

Camp Navajo  
Stakeholder Advisory Group

Thursday, Oct. 8, 2009  
Camp Navajo Training Site  
Bellemont, AZ

**Summary**

**Members in attendance:**

Nicole Coronado, ADEQ  
Lee Luedeker, AGFD  
Karen Underhill, Community member  
Randy Wilkinson, NGB  
Matt Ryan, Community member

**Members absent:**

Tom Britt, Community member  
LTC Mary Williams Lynch  
Kurt Novy, City of Flagstaff  
Shaula Hedwall, USFWS  
Shannon Clark, Coconino National Forest  
Tina Williams, Coconino National Forest

**Interested Parties:**

Gavin Fielding, ADEMA  
Zach Reichold, ADEMA

**Guests:**

Kathleen Anthony, MKM  
Dana Downs-Heimes, CH2MHill  
John Kim, Brown & Caldwell  
Wayne Miller, ADEQ  
Jason Hurd, Intrinsic

The following acronyms may be used throughout this document

ADEMA	Arizona Department of Emergency and Military Affairs
ADEQ	Arizona Department of Environmental Quality
AGFD	Arizona Game & Fish Department
AZARNG	Arizona Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act
COPC	Contaminants of Potential Concern
DD	Decision Document
DoD	Department of Defense
EDMS	Electronic Data Management System
EE/CA	Engineering Evaluation/Cost Analysis
ERA	Ecological Risk Assessment
HHRA	Human Health Risk Assessment
IAP	Installation Action Plan
IRP	Installation Restoration Program
HERA	Human Health & Ecological Risk Assessment
LTM	Long Term Management
MAMMS	Multiple Award Military Munitions Services
MAP	Management Action Plan
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MPPEH	Munitions Potentially Presenting an Explosive Hazard
MRWA	Munitions Response Work Areas
MWP	Master Work Plan
NAAD	Navajo Army Depot
NAU	Northern Arizona University
NGB	National Guard Bureau
OB/OD	Open Burn/Open Detonation

PCP	Post Closure Plan
ppb	Parts Per Billion
QA	Quality Assurance
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RC	Response Complete
RIP	Remedy in Place
ROD	Record of Decision
SAG	Stakeholder Advisory Group
SRL	Soil Remediation Level
TPP	Technical Project Planning
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded Ordnance

### **1. Welcome, Announcements and Action Items from June 2009 SAG Meeting**

Lee Luedeker welcomed everyone to the meeting and introduced Matt Ryan as a new community member on the SAG. He also said that he has invited Janet Lynn (CN Natural Resources), Todd Graef (Coconino County) and Sarah Reif (AGFD) to make a presentation at the February 2010 meeting regarding the interface between ACUB and API efforts to secure Rogers Lake.

This meeting summary and the PowerPoint presentations made at this SAG meeting are posted on the two project websites:

- <http://www.CampNavajoEnvironmental.org>
- <http://www.azdeq.gov/environ/waste/sps/state.html>

### **2. Introductions**

LTC Mary Williams-Lynch, the new Camp Navajo commander and a new SAG member, was unable to attend the meeting. LTC Lynch is also commander of one of the guard units that conducts drills at Camp Navajo, so she has a substantial presence at Camp Navajo.

### **3. MEC Surface Removal Project and Vadose Zone Monitoring**

Randy Wilkinson, NGB, discussed the MEC surface removal project, the vadose zone monitoring program, and the MD management project. Camp Navajo is ending some contracts and beginning new ones, so there is no CH2M Hill support for this SAG meeting.

**MEC Surface Removal Project.** Surface MEC removal at MRWA 02 was finished ahead of schedule in July 2009. About 360 acres, divided into more than 500 grid cells, were cleared. For each grid cell, contractors systematically swept through 5-foot lanes doing a visual inspection and using a metal detector.

The removal went smoothly. Essentially it was the same process as used in 2007, with no QA/QC issues. The team recovered 643 MEC and one additional submunition. The After Action Report is pending a new contract.

**Q:** Were any seed items recovered?

**A:** Yes. All 245 seeds planted last year were found.

**Vadose Zone Monitoring Project.** Year one was finished as of the end of September 2009. Of the 20 shallow wells that were installed, 11 contained water during the winter and three contained water in the summer. A majority of the wells with water were in the OD pits area. Three wells in the Volunteer Canyon tributary did not have water. The Year One Report is in progress.

Hydrographs used in the presentation show the water levels for the 20 wells from January 30 – July 31, 2009. Snow melt was definitely a major factor affecting water levels. A couple of precipitation events are shown in a second hydrograph. The Monsoon season did not happen this year. Summer samples were collected at the end of July, but from then on it was too dry. Only three wells had water during the summer. During a normal summer with monsoons we would expect more wells with water. During the winter, 11 samples were taken for primary COPCs and 8-9 samples for secondary COPCs. During the summer, the wells were re-sampled for primary COPCs.

**Q:** If this proceeds over time, will you drill more monitoring wells to replace them?

**A:** Not necessarily. We'll have to watch it closely and see. We're starting to evaluate the data now.

**Q:** Are maximum volumes found around early March?

**A:** Yes, when there was a major infiltration event.

NGB, CH2M Hill and ADEQ will discuss what is planned for year two. We are considering adding telemetry to some of the wells. With the telemetry and the rain gauge on good responding wells, we hope to predict when we should mobilize to do a sampling event. We'll do another year of sampling and hope for more data in summer 2010. Using the two sampling periods works well. As part of the Year One Report, we're looking at models and action levels and how to interpret the data. We'll be set to go, pending fiscal year funding, to do sampling and instrumentation.

**MD Management Project.** We recently completed a new Multiple Award Military Munitions Services (MAMMS) contract with CH2M Hill, which should get the OB/OD Area program to the closure permit. Near-term, it includes additional funds for field work on the soil management project and a MD management project. We hope to eliminate the MEC in storage and wrap up the field work by winter of 2009

The MD Management Project is essentially a housekeeping project. All the metallic debris and scrap that we have managed in all projects since 2004 will be collected. In 2004 we did approximately this same thing resulting in 170 tons of scrap metal and MD. We expect another 100-200 tons of material.

**Q:** What is the possibility of having to call for a cultural resource individual to go out and examine the piles? In the past there were some questionable items in the piles.

**A:** Camp Navajo implemented archaeological awareness training for all workers on the site to avoid any incidents. Again, we will tell the workers that if they see anything of interest to set it aside.

**Comment:** We might want to document any historical items found, such as packaging materials and old tubes. We need to document items that might be of significance, including historic trash piles. We need to develop a protocol to deal with similar issues.

**Q:** When was the report of cultural resources produced?

**A:** 2002 or 2003

The scrap piles will be collected from all the areas, such as the grid cell corners, OD pit excavation areas, etc. All will be inspected and moved to Pad 1 and inspected again. All MD materials are sent to a smelter in California, and we receive certification that it has been smelted. If any MD retains its shape and could be mistaken for a MEC item, it will get shredded. Any incidental MEC in piles will be managed the same as the rest of the MEC. No MD will be released to the public for recycling. Any non-munitions scrap can be recycled as scrap metal. An After Action Report will be compiled.

Contracting and planning for the fieldwork has taken longer than we had hoped, but we're getting back into the field this week to start sieving soil at NAAD 09C. All of our other sites are close to closure or actually closed. NAAD 02 is the big one and still ongoing. We have two aspects that need to come together to close the OD unit. The first is the site-related chemical constituent aspect of the OD pits, where we need to finish soil management work and write the After Action Report, including a revised HERA, and follow up with a Decision Document. Second, after completing the MEC removal at MRWA 02 this summer, we will finish the EE/CA report, currently in draft, and follow it with a Decision Document.

#### **4. NAAD 02 and 09C Removal Actions**

John Kim, Brown and Caldwell, updated the group on NAADs 02 and 09C removal actions. The focus is on soil management activities completed this year for NAAD 02 and 09C, both of which are part of the MRWA 02 site. A Soil Management Work Plan was approved by ADEQ in August 2009. An Explanation of Significant Differences (ESD), which documents changes to the NAAD 09C DD, is being reviewed by ADEQ. A notice of availability of the ESD will be published in local newspapers. The After Action Report will include a revised risk assessment. Then a Decision Document will be prepared to close out the chemical site component in the CERCLA and RCRA database.

The field process will involve mechanical excavation of the soil in batches of 500 cubic yards each to remove MEC and other debris. Then composite samples will be taken from each batch of soil for analysis. Once the results are confirmed acceptable, the soil will be transferred to the OD pits. The pits will have to be dewatered first, if necessary. Each batch of soil will be tracked as to which pit it goes in. Finally, post-use samples will be collected from former staging areas and the site will be restored.

Soil management activities began in May 2009 and were temporarily halted in August 2009 due to funding issues. All soil from NAAD 02 was moved to NAAD 09C to be processed. About 70% has been processed and sampled and post-use soil samples have been collected at NAAD 02. Samples have indicated that the processed soils are acceptable, and ADEQ has approved the placement of current soil batches into the OD pits. The former NAAD 02 staging area was reseeded, and storm water controls have been removed.

**Q:** Do you cover the piles to prevent erosion?

**A:** Yes, if they have not been analyzed then they are covered. Once they have been confirmed acceptable, then there is no reason to cover them.

**Q:** When will you begin hauling to fill the pits?

**A:** Early-November 2009 (maybe late-October) through mid-January 2010.

#### **5. Installation Restoration Program Long-Term Management Program**

Kate Anthony, MKM Engineers, updated SAG members on the Installation Restoration Program Long-Term Management (LTM) Program.

This effort has been underway since fall 2005. We monitor the Ammunition Workshop Area (NAADs 11B, 14D and 14G) and two landfills at NAADs 40 and 43. The ammunition workshop area is where some areas were previously excavated and several buildings were demolished. At NAAD 40, a former sanitary landfill, we conduct groundwater monitoring and site inspections, such as erosion control and check the fencing and signage for elk damage. At NAAD 43, a former construction debris landfill, we only do site inspections.

**Q:** Was the NAAD 40 landfill origin from the Wherry housing project?

**A:** Yes, I believe it was.

**LTM status.** We are currently in year four and have one year left on the contract. The LTM ramp down was initiated in fall 2007. Additional ramp down occurred in spring and fall 2008, and further ramp down will be evaluated in fall 2009. The ramp down strategies include an evaluation of historical data to determine the frequency for monitoring each well. After six sampling events with no detections, the well can be removed from the monitoring program. For NAAD 14D, the final well was removed in fall 2008. For NAAD 14G, the final well was removed in spring 2008. We are still monitoring five wells in NAAD 40.

**Q:** Do you physically remove the wells?

**A:** No, we just remove them from the LTM program. We can still sample water at the removed wells if necessary.

Some of the wells and analytes at NAAD 11B, have been removed, and some of the remaining wells are usually dry. NAAD 40 has required erosion repair several times. This year's visual inspection looked good. Every two years a surface elevation survey is done to make sure there has been no settling. In the four years, there has been very little settling. At NAAD 43, we primarily do maintenance for erosion control and elk damage. We completed erosion repairs last spring and all looks good for this winter.

## **6. OB/OD Area Program Update**

Randy Wilkinson, NGB, provided an OB/OD Area Program Update.

Major Brian Saunders left at the end of July. He is now in New York and continues as NGB active guard. LTC Bill Myer is back at NGB headquarters in Virginia and also remains involved in this project.

**Closure Strategy.** The studies are separated into two parts: 1) chemical contamination issues, and 2) munitions and explosives issues.

Last month the Decision Documents for NAADs 03 and 13 were finalized, and the Draft DD for 4 OB Sites was approved by ADEQ. The Draft Final DD for 4 OB Sites needs to go out for public comment before it is finalized.

CERCLA investigations have been completed for MRWA 01 and 20, and the surface removal is completed at MRWA 01. The EE/CAs were finalized in June 2009, and the Decision Document is currently being reviewed by ADEQ. A proposed plan will be issued for public comment and any comments received will be responded to in the Decision Document.

**Q:** How do you distribute for public comments?

**A:** The document will be available for review at the NAU Cline Library Special Collections Area and online at [www.CampNavajoEnvironmental.org](http://www.CampNavajoEnvironmental.org). Notices will be published in the *Arizona Daily Sun* and the *Williams-Grand Canyon News*.

**Q:** Do you have to do tribal consultation?

**A:** Not for CERCLA. We conducted archaeological studies, which determined whether or not our work would impact cultural sites. There was tribal consultation for the archaeological studies.

**Q:** When will the Decision Document be available for public review?

**A:** Four OB site DD's will go out for comment near the end of the month. We'll have a public meeting if public interest warrants it.

We removed more fence line, including the inner fence, and put signs up around the NAAD 01 area because we know there is potentially dangerous material in the sub surface. We also know there are some munitions at NAAD 03 outside of the waiver area. We haven't discussed that with ADEQ yet, but we're trying to be proactive and mark this area as well.

**Q:** Are they the same signs as were originally posted?

**A:** Yes, they were reused, but they don't say what we want them to yet. Now they say "Keep Out," but we need to provide a more specific warning. We posted signs every 100 feet around NAADs 01 and 03.

**Comment:** NGB has maps prepared for hunters showing restricted areas.

**Q:** What will prevent migration of those materials down that wash?

**A:** We have not seen any migration. We have seen erosion with a big spring flood that can uncover munitions. We'll be monitoring for anything that has surfaced.

Once the Decision Documents are fully completed for a typical CERCLA site, The Stakeholder Advisory Group would be dissolved. The primary purpose of the SAG is to help in planning stages but not with all the paperwork that comes afterward. The RCRA post closure permit has two public participation milestones: 1) during the pre-application process we hold a public meeting to announce we're applying for a RCRA permit, and 2) after we submit that permit application to ADEQ, they work up a draft permit and hold a public meeting before they issue the final permit. The post closure area is essentially the ICM waiver area, about 700 acres, but we're returning about 4,300 acres for training purposes.

**Site Closure Status:** The following table summarizes the status of all sites as of October 8, 2009. Items in red are changes since the June 2009 SAG meeting.

Site	Type	Contractor	Fieldwork	RI/RSE	HHRA	ERA	DD
01	CERCLA	MKM	Complete	Final	___	Final	Final
02	RCRA	B&C	Ongoing	Final	Future	Future	Future
03	CERCLA	B&C	Complete	Final	___	Final	<b><u>Final</u></b>
04	CERCLA	MKM	Complete	Final	___	Final	Final
05	RCRA	AMEC	Complete	Final	Final	Final	<b><u>Draft Final</u></b>
06	RCRA	AMEC	Complete	Final	Final	Final	<b><u>Draft Final</u></b>
07	CERCLA	MKM	Complete	Final	Final	Final	Final
08A	CERCLA	MKM	Complete	Final	___	Final	Final
08B	RCRA	AMEC	Complete	Final	Final	Final	<b><u>Draft Final</u></b>
09A	CERCLA	MKM	Complete	Final	___	Final	Final
09C	RCRA	B&C	Ongoing	Final	___	___	<b><u>Final</u></b>
09D	RCRA	AMEC	Complete	Final	___	Final	<b><u>Draft Final</u></b>
10	CERCLA	MKM	Complete	Final	___	Final	Final
13	RCRA	B&C	Complete	Final	Final	___	<b><u>Final</u></b>
20	CERCLA	B&C	Complete	Final	Final	___	Future
E76	CERCLA	MKM	Complete	Final	___	___	Final

MRWA	Type	Investigation	Removal	RI	EE/CA	PP	DD
01	CERCLA	Complete	Complete	Final	<u>Final</u>	Draft	Draft
02	RCRA	Complete	<u>Complete</u>	Final	<u>Client Draft</u>	---	Future
20	CERCLA	Complete	---	Final	<u>Final</u>	Draft	Draft

### **Decision Documents**

Decision Documents have been completed for:

- NAAD 09C DD and ESD
- The 7 OB/OD Area CERCLA Sites
- NAAD 03
- NAAD 13

DDs undergoing ADEQ review:

- The 4 OB Sites– DD needs public comment
- MRWA 01 and 20 – PP needs public comment

DDs undergoing NGB review:

- The 5 “IRP LTM Sites”– Client Draft is being reviewed by NGB
- The 28 “IRP Buyout Sites”– Client Draft is being reviewed by NGB
- The 18 “IRP Non-Buyout Sites” – Client Draft will be sent to NGB in October

DDs will be prepared for:

- The 7 “IRP Ineligible Sites”
- NAAD 02
- MRWA 02

### **Program Schedule**

#### **Summer 2009**

- Finalized EE/CAs for MRWA 01 & MRWA 20
- Completed surface MEC removal at MRWA 02
- Removed “inner fence”
- Installed signs at MRWA 01-01 & MRWA 02-03
- Completed 80% of NAAD 02/09C soil sieving
- MAMMS contract awarded September 21

#### **Fall 2009**

- Complete on-site soil management project
- Complete MD management project
- Finalize DDs for 4 OB sites & MRWAs 01 & 20
- Prepare vadose zone monitoring annual report

#### **Winter 2009-2010**

- Prepare after action reports
  - MRWA 02 surface MEC removal action
  - On-site soil management project
  - MD management project
- Conduct final open detonation event
- Finalize MRWA 02 EE/CA

**Spring 2010**

- Finalize after action reports
- Prepare MRWA 02 DD
- Prepare RCRA post closure plan & permit application
- New contract for IRP LTM (ER,A funds)
  - NAADs 11B, 40, and 43
  - MRWA 01 & 20?

**Summer 2010**

- Finalize MRWA 02 DD
- Negotiate RCRA post closure permit
  - Vadose zone monitoring
  - Municipal well monitoring
  - Signage
  - Land use controls
  - 5-year reviews

**Fall 2010**

- CERCLA closure
- New contract for RCRA post closure care (O&M funds)
  - MRWA 02

**7. Call to the Public**

No one from the public asked questions or made comments.

**8. Next SAG meeting**

The next SAG meeting will be February 11, 2010 from 10 a.m. to 12 noon.

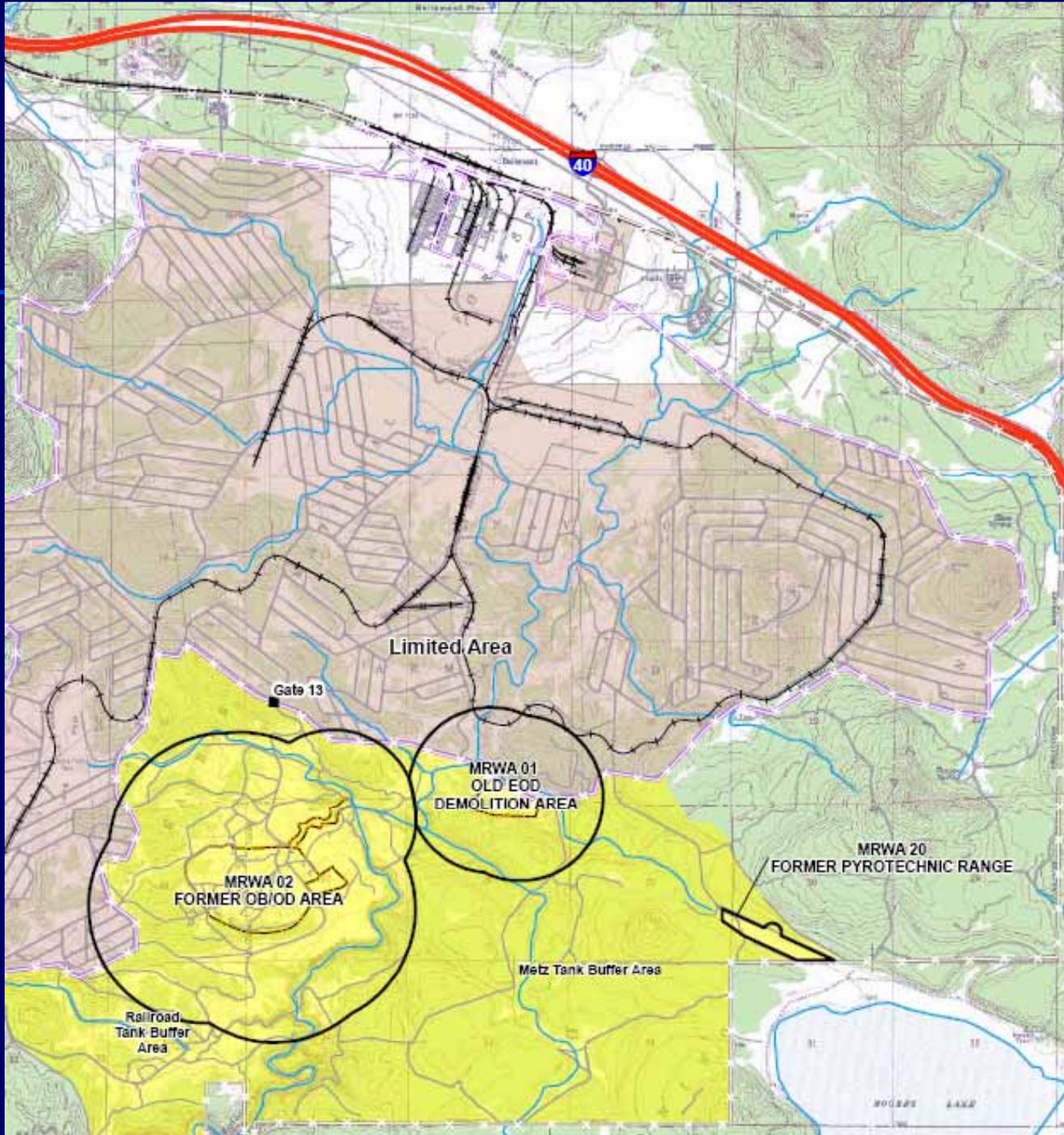
# OB/OD Area Closure Project



2009 MRWA 02  
Field Projects Update

Surface MEC Removal  
Vadose Zone Monitoring  
MD Management

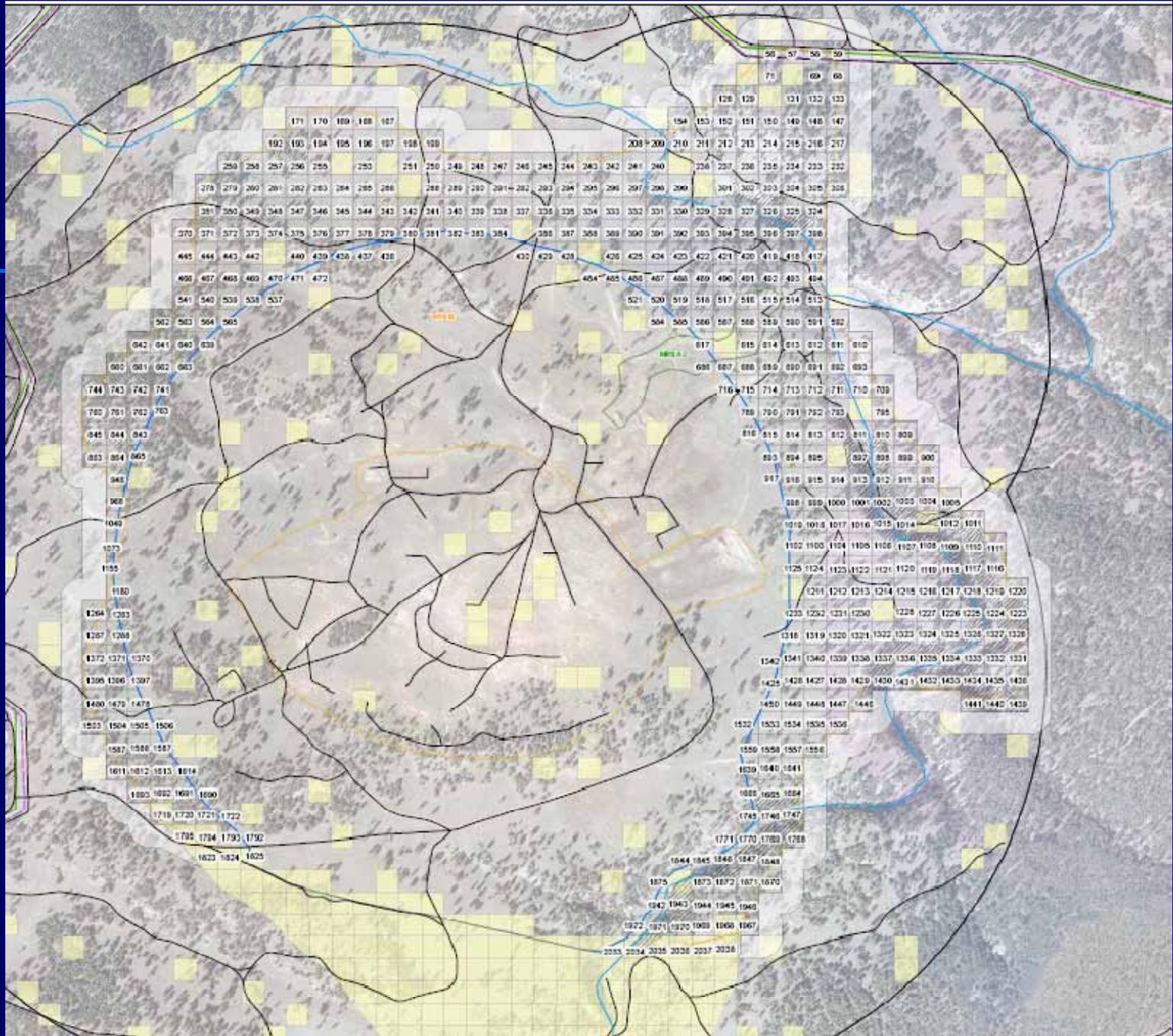




# MRWA 02

## Surface MEC Removal

- 361 acres outside DA Waiver boundary (517 full/partial grid cells)
- Completed July 9, 2009 (one month ahead of schedule)
- All sweeps passed QC and QA; 643 MEC recovered
- 1 additional submunition was recovered
- After Action Report on hold pending new contract





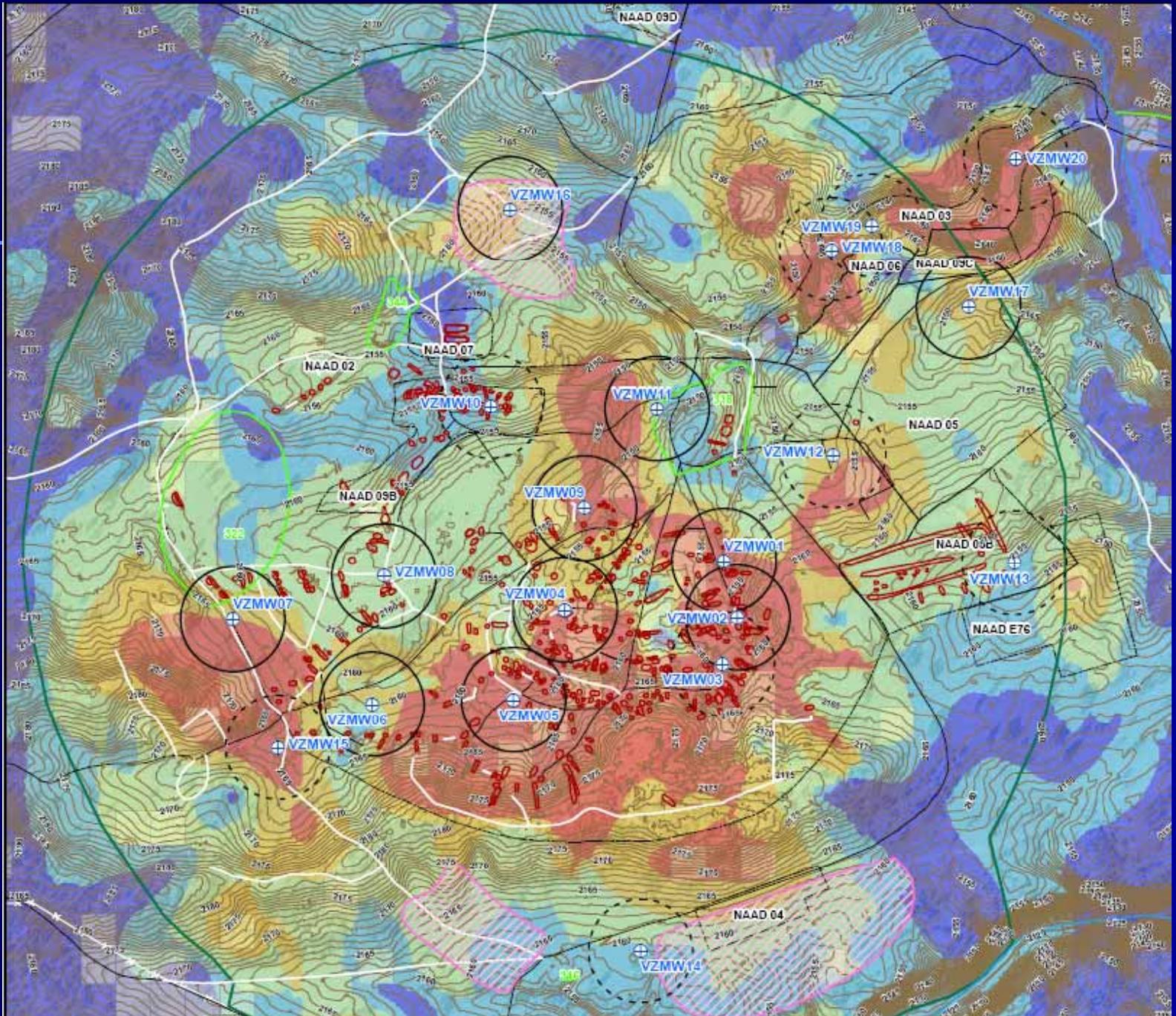
# MRWA 02

## Surface MEC Removal

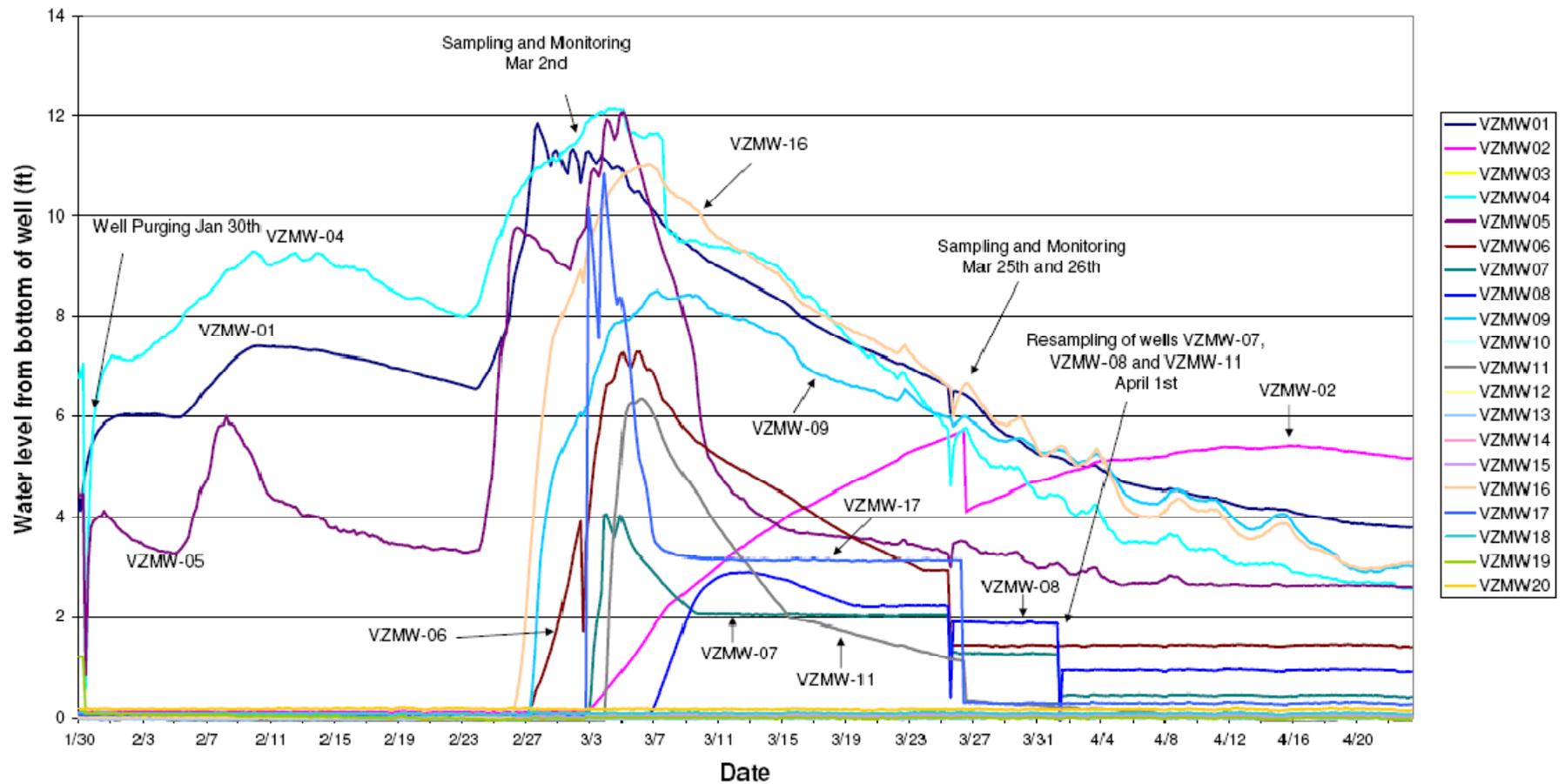


# Vadose Zone Monitoring Project Year 1

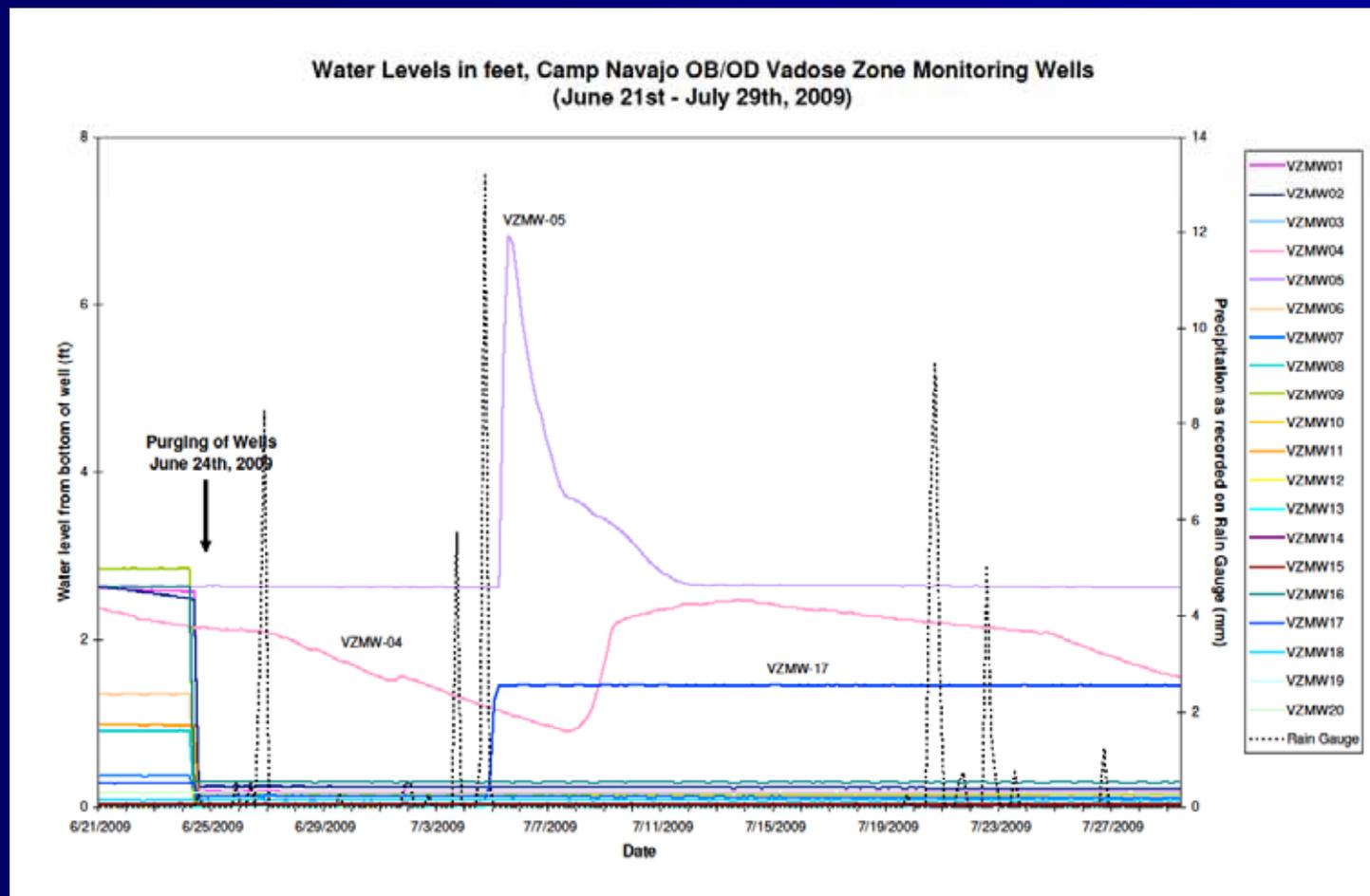
- 20 shallow wells installed and monitored to assess the potential for migration of munitions constituents in the vadose zone
- 11 wells contained water during winter period; 3 wells contained water during summer period
- Year 1 report in preparation



# Winter Hydrographs



# Summer Hydrographs



# Vadose Zone Monitoring Project Year 1

- 11 wells sampled during winter
  - 11 samples for perchlorate
  - 11 samples for explosives
  - 9 samples for nitrate
  - 8 samples for semi-volatile organic compounds
  - 8 samples for metals
- 3 wells sampled during summer
  - 3 samples for perchlorate
  - 3 samples for explosives

# Vadose Zone Monitoring Project Year 2

- Install telemetry
  - 3 wells and rain gauge
- Year 2 baseline data collection
  - Hope for a normal monsoon
- Develop model, action levels, and corrective action plan for post closure care
- Year 2 activities pending FY 10 funding

# Multiple Award Military Munitions Services (MAMMS) Contract Award

- NAAD 02/09C Soil Management Field Work
- Munitions Debris Management
- Blow in place of unsafe to move MEC
- Open detonation of consolidated MEC (4,717 items)
- NAAD 02 Decision Document
- MRWA 02 Decision Document
- Final Explosives Safety Submission
- RCRA Post Closure Plan/Permit

# MD Management Project

- Manage all MD generated during previous investigations and removal actions
  - 2005 MEC Data Gap Analysis (MRWA 01, 02, 20)
  - 2006 MEC Characterization (MRWA 01, 02, 20)
  - 2007/2009 Surface MEC Removal Actions (MRWA 01, 02)
  - All GPO, ECA, and QC seed items
  - NAAD 02/09C Removal Actions
  - NAAD 07 debris pile
  - Up to 10 additional piles
- Estimated at 100-200 tons

# MD Management Project

- Consolidate, segregate, inspect, certify, transport and smelt all MDAS (material documented as safe)
- Demilitarize all MDAS that retains its shape
- Consolidate, segregate, inspect, certify, transport and recycle all scrap metal
- Open detonation of any incidental MEC
- Prepare After Action Report

# Road to RCRA OD Unit Closure

- **NAAD 02**
  - NAAD 02/09C Soil Management Fieldwork
  - NAAD 02/09C Soil Management AAR, including Revised NAAD 02 HERA
  - NAAD 02 Decision Document
  
- **MRWA 02**
  - 2009 Surface MEC Removal AAR
  - MD Management AAR
  - MRWA 02 EE/CA Report
  - MRWA 02 Decision Document



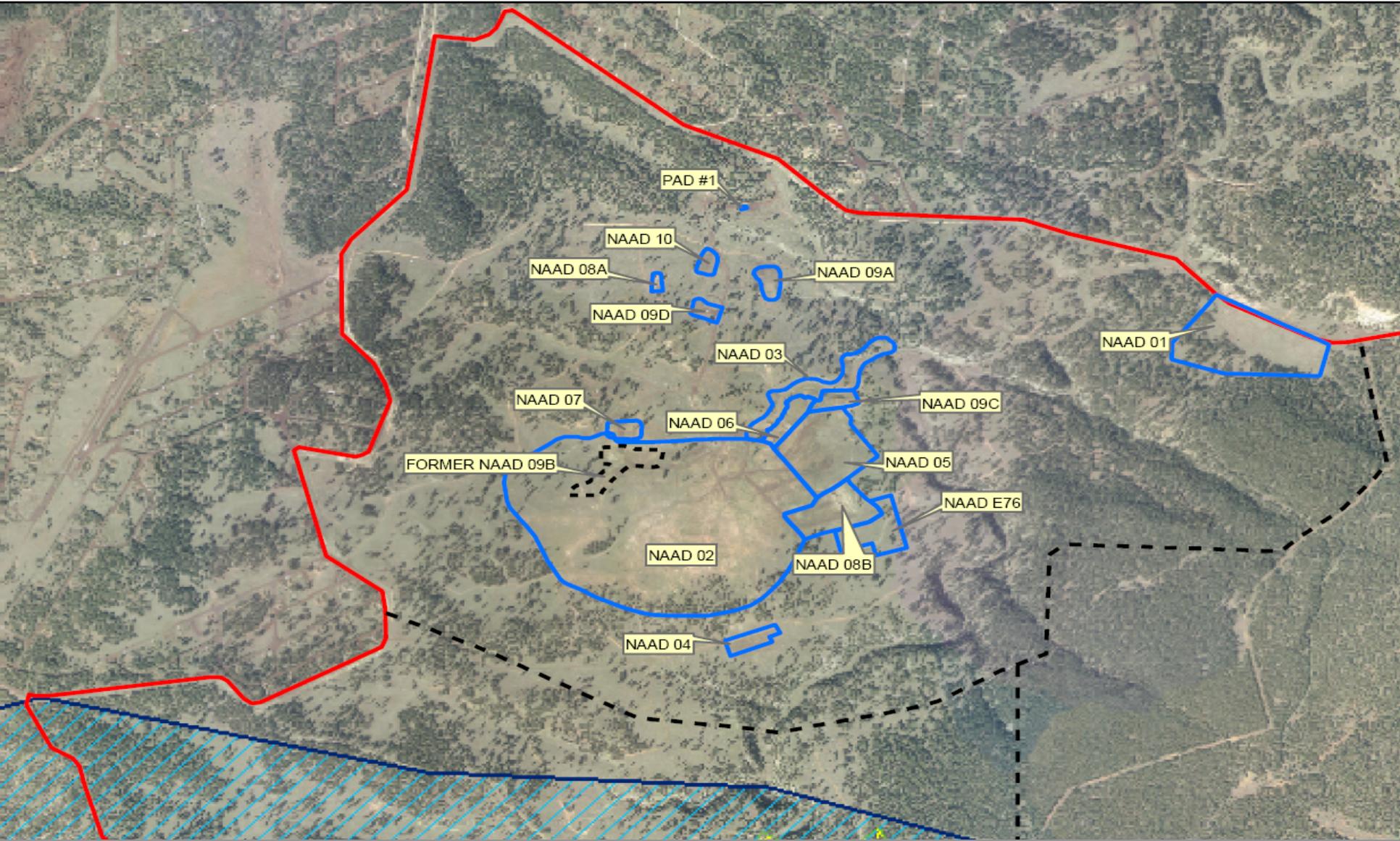
# Camp Navajo Brown & Caldwell NAAD 02 & 09C Project Status Stakeholder Advisory Group Meeting



October 08, 2009



# Locations of NAAD 02 and 09C





# NAAD 02 Project Status

- Final RI Report issued in April 2007 and was signed off by ADEQ in May 2007
- Risk assessment results indicated need to conduct an Interim Removal Action (IRA) at former NAAD 09B
- IRA field activities completed between August and December 2006 and in late March 2007
- Confirmation sampling results indicate IRA successfully mitigated contaminants driving unacceptable risks
- The IRA generating approximately 2,400 cubic yards (yd<sup>3</sup>) of soil; 700 yd<sup>3</sup> of soil was processed and sent off-site for disposal in December 2007 due to elevated lead concentrations
- Final After Action Report of the IRA results was issued and signed off by ADEQ in February 2009



# NAAD 09C RA Project Status

- RA field activities were conducted from November 2004 through November 2005
- Final RA confirmation soil sample results indicated concentrations of detected compounds were below appropriate action levels (i.e., R-SRLs and background)
- The RA generated 12,000 yd<sup>3</sup> of soil as well as MD, MEC, scrap metal and other non-routine wastes (paints and oils)
- All MD, scrap metal, and other non-routine wastes were profiled and managed off-site for disposal or recycling; MEC were detonated on-site within NAAD 02
- Approximately 400 yd<sup>3</sup> of soil was managed off-site due to elevated levels of Dioxin and Furans exceeding the NR-SRLs
- RA Completion Report was finalized and accepted by ADEQ in August 2008



# On-Site Soil Management Overview

- On-Site soil management of roughly 11,600 yd<sup>3</sup> at NAAD 09C and 1,700 yd<sup>3</sup> at NAAD 02 will consist of:
  - ✓ Soil Management Work Plan (finalized on 7-30-09 and signed off by ADEQ on 8-18-09)
  - ✓ “Explanation of Significant Differences” (ESD) that documents changes made to the NAAD 09C DD with ADEQ for signature; notice of availability of the ESD will be published in local newspapers
  - ✓ Field activities
  - ✓ Documentation in After Action Report to include revised risk assessment
  - ✓ Preparation of NAAD 02 DD to close out chemical site component in CERCLA and RCRA database

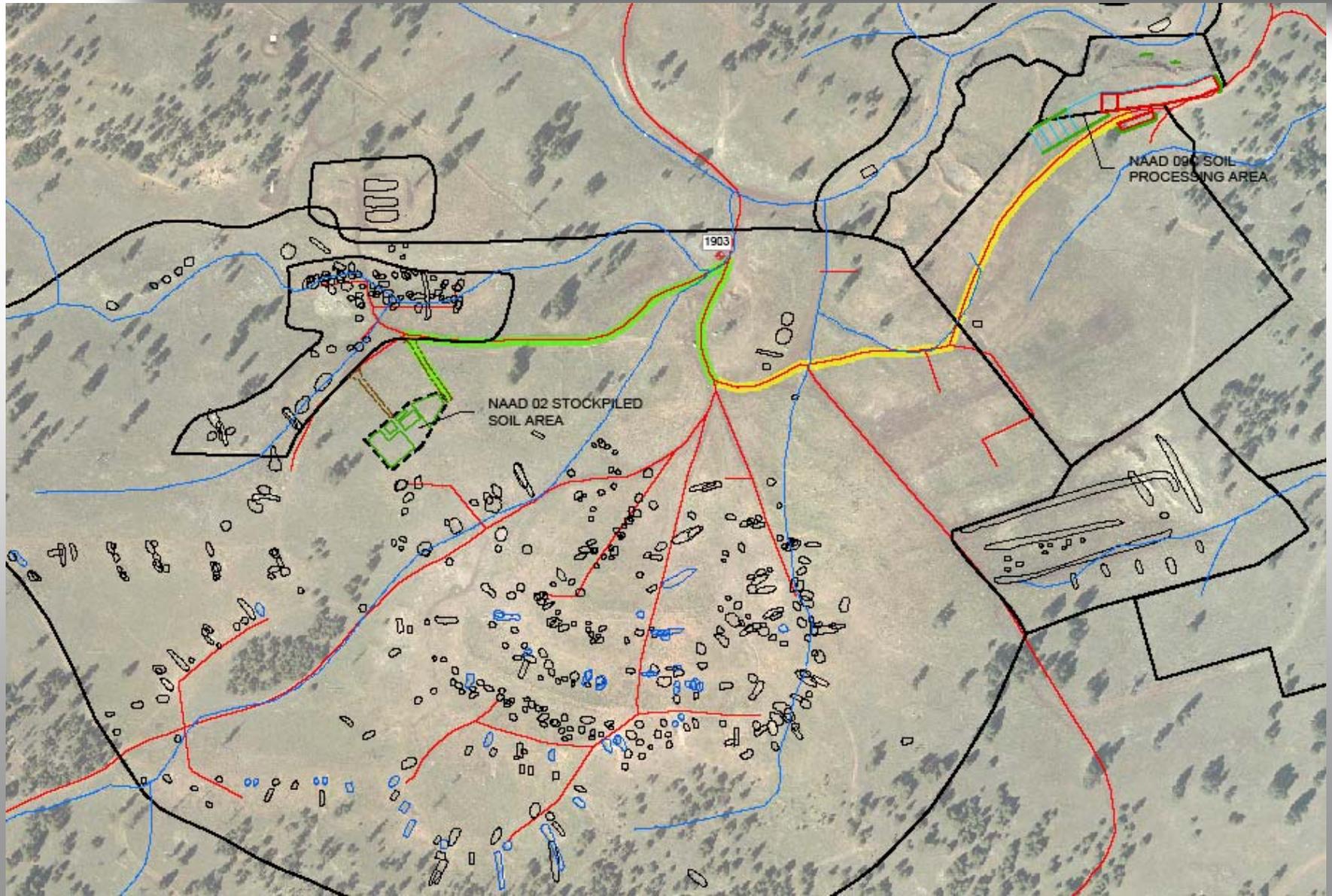


# On-Site Soil Management Field Process

- Mechanical excavation and mechanical screening of soils in 500 cubic yard batches
- Collection of composite soil samples from each batch of soil for laboratory analyses
- Confirm analytical results are acceptable for placement in pits
- Transfer of batch-specific processed soil to designated OD-pit
- Dewatering of pits that contain water and placement of soils into the pits
- Field documentation consisting of: Pit ID; Backfill start and completion date; GPS survey information; and total volume of soil placed in pit with corresponding soil batch numbers
- Waste management activities, including management of MEC
- Post activity sampling and analysis and site restoration



# Access to Pits at NAAD 02





# Former Stockpiled Soils at NAAD 02





# Former View Stockpiled Soils at NAAD 09C





# On-Site Soil Management Status

- Soil management activities began 5-11-09 and were temporarily suspended on 8-14-09 due to funding issues
- Soil processing status as of 8-14-09
  - ✓ All soil at NAAD 02 was moved to NAAD 09C and processed (screened)
  - ✓ Approximately 70% of soil at NAAD 09C has been processed
  - ✓ All processed soils are being staged at NAAD 09C in 500 yd<sup>3</sup> batches, with composite samples collected and analyzed for appropriate parameters
  - ✓ Post-use soil samples were collected within the former stockpiled soil staging area at NAAD 02 and analyzed for appropriate parameters.



# On-Site Soil Management Status (Continued)

- Analytical results of samples collected from each soil batch indicated that all processed soils could be placed in the OD pits
- ADEQ has approved placement of current soil batches in OD pits
- Analytical results of soil samples collected from former stockpiled soil staging area at NAAD 02 indicated that all detected compounds were less than R-SRLs
- These former staging areas were reseeded and storm water controls were removed



# On-Site Soil Management Photo





# On-Site Soil Management Photo





# On-Site Soil Management Photo





# On-Site Soil Management Photo





# On-Site Soil Management Photo





# On-Site Soil Management Photo





# On-Site Soil Management Photo





# On-Site Soil Management Photo





# Stockpiled Soils at NAAD 09C Current View



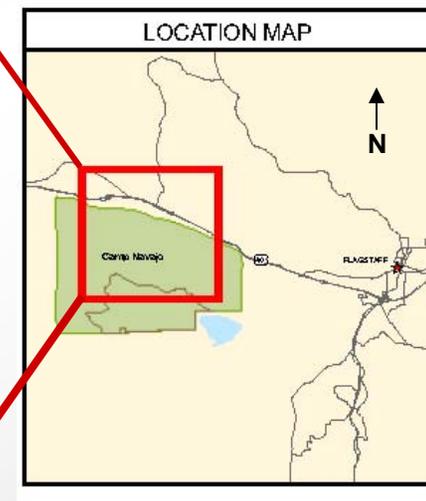
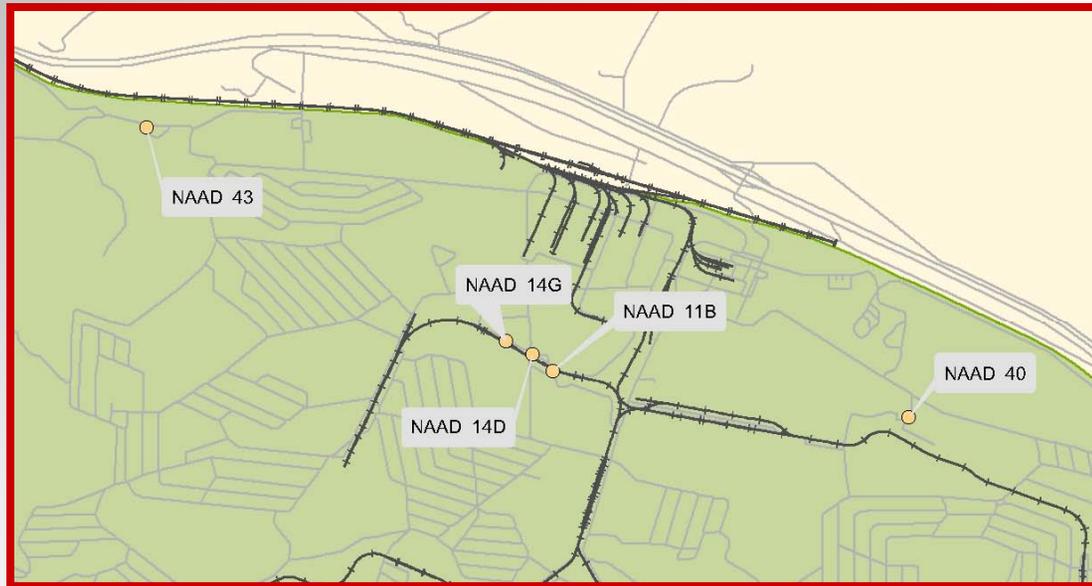


# Soil Management Activities to be Completed

- Soil management field activities scheduled to restart 10-12-09 and should end early December 09.
- Approximately 2000 to 2500 yd<sup>3</sup> unscreened soil remains at NAAD 09C that will be processed, sampled and analyzed for appropriate compounds
- Hauling and placement of processed soils in OD Pits at NAAD 02
- Waste management activities for MD, scrap metal and MEC
  - ✓ Examination and segregation of MD and scrap metal
  - ✓ Off-site disposal or recycling of segregated MD and scrap metal
  - ✓ On-site detonation of MEC (118 items found to date)
- Collection of soil samples from former stockpiled soil and staging areas at NAAD 09C for analyses of applicable parameters
- Site restoration and removal of storm water controls



*Long-Term Management for  
NAAD Sites 11B, 14D, 14G, 40, and 43  
Camp Navajo, Arizona*



- **MKM Engineers, Inc. (MKM) is managing long-term monitoring (LTM) activities at Camp Navajo, Coconino County, Arizona on behalf of the National Guard Bureau (NGB) and the Arizona Army National Guard (AZ ARNG).**
- **LTM activities are being conducted with regulatory oversight by the Arizona Department of Environmental Quality (ADEQ).**
- **MKM was tasked with continuing LTM operations at NAAD Sites 11B, 14D, 14G, 40, and 43, and developing and implementing an exit or ramp-down strategy for LTM efforts at these sites.**

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*Long-Term Management for  
NAAD Sites 11B, 14D, 14G, 40, and 43  
Camp Navajo, Arizona*



**Ammunition Workshop Area  
NAADs 11B, 14D and 14G**



**Former Sanitary Landfill  
NAAD 40**



**Former Construction Debris Landfill  
NAAD 43**

- **Several former Ammunition Workshop Area sites (NAADs 11B, 14D, and 14G) have an existing RIP and require LTM. In the Ammunition Workshop Area several buildings were demolished and some soil was excavated and disposed of as part of a previously performed demolition and removal action. LTM operations include groundwater monitoring.**
- **Two landfills sites, NAAD 40 (former sanitary landfill) and NAAD 43 (former construction debris landfill #5), are being considered for No Further Action by ADEQ. LTM operations at NAAD 40 include groundwater monitoring and site inspection. LTM operations at NAAD 43 include only site inspection.**



# *Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona*



## **NAAD 11B – Site Background**



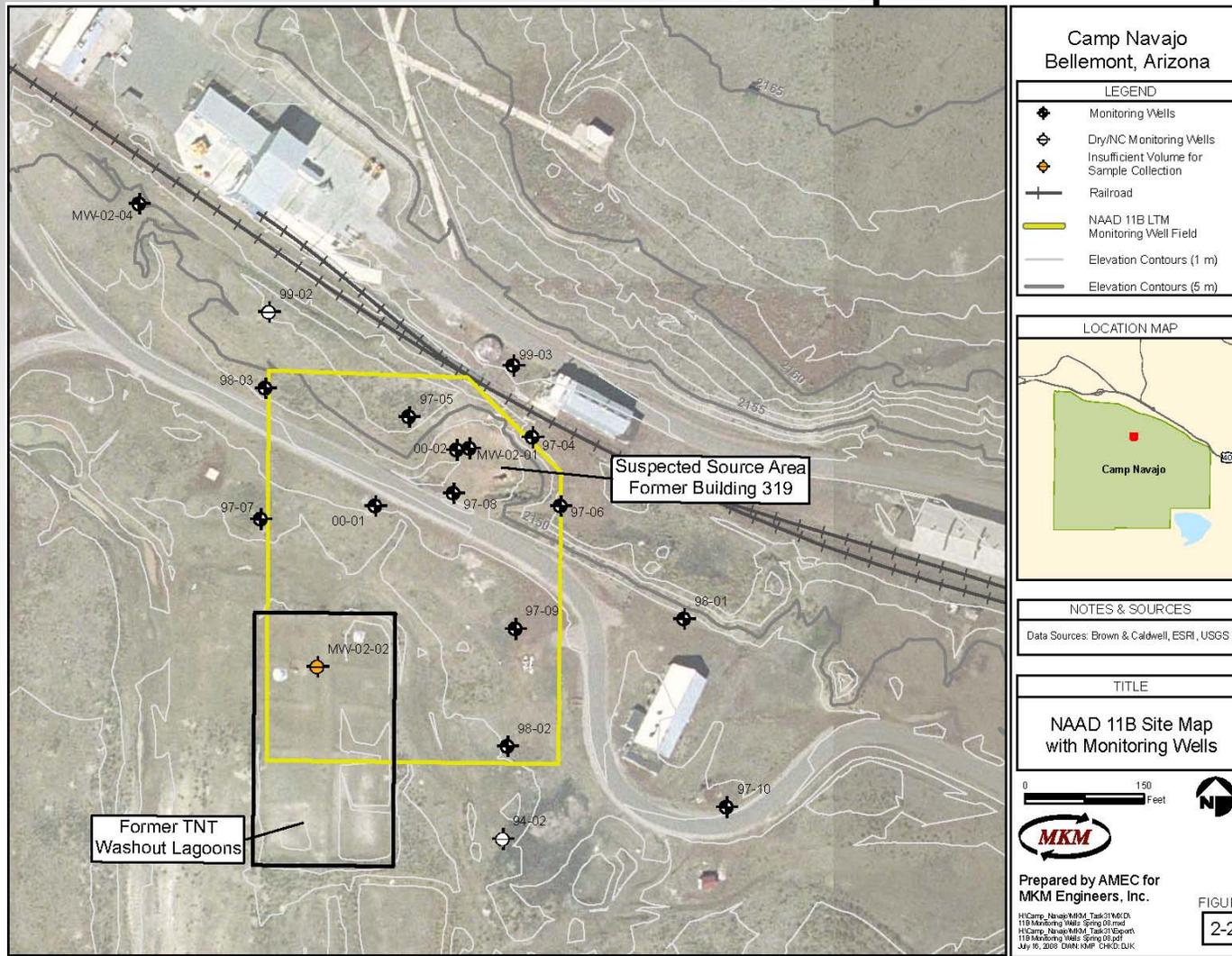
- **Building 318/319 housed the former TNT washout and recovery operations. Washout operations were discontinued at Building 318 in 1972 when TNT cleaning equipment was removed from the Site.**
- **Release mechanisms included spills inside and around Building 319 and drainage from Building 319 to lagoons along an unlined trench.**
- **Potential COCs – Explosives, Metals, Perchlorate (recommended by ADEQ).**
- **Remedial actions for closure evaluation involved the demolition of Building 319 and the excavation and removal of explosives contaminated soil in the northeast corner and at Well 98-04 in the former Impoundment #1.**
- **Groundwater depth ranges from 10 to 20 feet in sand units within the Camp Navajo Clay.**



# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## NAAD 11B – Site Map



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## *Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona*



### **NAAD 14D – Site Background**



- **Building 322 was a 4,840 square foot facility used for degreasing, cleaning, and spray painting ammunition in the Ammunition Workshop Area.**
- **Release mechanisms included spills, washout from daily operations, and discharge piping.**
- **Approximately 20 percent of the northern end of the building was removed in 1998 to accommodate road construction and widening of the access area into Building 375.**
- **The decontamination and demolition of Building 322 was completed in June 2004 and the remedial action for soil beneath the former building slab was completed in July 2004.**
- **Analytical results of confirmation soil samples collected by Brown and Caldwell and ADEQ after excavation activities in 2004 were below laboratory reporting limits.**
- **Potential COCs include Explosives, Metals, Hexavalent Chromium, VOCs, SVOCs, Diesel Range Organics, PCBs, Nitrate/Nitrite, and Perchlorate.**
- **Groundwater depth is approximately 24 feet below the ground surface.**

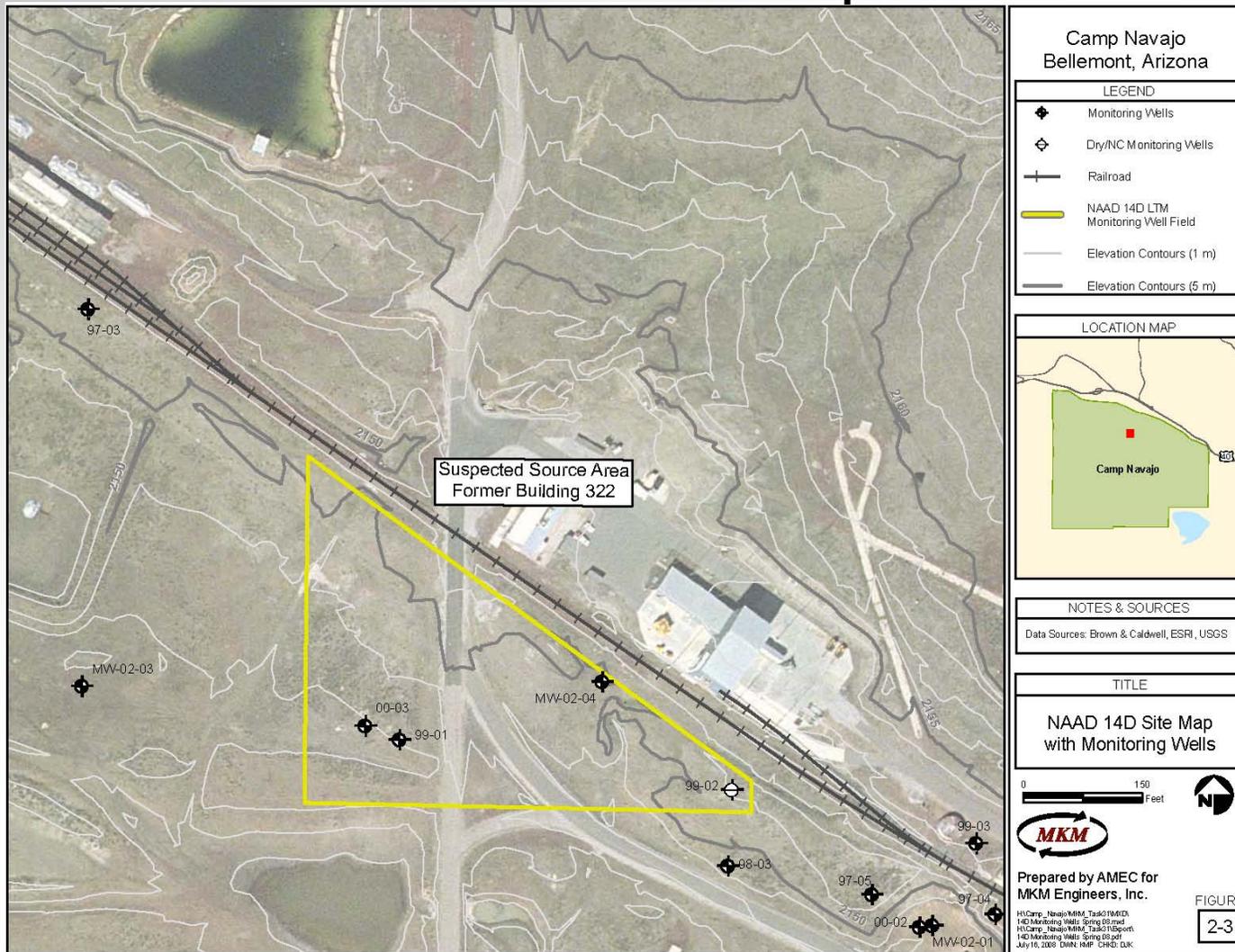
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# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## NAAD 14D – Site Map



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*Long-Term Management for  
NAAD Sites 11B, 14D, 14G, 40, and 43  
Camp Navajo, Arizona*



**NAAD 14G – Site Background**



- **Building 327 was used for ammunition repair and disposal. Specific tasks included repacking shells, disassembling boosters, spray painting, and small arms ammunition disposal.**
- **Release mechanisms included activities associated with ammunition repair and disposal conducted in building 327.**
- **Extensive soil, groundwater, and surface water investigations were conducted at this site.**
- **Potential COCs include Explosives, Metals, Hexavalent Chromium, Cyanide, SVOCs, PCBs, Nitrate, and Perchlorate (recommended by ADEQ).**
- **Surface water is typically ephemeral except for drainage ditches and two spring-fed ponds in the area. Groundwater is present in multiple sand layers of the Camp Navajo Clay, the shallowest of which is less than approximately 16 feet below ground surface.**

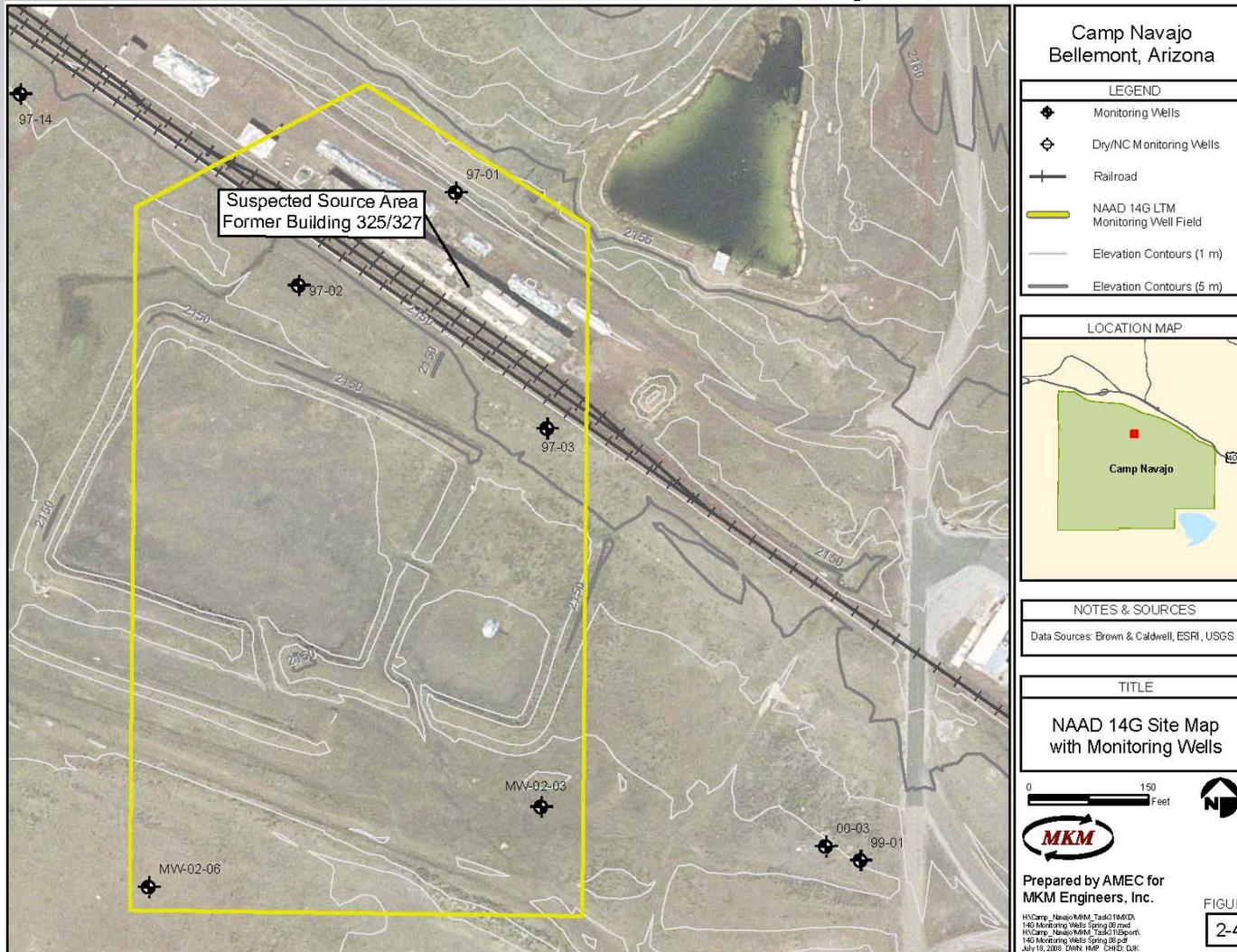
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# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## NAAD 14G – Site Map



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# *Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona*



## **NAAD 40 – Site Background**



- **The former Sanitary landfill (FSL) NAAD 40 covers approximately six acres and is located in a shallow alluvial valley in the eastern standard magazine area of Camp Navajo.**
- **The FSL was in operation from the 1940s until 1966, receiving primarily household waste. The site received dried sewage sludge between 1966 and 1981 and has been inactive since 1981.**
- **The FSL was capped in 2001 .**
- **Potential COCs include Metals, Hexavalent Chromium, VOCs, SVOC, Diesel Range Organics, and Nitrates/Nitrites.**
- **ADEQ considers the status of this site to be “No Further Action”. ADEQ also recommends groundwater monitoring and an operation and management O&M Plan which should include an annual inspection.**

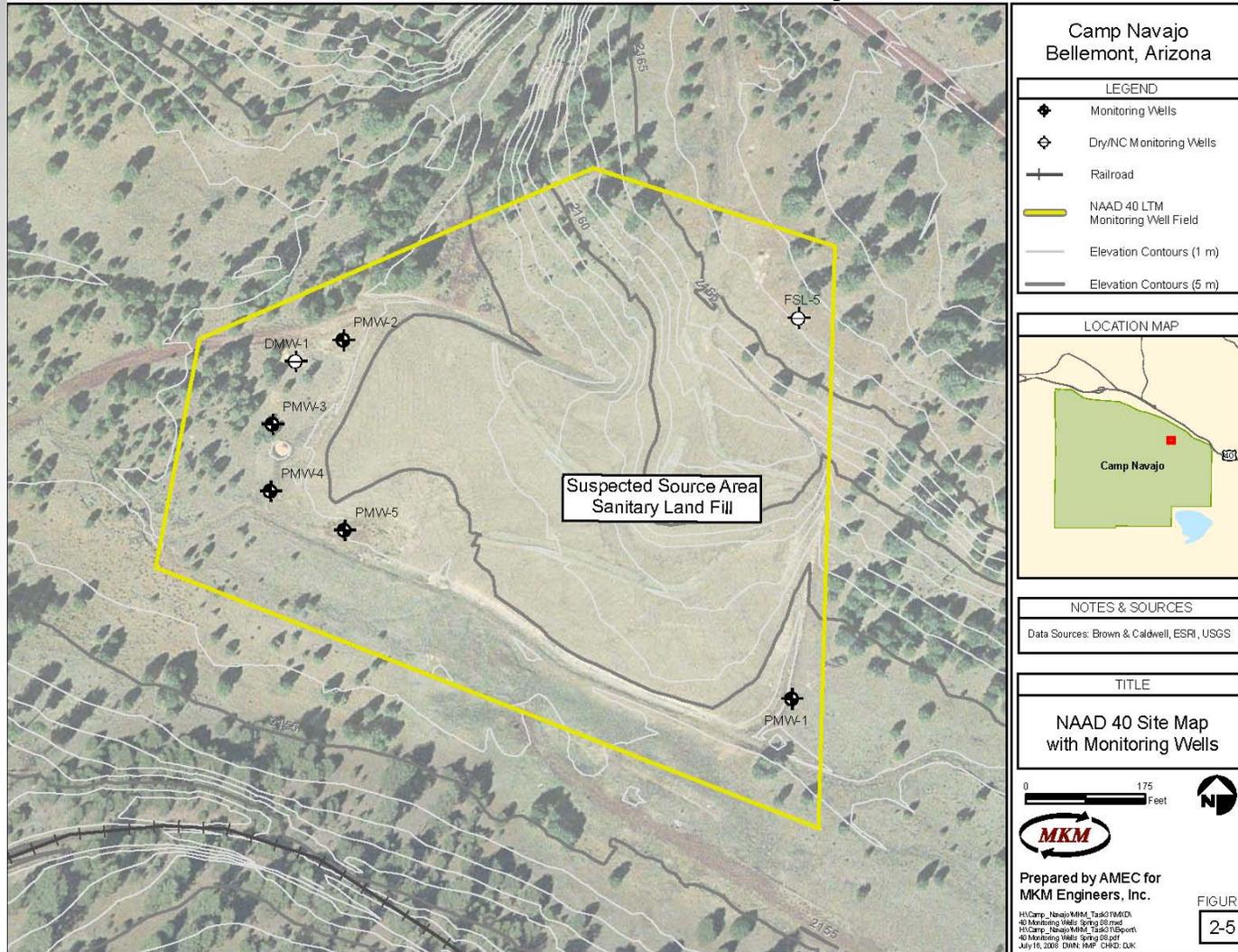
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# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## NAAD 40 – Site Map



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*Long-Term Management for  
NAAD Sites 11B, 14D, 14G, 40, and 43  
Camp Navajo, Arizona*



**LTM Project Status**

<b>LTM Year</b>	<b>Sampling Frequency</b>
Year 1	Quarterly Sampling (4Q05, 1Q06, 2Q06, 3Q06)
Year 2	Semiannual Sampling (Spring and Fall 2007)
Year 3	Semiannual Sampling (Spring and Fall 2008)
Year 4	Semiannual Sampling (Spring and Fall 2009)

- **LTM ramp down was Initiated in Fall 2007.**
- **Additional ramp down occurred in Spring & Fall 2008.**
- **Further ramp down will be evaluated in Fall 2009.**



## *Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona*



### **Ammunition Workshop Area Groundwater Mobility**

- **The groundwater has been characterized as a shallow and localized perched water bearing unit.**
- **No lateral or vertical migration due to the confining nature of the clay layers.**
- **The groundwater gradient may be influenced by recharge from the natural springs and holding pond northeast of the site.**



Seepage from Natural Springs Northeast of Monitoring Well 98-01



Seepage from Natural Spring Northeast of NAAD 14G

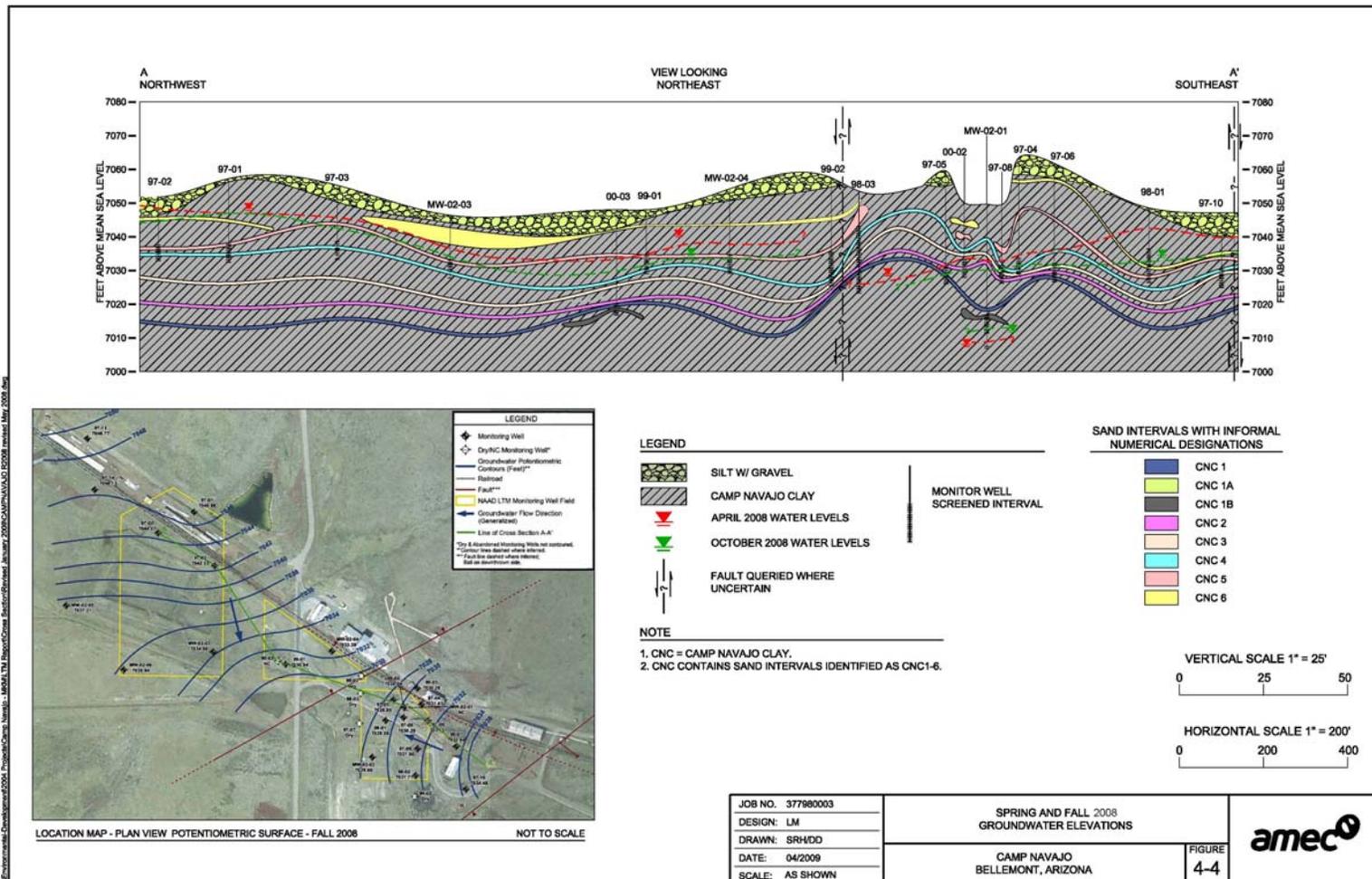
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# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## Ammunition Workshop Area Geologic Cross Section



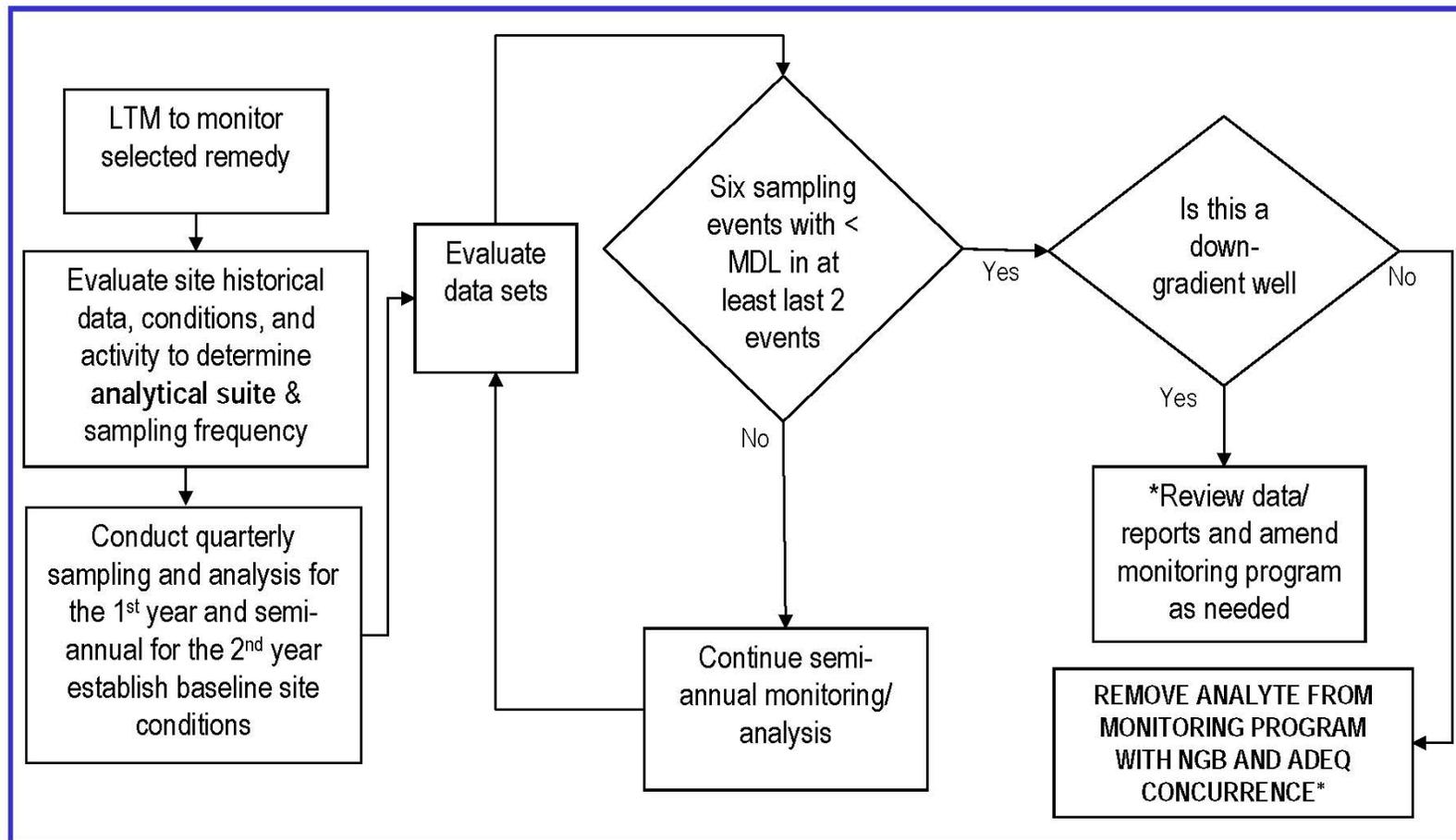
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# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## Ramp Down Strategy - Each Analytical Suite (By Well)



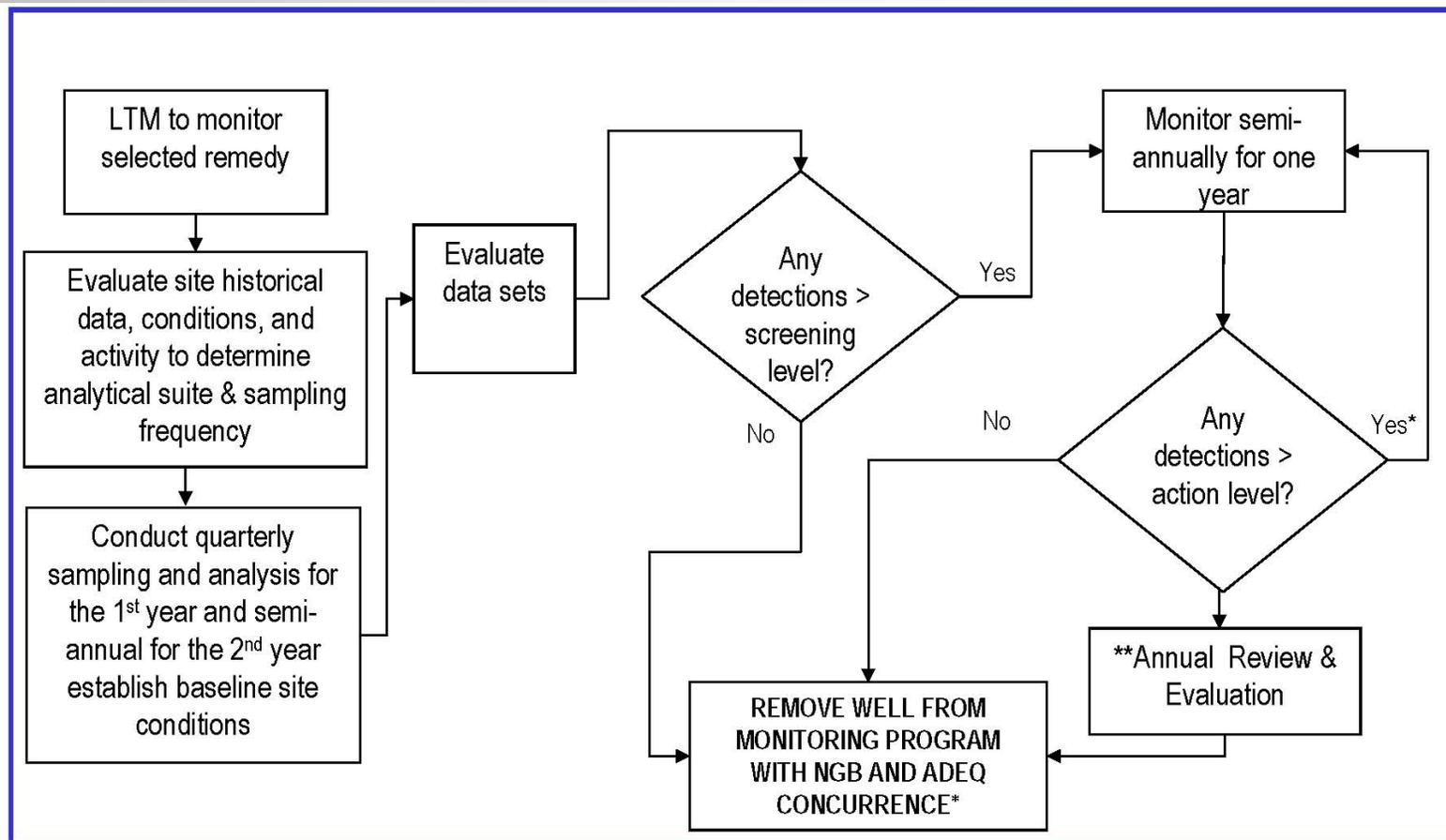
\*If contaminant is present in other wells continue to monitor, if not, remove from LTM program.



# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## Ramp Down Strategy – Well Sampling Frequency Decision Matrix



\*Down gradient wells remain in the monitoring program at the most conservative frequency consistent with other wells in the program for the specific site

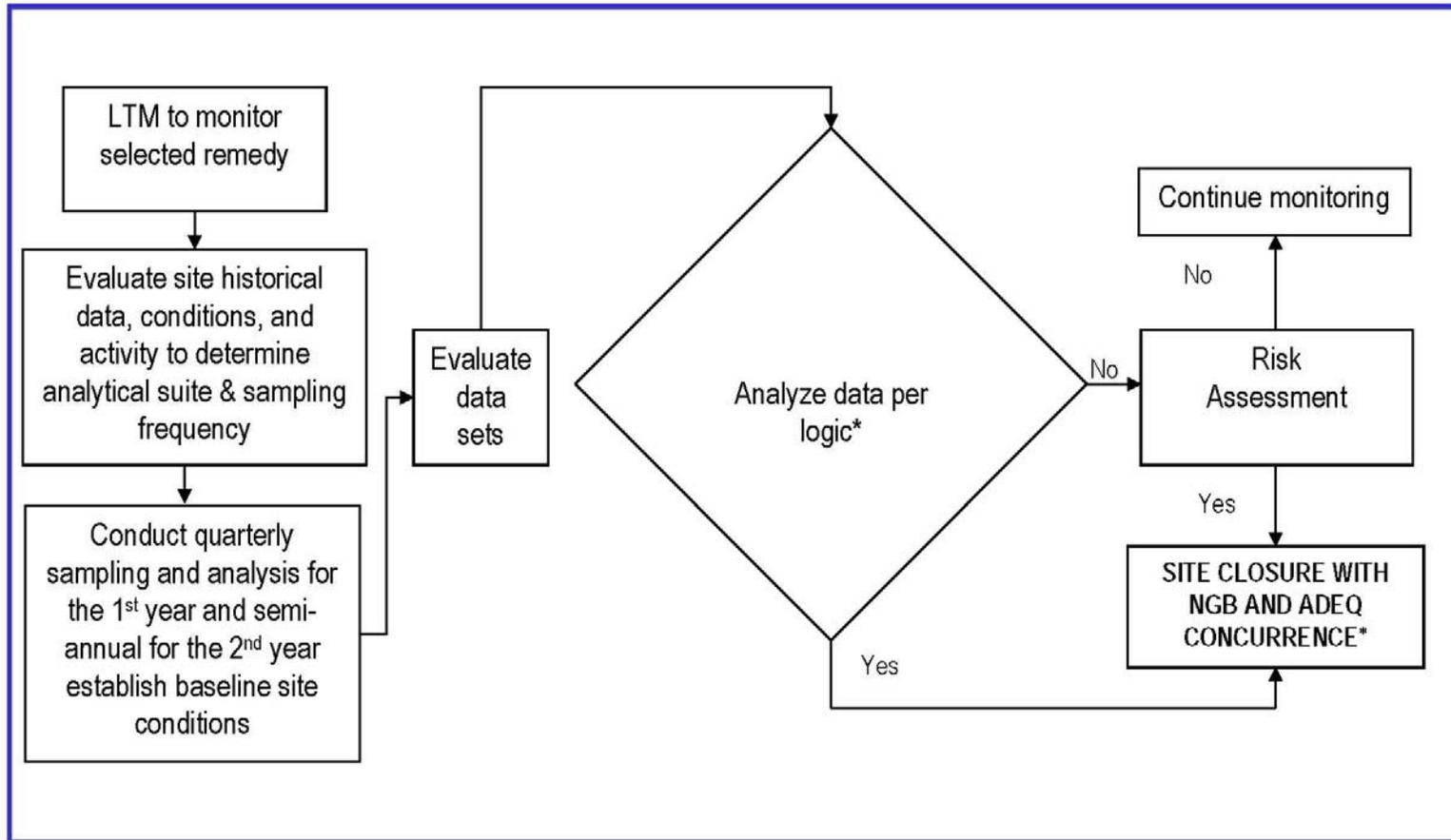
\*\*Review & evaluate selected remedy; data quality and usability; apply for regulatory adjustment to monitoring requirements.



# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## Ramp Down Strategy – Site Sampling Frequency Decision Matrix



\*If, after two years of quarterly sampling (six quarters of sample results), only minor exceedences to the screening guidance are observed in onsite or adjacent monitoring wells, and COCs are not detected at concentrations greater than the screening value in down-gradient well(s), the site may be removed from LTM with concurrence by the NGB and ADEQ.



*Long-Term Management for  
NAAD Sites 11B, 14D, 14G, 40, and 43  
Camp Navajo, Arizona*



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**Ramp Down Status**

**NAAD 14D**

- **Sampling has been discontinued because ramp down requirements were met.**
- **One well was removed in Fall 2007, two wells were removed in Spring 2008, and one well was removed in Fall 2008.**

**NAAD 14G**

- **Sampling has been discontinued because ramp down requirements were met.**
- **Four wells were removed in Fall 2007 and one well was removed in Spring 2008.**

**NAAD 40**

- **The frequency has been reduced to annual sampling for the five NAAD 40 wells.**



# Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona



## NAAD 11B Ramp Down Status

MW Number	Analyses																		
	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead	Mercury	1,3,5-TNB	2,4,6-TNT	RDX	1,3-DNB	4-A-2,6-DNT	2-A-4,6-DNT	Perchlorate	VOCs	SVOCs	TPH-DRO	PCBs	Nitrate/Nitrite
NAAD 11B																			
97-04	X		X		X			X	X	X			X	X					
97-05	R (Spring 2008)		R (Spring 2008)		R (Spring 2008)			R (Spring 2008)	R (Spring 2008)	X			X	X					
97-06	R (Fall 2008)		R (Fall 2008)		R (Fall 2008)			R (Fall 2007)	R (Fall 2007)	X			R (Fall 2008)	R (Fall 2008)					
97-08	R (Fall 2007)		R (Fall 2007)		R (Fall 2007)			R (Fall 2007)	R (Fall 2007)	X			X	R (Fall 2008)	R (Fall 2007)				
97-09	R (Fall 2007)		R (Fall 2007)		R (Fall 2007)			R (Fall 2007)	R (Fall 2007)	X			R (Fall 2008)	R (Fall 2008)					
98-02	R (Fall 2007)		R (Fall 2007)		R (Fall 2007)			R (Fall 2007)	R (Fall 2007)	X			R (Fall 2008)	R (Fall 2008)					
98-03	X		X		X			X	X	X			X	X					
99-03	X		X		X			X	X	X			X	X					
00-01	X		X		X			R (Fall 2008)	X	X			X	X					
00-02	R (Fall 2008)		R (Fall 2008)		R (Fall 2008)			R (Fall 2008)	R (Fall 2008)	X			X	X					
02-01	R (Fall 2007)		R (Fall 2007)		R (Fall 2007)			R (Fall 2007)	R (Fall 2007)	X			R (Fall 2008)	R (Fall 2008)					
02-02	X		X		X			X	X	X			X	X					

R = Removed from the LTM sampling program because ramp down requirements were met  
 X = Analyte remains in the LTM sampling program (Semiannual Sampling Frequency)



# *Long-Term Management for NAAD Sites 11B, 14D, 14G, 40, and 43 Camp Navajo, Arizona*



## **NAAD 40 - Former Sanitary Landfill**

### **Inspection and Maintenance**



**NAAD 40 Erosion Repair**



**NAAD 40 Erosion Repair**



**NAAD 40 biennial surface  
elevation survey**

- **Semiannual inspections.**
- **Annual inspections are performed by an Arizona Registered Professional Engineer.**
- **Biannual survey of landfill surface elevation monitoring points.**
- **Maintenance is performed as needed.**
- **Erosion control measures are repaired as needed.**

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*Long-Term Management for  
NAAD Sites 11B, 14D, 14G, 40, and 43  
Camp Navajo, Arizona*



**NAAD 43 - Former Construction Debris Landfill  
Inspection and Maintenance**



**NAAD 43 erosion control  
silt fence and hay waddling  
repaired in Fall 2008**



**NAAD 43 erosion control  
hay bails and hay waddling  
repaired in Fall 2008**



**NAAD 43 erosion control  
hay bails and silt fence  
repaired in Fall 2008**

- **Semiannual inspections.**
- **Maintenance is performed as needed.**
- **Erosion control measures are repaired as needed.**



# Camp Navajo Environmental Cleanup Program



## OB/OD Area Program Update

LTC William Myer  
NGB Restoration Program Manager

Mr. Randy Wilkinson  
NGB Restoration Project Manager

Stakeholders Advisory Group meeting  
8 October 2009



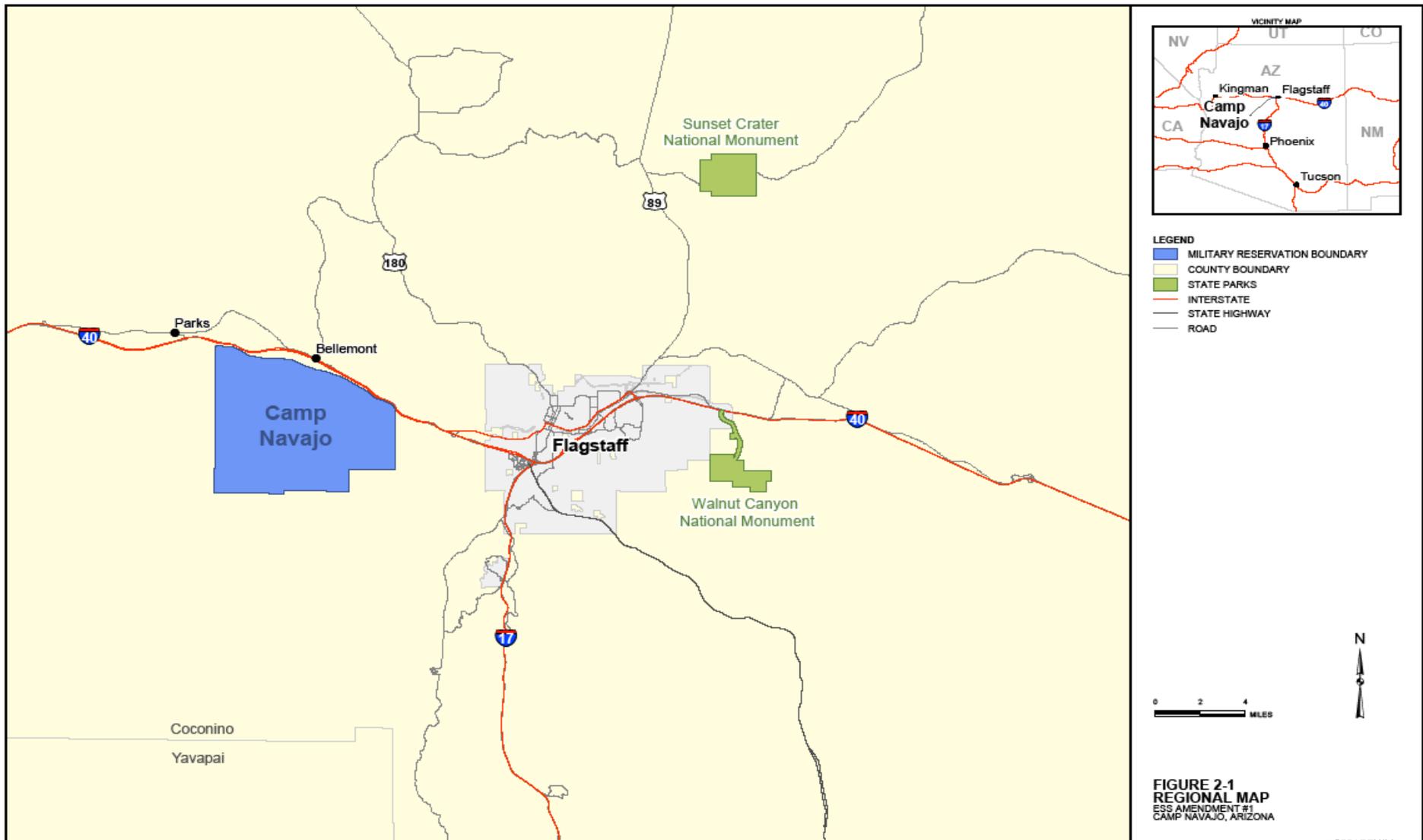
# SAG Briefing Agenda



- Closure Strategy
- NAAD and MRWA Closure Status
- DD Status
- Program Schedule

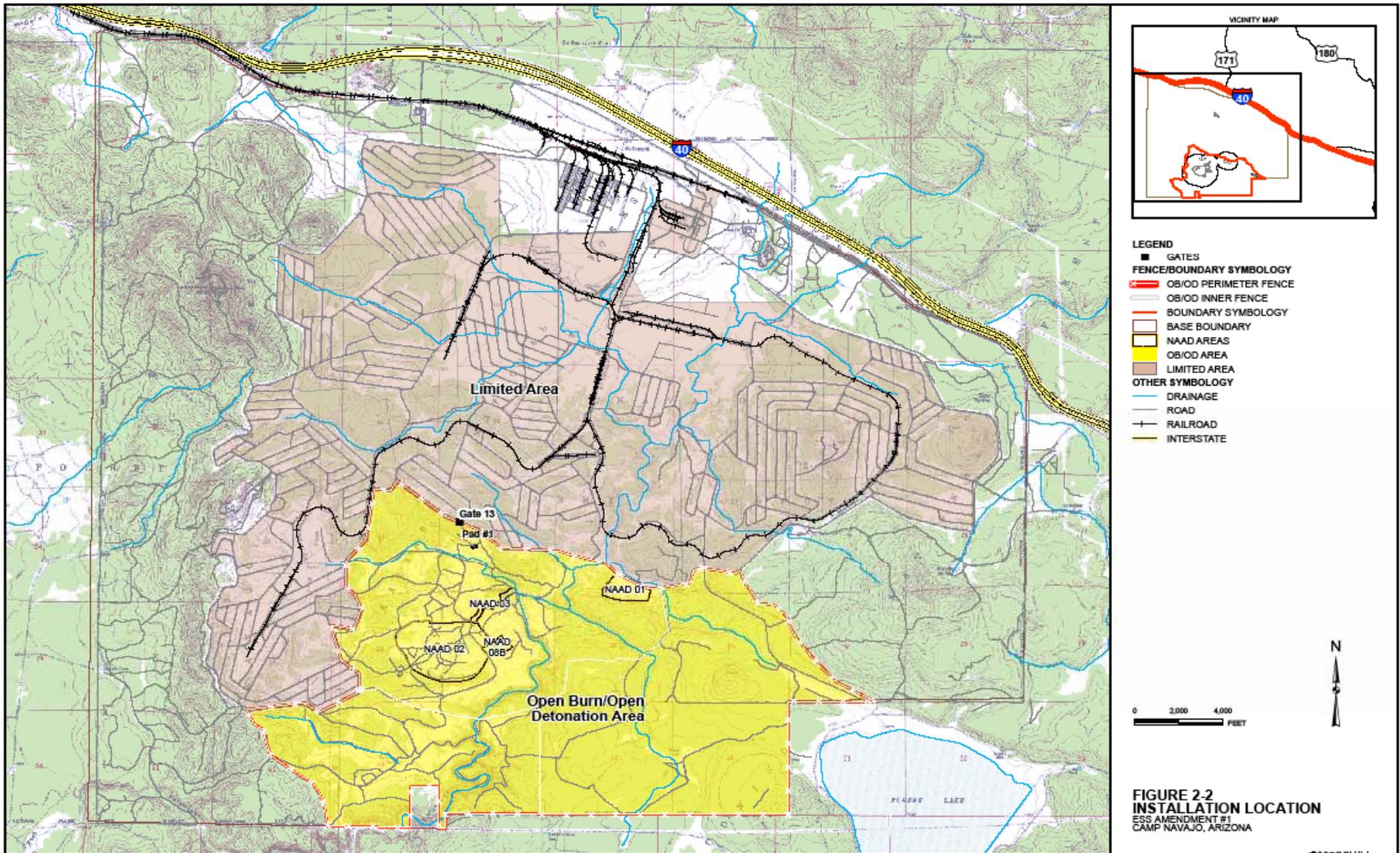


# Camp Navajo Location





# Camp Navajo OB/OD Area





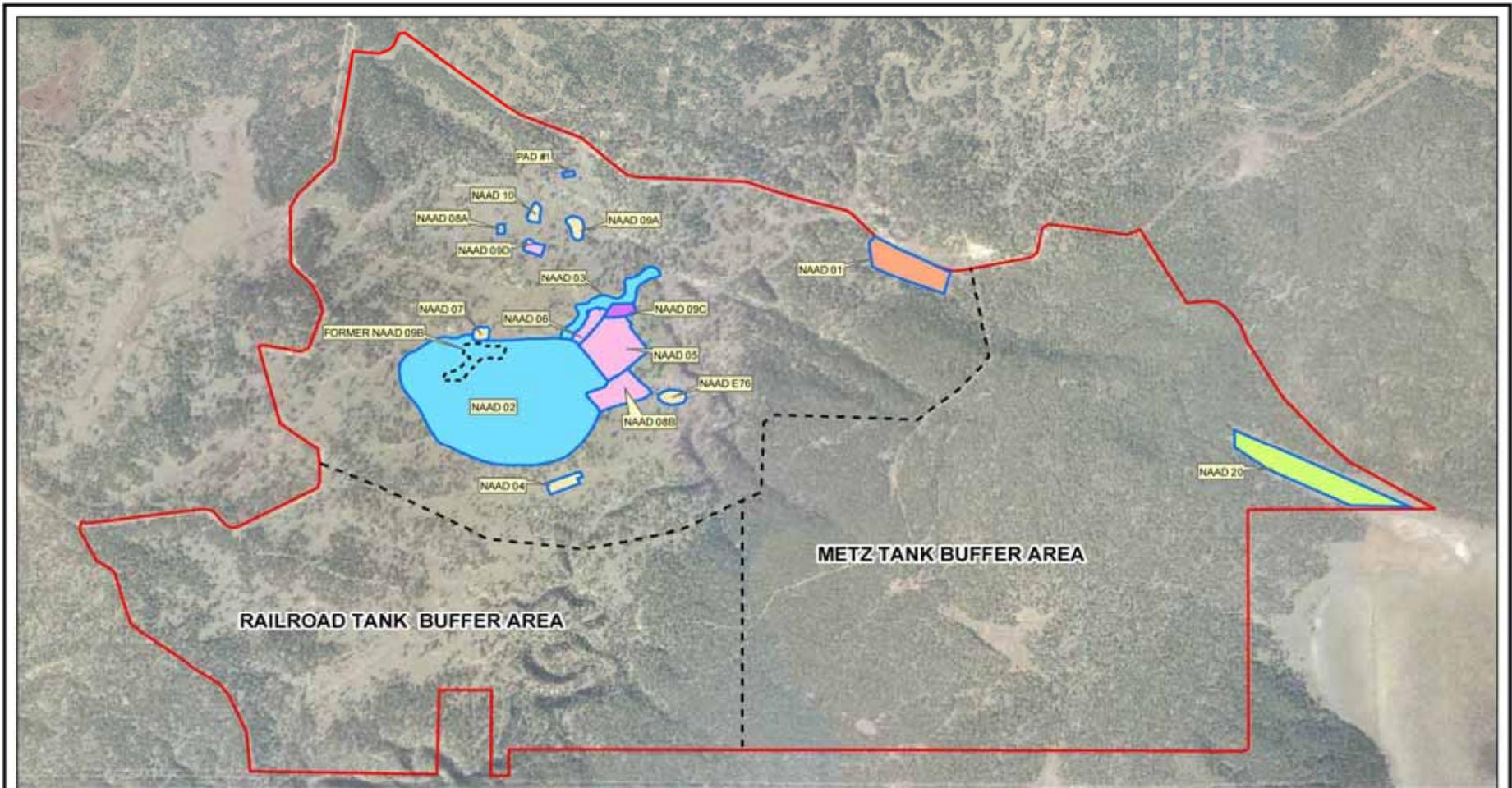
# Closure Strategy



1. Use the CERCLA risk-based cleanup process to investigate, remediate, and close out all OB/OD Area sites.
2. Separate the chemical contamination issue from the munitions and explosives of concern issue, and address MEC as separate operable units.
3. Focus closure of RCRA interim status permits on sites that were operated under interim status.
4. RCRA Post Closure.



# OB/OD Area NAAD Sites



SOURCE: AERIAL PHOTOGRAPHY BY SOUTHWEST MAPPING, OCTOBER 2002

**BROWN AND CALDWELL**

0 1,000 2,000  
SCALE IN FEET



## EXPLANATION

- |                   |            |             |
|-------------------|------------|-------------|
| OB/OD BOUNDARY    | AMEC       | CH2         |
| CURRENT NAAD SITE | BC         | MKM         |
| FORMER NAAD SITE  | BC AND CH2 | MKM AND CH2 |
| INNER FENCE       |            |             |

**CONTRACTOR SITES WITHIN THE OB/OD AREA**  
CAMP NAVAJO  
BELLEMONT, ARIZONA



# OB/OD Area NAAD Closure Status

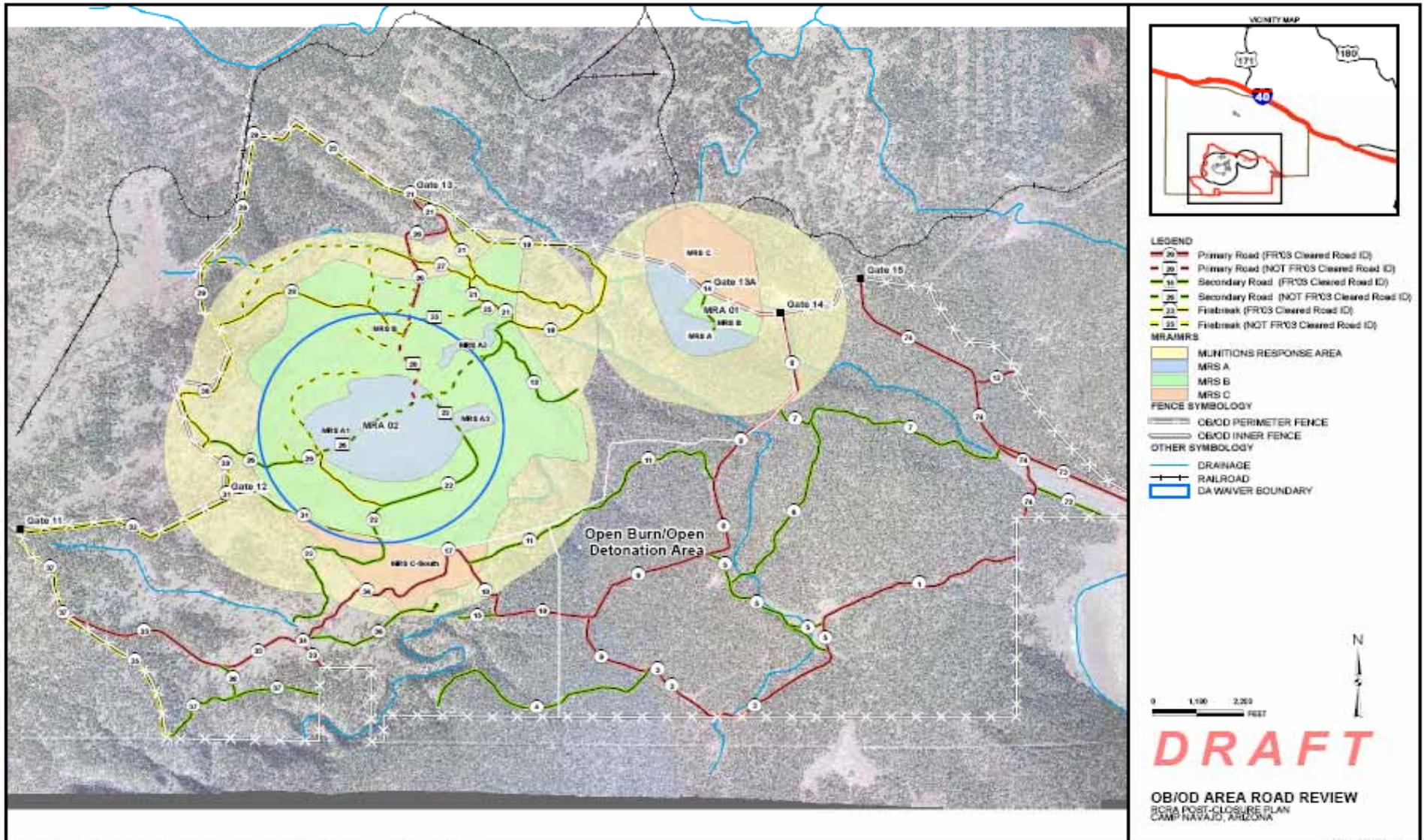


Site	Type	Contractor	Fieldwork	RI/RSE	HHRA	ERA	DD
1	CERCLA	MKM	Complete	Final	---	Final	Final
2	RCRA	B&C	Ongoing	Final	Future	Future	Future
3	CERCLA	B&C	Complete	Final	---	Final	<b><u>Final</u></b>
4	CERCLA	MKM	Complete	Final	---	Final	Final
5	RCRA	AMEC	Complete	Final	Final	Final	<b><u>Draft Final</u></b>
6	RCRA	AMEC	Complete	Final	Final	Final	<b><u>Draft Final</u></b>
7	CERCLA	MKM	Complete	Final	Final	Final	Final
08A	CERCLA	MKM	Complete	Final	---	Final	Final
08B	RCRA	AMEC	Complete	Final	Final	Final	<b><u>Draft Final</u></b>
09A	CERCLA	MKM	Complete	Final	---	Final	Final
09C	RCRA	B&C	Ongoing	Final	---	---	<b><u>Final</u></b>
09D	RCRA	AMEC	Complete	Final	---	Final	<b><u>Draft Final</u></b>
10	CERCLA	MKM	Complete	Final	---	Final	Final
13	RCRA	B&C	Complete	Final	Final	---	<b><u>Final</u></b>
20	CERCLA	B&C	Complete	Final	Final	---	Future
E76	CERCLA	MKM	Complete	Final	---	---	Final



# MRWA 01, 02, & 20

## Munitions Response Work Areas





# OB/OD Area MRWA Closure Status



MRWA	Type	Investigation	Removal	RI	EE/CA	PP	DD
01	CERCLA	Complete	Complete	Final	<b><i>Final</i></b>	Draft	Draft
02	RCRA	Complete	<b><i>Complete</i></b>	Final	Client Draft	NA	Future
20	CERCLA	Complete	---	Final	<b><i>Final</i></b>	Draft	Draft



# Decision Documents



- **DDs completed:**
  - NAAD 09C DD and ESD (B&C site)
  - 7 OB/OD Area CERCLA Sites (MKM sites)
  - NAAD 03 (B&C site)
  - NAAD 13 (B&C site)
- **DDs undergoing ADEQ review:**
  - 4 OB Sites (AMEC sites) – DD still needs public comment
  - MRWA 01 and 20 (CH2M HILL) – PP still needs public comment
- **DDs undergoing NGB review:**
  - 5 IRP LTM Sites (B&C) – Client Draft @ NGB
  - 28 IRP Buyout Sites (B&C) – Client Draft @ NGB
  - 18 IRP Non-Buyout Sites (B&C) – Client Draft to NGB in Oct
- **DDs will be prepared for:**
  - 7 IRP Ineligible Sites (B&C/CH2M HILL)
  - NAAD 02 (B&C/CH2M HILL)
  - MRWA 02 (CH2M HILL)



# Public Participation

**DDs will be available for review at:**

NAU Cline Library Special Collections Area and  
<http://www.CampNavajoEnvironmental.org>

**Notices will be placed in:**

Arizona Daily Sun and Williams-Grand Canyon News

**Send comments to:**

LTC William Myer

Camp Navajo

P.O. Box 16123

Bellefont, AZ 86015



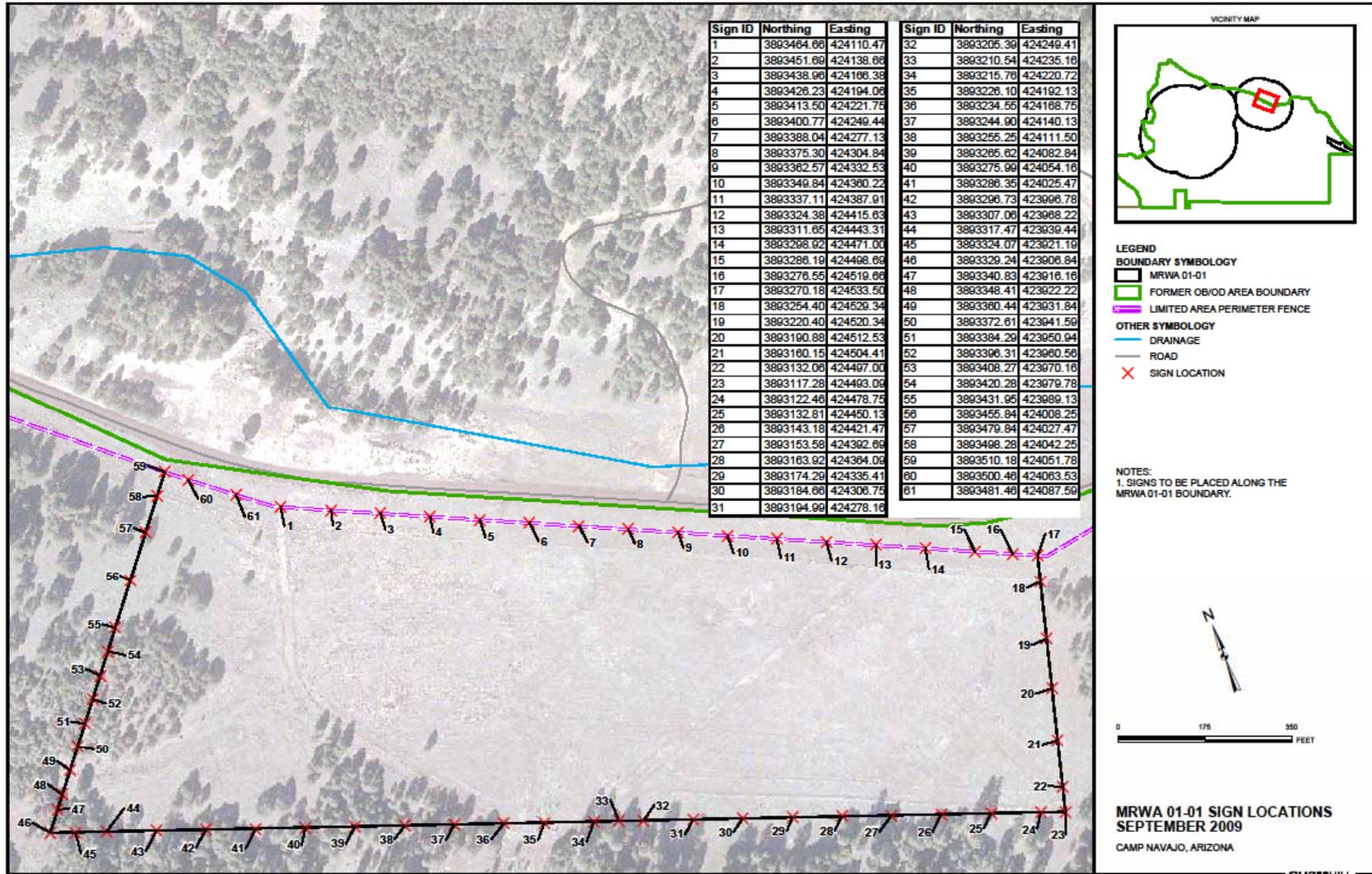
# Program Schedule



- **Summer 2009**
  - Finalized EE/CAs for MRWA 01 & MRWA 20
  - Completed surface MEC removal at MRWA 02
  - Removed “inner fence”
  - Installed signs at MRWA 01-01 & MRWA 02-03
  - Completed 80% of NAAD 02/09C soil sieving
  - Multiple Award Military Munitions Support (MAMMS) contract awarded September 21
- **Fall 2009**
  - Complete on-site soil management project
  - Complete MD management project
  - Finalize DDs for 4 OB sites & MRWAs 01 & 20
  - Prepare vadose zone monitoring annual report



# MRWA 01-01 Signs





# MRWA 02-03 Signs





# Program Schedule



- **Winter 2009-2010**
  - Prepare after action reports
    - MRWA 02 surface MEC removal action
    - On-site soil management project
    - MD management project
  - Conduct final open detonation event
  - Finalize MRWA 02 EE/CA
- **Spring 2010**
  - Finalize after action reports
  - Prepare MRWA 02 DD
  - Prepare RCRA post closure plan & permit application
  - New contract for IRP LTM (ER,A funds)
    - NAADs 11B, 40, and 43
    - MRWA 01 & 20?



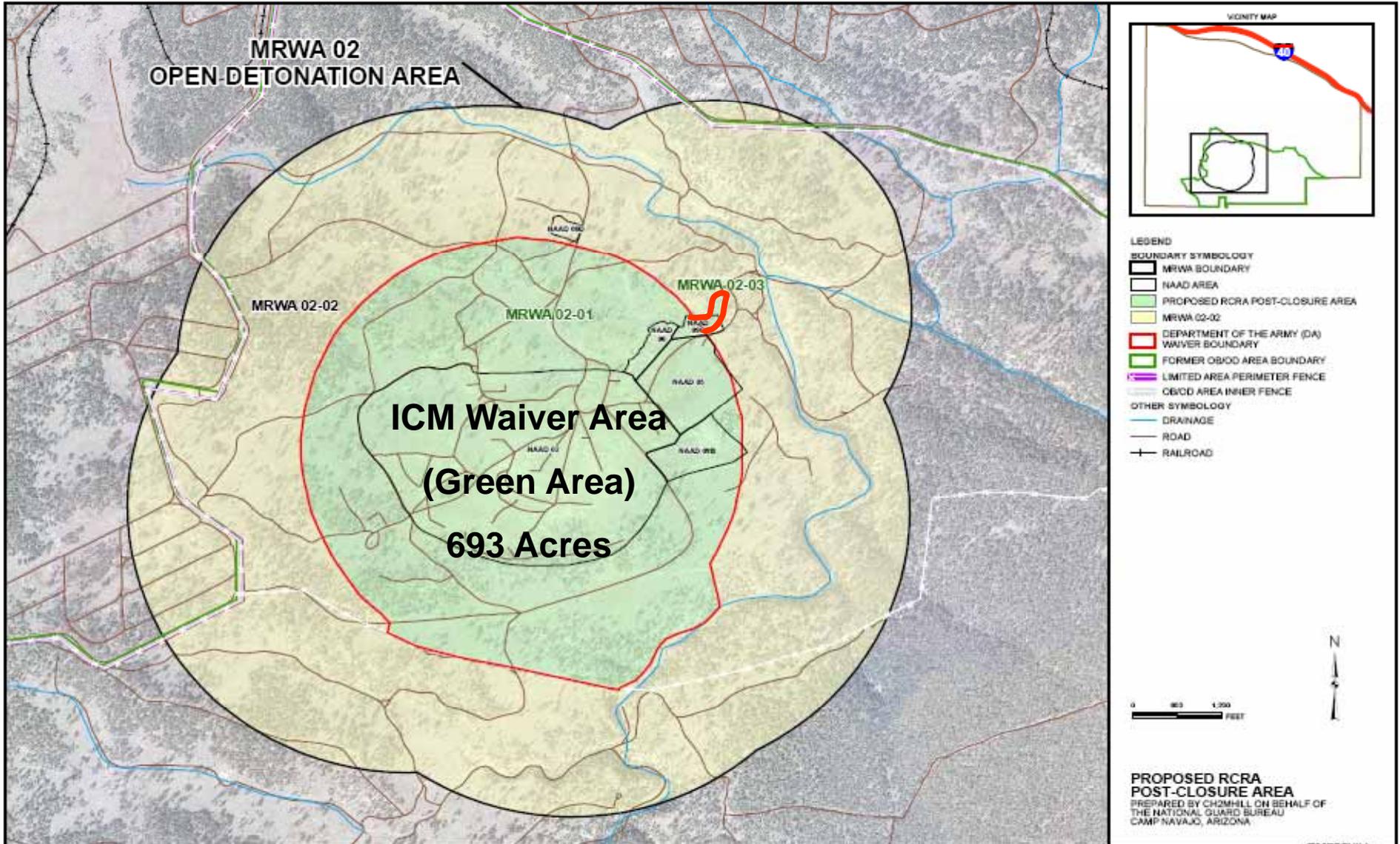
# Program Schedule



- **Summer 2010**
  - Finalize MRWA 02 DD
  - Negotiate RCRA post closure permit
    - Vadose zone monitoring
    - Municipal well monitoring
    - Signage
    - Land use controls
    - 5-year reviews
  
- **Fall 2010**
  - CERCLA closure
  - New contract for RCRA post closure care (O&M funds)
    - MRWA 02



# Post Closure Area





# Camp Navajo Environmental Cleanup Program POCs



LTC William Myer  
NGB Restoration Program Manager  
703-607-4504  
[Bill.Myer@us.army.mil](mailto:Bill.Myer@us.army.mil)

Mr. Randy Wilkinson  
NGB Restoration Project Manager  
928-773-3208  
[Randall.Wilkinson1@us.army.mil](mailto:Randall.Wilkinson1@us.army.mil)