

**DRAFT
PROPOSED PLAN
REMOVAL ACTION
NAAD 09C CLOSED OPEN BURN AREA
CAMP NAVAJO
BELLEMONT, ARIZONA**

July 12, 2004

Prepared for:

**Camp Navajo
P.O. Box 16123
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LIST OF ACRONYMS

ADEQ	Arizona Department of Environmental Quality
ARAR	Applicable or Relevant and Appropriate Requirements
AZ ARNG	Arizona Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CG	Phosgene
CK	Cyanogen Chloride
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
ESE	Environmental Science & Engineering, Inc.
FWPDBA	Former White Phosphorus Detonation and Burn Area
H	Mustard Gas
HLA	Harding Lawson Associates
HTW	Hazardous and Toxic Waste
MEC	Munitions and Explosives of Concern
MWP	Master Work Plan
NAAD	Navajo Army Depot
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGB	National Guard Bureau
OB/OD	Open Burn/Open Detonation
ORS	Ordnance-Related Scrap
PCB	Polychlorinated Biphenyls
PCDD	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
PWP	Plasticized White Phosphorous
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
SRL	Soil Remediation Level
TAL	Target Analyte List
TNT	Trinitrotoluene
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USEPA	U.S. Environmental Protection Agency
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WP	White Phosphorous

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1.0 INTRODUCTION

The National Guard Bureau (NGB), is soliciting public comments on this Proposed Plan that identifies the Preferred Alternative for cleaning up soil containing ordnance-related chemical residues, Munitions and Explosives of Concern (MEC) and unexploded ordnance (UXO) in the Closed Open Burn Area, also referred to as Navajo Army Depot (NAAD) 09C at Camp Navajo, Bellemont, Arizona (Figure 1-1). The NGB as the lead agency for cleanup activities at Camp Navajo has issued this document for public comment to fulfill public participation requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The public comment period on this Proposed Plan will commence on July 12, 2004 and end on August 12, 2004. To further encourage public participation, NGB has also scheduled a public meeting where all concerned parties can provide their comments on the activities outline in this Proposed Plan. The public meeting will be held at 6:00 pm, Thursday, July 22, 2004 at the following location:

Arizona Game & Fish Department Office
3500 S. Lake Mary Road
Flagstaff, Arizona

Copies of this Proposed Plan will be available for review on July 12, 2004 at the following locations:

Northern Arizona University Cline Library
Special Collections
Knoll Drive, Building 28
Flagstaff, Arizona

Arizona Dept of Environmental Quality
1110 West Washington Street
Phoenix, Arizona

The Proposed Plan can also be viewed at the following web site locations:

<http://www.adeq.state.az.us/environ/waste/sps/state.html>
<http://www.azdema.state.az.us/irp/>

All of the public wishing to provide comments can send their written correspondence to:

MAJ William M. Myer, P.G.
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P.O. Box 16123
Bellemont, Arizona 86015

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This Proposed Plan also presents summaries of other cleanup alternatives evaluated for use at NAAD 09C. The NGB, in consultation with the Arizona Department of Environmental Quality (ADEQ) Federal Projects Unit acting as the lead regulatory agency, will select a final remedy for NAAD 09C after reviewing and considering all information submitted during the 30-day public comment period. NGB, in consultation with ADEQ, may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments. Please refer to the Administrative Record file for additional information.

1.1 NAAD 09C BACKGROUND

Camp Navajo, originally known as Navajo Ordnance Depot, was established in 1942. In 1971, the installation was placed under reserve status and redesignated as Navajo Depot Activity. In 1982, operational control of the mission was transferred from the Secretary of the Army to the Arizona Army National Guard (AZ ARNG). From its inception to 1982, the installation's mission was to operate as a reserve supply depot for the receipt, shipping, storage, surveillance, minor maintenance, and demilitarization of ammunition and assigned commodities.

The Open Burn/Open Detonation (OB/OD) Area at Camp Navajo (Figure 1-2) was used for demilitarization and land disposal of obsolete and unserviceable conventional ammunitions, explosives, and limited chemical warfare agents from the installation's inception in 1942 until disposal operations ceased in 1994.

Figure 1-3 shows the location of NAAD 09C as well as other NAAD areas. NAAD 09C is a 2.1 acre area located in the east portion of the OB/OD Area along the top of a small hill overlooking and adjacent to the southern edge of the Former White Phosphorus Detonation and Burn Area (FWPDBA). Although designated a burn area, NAAD 09C was utilized to discard other materials until approximately 1990. Materials noted include metal banding, drums, artillery and mine casings, and burning residue. The FWPDBA, also referred to as NAAD 03, is a gently sloping ravine or canyon area that trends from the southwest toward the northeast and is the primary surface-water drainage for much of the central OB/OD Area. During precipitation events, stormwater runoff originating from this watershed, which is estimated to encompass about 950 acres, flows through the FWPDBA canyon and into Volunteer Canyon.

A standard practice in the clearing of waste dunnage, pallets, metal banding, and other material from the OB/OD Area was to use a bulldozer to accumulate and push these materials over the side of FWPDBA. This practice has resulted in the debris pile area now referred to as NAAD 09C, which is the subject of this proposed preferred action. The debris pile is a suspected continuing source of MEC and environmental-related contamination to the canyon floor area of NAAD 03. This debris pile has been designated a landfill by ADEQ. To meet ADEQ closure requirements the landfill must be capped and lined, otherwise stabilized, or excavated. Activities specific to the assessment and restoration of NAAD 09C are documented in this Proposed Plan.

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1.2 PREVIOUS NAAD 09C INVESTIGATIONS

The previous environmental investigations that have occurred at NAAD 09C, based upon available documentation, include the following:

- Environmental investigation conducted by Environmental Science and Engineering, Inc. (ESE, 1981); investigation included soil sampling.
- Soil sampling conducted by Dugway Proving Ground (1987); collection of soil samples.
- Closure Plan Investigation conducted by HLA (1996-1997); investigation tasks included surface and subsurface soil sampling, sediment sampling, surface water sampling.

1.3 NAAD 09C CHARACTERISTICS

Because intrusive investigations have not been substantially performed at NAAD 09C, the nature of residuals cannot be clearly ascertained. However, data collected from the earthen cover above the debris and from NAAD 03 channel floor materials below NAAD 09C indicate that trace-level detections of explosive residuals, chlorinated herbicides/pesticides, polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs) are present. These constituents could have originated from NAAD 09C, or may be indicative of releases from other NAAD areas.

A geophysical survey was performed during HLA's investigation to identify the boundaries of the NAAD 09C disposal area. However, these geophysical data were limited to the surveyable surfaces of the waste disposal area and did not extend beyond the exposed debris face leading into the NAAD 03 canyon area. According to the geophysical data, buried debris extends along the southern edge of the NAAD 03 drainage channel approximately 400 feet and measures about 40 to 50 feet wide (Figure 1-4). Field reconnaissance of NAAD 09C confirms these approximate general dimensions.

During precipitation events, stormwater run-off from NAAD 09C landfill drains through FWPDBA (NAAD 03) and into Volunteer Canyon, which functions as the OB/OD's primary surface-water drainage. Due to historic activities; the upstream portion of the ravine is expected to contain surface and subsurface contamination, along with MEC/UXO, ordnance-related scrap (ORS), and debris (drums, metal banding, pallets and dunnage) from the erosion of the NAAD 09C landfill and historic burning activities. The potential for MEC/UXO within NAAD 09C poses significant health, safety and environmental hazard on its own.

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2.0 PROPOSED REMEDY SCOPE

Sources of contamination include debris and potentially MEC/UXO at the surface and in the subsurface and residual explosives, propellants, and accelerants. The primary media of concern is the soil with potential impacts to surface water and sediment. Contaminants can potentially move from source areas through surface water runoff, water infiltration/percolation, plant/animal uptake, and dust (Figure 2-1). In the case of MEC, if the MEC explodes, debris (shrapnel, etc.) can be spread to other portions of FWPDDBA.

Locations and limited delineation of known hazardous and toxic waste (HTW) and MEC/UXO within the OB/OD Area have been previously documented (HLA, 1998). Additional investigation will be conducted to further delineate releases and fill data gaps at NAAD 09C.

It is the intent of NGB that the proposed remedial action shall serve as the final remedy for NAAD 09C. The objectives of the remedial action are to prevent current and future exposure to contaminated media and MEC/UXO through a combination of transfer and treatment technologies.

2.1 PRELIMINARY IDENTIFICATION OF ARARS

The preliminary Applicable or Relevant and Appropriate Requirements (ARARs) that have been identified for NAAD 09C are presented in Table 2-1, which have been grouped as action-, location-, and chemical-specific ARARs.

Action- and location-specific ARARs for the proposed removal action are qualitative (e.g., specific action for resource protection) and meet the applicable "standard of control" and other substantive requirements necessary to address conditions specific to NAAD 09C. At the conclusion of the removal action, if it is determined that compliance with the chemical-specific ARARs cannot be attained and the threat cannot be fully addressed, the NGB may develop additional ARARs for screening and further evaluation.

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2.2 PRELIMINARY IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

Based on the site history and previous investigations results, the following compounds are considered contaminants of potential concern (COPCs) at NAAD 09C:

- Target Analyte List (TAL) metals
- Explosive Compounds
- Propellants
- VOCs
- WP
- Pesticides
- Polychlorinated dibenzodioxins/dibenzofurans (PCDD/PCDF)
- PCBs

Under the NCP, response actions are required to meet local, state, and federal standards, requirements, criteria, or limitations. These actions must comply with the cleanup criteria and performance standards provided in the ARARs. For the removal action at NAAD 09C, chemical-specific ARARs are the current ADEQ non-residential Soil Remediation Levels (SRLs) and possibly the Groundwater Protection Levels (GPLs) for COPCs that may be detected during the removal at concentrations above applicable regulatory cleanup thresholds and/or those which pose a significant concern based on toxicity.

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3.0 SUMMARY OF RISKS

Figure 3-1 is a graphic depiction of the preliminary Conceptual Site Mode (CSM) as it relates to the materials present in NAAD 09C landfill and its potential effect on human health and environment. A discussion of the CSM is provided in the following sections.

The primary media of concern at NAAD 09C landfill is the soil with potential impacts to surface water and sediment. Contaminants can potentially move from NAAD 09C source areas through surface water runoff, water infiltration/percolation, and plant/animal uptake. Migration routes and mechanisms for HTW and MEC/UXO constituents at NAAD 09C are significant and relate to the potential erosion during stormwater run-off events, and subsequent transportation downstream beyond the installation boundary.

Interaction with the chemical and MEC/UXO hazards can include both human and ecological receptors. The current and future land use scenarios will dictate the human receptors for the OB/OD Area. At present, the area is restricted to entrance only to individuals with the required MEC/UXO training and/or accompanied by individuals with that training. However, potential hazards exist to hunters, Camp Navajo and National Guard personnel, trespassers, and wildlife that happen to wander into the OB/OD Area. The future land use of the OB/OD Area is continued military use. There is no current or planned future residential use of the area, nor is there any planned future use of the OB/OD Area by the public. However, hunters have been known to trespass into this area.

3.1 HUMAN-HEALTH RISKS

Current or future human receptors potentially exposed to chemicals from NAAD 09C may include the following: Installation (Facility) Worker; Construction/UXO Worker; Site Visitor; Recreational User; and/or Offsite Resident

For the human receptor category, the only activity in the near future that is expected to occur outside of the proposed OB/OD Area closure activities, may relate to security, fire protection, and fence maintenance and repair. These activities will not result in significant interaction because the activities occur on an infrequent basis. In the future, as the principal (MEC/UXO) and secondary (chemical residues) threats are eliminated through OB/OD Area footprint reduction, portions of the area may be used for military training and/or hunting, and will be subject to any restrictions associated with access or operations.

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3.2 CHEMICAL RISKS

With respect to chemical risks, the primary sources for chemical contaminants are the same as the sources for MEC/UXO. These primary sources are a result of the historical operations within NAAD 09C and include the surface and subsurface MEC. The MEC that is scattered within and outside of NAAD 03 and NAAD 09C is due to kickout and incomplete detonation during the OD activities. Chemical contaminants are expected to be explosives and propellants and their breakdown products. In addition, accelerants used to facilitate burns are expected contaminants.

3.3 MEC/UXO RISKS

Since the ecological population is high, the potential for interaction between ecological receptors and sources is present. The activities that would most likely result in an ecological receptor interacting with MEC are all unintentional and include; walking, running, or otherwise treading on MEC, or burrowing into buried MEC.

Current or future human receptors potentially interacting with MEC from NAAD 09C may include the following: Installation (Facility) Worker; Construction/UXO Worker; Site Visitor; and/or Recreational User. However, exposure to MEC is only possible if access to NAAD 09C is available and if intrusive activities are performed. With the exception of the Construction/UXO Worker who will have authorized access to the restricted site to conduct the removal activities, all other human receptors will not have direct access to the site. Consequently, the only possible exposure route of MEC for these individuals would be the unintentional and unauthorized access to the site.

3.4 ECOLOGICAL RISKS

The ecological receptors for NAAD 09C and FWPDBA have been considered because the land within and adjacent to the OB/OD Area is known to have a significant wildlife population, some of which are designated as special status species. Potential ecological receptors present at Camp Navajo have been grouped into the categories of “terrestrial” and “aquatic” and subcategories within each as follows (HLA, 1998):

TERRESTRIAL

Plants
Invertebrates
Reptiles
Birds

AQUATIC

Plants
Invertebrates
Amphibians

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3.5 CONCLUSIONS

It is the lead agency's current judgment that the proposed remedial activities identified in this Proposed Plan are necessary to obtain the necessary characterization data and eliminate the principal threats caused by NAAD 09C. This action will protect public health and the environment from actual or threatened releases of hazardous substances into the environment.

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4.0 REMEDIAL ACTION ALTERNATIVES

The Remedial Action Objectives (RAOs) for the site are:

- Minimize potential for migration to groundwater and/or surface water.
- Reduce or eliminate the direct contact threat associated with contaminated soil.
- Restore site to pre-disturbance conditions.

To accomplish these RAOs, post-removal confirmatory samples will be collected and submitted to a laboratory for analysis to ensure concentrations of contaminants are below the non-residential SRLs and possibly the GPLs.

4.1 SUMMARY AND EVALUATION OF ALTERNATIVES

The overall strategy for identification and analysis of remedial action alternatives considered the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) preference for treatment over conventional containment or land disposal approaches. Based on the location and reported/observed nature and extent of materials in NAAD 09C, only a limited number of alternatives were determined appropriate for the remedial action. Three remedial alternatives were identified for possible implementation at NAAD 09C; Stabilization, Containment, and Excavation. Because all of these alternatives are presumptive remedies, this allowed for a more streamlined evaluation.

4.1.1 Stabilization

The process involves mixing a reagent (cement kiln dust, cement, bitumen) and solidifying the material with the soil/material/debris and is coincident with a presumptive remedy for metals-in-soil sites (United States Environmental Protection Agency [USEPA], 1999). Reagents would be selected based on soil/material/debris characteristics and contaminants present and would be evaluated following the conduct of a treatability study. The treatability study would likely indicate the production of stable, low-porosity waste that meets land disposal requirements, thus meeting the implementability and effectiveness criteria of the analysis. However, this alternative is not cost-effective due to the limited volume of material presumed present in NAAD 09C, relatively high equipment mobilization cost that would be incurred, and the associated long-term maintenance/inspection cost. The estimated order-of-magnitude per-unit operating cost for a baseline technology (basic Portland cement) would be about \$1,650 per cubic yard of waste treated.

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4.1.2 Containment

Soil would be capped in place with a Resource Conservation and Recovery Act (RCRA) hazardous waste compliance cap. Institutional controls would be put in place to prevent the use of the area for any purpose other than waste management. Isolation of waste materials/debris using containment could, in some cases, prevent mobilization of contaminants and minimize surface water infiltration. Establishing a protective cover over the waste materials/debris could also reduce/limit direct contact and containment is the presumptive remedy for low-level threat metals-in-soil waste (USEPA, 1999). Additionally, containment was the selected remedy at 23 of 41 military installation landfills although none of these 23 landfills were less than one acre in size (USEPA, 1996). The primary issues that impair the technical practicality of containment relate to NAAD 09C's location in a drainage that potentially conveys significant quantities of water to Volunteer Canyon and, the potential nature and physical/chemical composition of waste materials/debris. Because of the previous factors, design and construction of a suitable containment system, including long-term maintenance/inspection cost, is neither technically practical nor cost-effective and thus not applicable for NAAD 09C.

4.1.3 Excavation (Removal Action)

Soil and debris would be excavated and transported off-site to an appropriate permitted facility for treatment and disposal of the soil. To evaluate the practicality of excavation, the type and overall volume of materials thought to be present in NAAD 09C, proximity to the tributary drainage, and the potential for erosion of materials into the drainage during inclement weather were considered. Because the estimated capital cost for excavation is less than either stabilization or containment, long-term benefits associated with unrestricted land use and no cost for operation and maintenance, this alternative is both technically practical and effective.

4.2 PREFERRED ALTERNATIVE

The preferred alternative for remediation of NAAD 09C is excavation and removal of all hazardous materials, MEC, and other inert debris. This alternative will be separated into two phases; Site Evaluation phase and Removal Action phase. The scope of the Site Evaluation phase will be to excavate three (3) test pits in the landfill area to assess the composition of the waste materials, their associated waste characteristics, and to provide necessary preliminary information to support development of the waste profile(s) for materials planned for off-site disposal and recycle. After site evaluation data has been evaluated the removal action will be implemented and confirmatory soil samples will be collected from within the post-excavated area for analysis of the COPC.

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The preferred alternative of excavation was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction, and is cost effective and reduces risk within a reasonable time frame in comparison to other alternatives. The following also presents further justification for selection of excavation as the preferred alternative.

Overall Protection of Human Health and the Environment addresses whether or not an alternative provides adequate protection, and describes how risks are eliminated, reduced or controlled through treatment, engineering controls or institutional controls. The preferred removal action will permanently remove any potential sources of hazardous materials, which may migrate into groundwater, surface water, or airborne emissions through dust. Additionally, removal and appropriate disposal of MEC or other ordnance will prevent accidental exposure. Consequently and risks to human health and the environment would essentially be eliminated.

Compliance with Federal and State Environmental Regulations considers if a remedy meets all applicable or relevant and appropriate requirements of federal and state environmental statutes, including provisions for invoking a waiver. The preferred removal action would meet applicable regulations.

Long-Term Effectiveness and Permanence relates to the amount of risk involved and addresses the ability of an alternative to protect human health and the environment over time, after the remediation goals have been met. The preferred removal action will permanently remove any potential sources of hazardous materials, which may migrate into groundwater, surface water, or airborne emissions through dust, and will allow for permanent closure of the landfill with no need for monitoring.

Reduction of Toxicity, Mobility or Volume addresses the anticipated performance of treatment that permanently and significantly reduces toxicity, mobility or volume of waste. The preferred removal action will remove all contaminants from the soil eliminating the toxicity, mobility, and volume of waste found at the source of NAAD 09C.

Short-Term Effectiveness and Environmental Impacts addresses the impact to the community and site workers during construction/implementation of the remedy, and includes the time needed to finish work. All three remedial alternatives would subject on-site personnel working on the site to become potentially exposed. However, the preferred removal action will require less time to complete and have no impact on the community during implementation.

Implementability addresses both the technical and administrative feasibility of an alternative. This includes the availability of materials and services required for cleanup. The excavation and removal action are an easily implemented alternative, and will meet the required closure goals at the site.

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Cost compares the differences in cost, including capital, operation, and maintenance. Although a detailed cost analysis was not performed for the Stabilization and Containment alternatives, the initial capital costs for excavation and disposal of materials will be relatively high, however no long term operations and maintenance costs will be required. Consequently, the overall cost for the preferred alternative may be less than the other two alternatives.

State Acceptance addresses whether the State agrees with, opposes, or has no comment on the preferred alternative. The ADEQ has not commented regarding this remedial option, however, for landfill closures, excavation is a preferred alternative.

Community Acceptance addresses the issues and concerns that the public may have regarding each of the alternatives. Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the decision document for the site. However, since the preferred alternative will permanently remove all waste and contaminated material versus leaving the waste in place, the probability of community acceptance for the preferred alternative is high.

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5.0 COMMUNITY PARTICIPATION

NGB provides information regarding cleanup activities at Camp Navajo to the public through public meetings, the Administrative Record file for the site, and announcements published in the Arizona Daily Sun. NGB encourages the community to gain more comprehensive understanding of the site and the activities that have been conducted at the Installation.

Information for the public comment period is as follows:

Public Comment Period

July 12, 2004, through August 12, 2004

Public Meeting for Proposed Plan

Date: July 22, 2004
Time: 6:00 pm
Location: *Arizona Game & Fish Department Office*
3500 S. Lake Mary Road
Flagstaff, Arizona

Locations of the Administrative Record file

Northern Arizona University Cline Library
Special Collections
Knoll Drive, Building 28
Flagstaff, Arizona

Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona

Web Site Locations to View Proposed Plan

<http://www.adeq.state.az.us/environ/waste/sps/state.html>
<http://www.azdema.state.az.us/jrp/>

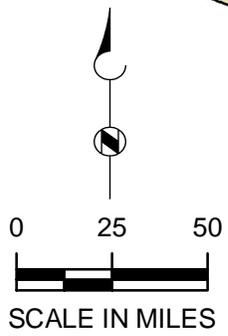
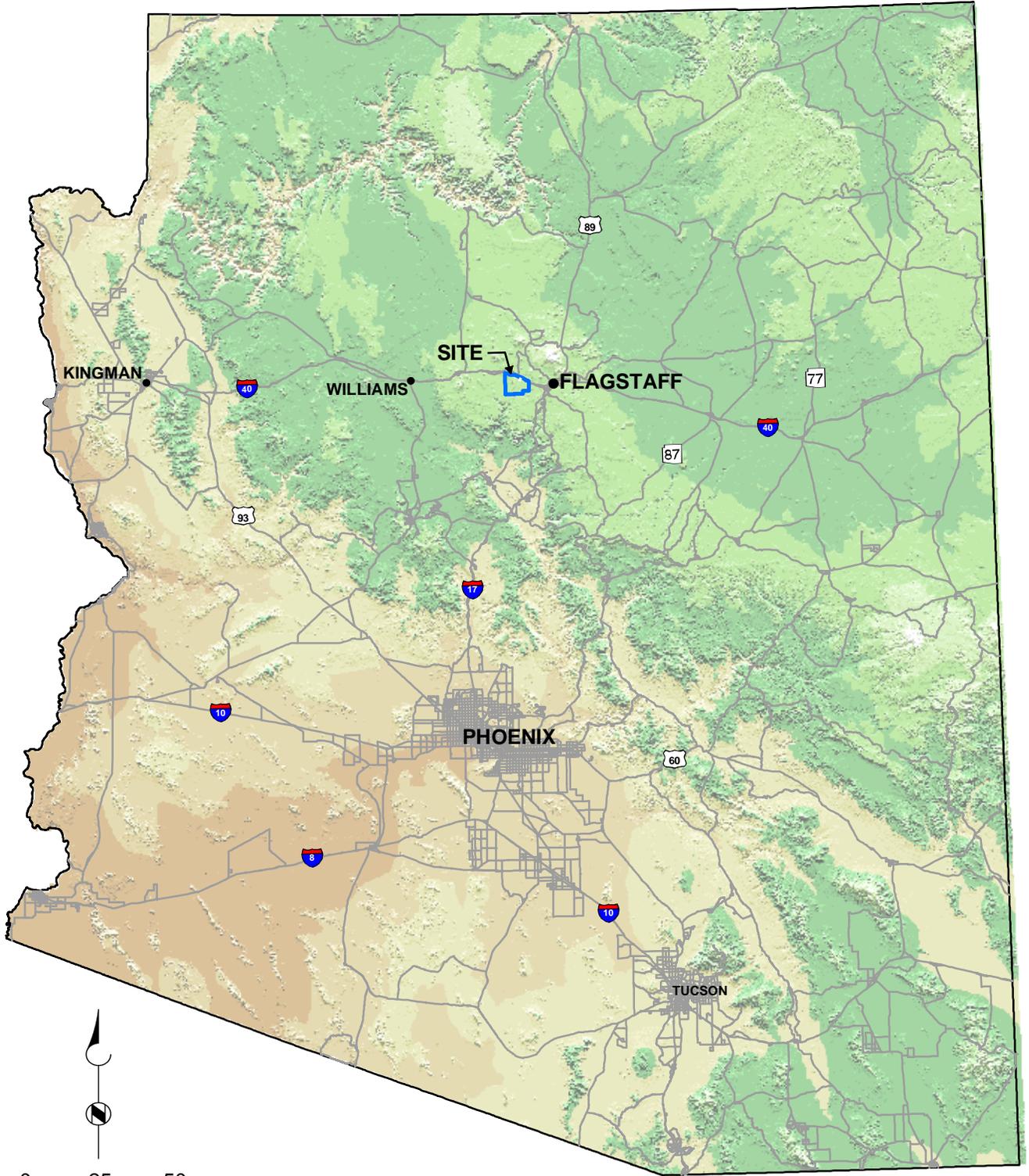
Send Written Comments to:

Name: MAJ William M. Myer, P.G
Address: Camp Navajo
P.O. Box 16123
Bellemont, Arizona 86015

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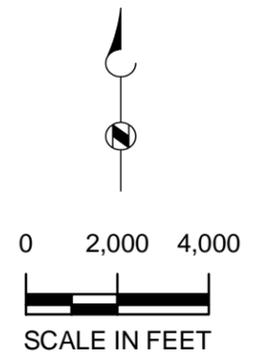
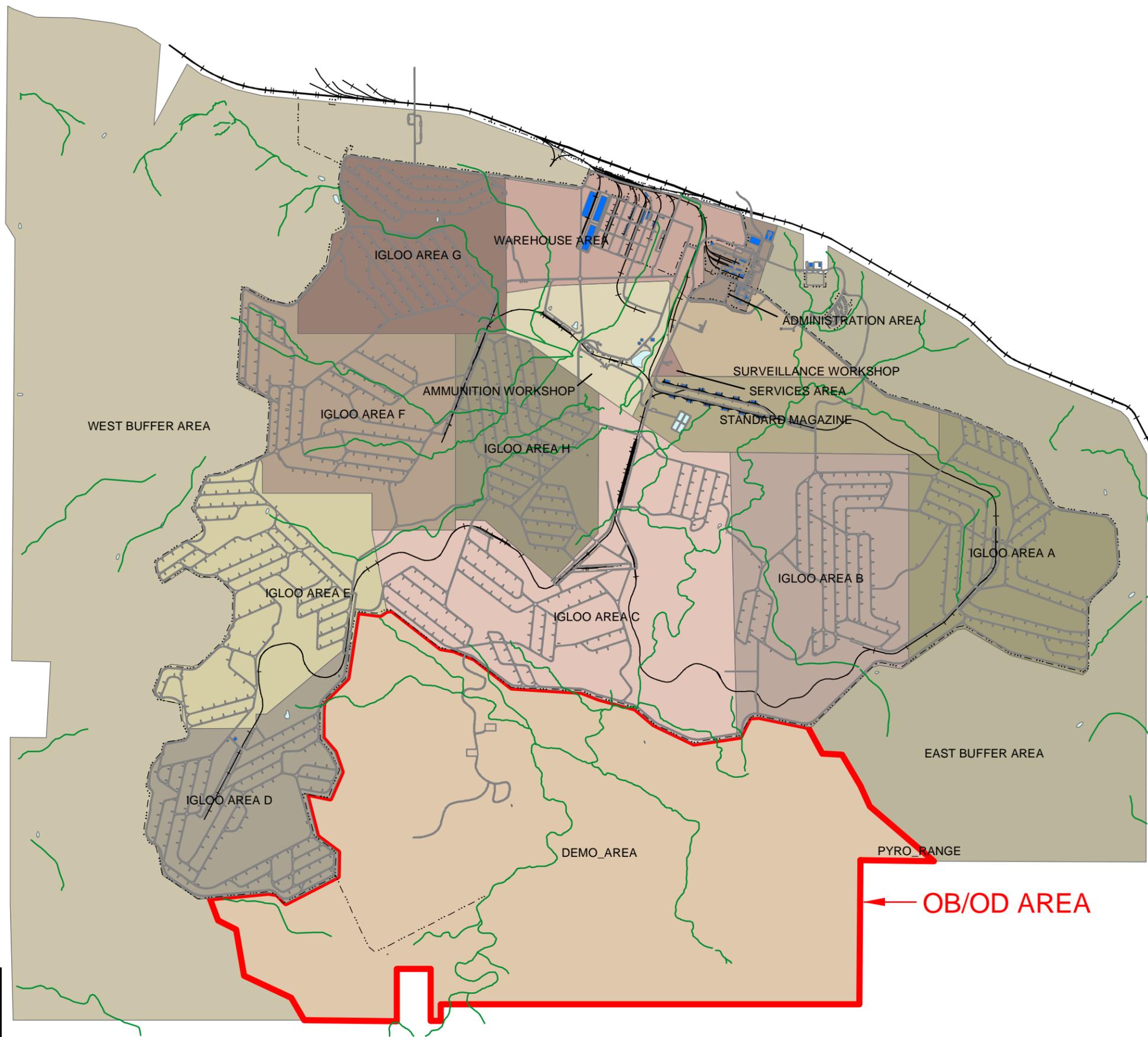
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EXPLANATION
 ■ CAMP NAVAJO BOUNDARY

Figure 1-1
 SITE LOCATION MAP
 CAMP NAVAJO
 BELLEMONT, ARIZONA

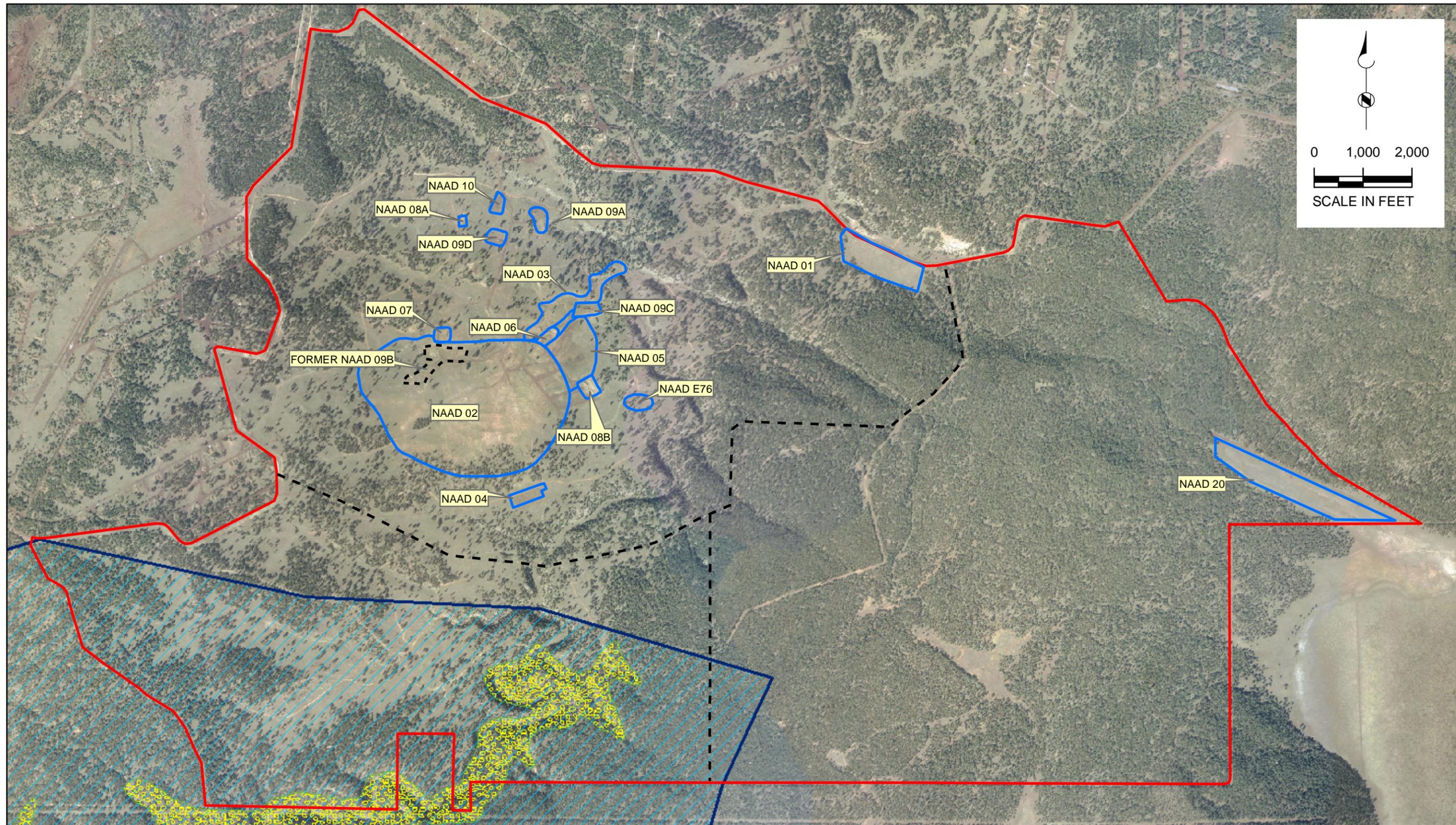


EXPLANATION

—	ROADS
—	STREAMS

Figure 1-2
 SITE PLAN OF CAMP
 NAVAJO WITH
 THE OB/OD AREA
 CAMP NAVAJO
 BELLEMONT, ARIZONA

**BROWN AND
 CALDWELL**



EXPLANATION

- | | |
|--|---|
|  OB/OD BOUNDARY |  MSO PROTECTED ACTIVITY CENTER |
|  NAAD SITE |  MSO CRITICAL HABITAT |
|  FORMER NAAD SITE | |
|  FENCE | |

Figure 1-3
 LOCATION MAP OF NAAD 09C
 AND SURROUNDING OB/OD AREA
 CAMP NAVAJO
 BELLEMONT, ARIZONA

**BROWN AND
 CALDWELL**

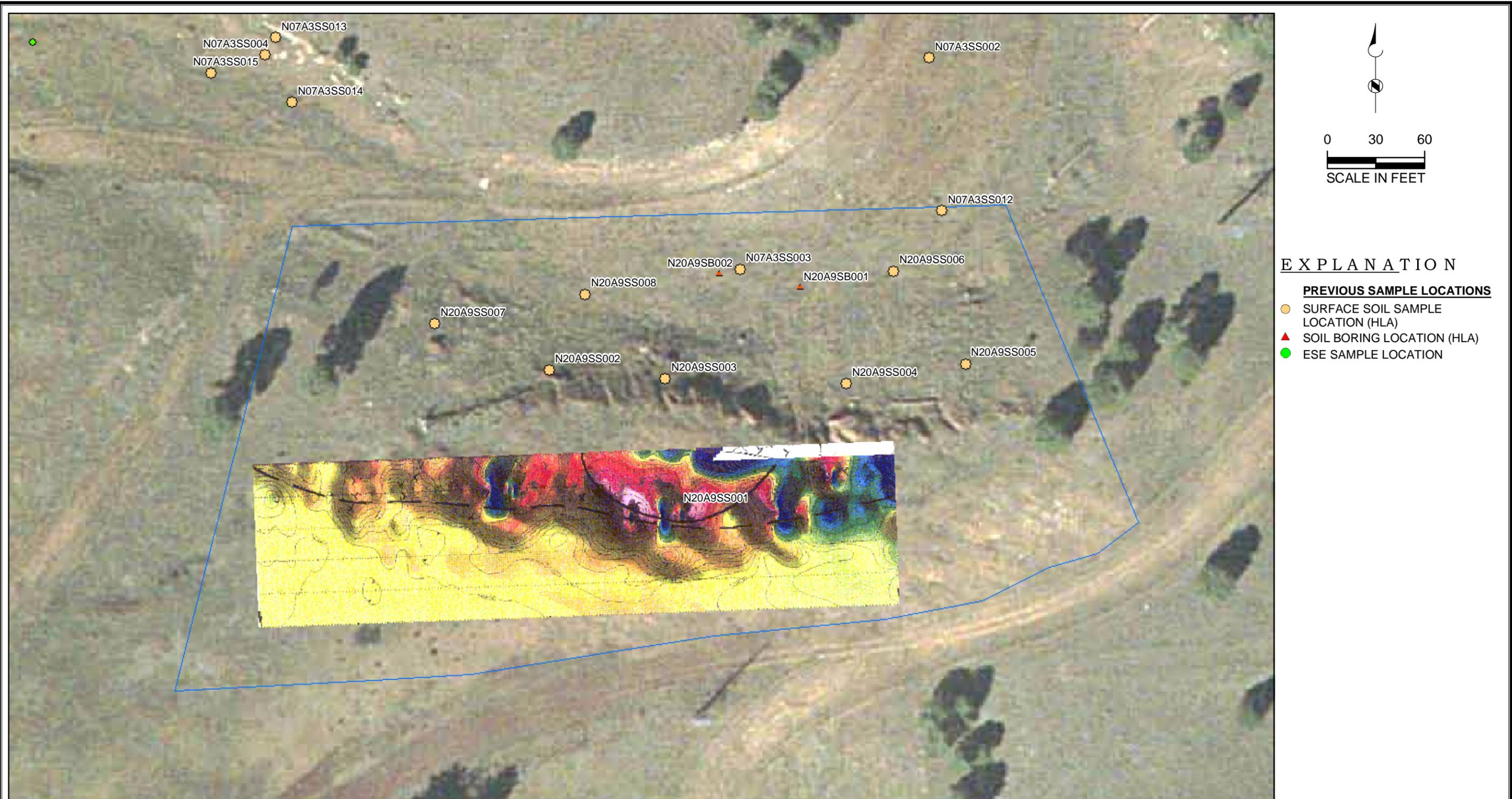


Figure 1-4
 NAAD 09C SITE PLAN WITH
 PREVIOUS SAMPLE LOCATIONS
 AND MAG CONTOUR MAP

CAMP NAVAJO
 BELLEMONT, ARIZONA

**BROWN AND
 CALDWELL**

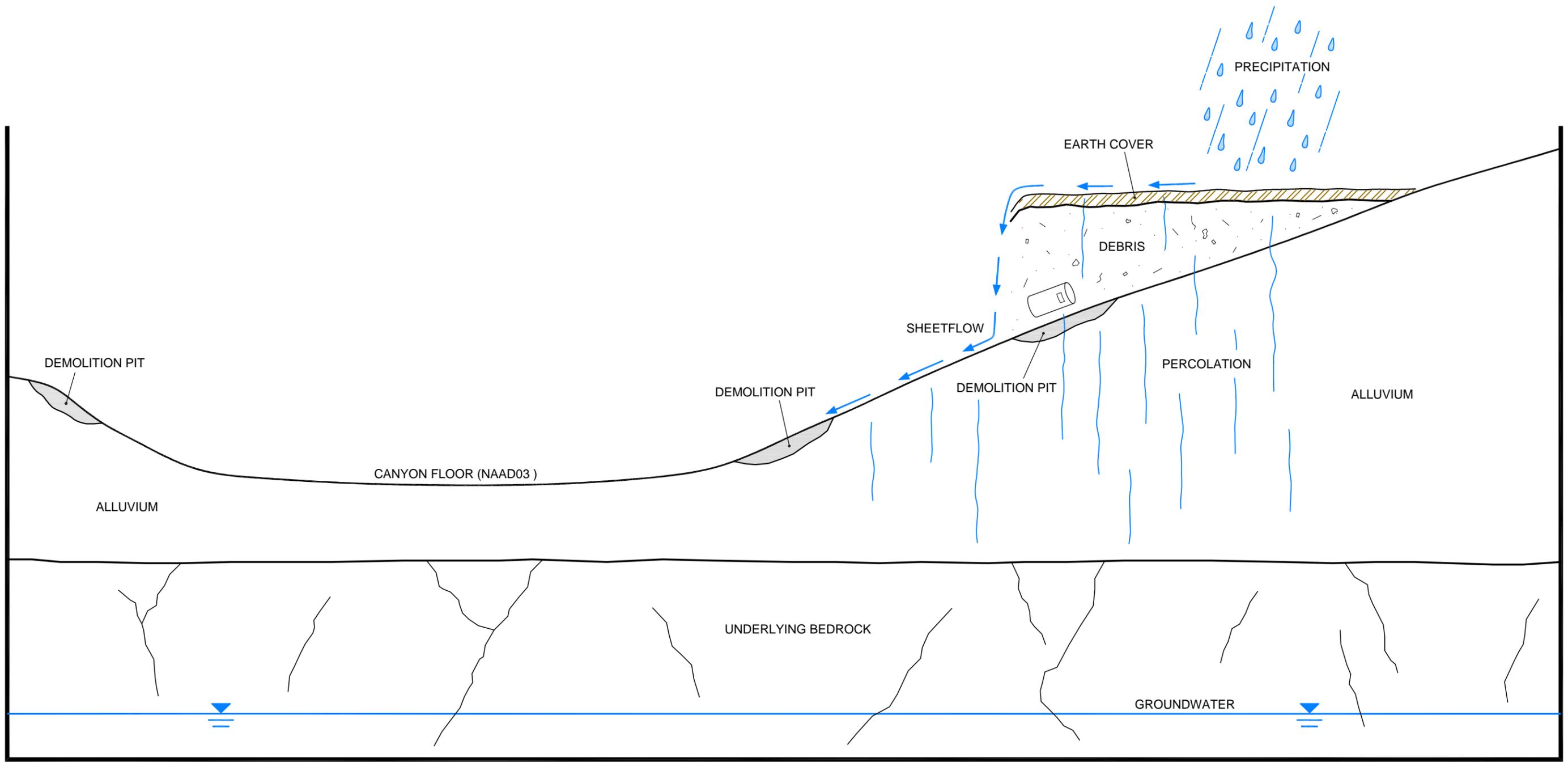


Figure 2-1
 PICTOGRAM - FWPDBA LANDFILL
 (NAAD 09C)
 AZARNG CAMP NAVAJO
 BELLMONT, ARIZONA



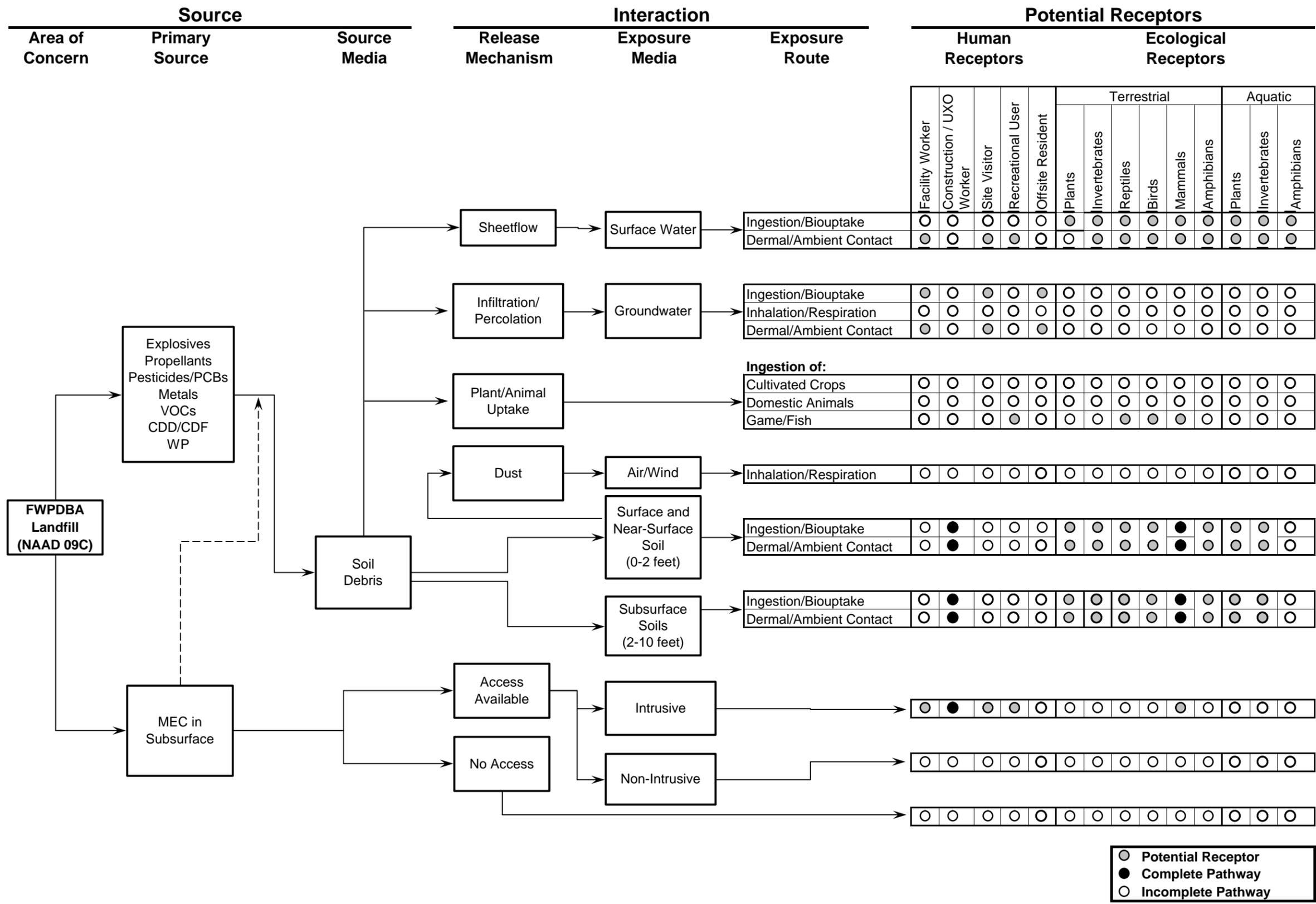


Figure 3-1. Revised Preliminary Conceptual Site Model for NAAD 09C Camp Navajo OB/OD Area

Note: CSM address exposure pathways from chemical and physical hazards associated with MEC and does not consider acute hazards in connection with unintentional detonation.

TABLE 2-1: SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) AND TO-BE-CONSIDERED (TBC) PROVISIONS SPECIFIC TO THE NAAD 09C REMOVAL ACTION

ACTIVITY	CITATION	REQUIREMENT
ACTION SPECIFIC		
Solid Waste Determination	40 CFR 260, 260.30-.31, 261.2, 261.49 A.A.C. § R18-13-13 A.A.C. § R18-13-3 A.A.C. § R18-13-16 A.R.S. § 494-9	Solid wastes are discarded material not excluded under 40 CFR 260.30 and .31. Discarded materials include abandoned, recycled, and inherently waste-like materials.
Hazardous Waste Determination	40 CFR 261 40 CFR 262.11 40 CFR 266, Subpart M A.A.C. § R18-260, 261	Waste generated during investigation and removal actions must be characterized to determine if the waste is hazardous.
Treatment, Storage, and Disposal of RCRA Hazardous Waste	40 CFR 265 A.A.C. § R18-8-2 40 CFR 265.13 40 CFR 265.171-173 40 CFR 265.190-201 40 CFR 265.16(a)(1) 40 CFR 265.52(a) 40 CFR 268.45 40 CFR 261.7	Managing hazardous waste Waste analysis requirements Container management requirements Tank management requirements Training requirements Contingency Plan Hazardous debris requirements Managing RCRA empty containers
Superfund Removal Procedures	USEPA/540/P-91/011	Guidance on consideration of state, federal and local ARARs during removal actions.
Transportation	40 CFR 262.30-34 49 CFR 100-199 USACE EM385-1-1 49 CFR 171 Subpart H A.A.C § R18-8-262	All hazardous waste will be marked, labeled, and shipped in accordance with applicable EPA and DOT requirements. All personnel shipping U.S. DOT hazardous materials will be trained.
Discharge of Stormwater	40 CFR 122-125 A.R.S. § 49-245-246 A.A.C. § R18-9-9	Stormwater permit/Management plans required for disturbances of land > 1 acre, or for discharge of contaminants in stormwater
Aquifer/Groundwater Protection Permit	A.A.C. R18-9-1	May be applicable if contaminants are impacting storm, surface or ground water
Air Quality – Release Limits	A.R.S. § 49-425 A.A.C. § R18-2-6	Permits may be required for open burning/open detonation
Endangered Species Act	16 USC Section 1531	Requires preservation of threatened and endangered species of flora and fauna
Preservation of Cultural Resources	Executive Order 11593 16 USC 469 42 USC 1996 40 CFR 6.30	Protection and preservation of identified cultural resources and notification of new finds.

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TABLE 2-1: SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) AND TO-BE-CONSIDERED (TBC) PROVISIONS SPECIFIC TO THE NAAD 09C REMOVAL ACTION

ACTIVITY	CITATION	REQUIREMENT
Health and Safety Protection	29 CFR Part 1910	Provides guidelines for workers engaged in activities requiring protective measures regulated by OSHA. Requirements apply to the handling of hazardous waste/materials at controlled hazardous waste sites. Provides guidelines for workers involved in response actions.
Health and Safety Protection	29 CFR 1926 Subpart P	Provides guidelines for workers engaged in construction activities, including using ditches and trenches.
	27 CFR/Part 55	Commerce in Explosives
	29 CFR Part 1910	Occupational Safety and Health Standards
	29 CFR Part 1926	Safety and Health Regulations for Construction
Hazardous Material Release	40 CFR Part 300	National Oil and Hazardous Substances Pollution Contingency Plan (CERCLA Process)
Munitions Management	40 CFR Parts 260-279	Hazardous Waste Management (RCRA ARARs) *Military Munitions Rule
HW Unit Closure	SWDA §3004(u), §3004(v) 40 CFR Parts 265, 270 A.A.C. § R18-8-265, 270	RCRA closure and permit requirements
Hazardous Materials Transportation	49 CFR Parts 100-199	Department of Transportation (Truck Transportation on Public Roads)
	Bureau of Alcohol, Tobacco and Firearms P 5400.7 (09/00)	Federal Explosives Law and Regulations 2000
	DERP	Management/Guidance for the Defense Environmental Restoration Program
MEC/UXO Management	DoD 4165.26-M	DoD Contractors Safety Manual for Ammunition and Explosives
	DoD 4160.21-M	Defense Reutilization and Marketing Manual
	DoD 4160.21-M-1	Defense Demilitarization Manual
MEC/UXO Management	DoD 4715.11	Environmental and Explosives Safety Management on Department of Defense Active and Inactive Ranges Within the United States
MEC/UXO Management	DoD 4715.12	Environmental and Explosives Safety Management on Department of Defense Active and Inactive Ranges Located Outside the United States
MEC/UXO Management	DoD 6055.9-STD	Ammunition and Explosives Safety Standards
	MAP	Munitions Action Plan
MEC/UXO Management	AR 50-6	Nuclear and Chemical Weapons and Material, Chemical Safety
MEC/UXO Management	AR 75-14	Inter-service Responsibilities for Explosive Ordnance Disposal
MEC/UXO Management	AR 190-11	Physical Security of Arms, ammunition, and Explosives

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TABLE 2-1: SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) AND TO-BE-CONSIDERED (TBC) PROVISIONS SPECIFIC TO THE NAAD 09C REMOVAL ACTION

ACTIVITY	CITATION	REQUIREMENT
	AR 200-1	Environmental Protection and Enhancement
	AR 200-3	Natural Resources – Land, Forest, and Wildlife Management
	AR 350-4	Integrated Training Area Management
	AR 385-10	The Army Safety Program
	AR 385-30	Safety Color Code Markings and Signs
	AR 385-61	The Army Chemical Agent Safety Program
MEC/UXO Management	AR 385-64	U.S. Army Explosive Safety Program
MEC/UXO Management	AR 740-32	Responsibilities for Technical Escort of Dangerous Materials
MEC/UXO Management	DACS-SF Ltr 30 Jun 00	Explosive Safety Policy for Real Property Containing Conventional Ordnance and Explosives
	DAP 385-61	Toxic/Chemical Agent Safety Standards
MEC/UXO Management	DAP 385-64	Ammunition and Explosives Safety Standards
MEC/UXO Management	FM 9-15	Explosive Ordnance Disposal Service and Unit Operations
Any Intrusive Activity in Contaminated Zones	TB 700-4	Decontamination of Facilities and Equipment
	TC 25-1	Training Land
	TC 25-8	Training Ranges
MEC/UXO Management	TM 5-1300	Structures to Resist the Effects of Accidental Explosions
MEC/UXO Management	IOCP 385-1	Classification and Remediation of Explosive Contamination
MEC/UXO Management	HQDA 385-01-1	Submunitions Request for Waiver
	EM 385 1-1	Safety and Health Requirements Manual
MEC/UXO Management	EM 1110-1-4009	Ordnance and Explosives Response
MEC/UXO Management	EP 75-1-2	Unexploded Ordnance Support for Hazardous, Toxic and Radioactive Waste and Construction Support Activities
MEC/UXO Management	EP 75-1-4	Recurring Reviews on Ordnance Explosives (OE) Response Actions
MEC/UXO Management	EP 385-1-95a	Basic Safety Concepts and Considerations for Ordnance Explosive Operations
MEC/UXO Management	EP 385-1-95b	Explosives Safety Submission
MEC/UXO Management	EP 1110-1-17	Establishing a Temporary Open Burn/Open Detonation Site for Conventional Ordnance and Explosives Projects

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TABLE 2-1: SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) AND TO-BE-CONSIDERED (TBC) PROVISIONS SPECIFIC TO THE NAAD 09C REMOVAL ACTION

ACTIVITY	CITATION	REQUIREMENT
MEC/UXO Management	EP 1110-1-18	Ordnance and Explosives Response
MEC/UXO Management	EP 1110-1-24	Establishing and Maintaining Institutional Controls for Ordnance and Explosives Projects
	ER 5-1-11	Program and Project Management
MEC/UXO Management	ER 385-1-92	Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Activities
	ER 415-1-10	Contractor Submittal Procedures
	ER 715-1-19	Service and Supply Contractor Performance Evaluations
	ER 1110-1-12	Quality Management
	ER 1110-1-263	Chemical Data Quality Management for Hazardous Waste Remedial Activities
	ER 1110-1-8153	Engineering and Design Ordnance Explosives Response
	ER 1110-1-8158	Corps Wide Centers of Expertise Program
MEC/UXO Management	CX/GD 97-01	Ordnance Detection, Sweep Efficiencies Guidance for Use in Ordnance and Explosives Cost Effectiveness Tool (OECERT)
MEC/UXO Management	IGD 98-04	Reportable Material at Ordnance Explosive Response Sites
MEC/UXO Management	IGD 99-02	Small Arms Determination
	IGD 01-01	OE Risk Impact Assessment for OE EE/CA Evaluations
	IGD 01-02	Implementation of Technical Project Planning
MEC/UXO Management	IGD 02-02	Exclusion Zone Requirements and Requirements for the Location of Personnel Decontamination Stations at Recovered Chemical Warfare Material (RCWN) Projects
	OE Reference Guide (Draft-Final)	Ordnance and Explosives Reference Guide for The Department of the Army Base Realignment and Closure Sites
Accident/Incident	OE-015	Accident/Incident Reports
	OE-025	Personnel/Work Standards
	OE-030	Site Specific Final Report
Waste Management	OE-040	Disposal Feasibility Report
Meetings	OE-045	Report/Minutes, Record of Meetings
Telephone Conversations	OE-055	Telephone Conversation/Correspondence Records
MEC/UXO Management	OE-060	Conventional Explosives Safety Submission (ESS)
Status Reporting	OE-080	Monthly Status Report

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ACTIVITY	CITATION	REQUIREMENT	
Status Reporting	OE-085	Weekly Status Report	
Reporting	OE-90	Ordnance Filler Report	
	OE-100	Analysis of Institutional Controls	
MEC/UXO Demolition	March 2000	Procedures for Demolition of Multiple rounds (Consolidated Shots) on Ordnance and Explosives Sites	
	August 10, 1999	Procedures for Establishment of Anomaly Review Boards	
Sampling		Site/Grid Statistical Sampling Based Methodology (SiteStats/GridStats) Documentation	
	HNC-ED-CS-S-96-8 Rev 1	Barricade Guide	
	HNC-ED-CS-S-98-1	Primary Fragment Characteristics	
	HNC-ED-CS-S-98-2	Range to No More Than One Hazardous Fragment per 600 Square Feet	
	HNC-ED-CS-S-98-7	Sandbags for Intentional Detonations	
	HNC-ED-CS-S-99-1	Open Front and Enclosed Barricades	
Sampling of UXO	July 1999	UXO Sampling Protocol	
	December 19, 2000	Interim Final Management Principles for Implementing Response Action at Closed, Transferring, and Transferred Ranges	
	September 5, 1997	Interim guidance for Biological Warfare Material (BWM) and Non-Stockpile Chemical Warfare Material Response Activities	
	January 20, 1994	Application of the Hazardous Waste Operations and Emergency Response Regulation to Ordnance and Explosives Sites	
	May 7, 1997	Coordination with the Ordnance and Explosives Center of Expertise (OE CX)	
	July 6, 1994	OE Center of Expertise Technical Advisory Group (TAG) for Archive Search Reports (ASRs)	
		Permit Equivalency Process for CERCLA On-Site Actions	
	June 2001 (Draft)	Handbook on Management of Unexploded Ordnance at Closed, Transferring, and Transferred Ranges	
	Hazardous Waste Management	Title 126	Hazardous Waste Regulations *
	CHEMICAL SPECIFIC		
Soil Remediation	A.A.C. § R18-7-201 et.seq.	Arizona established and negotiated soil cleanup standards for residential and nonresidential uses.	
Water Quality Protection	A.R.S. § 49-151 and 152 A.A.C. § R18-9 A.A.C. § R18-11 (A&Wc, Agh)	Federal and Arizona standards apply to protection of certain classes of surface and groundwater	

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ACTIVITY	CITATION	REQUIREMENT
LOCATION SPECIFIC		
Dust Control – Open Areas, Dry Washes, or Riverbeds	A.A.C. § R18-2-604(A)	No person shall cause, suffer, allow, or permit use, demolition, repair, construction, clearing/leveling, construction, or earth moving/excavation, without taking reasonable precautions to limit excessive amounts of particulate matter from becoming airborne. Dust and other types of air contaminants shall be kept to a minimum by good modern practices.
Dust Control – Open Areas, Dry Washes, or Riverbeds	A.A.C. § R18-2-604(B)	No person shall cause, suffer, or allow use by motor vehicles without taking reasonable precautions to limit excessive amounts of particulates from becoming airborne. Dust shall be kept to a minimum by using an acceptable means of control.

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