contractor shall keep the PM updated of the field work schedule. In addition, the Contractor shall notify the FWDA staff 10 working days prior to mobilization to the jobsite. During field events at FWDA, the Contractor shall have the field leader coordinate daily with the FWDA Caretakers. Coordination shall include a brief discussion on daily work, health/safety issues, if any, work progress, potential problems, deliveries, and any other job issues.

18.4 Project Access All vehicles entering FWDA are subject to post regulations. Drivers of vehicles must be willing to show proof of insurance upon request of the caretakers' office. Speed limit on the post is 15 mph in admin area and 25 mph all other areas. FWDA is generally open (main gate unlocked) from 06:45 to 17:00 hours 5 days a week. A series of gates lies between the administrative area and the project site. The contractor shall be required to coordinate with the Missile Defense Agency (MDA) and FWDA caretakers' office during the execution of this contract for access into FWDA and the work sites. Firearms, open flames, and smoking are prohibited on FWDA, violators will be removed from the project.

18.5 Meetings The PM and one other of his/her choice shall attend 10 meetings with a one day duration in Gallup,Santa Fe, Fort Worth or other location (10 total not 10 in each city) through the period of performance. Contractor shall be prepared to discuss any aspects of the project during the meeting.

<u>19.0 Government Furnished Equipment and Office Space</u> The Government may issue a FWDA radio or keys to the Contractor's field leader for use while on FWDA. The Contractor shall return the radio and keys to FWDA staff at the end of each day. The Contractor shall repair or replace the radio if it becomes damaged or broken while in the Contractor's possession. The Contractor shall coordinate with the FWDA Caretaker regarding the availability of office space.

20.0 New Mexico Gross Receipts Tax The Contractor may or may not be subject to the New Mexico Gross Receipts Tax. The Contractor shall be responsible for making this determination and payment, if required. If the Contractor's proposal for this task order includes the New Mexico Gross Receipts tax, then proof of payment must be provided to the PM.

<u>21.0 Points of Contact (POC)</u>

<u>21.1 Government Managers</u> The Government's Project Manger (PM) for this effort is Mr. Eric Kirwan, MEC/HTRW Section (CESWF-PER-DI), telephone No. 817/886-1673, FAX No. 817/886-6525.

<u>21.2 Contracting Representative (COR)</u> The government COR for this effort is Mr. Steve Carpenter, HTRW Section (CESPA), telephone No. 505/342-3690.

<u>21.3 FWDA BRAC Environmental Coordinator</u> The FWDA BEC is Mr. Mark Patterson, Ravenna Army Ammunition Plant, Ravenna, OH, 330/358-7312.

<u>21.4 FWDA Caretakers</u> Richard Cruz, 505-905-6190.Caretaker Office/Mike Chee, 505-905-5411.Building 1 Office, 505-905-6107, Shannon Jackson 505-905-6107

<u>21.5 On-site Corps Ordnance & Explosives Safety Specialist (OESS)</u> The OESS is TBD.

<u>21.6 On-site Corps Qaulity Asurance/constrnction Representative</u> Mike Scoville (CESWF-PER-DD), telephone No. 817/886/1875

<u>21.7MDA Caretaker</u> Martin Eastridge, 575-649-0352

Document Distribution List

Preliminary Draft (Army Review)	Hard Copies	PDF (CD)
Mark Patterson (FWDA BEC)	1	1
Micki Gonzales (FWDA)	1	2
Ft. Worth District POC (USACE SWF)	1	2
Albuquerque District (USACE SPA) Steve Carpenter	0	1
Regional Support Center (USACE SPK) Neal Navarro	0	1
Mike Kipp (USAEC)	0	1
Pat Ryan (Web manager)	0	1
Bill O'Donnell (BRACD)	0	1
Totals	**3**	**10**

Tribal Draft	Hard Copies	PDF (CD)
Mark Patterson (FWDA BEC)	0	1
Micki Gonzales (FWDA)	1	2
Bill O'Donnell (BRACD)	0	1
Ft. Worth District POC (USACE SWF)	0	2
Albuquerque District (USACE SPA) Steve Carpenter	0	1
Regional Support Center (USACE SPK) Neal Navarro	0	1
Mike Kipp (USAEC)	0	1
Pat Ryan (Web manager)	0	1
Sharlene Begay-Platero (NN)	1	7
Edward Wemytewa (POZ)	1	8
Clayton Seoutewa (BIA Zuni)	1	1
Rose Duwyenie. (BIA-NR)	1	2
Totals	**5**	**28**

Final (Regulatory Review)	Hard Copies	PDF (CD)
James Bearzi (NMED HWB)	2	2
Chuck Hendrickson (USEPA 6)	1	1
Mark Patterson (FWDA BEC)	0	1
Micki Gonzales (FWDA)	2	2

Bill O'Donnell (BRACD)	0	1
Ft. Worth District POC (USACE SWF)	0	2
Albuquerque District (USACE SPA) Steve Carpenter	0	1
Regional Support Center (USACE SPK) Neal Navarro	0	1
Mike Kipp (USAEC)	0	1
Sharlene Begay-Platero (NN)	1	7
Edward Wemytewa (POZ)	1	8
Clayton Seoutewa (BIA Zuni)	1	1
Ben Burshia (DOI/BLM)	0	1
Eldine Stevens (DOI/BLM)	0	1
Judith Wilson (DOI/BLM)	0	1
Rose Duwyenie (BIA-NR)	1	2
Angela Kelsey (BIA)	0	1
Pat Ryan (Web manager)	0	1
Totals	**9**	**35**

Final - VERSION 2	**Hard Copies**	**PDF (CD)**
James Bearzi (NMED HWB)	2	2
Chuck Hendrickson (USEPA 6)	1	1
Mark Patterson (FWDA BEC)	1	1
Micki Gonzales (FWDA)	2	2
Bill O'Donnell (BRACD)	0	1
Ft. Worth District POC (USACE SWF)	1	2
Albuquerque District (USACE SPA) Steve Carpenter	1	1
Regional Support Center (USACE SPK) Neal Navarro	0	1
Mike Kipp (USAEC)	0	1
Sharlene Begay-Platero (NN)	1	7
Edward Wemytewa (POZ)	1	8
Clayton Seoutewa (BIA Zuni)	1	1
Ben Burshia (DOI/BLM)	0	1
Eldine Stevens (DOI/BLM)	0	1
Judith Wilson (DOI/BLM)	0	1

Rose Duwyenie (BIA-NR)	1	2
Angela Kelsey (BIA)	0	1
Pat Ryan (Web manager)	0	1
Totals	**12**	**35**
Grand Total	**29**	**108**

22. REFERENCES.

22.1 Contract: Refer to "Basic Contract."

22.2 Data Item Descriptions (DIDs):

Data Item Descriptions are part of this contract and are available at the following: http://www.hnd.usace.army.mil/oew/didsindex.aspx

Attachment A: Quality Assurance and Surveillance Plan (QASP) Template

1.0 Overview

This performance-based Quality Assurance Surveillance Plan (QASP) sets forth the procedures and guidance that the Contracting Officer's Representative (COR) will use in evaluating the technical performance of the Contractor in accordance with the terms and conditions of the Task Order. The QASP objective is to explain Government procedures to be used to verify that appropriate performance and quality assurance methods are used in the management of this performance-based contract. The purpose of the QASP is to assure that performance of specific activities and completion of milestones are accomplished in accordance with all requirements set forth in the Task Order.

This QASP describes the mechanism for documenting noteworthy accomplishments or discrepancies for work performed by the Contractor. Information generated from COR's surveillance activities will directly feed into performance discussions with the Contractor. The intent is to ensure that the Contractor performs in accordance with performance metrics set forth in the Task Order documents, the Army receives the quality of services called for in the Task Order, and the Army only pays for the acceptable level of services received.

The QASP details how and when the COR will monitor, evaluate, and document Contractor performance on the Task Order. The QASP is intended to accomplish the following:

1. Define the role and responsibilities of participating Army officials.
2. Define the key milestones/deliverables that will be assessed.
3. Define acceptable, superior, and unacceptable performance standards for key milestones/deliverables.
4. Describe the surveillance methodology that will be employed by the Army in assessing the Contractor's performance.
5. Describe the surveillance documentation process and provide copies of the form that the Army will use in evaluating the Contractor's performance.
6. Outline payment and corrective action procedures.

This QASP will be revised and finalized by the COR and Contractor upon completion of the Project Management Plan (PMP).

2.0 Roles and Responsibilities of Army Officials

The COR is responsible for technical administration of the project and assures proper Army surveillance of the Contractor's performance. The COR is responsible for monitoring, assessing, recording, and reporting on the technical performance of the Contractor on a day-to-day basis.

The Contracting Officer (KO) has overall responsibility for overseeing the Contractor's performance. The KO is responsible for the day-to-day monitoring of the Contractor's performance in the areas of Task Order compliance, and Task Order administration; reviewing the COR's assessment of the Contractor's performance; and resolving all differences between the COR's assessment and the Contractor's assessment of performance. It is the KO that assures the Contractor receives impartial, fair, and equitable treatment under the Task Order. The KO is ultimately responsible for the final determination of the adequacy of the Contractor's performance. The KO is the only one authorized to obligate the Government on this Task Order.

The COR and KO may call upon the technical expertise of other Army officials and subject matter experts (SME) as required. These Army officials/SMEs may be called upon to review technical documents and products generated by the Contractor. Contracting Agency representatives will also conduct review of Task Order documentation such as invoices, monthly status reports, and work plans.

3.0 Key Milestones/Deliverables to be Assessed

At a minimum, the following milestones and associated deliverables will be evaluated in accordance with this QASP:

- Completion of the final Project Management Plan (PMP)
- Completion of all drafts and the Final Work Plan
- Completion of all other Plans in the project
- Completion of the CAMU
- Completion of low water crossing
- Completion of Project Report
- Approved interim milestones identified in the final PMP

Additionally, the Army will evaluate performance on the key quality control activities and events specified by the Contractor through their Quality Assurance (QA) strategy.

4.0 Performance Standards for Key Milestones/Deliverables

Since price is fixed in the performance-based acquisitions utilized by the Army, the Contractor's performance will be evaluated by assessing the key milestones/deliverables described above according to three standards: quality, timeliness, and safety. For each of these performance standards, the COR will assign one of three ratings of the Contractor's performance: superior, acceptable, or unacceptable (as shown in Table 1). Note: These performance standards may be modified to meet the needs of the Army.

Table 1 Performance Standards

Performance Standard	Superior Performance	Acceptable Performance	Unacceptable Performance
Quality	Contractor exceeds the requirements in the Task Order for the milestone/deliverable. Deliverables/milestones are approved after one round of comments from Army and Regulators and no revisions are required.	Contractor meets the requirements in the Task Order for the milestone/deliverable. Deliverables /milestones are approved with two rounds of comments received from Army and Regulators and no further revisions are required.	Contractor does not meet the requirements in the Task Order for the milestone/deliverable. Deliverables/milestones require more than two rounds of comments from Army and Regulators before being approved.
Timelines	Contractor provides acceptable milestone/deliverable ahead of the schedule outlined in the PMP.	Contractor provides milestone/deliverable according to the schedule outlined in the PMP.	Contractor provides milestone/deliverable behind the schedule outlined in the PMP

Safety	No safety deficiencies are reported during QA inspection of fieldwork. No lost time accidents or injuries are recorded during the fieldwork.	No more than two safety deficiencies are reported during QA inspection of fieldwork. If any safety deficiency is noted during the project, appropriate investigation, corrective action, implementation, and written verification of the corrective action are provided to the Army. No lost time accidents or injuries are recorded during the fieldwork.	More than two safety deficiencies are reported during QA inspection of fieldwork or a safety deficiency is reported but is not properly investigated, corrective action identified, implemented, and then verified through documentation provided to the Army. A lost time accident or injury is recorded during the fieldwork.

If a milestone/deliverable is rated as being of unacceptable quality at the time that the PMP deadline for the milestone/deliverable expires, the milestone/deliverable will automatically receive an unacceptable rating for timeliness. At no point will a milestone/deliverable receive an acceptable or superior rating for timeliness if it is rated as being of unacceptable quality. Overall acceptable performance on a milestone/deliverable requires ratings of acceptable or superior for the quality, timeliness, and safety standards.

5.0 Surveillance Methodology

The surveillance methods listed below will be used in the execution of this QASP.

100% Inspection
At the completion of all key milestones and deliverables, performance will be evaluated through 100% inspection (e.g., document review). The COR will document performance for each completed milestone/deliverable prior to payment, as described in Section 6.0.

Periodic Progress Inspection
At the COR's discretion, periodic inspections may be conducted to evaluate progress toward and/or completion of key milestones and deliverables. The COR may complete a periodic progress inspection if s/he believes that deficiencies exist that must be addressed prior to milestone/deliverable completion. While corrective action or re-performance will be required if necessary, the Contractor will not be financially penalized for unacceptable performance recorded in periodic progress reports, provided that final performance evaluation of the milestone/deliverable is deemed acceptable.

Customer Feedback
Additional feedback will be obtained through random customer feedback. To be considered valid, customer complaints must set forth clearly and in writing the detailed nature of the feedback, must be signed, and must be forwarded to the KO. The KO will maintain a summary log of all formally received customer feedback as well as a copy of each feedback in a documentation file.

6.0 Surveillance Documentation

The COR will use a performance evaluation form to record evaluation of the Contractor's performance for each milestone and deliverable in accordance with the methodology described in Sections 4.0 and 5.0. The COR must substantiate, through narratives in the form, all superior and unacceptable ratings.

Performance at the acceptable level is expected from the Contractor. At a minimum, the evaluation form will indicate actual and scheduled delivery times and number of reviews required to achieve the final product.

The COR will forward copies of all completed performance evaluation forms to the KO and Contractor within one week of performing the inspection. When a milestone/deliverable receives an overall unacceptable rating, the Contractor will explain, within 15 business days, in writing to COR why performance was unacceptable, how performance will be returned to acceptable levels, and how recurrence of the problem will be prevented in the future.

The KO will review each performance evaluation form prepared by the COR. When appropriate, the KO may investigate further to determine if all the facts and circumstances surrounding the event were considered in the COR opinions outlined on the form. The KO will immediately discuss any unacceptable rating with the Contractor to assure that corrective action is promptly initiated.

At the end of every year, the COR will prepare a written Contractor Performance Assessment Report (CPAR) for the KO summarizing the overall results of his/her surveillance of the Contractor's performance during the previous 12 months. This report will become part of the formal QA documentation.

The COR will maintain a complete QA file. This file will contain copies of all performance evaluation forms and any other related documentation. The COR will forward these records to the KO at termination or completion of the Task Order.

7.0 Payment and Corrective Action

Full payment for a milestone/deliverable will be provided upon verification of overall acceptable performance, as rated on quality and timeliness. This verification will be recorded in a performance evaluation form submitted to the KO specifying overall Contractor performance as either acceptable or superior for the milestone/deliverable.

If a milestone/deliverable receives an unacceptable rating for the quality performance standard, re-performance is required until the milestone/deliverable receives an acceptable rating. This re-performance is required regardless of cost or schedule constraints that may result from the unacceptable performance, unless the KO has opted to terminate the Task Order. If an acceptable rating is not achieved, the Government may reduce the contract price to reflect the reduced value of the services in accordance with FAR 52.246-4(e).

Table 2 summarizes the minimum key elements planned for the QASP. The final QASP will be developed with the COR and the contractor and will be based on the final PMP.

Additional Government surveillance activities may include, but are not limited to, the following:
- Work plan review and approval
- Participation in Technical Project Planning (or equivalent) sessions
- Oversight of all MEC operations including CE igloos and CAMU
- Oversight of geophysical survey & analysis activities
- Oversight of drilling, field sampling activities
- Oversight of all waste management functions/responsibilities
- Review of all waste management documentation
- Separate/split laboratory QA samples
- Review and approval of all access agreements associated with off-site areas

- Review and approval of meeting minutes from RAB/BCT meetings
- Review and approval of all deliverables to regulatory agencies
- Review of quality control documentation
- Review of project safety record
- Adherence to the approved work plan

Table 2 Performance Objectives, Acceptance Criteria, and Monitoring Methods

(SAMPLE) QASP Performance Objectives, Acceptance Criteria, and Monitoring Methods

Performance Objectives	Performance Standards	Acceptable Quality Levels
Approved Project Management Plan (PMP) and Quality Assurance Surveillance Plan (QASP): • Draft PMP and QASP within 30 calendar days of Task Order award, • Final PMP within 30 calendar days of receipt of Project Manger comments on the drafts.	Army approval through the Contracting Officer's Representative (COR).	Acceptable or superior performance, as defined in Table 1 of the QASP.

Monitoring Method: 100% inspection of milestones / deliverables associated with objective

What we're looking for:

- Detailed technical approach included in the PMP
- Project Team and Roles and Responsibilities are included in the PMP
- Interim Payment schedule included in the PMP
- Activity-based schedule included in the PMP
- Complete document submittal distribution list included in the PMP
- Project Status reports provided as proposed
- The Contractor keeps a record of each phone conversation, written correspondence, and meeting minutes affecting decisions related to the performance of this scope of work. Copies of this correspondence are submitted to the Project Manger.

QUALITY ASSURANCE MONITORING FORM

Date: ___/____/______

Work Task (Milestone/Activity): ______________________________

Survey Period: ___/____/______ through ___/____/______
Method of Surveillance: COR Review

Evaluation of Contractor's Performance: __________

Evaluation

Corrective Action Required: ☐ Yes ☐ No

Narrative Discussion of Contractor's Performance During Survey Period:

Discussion

CORRECTIVE ACTION FORM FOR QASP

1) Work Task (Milestone/Activity): ______________________

2) Survey Period: ___/___/_____ through ___/___/_____

3) Description of the Failure/Deficiency that Precipitated the Corrective Action:

Description

4) Description of the Criterion that the Failure/Deficiency was Evaluated Against:

Description

5) Personnel Involved in the Identification of the Failure/Deficiency, Determination of the Appropriate Corrective Action, Approval of the Corrective Action, and Implementation of the Corrective Action:

6) Description of the Corrective Action that was Required:

Description

7) Date/Time of Implementation of the Corrective Action: ___/___/_____

Description

8) Follow-Up Information to Prevent Recurrence of Failure/Deficiency (i.e., Need For Revision of Procedures or Specifications):

9) Personnel Responsible for Follow-Up Work:

10) Planned Date for Follow-Up Surveillance: ___/___/_____

11) Other Notes:

Other

Task Numbers	Tasks	Amounts
Task No. 1	HWMU Work Plan	
Task No. 2	Construct CAMU	
Task No. 3	Remove and Properly Dispose of Munitions on Signs and Fence Posts	
Task No. 4	Removal of Surface Debris from Revetments and Removal of Day Boxes	
Task No. 5	Management of Earth Covered Magazines	
Task No. 6	Maintenance of Roads	
Task No. 7	Construct a Low Water Crossing	
Task No. 8	Clean Debris and Sediment from Culverts	
Task No. 9	Construct a Fence Along the South and East Sides	
Task No. 10	Contingency Plan	
Task No. 11	Close HW Storage at Bldg. 5 and Establish HW Storage at ECM No. B1007	
Task No. 12	Arroyo Sweep 2011	
	Optional Tasks	
Option No. 1	HWMU Work Plan Implementation	
Option No. 2	Operation of the CAMU	
Option No. 3	Monitoring Well Abandonment	
Option No. 4	Abandonment of Well CMW07	
Option No. 5	Abandonment of Well CMW014	
Option No. 6	Abandonment of Well CMW17	
Option No. 7	Abandonment of Well CMW18	
Option No. 8	Abandonment of Well CMW21	
Option No. 9	Abandonment of Well FW38	
Option No. 10	Additional Year of EPP and SWPPP Management	
Option No. 11	Arroyo Sweep 2012	
Option No. 12	Arroyo Sweep 2013	
Option No. 13	Arroyo Sweep 2014	
Option No. 14	Arroyo Sweep 2015	
Option No. 15	HWMU Closure Report	
	Total	

PROGRAMMATIC AGREEMENT
Among
The United States Army,
The Navajo Nation, the Pueblo of Zuni, and
The New Mexico State Historic Preservation Officer
for Environmental Restoration Activities to be Undertaken
at Fort Wingate Depot Activity and Associated Project Lands

Whereas, the United States Army (Army) is proposing to close the Open Burn/Open Detonation Unit (OB/OD) and conduct post-closure care including ordnance cleanup, environmental restoration, and associated project activities at Fort Wingate Depot Activity (FWDA) including areas outside of the FWDA boundaries in accordance with the Resource Conservation and Recovery Act (RCRA) Permit EPA ID NM6213820974 (herein referred to as "the Undertaking"); and

Whereas, the Army has determined that ordnance removal, environmental restoration at non-ordnance related areas, and associated project activities from FWDA in New Mexico may have an effect upon properties that are or may be eligible to the National Register of Historic Places (National Register), and has consulted with the New Mexico State Historic Preservation Officer (SHPO) and the Advisory Council for Historic Preservation (ACHP) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470(f), Section 110(f) of the same Act (16 U.S.C. Section 470h-2[f], and Section 111 of the same Act (16 U.S.C. Section 470h-3) and has invited the SHPO and ACHP to participate as signatories to this agreement; and

Whereas, the ACHP has declined to participate in a letter dated 20 March 2007; and

Whereas, the Army is responsible for government-to-government consultation with Indian tribes and has formally invited the Zuni Tribe of the Zuni Reservation (Pueblo of Zuni) and the Navajo Nation to participate as invited signatories by virtue of the potential effects of the FWDA environmental restoration and ordnance cleanup project on properties to which they ascribe traditional religious and cultural significance, and the Army understands that the Navajo Nation has delegated signature authority to the Tribal Historic Preservation Officer (THPO) for undertakings off tribal land; and

Whereas, in accordance with 36 CFR 800.2 (c)(2)(i)(A), the Army has invited the Navajo Tribal Historic Preservation Officer and Pueblo of Zuni Governor to be signatories to this agreement for any undertakings that may affect historic properties on their respective tribal lands where they have assumed the responsibilities of the SHPO under section 101(d)(2) of the NHPA; and

Whereas, the Army has consulted with the Hopi, Apache, Comanche, Isleta Pueblo, Pueblo of Laguna, Pueblo of Acoma, and Pueblo of San Ildefonso and invited them to be concurring parties; and

Whereas, the Army Base Realignment and Closure (BRAC) Office is the responsible party for ensuring that all terms of this Programmatic Agreement (PA) are executed; and

Whereas, cultural resources at FWDA are at this time known to include properties likely eligible to the National Register; and

Whereas, the Army has completed the cultural resources survey of FWDA in compliance with requirements of the 1988 BRAC action; and

Whereas, many cultural resources that are likely eligible for the National Register are in locations that present a risk to human health and safety or will be subject to clean up actions that present a risk to human health and safety; and

Whereas, interested members of the public, including the Bureau of Land Management, Bureau of Indian Affairs, New Mexico Environmental Department, Department of the Interior, and Native Americans known to have an interest in the FWDA cultural resources, have been provided opportunities to comment on the effects of the FWDA environmental restoration and ordnance cleanup projects on historic properties through public hearings, consultation meetings, and other means; and

Now, Therefore, the Army, the SHPO, Pueblo of Zuni, and the Navajo Nation agree that the undertaking described above shall be implemented according to the following stipulations to take into account the effects of the undertaking on historic properties.

Definitions:

FWDA Project Archeologist: The professional archeologist employed by the Army who meets the Secretary of the Interior's Professional Qualification Standards for Archaeology and is charged with the oversight of the cultural resources investigations at FWDA for RCRA permit activities.

Professional archaeologists: Archaeologists employed by the Army who meet the Secretary of the Interior's Professional Qualification Standards for Archaeology.

Historic Properties: As defined by 36 CFR 800.16 (l) (1), *Historic property* means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

Properties of Religious and Cultural Significance to Indian Tribes: Within **this document**, this phrase means properties to which tribes attach religious and cultural significance but for which eligibility to the National Register has NOT YET been determined.

Tribal lands: as defined in 36 CFR 800.16 (x) *Tribal lands* means all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities.

STIPULATIONS- The Army shall ensure that the following measures are carried out:

1. Mitigation of Environmental Restoration and Munitions Response Activities:

All NHPA-related RCRA permit activities will follow the procedures and requirements contained within Basic Safety Concepts and Considerations for Munitions and Explosives of Concern (MEC) Response Action Operations, Engineer Pamphlet 385-1-95a (EP 385-1-95a). Given the extent and magnitude of the proposed restoration and munitions response action undertakings occurring over an extended period of time, it can be anticipated that of the over 700 archaeological sites and identified properties of religious and cultural significance to Indian Tribes on FWDA, many will be found to be eligible for the National Register and many will have a high potential for susceptibility to adverse effects. Outlined within this document is a plan that addresses the potential effects of the proposed undertakings on historic properties, including properties of traditional religious and cultural importance to Indian tribes.

1.1. Due to the potentially hazardous environment and hazardous nature of clean up activities and the scheduling requirements of clean up activities, throughout the conduct of all RCRA permitted activities, all cultural resources within the Area of Potential Effects (APE) including those known and those inadvertently discovered shall be treated as eligible for the National Register except those that have been formally determined ineligible and mitigation applied per the stipulations contained within this PA.

In order to take into account the effects of RCRA permitted activities on historic properties, the Army shall provide a list of all known cultural resources within the APE to the SHPO, THPO of the Navajo Nation and Pueblo of Zuni Fort Wingate Historic Preservation Officer and shall convene a consultation meeting and/or teleconference to initiate discussions of determinations of National Register eligibility prior to the initiation of RCRA permit activities covered by this PA. During the initial meeting/teleconference a schedule will be set with the SHPO and Navajo Nation THPO and Pueblo of Zuni Fort Wingate Historic Preservation Officer to complete any remaining determinations that are not completed in the initial meeting. If SHPO, the Navajo Nation, or Pueblo of Zuni do not concur with a determination of ineligibility, the eligibility of the property shall remain undetermined but the property shall be treated as eligible for the purposes of RCRA permit activities. Mitigation shall be applied to sites according to the stipulations within this PA.

1.2 For actions on tribal land where the tribe has assumed the responsibilities of the SHPO under section 101(d)(2) of the NHPA, the Army shall consult with the appropriate THPO, shall follow provisions of 36 CFR 800.2 (c)(2)(ii), and shall follow tribal regulations for any actions on tribal lands. For tribal land where the tribe has not assumed the responsibilities of the SHPO, the Army shall consult with the SHPO and the tribal representative designated by the tribe according to 36 CFR 800.2 (c)(2)(i)(B). The project personnel and professional archaeologists shall also follow all applicable tribal regulations.

1.3. Off-Site Mitigation Procedures
For areas and for actions on FWDA that present a threat to human health and safety, as defined by EP385-1-95a, where on-site mitigation is not possible, the Army shall employ the results of the study "Assessment of Sacred Sites and Properties of Traditional Religious and Cultural Importance within the Open Burn/Open Detonation Area at Fort Wingate Depot Activity, New Mexico" (NATHPO 2004) and the Department of Defense NALEMP study called "Conservation Plan for the Natural and Cultural Landscapes of Fort Wingate Depot Activity, New Mexico: A Demonstration Project for Partnership of The Navajo Nation, The Pueblo of Zuni, and the Department of the Army" (Office of Contract Archaeology, UNM 2007) as mitigation for adverse effects to historic properties.

1.4. On-Site Monitoring and Mitigation Procedures
Avoidance of historic properties and potential NAGPRA cultural items will be the first choice for RCRA permit activities. Where avoidance is not possible in areas and for actions determined by the Army not to represent a threat to human health and safety, the Army shall contract for professional archaeologists to accompany munitions and explosives of concern (MEC) clean-up personnel and the following measures outlined below will be implemented during munitions response and environmental restoration projects and activities under this PA.

Prior to the initiation of RCRA permit activities, the professional archaeologists and MEC personnel shall consult to develop procedures for field conduct that follow requirements of EP385-1-95a and shall discuss potential means of minimizing effects to sites when feasible during RCRA permit activities.

1.4.1.

Vehicular traffic/access roads and staging areas/ MEC surface removal

Determination of potential areas for vehicle access shall be coordinated with those persons designated by the Pueblo of Zuni and the Navajo Nation in order to minimize any adverse effects to historic properties.

When health and safety conditions permit, the Army shall employ professional archaeologists to monitor potential ground disturbing activities in areas containing or likely to contain historic properties. The professional archaeologists under contract to the Army will monitor conditions before and after surface removal of MEC within known site locations in order to avoid, if possible, or minimize any potential unnecessary adverse effects to such sites. Any work required on tribal land shall follow Stipulation 1.2.

1.4.2. MEC survey/removal

When health and safety conditions permit, the Army shall employ professional archaeologists to monitor MEC survey/removal activities within areas containing historic properties to avoid or minimize potential adverse effects. The archaeologists will document the findings before and after the activities with sketches, photos, and notes and will complete appropriate or update existing New Mexico Cultural Resource Information (NMCRIS) forms. In areas free of historic properties, during and after removal, inspections shall be accomplished to assess the possibility of the inadvertent discovery of previously unknown subsurface sites. In the event of inadvertent post-review discoveries, procedures outlined below in Stipulations 1.8 and 1.9 shall be followed. For MEC survey and removal on tribal land, the Army shall follow Stipulation 1.2.

1.4.3. MEC blow-in-place

When MEC items that are too hazardous to move are encountered, they shall be blown in place (BIP), in accordance with the provisions of EP 385-1-95a.
When health and safety considerations permit, the Army shall employ professional archaeologists to monitor MEC BIP within areas containing historic properties to avoid or minimize the potential adverse effects and shall record conditions before and after BIP. Areas subject to BIP and not containing historic properties shall be inspected by the professional archaeologists after BIP for the presence of inadvertent discoveries. In the event of inadvertent post-review discoveries, the project personnel shall follow the procedures in Stipulations 1.8 and 1.9. Where necessary, engineering controls (e.g. sandbagging), will be used during blow-in-place demolitions to minimize potential adverse impacts to historic properties.

For MEC BIP activities on tribal land the Army shall follow Stipulation 1.2.

1.4.4. New demolition craters/temporary stockpile areas/soil excavation and removal areas

The Army shall employ professional archaeologists to assist in the selection of placement of all required demolition craters in areas free of historic properties with the excavation of the required craters monitored for any inadvertently discovered subsurface cultural resources.

1.4.5. Existing demolition craters:

Existing demolition craters shall be used whenever possible and prior to any reuse, when health and safety considerations permit, shall be inspected by professional archaeologists for any evidence of historic properties. Any inadvertent discoveries shall be treated following the procedures in Stipulations 1.8 and 1.9. After consultation, reuse of existing demolition pits containing historic properties shall be used if the proposed prohibition of its use would have a detrimental effect on health and human safety.

1.4.6. Contaminated lands; excavation/posthole/soil borings by drill-rig/monitor well installation/soil sampling grids/ground-water cutoff trenches

The Army shall provide detailed maps of sampling or excavation project areas of FWDA and any other lands within the APE to the professional archaeologists, the Navajo Nation, the Pueblo of Zuni, and the SHPO and shall have all known historic properties flagged for avoidance within the area. All historic properties within the APE shall be located and flagged for avoidance. When allowed by health and safety requirements, the professional archaeologists shall accompany the Army personnel undertaking these activities to assist in the avoidance of historic properties. The professional archaeologists shall update historic property site information record the GPS (global positioning system) waypoint. Any new historic properties inadvertently discovered during this work shall be recorded according to New Mexico guidelines and the GPS waypoint will be recorded. Any inadvertent discoveries of potentially eligible historic properties during any of the above noted activities will be immediately (24 hrs) noted to the FWDA Project Archaeologist and procedures contained within Stipulations 1.8 and 1.9 shall be followed. Any activity on tribal land shall follow Stipulation 1.2.

1.5. Consultation Meetings

For all activities on non-tribal property, the Army shall consult with the Pueblo of Zuni, Navajo Nation, SHPO, and concurring parties in a conference meeting at least annually for the purpose of eliciting comments including input on access road placement and locations of historic properties for the goal of reducing the adverse effects upon these historic properties. Stipulation 1.2 shall be followed in the consultation meetings.

1.6. Tribal disclosure of Properties of Religious and Cultural Significance to Indian Tribes

The Army shall provide maps to the Pueblo of Zuni and the Navajo Nation (Tribes) showing the locations of individual projects and known properties of religious and cultural significance to Indian Tribes, archaeological sites, and any cultural resources determined to be historic properties. The Tribes shall be requested to indicate unrecorded properties of religious and cultural significance to Indian Tribes whose National Register eligibility may need to be assessed relevant to the FWDA munitions response and environmental restoration projects to the FWDA Project Archaeologist or his designee to be used in the planning the clean-up activities. This information will be maintained on an absolutely need-to-know basis. At least general locational information is critical for effective management, avoidance, and minimization of adverse impacts to these properties at FWDA and the entire APE. Such data is protected from disclosure under NHPA, Section 304, 16 U.S.C. 470w-3(a) and the Archeological Resources Protection Act (ARPA, Section 9(a), 16 U.S.C. 470hh(a). The exact location is not required unless the property of religious and cultural significance to an Indian Tribe is immediately adjacent to the proposed action.

The cultural significance of individual properties of religious and cultural significance to Indian Tribes is not required by the Army or its contractors except when such information is necessary to determine the eligibility of the site for inclusion in the National Register or under unusual circumstances where that information is critical to avoiding inadvertent impacts or other management concerns. Regardless, all information about properties of religious and cultural significance to Indian Tribes will be strictly managed and access to this information will only be provided after consultation with the Navajo Nation, Zuni Pueblo or other Tribe attaching traditional religious and/or cultural importance to the site(s) at issue. The Tribes shall be provided updated site information resulting from these activities.

1.7. Artifacts and related data

All artifacts and associated paper and electronic records and materials produced and/or procured during any and all project activities at FWDA shall be curated and managed in accordance with 36 CFR 79.

1.8 Inadvertent Discoveries

Upon any inadvertent discovery of cultural resources potentially eligible for the National Register and potentially subject to NAGPRA, the Army personnel shall immediately notify the professional archaeologists (if the discovery is not made by the archaeologists themselves), and Army personnel shall also notify the FWDA Project Archaeologist immediately. The professional archaeologists shall, in conjunction with the FWDA Project Archaeologist or his designee, make an assessment if potential NAGPRA cultural items are present. If potential NAGPRA cultural items are present, NAGPRA and Stipulation 1.9 shall be followed. If the inadvertent discovery does not include NAGPRA cultural items the professional archaeologist(s) shall treat the site as eligible, assess effects, and determine and apply appropriate mitigation per the provisions of this PA.

If threats to human health and safety preclude on-site mitigation, the alternate mitigation contained within stipulation 1.3 will be implemented. If conditions permit the recordation of information about the site before and after the required RCRA permit activity takes place, the archaeologists shall implement those procedures to mitigate adverse effects to the site.

1.9. Burials/subsurface and surface remains

Known burial locations and areas of any surface burial elements shall be avoided by restoration/ordnance clean-up activities if possible. If potential NAGPRA or NAGPRA Cultural Items are inadvertently discovered, they shall be avoided and activities relocated if possible. All instances of inadvertent discovery of NAGPRA cultural items (including human remains) shall be addressed in accordance with NAGPRA and its implementing regulations, 43 CFR Part 10 and the stipulations in the agreement document.

1.10. Buildings

The standing architectural resources and buildings of FWDA are not scheduled to be affected by restoration or remediation cleanup activities. Should such a requirement arise during the term of restoration and remediation activities, the Army shall coordinate with the SHPO.

1.11. Adverse Effects

Individual determinations of adverse effects to historic properties during environmental restoration activities will not require consultation with the ACHP and SHPO. Following the procedures outlined in the stipulations above, and taking into consideration previous historic and ethnographic studies conducted by the Army at FWDA, adverse effects will be considered to be mitigated for all environmental restoration activities.

1.12. Areas of severe risk

Due to risks to human health and safety concerns, remediation requirements shall take precedence over historic preservation concerns in highly hazardous and/or contaminated zones which shall be defined by the Army and EP385-1-95a. These areas shall be determined and clearly depicted on maps which shall be provided to all parties to this Agreement as these become known.

1.13. Cultural Resource Management reports

At the conclusion of each individual project a NMCRIS Information Abstract Form (NIAF) shall be completed and submitted to the Navajo Nation, Pueblo of Zuni, and SHPO. If historic properties or NAGPRA-related items are encountered, a preliminary report, along with copies of the appropriate state archaeological records, updated or new, as appropriate, and/or historic cultural property index (HCPI) forms for historic structures shall also accompany the NIAF form. The report shall contain a map of the project area, a description of the undertaking, results of any findings of cultural resources and/or NAGPRA related discoveries, the impacts to historic properties and/or NAGPRA-related items, and the mitigation measures employed. Any sensitive information that tribes do not want included in these reports shall be excluded upon their request.

An annual report containing the results of investigations carried out during the year shall be provided to the Navajo Nation, Pueblo of Zuni, and SHPO. In addition, a final technical cultural resources management report shall be produced for all restoration and cleanup actions at the conclusion of the RCRA clean-up process. This report shall summarize all of the work and all of the archaeological and cultural issues related to identification, determination of eligibility for the National Register, assessment and treatment of effects, data recovery, and curation. The final technical report shall be produced without tribally-defined sensitive data and shall exclude any other sensitive information that Tribes request be excluded.

A confidential technical report with project related data shall be produced in limited quantities for official use of the Army, SHPO, the Pueblo of Zuni, the Navajo Nation, and other relevant Native American tribes for all restoration and cleanup activities. If requested by Tribes, sensitive information particular to their tribe shall not be included in any other report except that provided to them.

If determined appropriate in consultation with signatories, public informational products shall be developed.

All draft reports shall be subject to 30 day review by the SHPO, Navajo Nation, and the Pueblo of Zuni, and THPOs if appropriate; the Army will consider all appropriate comments for inclusion within the final report.

2.0 DOD retained property

Provisions for historic properties on any retained lands, if any, shall be determined in consultation with the Pueblo of Zuni, the Navajo Nation, and SHPO.

3.0. Amendments

3.1. The *signatories* to this agreement may amend the terms of this Agreement and the provisions of any attachment hereto, by formal written notification of all parties (i.e., signatories and concurring parties) to this Agreement.

3.2. The Army shall ensure that any of the concurring parties to this PA whose interests may be affected by an amendment are asked to concur in such an amendment.

3.3. Upon execution of an amendment, each signatory shall attach a copy of the fully executed form to that party's copy of this PA, and shall enter the amendment number and date on the upper right hand corner of the first page of this PA.

4.0 Dispute resolution

4.1. Should any *signatory* to this Agreement object within 30 days to any plans or other documents provided by the Army or others for review pursuant to this Agreement or to any actions proposed or initiated by the Army that may pertain to the terms of this Agreement, the Army shall consult with the objecting *signatory* to resolve the objection. If the Army determines that the objection cannot be resolved, the Army shall forward the documentation relevant to the dispute to the ACHP. Within 30 days after receipt of all pertinent documentation, the ACHP will either:

4.1.1. Provide the Army with recommendations, which the Army will take into consideration in reaching a final decision regarding the dispute; or

4.1.2. Notify the Army that it will comment pursuant to 36 CFR 800.7, and proceed to comment. Any ACHP comment provided in response to such a request will be taken into consideration by the Army.

4.2. Any recommendation or comment provided by the ACHP pursuant to Stipulation 4.1 will be understood to pertain only to the subject of the dispute; the Army's responsibility to fulfill all actions under this Agreement that are not the subject(s) of the dispute will remain unchanged.

4.3. At any time during development of implementation plans for measures stipulated in this Agreement, should an objection to any such measure or its manner of implementation be raised by a member of the public, the Army shall take the objection into consideration and consult as needed with the objecting party, the SHPO, other relevant parties, and the ACHP to resolve the objection.

5.0. Termination

Any *signatory* to this PA may terminate the document by providing thirty (30) days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the Army will comply with 36 CFR 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.

6.0 Term of Agreement

6.1 The Army intends the term of this PA document to be in effect for restoration activities until the land is transferred out of Army jurisdiction or for ten years from the date of execution of this agreement, whichever is shorter.

6.2 In the event the Army does not fulfill the terms of this PA, the Army will comply with 36 CFR 800.4 through 800.6 with regard to individual undertakings covered by this PA.

7.0 Compliance with Federal Law

No provision of this PA shall be deemed to waive the provisions of Federal law, including, but not limited to the Archaeological Resources Protection Act, the National Historic Preservation Act, and the Native American Graves Protection and Repatriation Act.

The execution and implementation of this PA evidences that the Army has afforded the SHPO, Tribes, and ACHP a reasonable opportunity to comment on the effects of the MEC cleanup and environmental restoration projects of FWDA on historic properties and that the Army has taken into account the effects of the undertaking on historic properties.

8.0 Anti-Deficiency Clause

The stipulations of this agreement are subject to the provisions of the Anti-Deficiency Act. If compliance with the Anti-Deficiency Act alters or impairs the Army's ability to implement the stipulations of the agreement, the Army will consult according to the amendment and termination provisions found at Stipulations 3 and 5 of this agreement.

Signatories:

_______________________________ Date: MAY 0 6 2008
Jeffrey F. Willis
Department of the Army
Chief, Operational and Medical Branch
Base Realignment and Closure Division

_______________________________ Date: ______________
New Mexico State Historic Preservation Officer
(for undertakings affecting historic properties on non-tribal lands or where a tribe has not assumed the responsibilities of the SHPO under section 101(d)(2) of the NHPA)

_______________________________ Date: ______________
Navajo Nation Tribal Historic Preservation Officer
(signator for those affecting historic properties on Navajo Tribal lands and invited signator with designated signatory authority from the Navajo Nation for 106 undertakings on non-tribal land)

_______________________________ Date: 5/20/08
Governor, Pueblo of Zuni (signator for undertakings affecting historic properties on Zuni Tribal lands and invited signator for undertakings on non-tribal lands)

THE NAVAJO NATION

JOE SHIRLEY, JR.
PRESIDENT

Ben Shelly
VICE-PRESIDENT

December 9, 2009

Mark Patterson
Ravenna Army Ammunition Plant
8451 State Route 5
Building 1037
Ravenna, OH 44266

RE: Navajo cultural monitoring on the OB/OD grounds clean up of UXO.

Dear Mr. Patterson,

The Navajo Nation Historic Preservation Department is aware of the proposed clean up for Parcel 3, OB/OD grounds. It is the NNHPD's, understanding that the area in question has been in the past highly disturbed by mechanical excavation and detonation of ordinance. The clean up will consist of the use armored heavy equipment all excavated materials will be screened and piled for inspection. Based on this understanding, the Navajo Nation Historic Preservation Department will not require any cultural monitors for this specific clean up only.

If questions should arise or further clarification is needed, please call Ron Maldonado at (928) 871-7147 or email at ronpmaldonado@navajo.org.

Sincerely,

Alan S. Downer
Historic Preservation Officer
Navajo Nation Historic Preservation Department
P. O. Box 4950
Window Rock, Arizona 86515

xc: Steve Smith
CESWF-PER-D
819 Taylor Street, Room 3A12
P.O. Box 17300
Fort Worth, TX 76102-0300

APPENDIX B — Site Maps

Applicable figures related to the FWDA HWMU Work Plan are presented separately following the text and tables. No other site maps are included.

TABLE C-1
POINTS OF CONTACT
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Name	Organization	Project Role	Phone	Email Address
Steve Carpenter	USACE SPA	Contracting Representative (COR)	(505) 342-3690	martin.s.carpenter@usace.army.mil
Neal Navarro	USACE SPK	Toxicologist	(916) 557-5307	neal.navarro@usace.army.mil
Eric Kirwan	USACE SWF	Project Manager	(817) 886-1673	stephen.e.kirwan@usace.army.mil
Steve Smith	USACE SWF	FWDA Program Manager	(817) 886-1879	steve.w.smith@usace.army.mil
Mike Kipp	USAEC	U.S. Army Environmental Command		
Mike Scoville	USACE SFW	Onsite Corps Ordnance & Explosives Safety Specialist (OESS)	(814) 866-1875	
Richard Cruz	FWDA	FWDA Caretaker	(505) 905-6190	richard.cruz2@us.army.mil
Micki Gonzales	FWDA ARM	FWDA Administrative Records Manager	(505) 905-6108	lura.gonzales@us.army.mil
Mark Patterson	FWDA BEC	FWDA BRAC Environmental Coordinator	(330) 358-7312	mark.c.patterson@us.army.mil
Pat Ryan	FWDA EIMS	Environmental Information Management		patrick.f.ryan@saic.com
Martin Eastridge	MDA	MDA Caretaker	(575) 649-0352	
Chuck Hendrickson	EPA 6	Regulatory Review	(214) 665-2196	
John Kieling	NMED	New Mexico Environment Dept, RCRA Permits Management Program	(505) 476-6016	
Dave Cobrain	NMED	New Mexico Environment Dept, Hazardous Waste Bureau	(505) 476-6055	dave.cobrain@state.nm.us
Angela Kelsey	BIA	Bureau of Indian Affairs	(202) 219-2407	angela.kelsey@sol.doi.gov
Rose Duywenie	BIA Navajo	Bureau of Indian Affairs - Navajo Representative	(505) 863-8285	rose.duwyenie@bia.gov
Clayton Seoutewa	BIA Zuni	Bureau of Indian Affairs - Zuni Representative	(505) 782-7271	
Bill O'Donell	BRACD	Base Realignment and Closure Division	(703) 601-1570	william.odonnell@us.army.mil
Ben Burshia	DOI/BLM	Chief, Division Real Estate Services, Bureau of Indian Affairs	(202) 208-7737	ben.burshia@bia.gov
Tony Perry	NN	Navajo Nation Project Coordinator		
Darrell Tsabetsaye	POZ	Pueblo of Zuni		
Steve Cox	URS	Program Manager	(301) 258-5876	steven.cox@urs.com
John Carson	URS	Project Manager	(402) 952-2514	john.c.carson@urs.com
Dennis Day	URS	Program Health and Safety Officer	(402) 952-2525	dennis.day@urs.com
Mac Reed	URS	MMRP Health and Safety Officer	(615) 224-2148	mac.reed@urs.com
Mike Krause	URS	Program QC Manager	(402) 952-2519	michael.krause@urs.com
Andreas Kothleitner	URS	MMRP QC Manager	(402) 334-8181	andreas.kothleitner@urs.com
Jeff Aust	URS	Chemical QC Manager	(402) 952-2516	jeff.aust@urs.com
Brian Osborn	URS	Removal Action Task Manager	(402) 952-2504	brian.osborn@urs.com
Darrell Hall	URS	Geophysical Task Manager	(402) 952-2682	darrell.hall@urs.com
Joe Goehring	URS	Senior UXO Supervisor	(615) 618-5269	joe.goehring@urs.com
Randy Burrington	URS	UXO Safety/QC Officer	(402) 334-8181	randy.burrington@urs.com
Robert Deikmann	URS	UXO Safety/QC Officer	(402) 334-8181	robert.deikmann@urs.com

TABLE C-1
POINTS OF CONTACT
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Notes:
BIA = Bureau of Indian Affairs
BIA-NR = Bureau of Indian Affairs - Navajo Representative
BIA-Z = Bureau of Indian Affairs - Zuni Representative
BRACD = Base Realignment and Closure Division
DOI/BLM = Department of Interior Bureau of Land Management
EPA 6 = Environmental Protection Agency Region 6
FWDA = Fort Wingate Depot Activity
FWDA ARM = Fort Wingate Depot Activity Administartive Records Manager
FWDA BEC = Fort Wingate Depot Activity Base Realignment and Closure Environmental Coordinator
FWDA EIMS = Fort Wingate Depot Activity Environmental Information Management System
NMED = New Mexico Environment Department
NN = Navajo Nation
POZ = Pueblo of Zuni
URS = URS Group, Inc.
USACE SPA = U.S. Army Corps of Engineers - Albuquerque District
USACE SPK = U.S. Army Corps of Engineers - Sacramento District
USACE SWF = U.S. Army Corps of Engineers - Fort Worth District
USAEC = U.S. Army Environmental Command

This report was submitted under separate cover

FINAL

MUNITIONS CONSTITUENTS SAMPLING AND ANALYSIS PLAN

UNIFORM FEDERAL POLICY – QUALITY ASSURANCE PROJECT PLAN

HWMU, PARCEL 3

Fort Wingate Depot Activity

McKinley County, New Mexico

February 18, 2013

Contract No. W912QR-09-D-0025

Delivery Order No. DM01

Prepared for:

United States Army Corps of Engineers-

Albuquerque District	Fort Worth District
4101 Jefferson Plaza, NE	819 Taylor Street
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Prepared by:

URS

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16170613

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List of Acronyms and Abbreviations

%D	Percent Difference
%R	Percent Recovery
°C	Degrees Celsius
µg/kg	microgram per kilogram
AA	Atomic Absorption
ADR	Automated Data Review
AES	Atomic Emission Spectroscopy
APPL	Agriculture and Priority Pollutant Laboratories, Inc.
B.S.	Bachelor of Science
BRAC	Base Realignment and Closure
CA	Corrective Action
CAS	Chemical Abstracts Service
CCB	Continuing Calibration Blank
CCC	Calibration Check Compound
CCV	Continuing Calibration Verification
CD-R	Compact Disc-Recordable
CDC	Current Detonation Centers
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
COC	Chain of Custody
COD	Coefficient of Determination
COR	Contracting Officer's Representative
CPR	Cardiopulmonary Resuscitation
CRP	Current Residue Piles
DFTPP	Decafluorotriphenylphosphine
DDT	Dichlorodiphenyltrichloroethane
DL	Detection Limit

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DoD	Department of Defense
DQI	Data Quality Indicator
DQO	Data Quality Objective
EDMS	Environmental Data Management System
EICP	Extracted Ion Current Profile
ELAP	Environmental Laboratory Accreditation Program
FWDA	Fort Wingate Depot Activity
GC	Gas Chromatograph
GC/MS	Gas Chromatograph/Mass Spectrometer
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HPLC	High Performance Liquid Chromatography
HRGC	High Resolution Gas Chromatograph
HRMS	High Resolution Mass Spectrometer
HWMU	Hazardous Waste Management Unit
IC	Ion Chromatography
ICAL	Initial Calibration
ICP-AE	Inductively Coupled Plasma – Atomic Emission
ICS	Interference Check Sample
ICS-A	Interference Check Sample –A
ICS-AB	Interference Check Sample – AB
ICV	Internal Calibration Verification
ID	Identification
IDL	Instrument Detection Limit
IS	Incremental Sampling
J	Estimated
LC-MS	Liquid Chromatograph – Mass Spectrometer
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate

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LOD	Limit of Detection
LODV	Limit of Detection Verification
LOQ	Limit of Quantitation
MB	Method Blank
MCT	Matrix Conductivity Threshold
MD	Matrix Duplicate
MDL	Method Detection Limit
mg/kg	milligram per kilogram
ml	milliliter
MC	Munitions Constituent
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
M.S.	Master of Science
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
NMED	New Mexico Environment Department
No.	Number
OB/OD	Open Burn/Open Detonation
oz	ounce
P & P	Policies and Procedures
PBC	Performance Based Contract
PDS	Post Digestion Spike
P.E.	Professional Engineer
PFTBA	Perflurotriburylamine
Ph.D.	Doctorate of Philosophy
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control

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QSM	Quality Systems Manual
r	Correlation Coefficient
R	Rejected
RCRA	Resource Conservation and Recovery Act
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RF	Response Factor
RI	Remedial Investigation
RL	Reporting Limit
RPD	Relative Percent Difference
RRT	Relative Retention Time
RSD	Relative Standard Deviation
RT	Retention Time
SAP	Sampling and Analysis Plan
SEDD	Staged Electronic Data Deliverable
S/N	Signal/Noise
SOP	Standard Operating Procedure
SPCC	System Performance Check Compound
SSHP	Site Safety and Health Plan
SVOC	Semi-volatile Organic Compound
TBD	To Be Determined
TCDD	Tetrachlorodibenzo-p-dioxin
TD-AA	Thermal Desorption – Atomic Absorption
Tetryl	Methyl-2,4,6-trinitrophenylnitramine
U	Nondetect
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
UJ	Estimated Nondetect
URS	URS Group, Inc.
USACE	United States Army Corps of Engineers

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USEPA	United States Environmental Protection Agency
U.S.	United States
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WP	Work Plan

INTRODUCTION

This *Uniform Federal Policy for Quality Assurance Project Plan* (UFP-QAPP) has been prepared in support of the Fort Wingate Depot Activity (FWDA) Removal. It provides completed worksheets prepared in accordance with Part 1 of the UFP-QAPP (the UFP-QAPP Manual).

This compilation of worksheets is intended to meet the requirements of the Munitions Constituents (MC) Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP) and supplements the overall Hazardous Waste Management Unit (HWMU) Work Plan (WP) and Removal. Each worksheet addresses specific requirements of the UFP-QAPP. The ultimate success of an environmental program or project depends on the quality of the environmental data that is collected and used in decision-making, and this depends significantly on the adequacy of the QAPP and its effective implementation.

FWDA is an inactive U.S. Army Depot whose mission was to store, ship, and receive material and dispose of obsolete or deteriorated explosives and military munitions. The depot operated from the mid 1940s to 1993, at which time the active mission ceased and the installation closed. The current open burn/open detonation (OB/OD) area including the HWMU is located in the southern portion of the installation, inside Parcel 3. Demilitarization of unserviceable, obsolete, or waste explosives, propellants, munitions, and munitions components was accomplished at the OB/OD area. Propellants, small arms and bulk explosives were burned as a means of disposal. Explosives filled munitions were disposed of by detonation. Disposals by detonation were conducted within detonation craters that my have been tamped with an earthen cover to minimize fragmentation dispersal.

The purpose of the HWMU WP is to develop a plan to prescribe the means and methods for completing the munitions and explosives of concern (MEC) and debris removal at the HWMU.

More details associated with the site background, history, current and future land use and previous site investigations are presented in Chapter 1 of the WP.

1 QAPP Worksheet #1 (UFP-QAPP Manual Section 2.1) -- Title and Approval Page

HWMU Work Plan and Removal, Fort Wingate Depot Activity

Document Title

United States Army Corps of Engineers (USACE) – Albuquerque and Fort Worth Districts

Lead Organization

Jeff Aust, URS Group, Inc.

Preparer's Name and Organizational Affiliation

12120 Shamrock Plaza, Suite 100 Omaha, NE 68154 (402-334-8181), jeff.aust@urs.com

Preparer's Address, Telephone Number, and E-mail Address

12/01/2010

Preparation Date (Month/Day/Year)

Investigative Organization's Project Manager:

John Carson, URS Project Manager
Printed Name/Title

Signature/Date

Investigative Organization's Project QA Officer:

Mike Krause, URS Quality Assurance Officer
Printed Name/Title

Signature/Date

Lead Organization's Project Manager:

Eric Kirwan, USACE Project Manager
Printed Name/Title

Signature/Date

Primary Laboratory QA Manager:

Frances Lediaev, APPL QA Officer
Printed Name/Title

Signature/Date

QAPP Worksheet #2 (UFP-QAPP Manual Section 2.2.4) -- QAPP Identifying Information

Site Number/Code: Resource Conservation and Recovery Act Permit # NM6213820974

Operable Unit: Hazardous Waste Management Unit (HWMU) (Open Burning/Open Detonation [OB/OD] Unit) (FTWG-002-R-01).

Contractor Name: URS

Contractor Number: W912QR-04-D-0025

Contract Title: HWMU Work Plan and Removal

Work Assignment Number: Delivery Order DM01

1. Identify guidance used to prepare QAPP:
   Uniform Federal Policy for Quality Assurance Project Plans
   Department of Defense Quality Systems Manual, Version 4.2

2. Identify regulatory program:
   Military Munitions Response Program (MMRP) and Resource Conservation and Recovery Act (RCRA)

3. Identify approval entity:
   USACE Albuquerque and Fort Worth Districts, New Mexico Environment Department (NMED)

4. This is a project-specific QAPP.

5. List date(s) of scoping session(s) that were held:
   November 16, 2010

6. List dates and titles of QAPP documents written for previous site work, if applicable:
   Program Management Company. 1999. Fort Wingate Depot Activity, Final Open Burning/Open Detonation Area RCRA Interim Status Closure Plan Phase IA-Characterization and Assessment of Site Conditions for the Soils/Solid Matrix. November.

7. List organizational partners (stakeholders) and connection with lead organization:
   Base Realignment and Closure (BRAC) – Customer
   NMED – Regulator
   The Pueblo of Zuni and Navajo Nation – Tribal Nations

8. List data users:
   USACE Albuquerque and Fort Worth Districts, BRAC, Navajo Nation, Pueblo of Zuni, NMED, URS

9. If any required QAPP elements and required information are not applicable to the project, then circle the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusion below:
   Not applicable

1 QAPP Worksheet #3 (UFP-QAPP Manual Section 2.3.1) -- Distribution List

QAPP Recipients	Title	Organization / Address	Telephone Number	E-mail Address	Document Control Number
Eric Kirwan	USACE Project Manager	U.S. Army Corps of Engineers Fort Worth District 819 Taylor Street Fort Worth, TX 76102	(817) 886-1673	Stephen.e.kirwan@usace.army.mil	N/A
Steve Carpenter	USACE COR	U.S. Army Corps of Engineers Albuquerque District 4101 Jefferson Plaza, NE Albuquerque, NM 87109	(505) 342-3690	Martin.s.carpenter@usace.army.mil	N/A
Dave Cobrain	NMED	New Mexico Environment Department Hazardous Waste Bureau 2905 Rodeo Park Drive East, Bldg 1 Santa Fe, NM 87505	(505) 476-6055	Dave.cobrain@state.nm.us	N/A
Frances Lediaev	QA Manager	Agricultural & Priority Pollutants Laboratory, Inc. 908 N. Temperance Ave. Clovis, CA 93611	(559) 275-2175	Flediaev@applinc.com	N/A
TBD	URS Site Manager	URS 12120 Shamrock Plaza, Ste 100 Omaha, NE 68154	(402) 344-8181	To Be Determined (TBD)	N/A

QAPP Worksheet #4 (UFP-QAPP Manual Section 2.3.2) -- Project Personnel Sign-Off Sheet

Organization: USACE

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
Steve Smith	USACE – Fort Worth District Program Manager	(817) 886-1879		
Steve Carpenter	USACE – Albuquerque District COR	(505) 342-3690		
Eric Kirwan	USACE – Fort Worth District Project Manager	(817) 886-1673		

Organization: URS Group

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
John Carson	Project Manager	(402) 952-2514		
Jeff Aust	QAPP Preparer	(402) 952-2516		
Dennis Day	Health and Safety Officer	(402) 952-2525		

Organization: APPL

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read Email Receipt
Diane Anderson	Project Manager	(559) 275-2175		
Frances Lediaev	QA Manager	(559) 275-2175		

QAPP Worksheet #5 (UFP-QAPP Manual Section 2.4.1) -- Project Organizational Chart

A Project Organizational Chart for the FWDA HWMU Work Plan and Removal is provided as Figure 2-1 of the Work Plan (WP).

QAPP Worksheet #6 (UFP-QAPP Manual Section 2.4.2) -- Communication Pathways

The project communication pathways and point of contacts can be found in Appendix C of the WP.

QAPP Worksheet #7 (UFP-QAPP Manual Section 2.4.3) -- Personnel Responsibilities and Qualifications Table

Name	Title	Organization	Responsibilities	Education and Experience Qualifications
Steve Smith	USACE Program Manager	USACE Fort Worth District	Manages FWDA program – Coordinates with customer, Project Manager, and contractor	TBD
Steve Carpenter	USACE COR	USACE Albuquerque District	Manages contract – coordinates with Project Manager and contractor	TBD
Eric Kirwan	USACE Project Manager	USACE Forth Worth District	Manages project – coordinates with Program Manager, COR and contractor	TBD
John Carson	URS Project Manager	URS	Manages project – coordinates between lead agency and subcontractors	P.E., B.S. Civil Engineering, 16 years exp.
Jeff Aust	URS Project Chemist	URS	Field sampling and analytical laboratory oversight	Ph.D., Chemistry, 12 years exp.
TBD	URS Site Manager	URS	Supervises field sampling and coordinates all field activities	TBD
Mac Reed	URS MEC Safety	URS	Oversees URS MEC Safety Program. Mr. Reed will identify and assign field MEC Safety personnel	B.S. Industrial Education and Safety, M.S.
Dennis Day	Health and Safety Officer	URS	Oversees Health and Safety for field activities	CIH >15 years exp.
Diane Anderson	Laboratory Project Manager	APPL	Manages analytical laboratory	B.S. Chemistry, 28 years exp.
Frances Lediaev	Laboratory QA Officer	APPL	Performs lab QA oversight	B.S. Chemistry, 23 years exp.

QAPP Worksheet #8 (UFP-QAPP Manual Section 2.4.4) -- Special Personnel Training Requirements Table

Project Function	Specialized Training By Title or Description of Course	Training Provider	Training Date	Personnel / Groups Receiving Training	Personnel Titles / Organizational Affiliation	Location of Training Records / Certificates[1]
Field geology and sampling	Health and Safety Training per 29 CFR 1910.120 Tailgate meeting to discuss sampling plan and procedures	URS	January 2010 Start of fieldwork	TBD To be determined just prior to the start of field activities	Site Manager/Site Safety Officer, URS	URS, Omaha office Certificates available on request Field Log Book
	First Aid Training/CPR	Omaha First Aid Training	February 2010	TBD To be determined just prior to the start of field activities	Site Manager/Site Safety Officer, URS	URS, Omaha office Certificates available on request

[1] If training records and/or certificates are on file elsewhere, document their location in this column. If training records and/or certificates do not exist or are not available, then this should be noted. A record of the tailgate meeting will be made in the Field Log Book.

QAPP Worksheet #9 (UFP-QAPP Manual Section 2.5.1) -- Project Scoping Session Participants Sheet

Project Name: Fort Wingate Depot Activity HWMU Work Plan and Removal **Projected Date(s) of Sampling:** July 2012 **Project Manager:** John Carson	**Site Name:** Fort Wingate Depot Activity **Site Location:** McKinley County, New Mexico

Date of Session: November 16, 2010

Scoping Session Purpose: Determine sampling locations and general investigation approach

Name	Title	Affiliation	Phone #	E-mail Address	Project Role
Mark Patterson	BRAC Environmental Coordinator	BRAC	(330) 358-7312	mark.c.patterson@us.army.mil	Coordinate FWDA Cleanup Program
Steve Smith	USACE Program Manager	USACE – Fort Worth District	(817) 886-1879	Steve.w.smith@usace.army.mil	Oversee cleanup program
Steve Carpenter	USACE COR	USACE – Albuquerque District	(505) 342-3690	Martin.s.carpenter@usace.army.mil	Oversee contract compliance
Dave Cobrain	Staff Manager	NMED	(505) 476-6055	Dave.cobrain@state.nm.us	Regulatory Oversight
TBD	Environmental Specialist	NMED			Regulatory Oversight
John Carson	Project Manager	URS	(402) 952-2514	John_carson@urscorp.com	Project Manager
Brian Osborn	Senior Environmental Scientist	URS	(402) 952-2504	Brian_osborn@urscorp.com	Task Manager
Gene Rogge	Cultural Resources Group Manager	URS	(602) 861-7414	gene_rogge@urscorp.com	Cultural Resources Coordination

QAPP Worksheet #9 (UFP-QAPP Manual Section 2.5.1) -- Project Scoping Session Participants Sheet

<table>
<tr><td colspan="2">Project Name:
Fort Wingate Depot Activity HWMU Work Plan and Removal

Projected Date(s) of Sampling: July 2012

Project Manager: John Carson</td><td colspan="4">Site Name:
Fort Wingate Depot Activity

Site Location:
McKinley County, New Mexico</td></tr>
<tr><td colspan="6">Date of Session: November 16, 2010

Scoping Session Purpose: Determine sampling locations and general investigation approach</td></tr>
<tr><td>Andreas Kothleitner</td><td>Corporate UXO Quality Control Program Manager</td><td>URS</td><td>(858) 812-2805</td><td>Andreas_kothleitner@urscorp.com</td><td>UXO Quality Control Oversight</td></tr>
</table>

The initial kickoff meeting was held on November 16, 2010 at the administrative area of FWDA. Mark Patterson participated by phone, all other participants were in person. A powerpoint was presented to attendees for discussion. The powerpoint presented the project scope, including: planning, resource inventories, mobilization, debris excavation and processing, cultural resources monitoring, and sampling.

Sampling frequency for stockpile characterization was presented and discussed.

Sampling frequency for confirmation samples in excavations was discussed.

Analyte list will be criteria stipulated in RCRA permit.

Project schedule was presented to attendees. Including anticipation for short term deliverables.

QAPP Worksheet #10 (UFP-QAPP Manual Section 2.5.2) -- Problem Definition

Problem Definition

Historical site activities at FWDA have resulted in the presence of MEC and associated MC contamination of soil at the current OB/OD unit. Demilitarization of unserviceable, obsolete, or waste explosives, propellants, munitions, and munitions components was accomplished at the OB/OD unit. Propellants, small arms and bulk explosives were burned as a means of disposal. Explosives filled munitions were disposed of by detonation. Disposals by detonation were conducted within detonation craters that my have been tamped with an earthen cover to minimize fragmentation dispersal. Characterization soil samples will be collected during removal activities to determine if soil processed through the debris removal system can be returned to the excavation as fill. Confirmation soil samples will be collected from surface soils and the walls and the floors of the excavations to asses remaining Department of Defense (DoD)-related contamination levels after excavation.

Project Decision Condition:

For this removal action, information inputs to the decision-making process will include the collection and chemical analysis of soil. All detected analytes in soil will be compared to NMED residential soil screening levels listed in Worksheet #15. Further discussion of the project decisions are found in Chapter 3 of the WP.

QAPP Worksheet #11 (UFP-QAPP Manual Section 2.6.1) -- Project Quality Objectives/Systematic Planning Process Statements

Who will use the data? Data will be used by USACE Fort Worth and Albuquerque Districts, BRAC, Navajo Nation, Pueblo of Zuni, NMED, and URS to characterize the stockpiled soil that has been excavated and sifted and to assess DoD-related contamination levels at the surface soils and the walls and floors of excavations.
What will the data be used for? The data should result in sufficient information to adequately characterize the stockpiled soil at the site and to assess the levels of DoD-related contamination at the surface soils and the walls and floors of excavations.
What types of data are needed? Discrete (volatile organic compounds [VOCs]) and composite soil samples (all other analyses) will be collected as identified. (See Worksheet #17 for rationale.). The analytes are as required in Section III of the FWDA RCRA Permit.
How much data are needed? The number of samples will be determined based on the amount of stockpiled soil and number of detonation craters and excavation areas.
How good does the data need to be? Each soil sampling point result will be compared to the appropriate NMED residential soil screening level (SSL) criteria listed in Worksheet #15 and the established background concentration for the facility (metals only). If an NMED residential SSL is not available for an analyte, the USEPA residential regional screening level (RSL) will be used. Laboratory analytical data (generated by a DoD Environmental Laboratory Accreditation Program [ELAP] accredited laboratory using USEPA test methods) will be used to identify the presence of contamination. Composite and discrete samples will be duplicated in the field at a rate of 10% and analyzed by the laboratory (APPL) to assess field and laboratory precision.
When will data be collected? May 2012 through December 2013.

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-11 and do not replace DoD QSM Version 4.2 Appendix Table F-4.			
Analytical Group	VOCs				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
URS SOP No. 4	USEPA SW-846 8260B / APPL SOP ANA8260B	Precision – Lab	RPD < 30%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicate	S&A
		Accuracy/Bias	See Table 12-1 and 12-10	LCS, MS/MSD and surrogate recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-11 and do not replace DoD QSM Version 4.2 Appendix Table F-4.
Analytical Group	SVOCs	
Conc. Level	Low	

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
URS SOP No. 4	USEPA SW-846 8270C / APPL SOP ANA8270C	Precision – Lab	RPD < 30%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicates	S&A
		Accuracy/Bias	See Table 12-2 and 12-10	LCS, MS/MSD and surrogate recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	SA

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-13 and do not replace DoD QSM Version 4.2 Appendix Table F-3.
Analytical Group	Explosives	
Conc. Level	Low	

Sampling Procedure [1]	Analytical Method/SOP [2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
URS SOP No. 4	USEPA SW-846 8330A / APPL SOP HPL8330	Precision – Lab	Soil RPD < 30%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Lab	RSD < 20% for results above the LOQ	Laboratory Triplicates	S&A
		Precision – Field/Laboratory	If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicates	S&A S&A
		Accuracy/Bias	See Table 12-3 and 12-10	LCS, MS/MSD and surrogate recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A
		Sensitivity	Detected	Laboratory Fortified Blank at 3X MDL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) – Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-12 and do not replace DoD QSM Version 4.2 Appendix Table F-2.
Analytical Group	PCBs	
Conc. Level	Low	

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
URS SOP No. 4	USEPA SW-846 8082 / APPL SOP ANA8082	Precision – Lab	RPD < 30%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	RPD < 50% If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicate	S&A
		Accuracy/Bias	See Table 12-4 and 12-10	LCS, MS/MSD and surrogate recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

1

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-14 and do not replace DoD QSM Version 4.2 Appendix Table F-6.			
Analytical Group	Dioxins/Furans				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP**[2]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
URS SOP No. 4	USEPA SW-846 8290 / APPL SOP HPL8290	Precision – Lab	RPD < 20%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	RPD < 50% If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL	Field Duplicate	S&A
		Accuracy/Bias	See Table 12-5 Internal Standards 40-135%	LCS, MS/MSD and internal standard recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-14 and do not replace DoD QSM Version 4.2 Appendix Table F-6.			
Analytical Group	Dioxins/Furans				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP**[2]	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-15 and do not replace the appropriate DoD QSM Version 4.2 Appendix Table F-7.			
Analytical Group	Metals				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
URS SOP No. 4	USEPA SW-846 6010B and 7473 APPL SOPs ANA6010BPE, ANA7473	Precision – Lab	RPD < 20%	MD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	RPD < 50% If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicates	S&A S&A
		Accuracy/Bias	See Table 12-7	LCS, MS recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-15 and do not replace the appropriate DoD QSM Version 4.2 Appendix Table F-7.			
Analytical Group	Metals				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

1

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-18 and do not replace DoD QSM Version 4.2 Appendix Table F-12.
Analytical Group	Perchlorate	
Conc. Level	Low	

Sampling Procedure[1]	Analytical Method/SOP[2]	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
URS SOP No. 4	USEPA SW-846 6850 / APPL SOP HPL6850	Precision – Lab	RPD < 15%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	RPD < 50% If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicate	S&A
		Accuracy/Bias	See Table 12-6	LCS and MS/MSD and recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-18 and do not replace DoD QSM Version 4.2 Appendix Table F-12.			
Analytical Group	Perchlorate				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-16 and do not replace DoD QSM Version 4.2 Appendix Table F-10.			
Analytical Group	Cyanide				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
URS SOP No. 4	USEPA SW-846 9014 / APPL SOP AN.A	Precision – Lab	RPD < 20%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	RPD < 50% If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicate	S&A
		Accuracy/Bias	See Table 12-8	LCS, and MS/MSD recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness	S&A

Matrix	Soil	Data verification criteria are listed in Table 12-16 and do not replace DoD QSM Version 4.2 Appendix Table F-10.			
Analytical Group	Cyanide				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
				Check	

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

1

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-17 and do not replace DoD QSM Version 4.2 Appendix Table F-11.			
Analytical Group	Nitrate				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
URS SOP No. 4	USEPA SW-846 9056 / APPL SOP ANA9056	Precision – Lab	RPD < 15%	MS/MSD and/or LCS/LCSDs	S&A
		Precision – Field/Laboratory	RPD < 50% If both the parent and duplicate values are > 5X the RL, then 50% RPD for soil. If either the parent or duplicate value is < 5X the RL, then the difference between the parent and duplicate must be < 2X the RL.	Field Duplicate	S&A
		Accuracy/Bias	See Table 12-9	LCS and MS/MSD and recoveries	A
		Accuracy/Bias Contamination	No target compounds > ½ LOQ	Method blanks	A

QAPP Worksheet #12 (UFP-QAPP Manual Section 2.6.2) -- Measurement Performance Criteria Table

Matrix	Soil	Data verification criteria are listed in Table 12-17 and do not replace DoD QSM Version 4.2 Appendix Table F-11.			
Analytical Group	Nitrate				
Conc. Level	Low				
Sampling Procedure[1]	**Analytical Method/SOP[2]**	**Data Quality Indicators (DQIs)**	**Measurement Performance Criteria**	**QC Sample and/or Activity Used to Assess Measurement Performance**	**QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)**
		Sensitivity	Detected	Laboratory Fortified Blank at 3X DL	A
		Completeness	Greater than 95% laboratory analysis	Data Completeness Check	S&A

[1]Reference number from QAPP Worksheet #21
[2]Reference number from QAPP Worksheet #23

TABLE 12-1
ACCURACY AND PRECISION CRITERIA FOR VOC ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
1,1,1,2-Tetrachloroethane	75-125	30
1,1,1-Trichloroethane	70-135	30
1,1,2,2-Tetrachloroethane	55-130	30
1,1,2-Trichloroethane	60-125	30
1,1-Dichloroethane	75-125	30
1,1-Dichloroethene	65-135	30
1,1-Dichloropropene	70-135	30
1,2,3-Trichlorobenzene	60-135	30
1,2,3-Trichloropropane	65-130	30
1,2,4-Trichlorobenzene	65-130	30
1,2,4-Trimethylbenzene	65-135	30
1,2-Dibromo-3-chloropropane	40-135	30
1,2-Dibromoethane	70-125	30
1,2-Dichlorobenzene	70-120	30
1,2-Dichloroethane	70-135	30
1,2-Dichloropropane	70-120	30
1,3,5-Trimethylbenzene	65-135	30
1,3-Dichlorobenzene	70-125	30
1,3-Dichloropropane	75-125	30
1,4-Dichlorobenzene	70-125	30
2,2-Dichloropropane	65-135	30
2-Butanone	30-160	30
2-Chlorotoluene	70-130	30
2-Hexanone	45-145	30
4-Chlorotoluene	75-125	30
4-Methyl-2-pentanone	45-145	30
Acetone	20-160	30
Benzene	75-125	30
Bromobenzene	65-120	30
Bromochloromethane	70-125	30
Bromodichloromethane	70-130	30
Bromoform	55-135	30
Bromomethane	30-160	30
Carbon disulfide	45-160	30
Carbon tetrachloride	65-135	30
Chlorobenzene	75-125	30
Chloroethane	40-155	30
Chloroform	70-125	30
Chloromethane	50-130	30
cis-1,2-Dichloroethene	65-125	30
cis-1,3-Dichloropropene	70-125	30
Dibromomethane	75-130	30
Dibromochloromethane	65-130	30
Dichlorodifluoromethane	35-135	30
Ethylbenzene	75-125	30

TABLE 12-1
ACCURACY AND PRECISION CRITERIA FOR VOC ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Hexachlorobutadiene	55-140	30
Isopropylbenzene	75-130	30
m & p-Xylene	80-125	30
Methyl tert-butyl ether	65-135	30
Methylene chloride	55-140	30
Naphthalene	40-125	30
n-Butylbenzene	65-140	30
n-Propylbenzene	65-135	30
o-Xylene	75-125	30
p-Isopropyltoluene	75-135	30
sec-Butylbenzene	65-130	30
Styrene	75-125	30
tert-Butylbenzene	65-130	30
Tetrachloroethene	65-140	30
Toluene	70-125	30
trans-1,2-Dichloroethene	65-135	30
trans-1,3-Dichloropropene	65-125	30
Trichloroethene	75-125	30
Trichlorofluoromethane	25-185	30
Vinyl chloride	60-125	30

Notes:

Accuracy evaluation criteria are from Table G-5 and precision evaluation criteria are from Table F-4 of the DoD QSM, Version 4.2.

%R = Percent recovery

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

VOC = Volatile Organic Compound

TABLE 12-2
ACCURACY AND PRECISION CRITERIA FOR SVOC ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
1,2,4-Trichlorobenzene	45-110	30
1,2-Dichlorobenzene	45-100	30
1,3-Dichlorobenzene	40-100	30
1,4-Dichlorobenzene	35-105	30
2,4,5-Trichlorophenol	50-110	30
2,4,6-Trichlorophenol	45-110	30
2,4-Dichlorophenol	45-110	30
2,4-Dimethylphenol	30-105	30
2,4-Dinitrophenol	15-130	30
2,4-Dinitrotoluene	50-115	30
2,6-Dinitrotoluene	50-110	30
2-Chloronaphthalene	45-105	30
2-Chlorophenol	45-105	30
2-Methylnaphthalene	45-105	30
2-Methylphenol	40-105	30
2-Nitroaniline	45-120	30
2-Nitrophenol	40-110	30
3,3'-Dichlorobenzidine	10-130	30
3-Nitroaniline	25-110	30
4,6-Dinitro-2-methylphenol	30-135	30
4-Bromophenyl-phenyl ether	45-115	30
4-Chloro-3-methylphenol	45-115	30
4-Chloroaniline	10-100	30
4-Chlorophenyl-phenyl ether	45-110	30
4-Nitroaniline	35-115	30
4-Nitrophenol	15-140	30
Acenaphthene	45-110	30
Acenaphthylene	45-105	30
Anthracene	55-105	30
Benzo(a)anthracene	50-110	30
Benzo(a)pyrene	50-110	30
Benzo(b)fluoranthene	45-115	30
Benzo(g,h,i)perylene	40-125	30
Benzo(k)fluoranthene	45-125	30
Benzoic acid	0-110	30
Benzyl alcohol	20-125	30
Bis(2-chloroethoxy)methane	45-110	30
Bis(2-chloroethyl)ether	40-105	30
Bis(2-chloroisopropyl)ether	20-115	30
Bis(2-ethylhexyl)phthalate	45-125	30
Butylbenzylphthalate	50-125	30
Carbazole	45-115	30
Chrysene	55-110	30
Dibenz(a,h)anthracene	40-125	30

TABLE 12-2
ACCURACY AND PRECISION CRITERIA FOR SVOC ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Dibenzofuran	50-105	30
Diethylphthalate	50-115	30
Dimethylphthalate	50-110	30
Di-n-butylphthalate	55-110	30
Di-n-octylphthalate	40-130	30
Fluoranthene	55-115	30
Fluorene	50-110	30
Hexachlorobenzene	45-120	30
Hexachlorobutadiene	40-115	30
Hexachloroethane	35-110	30
Indeno(1,2,3-cd)pyrene	40-120	30
Isophorone	45-110	30
Naphthalene	40-105	30
Nitrobenzene	40-115	30
N-Nitroso-di-n-propylamine	40-115	30
N-Nitrosodimethylamine	20-115	30
N-Nitrosodiphenylamine	50-115	30
Pentachlorophenol	25-120	30
Phenanthrene	50-110	30
Phenol	40-100	30
Pyrene	45-125	30

Notes:

Accuracy evaluation criteria are from Table G-7 and precision evaluation criteria are from Table F-4 of the DoD QSM, Version 4.2.

%R = Percent recovery

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

SVOC = Semivolatile Organic Compound

TABLE 12-3
ACCURACY AND PRECISION CRITERIA FOR EXPLOSIVES ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
1,3,5-Trinitrobenzene	75 - 125	30
1,3-Dinitrobenzene	80 - 125	30
2,4,6-Trinitrotoluene	55 - 140	30
2,4-Dinitrotoluene	80 - 125	30
2,6-Dinitrotoluene	80 - 120	30
2-Amino-4,6-Dinitrotoluene	80 - 125	30
2-Nitrotoluene	80 - 125	30
3-Nitrotoluene	75 - 120	30
4-Amino-2,6-Dinitrotoluene	80 - 125	30
4-Nitrotoluene	75 - 125	30
HMX	75 - 125	30
Nitrobenzene	75 - 125	30
RDX	70 - 135	30
Tetryl	10 - 150	30

Notes:

Accuracy evaluation criteria are from Table G-12 and precision evaluation criteria are from Table F-3 of the DoD QSM, Version 4.2.

HMX = Cyclotetramethylenetetranitramine

%R = Percent Recovery

DoD = Department of Defense

QSM = Quality Systems Manaual

RDX = Cyclotrimethylenetrinitramine

RPD = Relative Percent Difference

Tetryl = methyl-2,4,6-trinitrophenylnitramine

TABLE 12-4
ACCURACY AND PRECISION CRITERIA FOR POLYCHLORINATED BIPHENYL ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Aroclor 1016	40-140	30
Aroclor 1260	60-130	30

Notes:

Accuracy evaluation criteria are from Table G-17 and precision evaluation criteria are from Table F-2 of the DoD QSM, Version 4.2.

%R = Percent recovery

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

TABLE 12-5
ACCURACY AND PRECISION CRITERIA FOR DIOXIN/FURAN ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	70-130	20
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	70-130	20
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	70-130	20
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	70-130	20
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	70-130	20
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	70-130	20
Octachlorodibenzo-p-dioxin (OCDD)	70-130	20
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	70-130	20
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	70-130	20
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	70-130	20
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	70-130	20
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	70-130	20
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70-130	20
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	70-130	20
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	70-130	20
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	70-130	20
Octachlorodibenzofuran (OCDF)	70-130	20

Notes:

Accuracy evaluation criteria were established by APPL and precision evaluation criteria are from Table F-6 of the DoD QSM, Version 4.2.

%R = Percent recovery

APPL = Agriculture and Priority Pollutants Laboratories, Inc.

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

TABLE 12-6
ACCURACY AND PRECISION CRITERIA FOR PERCHLORATE ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Perchlorate	80-120	15

Notes:

Accuracy evaluation criteria were established by APPL and precision evaluation criteria are from Table F-12 of the DoD QSM, Version 4.2.

%R = Percent recovery

APPL = Agriculture and Priority Pollutants Laboratories, Inc.

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

TABLE 12-7
ACCURACY AND PRECISION CRITERIA FOR METALS ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Aluminum	80-120	20
Antimony	80-120	20
Arsenic	80-120	20
Barium	80-120	20
Beryllium	80-120	20
Cadmium	80-120	20
Calcium	80-120	20
Chromium	80-120	20
Cobalt	80-120	20
Copper	80-120	20
Iron	80-120	20
Lead	80-120	20
Magnesium	80-120	20
Manganese	80-120	20
Mercury	80-120	20
Molybdenum	80-120	20
Nickel	80-120	20
Potassium	80-120	20
Selenium	80-120	20
Silver	75-120	20
Sodium	80-120	20
Thallium	80-120	20
Vanadium	80-120	20
Zinc	80-120	20

Notes:

Accuracy evaluation criteria are from Table G-19 and precision evaluation criteria are from Table F-7 of the DoD QSM, Version 4.2.

%R = Percent Recovery

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative Percent Difference

TABLE 12-8
ACCURACY AND PRECISION CRITERIA FOR CYANIDE ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Cyanide	75-125	20

Notes:

Accuracy evaluation criteria were established by APPL and precision evaluation criteria are from Table F-10 of the DoD QSM, Version 4.2.

%R = Percent recovery

APPL = Agriculture and Priority Pollutants Laboratories, Inc.

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

TABLE 12-9
ACCURACY AND PRECISION CRITERIA FOR NITRATE ANALYSIS
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Spiking Compound	Accuracy (%R)	Precision (RPD)
	Soil	Soil
Nitrate	90-110	15

Notes:

Accuracy evaluation criteria were established by APPL and precision evaluation criteria are from Table F-11 of the DoD QSM, Version 4.2.

%R = Percent recovery

APPL = Agriculture and Priority Pollutants Laboratories, Inc.

DoD = Department of Defense

QSM = Quality Systems Manual

RPD = Relative percent difference

TABLE 12-10
SURROGATE COMPOUND ACCURACY CRITERIA
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Analysis	Spiking Compound	Accuracy (%R) Soil
VOCs	1,2-Dichloroethane-d_4	54-154
	4-Bromofluorobenzene	85-120
	Toluene-d_8	85-115
SVOCs	2,4,6-Tribromophenol	35-125
	2-Fluorobiphenyl	45-105
	2-Fluorophenol	35-105
	Nitrobenzene-d_5	35-100
	Phenol-d_6	40-100
	Terphenyl -d_{14}	30-125
Explosives	1,2-Dinitrobenzene	65-135
Polychlorinated biphenyls	Decachlorobiphenyl	60-125

Notes:

Accuracy evaluation criteria were established by APPL or obtained from Table G-3 and precision evaluation criteria are from Table F-11 of the DoD QSM, Version 4.2.

%R = Percent recovery

APPL = Agriculture and Priority Pollutants Laboratories, Inc.

DoD = Department of Defense

QSM = Quality Systems Manual

VOC = Volatile Organic Compound

SVOC = Semi-volatile Organic Compound

TABLE 12-11
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHODS SW8260B AND SW8270C FORT WINGATE DEPOT ACTIVITY MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	VOC Soil samples: 48 hours until frozen by laboratory (< -7°C), 14 days to analysis SVOC Soil samples: 14 days to extract, 40 days to analysis	Contact URS as to additional measures to be taken.	VOCs and SVOCs: Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **R**-flag to nondetects to samples > 2X holding time criteria.
Sample temperature	Every cooler	4 ± 2 °C	Contact URS as to additional measures to be taken.	VOCs and SVOCs: Samples arriving at temperature 6-10°C, apply **J**-flag to detects and **UJ**-flag to nondetects. VOCs: Samples arriving at temperature > 10°C, apply **J**-flag to detects and **R**-flag to nondetects. SVOCs: Samples arriving at temperature > 10°C, apply **J**-flag to detects and **R**-flag to nondetects.
Minimum five point initial calibration (ICAL) for all analytes	ICAL prior to sample analysis	1. Average response factor (RF) for SPCCs: VOCs ≥ 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane; ≥ 0.1 for chloromethane, bromoform and 1,1-dichloroethane. SVOCs ≥ 0.050 2. RSD for RFs for CCCs: VOCs and SVOCs ≤ 30% and one option below: Option 1: RSD for each analyte ≤ 15% Option 2: linear least squares regression r ≥ 0.995	Correct problem then repeat ICAL	Apply **R**-flag to data without a valid ICAL

TABLE 12-11
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHODS SW8260B AND SW8270C
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Minimum five point initial calibration (ICAL) for all analytes (con't)		Option 3: non-linear regression: coefficient of determination (COD) $r^2 \geq$ 0.99 (6 points shall be used for second order, 7 points shall be used for third order)		
Second source calibration verification (ICV)	Once after each ICAL	All project analytes within ± 20% of true value.	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Continuing calibration verification (CCV)	Daily before sample analysis and every 12 hours of sampling time.	1. Average RF for SPCCs: VOCs ≥ 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane; ≥ 0.1 for chloromethane, bromoform and 1,1-dichloroethane. SVOCs ≥ 0.050 2. % Difference/Drift for all target compounds and surrogates: VOCs and SVOCs ≤ 20%D (Note: D = difference when using RFs or drift when using least squares regression or non-linear calibration.	Correct problem then repeat CCV and reanalyze all samples since last successful calibration verification	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Method blank	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination (< 10X for common laboratory contaminants).

TABLE 12-11
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHODS SW8260B AND SW8270C
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
LCS containing all analytes to be reported, including surrogates.	One per preparatory batch	QC acceptance criteria specified in QAPP Tables 12-1 and 12-2.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<30% or 1/2 the lower limit): Apply **J**-flag to detects and **R**-flag to nondetects.
Internal standards verification	Every field sample, standard and QC sample.	Retention time + 30 seconds from retention time of the midpoint standard in the ICAL; EICP area within -50% to +100% of ICAL midpoint standard.	Inspect mass spectrometer and GC for malfunstions. Reanalysis of samples analyzed while system was malfunctioning is mandatory.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Surrogate spike	All field and QC samples	QC acceptance criteria specified in QAPP Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary.	High bias: Apply **J**-flag to detects Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<10%): Apply **J**-flag to detects and **R**-flag to nondetects.
Matrix spike/matrix spike duplicate (MS/MSD)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Tables 12-1 and 12-2.	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	For the specific analyte(s) in the parent sample, apply **J**-flag to detects and **UJ**-flag to nondetects if acceptance criteria are not met. MS/MSD data should not be used alone to qualify data.

TABLE 12-11
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHODS SW8260B AND SW8270C
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ and 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects
Professional Judgment	As determined by URS Chemist	Common laboratory contaminants detected at levels > 2X the LOQ.	N/A	Apply **U**-flag to analytes detected in field samples.
Manual Integration	All	Acceptance by URS Chemist.	Provide justification for each instance of manual integration	Apply **R**-flag to all compounds with improper integration

Notes:

Data verification/validation criteria are from Table F-4 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-12
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8082
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	PCB soil samples: 14 days to extract, 40 days to analysis	None	PCB soil samples: Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **R**-flag to nondetects to samples > 2X holding time criteria.
Sample temperature	Every cooler	4 ± 2 °C	Contact URS as to additional measures to be taken.	Samples arriving at temperature 6-10°C, apply **J**-flag to detects and **UJ**-flag to nondetects. Samples arriving at temperature > 10°C, apply **J**-flag to detects and **R**-flag to nondetects.
Minimum five point ICAL for all analytes	ICAL prior to sample analysis	One of the options below: Option 1: RSD for each analyte ≤ 20% Option 2: linear least squares regression r ≥ 0.995 Option 3: non-linear regression: COD r^2 ≥ 0.99 (6 points shall be used for second order, 7 points shall be used for third order)	Correct problem then repeat initial calibration	Apply **R**-flag to data without a valid ICAL
Second source calibration verification (ICV)	Immediately following ICAL.	All project analytes within established retention time windows. GC methods: All project analytes within ± 20% of expected value from the ICAL.	Correct problem, then rerun ICV. If that fails, repeat ICAL.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.

TABLE 12-12
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8082
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Continuing calibration verification (CCV)	Prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence.	All project analytes within established retention time windows. <u>GC methods</u>: All project analytes within <u>+</u> 20% of expected value from the ICAL.	Correct problem then rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	<u>High bias</u>: Apply **J**-flag to detects. <u>Low bias</u>: Apply **J**-flag to detects and **R**-flag to nondetects.
Method blank	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.
LCS containing all analytes to be reported, including surrogates.	One per preparatory batch	QC acceptance criteria specified in QAPP Table 12-4	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	<u>High bias</u>: Apply **J**-flag to detects. <u>Low bias</u>: Apply **J**-flag to detects and **UJ**-flag to nondetects. <u>Very low bias</u> (%R<30% or 1/2 the lower limit): Apply **J**-flag to detects and **R**-flag to nondetects.

TABLE 12-12
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8082
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Surrogate spike	All field and QC samples	QC acceptance criteria specified in QAPP Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary.	High bias: Apply **J**-flag to detects Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<10%): Apply **J**-flag to detects and **R**-flag to nondetects.
Matrix spike/matrix spike duplicate (MS/MSD)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Table 12-4	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	For the specific analyte(s) in the parent sample, apply **J**-flag to detects if acceptance criteria are not met. MS/MSD data should not be used alone to qualify data.
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects
Manual Integration	All	Acceptance by URS Chemist.	Provide justification for each instance of manual integration	Apply **R**-flag to all compounds with improper integration

Notes:

Data verification criteria are from Table F-2 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-13
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8330A
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	soil samples: 14 days to extract, 40 days to analysis	None	soil samples: Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **UJ**-flag to nondetects to samples > 2X holding time criteria.
Initial calibration (ICAL)	Minimum of 5 calibration standards with the lowest standard concentration at or below the RL. Once calibration curve or line is generated, the lowest calibration standard must be reanalyzed	The apparent signal-to-noise ration at the LOQ must be at least 5:1. If linear regression is used. r ≥ 0.995. If using Internal Standardization, RSD ≤ 15%.	Correct problem then repeat initial calibration	Apply **R**-flag to data without a valid ICAL
Second source calibration verification (ICV)	Immediately following ICAL.	All analytes and surrogates within ± 15% of true value.	Correct problem, then rerun ICV. If that fails, repeat ICAL.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Continuing calibration verification (CCV)	Prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence.	All target analytes and surrogates within ± 15% of the expected value from the ICAL.	Correct problem then rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Method blank	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.

TABLE 12-13
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW8330A
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
LCS containing all analytes to be reported, including surrogates.	One per preparatory batch	QC acceptance criteria specified in QAPP Tables 12-3	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<30% or 1/2 the lower limit): Apply **J**-flag to detects and **R**-flag to nondetects.
Surrogate spike	All field and QC samples	QC acceptance criteria specified in QAPP Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available. If obvious chromatographic interference with surrogate is present, reanalysis may not be necessary.	High bias: Apply **J**-flag to detects Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<10%): Apply **J**-flag to detects and **R**-flag to nondetects.
Matrix spike/matrix spike duplicate (MS/MSD)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Table 12-3. Soil RPD 20%	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	For the specific analyte(s) in the parent sample, apply **J**-flag to detects if acceptance criteria are not met. MS/MSD data should not be used alone to qualify data.
Confirmation of positive results (second column or detector)	All positive results must be confirmed	Calibration and QC criteria same as for initial or primary column analysis. Results between primary and second column RPD ≤ 40%	N/A	Apply **J**-flag if RPD >40%. Apply **U**-flag if primary result not confirmed.

TABLE 12-13
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8330A
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are >5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate valie is < 5X the LOQ, then the difference between the paren and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects
Manual Integration	All	Acceptance by URS Chemist.	Provide justification for each instance of manual integration	Apply **R**-flag to all compounds with improper integration

Notes:

Data verification criteria are from Table F-3 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-14
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8290
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	soil samples: 14 days to extract, 40 days to analysis	None	soil samples: Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **R**-flag to nondetects to samples > 2X holding time criteria.
Sample temperature	Every cooler	4 ± 2 °C	Contact URS as to additional measures to be taken.	Samples arriving at temperature 6-10°C, apply **J**-flag to detects and **UJ**-flag to nondetects. Samples arriving at temperature > 10°C, apply **J**-flag to detects and **R**-flag to nondetects.
Initial calibration (ICAL) for all analytes identified in method	ICAL prior to sample analysis, as needed by the failure of calibration verification standard, and when a new lot is used as standard source for HRCC-3, sample fortification or recovery solutions.	Ion abundance ratios in accordance with criteria in Table 8 of the method; and S/N ratio ≥ 10 for all target analyte ions; and RSD ≤ 20% for the response factors (RFs) for all 17 unlabeled standards and RSD ≤ 20% for the RFs for the nine labeled internal.	Correct problem then repeat initial calibration. Calibration may not be forced through origin.	Apply **R**-flag to data without a valid ICAL.

TABLE 12-14
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW8290
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Calibration verification	At the beginning of each 12 hour period, and at the end of the analytical sequence.	Ion abundance ratios in accordance with criteria in Table 8 of the method; and For unlabeled standards, RF within ± 20% D of RF established in ICAL; and For labeled standards, RF within ± 30% D of RF established in ICAL.	Correct problem, repeat calibration verification standard. If that fails, repeat ICAL and reanalyze all samples analyzed since the last successful CCV. End-of-run CCV: If the RF for unlabeled standards ≤ 25% RPD and the RF for labeled standards ≤ 35% RPD (relative to the RF established in the ICAL), the mean RF from the two daily CCVs must be used for quantitation of impacted samples instead of the ICAL mean RF value. If the starting and ending CCV RFs differ by more than 25% RPD for unlabeled compounds or 35% RPD for labeled compounds, the sample may be quantitated against a new initial calibration if it is analyzed within two hours. Otherwise reanalyze samples with positive detections if necessary.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.

TABLE 12-14
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW8290
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Method blank	One per preparatory batch, run after calibration standards and before samples.	Use project-specific criteria, if available. Otherwise, no analytes detected ≥ LOD for the analyte or ≥ 5% of the associated regulatory limit for the analyte or ≥ 5% of the sample result for the analyte, whichever is greater, per method.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.
LCS (or fortified field blank)	One per preparatory batch	QC acceptance criteria specified in QAPP Table 12-5	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<30% or 1/2 the lower limit): Apply **J**-flag to detects and **R**-flag to nondetects.
Sample duplicate	One per preparatory batch	RPD ≤ 25% (between sample and sample duplicate), per method	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	Apply **J**-flag to detects and **UJ**-flag to nondetects
Matrix spike/matrix spike duplicate (MS/MSD)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Table 12-5	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	For the specific analyte(s) in the parent sample, apply **J**-flag to detects if acceptance criteria are not met. MS/MSD data should not be used alone to qualify data.
Internal Standards (IS)	Every field sample, standard and QC sample	%R for each IS in the original sample (prior to dilutions) within 40-135%	Correct problem, then reprep and reanalyze the samples with failed IS.	Apply **J**-flag to detects and **UJ**-flag to nondetects

TABLE 12-14
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW8290
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects
Manual Integration	All	Acceptance by URS Chemist.	Provide justification for each instance of manual integration	Apply **R**-flag to all compounds with improper integration

Notes:

Data verification criteria are from Table F-6 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-15
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHODS SW6010B AND SW7473
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	Soil metals: 6 months (mercury 28 days).	Contact URS as to additional measures to be taken.	Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **R**-flag to nondetects to samples > 2X holding time criteria.
Sample temperature	Every cooler	None (mercury 4 ± 2 °C)	Contact URS as to additional measures to be taken.	Mercury samples arriving at temperatures > 6°C, apply **J**-flag to detects and **UJ**-flag to nondetects.
Initial calibration for all analytes (ICAL) **ICP: minimum of two standards and a blank** **AA: minimum 5 standards and a calibration blank**	Daily ICAL prior to sample analysis	r ≥ 0.995	Correct problem then repeat initial calibration	Apply **R**-flag to data without a valid ICAL
Second source calibration verification (ICV)	Once after each ICAL, prior to beginning a sample run.	Value of second source for all analyte(s) within ± 10% of true value	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat initial calibration.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Continuing calibration verification (CCV)	After every 10 samples and at the end of the analysis sequence.	ICP: All analytes within ± 10% of true value. AA: Mercury within ± 20% of true value	Correct problem, rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Method and calibration blanks	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.

TABLE 12-15
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHODS SW6010B AND SW7473
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
LCS containing all analytes to be reported.	One per preparatory batch	QC acceptance criteria specified in QAPP Table 12-7.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<40%): Apply **J**-flag to detects and **R**-flag to nondetects.
Matrix spike (MS)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Table 12-7.	Examine the project-specific DQOs. If the matrix spike falls outside criteria, additional quality control tests are required to evaluate matrix effects.	For the specific analyte(s) in the parent sample. High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<40%): Apply **J**-flag to detects and **R**-flag to nondetects. No qualification if native
Matrix duplicate (MD)	One per preparatory batch per matrix.	RPD ≤ 20% (sample and sample duplicate)	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	Data shall be evaluated to determine the source of difference. Apply **J**-flag to detects if acceptance criteria are not met.
Interference check solutions (ICS) (ICP only)	At the beginning of an analytical run	ICS-A: Absolute value of concentration for all non-spiked analytes <LOD (unless ICS-AB: Within ± 20% of true value	Terminate analysis; locate and correct problem; reanalyze ICS,	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag
Dilution Test (ICP only)	One per preparatory batch	Five-fold dilution must agree within ± 10% of the original measurement	Perform post digestion spike addition	If the metal(s) outside criteria in parent sample were detected at levels > 50x the LOQ and the PDS fails. Apply **J**-flag to detects in parent sample.
Post-digestion spike (PDS) addition (ICP only)	When dilution test fails or analyte concentration in all samples < 50x LOD	Recovery within 75-125%	None	For the specific analyte(s) in the parent sample. Apply **J**-flag to detects.

TABLE 12-15
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHODS SW6010B AND SW7473
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects

Notes:

Data verification criteria are from Table F-7 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-16
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW9014
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	14 days	Contact URS as to additional measures to be taken.	Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **R**-flag to nondetects to samples > 2X holding time criteria.
Sample temperature	Every cooler	4 ± 2 °C	Contact URS as to additional measures to be taken.	Mercury samples arriving at temperatures > 6°C, apply **J**-flag to detects and **UJ**-flag to nondetects.
Initial calibration for all analytes (ICAL) (six standards and a calibration blank)	Daily ICAL prior to sample analysis	r ≥ 0.995	Correct problem then repeat ICAL	Apply **R**-flag to data without a valid ICAL
Distilled standards (one high and one low)	Once per multipoint calibration	Within ± 15% of true value	Correct problem then repeat distilled standards	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Second source calibration verification (ICV)	Once after each ICAL, prior to beginning a sample run.	Within ± 15% of true value	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Method blank	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.

TABLE 12-16
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW9014
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
LCS	One per preparatory batch	QC acceptance criteria specified in QAPP Table 12-8.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<40%): Apply **J**-flag to detects and **R**-flag to nondetects.
Matrix spike (MS)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Table 12-8.	Examine the project-specific DQOs. If the matrix spike falls outside criteria, additional quality control tests are required to evaluate matrix effects.	For the specific analyte(s) in the parent sample. High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<40%): Apply **J**-flag to detects and **R**-flag to nondetects. No qualification if native
Matrix duplicate (MD)	One per preparatory batch per matrix.	RPD $\leq$ 20% (sample and sample duplicate)	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	Data shall be evaluated to determine the source of difference. Apply **J**-flag to detects if acceptance criteria are not met.
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects

Notes:

Data verification criteria are from Table F-10 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-17
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW9056
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	28 days	Contact URS as to additional measures to be taken.	Soil samples: Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **UJ**-flag to nondetects to samples > 2X holding time criteria.
Initial calibration (ICAL) (minimum three standards and one calibration blank)	ICAL prior to sample analysis.	r $\geq$ 0.995	Correct problem then repeat initial calibration.	Apply **R**-flag to data without a valid ICAL.
Initial calibration verification (ICV) (second source)	Once after each ICAL, prior to beginning a sample run.	All analytes within $\pm$ 10% of true value and retention times within appropriate windows.	Correct problem, then rerun ICV. If that fails, repeat ICAL.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Midrange continuing calibration verification (CCV)	After every 10 field samples, and at the end of the analysis sequence.	All project analytes within established retention time windows. Within $\pm$ 10% of true value.	Correct problem then rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Method blank	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.
LCS containing all analytes to be reported	One per preparatory batch	QC acceptance criteria specified in QAPP Table 12-9.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<30% or 1/2 the lower limit): Apply **J**-flag to detects and **R**-flag to nondetects.

TABLE 12-17
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW9056
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Matrix spike/matrix spike duplicate (MS/MSD)	One per preparatory batch per matrix	QC acceptance criteria specified in QAPP Table 12-9.	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	For the specific analyte(s) in the parent sample, apply **J**-flag to detects if acceptance criteria are not met.
Sample duplicate	One per preparatory batch per matrix.	%D $\leq$ 10% (sample and sample duplicate)	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	Data shall be evaluated to determine the source of difference. Apply **J**-flag to detects if acceptance criteria are not met.
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects

Notes:

Data verification criteria are from Table F-11 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

TABLE 12-18
DATA VERIFICATION/VALIDATION CRITERIA FOR
USEPA METHOD SW6850
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Holding time	Every sample	28 days	Contact URS as to additional measures to be taken.	Soil samples: Apply **J**-flag to detects and **UJ**-flag to nondetects to samples < 2X holding time criteria. Apply **J**-flag to detects and **UJ**-flag to nondetects to samples > 2X holding time criteria.
Initial calibration (ICAL)	Minimum of 5 calibration standards to establish linearity at method set-up and after major maintenance	r $\geq$ 0.995 or RSD $\leq$ 20% The concentration corresponding to the absolute value of the calibration curve's Y-intercept must be $\leq$ LOD.	Correct problem then repeat ICAL	Apply **R**-flag to data without a valid ICAL
Initial calibration verification (ICV)	Once after each ICAL, analysis of a second source standard at the midpoint of the calibration	Within $\pm$ 15% of true value	Correct problem and verify second source standard. Rerun ICV. If that fails, correct problem and repeat ICAL.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.
Continuing calibration verification (CCV)	Analysis of mid-level standard after every 10 field samples. All samples must be bracketed by the analysis of a standard demonstrating that the system was capable of accurately detecting and quantifying perchlorate.	Within $\pm$ 15% of true value	Correct problem, rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **R**-flag to nondetects.

TABLE 12-18
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW6850
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Limit of Detection verification (LODV) (per batch)	Prior to sample analysis and at the end of the analysis sequence. It can be analyzed after every 10 samples in order to reduce the reanalysis rate.	Within ± 30% of true value	Correct problem and rerun LODV and all samples analyzed since last successful LODV. If a sample with perchlorate concentration at or between the LOD and LOQ is bracketed by a failing LODV, it must be reanalyzed. A sample with concentration above the LOQ can be reported.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects.
Isotope ratio $^{35}Cl/^{37}Cl$	Every sample, batch QC sample and standard	Monitor for either the parent ion at masses 99/101 or the daughter ion at masses 83/85 depending on which ions are quantitated. Theoretical ratio ~ 3.06. Must fall within 2.3 to 3.8.	If criteria are not met, the sample must be rerun. If the sample was not pretreated, the sample should be reextracted using cleanup procedures. If, after cleanup, the ratio still fails, use alternative techniques to confirm presence of perchlorate (i.e., a post spike sample, dilution to reduce any interference, etc.).	Apply **J**-flag to detects, **UJ**-flag to nondetects.

TABLE 12-18
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW6850
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Internal standard (IS)	Addition of ^{18}O-labeled perchlorate to every sample, batch QC sample, standard, instrument blank, and method blank.	Measured ^{18}O IS area within ± 50% of the value from the average of the IS area counts of the ICAL. RRT of the perchlorate ion must be 1.0 ± 2% (0.98 – 1.02).	Rerun the sample at increasing dilutions until the ± 50% acceptance criteria are met. If criteria cannot be met with dilution, the interference are suspected and the sample must be reprepped using additional pretreatment steps.	Apply **J**-flag to detects, **UJ**-flag to nondetects.
Interference check sample (ICS)	One ICS is prepared with every batch of 20 samples and must undergo the same preparation and pretreatment steps as the samples in the batch. It verifies the method performance at the matrix conductivity threshold (MCT). At least one ICS must be analyzed d	Within ± 30% of true value	Correct problem and then reanalyze all samples in that batch. If poor recovery from the cleanup filters is suspected, a different lot of filters must be used to reextract all samples in the batch. If column degradation is suspected, a new column must be calibrated before the samples can be reanalyzed.	Apply **J**-flag to detects, **UJ**-flag to nondetects.
Method blank (MB)	One per preparatory batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Correct problem. If required, reprep and reanalyze method blank and all samples processed with the contaminated blank.	Apply **U**-flag to analytes detected in field samples < 5X blank contamination.

TABLE 12-18
DATA VERIFICATION/VALIDATION CRITERIA FOR USEPA METHOD SW6850
FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

QC Check	Minimum Frequency	Acceptance Criteria	Laboratory Corrective Action	URS Flagging Criteria
Laboratory control sample (LCS)	One per preparatory batch. LCS must be spiked at the LOQ.	Recovery within method requirements, laboratory-generated limits, or 80-120% (whichever is more stringent) to verify calibration and to check method performance.	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	High bias: Apply **J**-flag to detects. Low bias: Apply **J**-flag to detects and **UJ**-flag to nondetects. Very low bias (%R<30% or 1/2 the lower limit): Apply **J**-flag to detects and **R**-flag to nondetects.
Matrix spike (MS)	One per preparatory batch per matrix. The MS must be spiked at the LOQ.	Recovery within 80-120% or within laboratory generated limits, whichever is more stringent.	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	For the specific analyte(s) in the parent sample, apply **J**-flag to detects if acceptance criteria are not met.
Laboratory duplicate	One per preparatory batch per matrix.	RPD ≤ 15%	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	Data shall be evaluated to determine the source of difference. Apply **J**-flag to detects if acceptance criteria are not met.
Field Duplicate	One per 10 field samples	If both the parent and duplicate values are > 5X the LOQ, then 50% RPD for soil samples. If either the parent or duplicate value is < 5X the LOQ, then the difference between the parent and duplicate must be < 2X the LOQ.	N/A	Apply **J**-flag to detects and **UJ**-flag to nondetects

Notes:

Data verification criteria are from Table F-12 of the DoD QSM, Version 4.2. Industry standard was used when flagging criteria was not specified in the DoD QSM, Version 4.2.

QAPP Worksheet #13 (UFP-QAPP Manual Section 2.7) -- Secondary Data Criteria and Limitations Table

Secondary Data	Data Source	Data Generator(s)	How Data Will Be Used	Limitations on Data Use
Final OB/OD Area RCRA Interim Status Closure Plan Phase IA. Report that includes 1) the characterization and assessment of site conditions. 2) the description, evaluation and recommendation of Closure-Remedial Option and 3) design, construction and operation of selected closure option.	Program Management Company, Inc., Final OB/OD Area RCRA Interim Status Closure Plan Phase IA – Characterization and Assessment of Site Conditions for the Soils/Solid Matrix, November, 1999.	Program Management Company, Inc.,	Utilize field results and trenching locations for determining some excavation locations.	None

QAPP Worksheet #14 (UFP-QAPP Manual Section 2.8.1) -- Summary of Project Tasks

Project Tasks:

1. Discrete (VOC) and composite (all other analyses) stockpile characterization soil samples and confirmation soil samples will be collected. Discussion of the sampling approach and sampling design and rationale is provided in Worksheet #17.

2. Samples will be collected using the URS SOPs. The SOPs are included in Appendix I.

Analysis Tasks:

1. APPL will analyze discrete VOCs and composite soil samples for, SVOCs, explosives, polychlorinated biphenyls (PCB) aroclors, dioxins/furans, perchlorate, cyanide, nitrate and metals using SW-846 Methods 8260B, 8270C, 8330A, 8082, 8290, 6850, 9014, 9056 and 6010B/7473, respectively.

Quality Control Tasks:

MS/MSDs will be collected at an approximate frequency of 5%.

Discrete samples will be duplicated in the field at a rate of 10% and analyzed by the primary laboratory (APPL) to assess field and laboratory precision.

Secondary Data:

Previously collected information will be used. See Worksheet #13.

Data Management Tasks:

Data will received from the laboratory in SEDD Type IIA format and placed in an Environmental Data Management System (EDMS) database after automated data review (ADR) and data verification/validation have been performed and data qualifiers have been added.

Documentation and Records:

All confirmation soil samples collected will have coordinate locations documented. This is not applicable for the stockpile samples since the samples are coming from temporary locations. All records of each sample and all field measurements will be documented in field logbooks.

Chain of Custody (COC) forms, airbills, and sample logs will be prepared and retained for each sample.

Copies of the finalized documents and technical project documents (including but not limited to the UFP-QAPP, SSHP, WP, etc.) will be retained in a central project file for a minimum of 10 years. Other project-related files, such as contract documents, employee benefits, and other information will be retained in accordance with URS policy as stated in URS Policies and Procedures (P & P) Number 070.040JDE

Data Packages:

APPL will complete analytical Level IV data packages in accordance with the DoD QSM. APPL will provide SEDD Type IIA electronic files.

QAPP Worksheet #14 (UFP-QAPP Manual Section 2.8.1) -- Summary of Project Tasks

Assessment / Audit Tasks: Field Sample Collection and Documentation Audits: To be determined by USACE or URS QA officer.
Data Review Tasks: APPL will verify that all data are complete for samples received. All data package deliverable requirements will be met. Data will be 100% verified by URS using an acceptable ADR deliverable. Also the criteria listed in Tables 12-11 through 12-18, in accordance with DoD QSM Version 4.2 will be utilized. A data verification report will be produced by URS for each sample delivery group. Verified and validated data and all related field logbooks/notes/records will be reviewed to assess total measurement error and determine overall usability of the data for project purposes. Data limitations will be determined and data will be compared to Project Quality Objectives and required Action Limits. Corrective action will be initiated as necessary. Final data are placed in an EDMS database, with any necessary qualifiers and tables are generated.

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: VOCs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1] Contract Laboratory (APPL)		
					DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
1,1,1,2-Tetrachloroethane	630-20-6	29100	a	5	0.69	1.38	5
1,1,1-Trichloroethane	71-55-6	15600000	a	5	0.81	1.62	5
1,1,2,2-Tetrachloroethane	79-34-5	8020	a	5	1.24	2.48	5
1,1,2-Trichloroethane	79-00-5	2810	a	5	0.48	0.96	5
1,1-Dichloroethane	75-34-3	64500	a	10	1.13	2.26	10
1,1-Dichloroethene	75-35-4	449000	a	5	0.79	1.58	5
1,1-Dichloropropene	563-58-6	33700	c	5	0.55	1.1	5
1,2,3-Trichlorobenzene	87-61-6	49000	b	5	0.28	0.56	5
1,2,3-Trichloropropane	96-18-4	49.7	a	20	1.24	2.48	20
1,2,4-Trichlorobenzene	120-82-1	73000	a	5	0.52	1.04	5
1,2,4-Trimethylbenzene	95-63-6	62000	b	5	1.18	2.36	5
1,2-Dibromo-3-chloropropane	96-12-8	1860	a	10	2.19	4.38	10
1,2-Dibromoethane	106-93-4	588	a	5	0.6	1.2	5
1,2-Dichlorobenzene	95-50-1	2310000	a	5	0.95	1.9	5
1,2-Dichloroethane	107-06-2	7890	a	5	0.72	1.44	5
1,2-Dichloropropane	78-87-5	15200	a	5	0.62	1.24	5
1,3,5-Trimethylbenzene	108-67-8	780000	b	5	0.97	1.94	5
1,3-Dichlorobenzene	541-73-1	31700	c	5	0.60	1.2	5
1,3-Dichloropropane	142-28-9	1600000	b	5	0.65	1.3	5
1,4-Dichlorobenzene	106-46-7	31700	a	5	0.67	1.34	5
2,2-Dichloropropane	594-20-7	15200	c	5	0.67	1.34	5
2-Butanone	78-93-3	31700000	a	10	0.71	1.42	10
2-Chlorotoluene	95-49-8	1560000	a	5	0.99	1.98	5
2-Hexanone	591-78-6	210000	b	10	0.16	0.32	10
4-Chlorotoluene	106-43-4	1600000	b	5	1.05	2.1	5
4-Methyl-2-pentanone	108-10-1	5300000	b	10	0.93	1.86	10
Acetone	67-64-1	66600000	a	10	2.8	5.6	10
Benzene	71-43-2	15400	a	5	0.63	1.26	5
Bromobenzene	108-86-1	300000	b	5	0.76	1.52	5

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: VOCs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1] Contract Laboratory (APPL) DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
Bromochloromethane	74-97-5	160000	b	10	0.81	1.62	10
Bromodichloromethane	75-27-4	5410	a	5	0.69	1.38	5
Bromoform	75-25-2	616000	a	5	0.80	1.6	5
Bromomethane	74-83-9	16500	a	5	1.60	3.2	5
Carbon disulfide	75-15-0	1530000	a	5	1.08	2.16	5
Carbon tetrachloride	56-23-5	10800	a	5	0.80	1.6	5
Chlorobenzene	108-90-7	376000	a	5	0.49	0.98	5
Chloroethane	75-00-3	29800000	a	5	0.85	1.7	5
Chloroform	67-66-3	5860	a	5	1.55	3.1	5
Chloromethane	74-87-3	275000	a	5	1.43	2.86	5
cis-1,2-Dichloroethene	156-59-2	156000	a	10	1.82	3.64	10
cis-1,3-Dichloropropene	10061-01-5	33700	c	5	1.07	2.14	5
Dibromomethane	74-95-3	51600	a	5	0.47	0.94	5
Dibromochloromethane	124-48-1	12100	a	5	0.65	1.3	5
Dichlorodifluoromethane	75-71-8	168000	a	10	0.83	1.66	10
Ethylbenzene	100-41-4	68400	a	5	0.64	1.28	5
Hexachlorobutadiene	87-68-3	61100	a	10	0.60	1.2	10
Isopropylbenzene	98-82-8	2340000	a	5	1.11	2.22	5
m & p-Xylene	136777-61-2	774000	a	10	0.43	0.86	10
Methyl tert-butyl ether	1634-04-4	901000	a	5	0.89	1.78	5
Methylene chloride	75-09-2	409000	a	50	4.58	9.16	50
Naphthalene	91-20-3	43000	a	5	0.41	0.82	5
n-Butylbenzene	104-51-8	3900000	b	5	0.52	1.04	5
n-Propylbenzene	103-65-1	3400000	b	5	0.42	0.84	5
o-Xylene	95-47-6	898000	a	5	0.61	1.22	5
p-Isopropyltoluene	99-87-6	2340000	c	5	0.45	0.9	5
sec-Butylbenzene	135-98-8	3900000	c	5	0.93	1.86	5
Styrene	100-42-5	7280000	a	5	0.69	1.38	5
tert-Butylbenzene	98-06-6	3900000	c	5	0.45	0.9	5

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: VOCs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1]		
					Contract Laboratory (APPL)		
					DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
Tetrachloroethene	127-18-4	7020	a	5	0.54	1.08	5
Toluene	108-88-3	5270000	a	5	0.65	1.3	5
trans-1,2-Dichloroethene	156-60-5	270000	a	5	1.35	2.7	5
trans-1,3-Dichloropropene	10061-02-6	33700	c	5	0.43	0.86	5
Trichloroethene	79-01-6	8770	a	5	0.71	1.42	5
Trichlorofluoromethane	75-69-4	1410000	a	5	1.26	2.52	5
Vinyl chloride	75-01-4	728	a	5	1.68	3.36	5

*Project Action Limit for total 1,3-Dichloropropene
[a] New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, June 2012
[b] USEPA Regional Screening Level Tables. November 2012.
[c] Surrogate value. See list below:
1,4-Dichlorobenezne for 1,3-dichlorobenzene
1.2-dichloropropene for 2,2-dichloropropene and cis- and trans-1,3-dichloropropene.
Isopropylbenzene for p-isopropyltoluene
4-nitroaniline for 3-nitroaniline
n-butybenzene for sec-butylbenzene and tert-butylbenzene
Pyrene for non-carcinogenic PAHs without toxicity factors
2,3,7,8-TCDD screening values will be used for all dioxins
2,3,7,8-TCDF screening values will be used for all furans.
[1] Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
µg/kg = microgram per kilogram
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
NMED = New Mexico Environment Department
VOC = Volatile Organic Compound

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: SVOCs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1] Contract Laboratory (APPL)		
					DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
1,2,4-Trichlorobenzene	120-82-1	73000	a	330	49.4	98.8	330
1,2-Dichlorobenzene	95-50-1	2310000	a	330	51.2	102.4	330
1,3-Dichlorobenzene	541-73-1	31700	c	330	50.7	101.4	330
1,4-Dichlorobenzene	106-46-7	31700	a	330	48.9	97.8	330
2,4,5-Trichlorophenol	95-95-4	6110000	a	330	60.1	120.2	330
2,4,6-Trichlorophenol	88-06-2	61100	a	330	48.3	96.6	330
2,4-Dichlorophenol	120-83-2	183000	a	330	50.5	101	330
2,4-Dimethylphenol	105-67-9	1220000	a	330	43.9	87.8	330
2,4-Dinitrophenol	51-28-5	1220000	a	660	53.7	107.4	660
2,4-Dinitrotoluene	121-14-2	15700	a	660	63.8	127.6	660
2,6-Dinitrotoluene	606-20-2	61100	a	660	60.6	121.2	660
2-Chloronaphthalene	91-58-7	6260000	a	330	52.4	104.8	330
2-Chlorophenol	95-57-8	391000	a	330	44.3	88.6	330
2-Methylnaphthalene	91-57-6	230000	b	330	50.4	100.8	330
2-Methylphenol	95-48-7	3100000	b	330	45.2	90.4	330
2-Nitroaniline	88-74-4	610000	b	660	62.4	124.8	660
2-Nitrophenol	88-75-5	--		330	47.8	95.6	330
3,3'-Dichlorobenzidine	91-94-1	10800	a	660	56.3	112.6	660
3-Nitroaniline	99-09-2	240000	c	660	61.1	122.2	660
4,6-Dinitro-2-methylphenol	534-52-1	4890	a	660	56.4	112.8	660
4-Bromophenyl-phenyl ether	101-55-3	--		330	56.6	113.2	330
4-Chloro-3-methylphenol	59-50-7	6100000	b	330	58.8	117.6	330
4-Chloroaniline	106-47-8	24000	b	330	16.5	33	330
4-Chlorophenyl-phenyl ether	7005-72-3	--		330	60.7	121.4	330
4-Nitroaniline	100-01-6	240000	b	330	72.8	145.6	330
4-Nitrophenol	100-02-7	--		660	59.8	119.6	660
Acenaphthene	83-32-9	3440000	a	330	53.8	107.6	330
Acenaphthylene	208-96-8	1720000	c	330	53.1	106.2	330

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: SVOCs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1] Contract Laboratory (APPL) DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
Anthracene	120-12-7	17200000	a	330	61.3	122.6	330
Benzo(a)anthracene	56-55-3	1480	a	330	58.0	116	330
Benzo(a)pyrene	50-32-8	148	a	330	50.7	101.4	330
Benzo(b)fluoranthene	205-99-2	1480	a	330	60.0	120	330
Benzo(g,h,i)perylene	191-24-2	1720000	c	330	55.2	110.4	330
Benzo(k)fluoranthene	207-08-9	14800	a	330	61.0	122	330
Benzoic acid	65-85-0	240000000	b	330	29.6	59.2	330
Benzyl alcohol	100-51-6	6100000	b	330	55.8	111.6	330
Bis(2-chloroethoxy)methane	111-91-1	180000	b	330	49.9	99.8	330
Bis(2-chloroethyl)ether	111-44-4	2680	a	330	50.0	100	330
Bis(2-chloroisopropyl)ether	108-60-1	91500	a	330	47.3	94.6	330
Bis(2-ethylhexyl)phthalate	117-81-7	347000	a	660	61.6	123.2	660
Butylbenzylphthalate	85-68-7	2600000	b	330	55.5	111	330
Carbazole	86-74-8	--		330	81.6	163.2	330
Chrysene	218-01-9	148000	a	330	60.6	121.2	330
Dibenz(a,h)anthracene	53-70-3	148	a	330	59.4	118.8	330
Dibenzofuran	132-64-9	78000	b	660	57.3	114.6	660
Diethylphthalate	84-66-2	48900000	a	330	62.1	124.2	330
Dimethylphthalate	131-11-3	611000000	a	330	63.3	126.6	330
Di-n-butylphthalate	84-74-2	6110000	a	330	65.9	131.8	330
Di-n-octylphthalate	117-84-0	347000	c	330	58.4	116.8	330
Fluoranthene	206-44-0	2290000	a	330	65.4	130.8	330
Fluorene	86-73-7	2290000	a	330	61.3	122.6	330
Hexachlorobenzene	118-74-1	3040	a	660	60.3	120.6	660
Hexachlorobutadiene	87-68-3	61100	a	330	51.7	103.4	330
Hexachloroethane	67-72-1	42800	a	330	49.9	99.8	330
Indeno(1,2,3-cd)pyrene	193-39-5	1480	a	330	60.4	120.8	330
Isophorone	78-59-1	5120000	a	330	57	114	330
Naphthalene	91-20-3	43000	a	330	50.5	101	330

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: SVOCs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1]		
					Contract Laboratory (APPL)		
					DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
Nitrobenzene	98-95-3	53500	a	330	49.8	99.6	330
N-Nitroso-di-n-propylamine	621-64-7	690	b	330	87.4	174.8	330
N-Nitrosodimethylamine	62-75-9	22.6	a	330	54.9	109.8	330
N-Nitrosodiphenylamine	86-30-6	993000	a	330	50.6	101.2	330
Pentachlorophenol	87-86-5	8940	a	660	58.7	117.4	660
Phenanthrene	85-01-8	1830000	a	660	58.2	116.4	660
Phenol	108-95-2	18300000	a	330	43	86	330
Pyrene	129-00-0	1720000	a	330	54.1	108.2	330

[a] New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, June 2012
[b] USEPA Regional Screening Level Tables. November 2012.
[c] Surrogate value. See list below:
1,4-Dichlorobenzene for 1,3-dichlorobenzene
1.2-dichloropropene for 2,2-dichloropropene and cis- and trans-1,3-dichloropropene.
Isopropylbenzene for p-isopropyltoluene

4-nitroaniline for 3-nitroaniline
n-butylbenzene for sec-butylbenzene and tert-butylbenzene
Pyrene for non-carcinogenic PAHs without toxicity factors
2,3,7,8-TCDD screening values will be used for all dioxins
2,3,7,8-TCDF screening values will be used for all furans.
[1] Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
µg/kg = microgram per kilogram
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
NMED = New Mexico Environment Department
SVOC = Semi-volatile Organic Compound

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: PCBs
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (µg/kg) Residential Soil	Source	Project Quantitation Limit Goal (µg/kg)	Achievable Laboratory Limits[1]		
					Contract Laboratory (APPL)		
					DLs (µg/kg)	LODs (µg/kg)	LOQs (µg/kg)
Aroclor 1016	12674-11-2	3930	a	50	9.8	19.6	50
Aroclor 1221	11104-28-2	1490	a	50	5.5	11	50
Aroclor 1232	11141-16-5	1490	a	50	3.6	7.2	50
Aroclor 1242	53469-21-9	2220	a	50	3.6	7.2	50
Aroclor 1248	12672-29-6	2220	a	50	3.6	7.2	50
Aroclor 1254	11097-69-1	1120	a	50	3.6	7.2	50
Aroclor 1260	11096-82-5	2220	a	50	3.6	7.2	50

[a] New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, June 2012
[1] Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
µg/kg = microgram per kilogram
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
NMED = New Mexico Environment Department
PCB = Polychlorinated Biphenyls

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Explosives
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (mg/kg) Residential Soil	Source	Project Quantitation Limit Goal (mg/kg)	Achievable Laboratory Limits[1]		
					Contract Laboratory (APPL)		
					DLs (mg/kg)	LODs (mg/kg)	LOQs (mg/kg)
1,3,5-Trinitrobenzene	99-35-4	2200	b	0.5	0.079	0.158	0.5
1,3-Dinitrobenzene	99-65-0	6.1	b	0.5	0.0634	0.1268	0.5
2,4,6-Trinitrotoluene	118-96-7	39.1	a	0.5	0.083	0.166	0.5
2,4-Dinitrotoluene	121-14-2	15.7	a	0.5	0.083	0.166	0.5
2,6-Dinitrotoluene	606-20-2	61.1	a	0.5	0.083	0.166	0.5
2-Amino-4,6-Dinitrotoluene	35572-78-2	150	b	0.5	0.075	0.15	0.5
2-Nitrotoluene	88-72-2	29.1	a	0.5	0.066	0.132	0.5
3-Nitrotoluene	99-08-1	7.82	a	0.5	0.071	0.142	0.5
4-Amino-2,6-Dinitrotoluene	1946-51-0	150	b	0.5	0.075	0.15	0.5
4-Nitrotoluene	99-99-0	244	a	0.5	0.080	0.16	0.5
HMX	2691-41-0	3910	a	0.5	0.08	0.16	0.5
Nitrobenzene	98-95-3	53.5	a	0.5	0.075	0.15	0.5
RDX	121-82-4	58.2	a	0.5	0.08	0.16	0.5
Tetryl	479-45-8	244	a	0.5	0.091	0.182	0.5

[a] New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, June 2012
[b] USEPA Regional Screening Level Tables. November 2012.

[1]Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
Shaded values are below the LOQ
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
HMX = Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/kg = milligram per kilogram
NMED = New Mexico Environment Department
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine
Tetryl = Methyl-2,4,6-trinitrophenylnitramine

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Dioxins/Furans
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (ng/kg) Residential Soil	Source	Project Quantitation Limit Goal (ng/kg)	Achievable Laboratory Limits[1]		
					Contract Laboratory (APPL)		
					DLs (ng/kg)	LODs (ng/kg)	LOQs (ng/kg)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	45	a	5	NA	NA	5
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	40321-76-4	--		12.5	NA	NA	12.5
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	57653-85-7	--		12.5	NA	NA	12.5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	39227-28-6	--		12.5	NA	NA	12.5
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	19408-74-3	--		12.5	NA	NA	12.5
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	35822-46-9	--		12.5	NA	NA	12.5
Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9	--		25	NA	NA	25
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	51207-31-9	450	a	5	NA	NA	5
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-41-6	--		12.5	NA	NA	12.5
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	--		12.5	NA	NA	12.5
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	--		12.5	NA	NA	12.5
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	--		12.5	NA	NA	12.5
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	--		12.5	NA	NA	12.5
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	--		12.5	NA	NA	12.5
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	--		12.5	NA	NA	12.5
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	--		12.5	NA	NA	12.5
Octachlorodibenzofuran (OCDF)	39001-02-0	--		25	NA	NA	25

[a]New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, June 2012
[1] Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
ng/kg = nanogram per kilogram
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation

NA = Not Applicable
NMED = New Mexico Environment Department

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Metals
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (mg/kg) Residential Soil	Source	Project Quantitation Limit Goal (mg/kg)	Achievable Laboratory Limits[1] Contract Laboratory (APPL)		
					DLs (mg/kg)	LODs (mg/kg)	LOQs (mg/kg)
Aluminum	7429-90-5	78000	a	10	1.98	4	10
Antimony	7440-36-0	31.3	a	0.5	0.18	0.4	0.5
Arsenic	7440-38-2	3.9	a	0.5	0.25	0.4	0.5
Barium	7440-39-3	15600	a	0.5	0.075	0.4	0.5
Beryllium	7440-41-7	156	a	0.2	0.044	0.2	0.2
Cadmium	7440-43-9	70.3	a	0.5	0.051	0.2	0.5
Calcium	7440-70-2	NA	NA	100	17	20	100
Chromium	7440-47-3	117000	a	0.5	0.14	0.4	0.5
Cobalt	7440-48-4	23	b	0.5	0.063	0.3	0.5
Copper	7440-50-8	3130	a	0.5	0.094	0.4	0.5
Iron	7439-89-6	54800	a	5	0.85	4	5
Lead	7439-92-1	400	a	0.5	0.16	0.4	0.5
Magnesium	7439-95-4	NA	NA	5	1.29	4	5
Manganese	7439-96-5	1860	a	0.5	0.13	0.4	0.5
Mercury	7439-97-6	15.6	a	0.1	0.01	0.04	0.1
Nickel	7440-02-0	1560	a	0.5	0.068	0.4	0.5
Potassium	7440-09-7	NA	NA	100	13.88	50	100
Selenium	7782-49-2	391	a	0.5	0.37	0.5	0.5
Silver	7440-22-4	391	a	0.1	0.036	0.08	0.1
Sodium	7440-23-5	NA	NA	100	11.1	50	100
Thallium	7440-28-0	0.78	a	0.75	0.206	0.4	0.75
Vanadium	7440-62-2	391	a	0.5	0.1	0.4	0.5
Zinc	7440-66-6	23500	a	5	1.15	4	5

[a] New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation June2012
bUSEPA Regional Screening Levels, Residential Soil, April 2012
[1] Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
mg/kg = milligram per kilogram
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
LOD = Limit of Detection

LOQ = Limit of Quantitation
NMED = New Mexico Environment Department

QAPP Worksheet #15 (UFP-QAPP Manual Section 2.8.1) -- Reference Limits and Evaluation Table

Matrix: Soil
Analytical Group: Perchlorate, Cyanide and Nitrate
Concentration Level: Low

Analyte	CAS Number	Project Action Limit (mg/kg) Residential Soil	Source	Project Quantitation Limit Goal (mg/kg)	Achievable Laboratory Limits[1] Contract Laboratory (APPL)		
					DLs (mg/kg)	LODs (mg/kg)	LOQs (mg/kg)
Perchlorate	14797-73-0	54.8	a	0.006	0.002	0.004	0.006
Cyanide	57-12-5	46.9	a	0.6	0.28	0.56	0.6
Nitrate	14797-65-0	125000	a	10	1.24	2.48	10

[a] New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, June 2012
[1] Achievable DLs, LODs and LOQs are limits that an individual laboratory can achieve when performing a specific analytical method.
mg/kg = milligram per kilogram
APPL = Agriculture and Priority Pollutant Laboratories, Inc.
CAS = Chemical Abstracts Service
DL = Detection Limit
LOD = Limit of Detection
LOQ = Limit of Quantitation
NMED = New Mexico Environment Department

QAPP Worksheet #16 (UFP-QAPP Manual Section 2.8.2) -- Project Schedule / Timeline Table

See Appendix J, Project Schedule in the WP.

QAPP Worksheet #17 (UFP-QAPP Manual Section 3.1.1) -- Sampling Design and Rationale

The sampling design and rationale are described in Section 3 of the WP.

QAPP Worksheet #18 (UFP-QAPP Manual Section 3.1.1) -- Sampling Locations and Methods/SOP Requirements Table

Sampling Location	Matrix	Depth (feet)	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)	Sampling SOP Reference[1]	Rationale for Sampling Location
Stockpile Characterization	Soil	0.5 to 1	VOCs, SVOCs, Explosives, PCB Aroclors, Dioxins/Furans, Explosives, Metals, Perchlorate, Cyanide and Nitrate	Low to nondetect	500 samples 50 duplicates	SOP No. 4	See Worksheet #17
Confirmation Sampling	Soil	0 to 0.5	VOCs, SVOCs, Explosives, PCB Aroclors, Dioxins/Furans, Explosives, Metals, Perchlorate, Cyanide and Nitrate	Low to nondetect	300 samples 30 duplicates	SOP No. 4	See Worksheet #17

[1] Specify the appropriate letter or number from the Project Sampling SOP References table (Worksheet #21).

QAPP Worksheet #19 (UFP-QAPP Manual Section 3.1.1) -- Analytical SOP Requirements Table

Matrix	Analytical Group	Concentration Level	Preparation and Analytical Method / SOP Reference[1]	Sample Volume	Containers	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation, analysis)
Discrete Soil	VOCs	Low	USEPA 5035A and 8260B / SOPs ANA5035A and ANA8260B	5g	3 x 40ml preweighed	Discrete Soil	48 hours until frozen by laboratory, 14 days to analysis
Composite Soil	SVOCs	Low	USEPA 3540C and 8270C / SOPs SOX004 and ANA8270C	8 oz	1 x 8oz glass jar	4°C ± 2°C	14 days to extraction, 40 days to analysis
Composite Soil	PCB Aroclors	Low	USEPA 3540C and 8082A / SOPs SOX005 and ANA8082A	8 oz	1 x 8oz glass jar	4°C ± 2°C	14 days to extraction, 40 days to analysis
Composite Soil	Dioxins/Furans	Low	USEPA 8290 / HPL8290	8 oz	1 x 8oz glass jar	4°C ± 2°C	14 days to extraction, 40 days to analysis
Composite Soil	Explosives	Low	USEPA 8330A / SOPs MSE018 and HPL8330	8 oz	1 x 8oz glass jar	4°C ± 2°C	14 days to extraction, 40 days to analysis
Composite Soil	Metals	Low	USEPA 3050B, 6010B, 7473 / SOPs PRE3050B, ANA6010B, ANA7473	8 oz	1 x 8 oz jar	4°C ± 2°C	6 months (28 days Hg)

QAPP Worksheet #19 (UFP-QAPP Manual Section 3.1.1) -- Analytical SOP Requirements Table

Matrix	Analytical Group	Concentration Level	Preparation and Analytical Method / SOP Reference[1]	Sample Volume	Containers	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation, analysis)
Composite Soil	Perchlorate	Low	USEPA 6850 / SOP HPL6850	8 oz	1 x 8 oz jar	4°C ± 2°C	28 days
Composite Soil	Cyanide	Low	USEPA 9014 / SOP ANA9010B 9014	8 oz	1 x 8 oz jar	4°C ± 2°C	14 days
Composite Soil	Nitrate	Low	USEPA 9056/SOP ANA 9056	8 oz	1 x 8 oz jar	4°C ± 2°C	28 days

1 [1]Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).

QAPP Worksheet #20 (UFP-QAPP Manual Section 3.1.1) -- Field Quality Control Sample Summary Table for Soil Characterization and Confirmation

Sample Location	Matrix	Analytical Group	Conc. Level	Preparation and Analytical SOP[1]	No. of Investigative Samples[2]	No. of Field Duplicate Samples	No. of MS/ MSD	No. of QA Split Samples	Total No. of Samples[3]
Stockpile Characterization	Soil	VOCs	Low	ANA5035A / ANA8260B	500	50	25	0	550
Stockpile Characterization	Soil	SVOCs	Low	SOX004 / ANA8270C	500	50	25	0	550
Stockpile Characterization	Soil	PCB Aroclors	Low	SOX005 / ANA8082A	500	50	25	0	550
Stockpile Characterization	Soil	Explosives	Low to nondetect	MSE018 / HPL8330	500	50	25	0	550
Stockpile Characterization	Soil	Metals	Low to nondetect	PRE3050B / ANA6010BPE and ANA7473	500	50	25	0	550
Stockpile Characterization	Soil	Dioxins/Furan s	Low to nondetect	HPL8290	500	50	25	0	550
Stockpile Characterization	Soil	Perchlorate	Low to nondetect	HPL6850	500	50	25	0	550
Stockpile Characterization	Soil	Cyanide	Low to nondetect	ANA9010C 9014	500	50	25	0	550
Stockpile Characterization	Soil	Nitrate	Low to nondetect	ANA9056	500	50	25	0	550
Confirmation Sampling	Soil	VOCs	Low	ANA5035A / ANA8260B	300	30	15	0	330

QAPP Worksheet #20 (UFP-QAPP Manual Section 3.1.1) -- Field Quality Control Sample Summary Table for Soil Characterization and Confirmation

Sample Location	Matrix	Analytical Group	Conc. Level	Preparation and Analytical SOP[1]	No. of Investigative Samples[2]	No. of Field Duplicate Samples	No. of MS/ MSD	No. of QA Split Samples	Total No. of Samples[3]
Confirmation Sampling	Soil	SVOCs	Low	SOX004 / ANA8270C	300	30	15	0	330
Confirmation Sampling	Soil	PCB Aroclors	Low	SOX005/ ANA8082A	300	30	15	0	330
Confirmation Sampling	Soil	Dioxins/Furan s	Low to nondetect	HPL8290	300	30	15	0	330
Confirmation Sampling	Soil	Explosives	Low to nondetect	MSE018 / HPL8330	300	30	15	0	330
Confirmation Sampling	Soil	Metals	Low to nondetect	PRE3050B/ ANA6010B and ANA7473	300	30	15	0	330
Confirmation Sampling	Soil	Perchlorate	Low to nondetect	HPL6850	300	30	15	0	330
Confirmation Sampling	Soil	Cyanide	Low to nondetect	ANA9010C 9014	300	30	15	0	330
Confirmation Sampling	Soil	Nitrate	Low to nondetect	ANA9056	300	30	15	0	330

[1] Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).
[2] MS/MSD samples are not included in the total number of samples. .

QAPP Worksheet #21 (UFP-QAPP Manual Section 3.1.2) -- Project Sampling SOP References Table

SOPs are located in Appendix I

Reference Number	Title, Revision Date and / or Number	Originating Organization	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP No. 1	Decontamination, Rev. 0	URS	See Section 1.2.1 of SOP No. 1	N	Includes descriptions and procedures for decontamination of personnel and equipment
SOP No. 2	Sample Handling, Documentation, and Tracking, Rev. 0	URS	N/A	N	Includes sample packaging, shipping, and chain of custody requirements
SOP No. 3	Investigation Derived Waste, Rev. 0	URS	See Section 3.2 of SOP No. 3	N	Includes descriptions of handling and disposal of Investigation Derived Waste
SOP No. 4	Soil Sampling, Rev. 0	URS	See Section 4.2.1 of SOP No. 4	N	Describes the methods for completing soil sampling.
SOP No. 5	Terra Core® Sampling Method	URS	See Section 5.2.1 of SOP No. 5	N	Describes method for collection of VOC soil samples.

QAPP Worksheet #22 (UFP-QAPP Manual Section 3.1.2.4) -- Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment	Calibration Activity	Maint. Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Resp. Person	SOP[1]
None									

[1] The Project Sampling SOP References table is found on Worksheet #21.

QAPP Worksheet #23 (UFP-QAPP Manual Section 3.2.1) -- Analytical SOP References Table

Laboratory SOPs are located in Appendix 2

SOP Reference Number [1]	Title, Revision Date, and / or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
SHR001	SHR001, Revision 36, 5/7/10 "Receiving Samples"	N/A	N/A	N/A	APPL 908 N. Temperance Ave. Clovis, CA 93611 (559) 275-2175	N
SHR012	SHR012, Revision 11, 6/15/10 "Sample Disposal and Waste Collection, Storage and Disposal"	N/A	N/A	N/A	APPL	N
DOC011	DOC011, Revision 8, 9/16/10 "Sample COC Database"	N/A	N/A	N/A	APPL	N
11-INS006	INS006, Revision 2, 7/21/10 "Routine Instrument Maintenance for PE Optima 4300DV/5300DV"	N/A	N/A	ICP-AE	APPL	N
ANA6010BPE	ANA6010BPE, Revision 13, 9/17/10 "Inductively Coupled Plasma-Atomic Emission Spectroscopy by EPA Method 6010B"	Definitive	Metals	ICP-AE	APPL	N
PRE3050B	PRE3050B, Revision 10, 6/23/10 "Acid Digestion of Sediments, Sludges and Soils by EPA Method 3050B"	Definitive	Metals	ICP-AE	APPL	N

QAPP Worksheet #23 (UFP-QAPP Manual Section 3.2.1) -- Analytical SOP References Table

Laboratory SOPs are located in Appendix 2

SOP Reference Number [1]	Title, Revision Date, and / or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
ANA7473	ANA7473, Revision 0, 12/15/10 "Mercury in Solids and Solutions Thermal Decomposition, Amalgamation and Atomic Absorption Spectrophotometry EPA Method 7473"	Definitive	Metals	TD-AA	APPL	N
11-INS007	11-INS007, Revision 0, 12/17/10 "Routine Instrument Maintenance for PE SMS 100"	N/A	N/A	TD-AA	APPL	N
HPL8330	HPL8330, Revision 1, 8/24/12 "Explosives Compounds: Diode Array Detector by High Pressure Liquid Chromatography"	Definitive	Explosives	HPLC	APPL	N
MSE018	MSE018, Revision 15, 6/23/10 "EPA Method 8330 Mechanical Orbital Shaker Extraction For Solid Explosive Samples"	Definitive	Explosives	HPLC	APPL	N
HPL MAIN	HPL MAIN, Revision 1, 6/11/2010 "LC/MS Instrument Maintenance"	N/A	N/A	HPLC	APPL	N
ANA8260B	ANA8260B, Revision 28, 9/17/10 "Analysis of Water/Soil/Sludge by EPA Method 8260B"	Definitive	VOCs	GC/MS	APPL	N
ANA5035A	ANA5035A, Revision 1, 6/15/10 "Closed-System Purge-and-Trap EPA Method 5035A"	Definitive	VOCs	GC/MS	APPL	N

QAPP Worksheet #23 (UFP-QAPP Manual Section 3.2.1) -- Analytical SOP References Table

Laboratory SOPs are located in Appendix 2

SOP Reference Number [1]	Title, Revision Date, and / or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
9-INS001	INS001, Revision 5, 7/21/10 "Evaluation and Maintenance of GC/MS Systems"	N/A	N/A	GC/MS	APPL	N
IN005	IN005, Revision 3, 6/15/10 "GC/MS Source Cleaning For All GC/MS Systems"	N/A	N/A	GC/MS	APPL	N
INS009	INS009, Revision 4, 6/15/10 "Evaluation/Maintenance of GC/MS Systems"	N/A	N/A	GC/MS	APPL	N
INS010	INS010, Revision 4, 6/15/10 "Reporting Malfunctions of Mass Spectrometers (5973N and 5971A)	N/A	N/A	GC/MS	APPL	N
INS011	IN011, Revision 2, 6/15/10 "GC/MS Source Cleaning"	N/A	N/A	GC/MS	APPL	N
ANA8270C	ANA8270C, Revision 14, 6/25/10 "Semivolatile Organic Compounds by EPA Method 8270C"	Definitive	SVOCs	GC/MS	APPL	N
SOX004	SOX004, Revision 9, 6/15/10 8270C (GC/MS) Soil, Sludges, and Solids Extraction by Soxhlet (EPA Method 3540C)	Definitive	SVOCs	GC/MS	APPL	N
SOX005	SOX005, Revision 10, 6/15/10 "OCL/OP/TRIA/CARB/PCB Soil, Sludges and Solids Extraction by Soxhlet USEPA Method 3540C"	Definitive	PCBs	GC	APPL	N

QAPP Worksheet #23 (UFP-QAPP Manual Section 3.2.1) -- Analytical SOP References Table

Laboratory SOPs are located in Appendix 2

SOP Reference Number [1]	Title, Revision Date, and / or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work? (Y/N)
9-INS002	INS002, Revision 6, 7/21/10 "Periodic Maintenance in the VOA Section"	N/A	N/A	GC	APPL	N
ANA8082	ANA8082, Revision 14, 9/17/10 "PCBs as Aroclors and Congeners by Gas Chromatography: Capillary Column Technique (EPA Method 8082)"	Definitive	PCBs	GC	APPL	N
HPL8290	HPL8290, Revision 6, 4/13/10 "Instrumental Analysis of Polychlorinated Dibenzodioxins (PCDD) and Polychlorinated Dibenzofurans (PCDF) by HRGC-HRMS (EPA Method 8290)"	Definitive	Dioxins/Furans	HRGC/HRMS	APPL	N
HPL6850	HPL6850, Revision 10, 6/10/10 "Analysis of Perchlorate in Environmental Samples by EPA 6850"	Definitive	Perchlorate	HPLC/MS	APPL	N
ANA9010C/9014	ANA9010C/9014, Revision 16, 4/19/10 "Total Cyanide Analysis EPA SW846 Method 9010C/9013/9014"	Definitive	Cyanide	Spectrophotometer	APPL	N
INO022	INO022, Revision 1, 10/15/10 "Calibrating the Spectrophotometer-TheromGenesys 10 uv"	N/A	N/A	Spectrophotometer	APPL	N

QAPP Worksheet #23 (UFP-QAPP Manual Section 3.2.1) -- Analytical SOP References Table

Laboratory SOPs are located in Appendix 2

SOP Reference Number [1]	**Title, Revision Date, and / or Number**	**Definitive or Screening Data**	**Analytical Group**	**Instrument**	**Organization Performing Analysis**	**Modified for Project Work?** (Y/N)
ANA9056	ANA9056, Revision 11, 4/20/10 “Inorganic Anion Analysis EPA SW846 Method 9056”	Definitive	Nitrate	IC	APPL	N
INO029	INO029, Revision 2, 9/17/10 “Maintenance for Dionex”	N/A	N/A	IC	APPL	N

[1] SOPs for the contract laboratory (APPL) are listed on the attached disk.

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC (Method 8082)	Initial multipoint calibration for all analytes (minimum five standards) (ICAL)	Initial calibration prior to sample analysis	One of the options below: Option 1: linear – RSD for each analyte ≤ 20% Option 2: linear – least squares regression r > 0.995 for each analyte. Option 3: non-linear – COD ≥ 0.99 (six points shall be used for second order, seven points shall be used for third order) not applicable for SW8082	Correct problem then repeat ICAL.	Analyst	ANA8082
GC (Method 8082)	Second-source calibration verification	Immediately following ICAL.	All project analytes within established retention time windows. GC methods: All project analytes within ± 20% of expected value from the ICAL;	Correct problem rerun second source verification. If that fails, correct problem and repeat initial calibration.	Analyst	ANA8082
GC (Method 8082)	Retention time window position established for each analyte and surrogate	Once per ICAL and at the beginning of the analytical shift.	Position shall be set using the midpoint standard of the initial calibration curve.	N/A	Analyst	ANA8082

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC (Method 8082)	Retention time window width established for each analyte and surrogate	At method set-up and after major maintenance (e.g., column change)	RT width is ±3 times standard deviation for each analyte (each quantitation peak SW8082) retention time from 72-hour study	N/A	Analyst	ANA8082
GC (Method 8082)	Second source calibration verification (ICV)	Immediately following ICAL	All analytes within established retention time windows. GC methods: All project analytes within ± 20% of expected value from the ICAL.	Correct problem, rerun ICV. If that fails, repeat initial calibration.	Analyst	ANA8082
GC (Method 8082)	Continuing calibration verification (CCV)	Prior to sample analysis, after every 10 field samples, and at the end of the analysis sequence.	All project analytes within established retention time windows. GC Methods: All project analytes within ± 20% of expected value from the ICAL.	Correct problem, then rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	Analyst	ANA8082
GC (Method 8082)	Confirmation of positive results (second column or second detector)	All positive results must be confirmed.	Calibration and QC criteria same as for initial or primary column analysis. Results between primary and second column RPD ≤ 40%.	NA	Analyst	ANA8082
GC/MS (Methods 8260B/8270C)	MS tuning check	Prior to ICAL and at the beginning of each 12-hour period.	The manufacture's specifications for DFTPP, PFTBA, or other specified compound shall be used. Mass assignments should be within ± 0.1 mass units of target values.	Retune instrument and verify. Rerun affected samples.	Analyst or certified instrument technician	ANA8260B, ANA8270C

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC/MS (Methods 8260B/8270C)	Breakdown check (8270C only)	At the beginning of each 12-hour period, prior to analysis of samples.	Degradation ≤ 20% for DDT. No visible peak tailing for Benzidine or Pentachlorophenol and should not exceed a tailing factor of 2.	Correct problem the repeat performance check.	Analyst or certified instrument technician	ANA8260B, ANA8270C
GC/MS (Methods 8260B/8270C)	Minimum five-point initial calibration (ICAL) for all analytes.	Prior to sample analysis	Average response factor (RF) for SPCCs: VOCs ≥ 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane; ≥ 0.1 for chloromethane, bromoform, and 1,1-dichloroethane. SVOCs ≥ 0.50. RSD for RFs for CCCs: VOCs and SVOCs ≤ 30% and one option below: RSD for each analyte ≤ 15% or least square regression ≥ 0.995	Correct problem then repeat ICAL	Analyst or certified instrument technician	ANA8260B, ANA8270C
GC/MS (Methods 8260B/8270C)	Second source calibration verification	After ICAL	All analytes within ± 20% of expected value	Correct problem and verify second source standard. Rerun second source verification. If fail, correct problem and repeat initial calibration	Analyst or certified instrument technician	ANA8260B, ANA8270C
GC/MS (Methods 8260B/8270C)	RT window position for each analyte and surrogate	Once per ICAL	Position shall be set using the midpoint standard of the ICAL curve when ICAL is performed. On days when ICAL is not performed, the initial CCV is used.	NA	Analyst or certified instrument technician	ANA8260B, ANA8270C

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC/MS (Methods 8260B/8270C)	Relative RT (RRT)	With each sample	RRT of each target analyte within ± 0.06 RRT units.	Correct problem, then reanalyze all samples analyzed since the last RT check; If fail then rerun ICAL and samples.	Analyst or certified instrument technician	ANA8260B, ANA8270C
GC/MS (Methods 8260B/8270C)	CCV	Daily, before sample analysis and every 12 hours of analysis time.	Average RF for SPCCs: VOCs ≥ 0.30 for chlorobenzene and 1,1,2,2-tetrachloroethane; ≥ 0.1 for chloromethane, bromoform, and 1,1-dichloroethane. SVOCs ≥ 0.50. %Difference/Drift for all target compounds and surrogates: VOCs and SVOCs ≤ 20%D	Correct problem, rerun CCV. Reanalyze all samples since last successful calibration verification. If fail, repeat initial calibration.	Analyst or certified instrument technician	ANA8260B, ANA8270C
GC/MS (Methods 8260B/8270C)	Internal Standards (IS)	Every field sample, standard, and QC sample.	RT ± 30 seconds from RT of the midpoint standard in the ICAL; EICP area within -50% to + 100% of ICAL midpoint standard	Inspect mass spectrometer and GC for malfunctions. Reanalysis of samples analyzed during failure is mandatory.	Analyst or certified instrument technician	ANA8260B, ANA8270C
GC-HRMS (Method 8290)	MS tuning sample	Prior to ICAL and at the beginning of each 12-hour period.	Static resolving power ≥ 10,000 (10% valley) for identified masses per method, and lock-mass ion between lowest and highest masses for each descriptor and level of reference compound ≤ 10% full-scale deflection, per method.	Retune instrument and verify. Rerun affected samples.	Analyst or certified instrument technician	HPL8290

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC-HRMS (Method 8290)	GC column performance check	Prior to ICAL or calibration verification. Use GC performance check solution per method.	Peak separation between 2,3,7,8-TCDD and other TCDD isomers result in a valley of ≤ 25%, per method; and Identification of all first and last eluters of the eight homologue retention time windows and documentation by labeling (F/L) on the chromatogram; and Absolute retention times for switching from one homologous series to the next ≥ 10 sec. for all components of the mixture.	Correct problem then repeat column performance check.	Analyst or certified instrument technician	HPL8290
GC-HRMS (Method 8290)	Minimum five-point initial calibration (ICAL) for all analytes	ICAL prior to sample analysis, as needed by the failure of calibration verification standard, and when a new lot is used as standard source of CCV, sample fortification (IS), or recovery solutions.	Ion abundance ratios in accordance with criteria in Table 8 of the method; and S/N ratio ≥ 10 for all target analyte ions; and RSD ≤ 20% for the response factors (RF) for all 17 unlabeled standards and RSD ≤ 20% for the RFs for the 9 labeled IS.	Correct problem then repeat ICAL.	Analyst or certified instrument technician	HPL8290

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC-HRMS (Method 8290)	CCV	At the beginning of each 12-hour period, and at the end of each analytical sequence.	Ion abundance ratios in accordance with criteria in Table 8 of the method; and For unlabeled standards, RF within ± 20%D of RF established in ICAL; and For labeled standards, RF within ± 30%D of RF established in ICAL.	Correct problem, repeat calibration verification standard. If that fails, repeat ICAL and reanalyze all samples analyzed since the last successful CCV. End-of-run CCV: If the RF for unlabeled standards ≤ 25% RPD and the RF for labeled standards ≤ 35% RPD (relative to the RF established in the ICAL), the mean RF from the two daily CCVs must be used for quantitation of impacted samples instead of the ICAL mean RF value. If the starting and ending CCV RFs differ by more than 25% RPD for unlabeled	Analyst or certified instrument technician	HPL8290

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
GC-HRMS (Method 8290)	CCV (cont.)			compounds or 35% RPD for labeled compounds, the sample may be quantitated against a new initial calibration if it is analyzed within two hours. Otherwise reanalyze samples with positive detections if necessary.		
GC-HRMS (Method 8290)	Internal standards (IS)	Every field sample, standard, and QC sample.	% recovery for each IS in the original sample (prior to dilutions) must be within 40-135%, per method.	Correct problem, then reprep and reanalyze the samples with failed IS.	Analyst or certified instrument technician	HPL8290
LC-MS (Method 6850)	6-point ICAL for linear calibration	At the beginning of each run sequence	RSD ≤ 20%	Correct problem then repeat initial calibration	Analyst or certified instrument technician	HPL6850
LC-MS (Method 6850)	Second source calibration verification	Directly following ICAL	within ± 15% of expected value	Correct problem and verify second source standard. Rerun second source verification. If fails, correct problem and repeat initial calibration	Analyst or certified instrument technician	HPL6850

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
LC-MS (Method 6850)	CCV at low point and mid point concentrations	At alternating concentrations every 10 field samples and at the beginning and close of each run sequence	% recovery of mid-point CCV within ± 15%D and of low point CCV ± 30%D	Correct problem, rerun ICAL if necessary, rerun CCV. Reanalyze all samples since last successful calibration verification	Analyst or certified instrument technician	HPL6850
LC-MS (Method 6850)	Internal Standard (IS)	Every sample, spike, blank and CCV	I.S. area counts within 50-150% of the average from the ICAL	Reanalyze sample. If there is a second failure and CCVs met acceptance criteria, sample matrix is considered suspect.	Analyst or certified instrument technician	HPL6850
ICP-AES (Method 6010B)	Establish instrument detection limits (IDLs)	At initial set-up and after significant change in instrument type, personnel, test method, or sample matrix.	IDL shall be ≤ LOD.	N/A	N/A	ANA6010B
ICP-AES (Method 6010B)	Calibrate using multipoint standard calibration	Daily prior to analysis of sample	r ≥ 0.995	Correct problem then repeat initial calibration	Analyst or certified instrument technician	ANA6010B
ICP-AES (Method 6010B)	Establish linear dynamic range	Once every six months.	The calculated value should be within ± 10% of the true values	N/A	Analyst or certified instrument technician	ANA6010B

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
ICP-AES (Method 6010B)	Run interference check solution	At the beginning of an analytical run.	ICS-A: Absolute value of concentration for all non-spiked analytes < LOD (unless they are a verified trace impurity from one of the spiked analytes. ICS-AB: Within ± 20% of its true value	Correct problem then repeat the calibration process or use internal standards to eliminate the problem	Analyst or certified instrument technician	ANA6010B
ICP-AES (Method 6010B)	Second source calibration verification (ICV)	Once after each ICAL, prior to beginning a sample run.	± 10% of its true value	Correct problem then repeat the calibration process	Analyst or certified instrument technician	ANA6010B
ICP-AES (Method 6010B)	Continuing calibration verification (CCV)	After every 10 field samples and at the end of the analysis sequence.	± 10% of its true value	Terminate analysis; recalibrate and reanalyze the samples	Analyst or certified instrument technician	ANA6010B
ICP-AES (Method 6010B)	Continuing calibration blank (CCB)	Before beginning a sample run, after every 10 samples, and at the end of the analysis sequence.	No analytes detected > LOD.	Terminate analysis; recalibrate and reanalyze the samples	Analyst or certified instrument technician	ANA6010B
TD-AA (Method 7473)	Initial Calibration (ICAL) for all analytes. Minimum 5 standards and a calibration blank	Daily ICAL prior to analyzing samples	Correlation coefficient is ≥ 0.995	Correct problem then repeat the calibration process	Analyst or certified instrument technician	ANA7473

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
TD-AA (Method 7473)	Second source calibration verification (ICV)	Once after 5-point standard calibration, prior to sample run	± 10% of its true value	Correct problem then repeat the calibration process	Analyst or certified instrument technician	ANA7473
TD-AA (Method 7473)	Continuing calibration verification (CCV)	After every 10 field samples and at the end of the analysis sequence.	± 20% of its true value	Correct problem, rerun calibration verification. If that fails, then repeat ICAL. Reanalyze all samples since the last successful calibration verification.	Analyst or certified instrument technician	ANA7473
TD-AA (Method 7473)	Calibration blank	Before beginning a sample run, after every 10 samples, and at the end of the analysis sequence.	No analytes detected > LOD.	Correct problem. Re-prep and reanalyze calibration blank. All samples following the last acceptable calibration blank must be reanalyzed.	Analyst or certified instrument technician	ANA7473
HPLC (Method 8330A)	Initial multipoint calibration for all analytes (minimum five standards) (ICAL)	Initial calibration prior to sample analysis	*Option 1*: RSD for each analyte $\leq$ 20% *Option 2:* Linear least squares regression r $\geq$ 0.995 *Option 3:* Non-linear regression: coefficient of determination $r^2 \geq 0.99$ (6 points shall be used for second order, 7 points shall be used for third order)	Correct problem then repeat initial calibration.	Analyst	HPL8330B

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
HPLC (Method 8330A)	Second-source calibration verification	Once per ICAL	All analytes within ± 15% of expected value.	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat initial calibration.	Analyst	HPL8330B
HPLC (Method 8330A)	Retention time window position establishment for each analyte and surrogate	Once per ICAL and at the beginning of the analytical shift	Position shall be set using the midpoint standard of the initial calibration curve or the value in the CCV run at the beginning of the analytical shift.	N/A	Analyst	HPL8330B
HPLC (Method 8330A)	Retention time window verified for each analyte	Each calibration verification standard	Analyte within established window	Correct problem then reanalyze all samples analyzed since the last retention time check. If they fail, redo ICAL and reset retention time window.	Analyst	HPL8330B
HPLC (Method 8330A)	Calibration verification Initial ICV and continuing CCV	ICV: Daily, before sample analysis CCV: After every 10 field samples and at the end of the analysis sequence	All analytes within ± 15% of expected value from the ICAL.	ICV: Correct problem then rerun ICV. If that fails, repeat initial calibration. CCV: Correct problem then repeat CCV and reanalyze all samples since last successful calibration verification.	Analyst	HPL8330B

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
Manual spectrophotometer (Method 9014)	6-point ICAL for linear calibration	Every field sample, standard, and QC sample.	Correlation coefficient (r^2) ≥ 0.995	Correct problem then repeat initial calibration	Analyst or certified instrument technician	ANA9010C/9014
Manual spectrophotometer (Method 9014)	ICV	At the beginning of each run sequence	Recovery within ± 10% of true value	Rerun ICV. If fails, correct problem and repeat initial calibration	Analyst or certified instrument technician	ANA9010C/9014
Manual spectrophotometer (Method 9014)	CCV	Once per every 10 samples	Recovery within ± 10% of true value	Correct problem, rerun CCV. Reanalyze all samples since last successful calibration verification	Analyst or certified instrument technician	ANA9010C/9014
Manual spectrophotometer (Method 9014)	CCB	Once per every 10 samples	Recovery < RL	Reanalyze all samples since last successful CCB if samples had detections	Analyst or certified instrument technician	ANA9010C/9014
IC (Method 9056)	Initial Calibration (ICAL) – five point ICAL	Initial calibration prior to sample analysis	Option 1: linear – RSD for each analyte ≤ 10% Option 2: linear – least squares regression r > 0.995 for each analyte. Option 3: non-linear – COD ≥ 0.99 (six points shall be used for second order, seven points shall be used for third order).	Correct problem then repeat initial calibration.	Analyst	ANA9056

QAPP Worksheet #24 (UFP-QAPP Manual Section 3.2.2) -- Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP[1]
IC (Method 9056)	Second-source calibration verification	Once per ICAL	All analytes within ± 10% of expected value	Correct problem and verify second source standard. Rerun second source verification. If that fails, correct problem and repeat ICAL	Analyst	ANA9056
IC (Method 9056)	Calibration verification: initial (ICV) and continuing (CCV)	ICV: Daily, before sample analysis, unless ICAL performed on same day when eluent is changed CCV: After every 10 samples, at the end of the analysis sequence	All analytes within ± 10% of expected value (%D)	ICV: Correct problem, rerun ICV. If that fails, repeat initial calibration. CCV: Correct problem then repeat CCV. Reanalyze all samples since last successful calibration verification	Analyst	ANA9056

[1] The Analytical SOP References table is found on Worksheet #23.

QAPP Worksheet #25 (UFP-QAPP Manual Section 3.2.3) -- Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument / Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP[1]
ICP-AE	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	11-INS006
TD-AA	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	11-INS007
GC-MS	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	INS009
GC	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	9-INS002
HPLC	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	HPL-MAIN

QAPP Worksheet #25 (UFP-QAPP Manual Section 3.2.3) -- Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument / Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP[1]
LC-MS	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	HPL-MAIN and INS010
GC-HRMS	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	9-INS001
Spectrophotometer	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	INO022
IC	Maintenance specified in Lab Equipment Maintenance SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Refer to SOP	Analyst	INO029

[1] The Analytical SOP References table is found on Worksheet #23.

1 QAPP Worksheet #26 (UFP-QAPP Manual Appendix A) -- Sample Handling System

Sample Collection, Packaging, and Shipment Sample Collection (Personnel/Organization): TBD, URS Sample Packaging (Personnel/Organization): TBD, URS Coordination of Shipment (Personnel/Organization): TBD, URS Type of Shipment/Carrier: Overnight/FedEx
Sample Receipt and Analysis Sample Receipt (Personnel/Organization): TBD by Chue Moua/APPL Sample Custody and Storage (Personnel/Organization): TBD by Chue Moua/APPL Sample Preparation (Personnel/Organization): TBD by Leonard Fong/APPL Sample Determinative Analysis (Personnel/Organization): TBD by Leonard Fong/APPL
Sample Archiving Field Sample Storage (No. of days from sample collection): 30 days Sample Extract/Digestate Storage (No. of days from extraction/digestion): 90 days Biological Sample Storage (No. of days from sample collection): N/A
Sample Disposal Personnel/Organization: TBD by Leonard Fong/APPL Number of Days from Analysis: 30 days

QAPP Worksheet #27 (UFP-QAPP Manual Section 3.3.3) – Sample Custody Requirements Table

Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory):

See SOP No. 2

Laboratory Sample Custody Procedures (receipt of samples, archiving, and disposal):

Sample Packaging (Personnel/Organization): TBD, URS

See the following SOPs

SOP #SHR001 Receiving Samples

SOP #SHR012 Sample Disposal

SOP #DOC011 Chain of Custody Database

Sample Identification Procedures:

See SOP No. 2

Chain of Custody Procedures:

See SOP No. 2

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	VOCs
Analytical Method / SOP Reference	USEPA SW-846 Method 8260B/ANA8260B

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-1	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-11

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	VOCs
Analytical Method / SOP Reference	USEPA SW-846 Method 8260B/ANA8260B

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-1	Examine the project-specific DQOs. Contact URS as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-11
Matrix spike duplicate (MSD)	One MS per preparatory batch per matrix	See Table 12-1	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-11
Surrogates	In all samples	See Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available.	Laboratory QA Manager	Accuracy/Bias	See Table 12-11

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	SVOCs
Analytical Method / SOP Reference	USEPA SW-846 Method 8270C/ANA8270C

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results. For common laboratory contaminants, no analytes detected > LOQ.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-2	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample	Laboratory QA Manager	Precision/Accuracy	See Table 12-11

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	SVOCs
Analytical Method / SOP Reference	USEPA SW-846 Method 8270C/ANA8270C

QC Sample	**Frequency / Number**	**Method / SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator**	**Measurement Performance Criteria**
			material is available.			
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-2	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-11
Matrix spike duplicate (MSD)	One MS per preparatory batch per matrix	See Table 12-2	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-11
Surrogates	In all samples	See Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available.	Laboratory QA Manager	Accuracy/Bias	See Table 12-11

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Total Metals
Analytical Method / SOP Reference	USEPA SW-846 Methods 6010B and 7473 / ANA6010BPE and ANA7473

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-7	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-15

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Total Metals
Analytical Method / SOP Reference	USEPA SW-846 Methods 6010B and 7473 / ANA6010BPE and ANA7473

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator	Measurement Performance Criteria
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-7	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-15
Sample duplicate	One sample duplicate per preparatory batch per matrix	See Table 12-7	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-15

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	PCB
Analytical Method / SOP Reference	USEPA SW-846 Method 8082 / ANA8082

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-4	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-12

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	PCB
Analytical Method / SOP Reference	USEPA SW-846 Method 8082 / ANA8082

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-4	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-12
Matrix spike duplicate (MSD)	One MS per preparatory batch per matrix	See Table 12-4	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-12
Surrogates	In all samples	See Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available.	Laboratory QA Manager	Accuracy/Bias	See Table 12-12

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Explosives
Analytical Method / SOP Reference	USEPA SW-846 Method 8330A / HPL8330

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-3	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-13

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Explosives
Analytical Method / SOP Reference	USEPA SW-846 Method 8330A / HPL8330

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-3	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-13
Matrix Spike Duplicate (MSD)	One MS per preparatory batch per matrix	See Table 12-3	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-13
Surrogates	In all samples	See Table 12-10	For QC and field samples, correct problem, then reprep and reanalyze all failed samples for failed surrogates in the associated preparatory batch, if sufficient sample material is available.	Laboratory QA Manager	Accuracy/Bias	See Table 12-13

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Perchlorate
Analytical Method / SOP Reference	USEPA SW-846 Method 6850 / HPL6850

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-6	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-18

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil					
Analytical Group	Perchlorate					
Analytical Method / SOP Reference	USEPA SW-846 Method 6850 / HPL6850					
QC Sample	**Frequency / Number**	**Method / SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-6	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-18
Sample Duplicate	One sample duplicate per preparatory batch per matrix	See Table 12-6	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-18

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Dioxins/Furans
Analytical Method / SOP Reference	USEPA SW-846 Method 8290 / HPL8290

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-5	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-14

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix		Soil				
Analytical Group		Dioxins/Furans				
Analytical Method / SOP Reference		USEPA SW-846 Method 8290 / HPL8290				
QC Sample	**Frequency / Number**	**Method / SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-5	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-14
Sample Duplicate	One sample duplicate per preparatory batch per matrix	See Table 12-5	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-14
Internal Standards	Every field sample, standard and QC sample	40-135%	Correct problem, then reprep and reanalyze the samples with failed internal standards	Laboratory QA Manager	Precision/Accuracy	See Table 12-14

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Nitrate
Analytical Method / SOP Reference	USEPA SW-846 Method 9056 / ANA9056

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-9	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-17

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil					
Analytical Group	Nitrate					
Analytical Method / SOP Reference	USEPA SW-846 Method 9056 / ANA9056					
QC Sample	**Frequency / Number**	**Method / SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-9	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-17
Sample Duplicate	One sample duplicate per preparatory batch per matrix	See Table 12-9	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-17

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QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Cyanide
Analytical Method / SOP Reference	USEPA SW-846 Method 9014 / ANA9010C 9014

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Method Blank (MB)	One per preparation batch	No analytes detected > 1/2 LOQ and > 1/10 the amount measured in any sample or 1/10 the regulatory limit (whichever is greater). Blank result must not otherwise affect sample results.	Re-extract or re-analyze samples associated with the MB except when the sample analysis resulted in a nondetect.	Laboratory QA Manager	Accuracy/Bias	No target compounds ≥ LOQ
Laboratory Control Sample (LCS)	One per preparation/analytical batch	See Table 12-8	Correct problem, then reprep and reanalyze the LCS and all samples in the associated preparatory batch for failed analytes, if sufficient sample material is available.	Laboratory QA Manager	Precision/Accuracy	See Table 12-16

QAPP Worksheet #28 (UFP-QAPP Manual Section 3.4) -- QC Samples Table

Matrix	Soil
Analytical Group	Cyanide
Analytical Method / SOP Reference	USEPA SW-846 Method 9014 / ANA9010C 9014

QC Sample	Frequency / Number	Method / SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Matrix Spike (MS)	One per preparation/analytical batch	See Table 12-8	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-16
Sample Duplicate	One sample duplicate per preparatory batch per matrix	See Table 12-8	Examine the project-specific DQOs. Contact the client as to additional measures to be taken.	Laboratory QA Manager	Precision/Accuracy	See Table 12-16

QAPP Worksheet #29 (UFP-QAPP Manual Section 3.5.1) -- Project Documents and Records Table

Sample Collection Documents and Records	On-Site Analysis Documents and Records	Off-Site Analysis Documents and Records	Data Assessment Documents and Records	Other
Field Logbook	Sample Receipt, Custody, and Tracking Records	Sample Receipt, Custody, and Tracking Records	Field Sampling Audit Checklists	
Chain of Custody Records	Sample Preparation Logs	Sample Prep Logs	Data Validation Reports	
Air Bills	Equipment Maintenance, Testing, and Inspection Logs	Equipment Maintenance, Testing, and Inspection Logs	Corrective Action Forms	
Custody Seals	Corrective Action Forms	Corrective Action Forms		
Corrective Action Forms	Reported Field Sample Results	Reported Field Sample Results		
	Sample Disposal Records	Reported Results for Standards, QC Checks, and QC Samples		
		Data package Completeness Checklist		
		Sample Disposal Records		
		Extraction/Cleanup-up Records		
		Raw Data (stored on disk CD-R)		

1 QAPP Worksheet #30 (UFP-QAPP Manual Section 3.5.2.3) -- Analytical Services Table

Matrix	Analytical Group	Concentration Level	Sample Locations/ID Number	Analytical SOP	Data Package Turnaround Time	Primary Laboratory / Organization (name and address, contact person and telephone number)	QA Laboratory / Organization (name and address, contact person and telephone number)
Soil	VOCs	Low	TBD	ANA8260B	21 days for full data package	Agricultural & Priority Pollutants Laboratory, Inc (APPL) 908 N. Temperance Ave Clovis, CA 93611 Attn: Diane Anderson (559) 275-2175	N/A
Soil	SVOCs	Low	TBD	ANA8270C	21 days for full data package	APPL	N/A
Soil	Explosives	Low	TBD	HPL8330	21 days for full data package	APPL	N/A
Soil	Metals	Low	TBD	ANA6010B/ ANA7473	21 days for full data package	APPL	N/A
Soil	Dioxins/Furans	Low	TBD	HPL8290	21 days for full data package	APPL	N/A
Soil	PCBs	Low	TBD	ANA8082	21 days for full data package	APPL	N/A
Soil	Perchlorate	Low	TBD	HPL6850	21 days for full data package	APPL	N/A
Soil	Cyanide	Low	TBD	ANA9010C 9014	21 days for full data package	APPL	N/A
Soil	Nitrate	Low	TBD	ANA9056	21 days for full data package	APPL	N/A

QAPP Worksheet #31 (UFP-QAPP Manual Section 4.1.1) -- Planned Project Assessments Table

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 (CA)** (title and organizational affiliation)	**Person(s) Responsible for Monitoring Effectiveness of CA** (title and organizational affiliation)
Review Field Logbooks and Chain of Custody forms	As work progresses	Internal	URS	John Carson, Project Manager and/or Jeff Aust, Project Chemist, URS	TBD, Sampling Team Leader, URS	TBD, Sampling Team Leader, URS	TBD, URS

QAPP Worksheet #32 (UFP-QAPP Manual Section 4.1.2) -- Assessment Findings and Corrective Action Responses

Assessment Type	**Nature of Deficiencies Documentation**	**Individual(s) Notified of Findings** (name, title, organization)	**Timeframe of Notification**	**Nature of Corrective Action Response Documentation**	**Individual(s) Receiving Corrective Action Response** (name, title, organization)	**Timeframe for Response**
Review Field Logbooks and Chain of Custody forms	Marked up copy of document	John Carson, Project Manager, URS	Within 24 hours of finding deficiency	Review of corrected documentation	TBD, Sampling Team Leader, URS	24 hours after notification

QAPP Worksheet #33 (UFP QAPP Manual Section 4.2) -- QA Management Reports Table

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)
Army Draft Project Report	One report after all field data collected.	March 2014	John Carson, Project Manager, URS	Steve Smith, Program Manager, USACE Fort Worth District Steve Carpenter, COR, USACE Albuquerque District Eric Kirwan, Project Manager, USACE Fort Worth District Mark Patterson, BRAC Environmental Coordinator, BEC Micki Gonzalles, Adminstrative Records Manager, FWDA Neal Navaro, Toxicologist, USACE Mike Kipp, USAEC Bill O’Donnell, BRACD

QAPP Worksheet #34 (UFP-QAPP Manual Section 5.2.1) -- Verification (Step I) Process Table

Verification Input	Description	Internal / External	Responsible for Verification (name, organization)
Chain of Custody and Shipping Forms	COC forms and shipping documentation will be reviewed internally upon their completion and verified against the packed sample coolers they represent. The shipper’s signature on the COC should be initialed by the reviewer, a copy of the COC retained in the project file, and the original and remaining copies taped inside the cooler for shipment.	I	TBD, Sampling Team Leader, URS
Laboratory Sample Receipt Reports	Laboratory report listing all samples received condition of receipt and analyses requested. Signed copy of COC included.	I	Jeff Aust, URS
Data Quality Control Reports	Upon report completion, a copy of the report will be placed in the project file.	I	John Carson, URS
Field Logbooks	Field logbooks will be reviewed internally and placed in the project file.	I	John Carson, URS
Laboratory Data	All laboratory data packages will be verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal. All received data packages will be verified externally according to the data validation procedures specified in Worksheet # 35	I E	Frances Lediaev, APPL Jeff Aust, URS

QAPP Worksheet #35 (UFP-QAPP Manual Section 5.2.2) -- Validation (Steps IIa and IIb) Process Table

Step IIa / IIb	Validation Input	Description	Responsible for Validation (name, organization)
IIb	Field Analytical Measurements	All field analytical parameters will be reviewed against the QAPP requirements for completeness and accuracy based on the field calibration records	TBD, URS
IIa	SOPs	Ensure that all sampling and analytical SOPs were followed	Jeff Aust, URS
IIb	Documentation of QC Sample Results	Establish that all required QC samples were analyzed and met evaluation criteria.	Jeff Aust, URS
IIb	Project Quantitation Limits	Verify that sample results met the quantitation limits specified in the QAPP	Jeff Aust, URS

QAPP Worksheet #36 (UFP-QAPP Manual Section 5.2.2) -- Validation (Steps IIa and IIb) Summary Table

Step IIa / IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIa	Soil	VOCs, SVOCs, Explosives, PCBs, Dioxins/Furans, Metals, Perchlorate, Cyanide and Nitrate	Low	DoD QSM Version 4.2	Jeff Aust, Project Chemist, URS
IIa	Soil	VOCs, SVOCs, Explosives, PCBs, Dioxins/Furans, Metals, Perchlorate, Cyanide and Nitrate	Low	QAPP Worksheets 12, 15 and 24. QAPP Tables 12-1 through 12-18	Jeff Aust, Project Chemist, URS

QAPP Worksheet #37 (UFP-QAPP Manual Section 5.2.3) -- Usability Assessment

The Data Usability Assessment will be performed by URS personnel. John Carson, URS Project Manager will be responsible for information in the Usability Assessment. He will also be responsible for assigning task work to the individual task members who will be supporting the Data Usability Assessment. Note that the Data Usability Assessment will be conducted on verified/validated data. After the Data Usability Assessment has been performed, data deemed appropriate for decision-making purposes will be used to determine the soil contamination at FWDA. The results of the Data Usability Assessment will be presented in the Removal report. The following items will be assessed and conclusions drawn based on their results.

Precision – Results of field duplicates will be presented separately in tabular format for each sample pair. For each field duplicate set, the results will be assessed as stated in Tables 12-11 through 12-18. MS/MSD RPDs are calculated by the laboratory and those with RPDs outside the criteria established in Tables 12-1 through 12-9 will be listed in tabular form in the data verification report. A discussion will follow summarizing the results of the laboratory precision. Any conclusions about the precision of the analyses will be drawn and any limitations on the use of the data will be described.

Accuracy/Bias Contamination – Results for all laboratory method blanks will be evaluated and analytes detected in these blanks will be listed in tabular form in the data verification report. Laboratory data will be qualified based on the criteria listed in Tables 12-11 through 12-18. A discussion will follow summarizing the results of the laboratory accuracy/bias. Any conclusions about the accuracy/bias of the analyses based on contamination will be drawn and any limitations on the use of the data will be described.

Overall Accuracy/Bias – Results for all LCS, surrogate and MS/MSD recoveries that are outside evaluation criteria will be presented in tabular format in the data verification reports. The results will be checked versus those listed in Tables 12-1 through 12-10. A discussion will follow summarizing the overall accuracy/bias. Any conclusions about the accuracy/bias of the analyses based on contamination will be drawn and any limitations on the use of the data will be described.

Sensitivity – Results for the sensitivity check standard will be provided by the laboratory for all analyses. The results for each analyte will be checked against the performance criteria presented on Worksheet #12 and cross checked against the quantitation limits presented on Worksheet #15. Results for analytes that exceed criteria will be identified on the tables. A discussion will follow summarizing the results of the laboratory sensitivity. Any conclusions about the sensitivity of the analyses will be drawn and any limitations on the use of the data will be described.

QAPP Worksheet #37 (UFP-QAPP Manual Section 5.2.3) -- Usability Assessment

Representativeness – A measure of representativeness will be provided by assessing if the proper analytical procedures, appropriate methods, laboratory SOPs, holding times and field duplicate procedures were followed. Any conclusions about the representativeness of the analyses will be drawn and any limitations on the use of the data will be described. Comparability – Comparability of results from other investigations at Fort Wingate is not applicable. Results will be obtained from stockpiles and after excavations. No comparable data exists for a comparability analysis. Completeness – A completeness check will be performed on all data generated by the laboratory. Completeness criteria are presented on Worksheet #12. Completeness will be calculated as the number of data points for each analyte that is deemed useable (not rejected) divided by the total number of data points for each analyte. Also DoD-related analytes with DLs above screening criteria will be considered not useable. Professional judgment will be used to exclude analytes that are non-DoD related that have DLs above screening criteria from the Completeness calculation. A discussion will follow summarizing the results of the calculation of data completeness. Any conclusions about the completeness of the data will be drawn and any limitations on the use of the data will be described. Graphics – Figures will be constructed showing the contamination levels at each sampling location. Reconciliation – Each of the measurement performance criteria listed in Worksheet #12 will be examined to determine if the objective was met. Each analysis will be evaluated separately in terms of the major impacts observed from the data verification/validation, DQI and measurement performance criteria assessments. Based on the results of these assessments, the quality of the data will be determined. Usability of the data will be based on the quality assessment. After establishing the usability of the data, it will be determined if the DQO was met and if project action limits were met. The final report will include a summary of all points that comprised the reconciliation of each objective. Any conclusions or limitations on the usability of any of the data will be described.

1

38.1 REFERENCES

Intergovernmental Data Quality Task Force. 2005. Uniform Federal Policy for Quality Assurance Project Plans. March.

New Mexico Environment Department. 2009. Hazardous Waste Bureau and Groundwater Quality Bureau Voluntary Remediation Program, Technical Background Document for Development of Soil Screening Levels, Revision 5. December

Program Management Company. 1999. Fort Wingate Depot Activity, Final Open Burning/Open Detonation Area RCRA Interim Status Closure Plan Phase IA-Characterization and Assessment of Site Conditions for the Soils/Solid Matrix. November.

United States Department of Defense, Environmental Data Quality Workgroup. 2010. Quality Systems Manual (QSM) for Environmental Laboratories, Version 4.2. October.

United States Environmental Protection Agency (USEPA). 2012. Regional Screening Levels. November.

ATTACHMENT 1
LABORATORY STANDARD OPERATING PROCEDURES

This appendix contains information for which the distribution is limited to protect sensitive information or the privacy of private land owners. If you need to access this appendix please contact:

Administrative Records Manager
Fort Wingate Depot Activity
Building 1
Historic Highway 66
(7 miles East of Gallup)
Ft. Wingate, NM 87316

Phone: (505) 905-6108

ATTACHMENT 2
LABORATORY CERTIFICATIONS

CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board/ACLASS

500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

APPL, Inc.
908 N. Temperance Avenue
Clovis, CA 93611

has been assessed by ACLASS
and meets the requirements of

ISO/IEC 17025:2005 and DoD-ELAP

while demonstrating technical competence in the field(s) of

TESTING

Refer to the accompanying Scope(s) of Accreditation for information regarding the types of tests to which this accreditation applies.

ADE-1410

Certificate Number

ACLASS Approval

Certificate Valid: 10/23/2011-10/23/2013
Version No. 003 Issued: 12/08/2011

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated January 2009*).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005 & DoD-ELAP

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

TESTING

Valid to: October 23, 2013 Certificate Number: ADE- 1410

I. Environmental

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

MATRIX	SPECIFIC TEST or GROUP OF ANALYTES**	SPECIFICATION OR STANDARD METHOD (all EPA unless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Solid / Solid Waste	Soxhlet Extraction	3540C	Soxhlet Extractors
Water / Wastewater	Liquid-Liquid Extraction	3520C	Liquid-Liquid Extractor
Water / Wastewater / Solid / Solid Waste	Silica gel cleanup	3630C	
Solid / Solid Waste	Incremental sampling	8330B, Appendix A	Puck mill grinder
Water / Wastewater / Solid / Solid Waste	Sulfur cleanup	3660B	
Water / Wastewater / Solid / Solid Waste	Sulfuric acid – permanganate cleanup	3665A	
Water / Wastewater / Solid / Solid Waste	Gel permeation cleanup	3640A	
Solid / Solid Waste	TCLP extraction	1311	Rotary Tumbler
Solid / Solid Waste	SPLP extraction	1312	Rotary Tumbler
Solid / Solid Waste	Waste Extraction Test (WET)	CCR Chapter 11, Article 5, Appendix II	Rotary Tumbler
Water / Wastewater	Total Dissolved Solids	160.1 / 2540C	Gravimetric
Water / Wastewater	Total Suspended Solids	2540D	Gravimetric
Water / Wastewater	Anion analysis	300.0 / 9056 / 9056A	Dionex Ion Chromatography
Solid / Solid Waste	Anion analysis	9056 / 9056A	Dionex Ion Chromatography

MATRIX	SPECIFIC TEST or GROUP OF ANALYTES**	SPECIFICATION OR STANDARD METHOD (all EPAunless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Water / Wastewater / Solid / Solid Waste	Perchlorate analysis	314.0	Dionex Ion Chromatography
Water / Wastewater / Solid / Solid Waste	Ammonia	350.1	Lachat Flow Injection Analysis
Water / Wastewater / Solid / Solid Waste	TKN	351.2	Lachat Flow Injection Analysis
Water / Wastewater / Solid / Solid Waste	Nitrate / Nitrite	353.2	Lachat Flow Injection Analysis
Water / Wastewater / Solid / Solid Waste	Sulfide	4200S2F	Titrimetric
Drinking Water / Water / Wastewater / Solid / Solid Waste	PCB Congeners	1668A	High Resolution GC/MS
Water / Wastewater / Solid / Solid Waste	Perchlorate	6850	HPLC/Electrospray Ionization/MS
Water / Wastewater	Oil & Grease	1664A	Gravimetric
Water / Wastewater	Oil & Grease	5520B	Gravimetric
Water / Wastewater	TRPH	5520BF	Gravimetric
Water / Wastewater / Solid / Solid Waste	Total Metals	6010B / 6010C	ICP
Water / Wastewater / Solid / Solid Waste	Total Metals	6020 / 6020A	ICP/MS
Water / Wastewater / Solid / Solid Waste	Hexavalent Chromium	7196A	UV/Vis
Solid / Solid Waste	Alkaline digestion of Hexavalent Chromium	3060A	

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MATRIX	SPECIFIC TEST or GROUP OF ANALYTES**	SPECIFICATION OR STANDARD METHOD (all EPAunless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Water / Wastewater	Hexavalent Chromium	218.6 / 7199	Dionex Ion Chromatography
Water / Wastewater / Solid / Solid Waste	Total Cyanide Distillation	9010C	Midi-Distillation unit
Water / Wastewater / Solid / Solid Waste	Total Cyanide Analysis	9014	UV/Vis
Water / Wastewater	Corrosivity - pH	9040C	Ion Selective Electrode
Solid / Solid Waste	Corrosivity - pH	9045D	Ion Selective Electrode
Water / Wastewater / Solid / Solid Waste	Chlorinated & Brominated Hydrocarbons	8011	GC/ECD
Water / Wastewater / Solid / Solid Waste	DRO/GRO	8015B/C/D	GC/FID
Water / Solid	OP Pesticides	8141A / 8141B	GC/ECD
Water / Wastewater / Solid / Solid Waste	OCL Pesticides	8081A / 8081B	GC/ECD
Water / Waste Water	PCB	608	GC/ECD
Water / Wastewater / Solid / Solid Waste	PCB	8082 / 8082A	GC/ECD
Water / Wastewater / Solid / Solid Waste	Herbicides	8151A	GC/ECD
Water / Wastewater / Solid / Solid Waste	VOA	8260B / 8260C	GC/MS
Water / Wastewater / Solid / Solid Waste	PAH	8270C SIM / 8270D SIM	GC/MS
Water / Wastewater / Solid / Solid Waste	Semi-VOA	8270C / 8270D	GC/MS

MATRIX	SPECIFIC TEST or GROUP OF ANALYTES**	SPECIFICATION OR STANDARD METHOD (all EPAunless specified)	* KEY EQUIPMENT OR TECHNOLOGY USED
Water / Wastewater / Solid / Solid Waste	Dioxins	8290	HRGC/HRMS
Water / Wastewater / Solid / Solid Waste	Nitroaromatics & Nitramines & Nitroguanadine PGDN Picric Acid	8330A / 8330B / 8321A	HPLC
Water / Wastewater / Solid / Solid Waste	Carbamates	8321A	HPLC
Solid / Solid Waste	Ignitability	1030	
Solid / Solid Waste	TOC	Walkley-Black	Titration
Water	DOC / TOC	5310B / 9060A	TOC Analyzer
Water	Ethane / Ethene / Methane	RSK175	GC / FID
Water	Alkalinity	2320B	Titrimetric
Water	MBAS	5540C	UV/Vis
Water	Electrical Conductance	2510B	EC meter

Notes:

1. ** = As Applicable*
2. *** = Refer to Accredited Analytes Listing for specific analytes in which the laboratory is accredited*
3. *This scope is part of and must be included with the Certificate of Accreditation No. ADE- 1410*

Vice President

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Accredited Analytes/Methods

WP Proficiency Testing Summary

Lab Name :	APPL, Inc.				
City/State :	Clovis, CA				

PartName	PartNumber	NELACCode	AnalyteName	EPA Method	PT results
WP Minerals #1	55144	1955	Total Dissolved Solids (TDS)	160.1	Approved
Oil & Grease	4120	1860	Oil & Grease	1664A	Approved
Oil & Grease - n-Hexadecane & Stearic	55084	1860	Oil & Grease	1664A	Approved
PCB Congeners in Water	PEO-403	9070	2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	1668A	Approved
PCB Congeners in Water	PEO-403	9025	2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	1668A	Approved
PCB Congeners in Water	PEO-403	9040	2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	1668A	Approved
PCB Congeners in Water	PEO-403	8980	2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	1668A	Approved
PCB Congeners in Water	PEO-403	8955	2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	1668A	Approved
PCB Congeners in Water	PEO-403	9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	1668A	Approved
PCB Congeners in Water	PEO-403	9050	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	1668A	Approved
PCB Congeners in Water	PEO-403	9045	2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	1668A	Approved
PCB Congeners in Water	PEO-403	8985	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1668A	Approved
PCB Congeners in Water	PEO-403	9055	2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	1668A	Approved
PCB Congeners in Water	PEO-403	9005	2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	1668A	Approved
PCB Congeners in Water	PEO-403	8995	2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	1668A	Approved
PCB Congeners in Water	PEO-403	9000	2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	1668A	Approved
PCB Congeners in Water	PEO-403	8936	2,4,4'-Trichlorobiphenyl (PCB 28)	1668A	Approved
PCB Congeners in Water	PEO-403	9060	3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	1668A	Approved
PCB Congeners in Water	PEO-403	9015	3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	1668A	Approved
PCB Congeners in Water	PEO-403	8965	3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	1668A	Approved
PCB Congeners in Water	PEO-403	8970	3,4,4',5-Tetrachlorobiphenyl (PCB 81)	1668A	Approved
PCB Congeners in Water	PEO-403	9025	PCB (129)+(138)+(163)	1668A	Approved
PCB Congeners in Water	PEO-403	9040	PCB (153)+(168)	1668A	Approved
PCB Congeners in Water	PEO-403	9046	PCB (156)+(157)	1668A	Approved
PCB Congeners in Water	PEO-403	9070	PCB (180)+(193)	1668A	Approved
PCB Congeners in Water	PEO-403	8936	PCB (20)+(28)	1668A	Approved
PCB Congeners in Water	PEO-403	8980	PCB (90)+(101)+(113)	1668A	Approved
PCB Congeners in Water	PEO-403	8870	PCBs, total	1668A	Approved
WP Hexavalent Chromium	55096	1045	Chromium VI	218.6	Approved
SWA Anions	55131	1540	Bromide	300.0	Approved
WP Minerals #1	55144	1575	Chloride	300.0	Approved
WP & DMRQA Nutrients	55035	1810	Nitrate as N	300.0	Approved
WP & DMRQA Nutrients	55035	1870	Orthophosphate as P	300.0	Approved
WP Nitrate & Nitrite	55130	1810	Nitrate as N	300.0	Approved
WP Nitrate & Nitrite	55130	1820	Nitrite + Nitrate as N	300.0	Approved
WP Nitrate & Nitrite	55130	1840	Nitrite as N	300.0	Approved
WP Minerals #2	55145	1730	Fluoride	300.0	Approved
WP Minerals #2	55145	2000	Sulfate	300.0	Approved
WP Perchlorate	55116	1895	Perchlorate	314.0	Approved
WP & DMRQA Nutrients	55035	1515	Ammonia as N	350.1	Approved
WP & DMRQA Nutrients #2	55064	1795	Total Kjeldahl Nitrogen	351.2	Approved
WP & DMRQA Nutrients	55035	1810	Nitrate as N	353.2	Approved
WP Nitrate & Nitrite	55130	1810	Nitrate as N	353.2	Approved
WP Nitrate & Nitrite	55130	1820	Nitrite + Nitrate as N	353.2	Approved
WP Nitrate & Nitrite	55130	1840	Nitrite as N	353.2	Approved
WP & DMRQA Trace Elements	55024	1000	Aluminum	6010B	Approved
WP Trace Elements	55025	1005	Antimony	6010B	Approved
WP & DMRQA Trace Elements	55024	1010	Arsenic	6010B	Approved
WP Trace Elements	55025	1015	Barium	6010B	Approved
WP Trace Elements	55025	1015	Barium	6010B	Approved
WP Trace Elements	55025	1020	Beryllium	6010B	Approved
WP Trace Elements	55025	1020	Beryllium	6010B	Approved
WP Trace Elements	55025	1025	Boron	6010B	Approved
WP & DMRQA Trace Elements	55024	1030	Cadmium	6010B	Approved
WP Minerals #1	55144	1035	Calcium	6010B	Approved
WP & DMRQA Trace Elements	55024	1040	Chromium	6010B	Approved
WP & DMRQA Trace Elements	55024	1050	Cobalt	6010B	Approved
WP & DMRQA Trace Elements	55024	1055	Copper	6010B	Approved
WP & DMRQA Trace Elements	55024	1070	Iron	6010B	Approved
WP & DMRQA Trace Elements	55024	1075	Lead	6010B	Approved
WP Minerals #1	55144	1085	Magnesium	6010B	Approved
WP & DMRQA Trace Elements	55024	1090	Manganese	6010B	Approved
WP Trace Elements	55025	1100	Molybdenum	6010B	Approved
WP & DMRQA Trace Elements	55024	1105	Nickel	6010B	Approved
WP Minerals #2	55145	1125	Potassium	6010B	Approved
WP & DMRQA Trace Elements	55024	1140	Selenium	6010B	Approved
WP Trace Elements	55025	1150	Silver	6010B	Approved
WP Minerals #2	55145	1155	Sodium	6010B	Approved
WP Trace Elements	55025	1160	Strontium	6010B	Approved
WP Trace Elements	55025	1165	Thallium	6010B	Approved
WP Tin	55095	1175	Tin	6010B	Approved
WP Tin	55095	1175	Tin	6010B	Approved
WP Trace Elements	55025	1180	Titanium	6010B	Approved
WP & DMRQA Trace Elements	55024	1185	Vanadium	6010B	Approved

WP & DMRQA Trace Elements	55024	1190	Zinc	6010B	Approved
NPTA			Zirconium	6010B	Approved
WP & DMRQA Trace Elements	55024	1000	Aluminum	6010C	Approved
WP Trace Elements	55025	1005	Antimony	6010C	Approved
WP & DMRQA Trace Elements	55024	1010	Arsenic	6010C	Approved
WP Trace Elements	55025	1015	Barium	6010C	Approved
WP Trace Elements	55025	1015	Barium	6010C	Approved
WP Trace Elements	55025	1020	Beryllium	6010C	Approved
WP Trace Elements	55025	1020	Beryllium	6010C	Approved
WP Trace Elements	55025	1025	Boron	6010C	Approved
WP & DMRQA Trace Elements	55024	1030	Cadmium	6010C	Approved
	55144	1035	Calcium	6010C	Approved
WP & DMRQA Trace Elements	55024	1040	Chromium	6010C	Approved
WP & DMRQA Trace Elements	55024	1050	Cobalt	6010C	Approved
WP & DMRQA Trace Elements	55024	1055	Copper	6010C	Approved
WP & DMRQA Trace Elements	55024	1070	Iron	6010C	Approved
WP & DMRQA Trace Elements	55024	1075	Lead	6010C	Approved
WP & DMRQA Trace Elements	55024	1090	Manganese	6010C	Approved
WP Trace Elements	55025	1100	Molybdenum	6010C	Approved
WP & DMRQA Trace Elements	55024	1105	Nickel	6010C	Approved
	55145	1125	Potassium	6010C	Approved
WP & DMRQA Trace Elements	55024	1140	Selenium	6010C	Approved
WP Trace Elements	55025	1150	Silver	6010C	Approved
WP Trace Elements	55025	1160	Strontium	6010C	Approved
WP Trace Elements	55025	1165	Thallium	6010C	Approved
WP Trace Elements	55095	1175	Tin	6010C	Approved
WP Trace Elements	55025	1180	Titanium	6010C	Approved
WP & DMRQA Trace Elements	55024	1185	Vanadium	6010C	Approved
WP & DMRQA Trace Elements	55024	1190	Zinc	6010C	Approved
NPTA			Zirconium	6010C	Approved
WP & DMRQA Trace Elements	55024	1000	Aluminum	6020	Approved
WP Trace Elements	55025	1005	Antimony	6020	Approved
WP & DMRQA Trace Elements	55024	1010	Arsenic	6020	Approved
WP Trace Elements	55025	1015	Barium	6020	Approved
WP Trace Elements	55025	1020	Beryllium	6020	Approved
WP Trace Elements	55025	1025	Boron	6020	Approved
WP & DMRQA Trace Elements	55024	1030	Cadmium	6020	Approved
	55144	1035	Calcium	6020	Approved
WP & DMRQA Trace Elements	55024	1040	Chromium	6020	Approved
WP & DMRQA Trace Elements	55024	1050	Cobalt	6020	Approved
WP & DMRQA Trace Elements	55024	1055	Copper	6020	Approved
WP & DMRQA Trace Elements	55024	1070	Iron	6020	Approved
WP & DMRQA Trace Elements	55024	1075	Lead	6020	Approved
WP & DMRQA Trace Elements	55024	1090	Manganese	6020	Approved
WP Trace Elements	55025	1100	Molybdenum	6020	Approved
WP & DMRQA Trace Elements	55024	1105	Nickel	6020	Approved
NPTA			Total Phosphorous	6020	Approved
	55145	1125	Potassium	6020	Approved
WP & DMRQA Trace Elements	55024	1140	Selenium	6020	Approved
WP Trace Elements	55025	1150	Silver	6020	Approved
WP Trace Elements	55025	1160	Strontium	6020	Approved
WP Trace Elements	55025	1165	Thallium	6020	Approved
WP Tin	55095	1175	Tin	6020	Approved
WP Trace Elements	55025	1180	Titanium	6020	Approved
WP & DMRQA Trace Elements	55024	1185	Vanadium	6020	Approved
WP & DMRQA Trace Elements	55024	1190	Zinc	6020	Approved
NPTA			Zirconium	6020	Approved
WP & DMRQA Trace Elements	55024	1000	Aluminum	6020A	Approved
WP Trace Elements	55025	1005	Antimony	6020A	Approved
WP & DMRQA Trace Elements	55024	1010	Arsenic	6020A	Approved
WP Trace Elements	55025	1015	Barium	6020A	Approved
WP Trace Elements	55025	1020	Beryllium	6020A	Approved
WP Trace Elements	55025	1025	Boron	6020A	Approved
WP & DMRQA Trace Elements	55024	1030	Cadmium	6020A	Approved
	55144	1035	Calcium	6020A	Approved
WP & DMRQA Trace Elements	55024	1040	Chromium	6020A	Approved
WP & DMRQA Trace Elements	55024	1050	Cobalt	6020A	Approved
WP & DMRQA Trace Elements	55024	1055	Copper	6020A	Approved
WP & DMRQA Trace Elements	55024	1070	Iron	6020A	Approved
WP & DMRQA Trace Elements	55024	1075	Lead	6020A	Approved
WP & DMRQA Trace Elements	55024	1090	Manganese	6020A	Approved
WP Trace Elements	55025	1100	Molybdenum	6020A	Approved
WP & DMRQA Trace Elements	55024	1105	Nickel	6020A	Approved
NPTA			Total Phosphorous	6020A	Approved
	55145	1125	Potassium	6020A	Approved
WP & DMRQA Trace Elements	55024	1140	Selenium	6020A	Approved
WP Trace Elements	55025	1150	Silver	6020A	Approved
WP Trace Elements	55025	1160	Strontium	6020A	Approved
WP Trace Elements	55025	1165	Thallium	6020A	Approved
	55095	1175	Tin	6020A	Approved
WP Trace Elements	55025	1180	Titanium	6020A	Approved
WP & DMRQA Trace Elements	55024	1185	Vanadium	6020A	Approved

WP & DMRQA Trace Elements	55024	1190	Zinc	6020A	Approved
NPTA			Zirconium	6020A	Approved
WP Perchlorate	55116	1895	Perchlorate	6850	Approved
WP Hexavalent Chromium	55096	1045	Chromium VI	7196A	Approved
WP Hexavalent Chromium	55096	1045	Chromium VI	7199	Approved
WP & DMRQA Trace Elements	55024	1095	Mercury	7470A	Approved
Volatiles	PEO-120-3B	5180	1,2,3-Trichloropropane	8011	Approved
Volatiles	PEO-120-3B	4570	1,2-Dibromo-3-chloropropane (DBCP)	8011	Approved
Volatiles	PEO-120-3B	4585	1,2-Dibromomethane (EDB, Ethylene dibromide)	8011	Approved
Volatiles	PEO-010	9408	Gasoline Range Organics, C6-C10	8015B	Approved
			Motor Oil	8015B	Approved
Petroleum Hydrocarbons in Water	PEO-010	99990	Total Purgeable Hydrocarbons	8015B	Approved
Petroleum Hydrocarbons in Water	PEO-011	9369	Diesel Range Organics (C10-C28)	8015B	Approved
Volatiles	PEO-010	9408	Gasoline Range Organics, C6-C10	8015C	Approved
			Motor Oil	8015C	Approved
Petroleum Hydrocarbons in Water	PEO-010	99990	Total Purgeable Hydrocarbons	8015C	Approved
Petroleum Hydrocarbons in Water	PEO-011	9369	Diesel Range Organics (C10-C28)	8015C	Approved
Volatiles	PEO-010	9408	Gasoline Range Organics, C6-C10	8015D	Approved
			Motor Oil	8015D	Approved
Petroleum Hydrocarbons in Water	PEO-010	99990	Total Purgeable Hydrocarbons	8015D	Approved
Petroleum Hydrocarbons in Water	PEO-011	9369	Diesel Range Organics (C10-C28)	8015D	Approved
WP Pesticide Amp 2	38046	7250	Chlordane	8081A	Approved
WP Organochlorine Pesticides	38122	7810	4,4';-Methoxychlor	8081A	Approved
WP Organochlorine Pesticides	38122	7355	4,4'-DDD	8081A	Approved
WP Organochlorine Pesticides	38122	7360	4,4'-DDE	8081A	Approved
WP Organochlorine Pesticides	38122	7365	4,4'-DDT	8081A	Approved
WP Organochlorine Pesticides	38122	7110	a-BHC	8081A	Approved
WP Organochlorine Pesticides	38122	7240	a-Chlordane	8081A	Approved
WP Organochlorine Pesticides	38122	7025	Aldrin	8081A	Approved
WP Organochlorine Pesticides	38122	7115	b-BHC	8081A	Approved
WP Organochlorine Pesticides	38122	7105	d-BHC	8081A	Approved
WP Organochlorine Pesticides	38122	7470	Dieldrin	8081A	Approved
WP Organochlorine Pesticides	38122	7510	Endosulfan I	8081A	Approved
WP Organochlorine Pesticides	38122	7515	Endosulfan II	8081A	Approved
WP Organochlorine Pesticides	38122	7520	Endosulfan sulfate	8081A	Approved
WP Organochlorine Pesticides	38122	7540	Endrin	8081A	Approved
WP Organochlorine Pesticides	38122	7530	Endrin aldehyde	8081A	Approved
WP Organochlorine Pesticides	38122	7535	Endrin ketone	8081A	Approved
WP Organochlorine Pesticides	38122	7120	g-BHC (Lindane)	8081A	Approved
WP Organochlorine Pesticides	38122	7245	g-Chlordane	8081A	Approved
WP Organochlorine Pesticides	38122	7685	Heptachlor	8081A	Approved
WP Organochlorine Pesticides	38122	7690	Heptachlor epoxide	8081A	Approved
			Hexachlorobenzene	8081A	Approved
WP Toxaphene	38125	8250	Toxaphene	8081A	Approved
WP Pesticide Amp 2	38046	7250	Chlordane	8081B	Approved
WP Organochlorine Pesticides	38122	7810	4,4';-Methoxychlor	8081B	Approved
WP Organochlorine Pesticides	38122	7355	4,4'-DDD	8081B	Approved
WP Organochlorine Pesticides	38122	7360	4,4'-DDE	8081B	Approved
WP Organochlorine Pesticides	38122	7365	4,4'-DDT	8081B	Approved
WP Organochlorine Pesticides	38122	7110	a-BHC	8081B	Approved
WP Organochlorine Pesticides	38122	7240	a-Chlordane	8081B	Approved
WP Organochlorine Pesticides	38122	7025	Aldrin	8081B	Approved
WP Organochlorine Pesticides	38122	7115	b-BHC	8081B	Approved
WP Organochlorine Pesticides	38122	7105	d-BHC	8081B	Approved
WP Organochlorine Pesticides	38122	7470	Dieldrin	8081B	Approved
WP Organochlorine Pesticides	38122	7510	Endosulfan I	8081B	Approved
WP Organochlorine Pesticides	38122	7515	Endosulfan II	8081B	Approved
WP Organochlorine Pesticides	38122	7520	Endosulfan sulfate	8081B	Approved
WP Organochlorine Pesticides	38122	7540	Endrin	8081B	Approved
WP Organochlorine Pesticides	38122	7530	Endrin aldehyde	8081B	Approved
WP Organochlorine Pesticides	38122	7535	Endrin ketone	8081B	Approved
WP Organochlorine Pesticides	38122	7120	g-BHC (Lindane)	8081B	Approved
WP Organochlorine Pesticides	38122	7245	g-Chlordane	8081B	Approved
WP Organochlorine Pesticides	38122	7685	Heptachlor	8081B	Approved
WP Organochlorine Pesticides	38122	7690	Heptachlor epoxide	8081B	Approved
			Hexachlorobenzene	8081B	Approved
WP Toxaphene	38125	8250	Toxaphene	8081B	Approved
WP PCBs in Water #2	38091	8880	Aroclor 1016	8082	Approved
WP PCBs in Water #2	38091	8885	Aroclor 1221	8082	Approved
WP PCBs in Water #2	38091	8890	Aroclor 1232	8082	Approved
WP PCBs in Water #2	38091	8895	Aroclor 1242	8082	Approved
WP PCBs in Water #2	38091	8900	Aroclor 1248	8082	Approved
WP PCBs in Water #2	38091	8905	Aroclor 1254	8082	Approved
WP PCBs in Water #2	38091	8910	Aroclor 1260	8082	Approved
WP PCBs in Transformer Oil #2	38092	8880	PCB in Oil 1016 or 1242	8082	Approved
WP PCBs in Transformer Oil #2	38092	100	PCB in Oil 1254	8082	Approved
WP PCBs in Transformer Oil #2	38092	8910	PCB in Oil 1260	8082	Approved
WP PCBs in Water #1	38094	8880	Aroclor 1016	8082	Approved
WP PCBs in Water #1	38094	8885	Aroclor 1221	8082	Approved
WP PCBs in Water #1	38094	8890	Aroclor 1232	8082	Approved
WP PCBs in Water #1	38094	8895	Aroclor 1242	8082	Approved
WP PCBs in Water #1	38094	8900	Aroclor 1248	8082	Approved

WP PCBs in Water #1	38094	8905	Aroclor 1254	8082	Approved
WP PCBs in Water #1	38094	8910	Aroclor 1260	8082	Approved
WP PCBs in Water	38095	8880	PCB in Oil 1016 or 1242	8082	Approved
WP PCBs in Water	38095	100	PCB in Oil 1254	8082	Approved
WP PCBs in Water	38095	101	PCB in Oil 1260	8082	Approved
WS PCBs in Water	38133	8880	Aroclor 1016	8082	Approved
WS PCBs in Water	38133	8885	Aroclor 1221	8082	Approved
WS PCBs in Water	38133	8890	Aroclor 1232	8082	Approved
WS PCBs in Water	38133	8895	Aroclor 1242	8082	Approved
WS PCBs in Water	38133	8900	Aroclor 1248	8082	Approved
WS PCBs in Water	38133	8905	Aroclor 1254	8082	Approved
WS PCBs in Water	38133	8910	Aroclor 1260	8082	Approved
PCBs in Water	PEO-020	8912	Aroclor 1016/1242	8082	Approved
PCBs in Water	PEO-020	8912	Aroclor 1016/1242	8082	Approved
PCBs in Water	PEO-020	8880	Aroclor-1016 (PCB-1016)	8082	Approved
PCBs in Water	PEO-020	8880	Aroclor-1016 (PCB-1016)	8082	Approved
PCBs in Water	PEO-020	8885	Aroclor-1221 (PCB-1221)	8082	Approved
PCBs in Water	PEO-020	8885	Aroclor-1221 (PCB-1221)	8082	Approved
PCBs in Water	PEO-020	8890	Aroclor-1232 (PCB-1232)	8082	Approved
PCBs in Water	PEO-020	8890	Aroclor-1232 (PCB-1232)	8082	Approved
PCBs in Water	PEO-020	8895	Aroclor-1242 (PCB-1242)	8082	Approved
PCBs in Water	PEO-020	8895	Aroclor-1242 (PCB-1242)	8082	Approved
PCBs in Water	PEO-020	8900	Aroclor-1248 (PCB-1248)	8082	Approved
PCBs in Water	PEO-020	8900	Aroclor-1248 (PCB-1248)	8082	Approved
PCBs in Water	PEO-020	8905	Aroclor-1254 (PCB-1254)	8082	Approved
PCBs in Water	PEO-020	8905	Aroclor-1254 (PCB-1254)	8082	Approved
PCBs in Water	PEO-020	8910	Aroclor-1260 (PCB-1260)	8082	Approved
PCBs in Water	PEO-020	8910	Aroclor-1260 (PCB-1260)	8082	Approved
WP PCBs in Water #2	38091	8880	Aroclor 1016	8082A	Approved
WP PCBs in Water #2	38091	8885	Aroclor 1221	8082A	Approved
WP PCBs in Water #2	38091	8890	Aroclor 1232	8082A	Approved
WP PCBs in Water #2	38091	8895	Aroclor 1242	8082A	Approved
WP PCBs in Water #2	38091	8900	Aroclor 1248	8082A	Approved
WP PCBs in Water #2	38091	8905	Aroclor 1254	8082A	Approved
WP PCBs in Water #2	38091	8910	Aroclor 1260	8082A	Approved
WP PCBs in Transformer Oil #2	38092	8880	PCB in Oil 1016 or 1242	8082A	Approved
WP PCBs in Transformer Oil #2	38092	100	PCB in Oil 1254	8082A	Approved
WP PCBs in Transformer Oil #2	38092	8910	PCB in Oil 1260	8082A	Approved
WP PCBs in Water #1	38094	8880	Aroclor 1016	8082A	Approved
WP PCBs in Water #1	38094	8885	Aroclor 1221	8082A	Approved
WP PCBs in Water #1	38094	8890	Aroclor 1232	8082A	Approved
WP PCBs in Water #1	38094	8895	Aroclor 1242	8082A	Approved
WP PCBs in Water #1	38094	8900	Aroclor 1248	8082A	Approved
WP PCBs in Water #1	38094	8905	Aroclor 1254	8082A	Approved
WP PCBs in Water #1	38094	8910	Aroclor 1260	8082A	Approved
WP PCBs in Water	38095	8880	PCB in Oil 1016 or 1242	8082A	Approved
WP PCBs in Water	38095	100	PCB in Oil 1254	8082A	Approved
WP PCBs in Water	38095	101	PCB in Oil 1260	8082A	Approved
WS PCBs in Water	38133	8880	Aroclor 1016	8082A	Approved
WS PCBs in Water	38133	8885	Aroclor 1221	8082A	Approved
WS PCBs in Water	38133	8890	Aroclor 1232	8082A	Approved
WS PCBs in Water	38133	8895	Aroclor 1242	8082A	Approved
WS PCBs in Water	38133	8900	Aroclor 1248	8082A	Approved
WS PCBs in Water	38133	8905	Aroclor 1254	8082A	Approved
WS PCBs in Water	38133	8910	Aroclor 1260	8082A	Approved
PCBs in Water	PEO-020	8912	Aroclor 1016/1242	8082A	Approved
PCBs in Water	PEO-020	8912	Aroclor 1016/1242	8082A	Approved
PCBs in Water	PEO-020	8880	Aroclor-1016 (PCB-1016)	8082A	Approved
PCBs in Water	PEO-020	8880	Aroclor-1016 (PCB-1016)	8082A	Approved
PCBs in Water	PEO-020	8885	Aroclor-1221 (PCB-1221)	8082A	Approved
PCBs in Water	PEO-020	8885	Aroclor-1221 (PCB-1221)	8082A	Approved
PCBs in Water	PEO-020	8890	Aroclor-1232 (PCB-1232)	8082A	Approved
PCBs in Water	PEO-020	8890	Aroclor-1232 (PCB-1232)	8082A	Approved
PCBs in Water	PEO-020	8895	Aroclor-1242 (PCB-1242)	8082A	Approved
PCBs in Water	PEO-020	8895	Aroclor-1242 (PCB-1242)	8082A	Approved
PCBs in Water	PEO-020	8900	Aroclor-1248 (PCB-1248)	8082A	Approved
PCBs in Water	PEO-020	8900	Aroclor-1248 (PCB-1248)	8082A	Approved
PCBs in Water	PEO-020	8905	Aroclor-1254 (PCB-1254)	8082A	Approved
PCBs in Water	PEO-020	8905	Aroclor-1254 (PCB-1254)	8082A	Approved
PCBs in Water	PEO-020	8910	Aroclor-1260 (PCB-1260)	8082A	Approved
PCBs in Water	PEO-020	8910	Aroclor-1260 (PCB-1260)	8082A	Approved
CWA Organophosphorous Pesticides	38135	7075	Azinphosmethyl	8141A	Approved
WP Organophosphorous Pesticides	38135	7075	Azinphosmethyl (Guthion)	8141A	Approved
CWA Organophosphorous Pesticides	38135	7300	Chlorpyrifos	8141A	Approved
WP Organophosphorous Pesticides	38135	7390	Demeton, (Mix of Isomers O:S [35%:56%])	8141A	Approved
CWA Organophosphorous Pesticides	38135	7390	Demeton, (Mix of Isomers O:S)	8141A	Approved
CWA Organophosphorous Pesticides	38135	7410	Diazinon	8141A	Approved
WP Organophosphorous Pesticides	38135	7410	Diazinon	8141A	Approved
CWA Organophosphorous Pesticides	38135	8610	Dichlorvos	8141A	Approved
CWA Organophosphorous Pesticides	38135	7475	Dimethoate	8141A	Approved
CWA Organophosphorous Pesticides	38135	8625	Disulfoton	8141A	Approved
WP Organophosphorous Pesticides	38135	8625	Disulfoton	8141A	Approved

CWA Organophosphorous Pesticides	38135	7565	Ethion	8141A	Approved
WP Organophosphorous Pesticides	38135	7565	Ethion	8141A	Approved
CWA Organophosphorous Pesticides	38135	7570	Ethoprop	8141A	Approved
CWA Organophosphorous Pesticides	38135	7770	Malathion	8141A	Approved
WP Organophosphorous Pesticides	38135	7770	Malathion	8141A	Approved
CWA Organophosphorous Pesticides	38135	7955	Parathion ethyl	8141A	Approved
CWA Organophosphorous Pesticides	38135	7825	Parathion methyl	8141A	Approved
CWA Organophosphorous Pesticides	38135	7985	Phorate	8141A	Approved
CWA Organophosphorous Pesticides	38135	8110	Ronnel	8141A	Approved
CWA Organophosphorous Pesticides	38135	8200	Stirophos	8141A	Approved
CWA Organophosphorous Pesticides	38135	7075	Azinphosmethyl	8141B	Approved
WP Organophosphorous Pesticides	38135	7075	Azinphosmethyl (Guthion)	8141B	Approved
CWA Organophosphorous Pesticides	38135	7300	Chlorpyrifos	8141B	Approved
WP Organophosphorous Pesticides	38135	7390	Demeton, (Mix of Isomers O:S [35%:56%])	8141B	Approved
CWA Organophosphorous Pesticides	38135	7390	Demeton, (Mix of Isomers O:S)	8141B	Approved
CWA Organophosphorous Pesticides	38135	7410	Diazinon	8141B	Approved
WP Organophosphorous Pesticides	38135	7410	Diazinon	8141B	Approved
CWA Organophosphorous Pesticides	38135	8610	Dichlorvos	8141B	Approved
CWA Organophosphorous Pesticides	38135	7475	Dimethoate	8141B	Approved
CWA Organophosphorous Pesticides	38135	8625	Disulfoton	8141B	Approved
WP Organophosphorous Pesticides	38135	8625	Disulfoton	8141B	Approved
CWA Organophosphorous Pesticides	38135	7565	Ethion	8141B	Approved
WP Organophosphorous Pesticides	38135	7565	Ethion	8141B	Approved
CWA Organophosphorous Pesticides	38135	7570	Ethoprop	8141B	Approved
CWA Organophosphorous Pesticides	38135	7770	Malathion	8141B	Approved
WP Organophosphorous Pesticides	38135	7770	Malathion	8141B	Approved
CWA Organophosphorous Pesticides	38135	7955	Parathion ethyl	8141B	Approved
CWA Organophosphorous Pesticides	38135	7825	Parathion methyl	8141B	Approved
CWA Organophosphorous Pesticides	38135	7985	Phorate	8141B	Approved
CWA Organophosphorous Pesticides	38135	8110	Ronnel	8141B	Approved
CWA Organophosphorous Pesticides	38135	8200	Stirophos	8141B	Approved
WP Herbicide Acid Mix #2	38136	8655	2,4,5-T	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8545	2,4-D (2,4-Dichlorophenoxyacetic acid)	8151A	Approved
WP Herbicide Acid Mix #2	38136	8560	2,4-DB	8151A	Approved
WP Herbicide Acid Mix #2	38136	8600	3,5-Dichlorobenzoic acid	8151A	Approved
WP Herbicide Acid Mix #2	38136	6500	4-Nitrophenol	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8505	Acifluorfen	8151A	Approved
WP Herbicide Acid Mix #2	38136	8530	Bentazon	8151A	Approved
WP Herbicide Acid Mix #2	38136	8540	Chloramben	8151A	Approved
WP Herbicide Acid Mix #2	38136	8550	Dacthal	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8555	Dalapon	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8595	Dicamba	8151A	Approved
WP Herbicide Acid Mix #2	38136	8605	Dichlorprop	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8620	Dinoseb (2-sec-Butyl-4,6-dinitrophenol)	8151A	Approved
NPTA			MCPA	8151A	Approved
NPTA			MCPP	8151A	Approved
WP Acrolein & Acrylonitrile	38126	6605	Pentachlorophenol	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8645	Picloram	8151A	Approved
WP Acrolein & Acrylonitrile	38126	8650	Silvex (2,4,5-TP)	8151A	Approved
Volatiles in Non-Portable Water	38083	5105	1,1,1,2-Tetrachloroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	5160	1,1,1-Trichloroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	5110	1,1,2,2-Tetrachloroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	5165	1,1,2-Trichloroethane	8260B	Approved
WP Oxygenates	38157	5185	1,1,2-Trichlorotrifluoroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4630	1,1-Dichloroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4640	1,1-Dichloroethene	8260B	Approved
Volatiles in Non-Portable Water	38083	4670	1,1-Dichloropropene	8260B	Approved
Volatiles in Non-Portable Water	38083	5150	1,2,3-Trichlorobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	5180	1,2,3-Trichloropropane	8260B	Approved
Volatiles in Non-Portable Water	38083	5155	1,2,4-Trichlorobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	5210	1,2,4-Trimethylbenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4570	1,2-Dibromo-3-chloropropane	8260B	Approved
Volatiles in Non-Portable Water	38083	4585	1,2-Dibromoethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4610	1,2-Dichlorobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4635	1,2-Dichloroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4655	1,2-Dichloropropane	8260B	Approved
Volatiles in Non-Portable Water	38083	5215	1,3,5-Trimethylbenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4615	1,3-Dichlorobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4660	1,3-Dichloropropane	8260B	Approved
Volatiles in Non-Portable Water	38083	4620	1,4-Dichlorobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4665	2,2-Dichloropropane	8260B	Approved
WP Ketones	38134	4410	2-Butanone	8260B	Approved
WP Ketones	38134	4410	2-Butanone	8260B	Approved
WP 2-Chloroethyl vinyl ether	38128	4500	2-Chloroethyl vinyl ether	8260B	Approved
Volatiles in Non-Portable Water	38083	4535	2-Chlorotoluene	8260B	Approved
WP Ketones	38134	4860	2-Hexanone	8260B	Approved
WP Ketones	38134	4860	2-Hexanone	8260B	Approved
Volatiles in Non-Portable Water	38083	4540	4-Chlorotoluene	8260B	Approved
Volatiles in Non-Portable Water	38083	4995	4-methyl-2-pentanone	8260B	Approved
WP Ketones	38134	4995	4-Methyl-2-pentanone	8260B	Approved
WP Ketones	38134	4995	4-Methyl-2-pentanone	8260B	Approved
WP Ketones	38134	4315	Acetone	8260B	Approved

WP Ketones	38134	4315	Acetone	8260B	Approved
WP Acrolein & Acrylonitrile	38123	0150	Acrolein	8260B	Approved
WP Acrolein & Acrylonitrile	38123	4325	Acrolein	8260B	Approved
WP Acrolein & Acrylonitrile	38123	1051	Acrolein	8260B	Approved
WP Acrolein & Acrylonitrile	38123	1051	Acrylonitrile	8260B	Approved
Volatiles in Non-Portable Water	38083	4375	Benzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4385	Bromobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4390	Bromochloromethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4395	Bromodichloromethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4400	Bromoform	8260B	Approved
Volatiles in Non-Portable Water	38083	4950	Bromomethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4450	Carbon disulphide	8260B	Approved
Volatiles in Non-Portable Water	38083	4455	Carbon tetrachloride	8260B	Approved
Volatiles in Non-Portable Water	38083	4475	Chlorobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4485	Chloroethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4505	Chloroform	8260B	Approved
Volatiles in Non-Portable Water	38083	4960	Chloromethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4645	cis-1,2-Dichloroethene	8260B	Approved
Volatiles in Non-Portable Water	38083	4680	cis-1,3-Dichloropropene	8260B	Approved
Volatiles in Non-Portable Water	38083	4575	Dibromochloromethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4595	Dibromomethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4625	Dichlorodifluoromethane	8260B	Approved
Volatiles in Non-Portable Water	38083	4765	Ethyl benzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4835	Hexachlorobutadiene	8260B	Approved
Volatiles in Non-Portable Water	38083	4840	Hexachloroethane	8260B	Approved
WP Oxygenates	38157	9375	Isopropyl ether (DIPE)	8260B	Approved
Volatiles in Non-Portable Water	38083	4900	Isopropylbenzene	8260B	Approved
NPTA			Methyl Ethyl Ketone	8260B	Approved
Volatiles in Non-Portable Water	38083	5000	Methyl tert-butyl ether (MTBE)	8260B	Approved
WP Oxygenates	38157	5000	Methyl tert-butyl ether (MTBE)	8260B	Approved
Volatiles in Non-Portable Water	38083	4975	Methylene chloride (Dichloromethane)	8260B	Approved
Volatiles in Non-Portable Water	38083	5005	Naphthalene	8260B	Approved
Volatiles in Non-Portable Water	38083	4435	n-Butyl benzene	8260B	Approved
Volatiles in Non-Portable Water	38083	5015	Nitrobenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	5090	n-Propylbenzene	8260B	Approved
WP Oxygenates	38157	5090	n-Propylbenzene	8260B	Approved
Volatiles in Non-Portable Water	38083	4440	sec-Butyl benzene	8260B	Approved
Volatiles in Non-Portable Water	38083	5100	Styrene	8260B	Approved
WP Oxygenates	38157	4370	tert-Amyl methyl ether (TAME)	8260B	Approved
WP Oxygenates	38157	4420	tert-Butyl alcohol (t-Butanol)	8260B	Approved
Volatiles in Non-Portable Water	38083	4445	tert-Butyl benzene	8260B	Approved
WP Oxygenates	38157	4770	tert-Butyl ethyl ether (ETBE)	8260B	Approved
Volatiles in Non-Portable Water	38083	5115	Tetrachloroethene	8260B	Approved
Volatiles in Non-Portable Water	38083	5140	Toluene	8260B	Approved
Volatiles in Non-Portable Water	38083	5260	Total Xylenes	8260B	Approved
Volatiles in Non-Portable Water	38083	4700	trans-1,2-Dichloroethene	8260B	Approved
Volatiles in Non-Portable Water	38083	4685	trans-1,3-Dichloropropene	8260B	Approved
Volatiles in Non-Portable Water	38083	5170	Trichloroethene	8260B	Approved
Volatiles in Non-Portable Water	38083	5175	Trichlorofluoromethane	8260B	Approved
Volatiles in Non-Portable Water	38083	5235	Vinyl chloride	8260B	Approved
NPTA			Cyclohexane	8260B	Approved
NPTA			Methyl Acetate	8260B	Approved
NPTA			Methylcyclohexane	8260B	Approved
NPTA			m&p Xylenes	8260B	Approved
NPTA			o-Xylene	8260B	Approved
NPTA			p-isopropyltoluene	8260B	Approved
NPTA			Vinyl Acetate	8260B	Approved
Volatiles in Non-Portable Water	38083	5105	1,1,1,2-Tetrachloroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	5160	1,1,1-Trichloroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	5110	1,1,2,2-Tetrachloroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	5165	1,1,2-Trichloroethane	8260C	Approved
WP Oxygenates	38157	5185	1,1,2-Trichlorotrifluoroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4630	1,1-Dichloroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4640	1,1-Dichloroethene	8260C	Approved
Volatiles in Non-Portable Water	38083	4670	1,1-Dichloropropene	8260C	Approved
Volatiles in Non-Portable Water	38083	5150	1,2,3-Trichlorobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	5180	1,2,3-Trichloropropane	8260C	Approved
Volatiles in Non-Portable Water	38083	5155	1,2,4-Trichlorobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	5210	1,2,4-Trimethylbenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4570	1,2-Dibromo-3-chloropropane	8260C	Approved
Volatiles in Non-Portable Water	38083	4585	1,2-Dibromoethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4610	1,2-Dichlorobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4635	1,2-Dichloroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4655	1,2-Dichloropropane	8260C	Approved
Volatiles in Non-Portable Water	38083	5215	1,3,5-Trimethylbenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4615	1,3-Dichlorobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4660	1,3-Dichloropropane	8260C	Approved
Volatiles in Non-Portable Water	38083	4620	1,4-Dichlorobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4665	2,2-Dichloropropane	8260C	Approved
WP Ketones	38134	4410	2-Butanone	8260C	Approved
WP 2-Chloroethyl vinyl ether	38128	4500	2-Chloroethyl vinyl ether	8260C	Approved
Volatiles in Non-Portable Water	38083	4535	2-Chlorotoluene	8260C	Approved

WP Ketones	38134	4860	2-Hexanone	8260C	Approved
Volatiles in Non-Portable Water	38083	4540	4-Chlorotoluene	8260C	Approved
Volatiles in Non-Portable Water	38083	4995	4-methyl-2-pentanone	8260C	Approved
WP Ketones	38134	4995	4-Methyl-2-pentanone	8260C	Approved
WP Ketones	38134	4315	Acetone	8260C	Approved
WP Acrolein & Acrylonitrile	38123	4325	Acrolein (Propenal)	8260C	Approved
WP Acrolein & Acrylonitrile	38123	1051	Acrylonitrile	8260C	Approved
Volatiles in Non-Portable Water	38083	4375	Benzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4385	Bromobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4390	Bromochloromethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4395	Bromodichloromethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4400	Bromoform	8260C	Approved
Volatiles in Non-Portable Water	38083	4950	Bromomethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4450	Carbon disulphide	8260C	Approved
Volatiles in Non-Portable Water	38083	4455	Carbon tetrachloride	8260C	Approved
Volatiles in Non-Portable Water	38083	4475	Chlorobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4485	Chloroethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4505	Chloroform	8260C	Approved
Volatiles in Non-Portable Water	38083	4960	Chloromethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4645	cis-1,2-Dichloroethene	8260C	Approved
Volatiles in Non-Portable Water	38083	4680	cis-1,3-Dichloropropene	8260C	Approved
Volatiles in Non-Portable Water	38083	4575	Dibromochloromethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4595	Dibromomethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4625	Dichlorodifluoromethane	8260C	Approved
Volatiles in Non-Portable Water	38083	4765	Ethyl benzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4835	Hexachlorobutadiene	8260C	Approved
Volatiles in Non-Portable Water	38083	4840	Hexachloroethane	8260C	Approved
WP Oxygenates	38157	9375	Isopropyl ether (DIPE)	8260C	Approved
Volatiles in Non-Portable Water	38083	4900	Isopropylbenzene	8260C	Approved
NPTA			Methyl Ethyl Ketone	8260C	Approved
Volatiles in Non-Portable Water	38083	5000	Methyl tert-butyl ether (MTBE)	8260C	Approved
WP Oxygenates	38157	5000	Methyl tert-butyl ether (MTBE)	8260C	Approved
Volatiles in Non-Portable Water	38083	4975	Methylene chloride (Dichloromethane)	8260C	Approved
Volatiles in Non-Portable Water	38083	5005	Naphthalene	8260C	Approved
Volatiles in Non-Portable Water	38083	4435	n-Butyl benzene	8260C	Approved
Volatiles in Non-Portable Water	38083	5015	Nitrobenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	5090	n-Propylbenzene	8260C	Approved
WP Oxygenates	38157	5090	n-Propylbenzene	8260C	Approved
Volatiles in Non-Portable Water	38083	4910	p-isopropyl tolutne	8260C	Approved
Volatiles in Non-Portable Water	38083	4440	sec-Butyl benzene	8260C	Approved
Volatiles in Non-Portable Water	38083	5100	Styrene	8260C	Approved
WP Oxygenates	38157	4370	tert-Amyl methyl ether (TAME)	8260C	Approved
WP Oxygenates	38157	4420	tert-Butyl alcohol (t-Butanol)	8260C	Approved
Volatiles in Non-Portable Water	38083	4445	tert-Butyl benzene	8260C	Approved
WP Oxygenates	38157	4770	tert-Butyl ethyl ether (ETBE)	8260C	Approved
Volatiles in Non-Portable Water	38083	5115	Tetrachloroethene	8260C	Approved
Volatiles in Non-Portable Water	38083	5140	Toluene	8260C	Approved
Volatiles in Non-Portable Water	38083	5260	Total Xylenes	8260C	Approved
Volatiles in Non-Portable Water	38083	4700	trans-1,2-Dichloroethene	8260C	Approved
Volatiles in Non-Portable Water	38083	4685	trans-1,3-Dichloropropene	8260C	Approved
Volatiles in Non-Portable Water	38083	5170	Trichloroethene	8260C	Approved
Volatiles in Non-Portable Water	38083	5175	Trichlorofluoromethane	8260C	Approved
Volatiles in Non-Portable Water	38083	5235	Vinyl chloride	8260C	Approved
NPTA			Cyclohexane	8260C	Approved
NPTA			Methyl Acetate	8260C	Approved
NPTA			Methylcyclohexane	8260C	Approved
NPTA			m&p Xylenes	8260C	Approved
NPTA			o-Xylene	8260C	Approved
NPTA			p-isopropyltoluene	8260C	Approved
NPTA			Vinyl Acetate	8260C	Approved
Base/Neutrals	PEO-121-2A	5155	1,2,4-Trichlorbenzene	8270C	Approved
Base/Neutrals	PEO-121-2A	5155	1,2,4-Trichlorobenzene	8270C	Approved
Base/Neutrals	PEO-121-2A	4610	1,2-Dichlorobenzene	8270C	Approved
Base/Neutrals	PEO-121-2A	4615	1,3-Dichlorobenzene	8270C	Approved
Base/Neutrals	PEO-121-2A	4620	1,4-Dichlorobenzene	8270C	Approved
Acid Compounds	PEO-022	6735	2,3,4,6-Tetrachlorophenol	8270C	Approved
Acid Compounds	PEO-022	6835	2,4,5-Trichlorophenol	8270C	Approved
Acid Compounds	PEO-022	6840	2,4,6-Trichlorphenol	8270C	Approved
Acid Compounds	PEO-022	6000	2,4-Dichlorophenol	8270C	Approved
Acid Compounds	PEO-022	6130	2,4-Dimethylphenol	8270C	Approved
Acid Compounds	PEO-022	6175	2,4-Dinitrophenol	8270C	Approved
Base/Neutrals	PEO-121-2A	6185	2,4-Dinitrotoluene (2,4-DNT)	8270C	Approved
Acid Compounds	PEO-022	6005	2,6-Dichlorophenol	8270C	Approved
Base/Neutrals	PEO-121-2A	6190	2,6-Dinitrotoluene (2,6-DNT)	8270C	Approved
Base/Neutrals	PEO-121-2A	5795	2-Chloronaphthalene	8270C	Approved
Acid Compounds	PEO-022	5800	2-Chlorophenol	8270C	Approved
Acid Compounds	PEO-022	6360	2-Methyl-4,6-Dinitrophenol	8270C	Approved
Base/Neutrals	PEO-121-2A	6385	2-Methylnaphthalene	8270C	Approved
Acid Compounds	PEO-022	6400	2-Methylphenol	8270C	Approved
Base/Neutrals	PEO-121-2B	6460	2-Nitroaniline	8270C	Approved
Acid Compounds	PEO-022	6490	2-Nitrophenol	8270C	Approved
Base/Neutrals	PEO-121-2A	5945	3,3'-Dichlorobenzidine	8270C	Approved

Base/Neutrals	PEO-121-2B	6465	3-Nitroaniline	8270C	Approved
Acid Compounds	PEO-022	6410	3 & 4-Methylphenol	8270C	Approved
Base/Neutrals	PEO-121-2A	5660	4-Bromophenyl phenyl ether	8270C	Approved
Acid Compounds	PEO-022	5700	4-Chloro-3-methylphenol	8270C	Approved
Base/Neutrals	PEO-121-2B	5745	4-Chloroaniline	8270C	Approved
Base/Neutrals	PEO-121-2A	5825	4-Chlorophenyl-phenylether	8270C	Approved
Base/Neutrals	PEO-121-2B	6470	4-Nitroaniline	8270C	Approved
Acid Compounds	PEO-022	6500	4-Nitrophenol	8270C	Approved
Base/Neutrals	PEO-121-1	5500	Acenaphthene	8270C	Approved
Base/Neutrals	PEO-121-1	5505	Acenaphthylene	8270C	Approved
Base/Neutrals	PEO-121-2B	5545	Aniline	8270C	Approved
Base/Neutrals	PEO-121-1	5555	Anthracene	8270C	Approved
Base/Neutrals	PEO-121-2A	5595	Benzidine	8270C	Approved
Base/Neutrals	PEO-121-1	5575	Benzo(a)anthracene	8270C	Approved
Base/Neutrals	PEO-121-1	5580	Benzo(a)pyrene	8270C	Approved
Base/Neutrals	PEO-121-1	5585	Benzo(b)fluoranthene	8270C	Approved
Base/Neutrals	PEO-121-1	5601	Benzo(b+k)fluoranthene	8270C	Approved
Base/Neutrals	PEO-121-1	5590	Benzo(g,h,i)perylene	8270C	Approved
Base/Neutrals	PEO-121-1	5600	Benzo(k)fluoranthene	8270C	Approved
Acid Compounds	PEO-022	5610	Benzoic acid	8270C	Approved
Base/Neutrals	PEO-121-2B	5630	Benzyl alcohol	8270C	Approved
Base/Neutrals	PEO-121-2A	5670	Benzyl butyl phthalate	8270C	Approved
Base/Neutrals	PEO-121-2A	5760	bis(2-Chloroethoxy) methane	8270C	Approved
Base/Neutrals	PEO-121-2A	5765	bis(2-Chloroethyl) ether	8270C	Approved
Base/Neutrals	PEO-121-2A	5780	bis(2-Chloroisopropyl) ether	8270C	Approved
Base/Neutrals	PEO-121-2A	6255	bis(2-Ethylhexyl) phthalate	8270C	Approved
Base/Neutrals	PEO-121-2B	7180	Caprolactam	8270C	Approved
Base/Neutrals	PEO-121-2B	5680	Carbazole	8270C	Approved
Base/Neutrals	PEO-121-1	5855	Chrysene	8270C	Approved
Base/Neutrals	PEO-121-1	5895	Dibenz(a,h) anthracene	8270C	Approved
Base/Neutrals	PEO-121-2A	5905	Dibenzofuran	8270C	Approved
Base/Neutrals	PEO-121-2A	6070	Diethyl phthalate	8270C	Approved
Base/Neutrals	PEO-121-2A	6135	Dimethyl phthalate	8270C	Approved
Base/Neutrals	PEO-121-2A	5925	Di-n-butylphthalate	8270C	Approved
Base/Neutrals	PEO-121-2A	6200	Di-n-octylphthalate	8270C	Approved
Base/Neutrals	PEO-121-1	6265	Fluoranthene	8270C	Approved
Base/Neutrals	PEO-121-1	6270	Fluorene	8270C	Approved
Base/Neutrals	PEO-121-2A	6275	Hexachlorobenzene	8270C	Approved
Base/Neutrals	PEO-121-2A	4835	Hexachlorobutadiene	8270C	Approved
Base/Neutrals	PEO-121-2A	6285	Hexachlorocyclopentadiene	8270C	Approved
Base/Neutrals	PEO-121-2A	4840	Hexachloroehane	8270C	Approved
Base/Neutrals	PEO-121-1	6315	Indeno(1,2,3-cd) pyrene	8270C	Approved
Base/Neutrals	PEO-121-2A	6320	Isophorone	8270C	Approved
Base/Neutrals	PEO-121-1	5005	Naphthalene	8270C	Approved
Base/Neutrals	PEO-121-2A	5015	Nitrobenzene	8270C	Approved
Base/Neutrals	PEO-121-2A	6530	N-nitrosodimethylamine	8270C	Approved
Base/Neutrals	PEO-121-2A	6545	N-nitrosodi-n-propylamine	8270C	Approved
Base/Neutrals	PEO-121-2A	6535	N-nitrosodiphenylamine	8270C	Approved
Acid Compounds	PEO-022	6605	Pentachlorophenol	8270C	Approved
Base/Neutrals	PEO-121-1	6615	Phenanthrene	8270C	Approved
Acid Compounds	PEO-022	6625	Phenol	8270C	Approved
Base/Neutrals	PEO-121-1	6665	Pyrene	8270C	Approved
Base/Neutrals	PEO-121-2B	5095	Pyridine	8270C	Approved
Low Level PAHs	PEO-259	5500	Acenaphthene	8270C SIM	Approved
Low Level PAHs	PEO-259	5505	Acenaphthylene	8270C SIM	Approved
Low Level PAHs	PEO-259	5555	Anthracene	8270C SIM	Approved
Low Level PAHs	PEO-259	5575	Benzo(a)anthracene	8270C SIM	Approved
Low Level PAHs	PEO-259	5580	Benzo(a)pyrene	8270C SIM	Approved
Low Level PAHs	PEO-259	5585	Benzo(b)fluoranthene	8270C SIM	Approved
Low Level PAHs	PEO-259	5590	Benzo(g,h,I)perylene	8270C SIM	Approved
Low Level PAHs	PEO-259	5600	Benzo(k)fluoranthene	8270C SIM	Approved
Low Level PAHs	PEO-259	5855	Chrysene	8270C SIM	Approved
Low Level PAHs	PEO-259	5895	Dibenzo(a,h)anthracene	8270C SIM	Approved
Low Level PAHs	PEO-259	6265	Fluoranthene	8270C SIM	Approved
Low Level PAHs	PEO-259	6270	Fluorene	8270C SIM	Approved
Low Level PAHs	PEO-259	6315	Indeno(1,2,3-cd) pyrene	8270C SIM	Approved
Low Level PAHs	PEO-259	5005	Naphthalene	8270C SIM	Approved
Low Level PAHs	PEO-259	6615	Penanthrene	8270C SIM	Approved
Low Level PAHs	PEO-259	6665	Pyrene	8270C SIM	Approved
Low Level PAHs			2-Methylnaphthalene	8270C SIM	Approved
Base/Neutrals	PEO-121-2A	5155	1,2,4-Trichlorbenzene	8270D	Approved
Base/Neutrals	PEO-121-2A	4610	1,2-Dichlorobenzene	8270D	Approved
Base/Neutrals	PEO-121-2A	4615	1,3-Dichlorobenzene	8270D	Approved
Base/Neutrals	PEO-121-2A	4620	1,4-Dichlorobenzene	8270D	Approved
Acid Compounds	PEO-022	6735	2,3,4,6-Tetrachlorophenol	8270D	Approved
Acid Compounds	PEO-022	6835	2,4,5-Trichlorophenol	8270D	Approved
Acid Compounds	PEO-022	6840	2,4,6-Trichlorphenol	8270D	Approved
Acid Compounds	PEO-022	6000	2,4-Dichlorophenol	8270D	Approved
Acid Compounds	PEO-022	6130	2,4-Dimethylphenol	8270D	Approved
Acid Compounds	PEO-022	6175	2,4-Dinitrophenol	8270D	Approved
Base/Neutrals	PEO-121-2A	6185	2,4-Dinitrotoluene (2,4-DNT)	8270D	Approved
Acid Compounds	PEO-022	6005	2,6-Dichlorophenol	8270D	Approved

Base/Neutrals	PEO-121-2A	6190	2,6-Dinitrotoluene (2,6-DNT)	8270D	Approved
Base/Neutrals	PEO-121-2A	5795	2-Chloronaphthalene	8270D	Approved
Acid Compounds	PEO-022	5800	2-Chlorophenol	8270D	Approved
Acid Compounds	PEO-022	6360	2-Methyl-4,6-Dinitrophenol	8270D	Approved
Base/Neutrals	PEO-121-2A	6385	2-Methylnaphthalene	8270D	Approved
Acid Compounds	PEO-022	6400	2-Methylphenol	8270D	Approved
Base/Neutrals	PEO-121-2B	6460	2-Nitroaniline	8270D	Approved
Acid Compounds	PEO-022	6490	2-Nitrophenol	8270D	Approved
Base/Neutrals	PEO-121-2A	5945	3,3'-Dichlorobenzidine	8270D	Approved
Base/Neutrals	PEO-121-2B	6465	3-Nitroaniline	8270D	Approved
Acid Compounds	PEO-022	6410	4 & 4-Methylphenol	8270D	Approved
Base/Neutrals	PEO-121-2A	5660	4-Bromophenyl phenyl ether	8270D	Approved
Acid Compounds	PEO-022	5700	4-Chloro-3-methylphenol	8270D	Approved
Base/Neutrals	PEO-121-2B	5745	4-Chloroaniline	8270D	Approved
Base/Neutrals	PEO-121-2A	5825	4-Chlorophenyl-phenylether	8270D	Approved
Base/Neutrals	PEO-121-2B	6470	4-Nitroaniline	8270D	Approved
Acid Compounds	PEO-022	6500	4-Nitrophenol	8270D	Approved
Base/Neutrals	PEO-121-2B	5545	Aniline	8270D	Approved
Base/Neutrals	PEO-121-2A	5595	Benzidine	8270D	Approved
Acid Compounds	PEO-022	5610	Benzoic acid	8270D	Approved
Base/Neutrals	PEO-121-2B	5630	Benzyl alcohol	8270D	Approved
Base/Neutrals	PEO-121-2A	5670	Benzyl butyl phthalate	8270D	Approved
Base/Neutrals	PEO-121-2A	5760	bis(2-Chloroethoxy) methane	8270D	Approved
Base/Neutrals	PEO-121-2A	5765	bis(2-Chloroethyl) ether	8270D	Approved
Base/Neutrals	PEO-121-2A	5780	bis(2-Chloroisopropyl) ether	8270D	Approved
Base/Neutrals	PEO-121-2A	6255	bis(2-Ethylhexyl) phthalate	8270D	Approved
Base/Neutrals	PEO-121-2B	7180	Caprolactam	8270D	Approved
Base/Neutrals	PEO-121-2B	5680	Carbazole	8270D	Approved
Base/Neutrals	PEO-121-2A	5905	Dibenzofuran	8270D	Approved
Base/Neutrals	PEO-121-2A	6070	Diethyl phthalate	8270D	Approved
Base/Neutrals	PEO-121-2A	6135	Dimethyl phthalate	8270D	Approved
Base/Neutrals	PEO-121-2A	5925	Di-n-butylphthalate	8270D	Approved
Base/Neutrals	PEO-121-2A	6200	Di-n-octylphthalate	8270D	Approved
Base/Neutrals	PEO-121-2A	6275	Hexachlorobenzene	8270D	Approved
Base/Neutrals	PEO-121-2A	4835	Hexachlorobutadiene	8270D	Approved
Base/Neutrals	PEO-121-2A	6285	Hexachlorocyclopentadiene	8270D	Approved
Base/Neutrals	PEO-121-2A	4840	Hexachloroehane	8270D	Approved
Base/Neutrals	PEO-121-2A	6320	Isophorone	8270D	Approved
Base/Neutrals	PEO-121-2A	5015	Nitrobenzene	8270D	Approved
Base/Neutrals	PEO-121-2A	6530	N-nitrosodimethylamine	8270D	Approved
Base/Neutrals	PEO-121-2A	6545	N-nitrosodi-n-propylamine	8270D	Approved
Base/Neutrals	PEO-121-2A	6535	N-nitrosodiphenylamine	8270D	Approved
Acid Compounds	PEO-022	6605	Pentachlorophenol	8270D	Approved
Acid Compounds	PEO-022	6625	Phenol	8270D	Approved
Base/Neutrals	PEO-121-2B	5095	Pyridine	8270D	Approved
Low Level PAHs	PEO-259	5500	Acenaphthene	8270D SIM	Approved
Low Level PAHs	PEO-259	5505	Acenaphthylene	8270D SIM	Approved
Low Level PAHs	PEO-259	5555	Anthracene	8270D SIM	Approved
Low Level PAHs	PEO-259	5575	Benzo(a)anthracene	8270D SIM	Approved
Low Level PAHs	PEO-259	5580	Benzo(a)pyrene	8270D SIM	Approved
Low Level PAHs	PEO-259	5585	Benzo(b)fluoranthene	8270D SIM	Approved
Low Level PAHs	PEO-259	5590	Benzo(g,h,I)perylene	8270D SIM	Approved
Low Level PAHs	PEO-259	5600	Benzo(k)fluoranthene	8270D SIM	Approved
Low Level PAHs	PEO-259	5855	Chrysene	8270D SIM	Approved
Low Level PAHs	PEO-259	5895	Dibenzo(a,h)anthracene	8270D SIM	Approved
Low Level PAHs	PEO-259	6265	Fluoranthene	8270D SIM	Approved
Low Level PAHs	PEO-259	6270	Fluorene	8270D SIM	Approved
Low Level PAHs	PEO-259	6315	Indeno(1,2,3-cd) pyrene	8270D SIM	Approved
Low Level PAHs	PEO-259	5005	Naphthalene	8270D SIM	Approved
Low Level PAHs	PEO-259	6615	Penanthrene	8270D SIM	Approved
Low Level PAHs	PEO-259	6665	Pyrene	8270D SIM	Approved
			2-Methylnaphthalene	8270D SIM	Approved
2,3,7,8-Tetrachlorodibenzo-p-dioxin	38186	9618	2,3,7,8-TCDD	8290	Approved
Dioxin	PEO-258	9519	1,2,3,4,6,7,8,9-OCDD	8290	Approved
Dioxin	PEO-258	9516	1,2,3,4,6,7,8,9-OCDF	8290	Approved
Dioxin	PEO-258	9426	1,2,3,4,6,7,8-Hpcdd	8290	Approved
Dioxin	PEO-258	9420	1,2,3,4,6,7,8-Hpcdf	8290	Approved
Dioxin	PEO-258	9423	1,2,3,4,7,8,9-Hpcdf	8290	Approved
Dioxin	PEO-258	9453	1,2,3,4,7,8-Hxcdd	8290	Approved
Dioxin	PEO-258	9471	1,2,3,4,7,8-Hxcdf	8290	Approved
Dioxin	PEO-258	9456	1,2,3,6,7,8-Hxcdd	8290	Approved
Dioxin	PEO-258	9474	1,2,3,6,7,8-Hxcdf	8290	Approved
Dioxin	PEO-258	9459	1,2,3,7,8,9-Hxcdd	8290	Approved
Dioxin	PEO-258	9477	1,2,3,7,8,9-Hxcdf	8290	Approved
Dioxin	PEO-258	9540	1,2,3,7,8-Pecdd	8290	Approved
Dioxin	PEO-258	9543	1,2,3,7,8-Pecdf	8290	Approved
Dioxin	PEO-258	9480	2,3,4,6,7,8-Hxcdf	8290	Approved
Dioxin	PEO-258	9549	2,3,4,7,8-Pecdf	8290	Approved
Dioxin	PEO-258	9606	2,3,7,8-TCDD	8290	Approved
Dioxin	PEO-258	9612	2,3,7,8-TCDF	8290	Approved
Dioxin	PEO-258	9438	Hpcdd, total	8290	Approved
Dioxin	PEO-258	9444	Hpcdf, total	8290	Approved

Dioxin	PEO-258	9468	Hxcdd, total	8290	Approved
Dioxin	PEO-258	9483	Hxcdf, total	8290	Approved
Dioxin	PEO-258	9556	PCDD + PCDF, total	8290	Approved
Dioxin	PEO-258	9991	PCDD, total	8290	Approved
Dioxin	PEO-258	9993	PCDF, total	8290	Approved
Dioxin	PEO-258	9555	Pecdd, total	8290	Approved
Dioxin	PEO-258	9552	Pecdf, total	8290	Approved
Dioxin	PEO-258	9609	TCDD, total	8290	Approved
Dioxin	PEO-258	9615	TCDF, total	8290	Approved
WP Carbamates	38156	7710	3-Hydroxycarbofuran	8321A	Approved
WP Carbamates	38156	7010	Aldicarb	8321A	Approved
WP Carbamates	38156	7015	Aldicarb sulfone	8321A	Approved
WP Carbamates	38156	7020	Aldicarb sulfoxide	8321A	Approved
NPTA			Barban	8321A	Approved
NPTA			Bromacil	8321A	Approved
WP Carbamates	38156	7195	Carbaryl	8321A	Approved
WP Carbamates	38156	7205	Carbofuran	8321A	Approved
NPTA			Chloroxuron	8321A	Approved
WP Carbamates	38156	7505	Diuron	8321A	Approved
NPTA			Linuron	8321A	Approved
WP Carbamates	38156	7800	Methiocarb	8321A	Approved
WP Carbamates	38156	7805	Methomyl	8321A	Approved
WP Carbamates	38156	7940	Oxamyl	8321A	Approved
WP Carbamates	38156	8075	Propham	8321A	Approved
WP Carbamates	38156	8080	Propoxur (Baygon)	8321A	Approved
CWA Nitroaromatics in Water	38172	6885	1,3,5-Trinitrobenzene	8330A	Approved
CWA Nitroaromatics in Water	38172	6160	1,3-Dinitrobenzene	8330A	Approved
CWA Nitroaromatics in Water	38172	9651	2,4,6-Trinitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	6185	2,4-Dinitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	6190	2,6-Dinitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	9303	2-Amino-4,6-dinitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	9507	2-Nitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	9510	3-Nitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	9306	4-Amino-2,6-dinitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	9513	4-Nitrotoluene	8330A	Approved
CWA Nitroaromatics in Water	38172	9522	HMX	8330A	Approved
CWA Nitroaromatics in Water	38172	5015	Nitrobenzene	8330A	Approved
NPTA			Nitroglycerin	8330A	Approved
NPTA			PETN	8330A	Approved
NPTA			PGDN	8330A	Approved
NPTA			Picric Acid	8330A	Approved
CWA Nitroaromatics in Water	38172	9432	RDX	8330A	Approved
CWA Nitroaromatics in Water	38172	6415	Tetryl	8330A	Approved
CWA Nitroaromatics in Water	38172	6885	1,3,5-Trinitrobenzene	8330B	Approved
CWA Nitroaromatics in Water	38172	6160	1,3-Dinitrobenzene	8330B	Approved
CWA Nitroaromatics in Water	38172	9651	2,4,6-Trinitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	6185	2,4-Dinitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	6190	2,6-Dinitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	9303	2-Amino-4,6-dinitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	9507	2-Nitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	9510	3-Nitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	9306	4-Amino-2,6-dinitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	9513	4-Nitrotoluene	8330B	Approved
CWA Nitroaromatics in Water	38172	9522	HMX	8330B	Approved
CWA Nitroaromatics in Water	38172	5015	Nitrobenzene	8330B	Approved
NPTA			Nitroglycerin	8330B	Approved
NPTA			PGDN	8330B	Approved
NPTA			Picric Acid	8330B	Approved
CWA Nitroaromatics in Water	38172	9432	RDX	8330B	Approved
CWA Nitroaromatics in Water	38172	6415	Tetryl	8330B	Approved
Low Level Nit/Nit	PEO-251	6885	1,3,5-Trinitrobenzene (1,3,5-TNB)	8330B	Approved
Low Level Nit/Nit	PEO-251	6160	1,3-Dinitrobenzene (1,3-DNB)	8330B	Approved
Low Level Nit/Nit	PEO-251	9651	2,4,6-Trinitrotoluene (2,4,6-TNT)	8330B	Approved
Low Level Nit/Nit	PEO-251	6185	2,4-Dinitrotoluene (2,4-DNT)	8330B	Approved
Low Level Nit/Nit	PEO-251	6190	2,6-Dinitrotoluene (2,6-DNT)	8330B	Approved
Low Level Nit/Nit	PEO-251	9303	2-Amino-4,6-dinitrotoluene (2am-dnt)	8330B	Approved
Low Level Nit/Nit	PEO-251	9507	2-Nitrotoluene	8330B	Approved
Low Level Nit/Nit	PEO-251	9510	3-Nitrotoluene	8330B	Approved
Low Level Nit/Nit	PEO-251	9306	4-Amino-2,6-dinitrotoluene (4am-dnt)	8330B	Approved
Low Level Nit/Nit	PEO-251	9513	4-Nitrotoluene	8330B	Approved
Low Level Nit/Nit	PEO-251	9522	HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	8330B	Approved
Low Level Nit/Nit	PEO-251	5015	Nitrobenzene	8330B	Approved
Low Level Nit/Nit	PEO-251	6485	Nitroglycerin	8330B	Approved
Low Level Nit/Nit	PEO-251	9432	RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	8330B	Approved
Low Level Nit/Nit	PEO-251	6415	Tetryl (Methyl-2,4,6-trinitrophenylnitramine)	8330B	Approved
Low Level Nit/Nit	PEO-252	9558	PETN	8330B	Approved
WP Cyanide, Total & Amenable	55132	1645	Total Cyanide	9010B	Approved
WP Cyanide, Total & Amenable	55132	1645	Total Cyanide	9010C & 9014	Approved
WP pH @ 25C	55061	1900	pH	9040B	Approved
WP pH @ 25C	55061	1900	pH	9040C	Approved
WP & DMRQA Nutrients	55035	1810	Nitrate as N	9056	Approved
WP & DMRQA Nutrients	55035	1870	Orthophosphate as P	9056	Approved

WP Nitrate & Nitrite	55130	1810	Nitrate as N	9056	Approved
WP Nitrate & Nitrite	55130	1820	Nitrite + Nitrate as N	9056	Approved
WP Nitrate & Nitrite	55130	1840	Nitrite as N	9056	Approved
SWA Anions	55131	1540	Bromide	9056	Approved
WP Minerals #1	55144	1575	Chloride	9056	Approved
WP Minerals #2	55145	1730	Fluoride	9056	Approved
WP Minerals #2	55145	2000	Sulfate	9056	Approved
WP & DMRQA Nutrients	55035	1810	Nitrate as N	9056A	Approved
WP & DMRQA Nutrients	55035	1870	Orthophosphate as P	9056A	Approved
WP Nitrate & Nitrite	55130	1810	Nitrate as N	9056A	Approved
WP Nitrate & Nitrite	55130	1820	Nitrite + Nitrate as N	9056A	Approved
WP Nitrate & Nitrite	55130	1840	Nitrite as N	9056A	Approved
SWA Anions	55131	1540	Bromide	9056A	Approved
WP Minerals #1	55144	1575	Chloride	9056A	Approved
WP Minerals #2	55145	1730	Fluoride	9056A	Approved
WP Minerals #2	55145	2000	Sulfate	9056A	Approved
WP & DMRQA Demands	55055	2040	Total Organic Carbon	9060	Approved
CWA UV 254 Absorbance/DOC	55088	1710	Dissolved Organic Carbon	9060	Approved
WP & DMRQA Demands	55055	2040	Total Organic Carbon	9060A	Approved
CWA UV 254 Absorbance/DOC	55088	1710	Dissolved Organic Carbon	9060A	Approved
~~Fluoride~~	~~4420~~	~~1730~~	~~Fluoride~~	~~9214~~	Approved
WP Minerals #2	55145	1505	Total Alkalinity (CaCO3)	SM 2320B	Approved
Minerals	4050	1610	Conductivity	SM 2510B	Approved
WP Conductance @ 25C	55026	1610	Specific Conductance	SM 2510B	Approved
Solids (Total Solids, TSS & TDS)	55085	1955	Total Dissolved Solids (TDS)	SM 2540C	Approved
WP Minerals #1	55144	1955	Total Dissolved Solids @ 180C	SM 2540C	Approved
Sulphide	55042	2005	Sulphide	SM 4500-S2F	Approved
Minerals	PEI-257	2005	Sulfide	SM 4500-S2F	Approved
WP & DMRQA Demands	55055	2040	Total Organic Carbon	SM 5310B	Approved
CWA UV 254 Absorbance/DOC	55088	1710	Dissolved Organic Carbon	SM 5310B	Approved
Miscellaneous Analytes	PEI-029	1860	Oil & Grease	SM 5520B	Approved
Total Petroleum Hydrocarbons (TPH) in Water	642	1935	TPH (Gravimetric)	SM 5520BF	Approved
WP MBAS	55083	2025	MBAS	SM 5540C	Approved
MBAS	55106	2025	MBAS	SM 5540C	Approved
NPTA			Ethane, Ethene, Methane	RSK175	Approved
Solids	4030	1960	Total Suspended Solids	SM 2540D	Approved
Solids (Total Solids, TSS & TDS)	55085	1960	Non-Filterable Residue (TSS)	SM 2540D	Approved

Accredited Analytes/Methods

WS Proficiency Testing Summary

Lab Name : APPL, Inc.

City/State : Clovis, CA

PartName	PartNumber	NELACCode	AnalyteName	EPA Method	PT Results
WS Minerals Mix #2	55123	1955	Total Filterable Residue	160.1	Approved
SDWA Solids (Total Solids, TSS & TDS)	55161	1955	Total Dissolved Solids	160.1	Approved
WS Chromium VI	55112	1045	Chromium VI	218.6	Approved
WS Inorganic Disinfection By-Products	55010	1540	Bromide	300.0	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1730	Fluoride	300.0	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1820	Nitrate and Nitrite as N	300.0	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1810	Nitrate as N	300.0	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1840	Nitrite as N	300.0	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1870	Orthophosphate as P	300.0	Approved
WS Sulphate/TOC	55070	2000	Sulfate	300.0	Approved
WS Minerals Mix #1	55122	1575	Chloride	300.0	Approved
WS Perchlorate	55099	1895	Perchlorate	314.0	Approved
SDWA Nutrients	55165	1515	Ammonia as N	350.1	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1820	Nitrate and Nitrite as N	353.2	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1810	Nitrate as N	353.2	Approved
WS NO3-, NO2-, F, PO4-3, and NO3- & NO2- as N	55011	1840	Nitrite as N	353.2	Approved
WS Perchlorate	55099	1895	Perchlorate	6850	Approved
WS pH @ 25C	55016	1900	pH @ 25	9040C	Approved
WS Minerals Mix #1	55122	1505	Alkalinity	SM 2320B	Approved
WS Minerals Mix #2	55123	1955	Total Filterable Residue	SM 2540C	Approved
SDWA Solids (Total Solids, TSS, & TDS)	55161	1955	Total Dissolved Solids	SM 2540C	Approved
WS Sulphate/TOC	55070	2040	TOC	SM 5310B	Approved
WS UV 254 Absorbance/DOC	55098	1710	Dissolved Organic Carbon (DOC)	SM 5310B	Approved
WS MBAS	55106	2025	MBAS	SM 5540C	Approved
Solids	5150	1960	Total Suspended Solids	SM 2540D	Approved
SDWA Solids (Total Solids, TSS, & TDS)	55161	1960	Non-Filterable Residue (TSS)	SM 2540D	Approved
Trace Metals	5070	1095	Mercury	EPA 245.1	Approved
WS Trace Elements Amp1	55012	1095	Mercury	EPA 245.1	Approved

Accredited Analytes/Methods
UST: Water Proficiency Testing Summary

Lab Name : **APPL, Inc.**
City/State : **Clovis, CA**

PartName	PartNumber	NELACCode	AnalyteName	EPA Method	PT Results
Petroleum Hydrocarbons in Water	PEO-010	102	Gasoline Range Organics, C6-C10	EPA 8015B	Approved
Petroleum Hydrocarbons in Water	PEO-010	9408	Gasoline Range Organics, C6-C10	EPA 8015C	Approved
Petroleum Hydrocarbons in Water	PEO-010	9408	Gasoline Range Organics, C6-C10	EPA 8015D	Approved
Petroleum Hydrocarbons in Wastewater	PEO-011	9369	Diesel Range Organics (DRO)	EPA 8015B	Approved
Petroleum Hydrocarbons in Wastewater	PEO-011	9369	Diesel range organics, C10-C28	EPA 8015B	Approved
GRO/BTEX in Water	PEO-114AK	4375	Benzene	EPA 8260B	Approved
GRO/BTEX in Water	PEO-114AK	4765	Ethylbenzene	EPA 8260B	Approved
GRO/BTEX in Water	PEO-114AK	5240	m+p-Xylene	EPA 8260B	Approved
GRO/BTEX in Water	PEO-114AK	5000	MTBE	EPA 8260B	Approved
GRO/BTEX in Water	PEO-114AK	5250	o-Xylene	EPA 8260B	Approved
GRO/BTEX in Water	PEO-114AK	5140	Toluene	EPA 8260B	Approved
GRO/BTEX in Water	PEO-114AK	5260	Xylene, total	EPA 8260B	Approved

Accredited Analytes/Methods

SOIL Proficiency Testing Summary

Lab Name :	**APPL, Inc.**				
City/State :	**Clovis, CA**				

PartName	PartNumber	NELACCode	AnalyteName	EPA Method	PT Results
PCB Congeners in Soil	SPE-068	9070	2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB 180)	1668A	Approved
PCB Congeners in Soil	SPE-068	9025	2,2',3,4,4',5'-Hexachlorobiphenyl (PCB 138)	1668A	Approved
PCB Congeners in Soil	SPE-068	9040	2,2',4,4',5,5'-Hexachlorobiphenyl (PCB 153)	1668A	Approved
PCB Congeners in Soil	SPE-068	8980	2,2',4,5,5'-Pentachlorobiphenyl (PCB 101)	1668A	Approved
PCB Congeners in Soil	SPE-068	8955	2,2',5,5'-Tetrachlorobiphenyl (PCB 52)	1668A	Approved
PCB Congeners in Soil	SPE-068	9085	2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	1668A	Approved
PCB Congeners in Soil	SPE-068	9050	2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	1668A	Approved
PCB Congeners in Soil	SPE-068	9045	2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	1668A	Approved
PCB Congeners in Soil	SPE-068	8985	2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	1668A	Approved
PCB Congeners in Soil	SPE-068	9055	2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	1668A	Approved
PCB Congeners in Soil	SPE-068	9005	2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	1668A	Approved
PCB Congeners in Soil	SPE-068	8995	2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	1668A	Approved
PCB Congeners in Soil	SPE-068	9000	2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	1668A	Approved
PCB Congeners in Soil	SPE-068	8936	2,4,4'-Trichlorobiphenyl (PCB 28)	1668A	Approved
PCB Congeners in Soil	SPE-068	9060	3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	1668A	Approved
PCB Congeners in Soil	SPE-068	9015	3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	1668A	Approved
PCB Congeners in Soil	SPE-068	8965	3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	1668A	Approved
PCB Congeners in Soil	SPE-068	8970	3,4,4',5-Tetrachlorobiphenyl (PCB 81)	1668A	Approved
PCB Congeners in Soil	SPE-068	9025	PCB (129)+(138)+(163)	1668A	Approved
PCB Congeners in Soil	SPE-068	9040	PCB (153)+(168)	1668A	Approved
PCB Congeners in Soil	SPE-068	9046	PCB (156)+(157)	1668A	Approved
PCB Congeners in Soil	SPE-068	9070	PCB (180)+(193)	1668A	Approved
PCB Congeners in Soil	SPE-068	8936	PCB (20)+(28)	1668A	Approved
PCB Congeners in Soil	SPE-068	8980	PCB (90)+(101)+(113)	1668A	Approved
PCB Congeners in Soil	SPE-068	8870	PCBs, total	1668A	Approved
RCRA Anions	55141	1540	Bromide (Br)	300.0	Approved
RCRA Anions	55141	1575	Chloride (Cl)	300.0	Approved
RCRA Anions	55141	1730	Fluoride (F)	300.0	Approved
RCRA Anions	55141	1810	Nitrate as N (NO3- as N)	300.0	Approved
RCRA Anions	55141	1870	Phosphate as P (PO43- as P)	300.0	Approved
RCRA Anions	55141	2000	Sulfate (SO42-)	300.0	Approved
RCRA Hexavalent Chromium	55104	1045	Chromium VI	3060A	Approved
RCRA Perchlorate	55143	1895	Perchlorate	314.0	Approved
RCRA Nutrients	55142	1515	Ammonia as N	350.1	Approved
RCRA Nutrients	55142	1795	Total Kjeldhal Nitrogen	351.2	Approved
RCRA Anions	55141	1810	Nitrate as N (NO3 as N)	353.2	Approved
RCRA Metals in Soil #2	55103	1000	Aluminum	6010B	Approved
RCRA Metals in Soil #1	55102	1005	Antimony	6010B	Approved
TCLP Metals	SPE-005	1005	Antimony, Sb	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1005	Antimony, Sb	6010B	Approved
RCRA Metals in Soil #1	55102	1010	Arsenic	6010B	Approved
TCLP Metals	SPE-005	1010	Arsenic, As	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1010	Arsenic, As	6010B	Approved
RCRA Metals in Soil #1	55102	1015	Barium	6010B	Approved
TCLP Metals	SPE-005	1015	Barium, Ba	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1015	Barium, Ba	6010B	Approved
RCRA Metals in Soil #1	55102	1020	Beryllium	6010B	Approved
TCLP Metals	SPE-005	1020	Beryllium, Be	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1020	Beryllium, Be	6010B	Approved
RCRA Metals in Soil #1	55102	1025	Boron	6010B	Approved
RCRA Metals in Soil #1	55102	1030	Cadmium	6010B	Approved
TCLP Metals	SPE-005	1030	Cadmium, Cd	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1030	Cadmium, Cd	6010B	Approved
RCRA Metals in Soil #2	55103	1035	Calcium	6010B	Approved
RCRA Metals in Soil #1	55102	1040	Chromium	6010B	Approved
TCLP Metals	SPE-005	1040	Chromium, Cr (total)	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1040	Chromium, Cr (total)	6010B	Approved
RCRA Metals in Soil #1	55102	1050	Cobalt	6010B	Approved
TCLP Metals	SPE-005	1050	Cobalt, Co	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1050	Cobalt, Co	6010B	Approved
RCRA Metals in Soil #1	55102	1055	Copper	6010B	Approved
TCLP Metals	SPE-005	1055	Copper, Cu	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1055	Copper, Cu	6010B	Approved
RCRA Metals in Soil #2	55103	1070	Iron	6010B	Approved
RCRA Metals in Soil #1	55102	1075	Lead	6010B	Approved
TCLP Metals	SPE-005	1075	Lead, Pb	6010B	Approved

TCLP Metals in Soil - CA WET	SPE-006	1075	Lead, Pb	6010B	Approved
RCRA Metals in Soil #2	55103	1085	Magnesium	6010B	Approved
RCRA Metals in Soil #1	55102	1090	Manganese	6010B	Approved
RCRA Metals in Soil #1	55102	1100	Molybdenum	6010B	Approved
TCLP Metals	SPE-005	1100	Molybdenum, Mo	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1100	Molybdenum, Mo	6010B	Approved
RCRA Metals in Soil #1	55102	1105	Nickel	6010B	Approved
TCLP Metals	SPE-005	1105	Nickel, Ni	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1105	Nickel, Ni	6010B	Approved
RCRA Metals in Soil #2	55103	1125	Potassium	6010B	Approved
RCRA Metals in Soil #1	55102	1140	Selenium	6010B	Approved
TCLP Metals	SPE-005	1140	Selenium, Se	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1140	Selenium, Se	6010B	Approved
RCRA Metals in Soil #1	55102	1150	Silver	6010B	Approved
TCLP Metals	SPE-005	1150	Silver, Ag	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1150	Silver, Ag	6010B	Approved
RCRA Metals in Soil #2	55103	1155	Sodium	6010B	Approved
RCRA Metals in Soil #1	55102	1160	Strontium	6010B	Approved
RCRA Metals in Soil #1	55102	1165	Thallium	6010B	Approved
TCLP Metals	SPE-005	1165	Thallium, Tl	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1165	Thallium, Tl	6010B	Approved
RCRA Metals in Soil #1	55102	1175	Tin	6010B	Approved
RCRA Metals in Soil #1	55102	1180	Titanium	6010B	Approved
RCRA Nutrients	55142	1910	Total Phosphorus	6010B	Approved
RCRA Metals in Soil #1	55102	1185	Vanadium	6010B	Approved
TCLP Metals	SPE-005	1185	Vanadium, V	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1185	Vanadium, V	6010B	Approved
RCRA Metals in Soil #1	55102	1190	Zinc	6010B	Approved
TCLP Metals	SPE-005	1190	Zinc, Zn	6010B	Approved
TCLP Metals in Soil - CA WET	SPE-006	1190	Zinc, Zn	6010B	Approved
RCRA Metals in Soil #2	55103	1000	Aluminum	6010C	Approved
RCRA Metals in Soil #1	55102	1005	Antimony	6010C	Approved
RCRA Metals in Soil #1	55102	1010	Arsenic	6010C	Approved
RCRA Metals in Soil #1	55102	1015	Barium	6010C	Approved
RCRA Metals in Soil #1	55102	1020	Beryllium	6010C	Approved
RCRA Metals in Soil #1	55102	1025	Boron	6010C	Approved
RCRA Metals in Soil #1	55102	1030	Cadmium	6010C	Approved
RCRA Metals in Soil #2	55103	1035	Calcium	6010C	Approved
RCRA Metals in Soil #1	55102	1040	Chromium	6010C	Approved
RCRA Metals in Soil #1	55102	1050	Cobalt	6010C	Approved
RCRA Metals in Soil #1	55102	1055	Copper	6010C	Approved
RCRA Metals in Soil #2	55103	1070	Iron	6010C	Approved
RCRA Metals in Soil #1	55102	1075	Lead	6010C	Approved
RCRA Metals in Soil #2	55103	1085	Magnesium	6010C	Approved
RCRA Metals in Soil #1	55102	1090	Manganese	6010C	Approved
RCRA Metals in Soil #1	55102	1100	Molybdenum	6010C	Approved
RCRA Metals in Soil #1	55102	1105	Nickel	6010C	Approved
RCRA Metals in Soil #2	55103	1125	Potassium	6010C	Approved
RCRA Metals in Soil #1	55102	1140	Selenium	6010C	Approved
RCRA Metals in Soil #1	55102	1150	Silver	6010C	Approved
RCRA Metals in Soil #2	55103	1155	Sodium	6010C	Approved
RCRA Metals in Soil #1	55102	1160	Strontium	6010C	Approved
RCRA Metals in Soil #1	55102	1165	Thallium	6010C	Approved
RCRA Metals in Soil #1	55102	1175	Tin	6010C	Approved
RCRA Metals in Soil #1	55102	1180	Titanium	6010C	Approved
			Total Phosphorus	6010C	Approved
RCRA Metals in Soil #1	55102	1185	Vanadium	6010C	Approved
RCRA Metals in Soil #1	55102	1190	Zinc	6010C	Approved
NPTA			Zirconium	6010C	Approved
RCRA Metals in Soil #2	55103	1000	Aluminum	6020	Approved
RCRA Metals in Soil #1	55102	1005	Antimony	6020	Approved
RCRA Metals in Soil #1	55102	1010	Arsenic	6020	Approved
RCRA Metals in Soil #1	55102	1015	Barium	6020	Approved
RCRA Metals in Soil #1	55102	1020	Beryllium	6020	Approved
RCRA Metals in Soil #1	55102	1025	Boron	6020	Approved
RCRA Metals in Soil #1	55102	1030	Cadmium	6020	Approved
RCRA Metals in Soil #2	55103	1035	Calcium	6020	Approved
RCRA Metals in Soil #1	55102	1040	Chromium	6020	Approved
RCRA Metals in Soil #1	55102	1050	Cobalt	6020	Approved
RCRA Metals in Soil #1	55102	1055	Copper	6020	Approved
RCRA Metals in Soil #2	55103	1070	Iron	6020	Approved
RCRA Metals in Soil #1	55102	1075	Lead	6020	Approved
RCRA Metals in Soil #2	55103	1085	Magnesium	6020	Approved
RCRA Metals in Soil #1	55102	1090	Manganese	6020	Approved

RCRA Metals in Soil #1	55102	1100	Molybdenum	6020	Approved
RCRA Metals in Soil #1	55102	1105	Nickel	6020	Approved
RCRA Metals in Soil #2	55103	1125	Potassium	6020	Approved
RCRA Metals in Soil #1	55102	1140	Selenium	6020	Approved
RCRA Metals in Soil #1	55102	1150	Silver	6020	Approved
RCRA Metals in Soil #2	55103	1155	Sodium	6020	Approved
RCRA Metals in Soil #1	55102	1160	Strontium	6020	Approved
RCRA Metals in Soil #1	55102	1165	Thallium	6020	Approved
RCRA Metals in Soil #1	55102	1175	Tin	6020	Approved
RCRA Metals in Soil #1	55102	1180	Titanium	6020	Approved
RCRA Metals in Soil #1	55102	1185	Vanadium	6020	Approved
RCRA Metals in Soil #1	55102	1190	Zinc	6020	Approved
NPTA			Zirconium	6020	Approved
RCRA Metals in Soil #2	55103	1000	Aluminum	6020A	Approved
RCRA Metals in Soil #1	55102	1005	Antimony	6020A	Approved
RCRA Metals in Soil #1	55102	1010	Arsenic	6020A	Approved
RCRA Metals in Soil #1	55102	1015	Barium	6020A	Approved
RCRA Metals in Soil #1	55102	1020	Beryllium	6020A	Approved
RCRA Metals in Soil #1	55102	1025	Boron	6020A	Approved
RCRA Metals in Soil #1	55102	1030	Cadmium	6020A	Approved
RCRA Metals in Soil #2	55103	1035	Calcium	6020A	Approved
RCRA Metals in Soil #1	55102	1040	Chromium	6020A	Approved
RCRA Metals in Soil #1	55102	1050	Cobalt	6020A	Approved
RCRA Metals in Soil #1	55102	1055	Copper	6020A	Approved
RCRA Metals in Soil #2	55103	1070	Iron	6020A	Approved
RCRA Metals in Soil #1	55102	1075	Lead	6020A	Approved
RCRA Metals in Soil #2	55103	1085	Magnesium	6020A	Approved
RCRA Metals in Soil #1	55102	1090	Manganese	6020A	Approved
RCRA Metals in Soil #1	55102	1100	Molybdenum	6020A	Approved
RCRA Metals in Soil #1	55102	1105	Nickel	6020A	Approved
RCRA Metals in Soil #2	55103	1125	Potassium	6020A	Approved
RCRA Metals in Soil #1	55102	1140	Selenium	6020A	Approved
RCRA Metals in Soil #1	55102	1150	Silver	6020A	Approved
RCRA Metals in Soil #2	55103	1155	Sodium	6020A	Approved
RCRA Metals in Soil #1	55102	1160	Strontium	6020A	Approved
RCRA Metals in Soil #1	55102	1165	Thallium	6020A	Approved
RCRA Metals in Soil #1	55102	1175	Tin	6020A	Approved
RCRA Metals in Soil #1	55102	1180	Titanium	6020A	Approved
RCRA Metals in Soil #1	55102	1185	Vanadium	6020A	Approved
RCRA Metals in Soil #1	55102	1190	Zinc	6020A	Approved
NPTA			Zirconium	6020A	Approved
RCRA Perchlorate	55143	1895	Perchlorate	6850	Approved
RCRA Hexavalent Chromium	55104	1045	Chromium VI	7196A	Approved
RCRA Hexavalent Chromium	55104	1045	Chromium VI	7199	Approved
TCLP Metals	SPE-005	1095	Mercury, Hg	7470A	Approved
TCLP Metals in Soil - CA WET	SPE-006	1095	Mercury, Hg	7470A	Approved
RCRA Metals in Soil #1	55102	1095	Mercury	7471B	Approved
Petroleum Hydrocarbons in Soil	SPE-007	9369	Diesel Range Organics C10-C28	8015B	Approved
Petroleum Hydrocarbons in Soil	SPE-007	9369	Diesel Range Organics C10-C28	8015C	Approved
Petroleum Hydrocarbons in Soil	SPE-007	9369	Diesel Range Organics C10-C28	8015D	Approved
Petroleum Hydrocarbons in Soil	SPE-008	101	Gasoline Range Organics, C6-C10	8015B	Approved
Petroleum Hydrocarbons in Soil	SPE-008	101	Total Purgeable Hydrocarbons	8015B	Approved
Petroleum Hydrocarbons in Soil	SPE-008	9408	Gasoline Range Organics, C6-C10	8015C	Approved
Petroleum Hydrocarbons in Soil	SPE-008	99990	Total Purgeable Hydrocarbons	8015C	Approved
Petroleum Hydrocarbons in Soil	SPE-008	9408	Gasoline Range Organics, C6-C10	8015D	Approved
Petroleum Hydrocarbons in Soil	SPE-008	99990	Total Purgeable Hydrocarbons	8015D	Approved
Toxaphene in Soil	38066	8250	Toxaphene	8081A	Approved
Chlorinated Pesticides in Soil	38101	7355	4,4'-DDD	8081A	Approved
Chlorinated Pesticides in Soil	38101	7360	4,4'-DDE	8081A	Approved
Chlorinated Pesticides in Soil	38101	7365	4,4'-DDT	8081A	Approved
Chlorinated Pesticides in Soil	38101	7110	a-BHC	8081A	Approved
Chlorinated Pesticides in Soil	38101	7240	a-Chlordane	8081A	Approved
Chlorinated Pesticides in Soil	38101	7025	Aldrin	8081A	Approved
Chlorinated Pesticides in Soil	38101	7115	b-BHC	8081A	Approved
Chlorinated Pesticides in Soil	38101	7105	d-BHC	8081A	Approved
Chlorinated Pesticides in Soil	38101	7470	Dieldrin	8081A	Approved
Chlorinated Pesticides in Soil	38101	7510	Endosulfan I	8081A	Approved
Chlorinated Pesticides in Soil	38101	7515	Endosulfan II	8081A	Approved
Chlorinated Pesticides in Soil	38101	7520	Endosulfan sulfate	8081A	Approved
Chlorinated Pesticides in Soil	38101	7540	Endrin	8081A	Approved
Chlorinated Pesticides in Soil	38101	7530	Endrin aldehyde	8081A	Approved
Chlorinated Pesticides in Soil	38101	7535	Endrin ketone	8081A	Approved
Chlorinated Pesticides in Soil	38101	7120	g-BHC (Lindane)	8081A	Approved
Chlorinated Pesticides in Soil	38101	7245	g-Chlordane	8081A	Approved

Chlorinated Pesticides in Soil	38101	7685	Heptachlor	8081A	Approved
Chlorinated Pesticides in Soil	38101	7690	Heptachlor epoxide	8081A	Approved
Chlorinated Pesticides in Soil	38101	7810	Methoxychlor	8081A	Approved
Chlordane in Soil	38141	7250	Chlordane	8081A	Approved
Toxaphene in Soil	38066	8250	Toxaphene	8081B	Approved
Chlorinated Pesticides in Soil	38101	7355	4,4'-DDD	8081B	Approved
Chlorinated Pesticides in Soil	38101	7360	4,4'-DDE	8081B	Approved
Chlorinated Pesticides in Soil	38101	7365	4,4'-DDT	8081B	Approved
Chlorinated Pesticides in Soil	38101	7110	a-BHC	8081B	Approved
Chlorinated Pesticides in Soil	38101	7240	a-Chlordane	8081B	Approved
Chlorinated Pesticides in Soil	38101	7025	Aldrin	8081B	Approved
Chlorinated Pesticides in Soil	38101	7115	b-BHC	8081B	Approved
Chlorinated Pesticides in Soil	38101	7105	d-BHC	8081B	Approved
Chlorinated Pesticides in Soil	38101	7470	Dieldrin	8081B	Approved
Chlorinated Pesticides in Soil	38101	7510	Endosulfan I	8081B	Approved
Chlorinated Pesticides in Soil	38101	7515	Endosulfan II	8081B	Approved
Chlorinated Pesticides in Soil	38101	7520	Endosulfan sulfate	8081B	Approved
Chlorinated Pesticides in Soil	38101	7540	Endrin	8081B	Approved
Chlorinated Pesticides in Soil	38101	7530	Endrin aldehyde	8081B	Approved
Chlorinated Pesticides in Soil	38101	7535	Endrin ketone	8081B	Approved
Chlorinated Pesticides in Soil	38101	7120	g-BHC (Lindane)	8081B	Approved
Chlorinated Pesticides in Soil	38101	7245	g-Chlordane	8081B	Approved
Chlorinated Pesticides in Soil	38101	7685	Heptachlor	8081B	Approved
Chlorinated Pesticides in Soil	38101	7690	Heptachlor epoxide	8081B	Approved
Chlorinated Pesticides in Soil	38101	7810	Methoxychlor	8081B	Approved
Chlordane in Soil	38141	7250	Chlordane	8081B	Approved
PCBs in Transformer Oil #2	38092	8880	PCB in Oil 1016	8082	Approved
PCBs in Transformer Oil #2	38092	8895	PCB in Oil 1242	8082	Approved
PCBs in Transformer Oil #2	38092	8905	PCB in Oil 1254	8082	Approved
PCBs in Transformer Oil #2	38092	8910	PCB in Oil 1260	8082	Approved
PCBs in Transformer Oil #2	38095	8880	PCB in Oil 1016	8082	Approved
PCBs in Transformer Oil #2	38095	8895	PCB in Oil 1242	8082	Approved
PCBs in Transformer Oil #2	38095	8905	PCB in Oil 1254	8082	Approved
PCBs in Transformer Oil #2	38095	8910	PCB in Oil 1260	8082	Approved
Aroclor in Soil	38142	8880	Aroclor 1016	8082	Approved
Aroclor in Soil	38142	8885	Aroclor 1221	8082	Approved
Aroclor in Soil	38142	8890	Aroclor 1232	8082	Approved
Aroclor in Soil	38142	8895	Aroclor 1242	8082	Approved
Aroclor in Soil	38142	8900	Aroclor 1248	8082	Approved
Aroclor in Soil	38142	8905	Aroclor 1254	8082	Approved
Aroclor in Soil	38142	8910	Aroclor 1260	8082	Approved
PCB in Soil	SPE-010	8912	Aroclor 1016/1242	8082	Approved
PCB in Soil	SPE-010	8880	Aroclor-1016 (PCB-1016)	8082	Approved
PCB in Soil	SPE-010	8885	Aroclor-1221 (PCB-1221)	8082	Approved
PCB in Soil	SPE-010	8890	Aroclor-1232 (PCB-1232)	8082	Approved
PCB in Soil	SPE-010	8895	Aroclor-1242 (PCB-1242)	8082	Approved
PCB in Soil	SPE-010	8900	Aroclor-1248 (PCB-1248)	8082	Approved
PCB in Soil	SPE-010	8905	Aroclor-1254 (PCB-1254)	8082	Approved
PCB in Soil	SPE-010	8910	Aroclor-1260 (PCB-1260)	8082	Approved
PCB in Soil	SPE-010	8912	Aroclor 1016/1242	8082	Approved
PCB in Soil	SPE-010	8880	Aroclor-1016 (PCB-1016)	8082	Approved
PCB in Soil	SPE-010	8885	Aroclor-1221 (PCB-1221)	8082	Approved
PCB in Soil	SPE-010	8890	Aroclor-1232 (PCB-1232)	8082	Approved
PCB in Soil	SPE-010	8895	Aroclor-1242 (PCB-1242)	8082	Approved
PCB in Soil	SPE-010	8900	Aroclor-1248 (PCB-1248)	8082	Approved
PCB in Soil	SPE-010	8905	Aroclor-1254 (PCB-1254)	8082	Approved
PCB in Soil	SPE-010	8910	Aroclor-1260 (PCB-1260)	8082	Approved
PCBs in Transformer Oil #2	38092	8880	PCB in Oil 1016	8082A	Approved
PCBs in Transformer Oil #2	38092	8895	PCB in Oil 1242	8082A	Approved
PCBs in Transformer Oil #2	38092	8905	PCB in Oil 1254	8082A	Approved
PCBs in Transformer Oil #2	38092	8910	PCB in Oil 1260	8082A	Approved
PCBs in Transformer Oil #2	38095	8880	PCB in Oil 1016	8082A	Approved
PCBs in Transformer Oil #2	38095	8895	PCB in Oil 1242	8082A	Approved
PCBs in Transformer Oil #2	38095	8905	PCB in Oil 1254	8082A	Approved
PCBs in Transformer Oil #2	38095	8910	PCB in Oil 1260	8082A	Approved
Aroclor in Soil	38142	8880	Aroclor 1016	8082A	Approved
Aroclor in Soil	38142	8885	Aroclor 1221	8082A	Approved
Aroclor in Soil	38142	8890	Aroclor 1232	8082A	Approved
Aroclor in Soil	38142	8895	Aroclor 1242	8082A	Approved
Aroclor in Soil	38142	8900	Aroclor 1248	8082A	Approved
Aroclor in Soil	38142	8905	Aroclor 1254	8082A	Approved
Aroclor in Soil	38142	8910	Aroclor 1260	8082A	Approved
PCB in Soil	SPE-010	8912	Aroclor 1016/1242	8082A	Approved
PCB in Soil	SPE-010	8880	Aroclor-1016 (PCB-1016)	8082A	Approved

PCB in Soil	SPE-010	8885	Aroclor-1221 (PCB-1221)	8082A	Approved
PCB in Soil	SPE-010	8890	Aroclor-1232 (PCB-1232)	8082A	Approved
PCB in Soil	SPE-010	8895	Aroclor-1242 (PCB-1242)	8082A	Approved
PCB in Soil	SPE-010	8900	Aroclor-1248 (PCB-1248)	8082A	Approved
PCB in Soil	SPE-010	8905	Aroclor-1254 (PCB-1254)	8082A	Approved
PCB in Soil	SPE-010	8910	Aroclor-1260 (PCB-1260)	8082A	Approved
PCB in Soil	SPE-010	8912	Aroclor 1016/1242	8082A	Approved
PCB in Soil	SPE-010	8880	Aroclor-1016 (PCB-1016)	8082A	Approved
PCB in Soil	SPE-010	8885	Aroclor-1221 (PCB-1221)	8082A	Approved
PCB in Soil	SPE-010	8890	Aroclor-1232 (PCB-1232)	8082A	Approved
PCB in Soil	SPE-010	8895	Aroclor-1242 (PCB-1242)	8082A	Approved
PCB in Soil	SPE-010	8900	Aroclor-1248 (PCB-1248)	8082A	Approved
PCB in Soil	SPE-010	8905	Aroclor-1254 (PCB-1254)	8082A	Approved
PCB in Soil	SPE-010	8910	Aroclor-1260 (PCB-1260)	8082A	Approved
OrganoPhosphorus Pesticides	38151	7075	Azinphosmethyl	8141A	Approved
OrganoPhosphorus Pesticides	38151	7390	Demeton, (Mix of Isomers O:S)	8141A	Approved
OrganoPhosphorus Pesticides	38151	7410	Diazinon	8141A	Approved
OrganoPhosphorus Pesticides	38151	8625	Disulfoton	8141A	Approved
OrganoPhosphorus Pesticides	38151	8110	Fenchlorphos (Ronnel)	8141A	Approved
OrganoPhosphorus Pesticides	38151	7770	Malathion	8141A	Approved
OrganoPhosphorus Pesticides	38151	7955	Parathion ethyl	8141A	Approved
OrganoPhosphorus Pesticides	38151	7825	Parathion methyl	8141A	Approved
OrganoPhosphorus Pesticides	38151	7985	Phorate	8141A	Approved
OrganoPhosphorus Pesticides	38151	8200	Tetrachlorvinphos (Stirophos)	8141A	Approved
OrganoPhosphorus Pesticides	38151	7075	Azinphosmethyl	8141B	Approved
OrganoPhosphorus Pesticides	38151	7390	Demeton, (Mix of Isomers O:S)	8141B	Approved
OrganoPhosphorus Pesticides	38151	7410	Diazinon	8141B	Approved
OrganoPhosphorus Pesticides	38151	8625	Disulfoton	8141B	Approved
OrganoPhosphorus Pesticides	38151	8110	Fenchlorphos (Ronnel)	8141B	Approved
OrganoPhosphorus Pesticides	38151	7770	Malathion	8141B	Approved
OrganoPhosphorus Pesticides	38151	7955	Parathion ethyl	8141B	Approved
OrganoPhosphorus Pesticides	38151	7825	Parathion methyl	8141B	Approved
OrganoPhosphorus Pesticides	38151	7985	Phorate	8141B	Approved
OrganoPhosphorus Pesticides	38151	8200	Tetrachlorvinphos (Stirophos)	8141B	Approved
Herbicide Acids in Soil	38146	8655	2,4,5-T	8151A	Approved
Herbicide Acids in Soil	38146	8650	2,4,5-TP	8151A	Approved
Herbicide Acids in Soil	38146	8545	2,4-D	8151A	Approved
Herbicide Acids in Soil	38146	8560	2,4-DB	8151A	Approved
Herbicide Acids in Soil	38146	8555	Dalapon	8151A	Approved
Herbicide Acids in Soil	38146	8595	Dicamba	8151A	Approved
Herbicide Acids in Soil	38146	8620	Dinoseb	8151A	Approved
Herbicide Acids in Soil	38146	6605	Pentachlorophenol	8151A	Approved
NPTA			Dichlorprop (2,4-DP)	8151A	Approved
NPTA			MCPA	8151A	Approved
NPTA			MSPP	8151A	Approved
Volatiles in Soil	38084	5105	1,1,1,2-Tetrachloroethane	8260B	Approved
Volatiles in Soil	38084	5160	1,1,1-Trichloroethane	8260B	Approved
Volatiles in Soil	38084	5110	1,1,2,2-Tetrachloroethane	8260B	Approved
Volatiles in Soil	38084	5165	1,1,2-Trichloroethane	8260B	Approved
Volatiles in Soil	38084	4630	1,1-Dichloroethane	8260B	Approved
Volatiles in Soil	38084	4640	1,1-Dichloroethene	8260B	Approved
Volatiles in Soil	38084	4670	1,1-Dichloropropene	8260B	Approved
Volatiles in Soil	38084	5150	1,2,3-Trichlorobenzene	8260B	Approved
Volatiles in Soil	38084	5180	1,2,3-Trichloropropane	8260B	Approved
Volatiles in Soil	38084	5155	1,2,4-Trichlorobenzene	8260B	Approved
Volatiles in Soil	38084	5210	1,2,4-Trimethylbenzene	8260B	Approved
Volatiles in Soil	38084	4570	1,2-Dibromo-3-chloropropane	8260B	Approved
Volatiles in Soil	38084	4585	1,2-Dibromoethane	8260B	Approved
Volatiles in Soil	38084	4610	1,2-Dichlorobenzene	8260B	Approved
Volatiles in Soil	38084	4635	1,2-Dichloroethane	8260B	Approved
Volatiles in Soil	38084	4655	1,2-Dichloropropane	8260B	Approved
Volatiles in Soil	38084	5215	1,3,5-Trimethylbenzene	8260B	Approved
Volatiles in Soil	38084	4615	1,3-Dichlorobenzene	8260B	Approved
Volatiles in Soil	38084	4660	1,3-Dichloropropane	8260B	Approved
Volatiles in Soil	38084	4620	1,4-Dichlorobenzene	8260B	Approved
Volatiles in Soil	38084	4665	2,2-Dichloropropane	8260B	Approved
Volatiles in Soil	38084	4535	2-Chlorotoluene	8260B	Approved
Volatiles in Soil	38084	4540	4-Chlorotoluene	8260B	Approved
Volatiles in Soil	38084	4995	4-Methyl-2-pentanone	8260B	Approved
Volatiles in Soil	38084	4375	Benzene	8260B	Approved
Volatiles in Soil	38084	4385	Bromobenzene	8260B	Approved
Volatiles in Soil	38084	4390	Bromochloromethane	8260B	Approved
Volatiles in Soil	38084	4395	Bromodichloromethane	8260B	Approved
Volatiles in Soil	38084	4400	Bromoform	8260B	Approved

Volatiles in Soil	38084	4950	Bromomethane	8260B	Approved
Volatiles in Soil	38084	4450	Carbon disulphide	8260B	Approved
Volatiles in Soil	38084	4455	Carbon tetrachloride	8260B	Approved
Volatiles in Soil	38084	4475	Chlorobenzene	8260B	Approved
Volatiles in Soil	38084	4485	Chloroethane	8260B	Approved
Volatiles in Soil	38084	4505	Chloroform	8260B	Approved
Volatiles in Soil	38084	4960	Chloromethane	8260B	Approved
Volatiles in Soil	38084	4645	cis-1,2-Dichloroethene	8260B	Approved
Volatiles in Soil	38084	4680	cis-1,3-Dichloropropene	8260B	Approved
Volatiles in Soil	38084	4575	Dibromochloromethane	8260B	Approved
Volatiles in Soil	38084	4595	Dibromomethane	8260B	Approved
Volatiles in Soil	38084	4625	Dichlorodifluoromethane	8260B	Approved
Volatiles in Soil	38084	4765	Ethyl benzene	8260B	Approved
Volatiles in Soil	38084	4835	Hexachlorobutadiene	8260B	Approved
Volatiles in Soil	38084	4840	Hexachloroethane	8260B	Approved
Volatiles in Soil	38084	4900	Isopropylbenzene	8260B	Approved
Volatiles in Soil	38084	5000	Methyl tert-butyl ether (MTBE)	8260B	Approved
Volatiles in Soil	38084	4975	Methylene chloride	8260B	Approved
Volatiles in Soil	38084	5005	Naphthalene	8260B	Approved
Volatiles in Soil	38084	4435	n-Butyl benzene	8260B	Approved
Volatiles in Soil	38084	5090	n-Propylbenzene	8260B	Approved
Volatiles in Soil	38084	4910	p-Isopropyl toluene	8260B	Approved
Volatiles in Soil	38084	4440	sec-Butyl benzene	8260B	Approved
Volatiles in Soil	38084	5100	Styrene	8260B	Approved
Volatiles in Soil	38084	4445	tert-Butyl benzene	8260B	Approved
Volatiles in Soil	38084	5140	Toluene	8260B	Approved
Volatiles in Soil	38084	5260	Total Xylenes	8260B	Approved
Volatiles in Soil	38084	4700	trans-1,2-Dichloroethene	8260B	Approved
Volatiles in Soil	38084	5170	Trichloroethene	8260B	Approved
Volatiles in Soil	38084	5175	Trichlorofluoromethane	8260B	Approved
Volatiles in Soil	38084	5235	Vinyl chloride	8260B	Approved
RCRA BTEX & MTBE	38161	4375	Benzene	8260B	Approved
RCRA BTEX & MTBE	38161	4765	Ethyl benzene	8260B	Approved
RCRA BTEX & MTBE	38161	5140	Toluene	8260B	Approved
RCRA BTEX & MTBE	38161	5000	Methyl tert-butyl ether (MTBE)	8260B	Approved
RCRA BTEX & MTBE	38161	5260	Total Xylenes	8260B	Approved
RCRA Ketones in Soil	38167	4410	2-Butanone (Methyl ethyl ketone)	8260B	Approved
RCRA Ketones in Soil	38167	4860	2-Hexanone	8260B	Approved
RCRA Ketones in Soil	38167	4995	4-Methyl-2-pentanone	8260B	Approved
RCRA Ketones in Soil	38167	4315	Acetone	8260B	Approved
RCRA Oxygenates	38169	5185	1,1,2-Trichlorotrifluoroethane	8260B	Approved
RCRA Oxygenates	38169	4770	Ethyl tert-butyl ether	8260B	Approved
RCRA Oxygenates	38169	9375	Isopropyl ether	8260B	Approved
RCRA Oxygenates	38169	5000	Methyl tert-butyl ether (MTBE)	8260B	Approved
RCRA Oxygenates	38169	5090	n-Propylbenzene	8260B	Approved
RCRA Oxygenates	38169	4370	tert-Amyl methyl ether	8260B	Approved
RCRA Oxygenates	38169	4420	tert-Butyl alcohol (t-Butanol)	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5105	1,1,1,2-Tetrachloroethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5160	1,1,1-Trichloroethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5110	1,1,2,2-Tetrachloroethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5165	1,1,2-Trichloroethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4630	1,1-Dichloroethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4640	1,1-Dichloroethene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5180	1,2,3-Trichloropropane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5155	1,2,4-Trichlorobenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4570	1,2-Dibromo-3-chloropropane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4585	1,2-Dibromoethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4610	1,2-Dichlorobenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4635	1,2-Dichloroethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4655	1,2-Dichloropropane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4615	1,3-Dichlorobenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4620	1,4-Dichlorobenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4410	2-Butanone (Methyl ethyl ketone)	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4860	2-Hexanone	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4995	4-Methyl-2-pentanone	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4315	Acetone	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4375	Benzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4385	Bromobenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4395	Bromodichloromethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4400	Bromoform	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4950	Bromomethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4455	Carbon tetrachloride	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4475	Chlorobenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4485	Chloroethane	8260B	Approved

RCRA Medium Level Volatiles in Soil	38199	4505	Chloroform	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4960	Chloromethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4645	cis-1,2-Dichloroethene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4680	cis-1,3-Dichloropropene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4575	Dibromochloromethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4595	Dibromomethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4625	Dichlorodifluoromethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4765	Ethyl benzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4900	Isopropylbenzene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5000	Methyl tert-butyl ether (MTBE)	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4975	Methylene chloride	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5005	Naphthalene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5100	Styrene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5115	Tetrachloroethene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5140	Toluene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4700	trans-1,2-Dichloroethene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	4685	trans-1,3-Dichloropropene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5170	Trichloroethene	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5175	Trichlorofluoromethane	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5235	Vinyl chloride	8260B	Approved
RCRA Medium Level Volatiles in Soil	38199	5260	Xylenes, total	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	4375	Benzene	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	4765	Ethylbenzene	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	5240	m+p-Xylene	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	5000	MTBE	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	5250	o-Xylene	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	5140	Toluene	8260B	Approved
GRO/BTEX in Soil	SPE-025AK	5260	Xylene, total	8260B	Approved
NPTA			Cyclohexane	8260B	Approved
NPTA			Methyl Acetate	8260B	Approved
NPTA			Methylcyclohexane	8260B	Approved
NPTA			m&p Xylenes	8260B	Approved
NPTA			o-Xylene	8260B	Approved
NPTA			p-isopropyltoluene	8260B	Approved
NPTA			Vinyl Acetate	8260B	Approved
Volatiles in Soil	38084	5105	1,1,1,2-Tetrachloroethane	8260C	Approved
Volatiles in Soil	38084	5160	1,1,1-Trichloroethane	8260C	Approved
Volatiles in Soil	38084	5110	1,1,2,2-Tetrachloroethane	8260C	Approved
Volatiles in Soil	38084	5165	1,1,2-Trichloroethane	8260C	Approved
Volatiles in Soil	38084	4630	1,1-Dichloroethane	8260C	Approved
Volatiles in Soil	38084	4640	1,1-Dichloroethene	8260C	Approved
Volatiles in Soil	38084	4670	1,1-Dichloropropene	8260C	Approved
Volatiles in Soil	38084	5150	1,2,3-Trichlorobenzene	8260C	Approved
Volatiles in Soil	38084	5180	1,2,3-Trichloropropane	8260C	Approved
Volatiles in Soil	38084	5155	1,2,4-Trichlorobenzene	8260C	Approved
Volatiles in Soil	38084	5210	1,2,4-Trimethylbenzene	8260C	Approved
Volatiles in Soil	38084	4570	1,2-Dibromo-3-chloropropane	8260C	Approved
Volatiles in Soil	38084	4585	1,2-Dibromoethane	8260C	Approved
Volatiles in Soil	38084	4610	1,2-Dichlorobenzene	8260C	Approved
Volatiles in Soil	38084	4635	1,2-Dichloroethane	8260C	Approved
Volatiles in Soil	38084	4655	1,2-Dichloropropane	8260C	Approved
Volatiles in Soil	38084	5215	1,3,5-Trimethylbenzene	8260C	Approved
Volatiles in Soil	38084	4615	1,3-Dichlorobenzene	8260C	Approved
Volatiles in Soil	38084	4660	1,3-Dichloropropane	8260C	Approved
Volatiles in Soil	38084	4620	1,4-Dichlorobenzene	8260C	Approved
Volatiles in Soil	38084	4665	2,2-Dichloropropane	8260C	Approved
Volatiles in Soil	38084	4535	2-Chlorotoluene	8260C	Approved
Volatiles in Soil	38084	4540	4-Chlorotoluene	8260C	Approved
Volatiles in Soil	38084	4995	4-Methyl-2-pentanone	8260C	Approved
Volatiles in Soil	38084	4375	Benzene	8260C	Approved
Volatiles in Soil	38084	4385	Bromobenzene	8260C	Approved
Volatiles in Soil	38084	4390	Bromochloromethane	8260C	Approved
Volatiles in Soil	38084	4395	Bromodichloromethane	8260C	Approved
Volatiles in Soil	38084	4400	Bromoform	8260C	Approved
Volatiles in Soil	38084	4950	Bromomethane	8260C	Approved
Volatiles in Soil	38084	4450	Carbon disulphide	8260C	Approved
Volatiles in Soil	38084	4455	Carbon tetrachloride	8260C	Approved
Volatiles in Soil	38084	4475	Chlorobenzene	8260C	Approved
Volatiles in Soil	38084	4485	Chloroethane	8260C	Approved
Volatiles in Soil	38084	4505	Chloroform	8260C	Approved
Volatiles in Soil	38084	4960	Chloromethane	8260C	Approved
Volatiles in Soil	38084	4645	cis-1,2-Dichloroethene	8260C	Approved
Volatiles in Soil	38084	4680	cis-1,3-Dichloropropene	8260C	Approved
Volatiles in Soil	38084	4575	Dibromochloromethane	8260C	Approved

Volatiles in Soil	38084	4595	Dibromomethane	8260C	Approved
Volatiles in Soil	38084	4625	Dichlorodifluoromethane	8260C	Approved
Volatiles in Soil	38084	4765	Ethyl benzene	8260C	Approved
Volatiles in Soil	38084	4835	Hexachlorobutadiene	8260C	Approved
Volatiles in Soil	38084	4840	Hexachloroethane	8260C	Approved
Volatiles in Soil	38084	4900	Isopropylbenzene	8260C	Approved
Volatiles in Soil	38084	5000	Methyl tert-butyl ether (MTBE)	8260C	Approved
Volatiles in Soil	38084	4975	Methylene chloride	8260C	Approved
Volatiles in Soil	38084	5005	Naphthalene	8260C	Approved
Volatiles in Soil	38084	4435	n-Butyl benzene	8260C	Approved
Volatiles in Soil	38084	5090	n-Propylbenzene	8260C	Approved
Volatiles in Soil	38084	4910	p-Isopropyl toluene	8260C	Approved
Volatiles in Soil	38084	4440	sec-Butyl benzene	8260C	Approved
Volatiles in Soil	38084	5100	Styrene	8260C	Approved
Volatiles in Soil	38084	4445	tert-Butyl benzene	8260C	Approved
Volatiles in Soil	38084	5140	Toluene	8260C	Approved
Volatiles in Soil	38084	5260	Total Xylenes	8260C	Approved
Volatiles in Soil	38084	4700	trans-1,2-Dichloroethene	8260C	Approved
Volatiles in Soil	38084	5170	Trichloroethene	8260C	Approved
Volatiles in Soil	38084	5175	Trichlorofluoromethane	8260C	Approved
Volatiles in Soil	38084	5235	Vinyl chloride	8260C	Approved
RCRA BTEX & MTBE	38161	4375	Benzene	8260C	Approved
RCRA BTEX & MTBE	38161	4765	Ethyl benzene	8260C	Approved
RCRA BTEX & MTBE	38161	5140	Toluene	8260C	Approved
RCRA BTEX & MTBE	38161	5000	Methyl tert-butyl ether (MTBE)	8260C	Approved
RCRA BTEX & MTBE	38161	5260	Total Xylenes	8260C	Approved
RCRA Ketones in Soil	38167	4410	2-Butanone (Methyl ethyl ketone)	8260C	Approved
RCRA Ketones in Soil	38167	4860	2-Hexanone	8260C	Approved
RCRA Ketones in Soil	38167	4995	4-Methyl-2-pentanone	8260C	Approved
RCRA Ketones in Soil	38167	4315	Acetone	8260C	Approved
RCRA Oxygenates	38169	5185	1,1,2-Trichlorotrifluoroethane	8260C	Approved
RCRA Oxygenates	38169	4770	Ethyl tert-butyl ether	8260C	Approved
RCRA Oxygenates	38169	9375	Isopropyl ether	8260C	Approved
RCRA Oxygenates	38169	5000	Methyl tert-butyl ether (MTBE)	8260C	Approved
RCRA Oxygenates	38169	5090	n-Propylbenzene	8260C	Approved
RCRA Oxygenates	38169	4370	tert-Amyl methyl ether	8260C	Approved
RCRA Oxygenates	38169	4420	tert-Butyl alcohol (t-Butanol)	8260C	Approved
NPTA			Cyclohexane	8260C	Approved
NPTA			Methyl Acetate	8260C	Approved
NPTA			Methylcyclohexane	8260C	Approved
NPTA			m&p Xylenes	8260C	Approved
NPTA			o-Xylene	8260C	Approved
NPTA			p-isopropyltoluene	8260C	Approved
NPTA			Vinyl Acetate	8260C	Approved
Acenaphthylene in Soils	SPE-003	5505	Acenaphthylene	8270C	Approved
BNAs in Soil	SPE-003	5155	1,2,4-Trichlorobenzene	8270C	Approved
BNAs in Soil	SPE-003	4610	1,2-Dichlorobenzene	8270C	Approved
BNAs in Soil	SPE-003	4615	1,3-Dichlorobenzene	8270C	Approved
BNAs in Soil	SPE-003	4620	1,4-Dichlorobenzene	8270C	Approved
BNAs in Soil	SPE-003	6835	2,4,5-Trichlorophenol	8270C	Approved
BNAs in Soil	SPE-003	6840	2,4,6-Trichlorophenol	8270C	Approved
BNAs in Soil	SPE-003	6000	2,4-Dichlorophenol	8270C	Approved
BNAs in Soil	SPE-003	6130	2,4-Dimethylphenol	8270C	Approved
BNAs in Soil	SPE-003	6175	2,4-Dinitrophenol	8270C	Approved
BNAs in Soil	SPE-003	6185	2,4-Dinitrotoluene (2,4-DNT)	8270C	Approved
BNAs in Soil	SPE-003	6005	2,6-Dichlorophenol	8270C	Approved
BNAs in Soil	SPE-003	6190	2,6-Dinitrotoluene (2,6-DNT)	8270C	Approved
BNAs in Soil	SPE-003	5795	2-Chloronaphthalene	8270C	Approved
BNAs in Soil	SPE-003	5800	2-Chlorophenol	8270C	Approved
BNAs in Soil	SPE-003	6360	2-Methyl-4,6-dinitrophenol	8270C	Approved
BNAs in Soil	SPE-003	6385	2-Methylnaphthalene	8270C	Approved
BNAs in Soil	SPE-003	6400	2-Methylphenol (o-Cresol)	8270C	Approved
BNAs in Soil	SPE-003	6460	2-Nitroaniline	8270C	Approved
BNAs in Soil	SPE-003	6490	2-Nitrophenol	8270C	Approved
BNAs in Soil	SPE-003	5945	3,3'-Dichlorobenzidine	8270C	Approved
BNAs in Soil	SPE-003	6410	3+4-Methylphenol (m+p-Cresol)	8270C	Approved
BNAs in Soil	SPE-003	6405	3-Methylphenol (m-Cresol)	8270C	Approved
BNAs in Soil	SPE-003	6465	3-Nitroaniline	8270C	Approved
BNAs in Soil	SPE-003	5660	4-Bromophenyl phenyl ether	8270C	Approved
BNAs in Soil	SPE-003	5700	4-Chloro-3-methylphenol	8270C	Approved
BNAs in Soil	SPE-003	5745	4-Chloroaniline	8270C	Approved
BNAs in Soil	SPE-003	5825	4-Chlorophenyl phenylether	8270C	Approved
BNAs in Soil	SPE-003	6410	4-Methylphenol (p-Cresol)	8270C	Approved
BNAs in Soil	SPE-003	6470	4-Nitroaniline	8270C	Approved

BNAs in Soil	SPE-003	6500	4-Nitrophenol	8270C	Approved
BNAs in Soil	SPE-003	5500	Acenaphthene	8270C	Approved
BNAs in Soil	SPE-003	5505	Acenaphthylene	8270C	Approved
BNAs in Soil	SPE-003	5545	Aniline	8270C	Approved
BNAs in Soil	SPE-003	5555	Anthracene	8270C	Approved
BNAs in Soil	SPE-003	5595	Benzidine	8270C	Approved
BNAs in Soil	SPE-003	5575	Benzo(a)anthracene	8270C	Approved
BNAs in Soil	SPE-003	5580	Benzo(a)pyrene	8270C	Approved
BNAs in Soil	SPE-003	5585	Benzo(b)fluoranthene	8270C	Approved
BNAs in Soil	SPE-003	5590	Benzo(g,h,i)perylene	8270C	Approved
BNAs in Soil	SPE-003	5600	Benzo(k)fluoranthene	8270C	Approved
BNAs in Soil	SPE-003	5610	Benzoic acid	8270C	Approved
BNAs in Soil	SPE-003	5630	Benzyl alcohol	8270C	Approved
BNAs in Soil	SPE-003	5760	bis(2-Chloroethoxy)methane	8270C	Approved
BNAs in Soil	SPE-003	5765	bis(2-Chloroethyl) ether	8270C	Approved
BNAs in Soil	SPE-003	5780	bis(2-Chloroisopropyl) ether	8270C	Approved
BNAs in Soil	SPE-003	6255	bis(2-Ethylhexyl) phthalate (DEHP)	8270C	Approved
BNAs in Soil	SPE-003	5670	Butyl benzyl phthalate	8270C	Approved
BNAs in Soil	SPE-003	5680	Carbazole	8270C	Approved
BNAs in Soil	SPE-003	5855	Chrysene	8270C	Approved
BNAs in Soil	SPE-003	5895	Dibenz(a,h) anthracene	8270C	Approved
BNAs in Soil	SPE-003	5905	Dibenzofuran	8270C	Approved
BNAs in Soil	SPE-003	6070	Diethyl phthalate	8270C	Approved
BNAs in Soil	SPE-003	6135	Dimethyl phthalate	8270C	Approved
BNAs in Soil	SPE-003	5925	Di-n-butyl phthalate	8270C	Approved
BNAs in Soil	SPE-003	6200	Di-n-octyl phthalate	8270C	Approved
BNAs in Soil	SPE-003	6265	Fluoranthene	8270C	Approved
BNAs in Soil	SPE-003	6270	Fluorene	8270C	Approved
BNAs in Soil	SPE-003	6275	Hexachlorobenzene	8270C	Approved
BNAs in Soil	SPE-003	4835	Hexachlorobutadiene	8270C	Approved
BNAs in Soil	SPE-003	6285	Hexachlorocyclopentadiene	8270C	Approved
BNAs in Soil	SPE-003	4840	Hexachloroethane	8270C	Approved
BNAs in Soil	SPE-003	6315	Indeno(1,2,3-cd) pyrene	8270C	Approved
BNAs in Soil	SPE-003	6320	Isophorone	8270C	Approved
BNAs in Soil	SPE-003	5005	Naphthalene	8270C	Approved
BNAs in Soil	SPE-003	5015	Nitrobenzene	8270C	Approved
BNAs in Soil	SPE-003	6530	n-Nitrosodimethylamine	8270C	Approved
BNAs in Soil	SPE-003	6545	n-Nitroso-di-n-propylamine	8270C	Approved
BNAs in Soil	SPE-003	6535	n-Nitrosodiphenylamine	8270C	Approved
BNAs in Soil	SPE-003	6605	Pentachlorophenol	8270C	Approved
BNAs in Soil	SPE-003	6615	Phenanthrene	8270C	Approved
BNAs in Soil	SPE-003	6625	Phenol	8270C	Approved
BNAs in Soil	SPE-003	6665	Pyrene	8270C	Approved
BNAs in Soil	SPE-003	5095	Pyridine	8270C	Approved
Low-Level PAHs in Soil	722	6665	Pyrene	8270CSIM	Approved
PAHs - Solids	SPE-017	5005	Naphthalene	8270CSIM	Approved
PAHs - Solids	SPE-017	5500	Acenaphthene	8270CSIM	Approved
PAHs - Solids	SPE-017	5505	Acenaphthylene	8270CSIM	Approved
PAHs - Solids	SPE-017	5555	Anthracene	8270CSIM	Approved
PAHs - Solids	SPE-017	5575	Benzo(a)anthracene	8270CSIM	Approved
PAHs - Solids	SPE-017	5580	Benzo(a)pyrene	8270CSIM	Approved
PAHs - Solids	SPE-017	5585	Benzo(b)fluoranthene	8270CSIM	Approved
PAHs - Solids	SPE-017	5590	Benzo(g,h,I)perylene	8270CSIM	Approved
PAHs - Solids	SPE-017	5600	Benzo(k)fluoranthene	8270CSIM	Approved
PAHs - Solids	SPE-017	5855	Chrysene	8270CSIM	Approved
PAHs - Solids	SPE-017	5895	Dibenzo(a,h)anthracene	8270CSIM	Approved
PAHs - Solids	SPE-017	6265	Fluoranthene	8270CSIM	Approved
PAHs - Solids	SPE-017	6270	Fluorene	8270CSIM	Approved
PAHs - Solids	SPE-017	6315	Indeno(1,2,3-cd) pyrene	8270CSIM	Approved
PAHs - Solids	SPE-017	6385	2-Methylnaphthalene	8270CSIM	Approved
PAHs - Solids	SPE-017	6615	Phenanthrene	8270CSIM	Approved
PAHs - Solids	SPE-017	6665	Pyrene	8270CSIM	Approved
BNAs in Soil	SPE-003	5155	1,2,4-Trichlorobenzene	8270D	Approved
BNAs in Soil	SPE-003	4610	1,2-Dichlorobenzene	8270D	Approved
BNAs in Soil	SPE-003	4615	1,3-Dichlorobenzene	8270D	Approved
BNAs in Soil	SPE-003	4620	1,4-Dichlorobenzene	8270D	Approved
BNAs in Soil	SPE-003	6835	2,4,5-Trichlorophenol	8270D	Approved
BNAs in Soil	SPE-003	6840	2,4,6-Trichlorophenol	8270D	Approved
BNAs in Soil	SPE-003	6000	2,4-Dichlorophenol	8270D	Approved
BNAs in Soil	SPE-003	6130	2,4-Dimethylphenol	8270D	Approved
BNAs in Soil	SPE-003	6175	2,4-Dinitrophenol	8270D	Approved
BNAs in Soil	SPE-003	6185	2,4-Dinitrotoluene (2,4-DNT)	8270D	Approved
BNAs in Soil	SPE-003	6005	2,6-Dichlorophenol	8270D	Approved
BNAs in Soil	SPE-003	6190	2,6-Dinitrotoluene (2,6-DNT)	8270D	Approved

BNAs in Soil	SPE-003	5795	2-Chloronaphthalene	8270D	Approved
BNAs in Soil	SPE-003	5800	2-Chlorophenol	8270D	Approved
BNAs in Soil	SPE-003	6360	2-Methyl-4,6-dinitrophenol	8270D	Approved
BNAs in Soil	SPE-003	6385	2-Methylnaphthalene	8270D	Approved
BNAs in Soil	SPE-003	6400	2-Methylphenol (o-Cresol)	8270D	Approved
BNAs in Soil	SPE-003	6460	2-Nitroaniline	8270D	Approved
BNAs in Soil	SPE-003	6490	2-Nitrophenol	8270D	Approved
BNAs in Soil	SPE-003	5945	3,3'-Dichlorobenzidine	8270D	Approved
BNAs in Soil	SPE-003	6410	3+4-Methylphenol (m+p-Cresol)	8270D	Approved
BNAs in Soil	SPE-003	6405	3-Methylphenol (m-Cresol)	8270D	Approved
BNAs in Soil	SPE-003	6465	3-Nitroaniline	8270D	Approved
BNAs in Soil	SPE-003	5660	4-Bromophenyl phenyl ether	8270D	Approved
BNAs in Soil	SPE-003	5700	4-Chloro-3-methylphenol	8270D	Approved
BNAs in Soil	SPE-003	5745	4-Chloroaniline	8270D	Approved
BNAs in Soil	SPE-003	5825	4-Chlorophenyl phenylether	8270D	Approved
BNAs in Soil	SPE-003	6410	4-Methylphenol (p-Cresol)	8270D	Approved
BNAs in Soil	SPE-003	6470	4-Nitroaniline	8270D	Approved
BNAs in Soil	SPE-003	6500	4-Nitrophenol	8270D	Approved
BNAs in Soil	SPE-003	5500	Acenaphthene	8270D	Approved
BNAs in Soil	SPE-003	5505	Acenaphthylene	8270D	Approved
BNAs in Soil	SPE-003	5545	Aniline	8270D	Approved
BNAs in Soil	SPE-003	5555	Anthracene	8270D	Approved
BNAs in Soil	SPE-003	5595	Benzidine	8270D	Approved
BNAs in Soil	SPE-003	5575	Benzo(a)anthracene	8270D	Approved
BNAs in Soil	SPE-003	5580	Benzo(a)pyrene	8270D	Approved
BNAs in Soil	SPE-003	5585	Benzo(b)fluoranthene	8270D	Approved
BNAs in Soil	SPE-003	5590	Benzo(g,h,i)perylene	8270D	Approved
BNAs in Soil	SPE-003	5600	Benzo(k)fluoranthene	8270D	Approved
BNAs in Soil	SPE-003	5610	Benzoic acid	8270D	Approved
BNAs in Soil	SPE-003	5630	Benzyl alcohol	8270D	Approved
BNAs in Soil	SPE-003	5760	bis(2-Chloroethoxy)methane	8270D	Approved
BNAs in Soil	SPE-003	5765	bis(2-Chloroethyl) ether	8270D	Approved
BNAs in Soil	SPE-003	5780	bis(2-Chloroisopropyl) ether	8270D	Approved
BNAs in Soil	SPE-003	6255	bis(2-Ethylhexyl) phthalate (DEHP)	8270D	Approved
BNAs in Soil	SPE-003	5670	Butyl benzyl phthalate	8270D	Approved
BNAs in Soil	SPE-003	5680	Carbazole	8270D	Approved
BNAs in Soil	SPE-003	5855	Chrysene	8270D	Approved
BNAs in Soil	SPE-003	5895	Dibenz(a,h) anthracene	8270D	Approved
BNAs in Soil	SPE-003	5905	Dibenzofuran	8270D	Approved
BNAs in Soil	SPE-003	6070	Diethyl phthalate	8270D	Approved
BNAs in Soil	SPE-003	6135	Dimethyl phthalate	8270D	Approved
BNAs in Soil	SPE-003	5925	Di-n-butyl phthalate	8270D	Approved
BNAs in Soil	SPE-003	6200	Di-n-octyl phthalate	8270D	Approved
BNAs in Soil	SPE-003	6265	Fluoranthene	8270D	Approved
BNAs in Soil	SPE-003	6270	Fluorene	8270D	Approved
BNAs in Soil	SPE-003	6275	Hexachlorobenzene	8270D	Approved
BNAs in Soil	SPE-003	4835	Hexachlorobutadiene	8270D	Approved
BNAs in Soil	SPE-003	6285	Hexachlorocyclopentadiene	8270D	Approved
BNAs in Soil	SPE-003	4840	Hexachloroethane	8270D	Approved
BNAs in Soil	SPE-003	6315	Indeno(1,2,3-cd) pyrene	8270D	Approved
BNAs in Soil	SPE-003	6320	Isophorone	8270D	Approved
BNAs in Soil	SPE-003	5005	Naphthalene	8270D	Approved
BNAs in Soil	SPE-003	5015	Nitrobenzene	8270D	Approved
BNAs in Soil	SPE-003	6530	n-Nitrosodimethylamine	8270D	Approved
BNAs in Soil	SPE-003	6545	n-Nitroso-di-n-propylamine	8270D	Approved
BNAs in Soil	SPE-003	6535	n-Nitrosodiphenylamine	8270D	Approved
BNAs in Soil	SPE-003	6605	Pentachlorophenol	8270D	Approved
BNAs in Soil	SPE-003	6615	Phenanthrene	8270D	Approved
BNAs in Soil	SPE-003	6625	Phenol	8270D	Approved
BNAs in Soil	SPE-003	6665	Pyrene	8270D	Approved
BNAs in Soil	SPE-003	5095	Pyridine	8270D	Approved
PAHs - Solids	SPE-017	5005	Naphthalene	8270DSIM	Approved
PAHs - Solids	SPE-017	5500	Acenaphthene	8270DSIM	Approved
PAHs - Solids	SPE-017	5505	Acenaphthylene	8270DSIM	Approved
PAHs - Solids	SPE-017	5555	Anthracene	8270DSIM	Approved
PAHs - Solids	SPE-017	5575	Benzo(a)anthracene	8270DSIM	Approved
PAHs - Solids	SPE-017	5580	Benzo(a)pyrene	8270DSIM	Approved
PAHs - Solids	SPE-017	5585	Benzo(b)fluoranthene	8270DSIM	Approved
PAHs - Solids	SPE-017	5590	Benzo(g,h,I)perylene	8270DSIM	Approved
PAHs - Solids	SPE-017	5600	Benzo(k)fluoranthene	8270DSIM	Approved
PAHs - Solids	SPE-017	5855	Chrysene	8270DSIM	Approved
PAHs - Solids	SPE-017	5895	Dibenzo(a,h)anthracene	8270DSIM	Approved
PAHs - Solids	SPE-017	6265	Fluoranthene	8270DSIM	Approved
PAHs - Solids	SPE-017	6270	Fluorene	8270DSIM	Approved

PAHs - Solids	SPE-017	6315	Indeno(1,2,3-cd) pyrene	8270DSIM	Approved
PAHs - Solids	SPE-017	6385	2-Methylnaphthalene	8270DSIM	Approved
PAHs - Solids	SPE-017	6615	Phenanthrene	8270DSIM	Approved
PAHs - Solids	SPE-017	6665	Pyrene	8270DSIM	Approved
Dioxins and Furans in Soil	SPE-016	9612	2,3,7,8-TCDD	8290	Approved
Dioxins and Furans in Soil	SPE-016	9606	PCDD + PCDF, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9992	PCDD, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9615	TCDD, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9519	1,2,3,4,6,7,8,9-OCDD	8290	Approved
Dioxins and Furans in Soil	SPE-016	9516	1,2,3,4,6,7,8,9-OCDF	8290	Approved
Dioxins and Furans in Soil	SPE-016	9426	1,2,3,4,6,7,8-Hpcdd	8290	Approved
Dioxins and Furans in Soil	SPE-016	9420	1,2,3,4,6,7,8-Hpcdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9423	1,2,3,4,7,8,9-Hpcdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9453	1,2,3,4,7,8-Hxcdd	8290	Approved
Dioxins and Furans in Soil	SPE-016	9471	1,2,3,4,7,8-Hxcdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9456	1,2,3,6,7,8-Hxcdd	8290	Approved
Dioxins and Furans in Soil	SPE-016	9474	1,2,3,6,7,8-Hxcdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9459	1,2,3,7,8,9-Hxcdd	8290	Approved
Dioxins and Furans in Soil	SPE-016	9477	1,2,3,7,8,9-Hxcdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9540	1,2,3,7,8-Pecdd	8290	Approved
Dioxins and Furans in Soil	SPE-016	9543	1,2,3,7,8-Pecdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9480	2,3,4,6,7,8-Hxcdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9549	2,3,4,7,8-Pecdf	8290	Approved
Dioxins and Furans in Soil	SPE-016	9606	2,3,7,8-TCDD	8290	Approved
Dioxins and Furans in Soil	SPE-016	9989	2,3,7,8-TCDF	8290	Approved
Dioxins and Furans in Soil	SPE-016	9438	Hpcdd, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9444	Hpcdf, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9468	Hxcdd, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9483	Hxcdf, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9992	PCDD + PCDF, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9991	PCDD, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9993	PCDF, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9555	Pecdd, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9552	Pecdf, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9989	TCDD, total	8290	Approved
Dioxins and Furans in Soil	SPE-016	9991	TCDF, total	8290	Approved
RCRA Carbamates	38158	7710	3-Hydroxycarbofuran	8321A	Approved
RCRA Carbamates	38158	7010	Aldicarb	8321A	Approved
RCRA Carbamates	38158	7015	Aldicarb sulfone	8321A	Approved
RCRA Carbamates	38158	7020	Aldicarb sulfoxide	8321A	Approved
RCRA Carbamates	38158	8080	Baygon (Propoxur)	8321A	Approved
RCRA Carbamates	38158	7195	Carbaryl	8321A	Approved
RCRA Carbamates	38158	7205	Carbofuran	8321A	Approved
RCRA Carbamates	38158	9384	Dioxacarb	8321A	Approved
RCRA Carbamates	38158	7505	Diuron	8321A	Approved
RCRA Carbamates	38158	7800	Methiocarb	8321A	Approved
RCRA Carbamates	38158	7805	Methomyl	8321A	Approved
RCRA Carbamates	38158	8025	Promecarb	8321A	Approved
RCRA Nitroaromatics in Soil	38155	6885	1,3,5-Trinitrobenzene	8330	Approved
RCRA Nitroaromatics in Soil	38155	6160	1,3-Dinitrobenzene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9651	2,4,6-Trinitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	6185	2,4-Dinitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	6190	2,6-Dinitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9303	2-Amino-4,6-dinitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9507	2-Nitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9510	3-Nitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9306	4-Amino-2,6-dinitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9513	4-Nitrotoluene	8330	Approved
RCRA Nitroaromatics in Soil	38155	9522	HMX	8330	Approved
RCRA Nitroaromatics in Soil	38155	5015	Nitrobenzene	8330	Approved
NPTA			Nitroglycerin	8330	Approved
NPTA			PGDN	8330	Approved
NPTA			Picric Acid	8330	Approved
NPTA			PETN	8330	Approved
RCRA Nitroaromatics in Soil	38155	9432	RDX	8330	Approved
RCRA Nitroaromatics in Soil	38155	6415	Tetryl	8330	Approved
RCRA Nitroaromatics in Soil	38155	6885	1,3,5-Trinitrobenzene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	6160	1,3-Dinitrobenzene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9651	2,4,6-Trinitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	6185	2,4-Dinitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	6190	2,6-Dinitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9303	2-Amino-4,6-dinitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9507	2-Nitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9510	3-Nitrotoluene	8330A	Approved

RCRA Nitroaromatics in Soil	38155	9306	4-Amino-2,6-dinitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9513	4-Nitrotoluene	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9522	HMX	8330A	Approved
RCRA Nitroaromatics in Soil	38155	5015	Nitrobenzene	8330A	Approved
NPTA			Nitroglycerin	8330A	Approved
NPTA			PGDN	8330A	Approved
NPTA			Picric Acid	8330A	Approved
NPTA			PETN	8330A	Approved
RCRA Nitroaromatics in Soil	38155	9432	RDX	8330A	Approved
RCRA Nitroaromatics in Soil	38155	6415	Tetryl	8330A	Approved
RCRA Nitroaromatics in Soil	38155	6885	1,3,5-Trinitrobenzene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	6160	1,3-Dinitrobenzene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9651	2,4,6-Trinitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9185	2,4-Dinitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	6190	2,6-Dinitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9303	2-Amino-4,6-dinitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9507	2-Nitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9510	3-Nitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9306	4-Amino-2,6-dinitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9513	4-Nitrotoluene	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9522	HMX	8330B	Approved
RCRA Nitroaromatics in Soil	38155	5015	Nitrobenzene	8330B	Approved
NPTA			Nitroglycerin	8330B	Approved
NPTA			PGDN	8330B	Approved
NPTA			Picric Acid	8330B	Approved
NPTA			PETN	8330B	Approved
RCRA Nitroaromatics in Soil	38155	9432	RDX	8330B	Approved
RCRA Nitroaromatics in Soil	38155	6415	Tetryl	8330B	Approved
RCRA Cyanide	55105	1645	Cyanide	9010B	Approved
RCRA Cyanide	55105	1645	Cyanide	9010C	Approved
RCRA Cyanide	55105	1645	Cyanide	9014	Approved
RCRA Corrosivity - pH Determination	55127	1625	Corrosivity	9045C	Approved
RCRA Corrosivity - pH Determination	55127	1625	Corrosivity	9045D	Approved
RCRA Anions	55141	1541	Bromide (Br)	9056	Approved
RCRA Anions	55141	1576	Chloride (Cl)	9056	Approved
RCRA Anions	55141	1731	Fluoride (F)	9056	Approved
RCRA Anions	55141	1811	Nitrate as N (NO3- as N)	9056	Approved
RCRA Anions	55141	1871	Phosphate as P (PO43- as P)	9056	Approved
RCRA Anions	55141	2001	Sulfate (SO42-)	9056	Approved
RCRA Anions	55141	1540	Bromide (Br)	9056A	Approved
RCRA Anions	55141	1575	Chloride (Cl)	9056A	Approved
RCRA Anions	55141	1730	Fluoride (F)	9056A	Approved
RCRA Anions	55141	1810	Nitrate as N (NO3- as N)	9056A	Approved
RCRA Anions	55141	1870	Phosphate as P (PO43- as P)	9056A	Approved
RCRA Anions	55141	2000	Sulfate (SO42-)	9056A	Approved
RCRA Nutrients	55142	2040	TOC	Walkley Black	Approved
Nutrients	PEO-014	2040	TOC	Walkley Black	Approved

1 Daily Health and Safety Report

2 Daily Quality Control Report

3 Daily Site Report

4 Dig Sheet Form

5 Explosives Accountability Log

6 Field Change Request Form

7 Geophysical Data Quality Control Review

8 Nonconformance and Corrective Action Report

9 Quality Control Surveillance Form

10 Site Visitors Log

11 Soil Sample Collection Field Sheet

12 Weekly Quality Control Report

Daily Health & Safety Report

General Information:

Fort Wingate Depot Activity **Report #** **Date:**
Contract #: W912QR-04-D-0025 **Task Order:** DM01
Start Time: **End Time:**
URS PM: John Carson

Weather Conditions:

High Temperature: **High**: ºF **Low:** ºF **Rain:** **Lightning:**

Winds: **Sun Rise:** **Sun Set:** **Humidity:**
UV: **Heat Index:** ºF

Site Personnel:

SUXOS: **UXOSO/UXOQCS:**

URS UXO Personnel
UXO:
Subcontractor Personnel
None

Visitors
None

Detail Of Daily Events: **DFW:**

Daily Safety Briefing:
Additional/Special Safety Topic:
Workload Categories (IAW SMS-018NA):
Today's SMS or Safety Moment Topic:
Daily Communication Test:

I CERTIFY THAT THE ABOVE REPORT IS COMPLETE AND CORRECT AND IN STRICT COMPLIANCE WITH THE SITE SPECIFIC HEALTH AND SAFETY PLAN.

____
URS UXO Safety Officer

DAILY QUALITY CONTROL REPORT

Fort Wingate Depot Activity

Project Manager	John Carson
Project	HWMU Work Plan & Removal
Project No.	16170613
Contract No.	W912QR-04-D-0025, DO DM01

Date

Day	S	M	T	W	TH	F	S

On Site Hours	
Travel Time	
Office Time	

Weather	Bright Sun	Clear	Overcast	Rain	Snow
Temp	To 32	32-50	50-70	70-85	85 up
Wind	Still	Moderate	High	**Report No.**	
Humidity	Dry	Moderate	Humid		

Subcontractors on Site:
Equipment on Site:
Visitors on Site:
URS Personnel on Site:
Field Work Performed (including sampling):
Quality Control Activities (including field calibration):

Health and Safety and Activities:
Observations/Problems Encountered/Corrective Action Taken:
Disposition of Ordnance Items Encountereed, (Include dates):
Changed Condiditons/Delays/Conflicts Encountered:
Other commnets or additional information:
Office Work Performed:
By ______________________ Title ______________

URS

URS Corporation 12120 Shamrock Plz Ste 300 Omaha, NE 68154 URS Project #: 16170613	Project Name: HWMU Work Plan and Removal Project Location: FWDA, McKinley County, New Mexico Report No.: Day/Date:

DAILY SITE REPORT

Weather: ( ) Clear ( ) P. Cloudy ( ) Cloudy Wind: (Appx. Range):)
Temperature (high): Low: Precipitation Site Conditions:

UXO Personnel on Site/Area of Responsibility/Daily Site Labor Hours (including subcontractors):

. Total Site Labor Hours today:

Work Performed: (Indicate location of work performed including equipment used):

Ordnance or Ordnance Related Material Encountered, Condition and Location: (Include all UXO, Inert Items, Training Items, CWM, a description of unknown items include photos):

Disposition of Ordnance Items Encountered, Include Dates: (i.e. Turn over to Military EOD, Disposal by detonation, Storage awaiting disposition):

Verbal Instructions Received or Given: (List any instructions received from client or given by URS on UXO issues identified and the corresponding action to be taken):

Changed Conditions/Delays/Conflicts Encountered: (List any conflicts which have hindered the identification, removal, and/or disposal of UXO containing energetic materials):

Other comments or additional information:

Contractor's Verification: The above report is complete and correct. All material and equipment used and work performed during this reporting period are in compliance with the plans and specifications except as noted above.

JOE GOEHRING **Date**
Senior UXO Supervisor (SUXOS)
Fort Wingate Depot Activity, McKinely County, New Mexico

Team Assignments
HWMU Work Plan and Removal
Fort Wingate Depot Activity, McKinley County, New Mexico

Site Management Staff

Project Mgrs John Carson-	**FWDA Project Mgr.**
SUXOS Joe Goehring-	

Field Staff

	Hours	UXO Supervisor
	Hours	Site Safety Officer/Quality Control Officer

Field Investigation Data Log
Intrusive Data Record

Team: _____ **UXO Team Leader:** ________________ **Date:** ___/___/___

Anomaly ID No.:	
Object Depth (from center of mass)	Inches
Object length	Inches
Object Diameter/Thickness	Inches
Object Weight (Estimated)	Lb
Slope of terrain (Check one box)	☐ **<10°** ☐ **10° to 30°** ☐ **>30**
Vegetation cover (Check one box)	☐ Clear ☐ Forest ☐ Swamp ☐ Brush
Soil type (Check one box)	☐ Dirt ☐ Sand ☐ Clay ☐ Rock
Inclination	**0° 45° 90° 135° 180°**
Orientation	**N-S NW-SE E-W SW-NE**
Hole Cleared	☐ Visual (48 in) ☐ Mag Cleared ☐ Not Cleared Distance from Flag:

Item Description/Justification/Comments

Anomaly type categories (Check Appropriate Box(es))

☐ **MEC** ☐ **MPPEH** ☐ **False Positive** ☐ **No Dig/Utility** ☐ **Target >4 ft**

☐ **UXO** ☐ **DMM** ☐ **MC** ☐ **MD** ☐ **Cultural Debris** ☐ **QC Seed** ☐ **RRD**

Was photo taken? ☐ **Yes** ☐ **No**

MEC Positive Identification (**If known, record below)**

Quantity:	**MEC Mark/Mod:**	**Nose Fuze Mark/Mod:**	**Tail Fuze Mark/Mod:**

Filler: ☐ Explosive ☐ Propellant ☐ Pyrotechnic ☐ Other **N.E.W.** ______**lbs**

Category:
☐ **Bombs** ☐ **Clusters/Dispensers** ☐ **Projectiles** ☐ **Grenades**
☐ **Misc. Explosive Devices** ☐ **Rockets** ☐ **Pyrotechnics and Flares** ☐ **Projectiles**

Fuzing Types
☐ Piezo-Electric ☐ Impact ☐ Base Detonating (BD) ☐ All-ways Acting ☐ Point Detonating (PD)
☐ Point-initiating Base-detonating (PIBD) ☐ Mechanical Time (MT) ☐ Powder Train Time Fuze (PTTF)

Physical Condition of MEC (Check all that apply)

☐ Intact ☐ Broken Open ☐ Filler Visible (Partial)

BAFB EOD ACTIONS

Disposition: (**Clarify Under Remarks**) ☐ PUCA ☐ BIP ☐ Other		**Date:**
Notifications To BAFB By:		**Date**
SUXOS		
SAFETY		

Remarks:____

____

EOD Team Chief Responding : ______________________________

EXPLOSIVES ACCOUNTABILITY LOG

Contract: W912QR-04-D-0025, DO DM01 **Project Name:** HWMU Work Plan and Removal

Date: **Work Area & Grid Numbers:**

Team Number: **Team Leader:**

Explosives Issued **Signature of Team Leader:**

Item	Quantity	Lot Number	Checker's Initials

Explosives Expended **Signature of Team Leader:**

Item	Quantity	Lot Number	Checker's Initials

Explosives Returned **Signature of SUXOS:**

Item	Quantity	Lot Number	Checker's Initials

The signatures in each section of this document indicate that the items listed in that section were in fact issued, expended , or returned to storage and that the quantities listed were verified through a physical count.

URS

URS CORPORATION
FIELD CHANGE REQUEST (FCR)

CONTRACT TASK ORDER NAME:	**CTO #**	**CHANGE REQUEST NO.**
TO:	**LOCATION:**	**DATE:**

RE:

_____ Drawing # ______________________ Title: _________________________
____
_____ Specific Sections: _________________ Title: _________________________
____
_____ Other: __________________________

1. DESCRIPTION (items involved, submit sketch, if applicable):

2. REASON FOR CHANGE

3. RECOMMENDED DISPOSITION (Submit sketch, if applicable):

_____ Minor Change _____ Major Change (Impacts Cost, Schedule)

4. DISPOSITION: (Approval Required by Client Representative)

_____ Not Approved (give reason).
_____ Considered minor change – APPROVED per recommended disposition – Documents will not be formally revised. Field office to maintain as –built records.
_____ Considered major change – Client approval required via contract modification process

Prepared by (Signature)	**Date:**
Client Project Manager	**Date:**
URS Project Manager (Signature)	**Date:**
URS UXO Safety Manager (Signature)	**Date:**

URS Corporation
12120 Shamrock Plaza, Suite 300
Omaha, NE 68154
Tel: 402.334.8181
Fax: 402.334.1984
www.urscorp.com

URS

HWMU Work Plan and Removal
Site Name: Fort Wingate Depot Activity
Geophysical Data
Quality Control Review-Draft

Geophysical Data Set:
Date Collected:
Description:

Raw Data Set Complete

☐ Yes ☐ No

Field Notes / Production Log

☐ Yes ☐ No

Processed Data File Reviewed

☐ Yes ☐ No

File Format

☐ Yes ☐ No

File format is acceptable

Static and Reference Objects Checks

☐ Yes ☐ No

Target Map

☐ Yes ☐ No

Noise Evaluation

☐ Yes ☐ No

Along Track Sampling

☐ Yes ☐ No

Across Track Sampling

☐ Yes ☐ No

Latency / Lag correction

☐ Yes ☐ No

Processed Data (Continued)

Data Leveling

☐ Yes ☐ No

Anomaly Selection

☐ Yes ☐ No

Selected Targets Agree with List

☐ Yes ☐ No

Unique Target ID

☐ Yes ☐ No

Blind Seed Items Targeted Correctly

☐ Yes ☐ No ☐ n/a

Positioning Correct

☐ Yes ☐ No

QC Data Reprocessing Completed

☐ Yes ☐ No

Summary:

Signed: **Date:**

URS
UXO and Range Service

NONCONFORMANCE AND CORRECTIVE ACTION REPORT

MEC Site Identification		Nonconforming Process						Report No.	Date
MEC Site:	HWMU FWDA	Geo survey	☐	Reacq:	☐	Other			
Grid:		Processing	☐	Clearance	☐	GEO Management			

Part I (UXOQC)

Description of Nonconforming Condition: **(1)**

Apparent Quality Requirement Not Complied With: **(2)**

-

Signature: ______________________ (URS GEOQC) (Date)

Corrective Action Due Date: ______________

Severity Level: __________

Copy Delivered to: ☐ URS SUXOS ☐ URS PM ☐GEO Ops ☐ MRP QCM ☐ URS GEO QC ☐ URS MRP Safety Mgr

Signature: ______________________ (URS SUXOS) (Date)

Signature: ______________________ (URS PM) (Date)

Part II OPERATIONS (Responsible Process Manager)

Recommended Corrective Actions **(3)**	Resurvey: ☐	Reacq: ☐	Other:
	Reprocess: ☐	Re-clear: ☐	

Root Cause Analysis (only for severity level 1): **(4)**

Signature: ______________________ (GEO Ops) (Date)

Signature: ______________________ (Geo PM) (Date)

Part III (Corrective Action Verification, GEO Ops, Geo PM, URS GEOQC, URS UXOQC)

Corrective Action Completed: ______________ (Date)

(5) Signature: ______________________ (GEO Ops)

(5) Signature: ______________________ (Geo PM)

Corrective Action Verified On: (Date)

(5) Signature: (URS GEOQC)

(Date) ______________

(5) Signature: ______________________ (URS UXOQC)

Closeout Comments UXOQC/GEOQC: **(6)**

☐ Approved ☐ Disapproved New NCR Number: ______________ Signature: ________________________________(UXOQC)

Note 1: When all actions have been completed a copy of this form shall be attached to the Grid Final QC Report Form

QUALITY CONTROL SURVEILLANCE REPORT	Report Number:
Project Name: HWMU Work Plan and Removal, Fort Wingate Depot Activity	Contract No: W912QR-04-D-0025, DO DM01
Client: USACE - SWF	Project Manager: John Carson

1 - Activity

☐ Project Management	☐ Geophysical Data Collection	☐ Data Management	☐ Brush Cutting/Clearing
☐ Intrusive Investigation	☐ Geophysical Data Processing	☐ Demolition	☐ UXO Avoidance
☐ Surface Sweep	☐ Anomaly Reacquisition	☐ Transect Activity	☐ Scrap Processing
☐ Survey	☐ Donovan Blast Chamber	☐ Water Jet Cutting	☐ Other:

2 - Phase

☐ Preparatory ☐ Initial ☐ Follow up

3 - References

4 - Observed Condition/Activities and Comments:

5 - Results of Surveillance

☐ Acceptable	☐ Unacceptable	Deficiency #: NCR #:
Conducted By:	Signature:	Date:

6 – Project Manager Review

☐ Concur ☐ Non-Concur	Signature:	Date

7 - Distribution

☐ PM ☐ Site Superintendent ☐ SUXOS ☐ QC Manager ☐ Safety ☐ Other:

SITE VISITORS LOG

CONTRACT:

TASK ORDER:

LOCATION:

DATE	NAME	TITLE	COMPANY	SAFETY BRIEF: Y/N	US CITIZEN: Y/N	TIME		REMARKS
						IN	OUT	

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: HWMU, Fort Wingate Depot Activity PROJECT NO. 16170613

SAMPLE NO. ______ BORING NO. ______

DATE/TIME COLLECTED: ______ PERSONNEL: ______

SAMPLE METHOD / DEPTH: ______

SAMPLE MEDIA: SOIL SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES NO SPLIT SAMPLE NO. ______

SAMPLE QC DUPLICATE: YES NO DUPLICATE SAMPLE NO. ______

MS/MSD REQUESTED: YES NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested

OVA MEASUREMENTS

Background ______

Breathing zone ______

Boring ______

Headspace ______

SAMPLE DESCRIPTION

DEPTH:	DESCRIPTION:

GENERAL COMMENTS

______

______

______

WEEKLY QUALITY CONTROL REPORT
HWMU Work Plan and Removal
Fort Wingate Depot Activity, McKinley County, New Mexico

CONTRACT NO.: W912QR-04-D-0025, DO DM01	WEEK OF:	REPORT NO.:
PROJECT NAME: HWMU Work Plan and Removal		DATE:
OPERATIONS WORK PERFORMED: (**Definable Features of Work (DFW) in bold)**		
QUALITY CONTROL ACTIVITIES:		
SURVEILLANCE REMARKS:		
PROBLEMS ENCOUNTERED/CORRECTIVE ACTIONS TAKEN:		
SPECIAL NOTES/OTHER:		
VISITORS:		

Signature: ______________________________ Date:

UXOQCS

1 This report was submitted under separate cover.

URS

11 January 2011

Mr. Steve Carpenter
U.S. Army Engineer – Albuquerque District
Corps of Engineers
4101 Jefferson Plaza NE
Albuquerque, NM 87109

Re: Personnel Qualification Certification Letter
Military Munitions Response Program (MMRP)
HWMU Work Plan and Removal
Fort Wingate Depot Activity, McKinley County, New Mexico

Dear Mr. Carpenter:

Data Item Description MMRP-09-012 requires a certification letter to be provided to identify and verify the qualifications of key unexploded ordnance (UXO) personnel for the MMRP RI field activities. Mr. Karl J. Goehring of URS Group, Inc. will be the Senior UXO Supervisor (SUXOS) for the HWMU Work Plan and Removal. I certify that the person listed meets or exceeds contract requirements for the functions they will perform. This letter will be updated when additional UXO personnel are identified for the HWMU Work Plan and Removal field activities.

If you have any questions please contact me at (402) 952-2514

Sincerely,

URS Group, Inc.

John Carson, P.E.
URS Project Manager

Enclosures: Resumes and EOD School Graduation Certificates

URS Group, Inc.
12120 Shamrock Plaza
Suite 300
Omaha, NE 68154
Tel: 402.334.8181
Fax: 402.334.1984
www.urscorp.com

KARL (JOE) GOEHRING

DATE ATTENDED BASIC EOD SCHOOL: MAR 1979
OTHER PERTINENT TRAINING: HAZWOPER 40 HOUR, OCT 1994; A.A. EXPLOSIVE ORDNANCE DISPOSAL TECHNOLOGY FEB 1996

MILITARY EOD ASSIGNMENTS:

MAR 1979-AUG 1983	EOD Team Member, Lackland AFB, TX
AUG 1983-AUG 1985	EOD Team Member, Hahn Air Base, Germany
SEP 1985-DEC 1992	EOD Team Leader, NCOIC, Beale AFB, CA
JAN 1993-FEB 1994	EOD Team Leader, NCOIC, Incirlik Air Base, Turkey
FEB 1994-FEB 1996	EOD Team Leader, Sr. Ops NCO, Vandenberg AFB, CA

CIVILIAN UXO EXPERIENCE:

MAR 1996 – JUL 1996 UXO Specialist, HFA, Jefferson Proving Grounds, IN
AUG 1996 – JUL 1997 UXO Supervisor, CMS, Inc., Ft. Ord, CA
AUG 1997 – NOV 1997 UXO Supervisor, HFA, Grissom AFB, IN
NOV 1997 – DEC 1997 UXO Specialist, HFA, Tobyhanna Army Depot, PA
JAN 1998 – MAY 1998 UXO Specialist, HFA, Camp Croft, SC
JUN 1998 – JUN 1999 UXO Specialist HFA, Former Lowry AFB, Bombing & Gunnery Range, Aurora, CO
JUL 1999 – AUG 1999 UXO Supervisor, HFA, Sioux Army Depot, Sydney, NE
AUG 1999 – OCT 1999 UXO Supervisor, HFA, Illinois Ordnance Plant, Marion, IL
NOV 1999 – DEC 1999 UXO Supervisor/Specialist, EODT, Camp Grant, IL
JAN 2000 – FEB 2000 UXO Supervisor, EHSI, Ft. Stewart, Hinesville, GA
FEB 2000 – MAR 2000 UXO Specialist, HFA, Denver Research Institute, Aurora, CO
MAR 2000 – JUN 2000 UXO Supervisor, TAC Services, NASA Space Center, Stennis, MS
JUN 2000 – OCT 2000 Senior UXO Supervisor, Ravenna Army Ammunition Plant, OH
OCT 2000-JAN 2002 Corporate UXO Manager SpecPro, Inc. San Antonio, TX
MAY 2001–JUN 2001 Senior UXO Supervisor, SpecPro, Inc., Ft. Greely, AK
AUG 2001– OCT 2001 Site Safety Officer, SpecPro, Inc., Delta Junction, AK
OCT 2001-DEC 2001 Senior UXO Supervisor, SpecPro, Inc., Seneca Army Depot, NY
JAN 2002-MAR 2003 Senior UXO Supervisor, Earth Tech, Benicia, CA
MAR 2003-MAY 2003 UXO Supervisor, ECC, Hohenfels, Germany
MAY 2003-MAR 2004 UXO Supervisor, Earth Tech, Fairbanks, AK
APR 2004-JUN 2004 Senior UXO Supervisor, URS Group, Inc., Black Hills, SD
APR 2004-NOV 2004 Senior UXO Supervisor, American Technologies, Inc. Jesup, GA
SEP 2004-NOV 2004 Senior UXO Supervisor, URS Group, Inc., Fmr. Sioux Army Depot, NE
DEC 2004-MAR 2005 Senior UXO Supervisor, American Technologies, Inc. Herlong, CA
MAR 2005-DEC 2007 Senior UXO Supervisor, URS Group, Inc., Cheyenne, WY
JAN 2008-FEB 2010 Senior UXO Supervisor, URS Group, Inc., Barksdale AFB, LA

Naval School
Explosive Ordnance Disposal

This certifies that

Airman Karl J. Goehring, 330-48-2868, USAF

having successfully completed
the prescribed course of study for

EXPLOSIVE ORDNANCE DISPOSAL SPECIALIST - G5ABN46430

is awarded this
Certificate

this *22nd* day of *March*, A.D. *1979*

J. T. KENNEDY, CDR, USN
COMMANDING OFFICER

NAVSCOLEOD FORM 1650/2

List of SOPs

SOP No. 1	Decontamination
SOP No. 2	Sample Handling, Documentation, and Tracking
SOP No. 3	Investigation Derived Waste
SOP No. 4	Soil Sampling
SOP No. 5	Terra Core® Sampling Method
SOP No. 6	Digital Geophysical Mapping
SOP No. 7	QC Processes
SOP No. 8	MEC Disposal
SOP No. 9	Electric Demolition
SOP No. 10	Remote Firing Device Demolition
SOP No. 11	Shock Tube/NONEL Demolition
SOP No. 12	Non-Electric Demolition
SOP No. 13	Detonation Cord
SOP No. 14	Open Burning

1.1 PURPOSE AND SCOPE

This document defines the SOP for decontamination at FWDA. This procedure is to be used together with the UFP-QAPP and the other SOPs. Health and safety procedures and equipment for the investigation are detailed in the SSHP. Applicable SOPs are listed below:

- SOP No. 4 - Soil Sampling

Site and/or Sample Cross-Contamination

The overall objective of a multimedia sampling program is to obtain samples that accurately depict the chemical, physical, and/or biological conditions at the sampling site. Extraneous contaminants can be brought onto the sampling location and/or introduced into the medium of interest during the sampling program (e.g. using sampling equipment that is not properly or fully decontaminated). Trace quantities of contaminants can consequently be captured in a sample and lead to false positive analytical results and, ultimately, to an incorrect assessment of the contaminant conditions associated with the site. Decontamination of sampling equipment (e.g., all non-disposable equipment that will come in direct contact with samples) and field support equipment (e.g., vehicles) is, therefore, required prior to, between, and after uses at FWDA to ensure that sampling cross-contamination is prevented, and that on-site contaminants are not carried off-site.

1.2 EQUIPMENT DECONTAMINATION PROCEDURES

The following sections present equipment decontamination procedures and necessary equipment.

1.2.1 Equipment List

The following is a list of equipment that may be needed to perform decontamination:

- Brushes
- Wash tubs
- Buckets
- Scrapers, flat bladed
- Hot water - high-pressure sprayer
- Sponges or paper towels
- Alconox detergent (or equivalent)
- Potable tap water
- Laboratory-grade de-ionized water
- Garden-type water sprayers
- Appropriate Health and Safety equipment (i.e., nitrile gloves, safety glasses, etc.)

- Appropriate IDW containers

1.2.2 Decontamination

This section presents the procedures for decontamination of equipment.

1.2.2.1 Sampling Equipment

The following steps will be used to decontaminate sampling equipment:

- Personnel will dress in suitable safety equipment to reduce personal exposure as required by the SSHP.
- Gross contamination on equipment will be scraped off a with a wire or suitable brush.
-
- Rinse with potable tap water.
- Wash with non phosphate detergent followed by a tap water rinse.
- Rinse with 0.1 molar nitric acid followed by a tap water rinse.
- Rinse with methanol followed by a tap water rinse.
- Rinse with potable tap water.
- Double rinse with deionized water.

Following decontamination, equipment will be placed in a clean area or on clean plastic sheeting to prevent contact with contaminated soil. If the equipment is not used immediately after decontamination, the equipment will be covered or wrapped in plastic sheeting, foil, or heavy-duty trash bags to minimize potential contact with contaminants.

1.2.2.2 Equipment Leaving the Site

Vehicles used for activities in non-contaminated areas shall be cleaned on an as-needed basis, as determined by the Site Safety Officer (SSO), using soap and water on the outside and vacuuming the inside. On-site cleaning will be required for very dirty vehicles leaving the area.

1.2.2.3 Decontamination Solutions

A decontamination solution should be capable of removing, or converting to a harmless substance, the contaminant of concern without harming the object being decontaminated. The preferred solution is a mixture of detergent and water, which is a relatively safe option compared to chemical decontaminants. A solution recommended for decontaminating consists of 1 to 1.5 tablespoons of Alconox per gallon of warm water. Skin surfaces should be decontaminated by washing with hand soap and water. The decontamination solution must be changed when it no longer foams or when it becomes extremely dirty. Rinse water must be changed when it becomes discolored, begins to foam, or when the decontamination solution cannot be removed.

1.2.2.4 Responsible Authority

Decontamination operations shall be supervised by the Field Manager, who is responsible for ensuring that all personnel follow decontamination procedures and that all contaminated equipment is adequately decontaminated. The Field Manager is also responsible for maintaining the decontamination zone and managing the wastes generated from the decontamination process.

Site activities should be conducted with the general goal of preventing the contamination of people and equipment. Using remote sampling techniques, bagging monitoring instruments, avoiding contact with obvious contamination, and employing dust suppression methods that would reduce the probability of becoming contaminated and, therefore, reduce the need and extent of decontamination. However, some type of decontamination will always be required on site. A sample personnel decontamination set-up guideline and a sample decontamination equipment and supplies list are included in the SSHP.

The Occupational Safety and Health Administration (OSHA) require that proper PPE must be worn when operating steam or pressure washing equipment. A rain suit, boots, hard hat, and a face shield are recommended to be worn. All personnel must be kept out of the path of steam or water spray.

1.2.2.5 Wastewater

Liquid wastewater from decontamination will be containerized, labeled, and stored for later disposal.

1.2.3 Emergency Decontamination

Hazardous waste facilities should also have in place emergency decontamination procedures, in order to prevent the loss of life or severe injury to site personnel. In the case of threat to life, decontamination should be delayed until the victim is stabilized; however, decontamination should always be performed first, when practical, if it can be done without interfering with essential lifesaving techniques or first aid, or if a worker has been contaminated with an extremely toxic or corrosive material that could cause severe injury or loss of life. During an emergency, provisions must also be made for protecting medical personnel and disposing of contaminated clothing or equipment.

1.2.4 Documentation

Sampling personnel will be responsible for documenting the decontamination of sampling and drilling equipment. The documentation will be recorded with waterproof ink in the sampler's field notebook with consecutively numbered pages. The information entered in the field book concerning decontamination should include the following:

- Decontamination personnel
- Date and start and end times

- Decontamination observations
- Weather conditions
- IDW handling

2.1 PURPOSE

This document defines the SOP for sample handling, documentation, and tracking at FWDA. This procedure is intended to be used together with the UFP-QAPP and other SOPs. Health and safety procedures and equipment for the investigation are detailed in the SSHP. Applicable SOPs are listed below:

- SOP No. 3 Investigation Derived Waste
- SOP No. 4 Soil Sampling

2.2 SAMPLE IDENTIFICATION

Samples collected during site activities will have discrete sample identification numbers. These numbers are necessary to identify and track each of the many samples collected for analysis during the life of this project. In addition, the sample identification numbers will be used in the database to identify and retrieve the analytical results received from the laboratory.

Each sample is identified by a unique code that indicates the parcel number, site identifier, source of sample, matrix, sample location identifier, and sample number. The sample locations will be numbered sequentially starting at location number 0001 or 001 depending on sample type. The sample parcel number is **P3** and site identifier is **HWMU**. Source of samples IDs will incorporate matrix IDs, include the following:

- CDC – Current Detonation Crater
- CRP – Current Residue Pile
- GRID – Surface Soil Grid Sample
- IDWS – Investigation Derived Waste Soil
- IDWW – Investigation Derived Waste Water
- SKPL – Stockpile Soil

Sample location numbers will start with **001** for all sample types except the stockpile soil, which will start with **0001**. Excavation soil samples will also designate what CDC or CRP the sample is being collected from as well as what part of the excavation has been sampled. Sample excavation identifiers include the following:

- –SW – Excavation Sidewall
- EB – Excavation Bottom

An example of the sample identification code for the first excavation sidewall soil sample collected from current residue pile 3 will be: **P3HWMU-CRP03-SW-001**

Where FWDA indicates the facility, CRP03 indicates an excavation soil sample from current residue pile 3, SW indicates the location is from the sidewall of the excavation and 01 indicates the first sample taken form the side wall.

An example of the sample identification code for a soil sample from the eighty-fifth stockpile will be **P3HWMU-SKPL0085**.

MS/MSD samples are given the same sample ID as the analytical sample, but have 'MS/MSD" written on the label. Field Duplicate samples are blind samples to the laboratory and are given a unique sample ID. Field Stockpile soil samples will add 1000 to the stockpile number or 100 to the Grid or excavation number.

The sampling locations, sample type, and sample sequence identifiers are established prior to field activities for each sample to be collected. On-site personnel will obtain assistance in defining any special sampling requirements from the Project Manager.

2.3 SAMPLE LABELING

Sample labels are filled out as completely as possible by a designated member of the sampling team prior to beginning field sampling activities each day. All sample labels are filled out using waterproof ink. At a minimum, each label will contain the following information:

- Sampler's company affiliation
- Site location
- Sample identification code (i.e., FWDA-GRID032)
- Date and time of sample collection
- Analyses required
- Method of preservation (if any) used
- Sample matrix (i.e., soil)
- Sampler's signature or initials

2.4 SAMPLE HANDLING

This section discusses proper sample containers, preservatives, and handling and shipping procedures. The UFP-QAPP summarizes the information contained in this section and also includes the sample holding times for each analyte.

2.4.1 Sample Containers

Certified, commercially clean sample containers are obtained from the contract analytical lab. The contract laboratory will label the bottles to indicate the type of sample to be collected.

Required preservatives are prepared and placed in the bottles at the laboratory prior to shipment to the site. Appropriate sample containers for the specific analyses required are listed in the UFP-QAPP.

2.4.2 Sample Preservation

Sample preservation efforts will commence at the time of sample collection and will continue until analyses are performed. Samples will be stored on ice at 4°C in coolers immediately following collection. The ice will be double bagged in plastic storage bags. Additional sample preservation requirements are listed in the UFP-QAPP. Chemical preservatives, if necessary, will have been added to the sample containers by the laboratory prior to shipment to the field, unless otherwise specified in the UFP-QAPP.

2.4.3 Sample Handling and Shipping

The sample containers are wiped clean of all sample residue and then wrapped in protective packing material (bubble wrap) and taped. Samples will then be placed right side up in a cooler and surrounded with ice (double bagged using plastic bags). Additional protective packing material is used around the upright samples as necessary. A temperature blank provided by the contract laboratory is placed in each sample cooler shipped.

A chain of custody (CoC) form will accompany each cooler. The CoC is put in a plastic bag and attached to the inside lid of the cooler. The cooler lid is taped closed with a custody seal for delivery to the laboratory. Once the cooler has been packed and the CoC has been secured inside the cooler, the cooler is sealed on both ends using several wraps of fiber-reinforced strapping tape. The tape should be applied from the back of the cooler and over the top of the cooler to pull the front of the cooler lid down. The wraps of strapping tape should cover the hinges of the cooler lid.

Once the strapping tape has been applied, two signed and dated custody seals will be place on two corners of the cooler. One custody seal will be placed on top of the strapping tape on one end of the cooler across the seam of the cooler and the cooler lid, on the front of the cooler. The other custody seal will be placed on top of the strapping tape across the seam between the cooler and cooler lid on the other end of the cooler, on the back of the cooler. The custody seals will be covered with one complete wrap of clear tape.

All water drain valves on the sample coolers will be sealed using duct tape to prevent leakage of any fluids from the cooler during shipment. Samples will be hand delivered or shipped by overnight express carrier for delivery to the analytical laboratory. All samples must be shipped for laboratory receipt and analyses within specific holding times. This may require daily shipment of samples with short holding times. The temperature of all coolers will be measured upon receipt at the laboratory.

2.4.4 Holding Times and Analyses

The holding time is specified as the maximum allowable time between sample collection and analysis and/or extraction, based on the analyte of interest and stability factors, and preservative (if any) used. Allowable holding times are listed in the UFP-QAPP. Chemical constituents that will be analyzed and other parameters to be measured during field investigations at FWDA are identified in the UFP-QAPP.

2.5 SAMPLE DOCUMENTATION AND TRACKING

This section describes documentation required in the field notes, on the SCFSs, on the daily quality control reports (DQCRs), and on the sample CoC forms.

2.5.1 Field Notes

Documentation of observations and data acquired in the field will provide information on the acquisition of samples and also provide a permanent record of field activities. The observations and data will be recorded using pens with permanent waterproof ink in a permanently bound weatherproof field log book containing consecutively numbered pages.

The information in the field log book will include the following as a minimum:

- Project name
- Location of sample
- Sampler's printed name and signature
- Date and time of sample collection
- Sample identification code
- Description of samples (matrix sampled)
- Sample depth (if applicable)
- Number and volume of samples
- Sampling methods or reference to the appropriate SOP
- Sample handling, including filtration and preservation, as appropriate for separate sample aliquots
- Analytes of interest
- Field observations
- Results of any field measurements, such as depth to water, pH, temperature, and conductivity
- Personnel present

- Level of PPE used during sampling

Changes or deletions in the field book should be lined out with a single strike mark, initialed, and remain legible. Sufficient information should be recorded to allow the sampling event to be reconstructed without relying on the sampler's memory.

Each page in the field books will be signed by the person making the entry at the end of the day, as well as on the bottom of each page. Anyone making entries in another person's field book will sign and date those entries.

2.5.2 Sample Collection Field Sheets

An SCFS for soil will be completed at each sampling location. The data sheet will be completely in full. If items on the sheet do not apply to a specific location, the item will be labeled as not applicable or not required. The information on the data sheet includes the following:

- Sample location number
- Date and time of sampling
- Person performing sampling
- Type of sample
- Number of samples taken
- Sample identification number
- Preservation of samples
- Record of any QC samples from site
- Any irregularities or problems which may have a bearing on sampling quality

2.5.3 Daily Quality Control Report

Each sampling crew will also maintain DQCRs to supplement the information recorded in the field logbook. DQCRs will be maintained by members of the field sampling team and cross-checked for completeness at the end of each day by the sampling team members and/or Field Manager. They will be signed and dated by individuals making entries and initials by the reviewer upon completion. Copies of the DQCR will be forwarded to the Program QC Manager for review. The DQCR will include the following information:

- Project name
- Project Number
- Personnel on site
- Visitor on site

- Subcontractors on site
- Equipment on site
- Weather conditions
- Field work performed
- Quality control and health and safety activities
- Problem, down time, and standby time
- Name and title of person completing the DQCR

2.5.4 Sample Chain of Custody

During field sampling activities, traceability of the sample must be maintained from the time that the samples are collected until laboratory data are issued. Initial information concerning collection of the samples will be recorded in the field log book as described above. Information on the custody, transfer, handling, and shipping of samples will be recorded on a CoC form. The CoC is a three-part carbonless form.

The sampler will be responsible for initiating and filling out the CoC form. The sampler will sign the CoC when the sampler relinquishes the samples to anyone else. One CoC form will be completed for each cooler of samples collected daily. The CoC will contain the following information:

- Sampler's signature and affiliation
- Project number
- Date and time of collection
- Sample identification number
- Sample type
- Analyses requested
- Number of containers
- Signature of persons relinquishing custody, dates, and times
- Signature of persons accepting custody, dates, and times
- Method of shipment
- Shipping air bill number (if appropriate)

The person responsible for delivery of the samples to the laboratory will sign the CoC form, retain the last copy of the three-part CoC form, document the method of shipment, and send the original and the second copy of the CoC form with the samples. Upon receipt at the laboratory, the person receiving the samples will sign the CoC form and return the second copy to the

Project Manager. Copies of the CoC forms documenting custody changes and all custody documentation will be received and kept in the central files. The original CoC forms will remain with the samples until final disposition of the samples by the laboratory. The analytical laboratory will dispose of the samples in an appropriate manner 60 to 90 days after data reporting. After sample disposal, a copy of the original CoC will be sent to the Project Manager by the analytical laboratory to be incorporated into the central files.

FORMS

URS Corp.

12120 Shamrock Plaza, Suite 300, Omaha, NE 68154 (402) 334-8181 Fax (402) 334-1984

CHAIN OF CUSTODY RECORD

Project Name	Project No.
Project Location	Project Manager
Sampler(s)	

Sample		Type		Sample Identification	Matrix	Containers		Analytical Parameters											Remarks
Date	Time	Comp.	Grab			No.	Type												

Signatures	Date	Time	Shipping Details	Special Instructions
Relinquished by:			Method of Shipment	
Received by:			Airbill No.	
Relinquished by:			Lab Address	
Received for Laboratory by:				

Custody.frm/rrm White copy - Laboratory Yellow copy - Laboratory Pink copy - URS

No. 150000

DAILY QUALITY CONTROL REPORT

Fort Wingate Depot Activity

Date ____________________

Day	S	M	T	W	TH	F	S

On Site Hours	
Travel Time	
Office Time	

Project Manager John Carson
Project HWMU Work Plan & Removal

Project No. 16170613
Contract No. W912QR-04-D-0025, DO DM01

Weather	Bright Sun	Clear	Overcast	Rain	Snow
Temp	To 32	32-50	50-70	70-85	85 up
Wind	Still	Moderate	High	**Report No.**	
Humidity	Dry	Moderate	Humid		

Subcontractors on Site:

Equipment on Site:

Visitors on Site:

URS Personnel on Site:

Field Work Performed (including sampling):

Quality Control Activities (including field calibration):

Health and Safety and Activities:
Observations/Problems Encountered/Corrective Action Taken:
Disposition of Ordnance Items Encountereed, (Include dates):
Changed Condiditons/Delays/Conflicts Encountered:
Other commnets or additional information:
Office Work Performed:
By ____________________ Title ____________

EXAMPLE SAMPLE LABEL

URS

12120 Shamrock Plz	Phone (402) 334-8181
Omaha, NE 68154	Fax: (402) 334-1984

Project: **HWMU WP & Removal, FWDA New Mexico** **16170613**

Sample ID: **FWDA-SKPL0123**

Analysis: **8260B VOCs, 8270C SVOCs, 8082 PCBs, 8290 Dioxins/Furans, 8330B Explosives, 6850 Perchlorate, 9014 Cyanide, 9056 Nitrate, 6010B Metals, 7473 Mercury**

Preservative:	**4°C**	Date:	**10-10-10**
Samplers:	**RA, JW**	Time:	**1045**

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: Fort Wingate Depot Activity ______ PROJECT NO. ______

SAMPLE NO. ______ BORING NO. ______

DATE/TIME COLLECTED: ______ PERSONNEL: ______

SAMPLE METHOD / DEPTH: ______ ______

SAMPLE MEDIA:	SOIL	SEDIMENT	SLUDGE
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO. ______
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO. ______
MS/MSD REQUESTED:	YES	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

______	______	______
______	______	______
______	______	______
______	______	______
______	______	______
______	______	______
______	______	______

OVA MEASUREMENTS

Background ______

Breathing zone ______

Boring ______

Headspace ______

SAMPLE DESCRIPTION

DEPTH:	DESCRIPTION:
______	______
______	______
______	______
______	______
______	______

GENERAL COMMENTS

______

______

______

3.1 PURPOSE AND SCOPE

This document defines the SOP for the handling and disposal of IDW. IDW will include soil cuttings, decontamination fluids and groundwater from monitoring well purging, excess well construction materials, and PPE. The procedures presented below are intended to be used with the UFP-QAPP and the other SOPs. Health and safety procedures and equipment for the investigation are detailed in the SSHP. Applicable SOPs are listed below:

- SOP No. 1 Decontamination
- SOP No. 4 Soil Sampling

3.2 EQUIPMENT LIST

The following equipment is required for handling IDW:

- Equipment (tanks, buckets) to transport aqueous IDW.
- Large polyethylene bulk water storage tanks for aqueous IDW.
- Sampling equipment and sample containers (for toxicity characteristic leaching procedure [TCLP] sampling).

3.3 FIELD PROCEDURES

3.3.1 IDW Handling

Aqueous

Decontamination fluids will be generated during sampling activities and will be containerized in either polyethylene tanks or 55-gallon drums. Since the decontamination fluids will start as clean potable water, decontamination fluids will likely contain minimal contamination. A water sample will be collected from each of the storage tanks and submitted to the laboratory for analysis. Analytical results will determine appropriate disposal methods and locations. If decontamination water has no detected contaminant levels (other than naturally occurring metals) the water may be placed in the evaporation tank behind Former Building 542. IDW water will be disposed of according to local, state, and federal regulations. No aqueous IDW will be discharged directly into waterways or drainages leaving Fort Wingate Depot Activity.

3.3.2 PPE

PPE used during investigation activities (including latex or nitrile gloves, paper towels, plastic bags, etc.) is expected to have minimal contamination, and will not be required to be containerized. All PPE will be treated as solid waste and will be placed in plastic trash bags and disposed of in a Fort Wingate Depot Activity trash receptacle or dumpster rented by URS.

3.3.3 Waste Storage

Aqueous IDW will be containerized in polyethylene tanks or 55-gallon drums. All IDW containers will be marked with the following information:

- Installation identification (i.e., FWDA)
- Site name and number
- Type of IDW (i.e., soil cuttings)
- Pending Hazardous Waste Analysis (if applicable)
- Date(s) of accumulation
- Name and phone number of Fort Wingate Depot Activity contact

All containerized IDW will be stored at a designated storage area identified by URS until the need for off-site disposal has been evaluated, as described in the following subsection.

3.3.4 Determination for Disposal

Containerized IDW will be properly characterized before disposal. Analytical results from the aqueous IDW will also be compared to standards to determine the appropriate disposal requirement. All IDW identified as a characteristically hazardous will be disposed to an appropriate, licensed facility.

3.3.5 IDW Disposal

For IDW that is identified as RCRA characteristically hazardous, URS will provide a waste profile based on analytical results, including TCLP results, to a licensed waste transportation subcontractor. The subcontractor will provide a waste manifest based on the profile provided by URS. URS will notify USACE when a manifest requires signature and coordinate with USACE to obtain the appropriate signature. An Army representative will sign all manifests. The subcontractor will then transport the IDW to a licensed waste disposal facility. Copies of all waste manifests will be provided to the USACE PM. All IDW will be properly manifested and shipped according to applicable State and Federal requirements.

4.1 PURPOSE AND SCOPE

This document defines the SOP for collecting soil samples from stockpiles, surface excavations and open excavations at CRPs and CDCs at FWDA. This SOP provides descriptions of equipment, field procedures, and QA/QC procedures implemented for the collection of soil samples. Specific sample locations and frequency of collection are presented in the UFP-QAPP. This procedure is intended to be used together with the UFP-QAPP and other SOPs. Health and safety procedures and equipment for the investigation are detailed in the SSHP. Applicable SOPs are listed below:

- SOP No. 1 –Decontamination
- SOP No. 2 – Sample Handling, Documentation, and Tracking
- SOP No. 5 – Terra Core® Sampling Method

Reference Standards

Wherever an ASTM designation is cited in this document, it shall mean the American Society for Testing and Materials Standard Specification of that designation appearing in the "1994 Annual Book of ASTM Standards," published by the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania. "EM 1110-2-1906" refers to United States Department of the Army, "Engineering and Design, Laboratory Soil Testing," 30 December 1970.

4.2 PROCEDURES FOR SOIL SAMPLING

Soil samples will be collected using stainless-steel hand utensils. Stockpile Characterization and Excavation Confirmation soil samples soil samples will be collected from 0 to 0.5 foot bgs for all analyses except VOCs. VOCs will be collected from 0.5 -1 foot bgs.

4.2.1 Equipment List

The following list of equipment will be needed to collect surface soil samples at FWDA:

Equipment for Surface Soil Sampling with Hand Utensils

- Stainless-steel spoon or trowel
- Weighted tape measure with 0.1-foot increments
- Surveyor's stakes and flags
- Ruler marked in 0.1-foot increments
- Field books/field sheets
- Stainless-steel knife, bowl
- Sample bottles provided by the laboratory

- Sample bottle labels
- Label tape (clear)
- Paper towels
- Camera and film
- Waterproof and permanent marking pens
- Plastic sheeting
- Plastic bags
- Appropriate health and safety equipment, as specified in the SSHP
- Appropriate decontamination supplies, as specified in SOP No. 1
- Ice chest with ice

4.2.2 Decontamination

Before sampling begins, the sampling equipment will be decontaminated according to the procedures contained in the work plan and SOP No. 1. Sampling equipment will be decontaminated between sampling locations.

4.2.3 Soil Sampling Procedures

The procedures for collecting soil samples are provided in the following sections.

4.2.3.1 Stockpile Soil Sampling Using Hand Utensils

This method of stockpile soil sample collection is to be used at FWDA. Samples will only be collected when machinery is powered down and not operating. The following procedure should be used to collect stockpile soil samples.

- Decontaminate sampling equipment according to the work plan and SOP No. 1.
- Record the sample location on a site map and in the field logbook.
- Don a clean pair of nitrile gloves.
- Clear and remove vegetation and any surface debris such as rocks, as necessary.
- Using a decontaminated spoon or trowel, remove soil from five (5) separate one square foot areas selected randomly of the stockpile until the sampling depth of 2 ft is reached.
- Collect the discrete soil for VOCs using the Terra Core® sampler from one of the one square foot areas. Fill 40mL VOAs with 5g plugs using SOP No. 5.

- Collect a composite soil sample for all other parameters using a decontaminated stainless-steel sampling spoon from all five of the separate 1 square foot areas into a decontaminated stainless steel bowl.
- Composite the soil by thoroughly mixing the soil in the decontaminated stainless-steel bowl with the sampling spoon. Fill the jar for the specified analysis. The required analyses and appropriate containers are listed in the UFP-QAPP.
- Label, store, and document sample according to SOP No. 2.
- Record applicable information on the Sample Collection Field Sheet.

4.2.3.2 Surface Excavation Soil Samples

- This method of surface excavation soil sample collection is to be used at Fort Wingate Depot Activities. The following procedure should be used to collect surface excavation soil samples from the 150-foot by 150-foot grids. Decontaminate sampling equipment according to SOP No. 1.
- Record the sample grid location on a site map and in the field logbook.
- Don a clean pair of nitrile gloves.
- Clear and remove vegetation and any surface debris such as rocks, as necessary.
- Using a decontaminated spoon or trowel, remove soil from 30 separate one square foot areas within the grid until the sampling depth of 0.5 ft is reached.
- Collect the discrete soil for VOCs using the Terra Core® sampler. Fill 40mL VOAs with 5g plugs using SOP No. 5.
- Collect a composite soil sample for all other parameters using a decontaminated stainless-steel sampling spoon from all 30 locations into a decontaminated stainless steel bowl.
- Composite the soil by thoroughly mixing the soil in the decontaminated stainless-steel bowl with the sampling spoon. Fill the jar for the specified analysis. The required analyses and appropriate containers are listed in the UFP-QAPP.
- Label, store and document sample according to SOP No. 2.
- Record applicable information on the Sample Collection Field Sheet.
- Identify the location for future reference using surveying stakes and flags.

4.2.3.3 Open Excavations of CRP and CDC

This method of open excavation soil sample collection is to be used at FWDA. The following procedure should be used to collect excavation soil samples from the CRP and CDC. Each excavation will have samples collected from the side walls and bottom. Samples from each wall will be collected laterally every 100 feet and a bottom sample will be collected for every 100-foot by 100-foot area.

- Decontaminate sampling equipment according to SOP No. 1.
- Record the sample area location on a site map and in the field logbook.
- Don a clean pair of nitrile gloves.
- Clear and remove vegetation and any surface debris such as rocks, as necessary.
- For sidewall samples using a decontaminated spoon or trowel, remove soil from nine (9) locations selected randomly from the wall until the sampling depth of 0.5 ft is reached. For excavation bottom, using a decontaminated spoon or trowel, remove soil from 30 locations selected randomly from the excavation bottom until a sampling depth of 0.5 ft is reached.
- Collect the discrete soil for VOCs using the Terra Core® sampler from one of the locations. Fill 40mL VOAs with 5g plugs using SOP No. 5.
- Collect a composite soil sample for all other parameters using a decontaminated stainless-steel sampling spoon from all nine areas into a decontaminated stainless steel bowl.
- Composite the soil by thoroughly mixing the soil in the decontaminated stainless-steel bowl with the sampling spoon. Fill the jar for the specified analysis. The required analyses and appropriate containers are listed in the UFP-QAPP.
- Label, store, and document sample according to SOP No. 2.
- Record applicable information on the Sample Collection Field Sheet.
- Identify the location for future reference using surveying stakes and flags.
- Repeat procedure for remaining excavation walls and excavation bottom

4.2.4 Field Quality Assurance/Quality Control Procedures and Samples

Field Quality Assurance/Quality Control samples are designed to help identify potential sources of external sample contamination and to evaluate potential error introduced by sample collection and handling. All QA/QC samples are labeled with QA/QC identification numbers and sent to the laboratory with the other samples for analyses.

4.2.4.1 Duplicate Samples

Duplicate samples are samples collected to assess precision of sampling and analysis. For the soil sampling, a duplicate sample will be collected at the same time as the initial sample. The initial sample bottles for a particular parameter or set of parameters will be filled first, then the duplicate sample bottles for the same parameter(s), and so on until all necessary sample bottles for both the initial sample and the duplicate sample have been filled. The duplicate soil sample will be handled in the same manner as the primary sample. The duplicate sample will be assigned a QA/QC identification number, stored in an iced cooler, and shipped to the laboratory on the day it is collected. Duplicate samples will be collected for all parameters. The soil will be divided evenly and then homogenized separately. Duplicate samples will be blind to the laboratory.

4.2.4.2 Matrix Spikes and Matrix Spike Duplicates

Matrix spikes (MS) and matrix spike duplicates (MSD) are used to assess the potential for matrix effects. Samples will be designated for MS/MSD analysis on the chain of custody form and on the bottles. It may be necessary to increase the sample volume for samples where this designation is to be made.

4.2.5 Sample Identification, Handling, and Documentation

Samples will be identified, handled, and recorded as described in this SOP and SOP No. 2. The parameters for analysis and preservation will be specified in the UFP-QAPP.

4.2.6 Documentation

Each field activity must be properly documented to facilitate a timely and accurate reconstruction of events in the field (see SOP No. 2). Sample Collection Field Sheets will be completed for all soil samples submitted for chemical analysis.

4.2.6.1 Field Logbook

The most important aspect of documentation is thorough, organized, and accurate record keeping. All information pertinent to the investigation and not documented on the boring log will be recorded in a bound logbook with consecutively numbered pages. All entries in logbooks will be made in waterproof ink and corrections will consist of line-out deletions that are initialed and dated. Entries in the logbook will include the following, as applicable:

- Project name and number
- Sampler's name
- Date and time of sample collection
- Sample number, location, and depth
- Sampling method
- Observations at the sampling site
- Unusual conditions
- Information concerning drilling decisions
- Decontamination observations
- Weather conditions
- Names and addresses of field contacts

- Names and responsibilities of field crew members
- Names and titles of any site visitors
- Location, description, and log of photographs (if taken)
- References for all maps and photographs
- Information concerning sampling changes, scheduling modifications, and change orders
- Summary of daily tasks (including costs) and documentation on any cost or scope of work changes required by field conditions
- Signature and date by personnel responsible for observations

Field investigation situations vary widely. No general rules can include each type of information that must be entered in a logbook for a particular site. A site-specific logging procedure will be developed to include sufficient information so that the sampling activity can be reconstructed without relying on the memory of field personnel. The logbooks will be kept in the field team member's possession or in a secure place during the investigation. Following the investigation, the logbooks will become a part of the final project file.

5.1 PURPOSE AND SCOPE

This document defines the SOP for collecting soil samples using the Terra Core® sampling method. This SOP provides descriptions of equipment, field procedures, and QA/QC procedures implemented for the collection of soil samples. Specific sample locations and frequency of collection are presented in the UFP-QAPP. This procedure is intended to be used together with the UFP-QAPP and other SOPs. Applicable SOPs are listed below:

- SOP No. 1 Decontamination
- SOP No. 4 Soil Sampling

5.2 SAMPLING USING THE TERRA CORE® SAMPLER

The Terra Core® Sampler is a single use device and cannot be cleaned and/or reused. The Terra Core® sampler is designed to sample and momentarily hold soil before dispensing soil into sample container. The samplers to be used are 5-gram samplers.

Three separate 5-gram soil plugs from the Terra Core® sampler will be placed three separate pre-weighed VOA vials. One VOA will contain methanol, and the other two VOA vials will contain organic free water.

5.2.1 Equipment List

The following list of equipment will be needed to collect soil samples for VOC analysis using the Terra Core® Sampler:

- Disposable 5-gram Terra Core® samplers with plunger
- Zipper lock-type storage bags
- 3-40 milliliter (ml) pre-weighed VOA vials with magnetic stirring bar, 1 with methanol, and 2 with water
- Sample vial label
- Packing tape to secure label
- Cooler with ice
- Field logbook
- Waterproof and permanent marking pens

5.2.2 Decontamination

There is no decontamination needed for the Terra Core® Samplers. The plastic Terra Core® samplers are intended for single use only and cannot be decontaminated.

5.2.3 Sampling Procedures for Clay Soils

Diagrams showing a Terra Core® sampler tool and recommended use are shown below:

- **Step 1:** Have ready a 40 ml glass VOA vial containing the appropriate solvent. With the plunger seated in the handle, push the Terra Core into freshly exposed soil until the sample chamber is filled. A filled chamber will deliver approximately 5 grams of soil.

- **Step 2**: Wipe all soil or debris from the outside of the Terra Core® sampler. The soil plug should be flush with the mouth of the sampler. Remove any excess soil that extends beyond the mouth of the sampler

- **Step 3:** Rotate the plunger that was seated in the handle top 90° until it is aligned with the slots in the body. Place the mouth of the sampler into the pre-weighed 40 ml VOA vial containing the appropriate solvent, magnetic stirring bar, and extrude the sample by pushing the plunger down. Quickly place the lid back on the 40 ml VOA vial.

  Note: When capping the 40 ml VOA vial, be sure to remove any soil or debris from the threads of the vial. Also dispense the soil into the vial as not to allow any solvent to splash out of the vial.

- Repeat **Step 3** for the other two vials and place the vials in a bubble wrap bag.
- **Step 4**: Affix the appropriate sample label to the bubble wrap bag containing the three VOA vials and cover the label with packing tape.
- **Step 5**: Place the bubble wrap bag containing the three VOA vials in a cooler with ice.

5.2.4 Sampling Procedures for Sand

The Terra Core® sampler cannot be used to directly sample sand. Sand samples must be collected using another sampling method, such as a split-spoon, hand auger, or stainless steel spoon.

5.3 TERRA CORE® SAMPLE HOLDING TIMES

The holding time for Terra Core® samplers is 48 hours from the time of sample collection to storage in freezer at the laboratory. The samples should still be shipped priority overnight on the same day as collected for sample integrity, and to ensure proper sample temperatures are maintained. Once the samples are properly preserved at the laboratory there is a 14 day holding time until analysis must be completed.

6.1 PURPOSE AND SCOPE

The purpose of this standard operating procedure (SOP) is to provide procedures and technical guidance on performing geophysical surveys to detect munitions and explosives of concern (MEC), including geophysical data processing and interpretation during field activities. In addition, this SOP ensures that data will be acquired in a consistent manner by all field personnel during this investigation. To ensure that the instrumentation can attain this measure of performance, a geophysical system verification (GSV) will be conducted throughout field activities.

6.2 GEOPHYSICAL DATA COLLECTION

6.2.1 Equipment and Procedures

6.2.1.1 Instrument Verification Strip

As part of a Geophysical System Verification (GSV), an Instrument Verification Strip (IVS) will be geophysically mapped prior to any geophysical surveying to verify system performance and establish expected levels for background noise. Execution of the IVS mapping will be consistent with the GSV approach defined in the DoD's Environmental Security Technology Certification Program (ESTCP) report: *Geophysical System Verification (GSV): A Physics-Based Alternative to Geophysical Prove-Outs for Munitions Response* (2009).

An initial IVS area will be selected prior to the commencement of DGM. The IVS should be representative of a 'typical' area of the site, and easy to access at the beginning and end of each field day. Two linear tracks at least 50 feet in length will be scanned in a real-time mode using and EM61 Mk2 or handheld instrument to verify that limited or no existing subsurface anomaly sources are present. The endpoints of each track will be clearly marked, and along each track there should be clear visibility and no obstructions. The IVS size and location will meet the following criteria:

- Located in a readily accessible area
- At least two tracks 100 feet in total length
- Seeded with a minimum of three industry standard objects with available predicted instrument response curves.
- Seeds emplaced on only one track, with seeds separated by a minimum of 15 feet.
- Similar terrain, geologic, and topographic conditions as the planned survey area
- Relatively free of above and below ground man-made disturbances and subsurface anomaly sources
- Comparable geophysical conditions to those expected to be encountered during production

6.2.1.2 Daily Tests

The following QC procedures will be performed and documented as part of DGM field procedures. QC tests will be combined in a digital project QC file with unique identifiers for day and time. **Table 1** summarizes the required equipment tests and frequencies of testing. A description of each test follows the table.

TABLE 1
REQUIRED EQUIPMENT TESTS AND FREQUENCY

Test No.	Test description	Specific detector	Power on	Beginning of day	Beginning and end of day	First day of project for each operator	One line per grid or 100 feet per linear mile
1	Equipment warm-up		X				
2	Static background			X			
3	Vibration (cable shake) test			X			
4	Personnel test				X		
5	Map IVS				X		
6	Six-line test					X	
7	Repeat data						X
8	Additional navigation test		As Necessary				

1. **Equipment/Electronics Warm-Up.** Equipment/electronics warm-up will be conducted to minimize sensor drift due to thermal stabilization. The manufacturer's instructions for equipment startup will be followed (at least 15 minutes for the EM61). If instrument readings fail to stabilize within the recommended warm-up period, an additional 5 minutes will be added. If instrument readings fail to stabilize after the additional 5 minutes, troubleshooting procedures will be initiated.
2. **Static Background Test.** A static background and static standard response test will be performed to quantify instrument background readings or electronic drift, and identify any interference spikes. A minimum of 3 minutes of static background data will be collected after instrument warm-up.
3. **Vibration Test (Cable Shake) and Personnel Test.** A vibration test, also known as a cable shake, will be used to identify shorting cables and problematic connectors. Cables will be shaken for a minimum of 5 seconds with the instrument held in a static position. If the vibration test identifies any significant changes in response or spikes, the associated cables and/or connectors will be checked immediately. The vibration test will be repeated once

repairs are complete. If data spikes persist, troubleshooting procedures will be initiated. If the data spike cannot be resolved, the equipment will be replaced.

4. **Personnel Test.** Field personnel will also approach the instrument to determine if they generate a response in the instrument. If personnel approaching the instrument produce a response, they will remove any metal on their person until the response is minimized.
5. **Map IVS.** The IVS will be mapped in each direction, while recording location and instrument data. Data will be stored in a file separate from production data. The instrument operator will maintain a pace typical of production data, and should maintain a track consistent with previous IVS mappings.
6. **Six Line Test.** This test is the same as the **Map IVS** test described above, only repeated 3 times at different speeds. The first mapping should be done at normal production pace, the second mapping at a slow pace, and the third mapping at a fast pace.
7. **Repeat Data.** Small amounts of data, roughly 2%, will be repeated as a standard operating procedure. Repeat data will be collected along the same transect/path as a portion of the original data. This will verify instrument leveling, and the consistency of instrument response.
8. **Additional Navigation Test.** Known seed items may be present in areas which DGM is performed. Known seed items will be mapped in two different directions in an ‘X’ pattern to verify the location of the seed item is accurately captured in the data.

6.2.1.3 Logbook Entries

One member of the team will be responsible for maintaining the logbook. Record the following information in the logbook:

- Investigation area
- Sketch of location
- Time and date survey started
- Time survey completed
- Names of team members
- Weather conditions
- Serial numbers of GPS rover unit and geophysical instrumentation
- Obstacles preventing completion of DGM survey as planned (See Section 3.3)
- Issues identified with system that might impact data quality

File names for the digitally recorded data. Each page of the logbook will be dated, sequentially numbered, and identified by the logbook number; all entries will be signed. The field team leader will place photocopies of the logbook pages in the appropriate folder located in the processing center at the end of each workday.

6.2.1.4 Data Files

A unique data file will be started for each of the following events:

- Static/ Vibration/ Personnel test
- Each time the IVS is performed
- When data acquisition is started in a new area
- When the system is powered-off and back on, including battery swaps
- Each time an issue with the system that could have a significant impact on data quality is identified and corrected (loose wheel, loose cable, metal caught on system, etc.).

Files will be named on the field computer using the date in a MMDD format, followed by the team number. A sequential letter will be assigned to the files started throughout the day. For January 31, Team 2, the first file name would be "0131T2a", and the second file would be "0131T2b". Teams should avoid generating large numbers of files outside of the events listed above, to reduce the effort in later data processing.

6.2.1.5 Equipment

The following is a list of equipment that will be necessary to perform digital geophysical mapping:

- EM61 coil and backpack;
- Appropriate signal and power cables;
- Allegro field data recorder;
- Global positioning system (GPS) receiver, antenna, controller, and tripod;
- GPS cables; and
- Sufficient batteries for daily operation.

The following additional equipment and forms will be assembled by the field team leaders:

- Task-specific field logbook;
- Black ink pens (indelible);
- Digital camera; and
- Personal protective clothing (as required by health and safety personnel).

6.2.1.6 Equipment Storage

End of the day:

- All equipment is returned to storage and the batteries are placed on charge.
- The waypoint/track maps and logbook pages are photocopied and placed in the appropriate folder located in the processing center.
- The data files are submitted to the Project Geophysicist.
- The completed survey areas are recorded in the tracking log.

6.2.2 Search Methods

6.2.2.1 Transect Methods

Transect surveys consist of geophysical detection equipment carried along a single meandering or straight line parallel set of lines spaced at regular intervals. The transect surveys may be used to find MEC or evidence of MEC, determine MEC anomaly density, and to delineate target areas. Results from transect surveys can also be used to delineate and select areas for further investigation using complete grid surveys, if required.

Transect spacing will be determined by the scope of work, site-specific history, and physical features of the site. The resultant DGM field data, combined with archival and anecdotal information, will be used to make determinations of specific source areas (e.g., impact area, burial area, etc.).

Some transect surveys may need to be conducted in wooded areas where no GPS is available because of tree cover or the use of Robotic Total Station (RTS) equipment is not practical. In this instance, the equipment operator will collect DGM data in fiducial mode, whereby each transect is started at a known surveyed coordinate and is continued in a straight line until a second surveyed coordinated is reached. The data will be registered based on a fiducial spacing set at intervals as recorded by the geophysical instrument involved. The data will then be interpolated using Oasis Montaj to spatially rectify the data.

6.2.2.2 100 Percent Grid Survey

A complete grid survey is defined as multiple transects within a grid with spacing less than the width of the detector equipment sensor swath (effective area imaged by the sensor). Generally, an area will be divided into 100-foot by 100-foot grids where complete geophysical coverage of the electromagnetic signature will be performed to discover electromagnetic anomalies associated with MEC. The primary method of deployment for complete grid surveys will be the EM61 using parallel transect surveys with 2.5-foot spacing. The EM61 employs a 3.2-foot by 1.6-foot coil. By placing parallel transects at a spacing of 2.5 feet, there will be sufficient overlap to avoid any data gaps.

Survey lanes will be clearly marked using rope, foam, paint, or cones, except where the terrain clearly records the wheel mark of the cart. Areas within established grids that cannot be mapped because of terrain and man-made impediments such as fences will be noted in the geophysical logbook. In a complete grid survey, 100-percent coverage of the area is the goal, but due to physical limitations, some number less than 100 percent may actually be collected by 100-percent of the area must be accounted for either with data of log book entries detailing obstructions.

6.2.2.3 Deviation From Transect Orientation and Spacing

During the geophysical surveys of transects and grids there are instances when the field team encounters obstacles such as large rocks, ditches and ravines, fences, utility signs, etc. It is important to record the type of feature encountered and the location so that it can be accounted for during the data interpretation phase. The data logger will be paused when these obstacles are encountered to minimize collection when equipment is not moving. The FTL will be responsible for determining whether an area is considered inaccessible. The following steps are recommended to perform transect deviation documentation:

- The FTL will designate one member of the team to perform documentation activities. The team member will be responsible for completion of the checklist, logbook entries, slope measurements, and photo documentation.
- When performing 100% mapping, the inaccessible area will be “traced” with the survey equipment whenever possible.
- Logbook deviation documentation will include:

9. Date
10. Time
11. Area ID
12. Transect designation
13. Slope measurements (if necessary)
14. Photo number
15. Photo description including orientation
16. Feature type and description

- A digital camera will be used to record a minimum of two photos of each deviation area. The electronic file will be downloaded by data management personnel at the end of each day or each remote mobilization.
- The area of deviation will also be noted on a map to the extent possible.

6.2.2.4 Photographs

Digital photographs will also be to document site conditions. Each team will maintain a photo log in their field logbook. The date, time, and subject of each photograph will be recorded at the time the photograph is taken. The digital cameras and copies of the photo logs will be turned in daily with field long entries.

6.2.3 Personnel Requirements

The Project Geophysicist is responsible for the overall coordination of data acquisition, data analysis, technical content, and technical review of data. The Project Geophysicist reports directly to the Project Manager. The geophysical survey teams, composed of Data Acquisition Specialists (DASs), are the primary data collection crews in the field. These teams are lead by Field Team Leaders (FTLs). The skill level and specific duties for the Project Geophysicist, data processors, FTLs, and DASs are presented in the following sections.

6.2.3.1 Project Geophysicist

The specific responsibilities of the Project Geophysicist include the following:

- Recommending experienced personnel and maintaining the geophysical staff throughout the project;
- Coordinating field teams and support personnel to ensure consistency of performance and maintenance of established schedules;
- Providing technical leadership in the discipline of geophysics and QC/QA of the geophysical and GPS data;
- Creating and maintaining a list of all equipment, computers, materials, and supplies necessary to perform the task;
- Coordinating field activities;
- Internal QC of geophysical data; and
- Database QC and maintenance.

6.2.3.2 Field Team Leader

The FTLs are responsible for field activities and personnel. The FTLs work as an integrated team with the Project Geophysicist to ensure the success of the data acquisition phase of the project. The specific responsibilities of the FTLs include the following:

- Scheduling field crew activities in concert with the Project Geophysicist;
- Establishing control of site access with the Project Geophysicist;
- Establishing and maintaining communications with team personnel;

- Coordinating and directing activities of all personnel on the geophysical field team, including setting and enforcing the schedules required to achieve the goals for each day's activities;
- Supervising geophysical field operations and related surveying activities, including directing field team activities;
- Logging all activities at the geophysical survey site in the field logbook and maintaining relevant files;
- Ensuring that all materials needed at the survey site are in stock (geophysical equipment, batteries, writing materials, tape, markers, etc.);
- Checking sites to be surveyed and access routes in advance of data acquisition activities;
- Downloading of data from field computers/palm pilots; and
- Creative thinking to improve the efficiency and/or quality of the data based on site-specific survey conditions.

The authority of the FTL includes the following:

- Shutting down operations on a site to prevent compromising technical quality; and
- Shutting down operations on a site to prevent compromising health and safety.

6.2.3.3 Data Acquisition Specialist

The DASs are responsible for the acquisition of geophysical data and will work in conjunction with the FTLs. Their responsibilities include the following:

- Following the geophysical survey protocol in a consistent manner; and
- Maintaining geophysical and related equipment and supplies in excellent condition.

All project staff collecting geophysical and GPS data are responsible for understanding and following the general procedures described in this document.

6.2.4 Training Requirements

Prior to the initiation of geophysical survey data collection, training sessions will be held for all personnel responsible for geophysical surveying and the downloading and QC of data. Survey methodology, data requirements, field note protocol, and transect deviation documentation will be explained in detail. The presentations will include an overall discussion of the survey approach and how the data collection and field documentation tasks integrate into the overall program. Training will also include review of the internal QC procedures listed in this SOP. The Project Geophysicist will be responsible for this training and any follow up training deemed necessary.

All personnel assigned to the geophysical investigation teams require an initial certification. Each team member must demonstrate his ability to perform assigned task associated with the geophysical investigation with the geophysical and GPS equipment at the approved IVS. If the equipment requires repair it must be recertified prior field use; all new or spare equipment must be certified prior to field use. Newly assigned personnel must complete an initial certification of the validation test plot.

6.3 GEOPHYSICAL DATA PROCESSING AND INTERPRETATION

6.3.1 Equipment

6.3.1.1 Hardware

A high quality PC is required to process and interpret geophysical data.

6.3.1.2 Software

- Geonics Dat61mk2.exe or equivalent is necessary to assign positions to data recorded on a handheld data logger such as an Allegro.
- Geometrics Magmap or equivalent is necessary to assign positions to data recorded on a laptop using Maglog (i.e. towed array).
- Geosoft Oasis Montaj is necessary for the majority of data processing and interpretation.

17. Procedures
18. Convert file from *.r61 to *.m61 format if data were recorded using a handheld data logger.
19. Assign coordinates using Dat61mk2 if data were recorded on a handheld data logger or Magmap if data were recorded using Maglog.
    - Dat61mk2 parameters:
    - 5 second time gap
    - Output file format: Geosoft
    - Amplitude: Linear
    - Geodetic coordinate system in DD.DDDD format
    - Export Time, Quality indicator and STD-4 data in Geosoft format.
    - Maglog parameters
    - Under the GPS Offset Setup (GPS menu) select 2 points to look forward and back, 0 clock bias and sensor separations as measured from towed array in the field.
    - Export data separately to default file names in Geosoft format.
20. Import IVS and static data into QC database and populate values in QC table.
21. Clip excess IVS data.

22. Start a new database for the production data in Geosoft. To ensure easy script operation, databases should be placed in directories carrying the same naming convention as the database. The typical convention is the numeric date with a signifier for team, e.g., 0131T2\0131T2.gdb for data collected on Jan 31 by Team 2.
23. Import ASCII xyz data files into new database.
24. Correct for latency using Geosoft QC/QA module latency correction GX based on latency observed in daily ISV.
25. Run script for coordinate conversion, leveling, and gridding.
26. Check background noise, velocity, and downline spacing to prepare deliverables and ensure DQOs are met.
27. Verify if any grids or areas have been completed and are ready for target selection.
28. Run target picking script and review target list.
29. Calculate the advanced processing parameters and update dig sheet to reflect changes.
30. Export data and anomaly selections for delivery to client and import into project database.
31. Complete processing log for data.

7.1 THREE-PHASE CONTROL PROCESS

The UXOQCS is responsible for verifying compliance with project requirements through implementation of the three-phase control process. This process ensures that project activities comply with the approved plans and procedures.

Elements of the three-phase control process are: (1) Preparatory Phase, (2) Initial Phase, and (3) Follow-Up Phase. Each control phase is important for obtaining a quality product. However, the preparatory and initial inspections are particularly valuable in preventing problems. Production work is not to be performed on a definable feature of work until a successful preparatory and initial phase inspection has been completed and documented. The specific QC monitoring requirements for the definable features of work are listed in Table 4-1 of the WP. The Daily Quality Control Report will be used to document the three-phase control process.

7.1.1 Preparatory Phase

Preparatory phase inspections are performed prior to beginning a definable feature of work. The purpose of the inspection is to review contracts, plans, specifications, SOPs, and other applicable documents and to verify that necessary resources (i.e., equipment and personnel), conditions, and controls are in place before work starts. This inspection phase is conducted with the people responsible for performing each definable feature of work to include managers, supervisors, and applicable subcontractors ensuring all involved know what is expected and understand their role. The client is invited to attend but is not required. The PM is responsible for ensuring that:

- Appropriate plans and procedures are developed, coordinated, and approved;
- Personnel required for the activity are identified and positions filled;
- Training has been identified and completed;
- Preliminary work and coordination have been completed;
- Equipment and materials required to perform the activity have been identified and are available; and
- Reviews have been performed.

The UXOQCS is responsible for assisting the PM in conducting preparatory phase inspections and verifying the following conditions:

- Appropriate plans and procedures have been developed, approved, reviewed, and are available;
- Personnel identified are available and meet the requirements/qualifications for the position or waivers have been obtained;
- Required training has been performed, documented and acknowledged; and
- Preliminary work and coordination have been completed;

Deficiencies identified during preparatory phase inspections will be documented and corrective action taken prior to beginning work. The UXOQCS will verify that corrective action has been complete and is appropriate before production work begins.

7.1.2 Initial Phase

Initial phase inspections are performed when a work process begins for each crew or team performing the definable feature of work. The purpose of the inspection is to:

- verify that the work to be performed will be in compliance with procedures and contract specifications,
- verify that equipment and personnel on site meet the requirements established during the preparatory phase,
- review acceptable level of workmanship for site personnel who will be conducting the definable feature of work,
- review preparatory phase inspection report, and
- resolve any differences of interpretation.

The initial phase is the first documented UXOQC field compliance inspection for a definable feature of work. Initial phase inspections may be repeated when acceptable levels of quality are not demonstrated or at the discretion of the UXOQCS.

- Equipment is on-hand, functional, in specification, and appropriate for the job;
- Required personnel resources are on site and properly qualified to perform the definable feature of work in accordance with the preparatory phase;
- Material and supplies are on-hand and meet contract specifications;
- Level of quality expected is understood by workers;
- Compliance with procedures and specifications;
- Acceptable level of workmanship is being performed;
- Corrective action taken during the preparatory phase inspection has resolved the deficiency and prevents recurrence; and
- Quality issues and any differences of interpretation by workers are resolved.; and
- Briefing on the process improvement program and FCR process has been completed.

Deficiencies identified during initial phase inspections will be documented and corrective action taken. The UXOQCS will verify that corrective action has been completed and is appropriate to prevent recurrence of the condition. When corrective action cannot be completed in a timely manner or the root cause is not known, immediate corrective action that fixes the deficiency may be taken, verified, and work continued pending root cause analysis and more appropriate corrective action.

7.1.3 Follow-up Phase

Follow-up phase inspections are performed after a work process has begun and periodically throughout the work process. The purpose of the inspection is to evaluate whether the process is being completed in accordance with agreed upon standards and to evaluate whether the level of quality meets QC acceptance criteria. The UXOQCS is responsible for monitoring work processes and verifying continued compliance with WP and QC criteria requirements. Follow-up phase inspections are excellent opportunities to observe work processes and identify possible process improvements (Section 4.15).

Deficiencies identified during follow-up phase inspections will be documented and corrective action will be taken. The UXOQCS will verify that corrective action has been completed and is appropriate to prevent recurrence of the condition. When corrective action cannot be completed in a timely manner or the root cause is not known, immediate corrective action that fixes the deficiency may be taken, verified, and work continued pending root cause analysis and more appropriate corrective action.

7.2 QC SEEDING FOR GEOPHYSICAL OPERATIONS

The purpose of this Standard Operating Procedure (SOP) is to provide a means of validating geophysical surveys, geophysical data processing and target anomaly selection, and UXO team excavation effectiveness during analog and/or digital geophysical operations.

This quality control (QC) activity will be performed as one of several QC measures to ensure that personnel operating geophysical instruments (analog or digital) in the field for the purpose of locating and excavating buried ordnance items have performed their function in a quality manner. This process also validates the instrument's capability to detect potential MEC items at the depth of detection limits determined by the geophysical prove-out. The method involves burying items simulating ordnance items in known locations where geophysical surveys will be performed and determining whether the items were found as a result of these surveys. The items will be placed at depths and orientations that, when surveyed effectively, will cause instrument responses that indicate the presence of a buried metallic item and are within the Project's established digital geophysical millivolt (mV) threshold.

7.2.1 Responsibilities

7.2.1.1 Project Manager (PM)

The PM shall be responsible for ensuring the availability of the resources needed to implement this SOP, and shall also ensure that this SOP is incorporated in plans, procedures and training for sites where this SOP is to be implemented.

7.2.1.2 UXO Quality Control (UXOQC)

UXOQC will be responsible for ensuring this SOP is effectively implemented. UXOQC site personnel are responsible for ensuring that quality control is maintained during all geophysical operations. UXOQC will perform all of the actions specified in this SOP for areas to be surveyed using digital and/or analog geophysical methods.

7.2.1.3 Quality Control Geophysicist (QCGEO)

The QCGEO for the site is responsible for ensuring that quality control related to digital geophysical procedures is maintained during all digital geophysical operations. The QCGEO, in conjunction with the UXOQC staff, will perform all of the actions specified in this SOP for areas to be surveyed using digital and/or analog geophysical methods.

7.2.1.4 UXO Safety Officer (UXOSO)

The UXOSO ensures that site operations are being conducted in a safe manner.

7.2.1.5 Senior Unexploded Ordnance Supervisor (SUXOS)

The SUXOS is responsible for all UXO field personnel and Operational work efforts.

7.2.2 Procedures

The following procedures should be followed to perform the seeding of items simulating ordnance items and the verification that the items were detected by the survey operations.

7.2.2.1 Pre-Survey

- Obtain at least one item simulating ordnance items (as discussed above) to be surveyed and ensure the items are buried at or shallower than the detection depths determined during the geophysical prove-out.

- Paint and number each simulate item to indicate that it is a quality control item and is inert.

- Record the location of the item using a Global Positioning System (GPS) accurate to sub-meter, or a survey transit with similar accuracy in accordance with work plan criteria.

- Record the depth to the highest surface point of the item from the ground surface using a measuring device such as a tape or ruler.

- Record the orientation and inclination of the item.

- Bury the item so there is as little evidence as possible that there has been surface disturbance.

- Photograph all seed items prior to covering them with soil to re-fill the excavation.

- For surface items (if applicable for surface clearances), place the items on the surface at the desired location, photograph, and document location using the accepted project GPS system.

7.2.2.2 Post-Survey

- Determine from dig locations selected by the geophysical data processors and individual dig location results whether the buried QC items were; 1) selected by the geophysical data processors and/or 2) found during intrusive operations.

7.3 NONCONFORMANCE/CORRECTIVE ACTION

Nonconformances shall be addressed via corrective action in a manner described in this QCP section.

7.3.1 Nonconformance Identification

Circumstances that prevent a work process to control the output from conforming to the contract requirements will be promptly identified, documented, investigated, and corrected appropriately. All project personnel have the responsibility, as part of their normal work duties, to promptly identify and report conditions adverse to quality. The methodology for the NCR process is described in the Material or Activity Nonconformances SOP. The status of NCRs will be maintained in a log and progress of their resolutions shall be documented and reviewed to ensure prompt attention to their conclusion.

7.3.2 Resolution, Corrective Action, and Verification

The appropriate level of management is responsible for evaluating the cause of a NCR and will recommend solutions for correcting the deficiency identified. Actions and technical justifications for an action proposed to resolve the NCR shall be reviewed and approved by personnel responsible for the technical aspect of the work.

Corrective action is the specific action or actions taken to correct the immediate situation and to reduce or prevent the likelihood of future occurrences. Examples of corrective action for the immediate situation include rerunning a portion of a test/operation that was not conducted in accordance with procedures, rerun the portion of an operation that failed a QC inspection, calibrating test equipment found to be out of calibration, rework of a specific activity, and rerunning any required tests. QC personnel will be responsible for verifying implementation of corrective action, monitoring the effectiveness of preventive action, and reporting any findings to the appropriate management level.

The UXOQCS shall maintain an NCR log. The NCR log will be used to track and control each nonconforming condition. At a minimum the log will contain, the date each nonconforming condition was discovered, the NCR tracking number, a brief description of the condition, the location, the department/manager responsible for disposition, the recommended disposition, the NCR closure date, and status of all nonconformance reports. The NCR log status will be maintained in the project files and available on-site.

7.3.3 Material and Equipment Nonconformance

QC personnel ensure that the following requirements are implemented:

- Materials and/or equipment that do not conform to prescribed technical and/or quality requirements are tagged or otherwise identified, documented, and reported as nonconforming. The documentation shall include the following information:
  - Identification of the technical and quality requirement(s) with which the item is not in compliance.
  - Identification of the current status of the item (i.e., whether the item is on hold or whether its use is conditional).
- Nonconforming materials and equipment are segregated, when possible, from conforming materials and/or equipment to the extent necessary to preclude their inadvertent use and commingling.
- The status of nonconforming material and/or equipment and the progress of their resolution are documented and routinely reviewed to ensure prompt attention to conclusion.

7.3.4 Deficiency Reporting

Deficiencies and nonconforming conditions are very similar and are conditions that, once identified, must be resolved or corrected prior to acceptance of an item or product. A deficiency is a condition that can be corrected quickly by standard methods during the normal course of work. A deficiency usually is not systemic in nature.

It will be the responsibility of all project personnel to identify deficiencies and notify their supervisor or manager as soon as the conditions are identified. Determination of any deficiencies must be supported with objective evidence. Deficiencies will be evaluated, resolved, or corrected and may be considered as opportunities to improve the process (Section 4.16).

7.3.5 Preventive Action

Preventive action is the specific action or actions taken to prevent or reduce the likelihood of future occurrences of nonconformance. Examples of preventive actions are clarifying or refining procedures, allowing for additional training, and/or enhancing monitoring.

Preventive action measures will be selected to prevent or reduce the likelihood of future occurrences and will address root causes to the extent identifiable. Selected measures will be appropriate in relation to the seriousness of the nonconformance and will be realistic in terms of the resources required to implement them. Preventive action measures will be communicated with affected staff, and a record of preventive action taken shall be documented as part of the NCR and maintained for project record.

7.3.6 Trend and Root Cause Analysis

7.3.6.1 Trend Analysis

As necessary, the PM or designee, as a part of a periodic assessment, shall perform a Project trend analysis. QC personnel shall verify the implementation of any preventive actions resulting from the trend analysis.

This management assessment shall propose and initiate measures necessary to deal with any problems requiring preventive action. When preventive action necessitates a revision to the project procedures, the PM (or designee) shall issue an administrative FCR describing the necessary change. QC personnel shall verify implementation of the preventive action.

The operations project team reviews results from the following sources and performs a trend analysis, when sufficient information and data are available to ensure that the analysis is meaningful. A trend analysis should be conducted once at least every 6 months for projects of 1 year or longer duration.

The trend analysis of QC and/or QA audits, subcontractor/supplier surveillance reports and nonconformance will include the following information:

- Total number of audit findings and observations, surveillance reports, and NCRs for each area of the QCP.
- A summary of the root causes for the nonconformance consolidated for each area of the QCP.
- Trends that are developing or that have developed.

7.3.6.2 Root Cause Analysis

The operations project team appointed by the PM shall determine root cause of a severity level 1 nonconformance. The root cause determination will depend upon project specific factors impacting the product development, product conformity or process performance. The nonconformity may be classified using an event and causal factors following the root cause analysis. The root cause analysis shall identify corrective actions to prevent recurrence. The record of the root cause analysis and corrective action taken shall be maintained on file with UXOQC as a part of the project record.

7.3.6.3 Preventive Action

For the period under review, the project operations team shall determine the root cause(s) of potential repetitive nonconformities and evaluate the need for action to prevent their recurrence. The project operations team shall prepare a report identifying the nonconformities for each area of the project processes/procedures, a consolidated summary of root causes of the nonconformities, and a statement of trends that are developing or have developed, and submit the report to the PM. The PM shall provide appropriate actions to prevent recurrence of the adverse trends. The Project team and UXOQC shall verify implementation of the preventive actions and report the results to the PM. The record of trend analysis and preventive action taken shall be maintained on file by UXOQC as a part of the project record.

7.3.7 Lessons Learned

During the course of field activities, data or information may be discovered that could eliminate or reduce challenges and/or offer opportunities for quality and productivity improvements through value engineering. Lessons learned are documented and communicated as soon as possible to allow access by project personnel. These lessons learned are considered valuable tools in updating plans and procedures for subsequent field activities. Lessons learned will be reviewed and distributed by the URS MR QPM to other applicable URS Project locations.

7.3.8 Field Change Request Form Process

An FCR form is to be completed for initiating changes to an approved, documented process. Any field team member assigned to perform or supervise a task that recognizes the necessity for a change in the task is responsible for initiating, completing, and submitting the FCR for review and approval of appropriate field changes. The FCR process includes review and approval of the recommended change by the site senior UXO staff, MR Quality Program Manager (MR QPM), MR Safety Program Manager (MR SPM), PM and appropriate Client Representatives prior to process alteration in the field and incorporation into a revised work plan element. The client may ask that the FCR be reviewed by appropriate regulatory personnel if it is deemed to be a significant change to a process or overall scope of work. When an FCR is approved, changes to procedures will be reviewed with project personnel during the morning meeting/safety briefing prior to implementation. FCRs will be numbered sequentially and will be maintained in the project files on-site. FCRs will be included as an appendix to the Final Report Supplement.

FCRs should be approved or disapproved in no more than one week.

8.1 PURPOSE AND SCOPE

The purpose of this document is to define the SOP for performing MEC disposal operations. These procedures give descriptions of briefings, equipment, field procedures, safety precautions, and QC measures to be implemented for the intentional detonation of MEC items. Specific locations and frequency of operations are presented in project-specific Work Plan Addendums and the approved ESS. When conducting MEC disposal operations this SOP will be used in conjunction with the approved Facility-Wide Work Plan, project-specific Work Plan Addendums, and the Government approved ESS for the site.

8.2 APPLICABILITY

This SOP is applicable to all qualified UXO Technicians assigned to URS project sites.

8.3 PERSONNEL REQUIREMENTS

A minimum of two UXO Technicians qualified in accordance with DDESB Technical Paper (TP) 18 (DDESB 2004) are required to conduct MEC disposal operations. One of which must be a qualified UXO Team Leader (UXO III). The team may include additional UXO qualified personnel, depending on project-specific and task-specific conditions and requirements. Additional support personnel may be used to make notifications, provide emergency assistance, and enforce exclusion zone security. The composition of the Demolition Team and support personnel will be determined by the UXO Team Leader or SUXOS if applicable.

8.3.1 Responsibilities

Ensuring acceptable performance of MEC disposal operations and maintenance of an acceptable and healthy work site is the responsibility of everyone assigned to the project site; therefore, all URS personnel as well as subcontractors are responsible for compliance to all applicable plans, SOPs, and references. Specific responsibilities are described below:

8.3.1.1 Senior Unexploded Ordnance Supervisor

The SUXOS will meet applicable requirements of DDESB TP 18 (DDESB 2004). The SUXOS is the technical lead for all MEC operations reporting directly to the PM. The SUXOS will confirm that field personnel conduct MEC operations at the site in accordance with the plans and procedures and in a systematic manner using proven operating methods and techniques. Typical responsibilities include:

- Planning, coordinating, and supervising all explosives operations
- Certifying munitions/range debris as ready for turn-in or disposal
- Coordinating on-site field activities (e.g., intrusive investigations) to minimize impacts to productivity and to ensure compliance with the APP

- Directly interfacing with and relaying safety and health concerns to the PM
- Managing on-site manpower and equipment necessary to safely conduct the tasks associated with the field investigation
- Preparing and submitting a detailed daily accounting of activities performed each workday
- Review personnel qualifications and monitor site specific training programs
- Review and approve demolition plans prior to execution; make team assignments, and coordinate the overall disposal operation
- Coordinating all MEC activities with the onsite USACE OESS

8.3.1.2 Unexploded Ordnance Safety Officer

The UXOSO will meet applicable requirements of DDESB TP18 (DDESB 2004). The UXOSO is responsible for implementing and enforcing the safety and health requirements listed in the project-specific APP. The UXOSO reports to the Munitions Response Safety Program Manager (MR SPM) and responsibilities include, but are not limited to:

- Evaluating MEC and explosives operational risks, hazards, and safety requirements
- Developing and implementing corrective action plans to eliminate or mitigate hazards
- Conducting and documenting daily safety inspections and weekly safety audits
- Conducting the UXO safety briefings for project and visiting personnel
- Monitoring compliance with the safety measures contained in the APP and associated documents during field activities
- Ensuring the proper use of personal protective equipment (PPE) in accordance with the requirements of the APP/SSHP
- Establishing and ensuring compliance with site-specific safety requirements
- Investigating and documenting injuries, illnesses, accidents, incidents, and near-misses
- Establishing and maintaining minimum separation distances (MSDs) during field operations in accordance with the DDESB-approved ESS/ESP/CSS
- Stopping work if health and/or safety are jeopardized or compromised

8.3.1.3 Unexploded Ordnance Quality Control Specialist

The UXOQCS will meet applicable requirements of DDESB TP18 (DDESB 2004). The UXOQCS is responsible for implementing and enforcing the QCP and verifying elements of the RI Work Plan. The UXOQCS reports to the Munitions Response Quality Program Manager (MR QPM) and responsibilities include, but are not limited to:

- Implementing a three-phase control process for each definable feature of work to include preparatory, initial, and follow-up inspections
- Conducting QC final acceptance sampling inspections
- Checking for defective or damaged equipment
- Verifying appropriate personnel are being utilized during field investigation activities
- Maintaining inspection and surveillance documentation (e.g., QC reports, equipment standardization results and equipment maintenance results, and nonconformance and corrective action documents)
- Performing and documenting daily inspections/surveillances of job site activities on a daily QC report (DQCR) form
- Verifying that required equipment tests and checks have been performed and that inspection and standardization results comply with specifications
- Issuing a stop work order for any unsafe or for any major quality nonconforming conditions.

8.3.1.4 Demolition Team Leader

The Demolition Team Leader reports directly to the SUXOS. He is responsible for providing direct supervision to and ensuring the safety of his demolition team. During MEC disposal operations, the Demolition Team Leader will review and work in accordance with the contents of all applicable references and this SOP; be familiar with the MEC being disposed of; submit demolition plans to the SUXOS prior to operations; conduct an operations and safety brief; make appropriate notifications; supervise the preparation, placement, and firing of demolition charges; take prompt action to preclude or control any hazardous situation; and strictly adhere to the approved procedures and governing SOPs for the site.

8.3.1.5 Demolition Team Members

The Demolition Team Members are required to comply with the provisions of the APP, SSHP, Work Plan, project-specific Work Plan Addendums, applicable references, and governing SOPs. They report directly to the Demolition Team Leader for their performing duties as a member of demolition team.

8.4 CONTENTS

Applicable SOPs and guidelines contained in this document are as follows:

- SOP No. 9 Electric Demolition
- SOP No. 10 Remote Firing Device Demolition
- SOP No. 11 Shock Tube/NONEL Demolition

- SOP No. 12 Non-Electric Demolition
- SOP No. 13 Use of Detonating Cord
- SOP No. 14 Open Burning

8.5 GENERAL SAFETY PRECAUTIONS

All URS and subcontractor personnel engaged in MEC disposal activities on URS sites will observe and rigidly adhere to the applicable safety precautions contained within the APP, SSHP, ESS, referenced publications, and this SOP. Demolition activities are inherently hazardous and require strict adherence to approved safety and operational procedures. Violations of procedures may result in immediate removal from this project and/or termination of employment. Also, situations may warrant additional safety measures, such as fire department support and medical assistance in an emergency. All site personnel have the responsibility to ensure the safety of support personnel, if their assistance is needed.

During MEC disposal operations, safety shall be the primary concern of all personnel. The most obvious requirements are to protect personnel, property, and the environment from fire, blast, noise, fragmentation, and toxic releases. Planned detonation of explosives requires more stringent safety distance requirements than those for ordnance in storage, and will be conducted in accordance with the requirements outlined in DoD 6055.09-M (2008a). URS will establish and maintain the ESS -approved minimum separation distances (MSDs) during intentional detonations.

The following are general safety precautions to be observed during MEC disposal operations:

- Safety aspects shall be considered during the planning of disposal operations and applicable safety precautions shall be included as part of the mandatory brief conducted prior to beginning disposal operations.
- The number of persons involved in MEC disposal operations will kept to a minimum, consistent with safe performance of the work at hand. Analyze explosive operations with a view toward reducing the number of personnel and quantity of explosive material subject to an accident. However, never allow one person to work alone.
- Only the Demolition Team, SUXOS, UXOSO, UXOQCS, and USACE OE Safety Specialist (OESS) will be permitted in the area where charges are being assembled and MEC disposal operations are being conducted.
- Use sufficient warning signals and maintain a restricted exclusion zone when explosive operations are conducted.
- Secure all access roads to the demolition area and visually check the site for any unauthorized personnel.
- Comply with the authorized explosive limits and safe separation distances of teams.

- Discontinue explosive operations when an unforeseen hazardous condition develops and do not resume operations until the condition is corrected.
- Do not permit smoking, matches, or other flame producing materials to be present during explosive operations.
- Plan for, provide for, and know the emergency procedures in the event of an accident.
- Designate an emergency vehicle (in addition to the vehicle associated with the demolition team) that will remain in the area during MEC disposal operations.
- Clear an appropriate distance (50 ft) around the disposal site of dry grass, leaves, and other extraneous combustible materials as deemed necessary.
- Perform MEC disposal operations only during daylight hours.
- Transport to the demolition site only those donor explosives needed to meet the requirement of the operation.
- Wear the required PPE when conducting MEC disposal operations. ANSI approved safety glasses must be worn when working with blasting caps and/or detonators.
- Use special care in disposing of deteriorated explosives, munitions items, and other hazardous materials.
- Keep explosives awaiting destruction, in small quantities at safe distances, and protect them from unintentional initiation. Do not expose explosives to prolonged direct rays of the sun.
- Protect explosives and munitions items from the elements and static electricity.
- Dual priming is recommended whenever practical.
- Carry blasting caps in an approved container and handle them carefully. Locate caps at least 50 ft downwind from other explosives, until they are needed for priming.
- Always point the explosive end of blasting caps, detonators, and explosive devices away from the body and other personnel during handling. This will minimize injury should the item explode.
- Do not bury blasting caps used for initiation of explosive charges. Detonating Cord will be used for priming explosives when buried below ground.
- Do not use blasting caps less than the equivalent of a commercial No. 8 cap unless used with commercial explosives and approved by the explosives manufacturer.
- If explosive charges are to be covered or tamped with earth, use detonating cord leads that protrude 1.8 meters (6 ft) from the earth.
- Do not surrender the blasting machine or activating device to the individual designated to fire the shot until the SUXOS is assured that the area is clear.
- Provide a minimum delay time of 30 seconds for electric operations between detonations.

- MEC will only be detonated after positive identification.
- Use caution when investigating post demolition shots. Search the area after each shot for any remaining explosives or explosive components utilizing a magnetometer as needed.
- Conduct operations in accordance with TM 60A-1-1-31 (EOD Disposal Procedures).

Prior to conducting a MEC disposal operation, the Demolition Team Leader will prepare a Demolition Plan (Enclosure 1) and conduct a Demolition Safety Briefing (Enclosure 2) for the members of the demolition team. The Demo Plan/Safety Briefing at a minimum will include; phases of the operation, review of explosive handling procedures, applicable safety precautions, location of demo area, emergency notification procedures, site specific characteristics, type and amount of MEC being destroyed, placement and quantity of counter charges, misfire procedures, post-detonation inspection, cleanup of the site, personal hygiene, two person rule, location of the emergency vehicle, wind direction (toxic fumes), and the location of first aid kit and fire extinguisher.

The vehicle engine will be started prior to initiating priming procedures and will be kept running.

Telephone or radio communication will be established with emergency response personnel. No radio or cellular telephone transmissions will take place in the vicinity during the positioning or connecting of electrical initiating devices.

8.6 LIST OF REFERENCE DOCUMENTS

The following documents are to be made available (hard copy and/or electronic) to all site UXO personnel conducting MEC disposal operations. UXO personnel involved with MEC disposal operations will have read the site specific ESP/ESS/CSS and be in compliance with all applicable references listed in the plan and this SOP. The following is a list of applicable references and regulations.

Department of the Army (DA). 1999. DA Pamphlet (DA PAM) 385-64, Ammunition and Explosives Safety Standards. December.

DA. 2008. Technical Manual (TM) 60A-1-1-31, Explosive Ordnance Disposal (EOD) Procedures, General Information on EOD Disposal Procedures (Revision 5). October.

Department of Defense Explosive Safety Board (DDESB). 2004. Technical Paper (TP) 18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel. December.

DDESB. 2009a. TP 16. Methodologies for Calculating Primary Fragment Characteristics. Revision 3. April.

DDESB. 2009b. "DDESB Approval of Minimum Separation Distance to Non-Essential Personnel When Using DDESB-Approved Consolidated Shot Method, September 25, 2009." September.

Department of Defense (DoD). 2008a. DoD 6055.09-M, DoD Ammunition and Explosives Safety Standards. (Change 2, August 2009, Administratively Reissued August 4, 2010). February.

DoD. 2008b. DoD Instruction (DoDI) 4140.62, Material Potentially Presenting an Explosive Hazard. November.

United States Army Corps of Engineers (USACE). 1998a. "Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions." Serena, J.M. and Crull, M. Huntsville Division, HNC-ED-CS-S-98-7. August.

USACE. 1998b. Procedures for Demolition of Multiple Rounds (Consolidated Shots) on Ordnance and Explosives (OE) Sites. Engineering and Support Center, Huntsville. August (Terminology Update March 2000).

USACE. 2008a. EM 385-1-1, Safety and Health Requirements Manual. 15 September.

USACE. 2008b. EM 385-1-97, Explosives Safety and Health Requirements Manual. 15 September. (Errata 1 through 5 dated June/July 2009 and July 2010).

USACE. 2010. Safety Advisory: Use of Jet Perforator During Intentional Detonation While Using Sandbag Mitigation for Engineering Controls. Huntsville Center, CEHNC-CX-MM. July.

ENCLOSURE 1
DEMOLITION PLAN

Project Site:________________________ Date:________________

SUXOS: ____________________
UXOSO: ____________________
UXOQC: ____________________
Team Leader: ____________________

Team Members: ____________________ ______________________
____________________ ______________________
____________________ ______________________

Demolitions Ops Start Time: _________ Stop Time: ____________

Communications: ____

MEC items to be destroyed and location:
____
____
____
____

Required Explosives:		Explosives Used:
Electric Blasting Caps (ea)	____________	_______________
Non-Electric Caps (ea)	____________	_______________
Shock Tube Detonators (ea)	____________	_______________
Detonating Cord (ft)	____________	_______________
Shock Tube (ft)	____________	_______________
Boosters (ea)	____________	_______________
Perforators (ea)	____________	_______________
Safety/Time Fuse (ft)	____________	_______________
Igniters (ea)	____________	_______________
Electric Squibs (ea)	____________	_______________

EZ/MSD for Demolition Shot: ___________________

Road Guards:

NW: ___________________ NE: _________________

SW: ___________________ SE: _________________

Personnel Assignments:

Notifications:	____________________
Cap work up:	____________________
Prime in:	____________________
RFD check out:	____________________
RFD set up:	____________________
Sandbags:	____________________
	____________________
	____________________
	____________________

ENCLOSURE 2
DEMOLITION SAFETY BRIEF

____ Verify notification calls made.

____ Team assignments (from Demo Plan). *NOTE*: Keep number of personnel setting up the shot to a minimum, Team Leader + 3, unless more personnel are required.

____ MEC and HE Safety Precautions:

- MEC handling	- HE precautions
- HE handling	- Shock tube precautions
- Detonating Cord	- Caps and/or detonators (25-foot separation)
- Prime in precautions	- Overview of Misfire procedures

- EMR/HERO precautions (no radio transmissions within 25 feet, no cell phones within 25 feet)

____ Plan of attack (MEC items, locations, demo materials, etc.)

____ Post blast inspection (personnel and procedures)

____ Exclusion Zone (EZ)/ Minimum Separation Distance (MSD)

____ Watch for low flying aircraft, non-essential personnel, vehicle traffic in the area.

____ No smoking, no horseplay, no unsafe acts.

____ Weather Information

____ Communications

____ Emergency Assistance (hospital, EMS, fire, police)

____ Emergency Radio Protocol (Break-Break-Break, Emergency-Emergency-Emergency, State nature of emergency, location, assistance need, Rally Points)

____ Emergency response procedures and plan of action.

ENCLOSURE 3
EXPLOSIVE VEHICLE CHECKLIST

EXPLOSIVE VEHICLE INSPECTION, **ON-SITE**

This form must be filled out for any vehicle carrying explosives, prior to loading.
This form is for use on-site only. If traveling on public highways, use DD Form 626.

DRIVER'S NAME	LICENSE NUMBER
COMPANY	
TYPE OF VEHICLE	VEHICLE NUMBER
INSPECTION DATE/TIME	INSPECTOR

PART INSPECTED	**SAT**	**UNSAT**	**COMMENT**
HORN			
STEERING SYSTEM			
WIPERS			
MIRRORS			
FIRE EXTINGUISHERS (10 ABC, 2 EACH)			
REFLECTORS			
EMERGENCY FLASHERS			
LIGHTS			
ELECTRIC WIRING			
FUEL SYSTEM			
EXHAUST SYSTEM			
BRAKE SYSTEM			
SUSPENSION			
CARGO SPACE			
TIRES, WHEELS, RIMS			
TAILGATE			

TARPAULIN			
PLACARDS			
INSPECTION RESULTS (INSPECTOR INITIALS)			
ACCEPTED:			
REJECTED:			
REMARKS			
DRIVER SIGNATURE/DATE		INSPECTOR SIGNATURE/DATE	

ENCLOSURE 4
EXPLOSIVES ACCOUNTABILITY LOG

EXPLOSIVES ACCOUNTABILITY LOG

Contract:		**Project Name:**	
Date:		**Work Area & Grid Numbers:**	
Team Number:		**Team Leader:**	
Explosives Issued	**Signature of Team Leader:**		
Item	**Quantity**	**Lot Number**	**Checker's Initials**
Explosives Expended	**Signature of Team Leader:**		
Explosives Returned	**Signature of SUXOS:**		
The signatures in each section of this document indicate that the items listed in that section were in fact issued, expended , or returned to storage and that the quantities listed were verified through a physical count.			

ENCLOSURE 5
DD FORM 626

MOTOR VEHICLE INSPECTION (TRANSPORTING HAZARDOUS MATERIALS)
(Read instructions before completing this form.)

This form applies to all vehicles which must be marked or placarded in accordance with Title 49 CFR.	1. GOVERNMENT BILL OF LADING/TRANSPORTATION CONTROL NUMBER

SECTION 1 - DOCUMENTATION	ORIGIN a.	DESTINATION b.
2. CARRIER/GOVERNMENT ORGANIZATION		
3. DATE/TIME OF INSPECTION		
4. LOCATION OF INSPECTION		
5. OPERATOR(S) NAME(S)		
6. OPERATOR(S) LICENSE NUMBER(S)		
7. MEDICAL EXAMINER'S CERTIFICATE*		

8. *(X if satisfactory at origin)*						9. CVSA DECAL DISPLAYED ON COMMERCIAL EQUIPMENT*	YES	NO
a. MILITARY HAZMAT ENDORSEMENT		d. ERG OR EQUIVALENT COMMERCIAL:		YES	NO			
b. VALID LEASE*		e. DRIVER'S VEHICLE INSPECTION REPORT*				a. TRUCK/TRACTOR		
c. ROUTE PLAN		f. COPY OF 49 CFR PART 397				b. TRAILER		

SECTION II - MECHANICAL INSPECTION
All items shall be checked on empty equipment prior to loading. Items with an asterisk shall be checked on all incoming loaded equipment.

10. TYPE OF VEHICLE(S)	11. VEHICLE NUMBER(S)

12. PART INSPECTED *(X as applicable)*	ORIGIN (1) SAT	ORIGIN (1) UNSAT	DESTINATION (2) SAT	DESTINATION (2) UNSAT		ORIGIN (1) SAT	ORIGIN (1) UNSAT	DESTINATION (2) SAT	DESTINATION (2) UNSAT	COMMENTS (3)
a. SPARE ELECTRICAL FUSES					k. EXHAUST SYSTEM					
b. HORN OPERATIVE					l. BRAKE SYSTEM*					
c. STEERING SYSTEM					m. SUSPENSION					
d. WINDSHIELD/WIPERS					n. COUPLING DEVICES					
e. MIRRORS					o. CARGO SPACE					
f. WARNING EQUIPMENT					p. LANDING GEAR*					
g. FIRE EXTINGUISHER*					q. TIRES, WHEELS, RIMS					
h. ELECTRICAL WIRING					r. TAILGATE/DOORS*					
i. LIGHTS AND REFLECTORS					s. TARPAULIN*					
j. FUEL SYSTEM*					t. OTHER *(Specify)*					

13. INSPECTION RESULTS *(X one)* ACCEPTED ☐ REJECTED ☐
(If rejected give reason under "Remarks". Equipment will be approved if deficiencies are corrected prior to loading.)

14. SATELLITE MOTOR SURVEILLANCE SYSTEM: *(X one)* ACCEPTED ☐ REJECTED ☐

15. REMARKS

16. INSPECTOR SIGNATURE *(Origin)*	17. INSPECTOR SIGNATURE *(Destination)*

SECTION III - POST LOADING INSPECTION
This section applies to Commercial and Government/Military vehicles. All items will be checked prior to release of loaded equipment and shall be checked on all incoming loaded equipment.

	ORIGIN (1) SAT	ORIGIN (1) UNSAT	DESTINATION (2) SAT	DESTINATION (2) UNSAT	COMMENTS (3)
18. LOADED IAW APPLICABLE SEGREGATION/COMPATIBILITY TABLE OF 49 CFR					
19. LOAD PROPERLY SECURED TO PREVENT MOVEMENT					
20. SEALS APPLIED TO CLOSED VEHICLE; TARPAULIN APPLIED ON OPEN EQUIPMENT					
21. PROPER PLACARDS APPLIED					
22. SHIPPING PAPERS/DD FORM 836 FOR GOVERNMENT VEHICLE SHIPMENTS					
23. COPY OF DD FORM 626 FOR DRIVER					
24. SHIPPED UNDER DOT EXEMPTION 868					

25. INSPECTOR SIGNATURE *(Origin)*	26. DRIVER(S) SIGNATURE *(Origin)*
27. INSPECTOR SIGNATURE *(Destination)*	28. DRIVER(S) SIGNATURE *(Destination)*

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Reset

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INSTRUCTIONS

SECTION I - DOCUMENTATION

General Instructions.

All items (2 through 9) will be checked at origin prior to loading. Items with an asterisk (*) apply to commercial operators or equipment only. Only Items 2 through 7 are required to be checked at destination.

Items 1 through 5. Self explanatory.

Item 6. Enter operator's Commercial Driver's License (CDL) number or Military OF-346 License Number. CDL and OF-346 must have the HAZMAT and other appropriate endorsements IAW Part 383.

Item 7. *Enter the expiration date listed on the Medical Examiner's Certificate.

Item 8.a. APPLIES TO MILITARY OPERATORS ONLY. Military Hazardous Materials Certification. In accordance with applicable service regulations, ensure operator has been certified to transport hazardous materials.

b. *Valid Lease. Shipper will ensure a copy of the appropriate contract of lease is carried in all leased vehicles and is available for inspection. (Defense Transportation Regulation (DTR) requirement.)

c. Route Plan. Prior to loading any Hazard Class/Division 1.1, 1.2, or 1.3 (Explosives) for shipment, ensure that the operator possesses a written route plan in accordance with 49 CFR Part 397. Route Plan requirements for Hazard Class 7 (Radioactive) materials are found in 49 CFR 397.101.

d. Emergency Response Guidebook (ERG) or Equivalent. Commercial operators must be in possession of an ERG or equivalent document. Shipper will provide applicable ERG page(s) to military operators.

e. *Driver's Vehicle Inspection Report. Review the operator's Vehicle Inspection Report. Ensure that there are no defects listed on the report that would affect the safe operation of the vehicle.

f. Copy of 49 CFR Part 397. Operators are required by regulation to have in their possession a copy of 49 CFR Part 397 (Hazardous Materials Driving and Parking Rules). If military operators do not possess this document, shipper may provide a copy to operator.

Item 9. *Commercial Vehicle Safety Alliance (CVSA) Decal. Check to see if equipment has a current CVSA decal and mark applicable box. Vehicles without CVSA, check documentation of the last vehicle periodic inspection.

SECTION II - MECHANICAL INSPECTION

General Instructions.

All items (12.a. through 12.t.) will be checked on all incoming empty equipment prior to loading. All UNSATISFACTORY conditions must be corrected prior to loading. Items with an asterisk (*) shall be checked on all incoming loaded equipment. Unsatisfactory conditions that would affect the safe off-loading of the equipment must be corrected prior to unloading.

SECTION II *(Continued)*

Item 12.a. Spare Electrical Fuses. Check to ensure that at least one spare fuse for each type of installed fuse is carried on the vehicle as a spare or vehicle is equipped with an overload protection device (circuit breaker). (49 CFR 393.95)

b. Horn Operative. Ensure that horn is securely mounted and of sufficient volume to serve purpose. (49 CFR 393.81)

c. Steering System. The steering wheel shall be secure and must not have any spokes cracked through or missing. The steering column must be securely fastened. Universal joints shall not be worn, faulty or repaired by welding. The steering gear box shall not have loose or missing mounting bolts or cracks in the gear box mounting brackets. The pitman arm on the steering gear output shaft shall not be loose. Steering wheel shall turn freely through the limit of travel in both directions. All components of a power steering system must be in operating condition. No parts shall be loose or broken. Belts shall not be frayed, cracked or slipping. The power steering system shall not be leaking. (49 CFR 396 Appendix G)

d. Windshield/Wipers. Inspect to ensure that windshield is free from breaks, cracks or defects that would make operation of the vehicle unsafe; that the view of the driver is not obscured and that the windshield wipers are operational and wiper blades are in serviceable condition. Defroster must be operative when conditions require. (49 CFR 393.60, 393.78 and 393.79)

e. Mirrors. Every vehicle must be equipped with two rear vision mirrors located so as to reflect to the driver a view of the highway to the rear along both sides of the vehicle. Mirrors shall not be cracked or dirty. (49 CFR 393.80)

f. Warning Equipment. Equipment must include three bidirectional emergency reflective triangles that conform to the requirements of FMVSS No. 125. FLAME PRODUCING DEVICES ARE PROHIBITED. (49 CFR 393.95)

g. Fire Extinguisher. Military vehicles must be equipped with two serviceable fire extinguishers with an Underwriters Laboratories rating of 10 BC or more. (Commercial motor vehicles must be equipped with one serviceable 10 BC Fire Extinguisher). Fire extinguisher(s) must be located so that it is readily accessible for use and securely mounted on the vehicle. The fire extinguisher must be designed, constructed and maintained to permit visual determination of whether it is fully charged. (49 CFR 393.95)

h. Electrical Wiring: Electrical wiring must be clean and properly secured. Insulation must not be frayed, cracked or otherwise in poor condition. There shall be no uninsulated wires, improper splices or connections. Wires and electrical fixtures inside the cargo area must be protected from the lading. (49 CFR 393.28, 393.32, 393.33)

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INSTRUCTIONS

SECTION II *(Continued)*

i. Lights/Reflectors. (Head, tail, turn signal, brake, clearance, marker and identification lights, Emergency Flashers). Inspect to see that all lighting devices and reflectors required are operable, of proper color and properly mounted. Ensure that lights and reflectors are not obscured by dirt or grease or have broken lenses. High/Low beam switch must be operative. Emergency Flashers must be operative on both the front and rear of vehicle. (49 CFR 393)

j. Fuel System. Inspect fuel tank and lines to ensure that they are in serviceable condition, free from leaks, or evidence of leakage and securely mounted. Ensure that fuel tank filler cap is not missing. Examine cap for defective gasket or plugged vent. Inspect filler necks to see that they are in completely serviceable condition and not leaking at joints. (49 CFR 393.83 and 396 Appendix G)

k. Exhaust System. Exhaust system shall discharge to the atmosphere at a location to the rear of the cab or if the exhaust projects above the cab, at a location near the rear of the cab. Exhaust system shall not be leaking at a point forward of or directly below the driver compartment. No part of the exhaust system shall be located where it will burn, char or damage electrical wiring, fuel system or any other part of the vehicle. No part of the exhaust system shall be temporarily repaired with wrap or patches. (49 CFR 393.83 and 396 Appendix G)

l. Brake System (to include hand brakes, parking brakes and Low Air Warning devices). Check to ensure that brakes are operational and properly adjusted. Check for audible air leaks around air brake components and air lines. Check for fluid leaks, cracked or damaged lines in hydraulic brake systems. Ensure that parking brake is operational and properly adjusted. Low Air Warning devices must be operative. (49 CFR 396 Appendix G)

m. Suspension. Inspect for indications of misaligned, shifted or cracked springs, loosened shackles, missing bolts, spring hangers unsecured at frame and cracked or loose U-bolts. Inspect for any unsecured axle positioning parts, and sign of axle misalignment, broken torsion bar springs (if so equipped). (49 CFR 396 Appendix G)

n. Coupling Devices (Inspect without uncoupling). Fifth Wheels: Inspect for unsecured mounting to frame or any missing or damaged parts. Inspect for any visible space between upper and lower fifth wheel plates. Ensure that the locking jaws are around the shank and not the head of the kingpin. Ensure that the release lever is seated properly and safety latch is engaged. Pintle Hook, Drawbar, Towbar Eye and Tongue and Safety Devices: Inspect for unsecured mounting, cracks, missing or ineffective fasteners (welded repairs to pintle hook is prohibited). Ensure safety devices (chains, hooks, cables) are in serviceable condition and properly attached. (49 CFT 396 Appendix G)

o. Cargo Space. Inspect to ensure that cargo space is clean and free from exposed bolts, nuts, screws, nails or inwardly projecting parts that could damage the lading. Check floor to ensure it is tight and free from holes. Floor shall not be permeated with oil or other substances. (49 CFR 177.815(e)(1) and 398.94)

p. Landing Gear. Inspect to ensure that landing gear and assembly are in serviceable condition, correctly assembled, adequately lubricated and properly mounted.

SECTION II *(Continued)*

q. Tires, Wheels and Rims: Inspect to ensure that tires are properly inflated. Flat or leaking tires are unacceptable. Inspect tires for cuts, bruises, breaks and blisters. Tires with cuts that extend into the cord body are unacceptable. Thread depth shall not be less than: 4/32 inches for tires on a steering axle of a power unit, and 2/32 inches for all other tires. Mixing bias and radial on the steering axle is prohibited. Inspect wheels and rims for cracks, unseated locking rings, broken, loose, damaged or missing lug nuts or elongated stud holes. (49 CFR 396 Appendix G)

r. Tailgate/Doors. Inspect to see that all hinges are tight in body. Check for broken latches and safety chains. Doors must close securely. (49 CFR 177.835(h))

s. Tarpaulin. If shipment is made on open equipment, ensure that lading is properly covered with fire and water resistant tarpaulin. (49 CFR 177.835(h))

t. Other Unsatisfactory Condition. Note any other condition which would prohibit the vehicle from being loaded with hazardous materials.

Item 14. For AA&E and other shipments requiring satellite surveillance, ensure that the Satellite Motor Surveillance System is operable. Shipper will instruct the driver to send a "test" emergency message to DTTS by having the driver activate the "emergency (panic) button". Shipper will contact DTTS at 1-800-826-0794 to verify that test message was received. Message must be received by DTTS for system to be considered operational.

SECTION III - POST LOADING INSPECTION

General Instructions.

All items will be checked prior to the release of loaded equipment. Shipment will not be released until deficiencies are corrected. All items will be checked on incoming loaded equipment. Deficiencies will be reported in accordance with applicable service regulations.

Item 18. Check to ensure shipment is loaded in accordance with 49 CFR Part 177.848 and the applicable Segregation or Compatibility Table of 49 CFR 177.848.

Item 19. Check to ensure the load is secured from movement in accordance with applicable service outload drawings.

Item 20. Check to ensure seal(s) have been applied to closed equipment; fire and water resistant tarpaulin applied on open equipment.

Item 21. Check to ensure each transport vehicle has been properly placarded in accordance with 49 CFR Part 172 Subpart F.

Item 22. Check to ensure operator has been provided shipping papers that comply with 49 CFR Part 172 Subpart C. For shipments transported by Government vehicle, shipping paper will be DD Form 836.

Item 23. Ensure operator(s) sign DD Form 626, are given a copy and understand the hazards associated with the shipment.

Item 24. Applies to Commercial Shipments Only. If shipment is made under DOT Exemption 868, ensure that shipping papers are properly annotated and copy of Exemption 868 is with shipping papers.

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Electric demolition operations will be conducted in accordance with the standard practices and procedures outlined in TM 60A-1-1-31 and applicable references. Electric firing procedures will be employed as one of three methods of choice for all venting due to the positive control of the operation.

An electric firing system is one in which electricity is used to fire the primary initiating element. An electric impulse supplied from a power source, usually an electric blasting machine, travels through the firing wire and cap lead wires to fire an electric blasting cap. The chief components of the system are the electric blasting cap/electric squibs, firing wire, and the blasting machine. The preparation of the explosive charge for detonation by electrical means is called electric priming. Static electricity is an increased hazard when operating in an extremely cold climate, high wind, or area of low humidity. Care must be taken to reduce the possibility of premature detonation of electric blasting caps and other electro-explosive devices.

9.1 EQUIPMENT

The following equipment will be needed to perform electric demolition procedures:

___ Firing wire	___ Ready Service Mag./Day Boxes
___ Galvanometer w/ approved batteries	___ Fire Extinguisher(s)
___ Blasting machine	___ First Aid Kit(s)
___ Electrical tape	___ Burn Blanket
___ Sandbags (filled as needed)	___ Wheel Chocks
___ Communications equip.	___ 5 gal. water
___ Electric blasting caps	___ Shovel
___ Explosive charge(s)	___ Fire fighting equip. (if available)
___ SOP's, Work Plans, Publications	___ Reflectors
___ DD Form 626	___ Explosive Vehicle Checklist

9.2 ELECTRIC DEMOLITION SAFETY PRECAUTIONS

The following safety precautions will be observed during electric demolition procedures.

- Personnel working with electric blasting caps or other electro-explosive devices will not wear static producing clothing such as nylon or silk.

- Prior to making connection with the electric blasting cap, the firing circuit will be tested for continuity.
- All parts of the firing circuit will be kept insulated from other conductors such as bare wires, rails, pipes, or other paths of stray current.
- Electric blasting caps will be connected to the firing circuit before connection to the main initiation charge. Always dual-prime the shot with two caps.
- Electric blasting caps of different manufacturers or types will not be used in the same system.
- The shunt will not be removed from the blasting cap wires until the individual performing the operation has grounded himself by touching the ground with a bare hand.
- The electric blasting caps will be tested for continuity with a galvanometer at least 50 ft downwind from any explosives prior to connecting them to the firing circuit. After the testing is completed, the lead wires will be short-circuited by twisting the bare ends of the wires together. The wires will remain shunted until ready to connect to the firing circuit.
- Grip the cap lead wires 3 to 6 in- behind the base of the cap, pull an initial arm's length of wire off the wire coil. The blasting cap will not be held directly in the hand when un-coiling the leads. The wires will be held approximately 6 in. from the cap. This will minimize injury should the cap explode. The lead wires will be straightened by hand and not thrown, waved, or snapped to loosen the coils.
- The electrical legs will be unrolled so that the cap is as far as possible from the operator and pointing away from him.
- The blasting cap will be placed in a hole in the ground or under a sandbag before removing the shunt and testing for continuity. Do not point toward other personnel or explosives.
- Only authorized and serviceable testing equipment will be used.
- The blasting machine will not be connected to the tiring wires until all pre-firing tests have been completed, and all preparations have been made to fire the charge
- The shunt will not be removed from the lead wires of blasting caps except when testing for continuity or actual connection into the firing circuit. The individual removing the shunts will be grounded prior to performing this operation to prevent accumulated static electricity from firing the blasting cap.
- Keep both ends of the firing wires shorted or twisted together except for testing or firing. The blasting caps will not be connected to the firing circuit unless the power end of the firing circuit leads is shorted.

9.3 ELECTRIC PREPARATION SEQUENCE

1. *Prepare and place all explosive charges.* Explosive charges will be prepared and placed according to the Demolition Team Leader's approved Demolition Plan.

2. *Test and maintain control of the blasting machine.* The blasting machine will be tested prior to demolition activities as specified in the manufacturer's instructions. The SUXOS or the designated Demolition Team Leader for that day's MEC demolition activities is responsible for maintaining control of the blasting machine at all times. This responsibility cannot be delegated.

3. *Test the galvanometer.* The galvanometer will be tested each day as recommended in the manufacturer's instructions. Both the open and closed circuit tests will be performed.

4. *Test the firing wire on the reel.* The firing wire leads will be separated at both ends and the leads at one end connected to the post of the galvanometer. When using the needle type galvanometer, no deflection will be noted. When using the digital type galvanometer, the number on the digital readout will remain constant. The wires will be shunted at one end and the leads of the other end connected to the galvanometer. When using the needle type circuit tester, the needle will travel at least 50% of the scale. When using the digital type galvanometer, the number will increase to indicate continuity. Both ends of the firing wire will be shunted after testing.

5. *Lay out the firing wire completely off the reel.* After locating an acceptable firing position, the wire will be laid out between the firing point and the charge. Vehicles will not drive over and personnel will not walk on the firing wire. The wire will be as short as possible. Loops in the wire will be avoided and it will be laid as flat as possible.

6. *Retest the firing wire.* The open- and short-circuit tests will be performed again. The process of unreeling the wire may separate broken wires not found in previous tests. Control of the firing position will be maintained from this point on. This control will ensure that no one tampers with the wires or fires the charge prematurely. Both ends of the firing wire will be shunted after the tests are complete.

7. *Test the blasting caps.* The cap will be removed from its container. The wire will be wrapped around the palm of the hand twice. This procedure will prevent tension on the cap wires and dropping the cap. The cap wires will be stretched to their full length. Care will be taken not to kink them. The cap will be placed under a sandbag, while stretching out the lead wires. Cap will be tested away from all other personnel. Personnel will keep their backs to the cap when testing it. Caps will be tested at least 50 ft downwind from other explosives or MEC. Cap wires will always be shunted when not being tested.

8. *Connect and test the cap circuit.* When two or more blasting caps are required for a dual-primed demolition operation, a common parallel circuit will be used. All blasting caps will be tested separately before being connected in a circuit. The blasting cap wires will be joined together using an appropriate splice. The entire circuit will be tested. After testing the circuit, the two free ends of the cap wires will be shunted and kept shunted until they are to be connected to the firing wire.

9. *Connect the firing wire.* The free ends of the blasting caps will be connected to the firing wire before priming the charges or taping a cap to detonating cord. The connections will be insulated with electrical tape.
10. *Test the entire circuit.* Before priming any charges, the circuit will be tested from the firing point. The caps will be placed at least 50 ft downwind from the charge, under protective sandbags, while performing this test. The ends of the firing wire will be connected to the galvanometer, and when using the needle type tester, the needle will defect to at least half scale. When using the digital type tester, the number will increase to indicate continuity. (If there is no increase, the system will have to be checked to locate the break in the circuit.) The ends of the firing wire will then be shunted.
11. *Prime the explosive charges.* When all non-essential personnel have the departed the demolition area and arrived at the firing point, request permission to prime from the SUXOS. When permission is granted, connect the blasting caps to the demolition shot. This can be done by “priming-in” directly to the donor charge or to the detonating cord that leads to the shot. Ensure the proper explosive continuity is still intact. Visually inspect all component of the down-range firing train. Depart to the firing point.

9.4 ELECTRIC FIRING PROCEDURES

1. *Account for all site personnel.* Once the demolition charges have been primed, set, and everyone has returned to the firing point, a head count will be taken. All personnel will be accounted for various positions around the demolition site. Communicate with road guards to ensure that all are accounted for in their safe area, and that no personnel have entered the EZ. Ensure that all notifications have been made and all site personnel have taken cover.
2. *Test the firing circuit.* At the firing point, perform grounding procedures and test the entire circuit using the galvanometer. Disconnect the firing wire shunt and touch free ends of firing wire to test instrument posts. This will cause a wide deflection of needle (or lamp) to glow. If the firing circuit is defective, shunt wire. Then go down¬range and recheck circuits. If the splice is found defective, replace wires. If the cap is found defective, replace it. Retest the entire circuit again to make sure that all breaks have been located before attempting to fire. If the firing circuit is good, shunt wire.
3. *Cycle the blasting machine.* Exercise the blasting machine several times before attaching the firing wire.
4. *Attach firing wire.* Disconnect firing wire shunt and connect to the blasting machine.
5. *Verbal warning.* Make three loud verbal announcements of “Fire in the Hole” on the radio and/or three, long, blast on the safety vehicle horn. Wait for a response.
6. *Initiate the charge.* If there is no response from verbal warning, initiate the charge by exercising the blasting machine until the shot fires. If a misfire occurs, proceed to the Electric Misfire Procedures (Section 9.5)
7. *Observe 5 minute wait.* After the detonation, observe a five minute wait time.

8. *Check the shot.* After the five minute wait time, the Demolition Team Leader and one other UXO Technician will proceed to the shot area; one person will check the shot and the second will remain at a safe distance to render assistance or aid, if required. A thorough search of the shot hole and immediate area will be conducted with a magnetometer to ensure that complete demolition was accomplished. If the shot is clear, the Demo Team Leader will notify the SUXOS.
9. *All clear*. The SUXOS will notify all personnel that the shot is clear and they may leave the safe area and open access roads as applicable.

9.5 ELECTRONIC DEMOLITION MISFIRES

In order to prevent misfires, ensure that all blasting caps are included in the firing circuit; all connections between blasting cap wires, connecting wires, and firing wires are property made; short circuits are avoided; grounds are avoided; and number of blasting caps in any circuit does not exceed the rated capacity of the power source on hand.

Common causes of electric misfires include inoperative or weak blasting machine or power source; improperly operated blasting machine or power source; defective and damaged connections, causing either a short circuit, a break in the circuit, or high resistance with resulting low current; faulty blasting caps; the use in the same circuit of blasting caps made by different manufacturers or of different design; and the use of more blasting caps than the power source rating permits. To clear electric misfires, follow the procedures below:

1. *Make several successive attempts to fire.* On the existing circuit, make several attempts to fire the shot.
2. *Check connection to blasting machine.* Check the firing wire connections to blasting machine terminals to be sure that the contacts are good. Repeat step 1.
3. *Disconnect, test, and reconnect firing wire.* Disconnect firing wire from blasting machine, test firing circuit with galvanometer, and reattach to blasting machine. Reattempt to fire.
4. *Disconnect firing wire.* Disconnect firing wire from blasting machine and shunt.
5. *30 minute wait time.* Allow a minimum of 30 minutes to elapse before starting to investigate, then take corrective action.
6. *Investigate circuit.* After the 30 minute wait time, test the firing circuit with circuit tester for breaks and short circuits. Correct any defects discovered.
7. *Remove old blasting caps.* Remove and disconnect old blasting caps and shunt wires.
8. *Connect new caps.* Connect wires of new blasting caps to firing circuit and re-prime the charge. Return to firing point. Repeat firing procedures in Section 9.4.

When practical, insert a new blasting cap into charge without disturbing the old blasting cap, or prime and place a new charge close enough to the original charge to ensure detonation of both.

Remote Firing Device (RFD) demolition operations will be conducted in accordance with the standard practices and procedures outlined in EODB 60A-1-1-31 and applicable references. RFD firing procedures will be employed as one of three methods of choice for MEC disposal due to the positive control of the operation.

A RFD firing system is one in which an encrypted radio signal is sent from a Control unit to activate the firing mechanism on a Receiver unit downrange. The downrange Receiver uses electricity to fire the primary initiating element. An electric impulse supplied from the Receiver power source travels through the lead wires to fire an electric blasting cap. When using shock tube/NONEL, the Receiver sends an electric impulse to initiate the explosive train contained with the shock tube to fire the detonators. The chief components of the system are the Control unit, Receiver unit, and electric blasting caps or shock tube/NONEL. The preparation of the explosive charge for detonation by electrical means is called electric priming. Static electricity is an increased hazard when operating in an extremely cold climate, high wind, or area of low humidity. Care must be taken to reduce the possibility of premature activation of RFD and subsequent detonation of electric blasting caps and other electro-explosive devices.

10.1 EQUIPMENT

The following equipment will be needed to perform RFD electric/shock tube demolition:

___ Remote Firing Device Boxes	___ Ready Service Mag. /Day Boxes
___ Galvanometer w/ approved batteries	___ Fire Extinguisher(s)
___ Shock Tube detonators	___ First Aid Kit(s)
___ Electric Blasting caps	___ Burn Blanket
___ Burn Kit	___ Blood borne Pathogens Kit
___ Communications equip.	___ 5 gal. water
___ Explosive charge (s)	___ Shovel
___ Electrical tape	___ Fire fighting equip. (if available)
___ SOP's, Work Plans, Publications	___ Reflectors
___ DD Form 626	___ Explosive Vehicle Checklist
___ Sandbags (filled as needed)	___ 5 gal. water
___ PPE	___ Crimpers, fixed-blade knife

10.2 RFD SAFETY PRECAUTIONS

The Remote Firing Device is used in conjunction with electric blasting caps and shock tube/NONEL detonators. Refer to the applicable section of this SOP for safety precautions relating to those items. The following safety precautions will be observed during Remote Firing Device demolition procedures:

- High power radio transmissions can cause electric blasting caps to detonate. Keep the high powered RFD Controller at least 25 feet or more from electric detonators.
- Keep portable radios, cell phones or any receiving/transmitting unit 25 feet away from the RFD controller and receivers.
- The Shock Tube Initiator on the Receiver Unit can develop up to 3,000 volts. Do not touch this tip or tip jacks while arming or firing the unit.
- Do not connect electric detonator wires or shock tube to Remote Unit unless the green Ready light is ON, the red Armed light is OFF, and the battery light is on steady.
- Do not use the system if any of the units show damage to the point that failure is suspected. Thoroughly test the system prior to use.
- Never approach the Receiver Unit if it is attached to live explosives unless you have a confirmed Ready status back to the Controller, you have waited at least 2 minutes for the automatic disarm, and you have observed the minimum wait times.
- Always keep Receiver unit(s) and Controller Unit separated from activation keys until ready to use. The Demolition Team Leader will maintain control of RFD Units and the SUXOS will maintain control of the keys until requested by the Demolition Team Leader. (RFD keys will be issued as required during shot set up and the controller key issued at the firing area.)
- Do not prime in to main charge until permission has been granted from the SUXOS.

10.3 RFD PREPARATION SEQUENCE

The RFD system will be tested prior to demolition activities as specified in the manufacturer's instructions. The results of this test will be recorded in the Demolition Team Leader's Logbook and/or on the approved Demolition Plan worksheet. Upon successful completion of test, the Demolition Team Leader will maintain positive control of all units until ready for use and surrender the activation keys to the SUXOS. The following step will be used in setting up a demolition shot using the RFD.

1. *Prepare and place all explosive charges.* Explosive charges will be prepared and placed according to the Demolition Team Leader's approved Demolition Plan.
2. *Test RFD units.* Position the Controller and Receiver units at least 5 feet apart, in a position where all units can be observed while testing. Install the antennas on the Receiver and Controller Units. On the Receivers, insert the enable keys and turn the POWER switches to

the ON positions. Observe that the READY, ARMED and POWER lights blink briefly on the power up. The yellow light next the ENABLE KEY should blink continuously to show the key is installed. The POWER light should remain on steady. Install a RFD shock tube plug (or connect electric test light wires to binding posts) into the jack(s) located on the side of each Receiver unit. On the Controller Unit, insert the Controller key and press the ON switch. Observe the yellow POWER and KEY lights are steady. On the Controller, press the STATUS switch. After a short time the green READY lights for the Remote Units that were previously prepared for use, will come on steady to show they are disarmed and communicating two-way. On the Controller, press the ARM switch. The ARMED lights for the selected Remote Units will blink for 15 seconds and come on steady. On the Remote Units, the red ARMED lights will come on steady. The system is armed. On the Controller, before 2 minutes have elapsed, press the DISARM switch. All Remotes will disarm with in 3 seconds. Re-arm the Controller Unit and wait 2 minutes. After the 2 minutes, all Remotes will return to the disarmed state. The red ARMED lights will go out, and the green READY lights will come on steady. Turn off all units. The system is now operationally ready for use.

3. *Surrender activation keys and maintain positive control of units.* Upon successful completion RFD test, surrender the activation keys to the SUXOS. The Demolition Team Leader will maintain control of the RFD units until ready for deployment at the demolition site. The above action provides positive control over the RFD system and prevents the unauthorized firing of the units. If electric blasting caps are being used with the RFD, perform steps 4 - 6 below for RFD preparation. If shock tube/NONEL detonators are being used, proceed to step 7 for RFD preparation.

4. *Test the galvanometer*. If electric blasting caps are being used with the RFD system, the galvanometer will be tested each day as recommended in the manufacturer's instructions. Both the open and closed circuit tests will be performed.

5. *Test the electric blasting caps.* The caps will be removed from its container. The wire will be wrapped around the palm of the hand twice. This procedure will prevent tension on the cap wires and dropping the cap. The cap wires will be stretched to their full length. Care will be taken not to kink them. The cap will be placed under a sandbag, while stretching out the lead wires. Cap will be tested away from all other personnel. Personnel will keep their backs to the cap when testing it. Caps will be tested at least 50 ft downwind from other explosives or MEC. Cap wires will always be shunted when not being tested.

6. *Connect and test the cap circuit.* When two or more blasting caps are required for a dual-primed demolition operation, a common parallel circuit will be used. All blasting caps will be tested separately before being connected in a circuit. The blasting cap wires will be joined together using an appropriate splice. The entire circuit will be tested. After testing the circuit, the two free ends of the cap wires will be shunted and kept shunted until they are to be connected to the RFD. Proceed to step 8.

7. *Prepare shock tube/NONEL detonators.* Remove detonators from day boxes. Place detonators under sand bag at least 25 feet from main charges and/or MEC. Extend the detonator lead lines to a location near the RFD receiver barricade location.

8. *Set up the RFD Receiver Unit.* Place the receiver unit in a protected (i.e. behind a tree, behind a sandbag barricade, etc.). Install the antenna 90 degree elbow first, then antenna down thru loop, and connect. Turn the switch to POWER ON position. Press and hold the PRESS TO TEST switch. Ensure at least 12.0 volts is displayed on the digital screen.
9. *Attach initiators.* If using electric blasting caps, observe grounding procedures and disconnect the shunt. Attach the appropriate wires the electrical contacts on the RFD receiver. If using shock tube/NONEL detonators, cut the crimped end of the tube with a fixed blade knife (i.e. box cutter) and insert the tube opening onto the electrode located inside the RFD shock tube plug. Attach RFD shock tube plug.
10. *Insert activation key.* Obtain the proper receiver unit key from the SUXOS. Insert the key into the ENABLE KEY position. The yellow light next to the key will begin flashing. Close and fasten the lid.
11. *Prime the explosive charges.* When all non-essential personnel have the departed the demolition area and arrived at the firing point, request permission to prime from the SUXOS. When permission is granted, connect the blasting caps or shock tube/NONEL detonators to the demolition shot. This can be done by “priming-in” directly to the donor charge or to the detonating cord that leads to the donor charge. Ensure the proper explosive continuity is still intact. Visually inspect all component of the down-range firing train. Depart to the firing point.

10.4 RFD FIRING PROCEDURES

1. *Account for all site personnel.* Once the demolition charges have been primed, set, and everyone has returned to the firing point, a head count will be taken. All personnel will be accounted for in various positions around the demolition site. Communicate with road guards to ensure that all are accounted for in their safe area, and that no personnel have entered the EZ. Ensure that all notifications have been made and all site personnel have taken cover.
2. *Set up the RFD Control unit.* Upon confirmation that everyone is accounted for, activate the Control unit by obtaining the Control unit activation key from SUXOS. Install the antennae and press the ON SWITCH. The yellow POWER light will illuminate. The BATTERY Indicator should read 40% or higher. Press the SELECT switches (1-6) to select the Receiver units to be fired. The yellow lights for the activated units will light. NOTE: Always hold all switches until the audible indicator goes out. Press the STATUS switch to perform a status request of all selected Receiver units. After a short time, the green READY light will be shown for all selected Receiver units to indicate the Control unit is communicating bi-directionally with the Receivers. About 30 seconds from firing, press and hold ARM switch for ¼ second. The red ARMED light will blink for 15 seconds and come on steady (If any of the ARMED lights remain blinking, those Remote Units are not within 2-way range of the Controller and may not fire). The demolition shot is now ready to fire. The RFD system will disarm if the shot isn’t fired within 2 minutes of arming. NOTE: You may perform a manual status check at any time by pressing the Status switch. After a short time, the results

will be shown on the display panel. You may disarm any selected Remote by pressing the DISARM switch at any time. After a short time, the results will be shown on the display panel. In an emergency situation, you may disarm all Remotes within 3 seconds by removing the Controller's Key.

3. *Verbal warning.* Make three loud verbal announcements of "Fire in the Hole" on the radio and/or three, long, blast on the safety vehicle horn. Wait for a response.
4. *Initiate the charge.* If there is no response from verbal warning, initiate the charge by pressing the TWO FIRE SWITCHES at the same time and hold for 1/2 second. Shot initiation should be detected. The green READY lights for the selected Receivers should flash for a short time and come on steady. Ensure the READY lights are on steady (not flashing) before approaching the remotes. When all Remotes are disarmed and confirmed Ready on the Controller Panel, turn off the Controller by pressing the OFF switch. Remove the Controller's Key and secure the Control box. If a misfire occurs, proceed to the Remote Firing Device Misfire Procedures (Section 10.5)
5. *Observe 5 minute wait.* After the detonation, observe a five minute wait time.
6. *Check the shot.* After the five minute wait time, the Demolition Team Leader and one other UXO Technician will proceed to the shot area; one person will check the shot and the second will remain at a safe distance to render assistance or aid, if required. A thorough search of the shot hole and immediate area will be conducted with a magnetometer to ensure that complete demolition was accomplished. If the shot is clear, the Demo Team Leader will notify the SUXOS.
7. *All clear.* The SUXOS will notify all personnel that the shot is clear and they may leave the safe area and open access roads as applicable.

10.5 RFD MISFIRE PROCEDURES

In order to prevent RFD misfires, ensure all connections of the firing train are properly connected prior firing. Common causes for RFD misfires are moisture in shock tube, improper splice, and connection or controller unit unable to communicate with remote unit due to barricades or distance. To clear RFD misfires, follow the procedures below:

1. *Reattempt to fire.* Make additional attempts to fire the control unit. If no response, move the Control unit to a different location and try again (may have been in a "dead" spot). Try to have 'line of sight" with the receiver. If no detonation occurs after reattempts, shut down the Control unit.
2. *Repeat set up and firing of Control unit.* Follow the procedures in steps 2 – 4 of RFD Firing Procedures. If no response, return Control unit key to the SUXOS and continue with the following steps.
3. *Observe 1 hour wait time.* Allow a minimum 1 hour to elapse before starting to investigate.
4. *Check all connections.* After 1 hour has elapsed, proceed down range and check all connections. Look for proper installation of Receiver antennae, key placement, battery

voltage level, wire connections for electric caps or tube placement and plug insertion for shock tube, on the Receiver. Inspect firing train (i.e. shock tube, caps or detonators, detonating cord, and main charge). Make corrective action and/or replace items as necessary.

5. *Return to firing point.* After corrective action has completed, return to firing point and perform RFD Firing Procedures.

Shock Tube/NONEL demolition operations will be conducted in accordance with the standard practices and procedures outlined in TM 60A-1-1-31 and applicable references. Shock Tube/NONEL firing procedures will be employed as one of three methods of choice for MEC disposal due to the positive control of the operation.

A shock tube/NONEL firing system is one in which an explosive train contained within the tube is initiated with a firing device. The shock tube/NONEL system is a thin plastic tube of extruded polymer with a layer of PETN coated on its interior surface. The PETN propagates a shock wave, which is normally contained within the plastic tubing. The shock tube offers the controlled instantaneous action of electric initiation without the risk of premature initiation of the detonator by radio transmissions, high-tension power lines or by static electricity discharge. The NONEL system uses detonators in the bunch blocks and in the detonator assembly, which are to be, handled in accordance with the approved procedures contained within this SOP. The high reliability of the shock tube initiating system is due to the fact that all of the components are sealed and unlike standard non-electric priming components, cannot be easily degraded by moisture. Cutting the shock tube makes the open end vulnerable to moisture and contamination, therefore care must be taken to prevent moisture and foreign matter from getting in the shock tubes exposed ends.

11.1 EQUIPMENT

The following equipment will be needed to perform shock tube/NONEL demolition procedures:

___ Shock tube/NONEL Firing Device	___ Ready Service Mag. /Day Boxes
___ Shock Tube detonators	___ Fire Extinguisher(s)
___ Explosive charge (s)	___ First Aid Kit(s)
___ Crimpers, fixed-blade knife	___ Burn Blanket
___ Burn Kit	___ Blood borne Pathogens Kit
___ Communications equip.	___ 5 gal. water
___ PPE	___ Shovel
___ Electrical tape	___ Fire fighting equip. (if available)
___ SOPs, Work Plans, Publications	___ Reflectors
___ DD Form 626	___ Explosive Vehicle Checklist
___ Sandbags (filled as needed)	___ 5 gal. water

11.2 SHOCK TUBE/NONEL SAFETY PRECAUTIONS

Shock Tube/NONEL demolition procedures may be used in conjunction with the Remote Firing Device. Refer to the applicable section of this SOP for safety precautions relating to the RFD. The following safety precautions will be observed during Shock Tube/NONEL demolition procedures:

- Do not cross shock tube trunk lines over themselves.
- Use only a clean sharp knife or approved shock tube/NONEL line cutter to cut shock tube/NONEL.
- Always cut shock tube/NONEL squarely across and make sure the cut is clean.
- After cutting a piece of shock tube/NONEL, immediately tie a tight overhand knot in one or both cut ends to prevent moisture from entering the tube.
- Never pull, stretch, kink or put undue tension on the shock tube.
- Although the detonation along the shock tube is normally contained within the plastic tubing, burns may occur of the shock tube is held in hand.
- Use only the splicing tubes provided by the manufacturer to make splices. Every splice in the tube reduces the reliability of the priming system; therefore keep the number of splices to a minimum.
- Always dispose of excess pieces of shock tube/NONEL in accordance with local laws as they relate to flammable/hazardous materials.

11.3 SHOCK TUBE/NONEL PREPARATION SEQUENCE

Shock tube/NONEL assemblies are often configured differently. The procedures below are provided to give guidance on the complete assembly of individual components within the shock tube/NONEL system. If the shock tube/NONEL is already partially assembled, omit the appropriate steps accordingly. The following step will be used in setting up a demolition shot using shock tube/NONEL:

1. *Prepare and place all explosive charges.* Explosive charges will be prepared and placed according to the Demolition Team Leader's approved Demolition Plan.
2. *Lay out shock tube/NONEL.* Spool out the desired length of shock tube from the firing/initiation point to the demolition site and cut with a sharp knife or razor blade. Immediately seal off the shock tube remaining on the spool by tying a tight overhand knot in the bitter end. Weight down the lose end of trunk line.
3. *Lay out shock tube/NONEL detonators.* Remove the shock tube/NONEL detonators for day box and place under sandbag. While keeping the detonators bunkered under the sandbag, extend the lead lines to the shock tube/NONEL main line.

4. *Prepare splice.* Using a sharp knife or razor cut the sealed end off of the detonator assembly. Loosely tie the two shock tube ends to be sliced together in a 3” to 6” loose overhand knot. Push one of the shock tube ends to be spliced firmly into one of the pre-cut splicing tubes provided by the manufacturer at least ¼ inch. Push the other shock tube end firmly into the other end of the splicing tube at least ¼ inch. Secure splice with tape if needed. Secure both sides of the knot area firmly to the ground to prevent the splice from separating during the firing process.

5. *Prepare Bunch Block (as needed).* If multiple items are to be destroyed using a bunch block, lay out lead lines at the demolition site that extend from the main charge. Secure the bunch block with a sandbag or some other item to keep them from moving. No more than six leads may be used from any one bunch block.

6. *Prime the explosive charges.* When all non-essential personnel have the departed the demolition area and arrived at the firing point, request permission to prime from the SUXOS. When permission is granted, connect the shock tube/NONEL detonator(s) to the bunch block or demolition shot. This can be done by “priming-in” directly to the donor charge, detonating cord that leads to the shot, or bunch block. Figures 1 and 2 illustrate the set up.

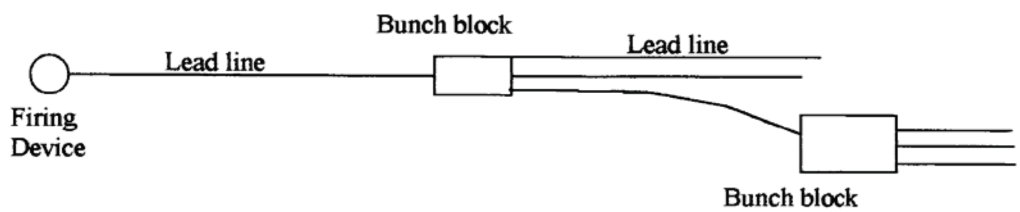


Figure 1

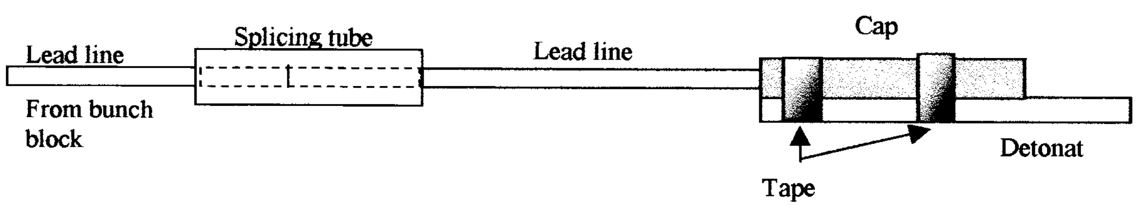


Figure 2

Ensure the proper explosive continuity is still intact after attachment. Visually inspect all component of the down-range firing train. Depart to the firing point.

11.4 SHOCK TUBE/NONEL FIRING PROCEDURES

1. *Account for all site personnel.* Once the demolition charges have been primed, set, and everyone has returned to the firing point, a head count will be taken. All personnel will be accounted for in various positions around the demolition site. Communicate with road guards to ensure that all are accounted for in their safe area, and that no personnel have

entered the EZ. Ensure that all notifications have been made and all site personnel have taken cover.

2. *Prepare shock tube/NONEL and firing device.* Cut off the sealed end of shock tube/NONEL. If the tube had been previously cut during setup, make a new cut 18 inches from previous cut at the overhand knot. Insert a primer (if needed) into the firing device. There are many different models of shock tube/NONEL firing devices. Ensure the operator is familiar with the device being used.
3. *Attach shock tube/NONEL to firing device.* Connect the shock tube/NONEL main line to the firing device ensuring that the tube is properly seated.
4. *Verbal warning.* Make three loud verbal announcements of "Fire in the Hole" on the radio and/or three, long, blast on the safety vehicle horn. Wait for a response.
5. *Initiate the charge.* If there is no response from verbal warning, initiate the charge by triggering the firing device until the primer discharges. If a misfire occurs, proceed to the Shock Tube/NONEL Misfire Procedures (Section 11.5)
6. *Observe 5 minute wait.* After the detonation, observe a five minute wait time.
7. *Check the shot.* After the five minute wait time, the Demolition Team Leader and one other UXO Technician will proceed to the shot area; one person will check the shot and the second will remain at a safe distance to render assistance or aid, if required. A thorough search of the shot hole and immediate area will be conducted with a magnetometer to ensure that complete demolition was accomplished. If the shot is clear, the Demo Team Leader will notify the SUXOS.
8. *All clear.* The SUXOS will notify all personnel that the shot is clear and they may leave the safe area and open access roads as applicable.

11.5 SHOCK TUBE/NONEL MISFIRE PROCEDURES

When using shock tube/NONEL, the most common cause of misfires is known as "black tube failure". The shock tube propagates up to the detonator but the detonator fails to function. The following steps will be taken in the event of a shock tube/NONEL misfire:

1. *Reattempt to fire.* The most common cause of a misfire in a shock tube priming system is the initiating element. The most common failure with this system is the primer not firing. The corrective action is to re-cock the igniter by pushing in on the pull rod to re-engage the firing pin and then actuate the igniter again.
2. *Adjust and reattempt to fire.* If the shock tube fails to propagate; remove the shock tube from the firing device, cut off six inches of the shock tube, insert a new primer, re-insert the shock tube ensuring that it is properly seated and re-fire. If two or three retries with the igniter do not result in it firing, cut the shock tube, replace the igniter with a new one and repeat the firing procedures. If, or when you activate the firing device and the shock tube gets blown out of the firing device without activating, cut off six inches of the shock tube, replace the primer and re-insert the shock tube into the firing device.

3. *Inspect shock tube/NONEL main line.* If the igniter appears to have functioned properly (primer pops and smokes), but the charge did not fire, cut a 1-ft section from the shock tube starting approximately 6 in. from the igniter. Hold the 1-ft piece of shock tube so that one end is over the palm of your hand and gently blow through the other end. If a fine powder is blown from the shock tube, it has not fired. If this is the case, install a new igniter on a freshly cut end of the priming shock tube and reattempt to fire the charge.
4. *Observe 1 hour wait time.* If the igniter/firing device functioned properly and no fine powder was blown from the shock tube in the previous step, or the shock tube was heard to fire or its flash was seen, observe the standard 1 hour waiting time before going downrange to check the next element in the priming train. Shock tube detonators are non-electric caps and the standard rules apply in the event of a misfire.
5. *Investigate firing train.* After the 1 hour waiting time has passed, proceed downrange and check the detonator of the first component in the explosive firing train. If the detonator has not fired, attach an identical component to the shock tube (or detonating cord) of the uninitiated second component close to the unfired detonator of the failed component. Lay out the shock tube of the replacement component back to the site from which the shot is to be initiated and replace the standard initiator attachment and fire when it is acceptable to do so. If the first component of the firing train was not the one that failed, check out each succeeding component until the failed one is found and replace the failed or fired relay components back to the firing point. To determine whether the shock tube has failed to fire at a particular point, Step 3 may be done with a 1-ft section of shock tube cut from the suspect area. If the failed component appears to be the final detonator, it may be replaced as above if it is easily accessible. If it is placed inside the explosive charge, it must not be disturbed. A new detonator and donor charge will be attached. Never yank or pull hard on the shock tube because it may actuate the detonator.
6. *Return to firing point.* After corrective action has completed, return to firing point and perform Shock Tube/NONEL Firing Procedures.

Non-electric demolition operations will be conducted in accordance with the standard practices and procedures outlined in TM 60A-1-1-31 and applicable references. Non-electric firing procedures will be employed as a method of last resort for MEC disposal due to the lack of positive control of the operation.

A non-electric system is one in which an explosive charge is prepared for detonation by means of a non-electric-blasting cap. The basic priming materials consist of a non-electric blasting cap, safety/time fuse, and an igniter. When activated, the igniter uses a primer to produce a flame. This flame is transferred to the safety/time fuse. The safety/time fuse transmits the flame from the igniter to the blasting cap. The blasting cap provides a shock adequate enough to detonate the explosives. If more than one charge must be detonated simultaneously, the non-electric system must be combined with detonating cord to ensure simultaneous firing.

12.1 EQUIPMENT

The following equipment will be needed to perform non-electric demolition procedures:

_ Igniters	___ Ready Service Mag. /Day Boxes
___ Safety/Time fuse	___ Fire Extinguisher(s)
___ Non-Electric blasting caps	___ First Aid Kit(s)
___ Crimpers, fixed-blade knife	___ Burn Blanket
___ Burn Kit	___ Blood borne Pathogens Kit
___ Communications equip.	___ 5 gal. water
___ Explosive charge (s)	___ Shovel
___ Electrical tape	___ Fire fighting equip. (if available)
___ SOPs, Work Plans, Publications	___ Reflectors
___ DD Form 626	___ Explosive Vehicle Checklist
___ Sandbags (filled as needed)	___ 5 gal. water
___ PPE	___ Tape measure

12.2 NON-ELECTRIC SAFETY PRECAUTIONS

The following safety precautions will be observed during non-electric demolition procedures along with the general safety precautions contained in Section 1.5:

- Use only standard blasting caps of at least the equivalent of a commercial No.8 blasting cap.
- Keep blasting caps in approved containers, located at least 50 feet from other explosives, until they are needed for priming.
- Do not bury blasting caps. Use detonating cord to position blasting caps above the ground. Buried blasting caps are subject to unobserved pressures and movement could lead to premature firing or misfires.
- Handle non-electric blasting caps only by their open ends except during attachment to safety fuse and/or detonating cord.
- Handle primed safety fuse with care to avoid contact between blasting caps or between the caps and other hard objects.
- Do not prime more than the required number of charges. Any primed charges which are not used will be expended; they will not be returned to explosive storage locations.
- Do not insert anything but safety fuse or detonating cord into the open end of a blasting cap.
- Do not force safety fuse into a blasting cap. If it does not enter easily, reject the cap and/or fuse.
- Do not crimp blasting caps by any means except a cap crimper designed for the purpose; ensure that the fuse cutting section of the crimpers is not accidentally used in crimping.
- Do not allow the safety fuse to coil up and contact itself after being ignited. If the fuse wrapping comes in contact with itself at a point nearer the blasting cap, premature detonation could occur.
- Handle any percussion detonator with the same care as a blasting cap. Take care to protect its primer end from blows or shock.
- Do not confuse detonating cord with safety fuse. Some foreign materials of this type are difficult to identify. If such materials must be used, they should be carefully and safely tested prior to use.

12.3 NON-ELECTRIC PREPARATION SEQUENCE

The procedures listed below are provided to give guidance on the complete assembly of individual components within the non-electric firing system. Prior to assembly, all components of the non-electric system will be inspected. If any of the non-electric firing system components are defective, reject the component and use a satisfactory replacement. The following steps will be used in setting up a demolition shot using a non-electric firing train:

1. *Conduct a test burn.* Cut and discard a 6 inch (approximate) length from the free end of safety/time fuse to prevent a misfire caused by exposed powder absorbing moisture from air.

Then cut off a 6 foot length of safety/time fuse to check burning rate. Conduct this test at least 50 feet downwind from any explosives. Attach a fuse igniter and ignite fuse. Note the amount of time required for the fuse to burn. Compute burning rate per foot by dividing time in seconds by length in feet. NOTE: All safety/time fuse in the same roll should burn at the same rate. In older types of fuse coils, the rate should be between 30 and 45 seconds per foot. New safety fuse (M700) should burn uniformly at 40 seconds per foot.

2. *Prepare safety/time fuse.* Cut fuse long enough to permit the person initiating the charge to reach a safe distance by walking at a normal pace before the explosion. Plan to dual prime and use a minimum of 6 feet under normal conditions. This cut should be made squarely across the fuse using an approved crimper. Attach and weatherproof the fuse igniters to the safety/time fuse.

3. *Attach non-electric blasting caps.* Take one blasting cap from cap box; inspect it by looking into open end. Use only clean caps that are free of dirt and/or debris. If any foreign matter or dirt is present, hold it with open end down, and shake it gently or lightly bump hand holding it against other hand. If foreign matter does not come out, dispose of cap and use another. Hold safety fuse vertically with square cut end up; slip blasting cap gently down over it so that flash charge of cap is in contact with end of the fuse; if not in contact, it may misfire. If the safety/time fuse end is flattened or it is too large to enter blasting cap freely, roll it between thumb and fingers until size is reduced to permit free entry. After blasting cap has been seated, hold cap firmly against fuse. Slide second finger down outer edge of blasting cap to guide crimpers, thus obtaining accurate crimping position. Slightly crimp blasting cap at a point between 0.125 and 0.25 inch (1/8 and 1/4 inch) from open end. Position the blasting cap and time fuse off to the side or behind the body to complete crimp (ensure the downrange area of the cap is clear before completing crimp. NOTE: For weatherproofing blasting caps, an additional crimp may be installed 0.125 inch (1/8 inch) above with a 90 degree turn.

4. *Secure caps and safety/time fuse.* Once the initiator(s) have been assembled, secure in an approved container and transport to the demolition site.

5. *Prepare and place all explosive charges.* Explosive charges will be prepared and placed according to the Demolition Team Leader's approved Demolition Plan.

6. *Prime the explosive charges.* When all non-essential personnel have the departed the demolition area and arrived at the firing point, request permission to prime from the SUXOS. When permission is granted, connect the blasting caps to the demolition shot. This can be done by "priming-in" directly to the donor charge or to the detonating cord that leads to the shot. Safety/time fuse should be laid in a straight line and be secured by earth or suitable material at each end of the fuse. This will prevent the fuse from coiling up on itself after ignition. The safety/time fuse should not be allowed to cross itself or another fuse. After all items have placed and secured, ensure the proper explosive continuity is still intact. Visually inspect all components of the down-range firing train.

12.4 NON-ELECTRIC FIRING PROCEDURES

1. *Account for all site personnel.* Once the demolition charges have been primed, set, and all non-essential personnel have arrived at the safe area, a head count will be taken. All personnel will be accounted for in various positions around the demolition site. Communicate with road guards to ensure that all are accounted for in their safe area, and that no personnel have entered the EZ. Ensure that all notifications have been made and all site personnel have taken cover.
2. *Verbal warning.* Make three loud verbal announcements of "Fire in the Hole" on the radio and/or three, long, blast on the safety vehicle horn. Wait for a response.
3. *Initiate the charge.* If there is no response from verbal warning, initiate the charge by removing the safety pin on the igniter, hold the igniter barrel in one hand, grasp the pull ring with other. When the firing command is given, push the ring and shaft in, turn 90 degrees and pull the shaft and ring out. The percussion primer in the igniter should fire and smoke should be observed coming from the time fuse. Mark the time of ignition. If no ignition occurs, repeat this process up to two times (three total attempts). If there is no ignition after three attempts, cut the time fuse near the igniter and attach a new igniter. Repeat initiation until ignition occurs. Mark the time of ignition and depart the demolition site for the safe area.
4. *Account for all site personnel.* After ignition, conduct a head count to ensure that everyone is in the safe area and no one has entered the EZ.
5. *Countdown to detonation.* Give all personnel a verbal standby via radio communications at the 1 minute, 30 seconds, and 10 seconds till detonation times. Take cover for detonation. If a misfire occurs, proceed to the Non-Electric Misfire Procedures (Section 12.5)
6. *Observe 5 minute wait.* After the detonation, observe a five minute wait time.
7. *Check the shot.* After the five minute wait time, the Demolition Team Leader and one other UXO Technician will proceed to the shot area; one person will check the shot and the second will remain at a safe distance to render assistance or aid, if required. A thorough search of the shot hole and immediate area will be conducted with a magnetometer to ensure that complete demolition was accomplished. If the shot is clear, the Demo Team Leader will notify the SUXOS.
8. *All clear.* The SUXOS will notify all personnel that the shot is clear and they may leave the safe area and open access roads as applicable.

12.5 NON-ELECTRIC MISFIRE PROCEDURES

When using non-electric firing systems, the most common causes of misfires are from improperly seating the cap to safety/time fuse, moisture in the time fuse, and/or a break the explosive train. The following steps will be taken in the event of a non-electric misfire:

1. Observe a minimum 1 hour wait time. Allow a minimum of 1 hour for non-electric initiated cap misfires to elapse after the maximum delay predicted for any part of the demolition shot has passed, before starting to investigate.
2. Investigate firing train. After the 1 hour waiting time has passed, proceed downrange, and check the safety/time fuse, non-electric caps, detonating cord, and main charge.
3. Make corrective action. If the caps failed to function, cut the detonating cord between the cap and main charge. Attach a new cap and safety/time fuse to the end of the detonating cord and repeat firing procedures. If the detonating cord failed to function, attach a new cap and safety/time fuse to the end of the detonating cord and repeat firing procedures. If the main charge failed to function, re-prime the main charge (if intact) or place a new charge along side of the failed charge. Repeat firing procedures.

13.1 USE OF DETONATION CORD

The use of detonating cord in firing systems is especially applicable for multiple shots, under water, and underground blasting because the blasting cap of the initiating system may remain above the water or ground. Detonating cord may be detonated by electric and non-electric blasting caps, shock tube/NONEL detonators, and/or other explosive sources.

Detonating cord connections can be made in many shapes and forms. The main line/branch line and ring main systems are the most commonly used. When using a main line/branch line system, any number of branch lines may be connected to a main line, but only one branch line is connected to a main line at anyone point. A branch line is never connected to a main line at a splice in the main line. The ring main is basically the same, except the main ring line makes a complete circle back to the initiation point. Any number of extensions can stem from the ring.

The items listed below are safety precautions to be observed while using detonating cord:

- Use only a clean sharp knife to cut detonating cord. This provides the safest action to cut detonating cord.
- Do not attempt to cut detonating cord with a blow from a sharp or blunt object or by sawing. Such action could cause the detonating cord to detonate.
- Always cut detonating cord from the spool before attaching to the down line charge. This will minimize the destructive effect of a premature detonation of the demolition charge.
- Do not damage the covering or the explosive core. Such damage may cause a misfire.
- Layout the lines of detonating cord as straight as possible, but not stretched taut. Detonating cord forms a spiral as it is unwound from the spool and must be straightened out carefully before firing to avoid misfire.
- Ensure that branch lines touch one another, or the main line only at the connections. Touching branch lines may be blown apart without detonation. Avoid kinks and sharp bends in laying out detonating cord. A misfire is probable in these cases.

The actual connections of the various lines, branches, and/or lengths of detonating cord vary depending on the type of shot. The items listed below are types of connections to be used when attaching multiple sections of detonating cord:

- The square knot is used to extend a line of detonating cord. The 6 inches of cord protects the active part of the cord from moisture. At low temperatures, detonating cord is brittle. A detonating cord clip, twine, tape, wire, or twist ties may be used in lieu of the square knot.
- A modified girth hitch is used to connect a branch line of detonating cord to a main line of detonating cord. The angle between the branch and main line shall not be less than 90 degree. The branch line may not detonate if the angle is less. The 6 inches of cord protects the active part of the connection from moisture. Girth hitches must be tight to

prevent slipping on the main line. Tape or twine may be used to prevent slipping and unraveling during cold weather operations.

- The detonating cord connector can also be used to connect detonating cord end-to-end or at right angles. This connector may also be used to fasten a blasting cap, either electric or non-electric, to the detonating cord for initiation.
- Tape may be used to splice two lengths of detonating cord together and for attaching branch lines of the main line. When splicing two cords together, overlap the two ends to permit a 6-inch (approximate) overlap beyond the taped portion. Connect branch lines by taping the branch line to the main line so as to leave a 6-inch pigtail extending along the main line away from the source of initiation.
- In most instances, the main charge or detonating cord should be dual primed. A dual firing system consists of two completely independent initiating systems. Each system is capable of initiating the charge by itself. The following items are various methods of dual priming systems that attach to the main charge or detonating cord:
- A dual priming system for detonating cord can consist of; two independent electric, non-electric, or shock tube/NONEL systems attached to a single length of detonating cord. The detonating cord should have a 6 inch pigtail installed at the initiation point.
- A dual priming system for the main charge can be installed by using priming adapters. If priming adapters are not available, but blocks have cap wells, insert blasting cap/non-electric detonator into each cap well; tie in place with a string, or fasten with tape or some other available material. If demolition block does not have a cap wells, make holes in the block with a pointed non-sparking instrument, or pointed handle on M2 crimpers, large enough to contain the blasting caps/ detonators. Insert blasting caps/ detonators into holes; tie in place with a string, or fasten with tape or some other available material.

Demolition blocks may be primed with detonating cord in several ways. The following are a few examples of attachment:

- Sensitized detonating cord. The method which offers the greatest assurance of detonation is to affix a non-electric blasting cap to end of detonating cord and place it in demolition block.
- Alternate method No.1. Tie detonating cord around explosive block (on top of booster, if present) using clove hitch with two extra turns. The detonating cord must fit snugly against blocks and loops must be pushed close together. Use an electric/non-electric blasting caps or shock tube/NONEL detonators to initiate the detonating cord at the pigtail.
- Alternate method No.2. Place a loop of detonating cord on explosive with four wraps around the block and loop. The running end of the detonating cord is pulled through eye of loop and tightened. This method is also initiated by electric/non-electric blasting caps or shock tube/NONEL detonators.

- Whipping method. The whipping method gives an extra boost for priming charges with detonating cord. Whipping is similar to alternate method No.2 except eight wraps of detonating cord are placed around the explosive. When using lightweight detonating cord, whip with eight wraps for charges 1.25 pounds or less, and for charges over 1.25 pounds, pyramid seven wraps on top of nine wraps.
- Internal knot. To prime plastic explosive with single-strand detonating cord, form knot and insert knot into a block of explosive or a molded piece of explosive.
- Double-strand. To prime plastic explosive with double-strand detonating cord, cut two lengths of detonating cord approximately 36 inches (914 millimeters) longer than line of ordnance to be disposed of. Marry lengths of detonating cord into a molded piece of explosive.
- Underwater demolition. For under water demolition shots, all lengths/sections of detonating cord will be double-stranded and married together with tape. The attachment method used on the main charge will vary depending on the type of explosives used. The detonating cord length will be a minimum of 1.5 times the water depth to allow scope for current, surface action, and wind. Waterproofing measures will be applied to any exposed areas of the explosive firing train.

Open burn operations and associated electric or non-electric demolition procedures will be conducted in accordance with the standard practices and procedures outlined in TM 60A-1-1-31 and applicable references.

An open burn site suitable for the disposal of MEC will be constructed in accordance with applicable permits, directives and procedures outlined in TM 60A-1-1-31.

14.1 EQUIPMENT

The following equipment will be needed to perform open burn disposal operations:

___ Remote Firing Device Boxes	___ Ready Service Mag. /Day Boxes
___ Galvanometer w/ approved batteries	___ Fire Extinguisher(s)
___ Powder train time fuze	___ Wire mesh
Smokeless Powder (IMR 4831)	___ First Aid Kit(s)
___ Electric Squibs/ Electric Matches	___ Burn Blanket (gel coated)
___ Burn Kit	___ Blood borne Pathogens Kit
___ Communications equip.	___ 5 gal. water
___ Thermite grenades	___ Shovel
___ Electrical tape	___ Fire fighting equip. (if available)
___ SOPs, Work Plans, Publications	___ Reflectors
___ DD Form 626	___ Explosive Vehicle Checklist
___ Sandbags (filled as needed)	___ 5 gal. water
___ PPE	___ Crimpers, fixed-blade knife

14.2 OPEN BURN SAFETY PRECAUTIONS

The Disposal Team Leader, SUXOS, and UXOSO shall ensure that the following burn specific safety precautions are followed:

- Observe minimum safety distances in accordance with the approved ESS

- When safety fuse is used to ignite the combustible train, lay out the safety fuse in a straight line and place a heavy object on both ends so the fuse will not curl up and cause premature ignition or burn
- Observe applicable wait times in accordance with Section 14.3 and 60A-1-1-31
- Do not perform consecutive black powder burns on the same burn site within a 24 hour period
- Do not use volatile flammable liquids
- Ensure that all fire fighting equipment is on station prior to commencing burn operations
- Ensure that at least 1 gel coated burn blanket is on station prior to commencing burn operations

14.3 OPEN BURN PROCEDURES

The Disposal Team Leader will supervise all burn activities. The Disposal Team Leader will ensure that the following preparatory activities are completed.

- Disposal team will ensure that a 200 foot border around the burn site is clear of combustible materials
- Munitions to be burned will be placed on dunnage (combustible materials such as wooden pallets)
- Nonvolatile flammable liquids may be poured over the munitions and dunnage.
- A non-flammable screen will be placed over the burn pad and anchored down to prevent kick outs
- A combustible train shall be constructed leading away from the burn pan

The Disposal Team Leader will supervise the preparation of the ignition system. The ignition system will consist of a thermite grenade or bag of smokeless powder. The system will be initiated by an electric squib, electric match or a powder train time fuze. The electric or nonelectric initiation system will be prepared in accordance with 60A 1-1-31.

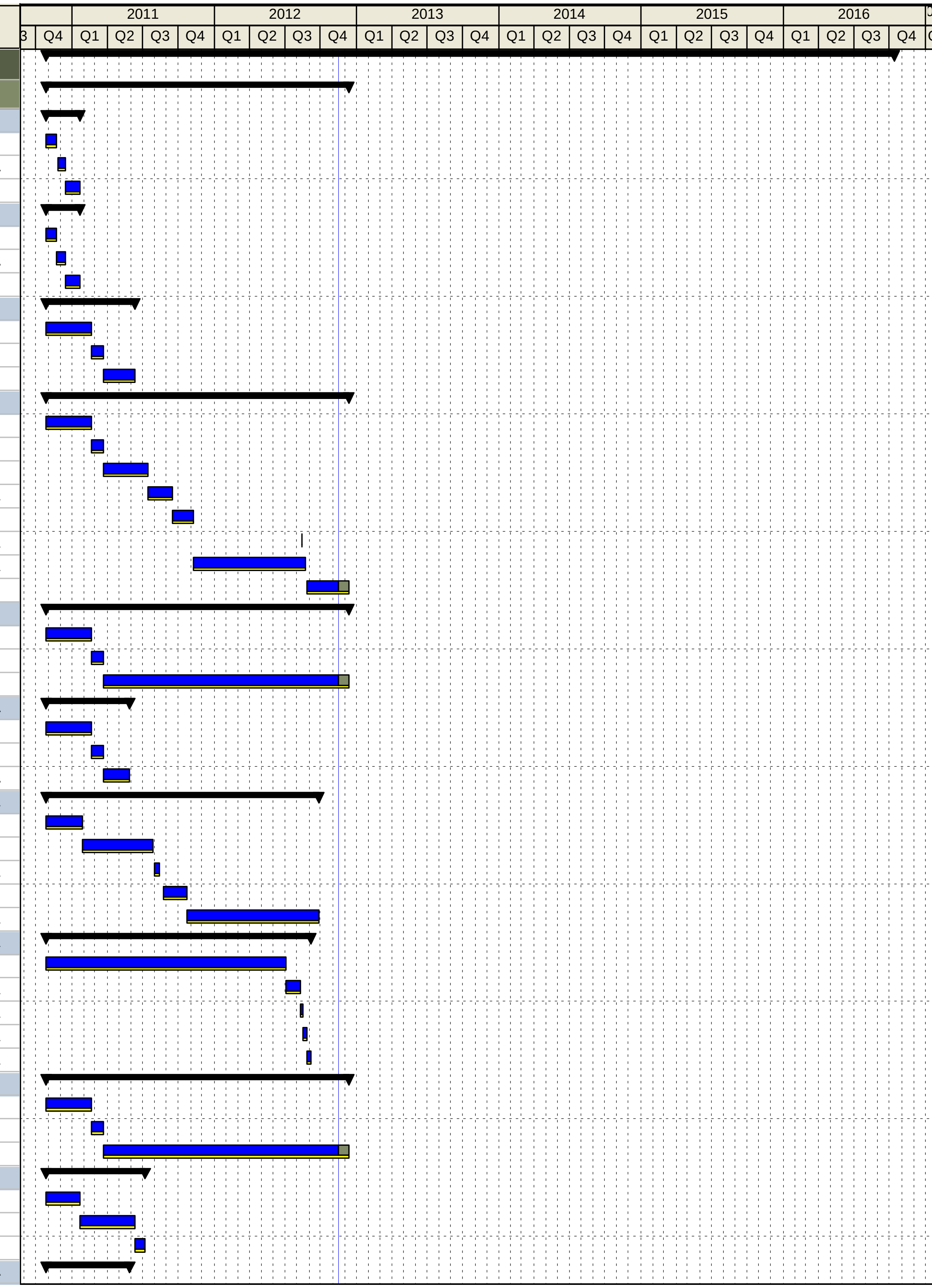
The Disposal Team Leader will supervise the following post burn activities:

- Observe at least a 30 minute wait time after the last visual signs of burning
- The Disposal Team Leader and one team member shall return to the burn pan to inspect the burn area for completeness of burn, heat retainment, and any other dangerous conditions
- If burn is declared complete and area is declared safe by the Disposal Team Leader, operations at the CAMU may resume

- A single burn pan will be used to conduct open burns. Successive burns shall not be conducted in the same day.

Fort Wingate Depot Activity

Activity ID	Activity Name	Original Duration	Start	Finish
	HWMU Work Plan and Removal, Fort Wingate Depot Acitivity	1555	25-Oct-10 A	12-Oct-16
	HWMU Work Plan	555	25-Oct-10 A	12-Dec-12
	Project Management Plan (PMP)	61	25-Oct-10 A	20-Jan-11 A
	Submit Army Draft PMP	29	25-Oct-10 A	22-Nov-10 A
	Army Review and Comment of Army Draft PMP	19	24-Nov-10 A	14-Dec-10 A
	Submit Final PMP (including RTC)	35	15-Dec-10 A	20-Jan-11 A
	Quality Assurance Surveillance Plan (QASP)	61	25-Oct-10 A	20-Jan-11 A
	Submit Army Draft QASP	29	25-Oct-10 A	22-Nov-10 A
	Army Review and Comment of Army Draft QASP	20	23-Nov-10 A	14-Dec-10 A
	Submit Final QASP (including RTC)	35	15-Dec-10 A	20-Jan-11 A
	Quality Assurance Project Plan (QAPP)	162	25-Oct-10 A	10-Jun-11 A
	Submit Army Draft QAPP	116	25-Oct-10 A	21-Feb-11 A
	Army Review and Comment of Army Draft QAPP	29	22-Feb-11 A	22-Mar-11 A
	Submit Final QAPP (including RTC)	79	23-Mar-11 A	10-Jun-11 A
	HWMU Work Plan	555	25-Oct-10 A	12-Dec-12
	Submit Army Draft HWMU Work Plan	116	25-Oct-10 A	21-Feb-11 A
	Army Review and Comment on Army Draft HWMU Work Plan	30	22-Feb-11 A	23-Mar-11 A
	Submit Tribal Draft HWMU Work Plan (including RTC)	112	24-Mar-11 A	15-Jul-11 A
	Tribal Review and Comment of HWMU Work Plan	62	16-Jul-11 A	16-Sep-11 A
	Submit Final HWMU Work Plan (including RTC)	55	16-Sep-11 A	09-Nov-11 A
	Stakeholder's Meeting on HWMU Work Plan	1	14-Aug-12 A	14-Aug-12 A
	NMED Review and Comment of HWMU Work Plan	289	10-Nov-11 A	24-Aug-12 A
	Submit Approved Final HWMU Work Plan	110	25-Aug-12 A	12-Dec-12
	Quality Control Plan (QCP)	555	25-Oct-10 A	12-Dec-12
	Submit Army Draft QCP	116	25-Oct-10 A	21-Feb-11 A
	Army Review and Comment on Army Draft QCP	30	22-Feb-11 A	23-Mar-11 A
	Submit Final QCP (including RTC)	627	24-Mar-11 A	12-Dec-12
	Accident Prevention Plan (APP)	152	25-Oct-10 A	27-May-11 A
	Submit Army Draft APP	116	25-Oct-10 A	21-Feb-11 A
	Army Review and Comment of Army Draft APP	29	22-Feb-11 A	22-Mar-11 A
	Submit Final APP (including RTC)	66	23-Mar-11 A	27-May-11 A
	Explosives Safety Submission (ESS)	498	25-Oct-10 A	24-Sep-12 A
	Submit Army Draft ESS	92	25-Oct-10 A	28-Jan-11 A
	Army Review and Comment of Army Draft ESS	180	29-Jan-11 A	29-Jul-11 A
	Submit Army Draft with Revisions ESS (including RTC)	15	30-Jul-11 A	13-Aug-11 A
	DDESB Review of Army Draft with Revisions ESS	60	24-Aug-11 A	23-Oct-11 A
	Submit Final ESS (including RTC)	337	24-Oct-11 A	24-Sep-12 A
	Certificate of Risk Assessment (CORA)	485	25-Oct-10 A	05-Sep-12 A
	Submit Army Draft CORA	610	25-Oct-10 A	02-Jul-12 A
	Army Review and Comment of Army Draft CORA	38	03-Jul-12 A	09-Aug-12 A
	Submit Army Draft with Revisions CORA (including RTC)	8	10-Aug-12 A	17-Aug-12 A
	DDESB Review of Army Draft with Revisions CORA	10	18-Aug-12 A	27-Aug-12 A
	Submit Final CORA (including RTC)	9	28-Aug-12 A	05-Sep-12 A
	Environmental Protection Plan (EPP)	555	25-Oct-10 A	12-Dec-12
	Submit Army Draft EPP	116	25-Oct-10 A	21-Feb-11 A
	Army Review and Comment of Army Draft EPP	29	22-Feb-11 A	22-Mar-11 A
	Submit Final EPP (including RTC)	628	23-Mar-11 A	12-Dec-12
	Storm Water Pollution Prevention Plan (SWPPP)	182	25-Oct-10 A	08-Jul-11 A
	Submit Army Draft SWPPP	85	25-Oct-10 A	21-Jan-11 A
	Army Review and Comment of Army Draft SWPPP	139	22-Jan-11 A	10-Jun-11 A
	Submit Final SWPPP (including RTC)	27	11-Jun-11 A	08-Jul-11 A
	Cultural Resources Management Plan (CRMP)	152	25-Oct-10 A	27-May-11 A

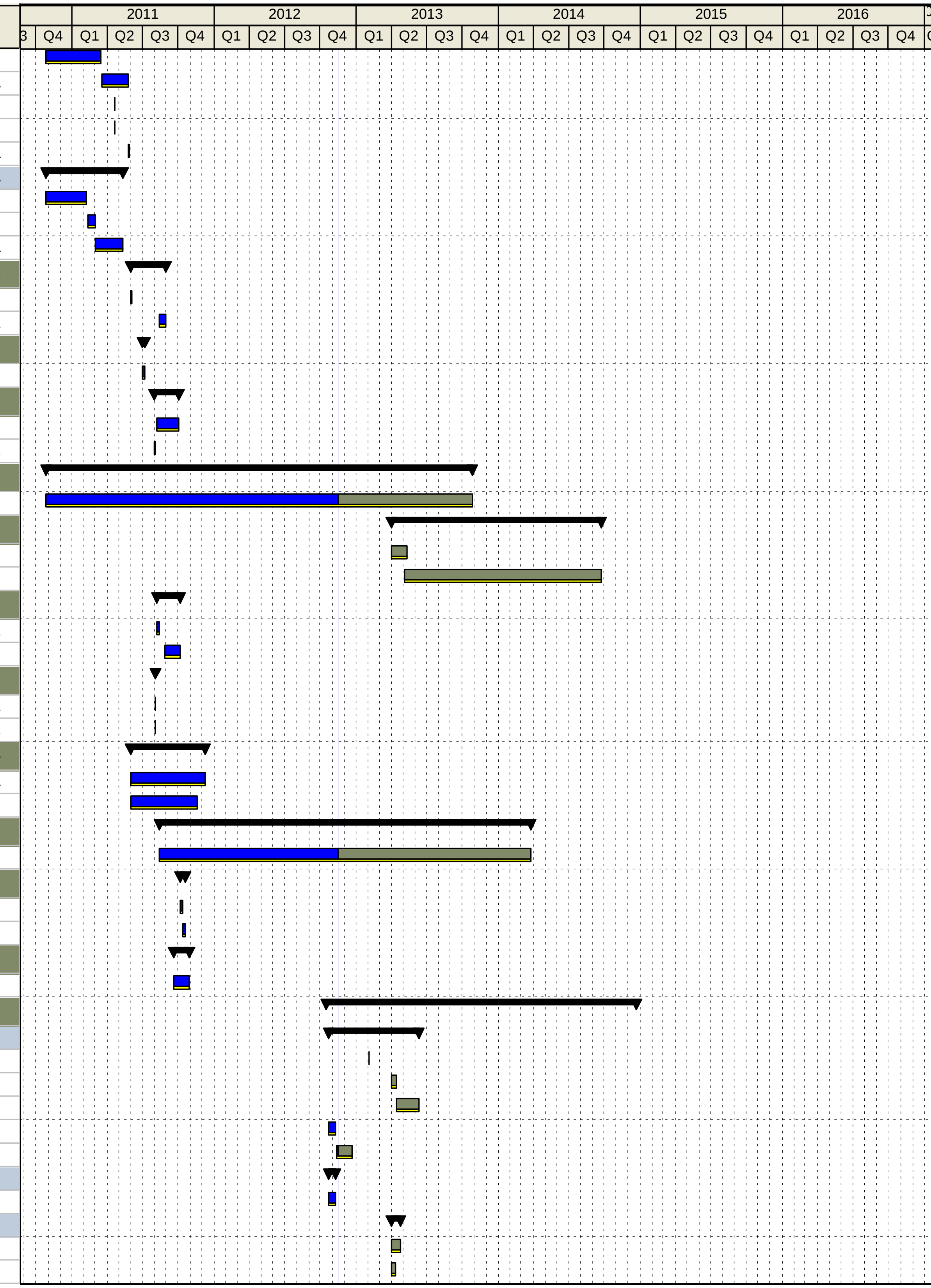


URS

Primary Baseline · Remaining Work · Milestone
Actual Work · Critical Remaining Work · Summary

Fort Wingate Depot Activity

Activity ID	Activity Name	Original Duration	Start	Finish
	Submit Army Draft CRMP	140	25-Oct-10 A	17-Mar-11 A
	Army Review and Comment of Army Draft CRMP	68	18-Mar-11 A	24-May-11 A
	Submit Tribal Draft CRMP (including RTC) - Task Not Required	0	22-Apr-11 A	22-Apr-11 A
	Tribal Review and Comment of CRMP - Task Not Required	0	22-Apr-11 A	22-Apr-11 A
	Submit Final CRMP (including RTC)	4	24-May-11 A	27-May-11 A
	Work Plan for Auxillary Tasks	141	25-Oct-10 A	12-May-11 A
	Submit Army Draft Work Plan	103	25-Oct-10 A	08-Feb-11 A
	Army Review of Army Draft Work Plan	21	09-Feb-11 A	01-Mar-11 A
	Submit Final Work Plan (including RTC)	72	02-Mar-11 A	12-May-11 A
	Construct CAMU	64	02-Jun-11 A	30-Aug-11 A
	Cultural Monitoring of the CAMU Location	2	02-Jun-11 A	03-Jun-11 A
	Construct CAMU	12	15-Aug-11 A	30-Aug-11 A
	Remove and Properly Dispose of Munitions on Signs and Fence Post	6	01-Jul-11 A	08-Jul-11 A
	Munitions Removal and Disposal	6	01-Jul-11 A	08-Jul-11 A
	Removal of Surface Debris from Revetments and Removal of Day Boxes	46	02-Aug-11 A	04-Oct-11 A
	Removal and Disposal of Debris from Revetment	42	08-Aug-11 A	04-Oct-11 A
	Removal of Day Boxes (2)	1	02-Aug-11 A	02-Aug-11 A
	Management of Earth Covered Magazines (ECMs)	782	25-Oct-10 A	25-Oct-13
	Operation and Maintenance of ECMs	782	25-Oct-10 A	25-Oct-13
	Maintenance of Roads	387	01-Apr-13	23-Sep-14
	Initial Road Development and Maintenance	30	01-Apr-13	10-May-13
	Ongoing Maintenance of Roads	362	06-May-13	23-Sep-14
	Construct a Low-water Crossing	44	08-Aug-11 A	06-Oct-11 A
	Remove Debris and Sediment from Arroyo	6	08-Aug-11 A	15-Aug-11 A
	Construct Low-water Crossing	30	26-Aug-11 A	06-Oct-11 A
	Clean Debris and Sediment from Culverts	2	03-Aug-11 A	04-Aug-11 A
	Clean Debris from Culvert Under West Patrol Road North of Parcel 3	2	03-Aug-11 A	04-Aug-11 A
	Clean Debris from Culvert Under HWMU Access Road North of HWMU	2	03-Aug-11 A	04-Aug-11 A
	Construct a Fence Along the South and East Sides	138	01-Jun-11 A	09-Dec-11 A
	UXO Support for Fence Construction	138	01-Jun-11 A	09-Dec-11 A
	Construct Security Fence	122	01-Jun-11 A	17-Nov-11 A
	Contingency Plan	682	15-Aug-11 A	25-Mar-14
	Updates to Contingency Plan	682	15-Aug-11 A	25-Mar-14
	Close the Hazardous Waste Storage at Bldg 15 & Establish a Hazardous Waste Storage at ECM No. B1007	8	07-Oct-11 A	18-Oct-11 A
	Establish Hazardous Waste Storage Site	5	07-Oct-11 A	13-Oct-11 A
	Close Hazardous Waste Storage Site	3	14-Oct-11 A	18-Oct-11 A
	Arroyo Sweep North of HWMU - 2011	30	19-Sep-11 A	28-Oct-11 A
	Arroyo Sweep 2011	40	19-Sep-11 A	28-Oct-11 A
	Option 1 - Remove MEC and Debris from HWMU	571	15-Oct-12 A	22-Dec-14
	Project Planning	166	22-Oct-12 A	10-Jun-13
	Stakeholder's Meeting	1	04-Feb-13*	04-Feb-13
	Cultural Resources Inventory	10	02-Apr-13*	15-Apr-13
	Submit Cultural Resources Inventory Report	40	16-Apr-13	10-Jun-13
	Environmental Assessment (EA) and Wetlands Delineation	15	22-Oct-12 A	09-Nov-12 A
	Submit EA Reports	30	12-Nov-12 A	21-Dec-12
	Topographic Land Survey	15	22-Oct-12 A	09-Nov-12 A
	Survey Benchmarks, Boundary, and Topography	15	22-Oct-12 A	09-Nov-12 A
	Mobilization and Site Setup	20	01-Apr-13	26-Apr-13
	Prepare Site and Setup Plant	20	01-Apr-13*	26-Apr-13
	Implement Pollution and Environmental Protection Controls	10	01-Apr-13	12-Apr-13



URS

Primary Baseline
Remaining Work
Milestone
Actual Work
Critical Remaining Work
Summary

Wingate-NEW FIELD

Fort Wingate Depot Activity

Activity ID	Activity Name	Original Duration	Start	Finish
	Risk Reduction Surface Clearance	20	15-Oct-12 A	09-Nov-12 A
	Complete Surface Sweep	20	15-Oct-12 A	09-Nov-12 A
	Vegetation Removal	15	15-Apr-13	03-May-13
	Complete Vegetation Removal	15	15-Apr-13*	03-May-13
	Debris and Contaminated Soils Removal	403	06-May-13	19-Nov-14
	Excavate and Stockpile Shallow Soils and Debris	70	06-May-13	09-Aug-13
	Real Time Post Excavation Geophysical Mapping	333	12-Aug-13	19-Nov-14
	Excavate and Stockpile Deep Soils and Debris	308	12-Aug-13	15-Oct-14
	Debris and Contaminated Soils	399	15-May-13	24-Nov-14
	Screeing Soils and Debris	384	15-May-13	03-Nov-14
	Screened Soils Characterization Sampling	384	15-May-13	03-Nov-14
	Decontamination of Munitions Debris	384	15-May-13	03-Nov-14
	Disposal of MEC and MPPEH in ECMs	14	15-May-13*	03-Jun-13
	MEC Disposal (from screening plant and BIP only)	384	15-May-13	03-Nov-14
	Confirmation Soil Sampling	384	15-May-13	03-Nov-14
	Site Restoration	15	04-Nov-14	24-Nov-14
	Demobilization from Field Effort	20	25-Nov-14	22-Dec-14
	Demobilization from Field Effort	20	25-Nov-14	22-Dec-14
	Option 2 - Operation of the CAMU	391	06-May-13	03-Nov-14
	CAMU Operation including MEC Disposal	391	06-May-13	03-Nov-14
	Option 3 - Monitoring Well Abandonment	6	03-Jul-13	10-Jul-13
	Abandonment of Wells CMW06, CMW16, and CMW20	6	03-Jul-13*	10-Jul-13
	Options 4 through 9 - Well Abandonment	6	03-Jul-13	10-Jul-13
	Abandonment of Well CMW07	6	03-Jul-13*	10-Jul-13
	Abandonment of Well CMW014	6	03-Jul-13	10-Jul-13
	Abandonment of Well CMW17	6	03-Jul-13	10-Jul-13
	Abandonment of Well CMW18	6	03-Jul-13	10-Jul-13
	Abandonment of Well CMW21	6	03-Jul-13	10-Jul-13
	Abandonment of Well FW38	6	03-Jul-13	10-Jul-13
	Option 10 - One Year of SWPPP and EPP Field Maintenance	261	01-Jan-14	31-Dec-14
	Additional Year of SWPPP Management	261	01-Jan-14*	31-Dec-14
	Additional Year of EPP Management	261	01-Jan-14	31-Dec-14
	Options 11 through 14 - Arroyo Sweep North of HWMU	813	01-Oct-12 A	11-Nov-15
	Arroyo Sweep 2012	30	01-Oct-12 A	09-Nov-12 A
	Arroyo Sweep 2013	30	01-Oct-13*	11-Nov-13
	Arroyo Sweep 2014	30	01-Oct-14*	11-Nov-14
	Arroyo Sweep 2015	30	01-Oct-15*	11-Nov-15
	Option 15 - HWMU Project Report	472	23-Dec-14	12-Oct-16
	Submit Army Draft HWMU Project Report	90	23-Dec-14	22-Mar-15
	Army Review and Comment of Army Draft HWMU Project Report	30	23-Mar-15	21-Apr-15
	Submit Tribal Draft HWMU Project Report (including RTC)	15	22-Apr-15	06-May-15
	Tribal Review and Comment of HWMU Project Report	90	07-May-15	04-Aug-15
	Submit Final HWMU Project Report (including RTC)	15	05-Aug-15	19-Aug-15
	Stakeholder's Meeting on HWMU Project Report	5	30-Jun-16	04-Jul-16
	NMED Review and Comment of HWMU Project Report	360	20-Aug-15	13-Aug-16
	Submit Approved Final HWMU Project Report	60	14-Aug-16	12-Oct-16

URS

Primary Baseline
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Wingate-NEW FIELD

TRIBAL DRAFT FORT WINGATE REMOVAL WORK PLAN, HWMU, PARCEL 3, AT THE FORT WINGATE DEPOT ACTIVITY, McKINLEY COUNTY, NM
COMMENT RESPONSE TABLE
SEPTEMBER 9, 2011

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
Pueblo of Zuni, Division of Natural Resources (Stephen Beran, Kirk Bemis, Nelson Luna)					
A-1	2-1 / 15 and 16		"Program Manager" is referenced twice.	Remove one reference to "Program Manager."	Agree. One reference to Program Manager will be deleted.
A-2	3-4 / 1 through 29		The Section paragraphs are not numbered correctly.	Renumber paragraphs on Page No. 3-4.	Agree. The paragraph numbers will be corrected.
A-3	3-4 / Section 3.4.1, 10 to 19		Obtain required NMED air permits for CAMU open burning and flashing operations.	Identify air permitting requirements and incorporate specific tasks within the Work Plan, and identify position responsible for administering the air permit(s).	During the RCRA Permit Modification process, the NMED Air Quality Bureau was consulted, and concluded that the CAMU would not produce emissions that exceed the thresholds in NMAC 20.2.72 and an Air Permit is not required. The Air Quality Bureau determined that the CAMU may require a Notice of Intent under MNAC 20.2.73.200. The following text will be added as another bullet after line 8 on Page 3-4, "Identify and obtain the required permits/notifications to complete the work (i.e, NPDES, Air NOI, etc)."
A-4	3-4 / Section 3.4.1, 21 to24		SWPPP should address on-site fuel storage and refueling if not addressed elsewhere in the Work Plan.	Provisions for spill containment and response should be addressed by the SWPPP or other Work Plan component.	Agree. The SWPPP will provide provisions for material handling and spill response. No changes will be made to the text.
A-5	3-8 through 3-13		Soil and debris handling including grizzly feeder screens, and hammer mill operations described in Section 3.8 may produce fugitive dusts requiring dust suppression and on-site	3.8 Debris and Soils Processing operations described are likely to produce dust emissions. The Work Plan should have provisions to determine compliance with the CAA	The following text will replace the bullet starting on Line 19 on page 6-8: "It is anticipated that planned activities will generate fugitive dust emissions as well as vehicle

			monitoring.	opacity limits and contingencies to institute dust suppression controls as needed.	emissions associated with equipment. Area ambient air will be periodically monitored in real time at the nearest downwind receptor or at the parcel boundary by visual assessment, or using a MSE pDR-100 (or equivalent). If measurements exceed 1.0 mg/m3 at the monitoring point then dust control measures will be implemented at the source to limit the generation of dust to the extent possible. Source implementation measures include wetting down roads or equipment. Haul roads within the work area will be maintained to reduce dust generation."
A-6	3-11 and 3-12 / Section 3.8.7		The NMED Air Quality Bureau permit type and requirements are not identified. Permit conditions may require attention to wind speed, hours of operation, inversions, etc.	At a minimum, the permit type should be identified in the Work Plan and the position responsible for obtaining and administering the permit should be reported in the Work Plan. There is a potential that Section 3.10 Flashing Process will require permitting. The Work Plan should identify the position having permitting and project responsibility.	Please see response to Comment A-3.
A-7	3-13 / Section 3.10, 28 and 29		SOP No. 16 is not completed and is not referenced in the Table of Contents.	SOP No. 16 should be completed and incorporated into the Work Plan.	The text in Section 3.10 is incorrect. The reference will be changed to SOP No. 15. However; SOP 15 is still under development as different methods of executing the flashing process are explored. SOP No. 15 will be developed and submitted for review at a later date. Once review comments have been resolved, SOP No. 15 will be incorporated into the Work Plan.
A-8	6-8		The Work Plan reports that fugitive dust emissions are anticipated.	See Comment No. 6 recommendations. Plans for fugitive dust emissions field measurements	Please see response to Comment A-5.

	19 through24			and contingencies for implementing dust suppression controls should be addressed in the Work Plan.	
A-9	3-13 30 through 34		The Work Plan does not report how fuel storage and refueling, spill prevention, and response will be managed during the project.	Report how spill prevention and response will be managed during the project (e.g., SWPPP, SOP).	Please see response to comment A-4.
A-10	3-13 30 through		The Work Plan does not identify the position responsible for reporting spills for RQs and contamination to surface waters.	Identify the regulatory requirements and individual who will report spills to NMED and/or EPA.	The text on line 32 of page 6-8 will be changed to read the following: "…during field activities; however, if a fuel spill were to occur in such quantity as may with reasonable probability injure or be detrimental to human health or the environment, the operating contractor will contain the spill and contact the COR. The owner, operator or person-in-charge of FWDA will report the spill to the NMED by calling (866) 428-6535 in non-emergencies or calling (505) 827-9329 for emergencies".
A-11	3-29 Section 3.19		Operation of the MD Flashing Process unit may require decontamination and disposal of regulated wastes.	The Work Plan should report MD Flashing Process decontamination procedures, waste determinations, and waste disposal management as applicable. If these are not concerns, the Work Plan should report this.	The flashing process is incorporated as a voluntary process. Flashing will be completed on material that has been inspected and already deemed free of explosive material. Generation of wastes as a result of this process is not anticipated. The following sentence will be added after the 3rd sentence of Section 3.19.3. "The voluntary flashing process is not considered treatment and therefore no wastes requiring management are anticipated from the flashing process. All treatment will be performed in the CAMU."
A-12	6-6		Mitigation procedures for the MD Flashing Process are not reported.	Report mitigation procedures for the MD Flashing Process as needed for decontamination, waste determinations, and management of	Please see response to Comment A-11.

	Section 6.2			regulated wastes.	
A-13	6-8 / 9 and 10		Work Plan text references Section 3.20 for hazardous waste issues.	Section 3.20 applies to Cultural Resources Monitoring. Section 3 tables which follow Section 3.20 apply to regulated wastes. Tables should be accurately referenced and incorporated into the Work Plan.	The reference to Section 3.20 on line 10 will be changed to 3.19. The table does appear to be accurately referenced in the Work Plan.
A-14	6-8 / 19 through 24		The Work Plan reports that fugitive dust emissions are anticipated.	See Comment No.'s 5 and 6 recommendations. Plans for fugitive dust emissions field measurements and contingencies for implementing dust suppression controls should be addressed in the Work Plan.	Please see response to comment A-5.
A-15	6-8 / 27 through 34		The Work Plan does not identify the regulatory requirements for managing fuels and spill reporting; and, position responsible for project oversight and reporting.	Identify the regulatory requirements and individual who will report spills to NMED and/or EPA.	Please see response to comment A-10.
A-16	iii / Appendix I Table of Contents		SOP No. 15 Thermal Treatment of MD should be identified in the Table of Contents.	Correct Table of Contents.	Please see response to Comment A-7. SOP 15 has been renamed to "Flashing of MD". The TOC will reflect the change.
A-17	15-1 / Appendix I		SOP No. 15 Thermal Treatment of MD is not completed.	Complete SOP No. 15.	Please see response to Comment A-7.

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FINAL REMOVAL WORK PLAN AT THE
FORT WINGATE DEPOT ACTIVITY, McKINLEY COUNTY, NM
COMMENT RESPONSE TABLE
DOCUMENT SUBMITTED NOVEMBER 09, 2011
COMMENTS RECEIVED AUGUST 16, 2012

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
			New Mexico Environment Department (John Kieling)		
			GENERAL COMMENTS		
N-1			NMED understands the Permittee intends to establish a new Area of Contamination to manage waste generated during cleanup activities associated with the Hazardous Waste Management Unit (HWMU). The Permittee is reminded to submit a letter requesting the addition of the Area of Contamination, which must include a map that identifies the boundary of the Area of Contamination, to NMED for approval.		Comment noted. The Permittee will prepare and submit a request to establish an Area of Contamination to the NMED for approval for any areas outside the HWMU used to manage waste.
N-2			NMED does not typically review Standard Operating Procedures (SOPs) or Quality Assurance Project Plans (QAPPs); however, due to the inclusive nature of these documents to this Work Plan, the SOPs and QAPPs have been reviewed. The SOPs presented in Appendix I, Field Standard Operating Procedures are generalized. Include SOPs which are specific to, and describe the precise activities necessary for, executing the removal activities outlined in the		Per our discussions with NMED and subsequent e-mail from the Lane Andress (NMED reviewer) indicated that this comment was intended toward SOPs from an unrelated Work Plan. During the discussion, it was noted that specifically SOP No. 15 was missing (please see Comment 31). By addressing the NMED's specific comments to the Work Plan, we assume that this comment will be effectively addressed.

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			Work Plan. Revise the current Work Plan to provide specific descriptions of the proposed methods and procedures for conducting the removal activities, waste management, and sampling of environmental media		
N-3			Appendices; in the hard copy of the revised Work Plan insert a page to the "Appendices" tab which includes a list of all Appendices included on the CD attached to the Work Plan.		A page will be inserted following the Appendices tab that lists the Appendices included on the CD.
N-4			The footnotes in Table 3-2 Confirmation and Characterization Soil Screening Levels, Fort Wingate Depot Activity, McKinley County, New Mexico list the NMED 2009 Soil Screening Levels (SSLs) and the USEPA 2009 Regional Screening Levels (RSLs). NMED updated the soil screening guidance (SSG) in February 2012. Permittee is directed to use updated SSLs provided in Table A-1 (NMED Soil Screening Levels) of the NMED Risk Assessment Guidance for Site Investigations and Remediation February 2012. A copy of this document can be found on NMEDs website: http://www.nmenv.state.nm.us/HWB/guidance.html The most recent version of the SSG must now be used in the evaluation of site data instead of the NMED 2009 version. When no NMED SSL is listed for a constituent, the current update to the USEPA RSLs must be used. Correct Table 3-2 in the revised Work Plan to reflect the most		The updated SSLs provided in Table A-1 (NMED Soil Screening Levels) of the NMED Risk Assessment Guidance for Site Investigations and Remediation February 2012 will be used. When no NMED SSL is listed for a constituent, the current USEPA RSLs will be. Table 3-2 will be updated to reflect the current SSLs and RSLs.

			current SSLs and RSLs		
			SPECIFIC COMMENTS		
N-5			Appendix I, Field Standard Operating Procedures, lists SOP No. 15, Flashing of [Munitions debris] MD in the table of contents, however, SOP 15 is not included in Appendix I. In the revised Work Plan incorporate SOP No. 15, Flashing of MD in revised Work Plan, including details regarding the staging of materials to be flashed, flashing process, a description of potential waste generation, if any, and the transporting of flashed materials off site.		The Permittee is currently considering available options for executing the flashing process and the SOP is dependent on the selected vendor to provide the equipment/service. After verbal discussions with the NMED via teleconference on October 2, 2012 and in response to Comment 31, Section 3.10 of the Work Plan will be revised to include a more detailed description of the the flashing process and SOP 15 will be removed from Appendix I.
N-6			Several acronyms are used in the appendices that are not defined or on the list of acronyms (e.g., RFD, "ESS/ESP/CSS" (only ESS is on acronym list), HE, "EMR/HERO", NONEL, PETN, ECO, DMM, HTRW) and in the Work Plan (e.g., Section 3.11, MPPEH Inspection Process, page 3-15 line 3 the acronym for DMM is used, and it is not in acronym list). All acronyms used in the work plan and appendices must be defined when first used and also be included in the List of Abbreviations and Acronyms included on page i of the Work Plan. Revise the Work Plan accordingly		Acronyms will be spelled out at first use throughout the work plan and the acronym list in the work plan will be updated to include missing acronyms.
N-7			In Appendix E, Munitions Constituents, QAPP worksheet #15 (UFP-QAPP Manual Section 2.8.1)-		Worksheet #15 will be revised to include TAL metals. Associated sections of the work plan will be

			Reference Limits and Evaluation Table, Analytical Group: Metals, page 15-11 the list of analytes provided indicates that the analysis of RCRA 8 metals will be performed on samples associated with the HWMU. The Permittee must analyze all samples undergoing metals analysis associated with the HWMU for Target analyte List (TAL) metals or provide justification for a more limited analyte list. Modify all associated sections of the revised Work Plan accordingly		modified accordingly.
N-8			In Appendix E, Munitions Constituents Sampling and Analysis Plan, QAPP Worksheet #19 (UFP-QAPP Manual Section 3.1.1)--Analytical SOP Requirements Table, page 19-1, fifth row the Permittee states laboratory analyses for explosives will be completed via USEPA Method 8330B and that the sample volume to be collected for analysis will be 8 ounces (oz). USEPA Method 8330B requires a sample size of 1 kg (35.27 oz) if multi-incremental (MI) sampling is conducted. Propose to collect the sample volume required by USEPA Method 8330B for MI sampling, as applicable. Edit QAPP Worksheet #19 and appropriate sections of the revised Work Plan to ensure adequate sample volume is collect to obtain defensible results from laboratory analyses for explosives		QAPP Worksheet #19 and all applicable section of the Work Plan will be revised to indicate that the laboratory analysis for explosives will be completed via USEPA Method 8330a.

N-9			Section 1.6.1.1 HWMU, page 1-4, last paragraph, the Permittee states there are "…10 areas identified as Current Residue Piles (CRPs) 1 through 10…" Figure 1-2, HWMU and CAMU Location, Figure 3-4 Proposed Excavation Areas, and Figure 3-7, Anticipated Sampling Plan shows the locations of the CRPs, however CRP4 is not located on any of these figures. Revise relevant figures to include CRP4.		Figures 1-2, 3-4, and 3-7 will be revised to show CRP4.
N-10			Section 1.6.1.1 HWMU, bottom page 1-4, top page 1-5 indicates that areas impacted by open burn/open detonation (OB/OD) activities in the HWMU may lie beyond the marked boundary of the HWMU. The revised Work Plan must include a discussion regarding action(s) to be taken when newly discovered detonation craters, CRPs, and other range-related debris (RRD), which overlaps the boundary or lie just beyond the boundary of the HWMU, is encountered during HWMU investigation and removal activities.		A paragraph will be added to the end of Section 3.18 that states: "Newly discovered areas impacted by OB/OD activities that lie beyond the marked boundary of the HWMU will remain in place and be addressed during follow on activities. Excavation side slopes at the HWMU boundary will be graded and stabilized as described in Sections 3.18.1 and 3.18.2."
N-11			Section 1.6.1.1 HWMU, bottom of page 1-4 and top of page 1-5; synopsis of historical activities at the HWMU do not include partial treatment and disposal of wastes from the trinitrotoluene (TNT) washout lagoons. Include all available information regarding waste from the TNT washout lagoons which was transported to and treated at the		Upon review of the Parcel 3 Summary History Report and Phase IA Report (Appendix E of the History Report) wastes from the TNT Washout Lagoon was not burned at the HWMU. Recommend that no changes be made to the text.

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			HWMU in the revised Work Plan.		
N-12			Based on the information presented in Section 1.14.3 1996-1998 Facility-Wide Removal Activities, page 1-10, line 19 it is not clear if Munitions and Explosives of Concern (MEC) debris was removed from the HWMU during this time period, or the estimated volume removed. Provide clarification on the types and amount of MEC debris removed from the HWMU during this time period.		The following text will be added to the end of the section: "Approximately 262 MEC items were removed from the areas, including 20 mm, 37 mm, and 40 mm projectiles, M20 boosters, BLU-2, BLU-3, and BLU-4 bomblets and various fuzes."
N-13			In Section 1.14.4 1996 Phase IA – Characterization and Assessment of Site Conditions for the Soils/Solid Matrix, page 1-11, line 9 the Permittee states "[t]he trenching operations at the five detonation craters identified scattered ordnance fragments…" According to Figure 1-2, HWMU and CAMU Location, Fort Wingate Depot Activity, McKinley County, New Mexico, there are 12 current detonation caters (CDCs), it is unclear which five detonation craters are referenced. In the revised report, define which five CDCs are referred to in this statement. In addition, label the current detonation craters (CDCs) and CRPs on the Figure (1-2).		The sentence will be revised to state: "The trenching operations at the five detonation craters (CDC02, CDC04, CDC06, CDC-8, and CDC10) identified scattered ordnance fragments, projectiles, ash…"
N-14			Section 2.3.14 Natural Resources Manager, page 2-7 indicates a Natural Resources Manager will be responsible for managing wetland and Threatened & Endangered (T&E) surveys as well as manage compliance		The following will be inserted as a new Section: Section 2.3.15 Other Agencies Other agencies that will provide technical or regulatory oversight of

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			with the Environmental Protection Plan. Include a section listing the various governmental agencies and organizations providing technical and regulatory oversight of the wetland and T&E surveys as well as the environmental restoration of the site in the revised Work Plan.		wetland and T&E surveys and site restoration include: • United States Fish and Wildlife Service • NMED Water Quality Bureau • USACE Albuquerque District • McKinley County Extension Office
N-15			In Section 3.3 HWMU Boundary and Topographic Land Survey, page 3-3, line 16 the Permittee states"…will complete flyover stereo photography and generate a topographic survey of the HWMU before fieldwork begins and after the removal has been completed." Indicate that before and after removal flyover stereo photographs and topographic surveys will be included with the final report.		The following sentence will be added to the end of the Section: "The flyover stereo photography and topographic surveys will be included in an appendix in the Removal Report."
N-16			In Section 3.4.4 Processing Plant Setup, page 3-5, line 8 the Permittee states "[Geophysical digital mapping] DGM data will be collected over the footprint area, as described in Section 3.16…" Section 3.16 refers to confirmation soil sampling and not post-excavation DGM. Correct this error in the revised Work Plan.		The sentence will be changed to state: "DGM data will be collected over the footprint area, as described in section 3.14, to subsurface target…"
N-17			Figure 3-2, Processing Plant Site Map, Fort Wingate Depot Activity, McKinley County, New Mexico and Figure 3-3, Processing Plant Site Map, Fort Wingate Depot Activity, McKinley County, New Mexico does not label the CRPs or CDCs depicted		The CDCs and CRPs will be labeled on Figure 3-2. Figure 3-3 will be further labeled to identify the CDCs, CRPs and the processing plant elements.

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			in green on the figure. CDC1 is labeled as a "Clean Stockpile". Clearly depict the locations of the CRPs and CDCs and differentiate them from the locations of future processing plant items on a figure in the revised Work Plan.		
N-18			Figure 3-3 Processing Plant Site Map, Fort Wingate Depot Activity, McKinley County, New Mexico, does not show the foot print of the processing plant. Depict and label the foot print of all the components of the processing plant on a figure in the revised Work Plan.		The processing plant and its components will be included on Figure 3-3.
N-19			In Section 3.5 Surface Clearance, bottom of page 3-5 to top of page 3-6 the Permittee states "[t]he HWMU will be divided into 200 foot by 200 foot grids. Each grid will be divided into search lanes to ensure complete coverage for each grid." In the revised Work Plan provide more information regarding how many search lanes are anticipated and the width of the search lanes. Appendix I, Field Standard Operating Procedures, Section 6.2.2.2 100 Percent Grid Survey, page 6-5, line 27 states "[g]enerally an area will be divided into 100-foot by 100-foot grids…" The grid size must be consistent throughout the revised Work Plan or justification for any differences must be provided.		The second and third sentences of the paragraph will be changed to state: "The HWMU will be divided into 100 foot by 100 foot grids. Each grid will be divided into 20, five foot wide search lanes to ensure complete coverage of each grid."
N-20			In Section 3.6 Vegetation Removal, page 3-6, line 9 the Permittee states "[r]emoved vegetation will be		The last sentence of the paragraph will be deleted and the following paragraph will be added to the

			stockpiled outside of, but adjacent to the HWMU." It is likely that small amounts of soil will be generated in the vegetation removal process (e.g., shallow soils around roots of vegetation) which may contain MEC and MD. No detail is given in the Work Plan regarding soils generated from vegetation removal processes, the process of screening for and removing MEC and MD, the ultimate disposal the soils or stockpiled removed vegetation. Include this information in the revised Work Plan.		section: "As the vegetation is removed, UXO Technicians will observe and inspect the vegetation for MEC and MD. If MEC or MD is identified in the vegetation or root mass, the vegetation will be segregated and further inspected as described in Section 3.11. The vegetation will be stockpiled within the HWMU footprint and allowed to decompose. Any future disposal of the vegetation will be completed under additional corrective action."
N-21			In Section 3.7 Debris and Incidental Soils Excavation, page 3-6, line 14 the Permittee states "…the anticipated excavation areas shown in Figure 3-4." However, Figure 3-4 Proposed Excavation Areas, Fort Wingate Depot Activity, McKinley County, New Mexico, does not clearly depict excavation areas. In the revised Work Plan, revise all appropriate figures to clearly depict areas to be excavated using a designated key or outline color and description (e.g., anticipated excavation areas) on the relevant figure(s).		The figure depicts all areas of anticipated excavation. The legend will be revised to note that the areas shown on the figure are the anticipated limits of excavation.
N-22			In Section 3.7.1 Excavation Sequence, page 3-6, line 18 the Permittee states "[s]oils and debris will be excavated from the areas shown in Figure 3-4…the total quantity of debris to be excavated is provided in Table 3-1." The four areas shown in Table 3-1 Anticipated Quantities and Excavation		The "Other Areas of Potential Subsurface Debris" will be labeled 1 through 4 on Figure 3-4 and other relevant figures.

			Depths, Fort Wingate Army depot Activity, McKinley County, New Mexico as 'Other Areas of Potential Subsurface Debris' 1 through 4, cannot be matched to corresponding areas of Figure 3-4 Proposed Excavation Areas, Fort Wingate Depot Activity, McKinley County, New Mexico as the areas designated as 'Other Areas of Potential Subsurface Debris' are not numbered on the figure. Label 'Other Areas of Potential Subsurface Debris' 1 through 4 on all relevant figures in the revised Work Plan.		
N-23			In Section 3.7.1 Excavation Sequence, page 3-6, line 23 the Permittee states "[e]xcavation operations will generally be completed working from…(south to north) of the arroyo to prevent re-contamination of the areas where excavation work has been performed. The Work Plan Figure 3-3, Processing Plant Site Map, Fort Wingate Army depot Activity, McKinley County, New Mexico show the processing plant will be set up in the southern portion of the HWMU. In the revised Work Plan, explain the procedures to prevent areas that have been previously excavated (i.e., they lie between processing plant and area of active excavation) from being re-contaminated.		The following text will be added to the end of the paragraph: "Transport trucks will utilize common haul roads to and from the processing plant. By using common haul roads, the area for potential recontamination will be limited to these common roads. Upon completion of the excavation and hauling activities, UXO technicians will complete a "mag and dig" operation of the common road areas. A DGM survey of the haul roads will be completed to document that target anomalies have been resolved."
N-24			In Section 3.7.2 Excavation Method, page 3-7, line 30 the Permittee states "[w]hen the modeled limits of an		The first sentence will be revised to state the following: "When the modeled limits of an excavation have

			excavation have been reached, Unexploded Ordinance (UXO) technicians will complete an instrument aided visual inspection…to determine if the Digital Geophysical Mapping (DGN) verification of the excavation is appropriate.” Explain what is meant by this statement as well as provide detail on how the instrument aided visual inspection will be performed, including the instruments that will be used, in the revised Work Plan.		been reached, UXO technicians will complete an instrument aided visual inspection of each excavation to verify that debris has been removed prior to collecting DGM of the excavation. The visual inspection will be completed by a UXO technician equipped with a hand held detector such as a Schonstedt GA-52CX magnetic locator or a White’s or Minelab’s all metal detector. The UXO technician will visually inspect the surface and use the detector to identify any area that may have a high density of subsurface anomalies and require additional removal. If visual or detector evidence of debris is not identified, the area will be considered ready for DGM collection,”
N-25			In Section 3.8.1 Grizzly Feeder and Screen, page 3-9, line 14 the Permittee states “…the resulting oversize material that does not fall between the grizzly bars will transition across the grizzly to an “oversize” pile. On line 18 of the same page the Permittee states “...the oversize materials will be visually inspected by UXO technicians. Based on findings this material may be re-fed into the grizzly.” If “oversize” material is material that was too big to initially fall between the grizzly bars it is unclear why this material would be re-fed into the grizzly. Provide clarification in the revised Work Plan.		The second sentence of the paragraph will be revised to state: “This material may be re-fed into the grizzly if it is discovered that "blanketing" of material over the grizzly occurred, thus not allowing smaller material to fall through. "Blanketing" occurs when larger rocks or debris become lodged in the grizzly bars or cover the grizzly bars to the point that it creates a blanket over an area of the bars and does not allow smaller (less than 6-inch) material to pass through. If this occurs and less than 6-inch material is found in the "oversize" pile, UXO technicians will clear the grizzly of

					lodged materials when the plant is shut down. The smaller material located in the "oversize'" pile will be picked up by a remote front-end loader and re-run over the grizzly."
N-26			In Section 3.8.3 Triple Deck Screen, page 3-10, line 28 the Permittee states "[m]aterials passing through the 5/8-inch screen will be deposited onto a conveyor beneath the screen. The conveyor will transport the material to a stockpile area where a rotating stacker…will spread the materials onto the stockpile." According to Figure 3-5 Processing Plant Schematic, Fort Wingate Army depot Activity, McKinley County, New Mexico, there is a "post screen overhead magnet" and "metallic debris collection" station on the conveyor between the 5/8-inch screen and the stockpile area. In the revised Work Plan, describe all portions of the processing plant along with the function of each constituent.		The second paragraph of the section will be deleted. The following text will be inserted at the end of Section 3.8.4: 'Material that passes through the 5/8" bottom screen of the Triple Deck Screen will be deposited onto a flat 20' long, 6' wide conveyor. The screened material will be spread into a thin layer on this conveyor and subjected to a "polishing" exposure of a post-screen overhead electromagnet. Ferrous material that is picked-up by the overhead magnet will be deposited into a metallic debris collection bin staged adjacent to the conveyor and magnet. This "polishing" exposure is a final quality step prior to being deposited onto the radial stacker for stockpiling."
N-27			In Section 3.8.6 Size Reduction, page 3-11, lines 14 – 25 the Permittee describes the final step of the materials separation process which uses a hammer mill to reduce size of materials. Provide a discussion of the potential for explosive hazards while using the hammer mill and the proposed precautionary measures.		The following text will be inserted at the end of the second paragraph of Section 3.8.6: "The potential for a high order detonation within the 2 inch thick hardened steel hammer mill is unlikely. Prior to entering the hammer mill, ferrous materials will have been removed by one of the three overhead electromagnets. Essential personnel will be protected by the requisite shielding and distance in accordance with the DDESB-approved ESS if an

					unanticipated detonation should occur."
N-28			In Section 3.8.7 Eddy Current Non-Ferrous Metal Removal the Permittee states "[t]he entire contents of the non-ferrous waste collection from the eddy-current process will be transported to the CAMU and burned in accordance with Appendix I, SOP No. 14..." In the revised Work Plan, provide the details regarding the disposition of the burn residues resulting from these activities.		The following text will be added to the end of the Section: "An MPPEH inspection will be completed on the post-burn residues as described in Section 3.11. Ash generated from the burn will containerized for disposal in accordance with its waste profile.
N-29			In Section 3.9 Stockpile Management and Characteristic Sampling, page 3-13, line 1 the Permittee states "[results] will be compared to the contaminants listed in 40 CFR 261.31-33 as being characteristically toxic to determine if the potential exists for the soil to be hazardous." This statement incorrectly references to 40 CFR 261.31-33, which presents listed wastes instead of 40 CFR 261.20-24 which refers to characteristic wastes. Correct this typographical error in the revised Work Plan.		"40 CFR 261.31-33" will be changed to "40 CFR 261.20-24"
N-30			In Section 3.9.1 Stockpile Sampling Method, page 3-13, line 17 the Permittee states "[o]ne sample will be collected from each 250 cubic yard stockpile…" and on line 22 states "[o]ne composite soil sample will be collected from five locations in each pile." Samples must be comprised of a composite of 10 subsamples; five subsamples must be collected within		The sentence will be replaced with the following text: "One composite sample will be collected from 10 subsample locations within each 250 cubic yard stockpile. Five subsample locations will be collected from the first 125 cubic yards of material deposited from the conveyor and five subsamples will be collected from the second 125 cubic yards deposited

			the first half of the stockpile deposited from the conveyor and five subsamples must be collected from the last half of the stockpile deposited from the conveyor. Samples must be collected one to two feet below the surface of the stockpile.		from the conveyor. The subsamples will be collected one to two feet below the surface of the stockpile.”
N-31			In Section 3.10 MD Flashing Process, page 3-13, line 28, the Permittee states “[a]ll MD that is generated during the separation process will be flashed in accordance with SOP No. 15.” Although line 16 of the first page of Appendix I (Field Standard Operating Procedures) lists SOP No. 15 (Flashing of MD), it is not included in the appendix. Communications with USACE (conference call with Steve Smith and Eric Kirwan of USACE and & NMED on 6/22/12) indicated that this SOP has not been written yet. The revised Work Plan must include the site specific details regarding selection of materials for flashing, the treatment unit, operation of the unit, estimated soak times, segregation of treated and untreated MD, and management and disposal of any residues associated with the MD flashing process including emissions from the flashing unit (see Comment 46).		The Permittee is currently considering available options for executing the flashing process and the SOP is dependent on the selected vendor to provide the equipment/service. After verbal discussions with the NMED via teleconference on October 2, 2012 and in response to Comment 31, Section 3.10 of the Work Plan will be revised to include more detailed descriptions of the of the flashing unit and process. SOP No. 15 will be removed from Appendix I.
N-32			In Section 3.11 [Material Potentially Presenting an Explosive Hazard] MPPEH Inspection Process, page 3-15, line 13, the Permittee states “...processing MPPEH for certification		MPPEH is not certified as MD or RRD. The sentence will be changed to state: “The SUXOS will ensure the specific procedures and responsibilities for processing

			as MD or RRD [as] specified in the WP...” A brief description of the process for certifying MPPEH as MD or RD was not found in the Work Plan. Provide the location(s) of the MD certification process(es), including the applicable portions of all cited reference documents as an appendix in the electronic copy of the revised Work Plan.		MPPEH for certification as MDAS are being followed.” Publications that describe the MPPEH procedures are DoDI 4140.62 and EM1110-1-4009, Chapter 14. These are not applicable appendices to a Military Munitions Response Program Work Plan Recommend that the publications be provided to the NMED separately for reference.
N-33			In Section 3.12 MEC Disposition, page 3-16, line 31 the Permittee states “[d]onor explosives, consisting of jet perforators or pentolite boosters, will be obtained from an explosives vendor and stored in two ECMs located on Explosive Storage Block B.” According to FWDAs latest submittal of Quarterly Inventory and Inspection Reports for Igloo Block B, dated June, 18, 2012 only one Earth Covered Magazine (ECM) is currently empty. Provide clarification on donor explosives storage logistics in the revised Work Plan.		The following text will be added to the end of the third paragraph of Section 3.13: “In order to ensure that storage space for donor explosives is available, the contents of the ECMs will be managed in accordance with the DDESB-approved ESS.”
N-34			In Section 3.13 CAMU Operation, page 3-17, line 10 the Permittee states “[a]fter construction is complete, baseline soil samples will be collected from the CAMU and analyzed for metals, explosives, perchlorate, total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), nitrate, cyanide, polychlorinated		The last sentence of the first paragraph of Section 3.13 will be revised to state the following: “…from the CAMU and analyzed for metals, explosives, perchlorate, total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), nitrate, cyanide, polychlorinated biphenyls (PCBs), dioxins, furans

			biphenyls (PCBs), dioxins, and furans." In the revised Work Plan, state samples will be analyzed for diesel range organics (DRO), oil range organics (ORO) and target analyte list (TAL) metals in accordance with IX.L of the FWDA Permit Modification (Permit) dated June 27, 2011.		diesel range organics (DRO), oil range organics (ORO), and target analyte list (TAL) metals in accordance with IX.L of the FWDA RCRA Permit Modification dated June 27, 2011."
N-35			In Section 3.13 CAMU Operation, page 3-17, line 26 the Permittee states "[w]astes generated during CAMU operations will be characterize[d] prior to disposal. Waste requiring characterization will include ash from burn activities and soils that may have been impacted during CAMU operation. A sample will be collected to develop a waste profile for each waste stream… [c]hemical analysis will include [toxicity characteristic leaching procedure] TCLP and totals analysis will be collected for barium, chromium, lead, mercury, and 2,4-dinitrotoluene." To develop adequate waste stream profiles, a larger analyte suite is necessary. In the revised Work Plan, add the following chemical analyses: TCLP semi-volatiles (full list), TAL metals, and dioxins and furans. The revised Work Plan must also list all analytical methods that will be used to develop waste profiles.		The last sentence of Section 3.13 will be revised to state the following: "Chemical analysis will include TCLP and total analysis for barium, cadmium, chromium, lead, mercury 2,4-dinitrotoluene, TCLP SVOCs, dioxins, furans, and TAL metals."
N-36			In Section 3.14.1 Instrument Verification Strip [IVS], page 3-17, line 10 the Permittee states "[t]he IVS will be composed of two linear tracks 35 meters in length. Nine industry		"The IVS will be composed of two linear tracks 35 meters in length. Six industry standard objectives (ISOs) or inert munitions simulants with known characteristic responses will

			standard objectives (ISOs) or inert munitions stimulants with known characteristic responses will be aligned and buried in the first track, no closer than 5 meters apart…” It is not possible to fit nine ISOs, no less than 5 meters apart, within a linear track of 35 meters. Correct this statement in the revised Work Plan.		be aligned and buried in the first track, no closer than 5 meters apart…”
N-37			In Section 3.15.2.1 Standard Data Processing and Target Selection, page 3-23, line 1 the Permittee states “[t]he locations of known cultural features recorded during the survey will be plotted on the same map. Anomalies that are in close proximity to those features will be masked and excluded from target selection.” From the information provided, it is unclear if an evaluation will be made to determine if these anomalies pose potential environmental or explosive threat, and if so, whether subsequent actions will be indicated (e.g., removal actions, notifying tribal representatives). Provide clarification and more detail in the revised Work Plan.		As described in the Cultural Resources Management Plan, written in consultation with the Zuni Cultural Resource Enterprise, there are not any properties listed in or eligible for the National Register located within the HWMU and a survey will not be completed as it is not possible to safely conduct further cultural resource inventory or archeological testing within the HWMU. As a result no anomalies will be excluded from target selection due to known or the discovery of cultural features. Notifications, documentation, removal, and handling of any inadvertent discoveries during the work will be completed in accordance with the Cultural Resources Management Plan. The bullet will be removed from the text.
N-38			In Section 3.16 Confirmation Soil Sampling, page 3-27, line 4 the Permittee states “[i]n accordance with 7.3 of Attachment 7 of the RCRA Permit, the Army my elect to propose an alternate land use scenario and associated cleanup goals for the site.”		Comment noted.

			NMED is not inclined to accept less stringent cleanup levels than the residential land use scenario since the site may ultimately be returned to tribal trust.		
N-39			In Section 3.16.1 Confirmation Soil Sampling Method, page 3-27, line 21 the Permittee states "[s]amples will be collected from the bottom and sidewalls of each excavation of CDC and CRP. Each CDC and CRP will have one sample from each sidewall (north, south, east, and west) and the bottom. Samples will be collected laterally every 150 feet of sidewall and from the bottom for every 150 feet by 150 feet area." Some CDCs and CRPs are smaller than 150 feet by 150 feet area (i.e., CDC8 is approximately 60 feet by 60 feet according to Figure 3-7, Anticipated Sampling Plan, Fort Wingate Depot Activity, McKinley County, New Mexico). The sidewalls of each excavation must be sampled at a frequency of one sample for every 50 feet of sidewall or at a minimum of one sample for every sidewall that is less than 50 feet long. For sidewalls where excavation depths are greater than 20 feet below ground surface (bgs), one vertical sidewall sample must be taken for each 10 feet of depth bgs. For example, a sidewall for a 21 ft deep excavation must have two samples collected for every 50 feet of sidewall, at two different		Per the follow-on phone conversation with the NMED on November 6, 2012, composite samples will be collected from every 100 feet of excavation side wall. If there are any excavations deeper than 20 feet, one composite sample will be collected for every 10 feet of depth every 100 feet of sidewall. A composite sample will be collected from the bottom of every excavation that is smaller than 100 feet by 100 feet (10,000 square feet) and one composite sample will be collected from the every 100 feet by 100 feet (10,000 square feet) of excavation bottom for excavations larger than 100 feet by 100 feet). The composite samples will be comprised of nine subsamples for areas smaller than 100 feet by 100 feet. The composite samples will be comprised of 30 subsamples for areas larger than 100 feet by 100 feet. The section will be revised to denote the sampling area and logic as well as further describe how the samples will be collected.

			depths. In addition, a composite sample comprised of nine subsamples is sufficient for confirmation sampling at the bottoms of CDC and CRP excavations in smaller excavation areas (i.e., 60 feet by 60 feet), however multi-incremental (MI) sampling is required for larger excavation bottoms using a minimum of 30 incremental samples. Modify the confirmation soil sampling method section in the revised Work Plan.		
N-40			In Section 3.16.1 Confirmation Soil Sampling Method, page 3-27, line 24 the Permittee states "[t]he remainder of the site will be divided into grids approximately 150 feet by 150 feet [22,500 square feet (half acre)] and a sample will be collected within each grid. See Figure 3-7 for composite sample layout." It is unclear from the text if the sample taken within each grid will be a composite or discreet sample, and how many subsamples will be in the composite sample. Figure 3-7 indicates there will be nine subsamples within each single grid composite sample. All samples for grids greater than 6,500 square feet must be a comprised of 30 subsamples, for grids less than 6,500 square feet, nine subsamples per grid is sufficient. Clarify the confirmation sampling information in the text of the revised Work Plan.		This section will be revised to reflect the follow on discussion with NMED on November 6, 2012. Included in the revision, a more detailed description of the sample locations and composite sample collection method and requisite number of subsamples.

N-41			From the information presented on Figure 3-7, Anticipated Sampling Plan, Fort Wingate Depot Activity, McKinley County, New Mexico it is unclear which areas will be excavated and sampled. Identify anticipated excavation limits and sampling locations for all areas must be added (e.g., extent of subsurface waste, area of shallow waste, other areas of potential subsurface debris, arroyo) as well as approximate anticipated excavation boundaries and sampling locations within CRPs and CDCs, on Figure 3-7 in the revised Work Plan.		Figure 3-7 will be revised to show the anticipated sampling locations as reflected in the responses to Comments 39 and 40.
N-42			Section 3.17 Groundwater Monitoring Well Abandonment, page 3-28, line 2, details associated with monitoring well abandonment (e.g., number of wells, well identification numbers, copies of plugging record for each well (as submitted to the New Mexico Office of the State Engineer)) must be included in the Report. The revised Work Plan must indicate whether or not the groundwater monitoring wells will be replaced, and if so, propose an approximate time frame for their replacement.		The following text will be added to the end of the first paragraph of Section 3.17: "Well plugging records will be included in an appendix to the Removal Report. Plugged monitoring wells may be replaced as part of the groundwater investigation in accordance with Section VI of the Permit beginning after closure of the HWMU under Permit Section III.A. Well replacement will occur in approximately 2019."
N-43			In Section 3.18.2 Vegetation, page 3-28, line 28 the Permittee states "[a] seed mixture, consisting of drought tolerant species native to northwest New Mexico will be placed in areas disturbed by the removal activities…Prior to revegitation, coordination with McKinley County		After consulting with the McKinley County Extension office, they indicated that buffalo grass and blue grama would be native seeds appropriate for the restoration effort. The sentence will be revised to state: "A seed mixture, consisting of drought tolerant species native to

			Extension Office will be completed to verify the most appropriate reseeding times." In the revised Work Plan, provide a list of the plant species to be planted in HWMU after removal activities.		northwest New Mexico, such as blue grama and buffalo grass, will be placed in areas disturbed by the removal activities…"
N-44			Section 3.18.2 Vegetation, page 3-29, line 1 states "[a]ny wetland area's identified during the environmental resources inventory will undergo wetland mitigation in accordance with the wetlands mitigation plan and the USACE 404 permit." The Permittee must provide documentation in the Report that all State and Federal restoration requirements were met in accordance with Section I.C (Effect of Permit), of FWDA's RCRA Permit.		Comment noted.
N-45			In Section 3.19.2 [Investigatation-derived Waste] IDW, page 3-29, line 30 the Permittee states "[d]econtamination water will be containerized in drums or tanks…A characterization sample will be collected from each container sent to [the laboratory] for chemical analysis of those constituents required by the disposal facility." In the revised Work Plan, add the following analyses, if not already required by the disposal facility, SVOCs, explosives, PCBs, dioxins, furans, and RCRA 8 metals.		The text will be revised to state the following: "A characterization sample will be collected from each container and sent to APPL for chemical analysis for those constituents required by the disposal facility as well as SVOCs, explosives, PCBs, dioxins, furans, and RCRA 8 metals."
N-46			In Section 3.19.3 Recyclable Material, page 3-30, line 7 the Permittee states "[t]he voluntary flashing process is not considered treatment and therefore no wastes requiring management are		Please see response to Comment 31. The changes incorporated into the Work Plan from Comment 31 will include that the NMED Air Quality Bureau concurs that the work

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			anticipated from the flashing process." It is unclear if the flashing process will produce emissions. Describe the flashing process in the revised Work Plan and explain why the flashing process is not considered treatment. The revised Work Plan must also state whether or not a permit from NMEDs Air Quality Bureau is necessary for the flashing unit (see Comment 31).		qualifies for an exemption 20 NMAC, Chapter 2, Part 72, Section 72.202.A(5).
N-47			In Section 3.19.4 Hazardous Waste Plan, page 3-30, line 15 the Permittee states "[t]he waste will be transported…to Clean Harbors or other facility permitted to accept and treat hazardous waste." The Permittee must keep copies of waste disposal information (e.g., waste manifests) on file at the FWDA information repository as well as include electronic copies of the waste manifests in an appendix of the Report.		The following text will be added to the end of the Section 3.19.4: "Waste disposal documentation (e.g. waste manifests) will be kept on file at the FWDA information repository as will be included as an appendix to the Removal Report."
N-48			The location of the CAMU is not depicted on Figure 3-1 Anticipated Haul and Evacuation Routes, Fort Wingate Depot Activity, McKinley County, New Mexico. Add the location of the CAMU to Figure 3-1 in the revised Work Plan.		The location of the CAMU will be identified on Figure 3-1.
N-49			In Section 4.5 Visitor Documentation NMED and USEPA are not listed as authorized visitors to the site. In the revised Work Plan edit Section 4.5 to include NMED and USEPA as authorized visitors.		The paragraph is not intended to identify all parties who might enter the HWMU, but instead to identify those who are authorized to visit the site for project or mission related functions. EM 385-1-97 defines authorized visitors as DoD, DA, USACE, or other personnel (EM CX,

					DDESB, HQ Safety, etc.) conducting project or mission related functions, such as Quality Assurance Representatives (QARs), safety and quality inspectors (including geophysicists performing quality assurance functions), and project management. The NMED and USEPA will not be conducting project or mission related functions as defined in EM 385-1-97 and are not considered authorized visitors by its definition. The Army and its contractor recognize the NMED and USEPA will need to conduct site visits and will be provided opportunities to do so during down times, for safety. Recommend no changes be made to the text.
N-50			In the revised Work Plan, add “Site Restoration” and its associated “Inspection/Surveillance Points” needs to be added to Table 4-1 Definable Features of Work and QC Actions, Fort Wingate Depot Activity, McKinley County, New Mexico as a “Definable Feature of Work”.		The Quality Control Plan presented in Section 4 of the Work Plan is specific to conducting quality control of MEC-related activities only. Recommend that no changes be made to Table 4-1.
N-51			In Section 4.13.2 Resolution, Corrective Action, and Verification, page 4-14, line 10 the Permittee States “[t]he [Nonconformance Report] NCR log will be used to track and control each non conforming condition…[and]…will be maintained		A sentence will be added to the end of the second paragraph of Section 4.13.2 that states: “Copies of the NCR log will be included as an Appendix to the Removal Report.”

			in the project files and available on-site.” In the revised Work Plan state that the NCR log will be included as an Appendix in the Report.		
N-52			In accordance with Section I.C Effect of Permit, of the FWDA RCRA Permit, Section 6 Environmental Protection of the Work Plan must be amended to include reducing adverse impacts to the environment that may occur as a result of field activities (e.g., potential ponding of water, potential flooding).		The following bullets will be added to Section 6.2: • Except for open excavations, disturbed areas will be graded to provide positive drainage and minimize the potential for ponded water. • Grading and excavation within the arroyo will be completed so as not to restrict the channel and create the potential for upstream flooding. The channel will remain clear and open.
N-53			Section 6.1.5.2 Groundwater, page 6-5, line 17 is a very basic summary of groundwater for the entire FWDA facility and refers primarily to the Administration Area at FWDA. In the revised Work Plan, include a discussion of the specific hydrogeologic conditions within the HWMU, including depth(s) to the water table, and Sonsela sandstone, which outcrops in Parcel 3.		Per our discussions with the NMED on October 2, 2012, due to the small number of wells located within the HWMU, several of which are dry, it is currently difficult to accurately detail the groundwater conditions at the HWMU. However, the information in the Final Closure Plan Phase I Work Plan will be summarized in Section 6.1.5.2.
N-54			Section 6.1.7 Cultural and Archaeological Resources, page 6-5, line 33 “[t]he Fenced Up-Horse Canyon is located on a ridge top…” This appears to be an inaccurate		The resource cites that The Fenced-Up Horse Canyon is located on a ridge top. The sentence will be changed to state: “The Fenced-Up Horse Canyon contains the highest

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			statement. Review documentation and make corrections as necessary in the revised Work Plan.		frequency of pueblo sites."
N-55			Section 6.2 Mitigation Procedures, page 6-6, line 35 states "[t]he delineation report would include a mitigation plan which will detail avoidance and minimization measures related to jurisdictional wetlands." The Permittee must include an electronic copy of the wetlands delineation report as a reference document in the Report.		Comment noted, the Wetlands Delineation Report will be included as a reference document to the Removal Report.
N-56			In Section 6.2 Mitigation Procedures, page 6-7, line 24 the Permittee states" [t]he cultural resource monitoring is detailed in Section 3.21." Cultural resource monitoring is covered in Section 3.20. Correct this typographical error in the revised Work Plan.		The sentence will be revised to state: "The cultural resource monitoring is detailed in Section 3.20."
N-57			In Section 6.2 Mitigation Procedures, page 6-7, line 33 the Permittee states "MEC items disposition is detailed in Section 3.13 [MEC Disposition]." This is incorrect, Section 3.12 covers MEC disposition. Section 3.13 covers CAMU operation. Correct this typographical error in the revised Work Plan.		The sentence will be revised to state: "MEC items disposition is detailed in Section 3.12."
N-58			In Section 6.2 Mitigation Procedures, page 6-7, line 33 the Permittee states "MD and other metallic debris disposition are detailed in Sections 3.12 [MEC disposition] and 3.20 [Cultural Resources Monitoring]." This is incorrect, Section 3.20 covers		The sentence will be revised to state: "MD and other metallic debris disposition are detailed in Sections 3.12 and 3.19.3."

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			cultural resource monitoring. It is unclear which section the Permittee meant to reference. Revise the Work Plan accordingly.		
N-59			In Section 6.2 Mitigation Procedures, page 6-8, line 15 the Permittee states "IDW generated during the FWDA field activities will be disposed of as described in Section 3." Section 3.20 covers cultural resources monitoring and Section 3.19 covers IDW. Correct this typographical error in the revised Work Plan.		The sentence will be revised to state: "IDW generated during the FWDA field activities will be disposed of as described in Section 3.19."
N-60			In Appendix I, Field Standard Operating Procedures, SOP No. 14 Open Burning, Section 14.3 Open Burning Procedures, page 14-3, first bullet the Permittee states "[i]f the burn is declared complete…the burn pad and immediate area may be wetted with generous amounts of water." Section IX.G.3 Open Burning (OB) of the Permit states "…no cool down procedures (e.g., drenching with water) shall be used, except in an emergency." Revise the open burning procedures to be in accordance with the Permit requirements.		The following changes will be made to the SOP No 14: The second bullet of Section 14.2 will be deleted. The first bullet of Section 14.3 will be deleted. The last sentence of the second paragraph of Section 14.3 will be revised to state: "The electric or nonelectric initiation system will be prepared in accordance with 60A-1-1-31. The second to last bullet in Section 14.3 will be revised to state: "• If burn is declared complete and area is declared safe by the Disposal Team Leader, operations at the CAMU may resume.".
N-61			In Appendix I, Field Standard Operating Procedures, SOP No. 14 Open Burning, Section 14.3 Open Burning Procedures, page 14-3, second bullet the Permittee states		The last bullet in Section 14.3 will be deleted and replaced with the following text: "A single burn pan will be used to conduct open burns. Successive burns shall not be

			"…successive burns can begin at burn pads 50 feet upwind from previous burns, provided that the previously used pad has been watered or 4 hours has elapsed." Section IX.G.3 Open Burning (OB) of the Permit states "[w]hen a burn treatment is required…a single burn pan shall be employed." Furthermore, Section IX.B.3 Burn Pan Design outlines the requirements for constructing the burn pans. The use of a burn pad is not allowed for OB treatment at the CAMU. Revise the Work Plan to be in accordance with the conditions specified in FWDAs RCRA Permit (see also Comment 61).		conducted in the same day."
N-62			In Appendix I, SOP No. 14, Section 14.3 Open Burn Procedures, page 14-3, line 1 the Permittee states "[i]f the burn is declared complete and area is declared safe by the Disposal Team Leader, the burn pad and immediate surrounding area may be wetted with generous amounts of water." Watering down burned material is prohibited, as stated in Section IX.G.3 Open Burning (OB) of Permit "…no cool down procedures (e.g., drenching with water) shall be used, except in an emergency." Revise Appendix I, Section 14 of the Work Plan to comply with the Permit.		Please see response to Comments 60 and 61.
N-63			The Work Plan does not provide the CAMU burn pan design. The burn pan must follow specifications outlined in Section IX.B.3 Burn Pan Design of the		The burn pan design will be included in an appendix to the Work Plan.

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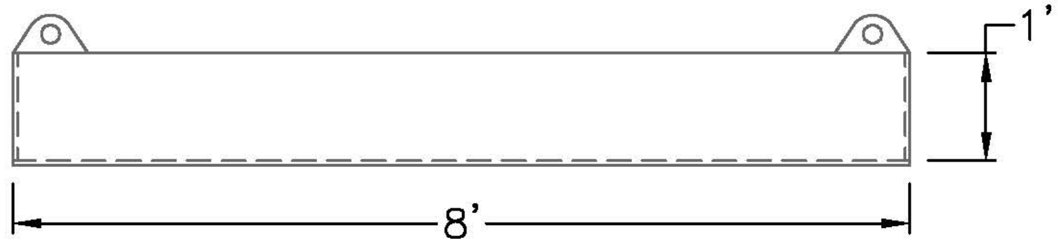
			Permit. Provide details of Burn Pan Design in the revised Work Plan.		
N-64			The Work Plan does not provide information regarding recordkeeping procedures for the CAMU. Recordkeeping, at a minimum, must comply with IX.M Recordkeeping for the Treatment Operations of the Permit. Provide details of recordkeeping procedures for the CAMU in the revised Work Plan.		The following text will be added after the fourth paragraph of Section 3.13: "Recordkeeping during operation of the CAMU will comply with Section IX.M of the FWDA RCRA Permit. A logbook will be maintained documenting the following information after each open burn or demolition shot; volume and type of munitions destroyed, method of destruction, type and volume of ignition source, estimated volume of any incidental solid waste destroyed and reason it could not be separated from the WMM, and date and time of the operation. The logbook will also include descriptions of any maintenance activities completed at the CAMU."

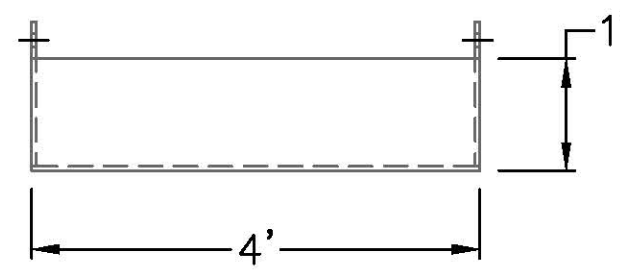
COUNTY RFP NO. xx-xx-xx

NOTE:
1) ALL STEEL TO BE $\frac{1}{2}$" PLATE, A36 MINIMUM.
2) WELDS TO BE $\frac{3}{16}$" FILLET AND BUTT WELDS WHERE APPROPRIATE.
3) REMOVE ALL BURRS AND SHAPR EDGES.

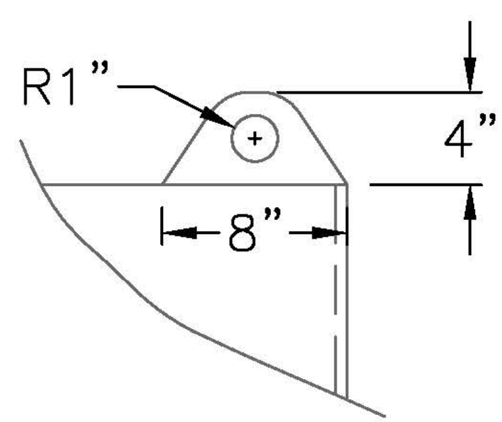


PLAN VIEW

SIDE VIEW



SIDE VIEW



LIFTING POINT DETAIL

30% REVIEW
"NOT FOR CONSTRUCTION"

URS
One Park Square
6501 Americas Parkway, NE Suite 900
Albuquerque, NM 87110-5311 USA
505 855-7500 Tel 505 855-7555 FAX

NO.	DESCRIPTION	DATE	BY
3			
2			
1			

REVISIONS

FT. WINGATE

BURN PAN DESIGN

SHEET NO.

DESIGNED BY: REB DRAWN BY: AJN CHECKED BY: LNI PLOT DATE: DRAWING PATH: P:\24342786 CR6100BRIDGE\DRAWINGS\