

## Final Meeting Minutes

May 6, 2014

**Project:** Former Camp Butner Restoration Advisory Board (RAB)

**Date:** May 6, 2014, 6:30 PM – 8:30 PM

**Place:** Butner Town Hall  
415 Central Avenue  
Butner, North Carolina 27509

### Attendees:

The table below presents a list of the attendees to the May 6, 2014, RAB meeting, and **Attachment 1** provides the attendance sign-in sheet.

Name	Organization
Ray Livermore	USACE Wilmington District
Chris Cochrane	USAESCH
Sarah Dyer	USAESCH
Kimberly Vaughn	HydroGeoLogic, Inc. (HGL)
Doug Logan	Granville County Emergency Management
Donald Slaughter	Resident, Butner Public Safety representative
Marti Morgan	North Carolina Department of Environment and Natural Resources (NC DENR)
Vicky Cates	Town of Butner (Chairwoman)
Richard and Joyce Veazey	Citizens of Granville County, residents within former Camp Butner
Hope Taylor	Clean Water for North Carolina, Granville resident

**Prepared By:** Kimberly Vaughn

**Topic:** RAB Meeting # 20

### Objectives

The RAB meeting objectives are to discuss the former Camp Butner FUDS project, solicit feedback from the community and stakeholders, and summarize the results of the current Remedial Investigation (RI) project.

### Introduction

Ms. Vicky Cates called the meeting to order and requested an introduction of all meeting attendees. Mr. Ray Livermore, USACE discussed the status of the former Camp Butner FUDS since the last RAB meeting and reviewed the topics to be discussed this evening.

## Remedial Investigation Update

Mr. Livermore introduced Kimberly Vaughn, present as Deputy Project Manager for HGL. Ms. Vaughn presented a summary of the remedial investigation status (see **Attachment 2 – RAB Meeting slide presentation**) with a focus on the current draft final RI Report, pending review by North Carolina Department of Environment and Natural Resources (NCDENR).

Mr. Donald Slaughter attending from the Butner Public Safety department, reported what he described as additional bazooka ranges (for training in dummy rounds) across from the incinerator. Mr. Slaughter believes that these were ranges where practice rounds were used in training. The location is near the intersection of F Street and 33<sup>rd</sup> Street to the north, near the power line. Mr. Slaughter reported to the group that assault training, flamethrower pits, hand grenade training, and dummy bazookas were all used north of that road and to the west toward the Flame Thrower Range. Mr. Slaughter also brought in a spike as an example of the arrangements of spike and concertina wire present in the flamethrower pits. Mr. Slaughter emphasized that his concern is that these spikes are a danger of impalement to citizens or hunters. Mr. Livermore provided a photographed example of the spike and wire that are present onsite after the RAB meeting (see Figure 1).



Figure 1

The group discussed the November 2013 reported find from outside of the munitions response area (MRA) as summarized by email from Mr. Doug Logan to Mr. Ray Livermore (see photo). As discussed through email traffic in November 2013, it is believed that this item was found inside the MRA boundary, and transported to the address where it was subsequently located and destroyed. A photograph was provided from Mr. Doug Logan, on Wednesday, November 13, 2013 by email to Mr. Ray Livermore (see Figure 2) with this description:

“FYI, we responded to a UXO discovery at 642 Charlie Huff Rd, Oxford, NC 27565, on Monday, Nov 4, 2013. The item was an

in-tact 155MM projectile discovered lying next to the back steps on an old farm house. The owner was cleaning up around his parents' farm house and discovered the UXO underneath an overgrowth of ivy. From all appearances, the UXO had been found on their property and moved to that location some years ago. The NCSBI Hazardous Devices Unit responded and contacted an EOD Team from Ft. Bragg. The UXO was moved by the EOD team to a safe location on the property and counter-exploded.”



Mr. Livermore, Mr. Slaughter, and Ms. Cates, discussed the historical list of externally reported items. Mr. Doug Logan maintains a list of citizen reported finds. To the extent possible these items need to be gathered and incorporated into the project GIS.

Ms. Vaughn reviewed the contents of the slide presentation including the site history to date, the results of the RI field activities, the conclusions and recommendations of the RI project, and the development of boundaries for the MEC contaminated areas. Using the figures (**Attachment 3 – RAB meeting figures**) provided as handouts, the group discussed the rights-of-entry granted and the investigation conducted. Ms. Vaughn summarized that HGL has reviewed the field investigation data and has made conclusions and recommendations for where a MEC hazard for and MC hazard may be present on-site. The report concludes that there is potential for humans to come into contact with explosive hazards (MEC contamination) and that the extent of that MEC contamination has been determined. A new MRS boundary for the MEC contamination areas is now recommended. The lands that are outside of the MEC contamination are will be called “Remaining Lands” where there is a low potential for explosive

hazards (MEC) to be present. There were no indications that munitions constituents contamination is present at the Butner site. These MRSs are recommended to go forward to the feasibility study phase of the project. Ms. Vaughn summarized the recommendations that the RI report makes for the MRSs going forward, including the new Hand Grenade Range #2 MRS that was identified during the RI field activities.

Ms. Vaughn summarized that the feasibility study, based on the RI recommendations, will evaluate the different remedies and technologies available. The cost analysis is also done in the feasibility study for each alternative that is presented. The best alternative is evaluated in the

feasibility study, and the future proposed plan presents a recommended alternative. Those recommendations are presented at a future public meeting for review and comment. The next actions for HGL on the RI project will be to finalize the RI report and continue with the feasibility study, proposed plan, and the proposed plan public meeting. Mr. Livermore noted that the RAB meeting attendees will be advised when the proposed plan public meeting is scheduled.

### **School/Education Program Discussion**

Mr. Livermore, Mr. Logan, Mr. Veazey and Ms. Cates discussed the school education program. There has been discussion in the past to revisit the school education program and make improvements. For instance, Mr. Livermore asked what other potential tools are available such as websites or coloring books. Mr. Livermore mentioned the DVD with the educational video that was created previously. A discussion of whether the safety officer for the school district could provide live safety training for school children with visual aids occurred. It was decided that encouraging children to touch “dummy” items sends the wrong message for not touching items that might be found outdoors.

Mr. Logan has a box of the DVD movies that were previously made. There are coloring books and/or brochures that are available, and the schools are able to reproduce extra copies off of a master document. Ms. Chris Cochrane mentioned that handouts and giveaways for older schoolchildren are available as well. There are also other videos with general content that are not specific to Butner that could be provided. Ms. Cates asked that the materials present the history also for the schoolchildren. She would like the content to explain why the munitions are present. She noted there is not much history presented in previous handouts or materials before presenting the 3Rs for safety. The group discussed that if a PowerPoint slide presentation with up-dated photos suitable for older children is developed it could be placed on the county’s website. The possibility to use the existing DVD video on a YouTube channel dedicated to the Camp Butner site was discussed. Mr. Slaughter stated that he would be glad to present these educational materials at future public gatherings. The group discussed that handouts should be focused on using non-technical languages for a non-technical audience. Mr. Livermore asked what public events are occurring in future and Mr. Slaughter stated there is a wreath laying planned for Memorial Day and the Chicken Pickin June 7. This festival has fireworks and events, with street closings for booths etc.

Mr. Slaughter also stated that the Butner Public Safety department goes into the schools regularly for safety lectures on fire prevention. Ms. Taylor asked where are these educational materials located, for the group to obtain them. Mr. Logan stated that he has distributed them in the past and is not sure but he believes that the tax assessor’s office may have some of these materials available. Mr. Slaughter stated he could use them as handouts for the fire and/or crime prevention safety lectures that are given regularly to middle school aged children. Mr. Livermore will evaluate what type of educational handouts can be enveloped in time for the May and June events that were discussed. Ms. Cochrane stated she has many giveaways and handouts that she can help provide. Mr. Slaughter stated there are also community watch meetings which would be a good place to distribute these materials and could further serve to educate the public about the former Camp Butner. This could assist in getting rights of entry granted in future. Mr. Livermore discussed with Mr. Slaughter and USACE would have to determine whether the

concertina wire and stakes/spikes could be addressed under the FUDS program. Ms. Taylor asked whether the public meeting scheduled for the Proposed Plan review would be a good place to get some media coverage for either newspaper or TV news coverage to help publicize the site.

### **Next RAB Meeting**

The group discussed the next RAB meeting to be scheduled in August or September for preparation ahead of the public meeting set for the proposed plan. Ms. Taylor noted that any articles or media coverage with photographs that could be placed in local media may develop interest ahead of the public meeting. Mr. Livermore discussed with the group that the news release that will be published ahead of the proposed plan could be reviewed by the RAB group. He suggested a future teleconference, if needed, to discuss any concerns for the news release could be developed. Meeting was adjourned

#### Action Items Include:

- USACE – provide MEC contamination boundary GIS data to Granville County Planning.
- USACE – provide internet link to Savannah District UXO education section for older children. *This was completed in May 2014.*
- USACE – provide power point presentation with UXO pictures and Camp Butner background information geared towards older children. *This was completed in May 2014.*
- USACE – provide internet link to Playing It Safe Video created for Camp Butner in 2004. *This was completed in May 2014.*
- USACE – determine eligibility of project for removal of concertina wire stake.
- USACE/RAB – Advertise (media release) and arrange for a meeting prior to the Proposed Plan/RAB meeting for the community to discuss the PP
- HGL – incorporate revisions needed to the RI report and finalize the report ahead of the proposed plan public meeting.

**Attachment 1, Attendance Sign-In Sheet**

**RAB MEETING  
ATTENDANCE SIGN-IN SHEET**

**Project:** former Camp Butner Remedial Investigation / Feasibility Study

**Date/Time:** May 6, 2014, 6:30 pm

**Place:** Butner Town Hall, Multi-Purpose Room, 415 Central Avenue, Butner, North Carolina



PRINTED NAME	ORGANIZATION	PHONE NUMBER	Email	Initials
Vicky Cates	Town of Butner	919.599.0782	vicky.cates@va.gov	VR
Richard & Joyce Veazey	residents	919-578-9039	vjveazey@aol.com	RLV
Donald Slaughter	Resident Butner Public Safety	919-575-6501 X 109	donald.slaughter@butnerps.org	DS
Chris Cochran	USACE			
Doug Logan	GRANVILLE COUNTY EMERGENCY MANAGEMENT	919-603-1310	doug.logan@granvillecounty.org	DL
 Sarah Dyer	USACE	256-895-5518		SD
Hope Taylor	Clean Water for NC Granville Resident	919-603-032	hope@cwfncc.org	HCT

**Attachment 2 – RAB Meeting Slide Presentation**



**Former Camp Butner**


Remedial Investigation  
Update  
RAB Meeting  
**6 May 2014**



Anti-tank class at Camp Butner

INTRODUCTION AND OBJECTIVES

**FORMER CAMP BUTNER  
REMEDIAL INVESTIGATION**



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## Introductions

- Government Agencies – Federal, State and Local
  - U.S. Army Corps of Engineers (USACE)
    - CESAW, CESAS, CEHNC
  - North Carolina Department of Environment and Natural Resources (NCDENR)
- Technical
  - U.S. Army Engineering and Support Center, Huntsville (USAESCH)
  - HydroGeoLogic, Inc. (HGL)



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## Key Definitions

- MPPEH** - Material Potentially Presenting an Explosive Hazard, material that potentially contains explosives or munitions whether it be MEC or MD
- MEC** – Munitions and Explosives of Concern-Specific categories of military munitions that may pose unique explosives safety risks. MEC includes unexploded ordnance (UXO), discarded military munitions (DMM), and explosive concentrations of munitions constituents (MC).
- MD** – Munitions Debris (MD), scrap metal from munitions (no explosive safety risk)
- MC** – Munitions Constituents-Any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials and emission, degradation, or breakdown elements of such ordnance or munitions.




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**PROJECT HISTORY**


**FORMER CAMP BUTNER  
REMEDIAL INVESTIGATION**



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**Site History**

- Established 1942
  - 40,384 acres / 23,000 acres of live-fire artillery ranges
- Multiple Previous Investigations
  - Engineering Evaluation / Cost Analysis
  - Removal Actions (both time critical and non-time critical)
- Available historical data incorporated into the GIS for this RI/FS
- Remedial Investigation (this phase)



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## RI/FS Project Purpose

- Remedial Investigation (RI) Purpose
  - Determine the nature and extent of MEC and MC across a site
  - Determine potential risks to human health and/or the environment
- Feasibility Study (FS) Purpose
  - Evaluates alternative munitions response options



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## MRSs included in Butner RI/FS

Handout Figure 1.2, and webmap



- ▶ Flame Thrower Range (FTR)
- ▶ Hand Grenade Range (HGR)
- ▶ Army National Guard Property (ARNG)
- ▶ Range Complex 1 (RC 1)
- ▶ Range Complex 2 (RC 2)



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## RI/FS Project to Date

- Final Work Plan September 2012
- Field activities October 2012 through May 2013
- Additional sampling October 2013
- Draft (internal to USACE) RI Report January 2014
- Draft Final RI Report for regulatory review May 2014



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## Planned approach (MEC) Interpreted Impact Areas

- Transect Investigations –
  - Digital Geophysical Mapping (DGM) transects
    - VSP-developed spacing – at 300 ft. and 500 ft.
  - Develop anomaly density figures (low, medium, and high density areas)
- DGM grid locations selected
  - Investigate selected anomalies (targets)
- Evaluate Investigation results and refine (with project team concurrence)
- Figure 3.1a, 3.1b, and 3.1c



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## Planned approach - MEC Outside Interpreted Impact Areas

- Instrument assisted surface reconnaissance
  - Parallel transects, 500-ft spacing
- DGM grids
  - Placed in historical use areas that are outside the interpreted impact areas
- Intrusive Investigation of Selected anomalies in the DGM Grids
- Evaluate Investigation results and refine (with project team concurrence)
- Figure 3.1a, 3.1b, and 3.1c



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## Proposed Transects

- 300 ft DGM Transect
- 500 ft DGM Transect
- 500 ft Recon Transect
- ▭ Former Camp Butner

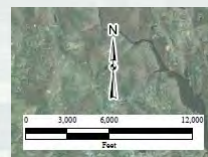


Figure 3.1a, Work Plan proposed transects



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## Planned Approach MC characterization

- 10 incremental sampling methodology (ISM) sampling units (SU) per MRS
- Dependent on ISM surface soil results, conduct additional sampling, if needed
- 10 ISM SUs collected for background (metals)



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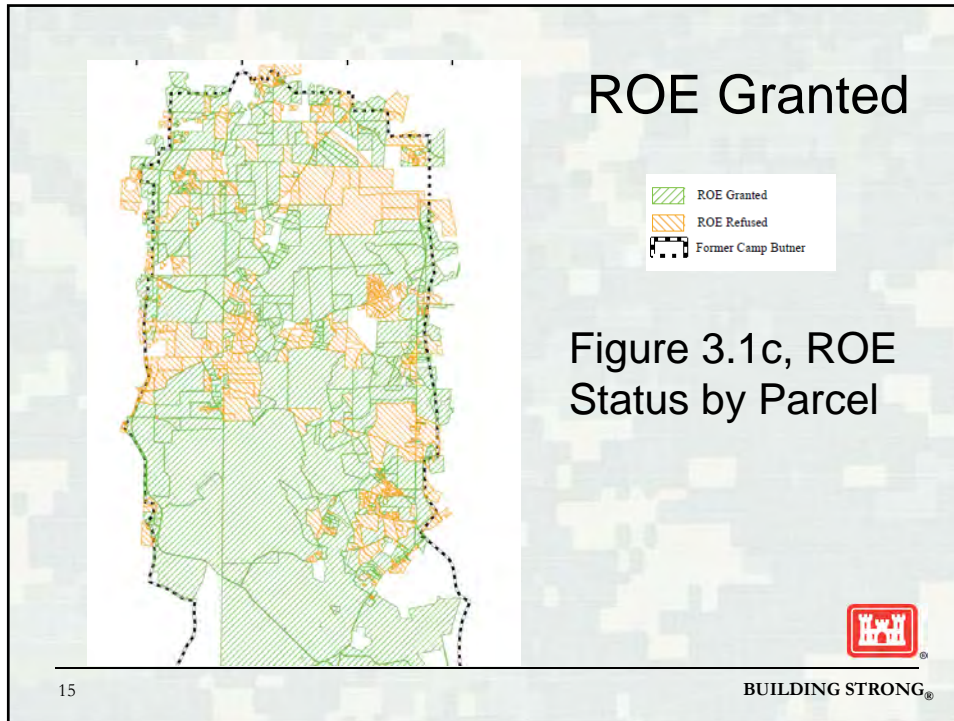
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REMEDIAL INVESTIGATION FIELD ACTIVITIES:  
RI DATA COLLECTED

**FORMER CAMP BUTNER  
REMEDIAL INVESTIGATION**



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## MEC Investigation

### MEC presence confirmed

Activity	Actuals			Proposed			% of Work Plan Proposed Coverage <sup>1</sup>
	RC1 MRS	RC2 MRS	ARNG MRS	RC1 MRS	RC2 MRS	ARNG MRS	
Reconnaissance Transects (miles)	40	48.7	29.2	67	85	29	73%
DGM Density Transects (miles)	68	69.4	49.3	110	98	52	76%
DGM Survey Grids	62	101	89	158	133	77	77%
DGM Grids Intrusive	62	91	89	158	133	77	75%
Analog Intrusive Grids <sup>3</sup>	28	13	NA				
RI met applicable DQOs for areas where ROE were granted? <sup>2</sup>	Yes	Yes	Yes				

1 - Less than 100% due to ROE refusals from landowners  
 2 - DQOs applicable to each MRS are listed in Table 3.4 of the RI report.  
 3- The quantity of analog intrusive grids cannot be estimated during the work plan stage, prior to the field activities, as the specific landowner restrictions on brush cutting are unknown during the work plan stage.

  
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## MEC Located and Destroyed

MEC ID	Anomaly ID (if applicable)	Nomenclature	Type	Date Found	Date Destroyed	MEC	MD
ARNG-001	ARNG 11-43	M48	60mm HE Mortar	3/22/13	3/22/13	X	
ARNG-002	ARNG 14-18	M49	60mm HE Mortar	4/2/13	4/2/13	X	
ARNG-003	NA	M70	57mm AP-T projectile	4/4/13	4/18/13		X
ARNG-004	ARNG 13-05	M2	3.25-inch AA Target Rocket	4/17/13	4/18/13		X
ARNG-005	ARNG 82-16	Mk II	Hand Grenade, HE	4/25/13	4/25/13	X	
ARNG-006	NA	Mk II	Hand Grenade, HE	4/25/13	4/25/13	X	
ARNG-007	NA	Mk II	Hand Grenade, HE	4/25/13	4/25/13	X	
ARNG-008	NA	Mk II	Hand Grenade, HE	4/25/13	4/25/13	X	



04-02-2013 – ARNG-002, M49, 60mm HE Mortar, fuzed; discovered by HGL Team 1 while intrusively investigating grid ARNG-14.



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See also webmap and Figure 1.4 and Figure 4.4a

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## MEC Located and Destroyed



04-25-2013 – ARNG-005, Mk II Hand Grenade; discovered by HGL Team 2 while investigating grid ARNG-082.



04-25-2013 – ARNG-008, Mk II Hand Grenade; discovered by HGL Team 2 while investigating grid ARNG-082.

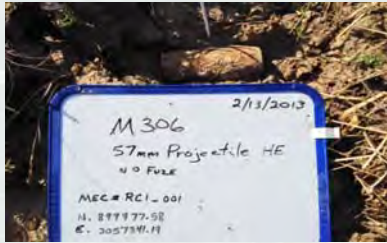


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## MEC Located and Destroyed

MEC ID	Anomaly (if applicable)	Nomenclature	Type	Date Found	Date Destroyed	MEC	MD
RC1-001	NA	M306	57mm HE projectile	2/13/13	2/14/13	X	
RC1-002	NA	M306	57mm HE projectile	2/14/13	2/14/13	X	
RC1-003	NA	M70	57mm AP-T projectile	2/14/13	2/14/13		X
RC1-004	NA	M6	2.36-inch Rocket Warhead	5/16/13	5/16/13	X	



02-13-2013 – RC1-001, M306, 57mm HE Projectile, unfuzed; located by AMEC crew laying on the surface at the Carrington parcel



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## MEC Located and Destroyed

MEC ID	Anomaly (if applicable)	Nomenclature	Type	Date Found	Date Destroyed	MEC	MD
RC2-001	NA	M107	155mm HE projectile	4/15/13	4/15/13	X	
RC2-002	RC2 019-16	M63 Mod 1	37mm Projectile, TP	5/1/13	5/1/13	X	
RC2-003	RC2 106-12	M63 Mod 1	37mm Projectile, TP	5/15/13	5/15/13	X	



05-01-2013 – RC2-002, M63 Mod 1, 37mm TP Projectile; discovered by HGL Team 2 during intrusive investigation operations in grid RC2-019 at Philip Robbins' property.



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## MC Investigation

- No risks to human health or ecological receptors was identified during the MC investigation
- Samples collected in biased locations
  - Areas where MEC and/or large quantities of MD were found
  - Areas of high anomaly density

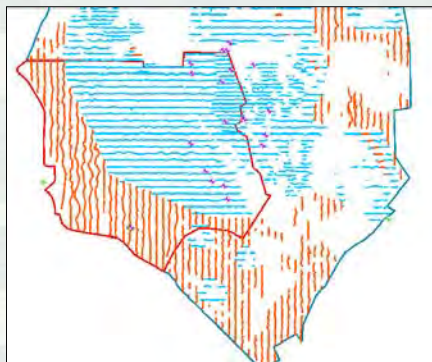


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See Figure 1.4 and Figure 4.7, and webmap

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## MC Investigation



- Ten ISM soil samples each were collected from RC1 MRS and RC2 MRS.
- Eleven ISM soil samples were collected from the ARNG MRS. (1 additional at the new Hand Grenade Range MRS)
- Ten ISM soil samples were collected from outside the MRA boundary, to be representative of ambient soil conditions.




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See Figure 1.4 and Figure 4.7, and webmap

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**REMEDIAL INVESTIGATION SUMMARY AND  
RECOMMENDATIONS**

**FORMER CAMP BUTNER  
REMEDIAL INVESTIGATION**

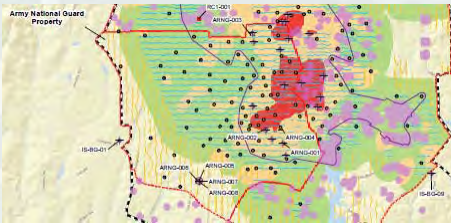


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## Remedial Investigation Report

Results of the remedial investigation are presented in the  
RI Report

- ▶ MEC results, including a MEC hazard assessment (MEC HA)
- ▶ MC results, including a risk assessment



RI conclusions:  
Are MEC hazards present?  
If so, what is the extent?  
Are MC hazards present?  
If so, what is the extent?



24 See Figure 1.4 and 4.4a,  
Presenting MEC contamination boundary proposed

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## MEC Characterization

- RI conclusion: there is potential for human receptors to come into contact with explosive hazards
  - ▶ The extent of the MEC contamination has been determined
  - ▶ An MRS boundary for the MEC contamination is recommended
  - ▶ A Remaining Lands MRS is recommended to be established (areas outside the MEC contaminated area, with a low potential for explosive hazards)
  - ▶ A new Hand Grenade Range to be established
  - ▶ Applicable MRSs are recommended to go forward to the Feasibility Study



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## MC Characterization

- No MC was detected at levels constituting a risk to human health or the environment, indicating there is no MC contamination.
- No risk to human health based on the risk assessment
- No ecological risks were identified



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## MRSs Recommended for FS For MEC Hazards only

- Feasibility study recommended for the following MRS:
  - ▶ MEC Contaminated Area
  - ▶ Remaining Lands Area
  - ▶ FTR MRS
  - ▶ ARNG Hand Grenade Range
- No Further Action
  - ▶ HGR MRS



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## Feasibility Study

- Based on the RI recommendations
  - ▶ Different remedies and technologies are explored and screened
  - ▶ A cost analysis is done for each alternative presented
  - ▶ The best alternative is evaluated and the proposed plan presents a recommended alternative
  - ▶ Recommendations will be presented at a public meeting




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CLOSING AND ACTION ITEMS REVIEW

**FORMER CAMP BUTNER  
REMEDIAL INVESTIGATION**


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**Moving Forward - Schedule**

- TPP Meeting #3 (today)
  - Follow up Teleconference to discuss review comments)
- Final RI Report (June/July 2014)
- Draft through Final FS (June through August 2014)
- Draft through Final Proposed Plan (July to September 2014)
- Proposed Plan Public Meeting (September 2014)
- Draft through Final Decision Document (September through December 2014)

*Overlap reviews of draft documents with other deliverables*



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Action Items Review and Closing



**Questions?**

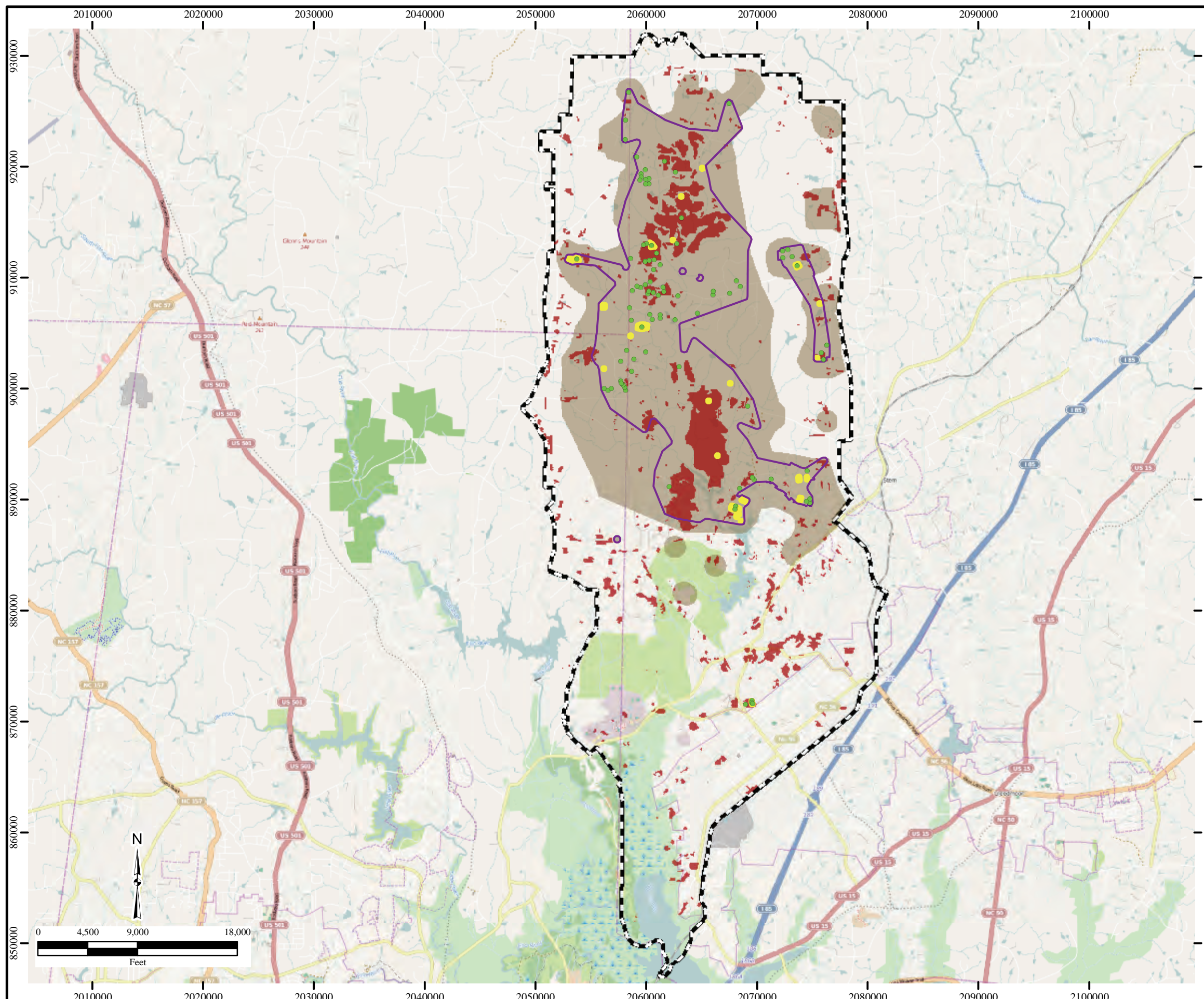
*RC2-001, M107, 155mm HE Projectile*











**Attachment 3 – RAB Meeting Handouts**

**Figure 1.3**  
**MRS Historical**  
**Investigation Results**



**Legend**

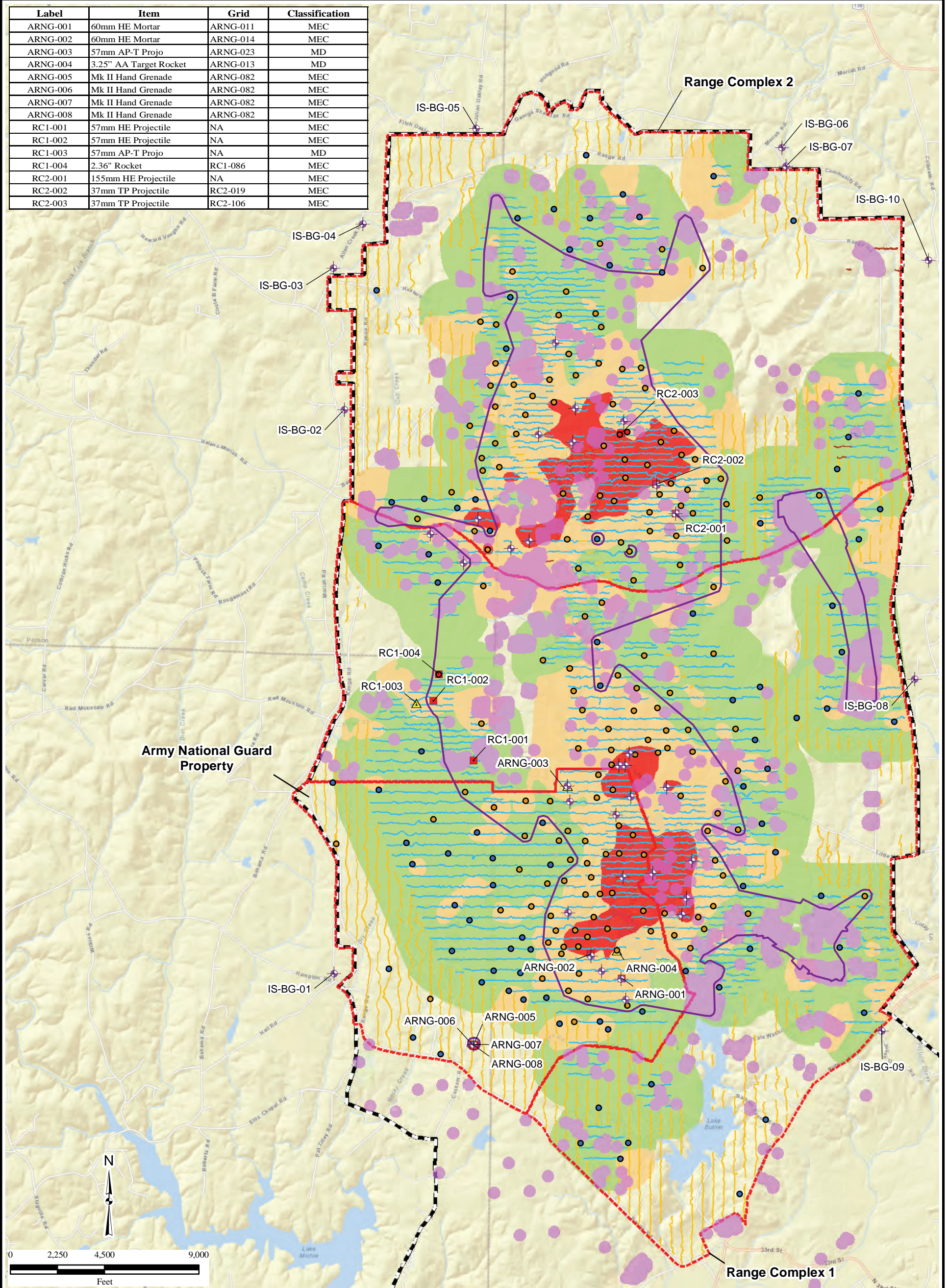
-  Historical MEC Findings
-  MEC Area Based on Historical MEC Findings
-  MEC Contamination
-  Historical Analysis Area
-  Suspected Munitions Use Area
-  Former Camp Butner

Notes:  
Historical results include the EE/CA data and various data from previous removal actions.

MRS=Munition Response Site  
RI=Remedial Investigation

\\Gst-srv-01\HGLGIS\Camp\_Butner\_MSIW\RI\_Report\  
(1-03)Historical\_Use.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Street Map





Label	Item	Grid	Classification
ARNG-001	60mm HE Mortar	ARNG-011	MEC
ARNG-002	60mm HE Mortar	ARNG-014	MEC
ARNG-003	57mm AP-T Projo	ARNG-023	MD
ARNG-004	3.25" AA Target Rocket	ARNG-013	MD
ARNG-005	Mk II Hand Grenade	ARNG-082	MEC
ARNG-006	Mk II Hand Grenade	ARNG-082	MEC
ARNG-007	Mk II Hand Grenade	ARNG-082	MEC
ARNG-008	Mk II Hand Grenade	ARNG-082	MEC
RC1-001	57mm HE Projectile	NA	MEC
RC1-002	57mm HE Projectile	NA	MEC
RC1-003	57mm AP-T Projo	NA	MD
RC1-004	2.36" Rocket	RC1-086	MEC
RC2-001	155mm HE Projectile	NA	MEC
RC2-002	37mm TP Projectile	RC2-019	MEC
RC2-003	37mm TP Projectile	RC2-106	MEC

\\Gst-srv-01\HGLGIS\Camp\_Butner\_MSI\RI\_Report\  
 (1-04)MEC\_MD.mxd  
 5/1/2014 RB  
 Source: HGL, ESRI Online Imagery

<ul style="list-style-type: none"> <li>■ MEC</li> <li>▲ Munition Debris</li> <li>⊕ Background Sample Location</li> <li>● Grid Intrusive Results</li> <li>● MEC</li> <li>● Munition Debris</li> <li>● Cultural Debris</li> <li>● Other</li> <li>● SAA, Other</li> </ul> <p>Notes:                      DGM=Digital Geophysical Mapping                      MD=Munitions Debris                      MEC=Munitions and Explosives of Concern                      MRS=Munitions Response Site                      NA=Not Applicable                      SAA=Small Arms Ammunition</p>	<p><b>Legend</b></p> <ul style="list-style-type: none"> <li>— Analog Transect</li> <li>— DGM Transect</li> <li>— Recon Transect</li> <li>— MEC Contamination Boundary</li> <li>⬜ MRS</li> <li>■ MEC Characterized Area</li> <li>⬜ Former Camp Butler</li> </ul>	<ul style="list-style-type: none"> <li>■ High Anomaly Density</li> <li>■ Medium Anomaly Density</li> <li>■ Low Anomaly Density</li> </ul>
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**Figure 1.4**  
**MEC and MD Found**



**Figure 3.1a**  
**Proposed Transect Paths**

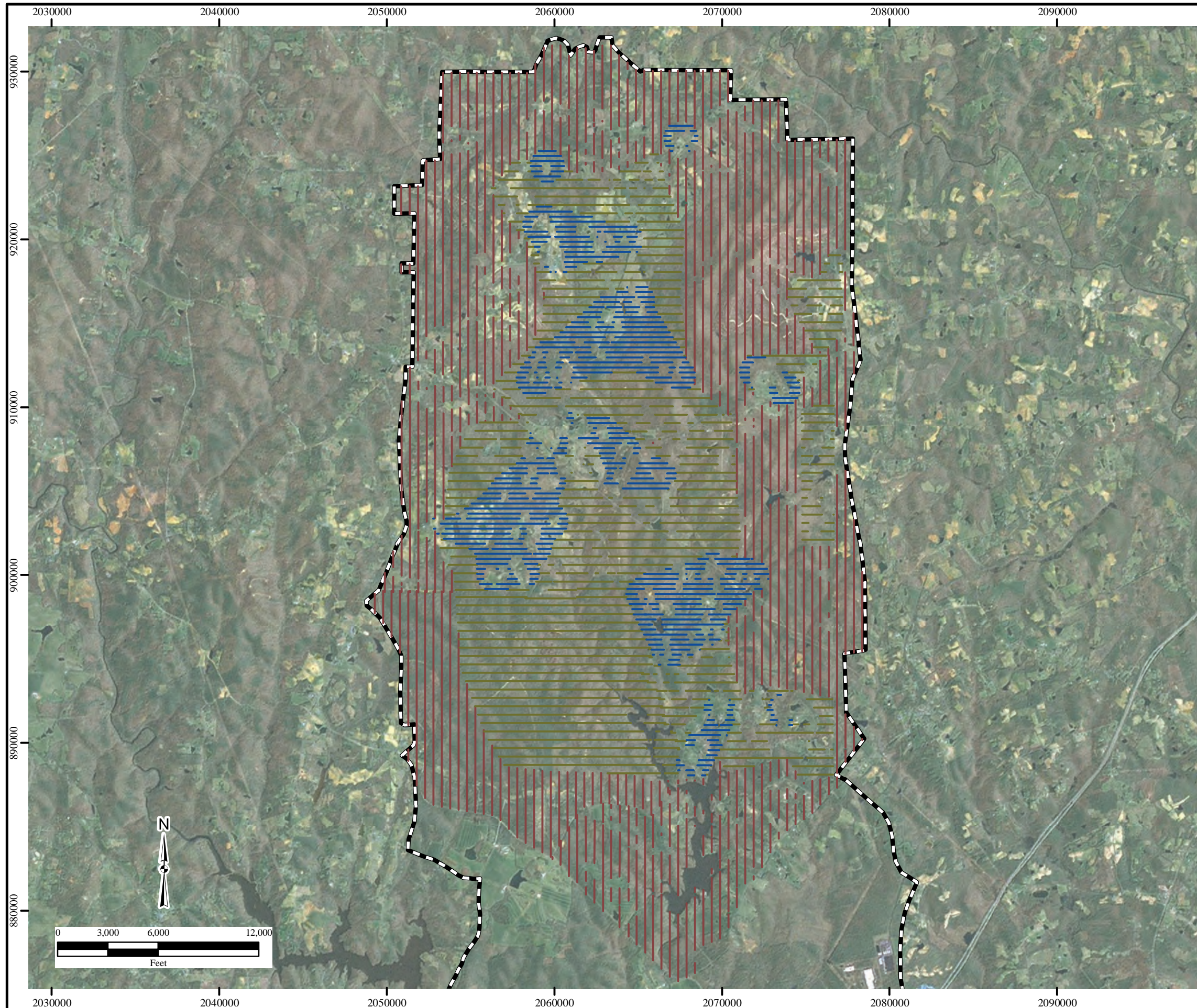
Legend

-  300 ft DGM Transect
-  500 ft DGM Transect
-  500 ft Recon Transect
-  Former Camp Butner

Notes:  
DGM=digital geophysical investigation  
RI=remedial investigation





Transects are spaced at 300ft in areas where 37mm projectiles have been found. Transects are spaced at 500ft in all other areas. Non-intrusive DGM transects will be used to determine the extent of areas with elevated anomaly concentrations. After initial transect investigation, grids will be placed to define nature of anomalies. DGM Grids will be placed at 20% of DGM Transect acreage and intrusively investigated. DGM Grids will also be placed in areas where TEC Historical Analysis is not covered by DGM Transects at rate of 3% of the TEC acreage. Reconnaissance Transects will be non-intrusive, instrument assisted transects to verify the absence of MEC use. Areas presently characterized will not be investigated.

\\Gst-srv-01\HGLGIS\Camp\_Butner\MSIW\RI\_Report\  
(3-01a)Prop\_Transects.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery



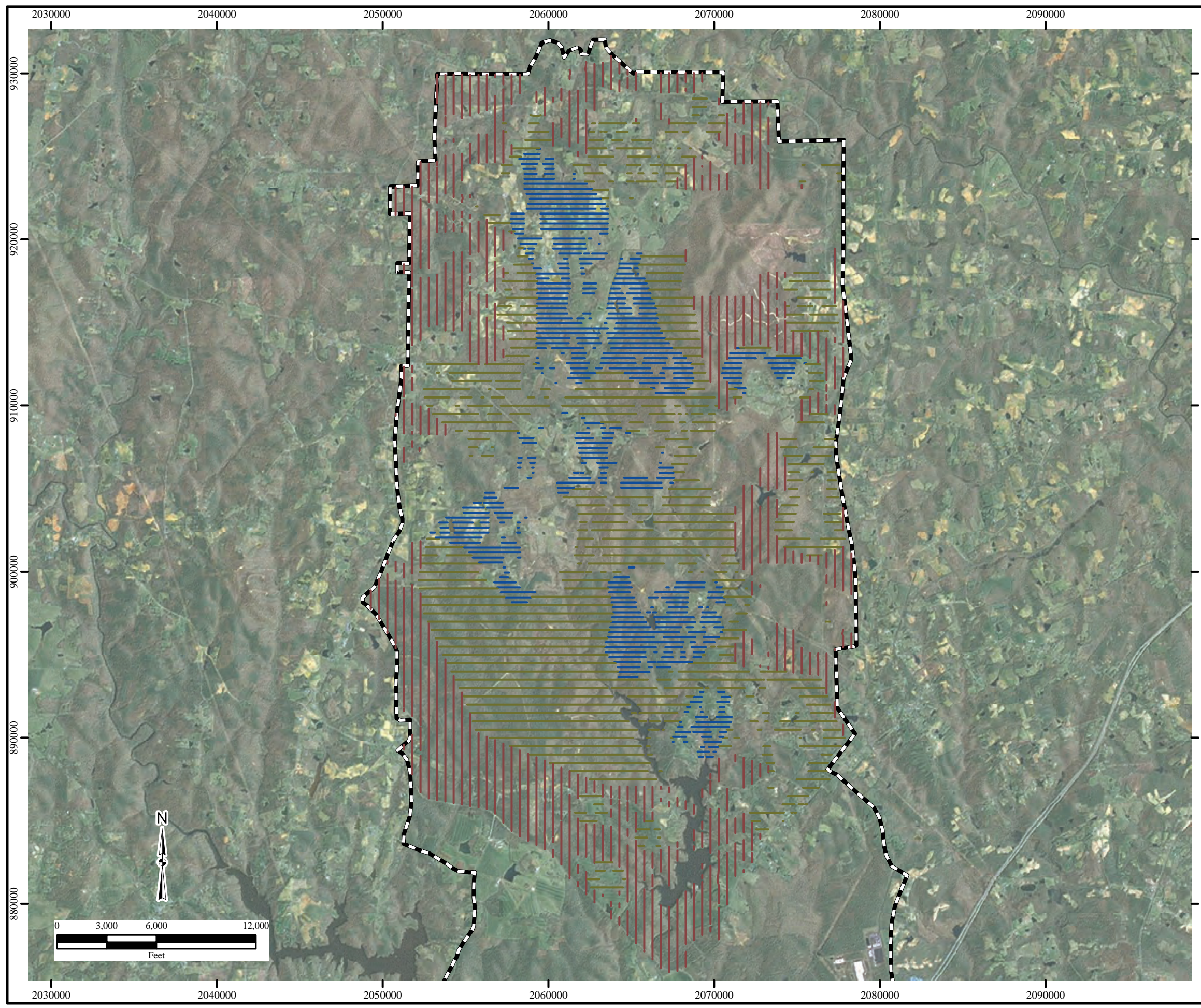
**Figure 3.1b**  
**Proposed Transect Paths**

Legend

-  300 ft DGM Transect
-  500 ft DGM Transect
-  500 ft Recon Transect
-  Former Camp Butner

Notes:  
DGM=digital geophysical investigation  
RI=remedial investigation

Transects are spaced at 300ft in areas where 37mm projectiles have been found. Transects are spaced at 500ft in all other areas. Non-intrusive DGM transects will be used to determine the extent of areas with elevated anomaly concentrations. After initial transect investigation, grids will be placed to define nature of anomalies. DGM Grids will be placed at 20% of DGM Transect acreage and intrusively investigated. DGM Grids will also be placed in areas where TEC Historical Analysis is not covered by DGM Transects at rate of 3% of the TEC acreage. Reconnaissance Transects will be non-intrusive, instrument assisted transects to verify the absence of MEC use. Areas presently characterized will not be investigated.






\\Gst-srv-01\HGLGIS\Camp\_Butner\MSIW\RI\_Report\  
(3-01b)Prop\_Transects.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery

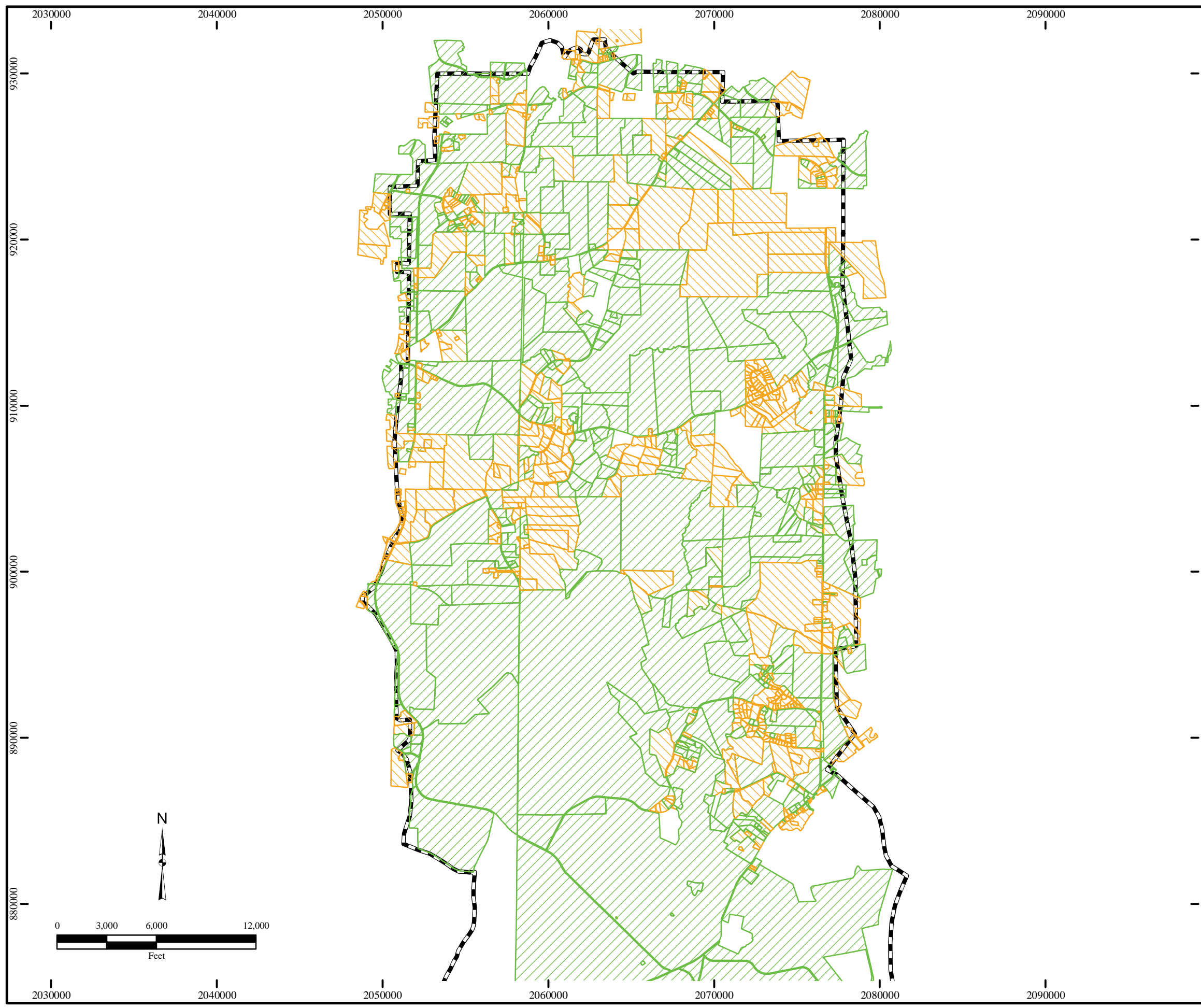


**Figure 3.1c**  
**Proposed Transect Paths**

Legend







-  ROE Granted
-  ROE Refused
-  Former Camp Butner

\\Gst-srv-01\HGLGIS\Camp\_Butner\Miscellaneous\_Figures\  
(3-01c)Prop\_Transects.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery

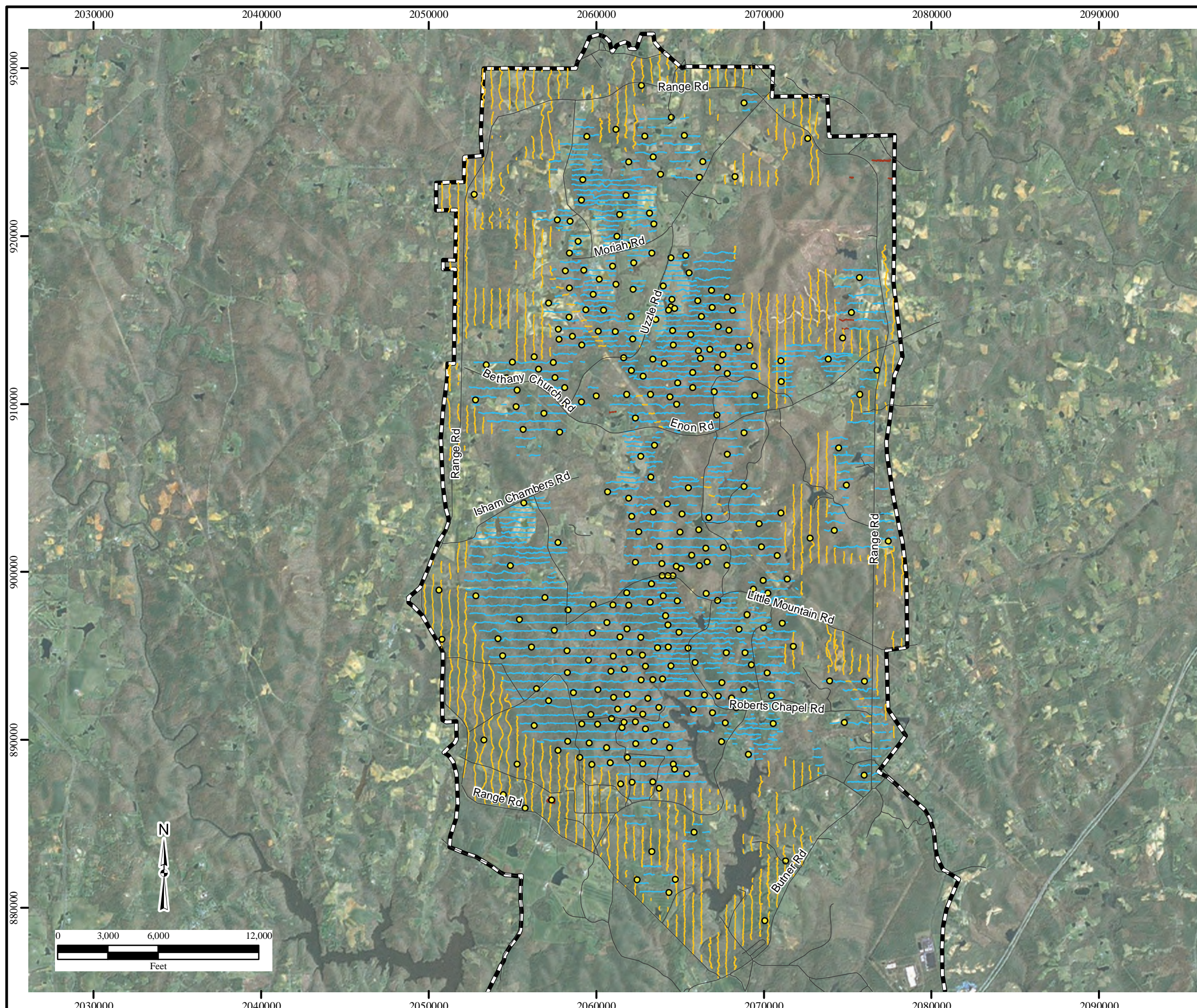


**Figure 4.1**  
**Actual Transect Paths and**  
**Grid Locations**

Legend

-  Grid
-  Analog Transect
-  DGM Transect
-  Recon Transect
-  Road
-  Former Camp Butner

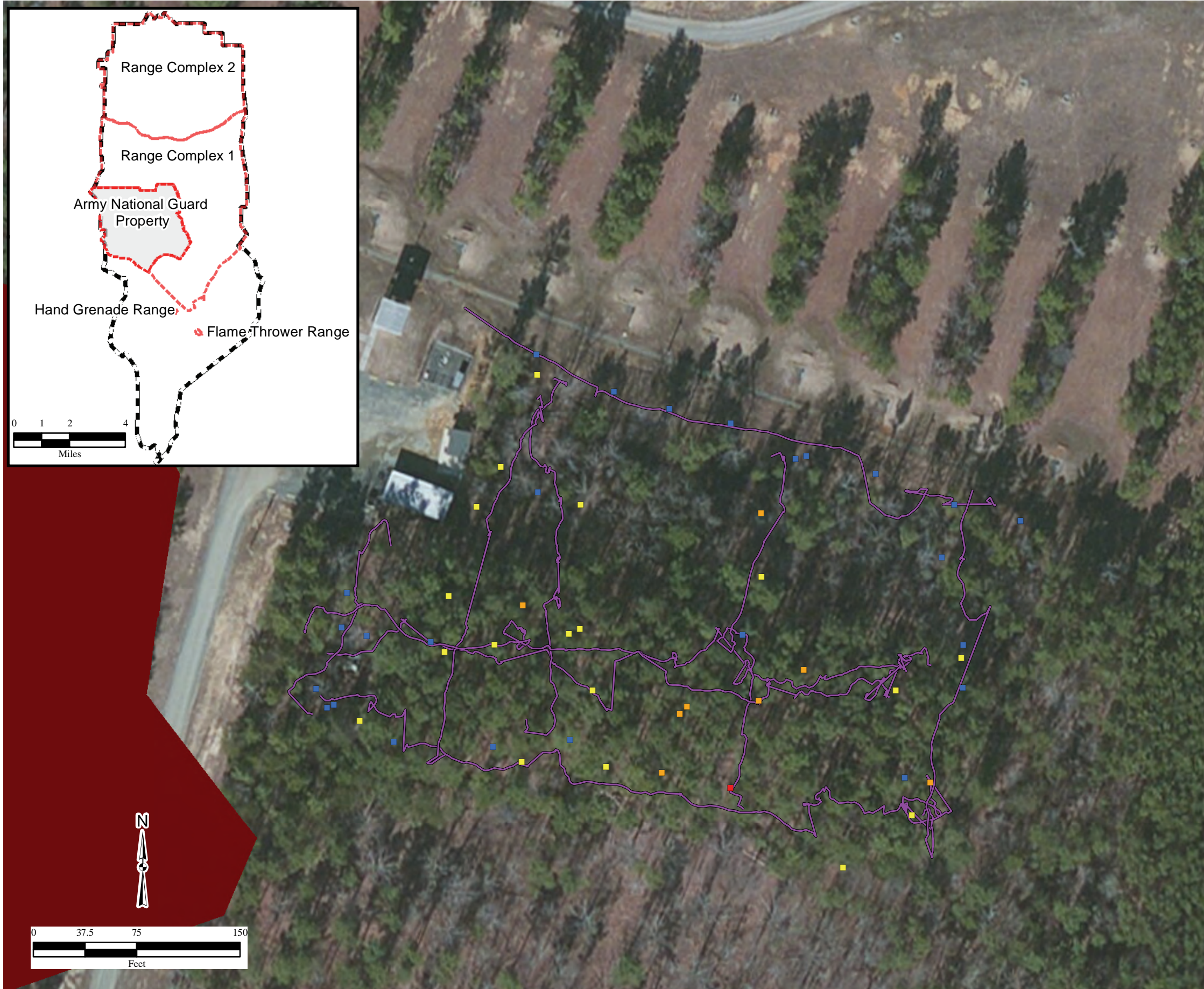
Notes:  
DGM=Digital Geophysical Mapping  
Grid locations displayed are the southwest corner points.



\\Gst-srv-01\HGLGIS\Camp\_Butner\_MSIW\RI\_Report\  
(4-01)Transects\_Grids.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery



**Figure 4.2**  
**Army National Guard**  
**Grenade Range**



**Legend**

**Anomaly Counts (Surface and Subsurface Counts)**

- 0-10
- 10-20
- 20-30
- 30-40

— Analog Transect

■ TEC Historical Analysis

□ MRS

□ Former Camp Butner

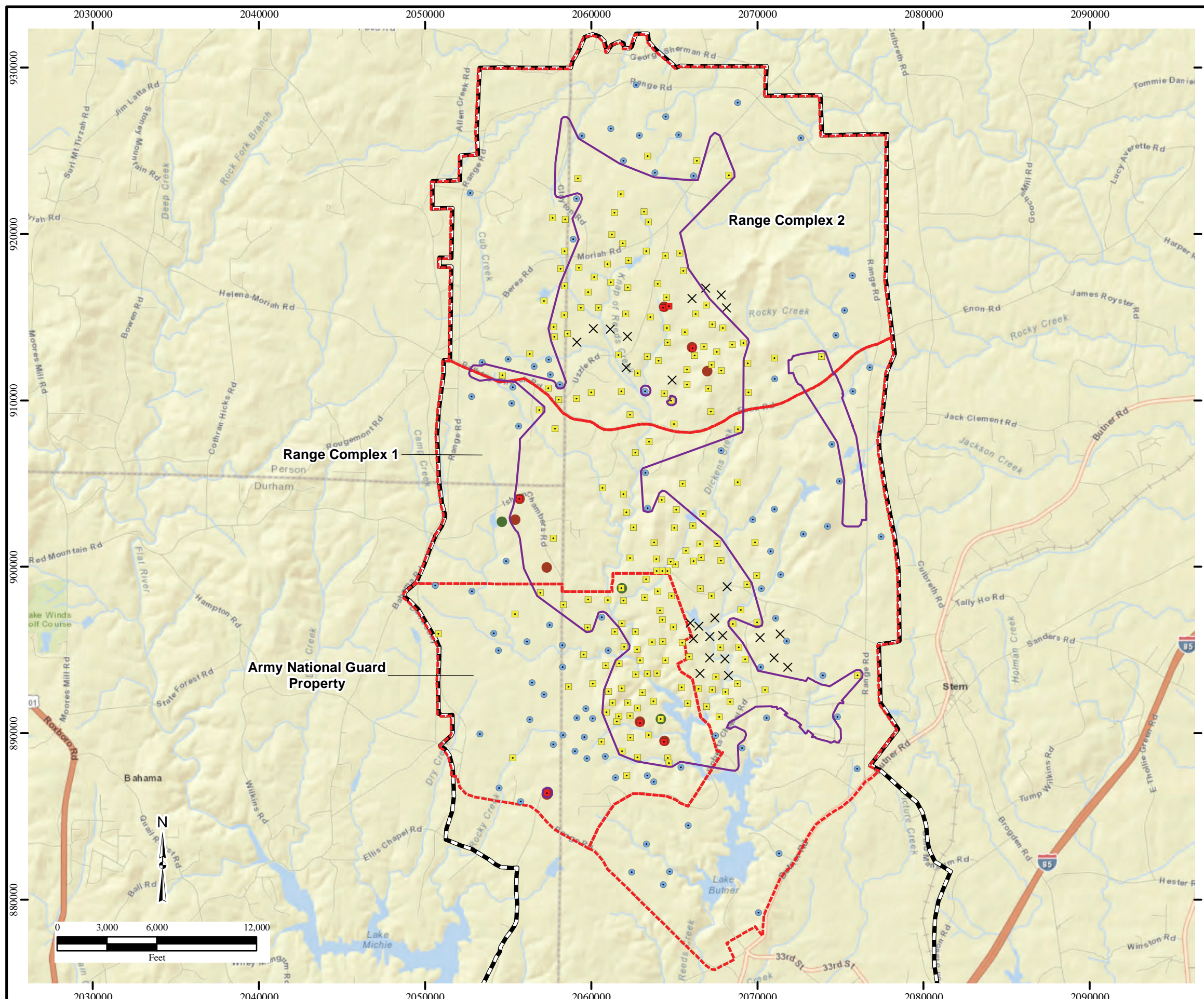
Note:  
MRS=munitions response site

\\Gst-srv-01\HGLGIS\Camp\_Butner\MSI\RI\_Report\  
(4-02)Anomaly\_Counts.mxd  
5/1/2014 JP  
Source: HGL, USACE  
ESRI Online Bing Maps Aerial  
Coordinate System: NAD83, State Plane, North Carolina FIPS 3200, Feet





**Figure 4.4a**  
**Remedial Investigation**  
**MEC Delineation**



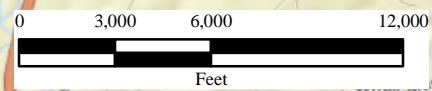
**Legend**

- MEC
  - Muniton Debris
- Grid Intrusive Results**
- MEC
  - Muniton Debris
  - Cultural Debris
  - × Access Refused
  - MEC Contamination
  - MRS
  - Former Camp Butner

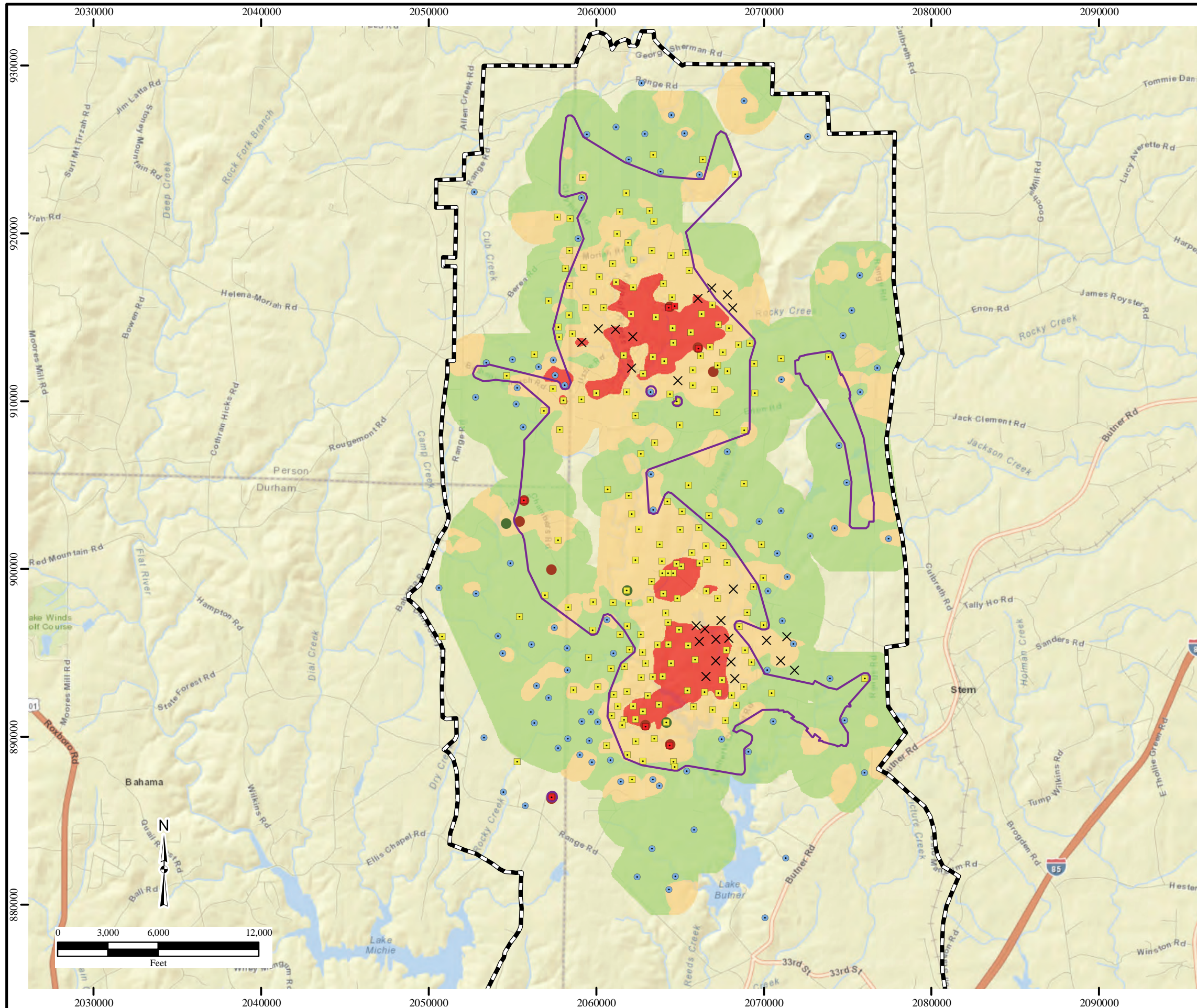
Notes:  
Grid locations displayed are the southwest corner points.  
ARNG MEC contaminated area = 1267.44 acres  
ARNG remaining land = 3557.02 acres  
RC1 MEC contaminated area = 5220.70 acres  
RC1 remaining land = 7142.32 acres  
RC2 MEC contaminated area = 4298.50 acres  
RC2 remaining land = 7230.89 acres

ARNG= Army National Guard Property  
MRS=Muniton Response Site  
MEC=Munitions and Explosives of Concern  
RC=range complex

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5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery



**Figure 4.4b**  
**Digital Geophysical Mapping**  
**Anomaly Density**



Legend

- MEC
- Munition Debris
- Grid Intrusive Results**
- MEC
- Munition Debris
- Cultural Debris
- × Access Refused
- ▭ MEC Contamination
- ▭ MRS
- High Anomaly Density
- Medium Anomaly Density
- Low Anomaly Density
- ▭ Former Camp Butner






Notes:  
Grid locations displayed are the southwest corner points.  
DGM=Digital Geophysical Mapping  
MEC=Munitions and Explosives of Concern

\\Gst-srv-01\HGLGIS\Camp\_Butner\_MSIW\RI\_Report\  
(4-04b)DGM\_AnomDens.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery



**Figure 4.4c**  
**All Historical Investigation Results**

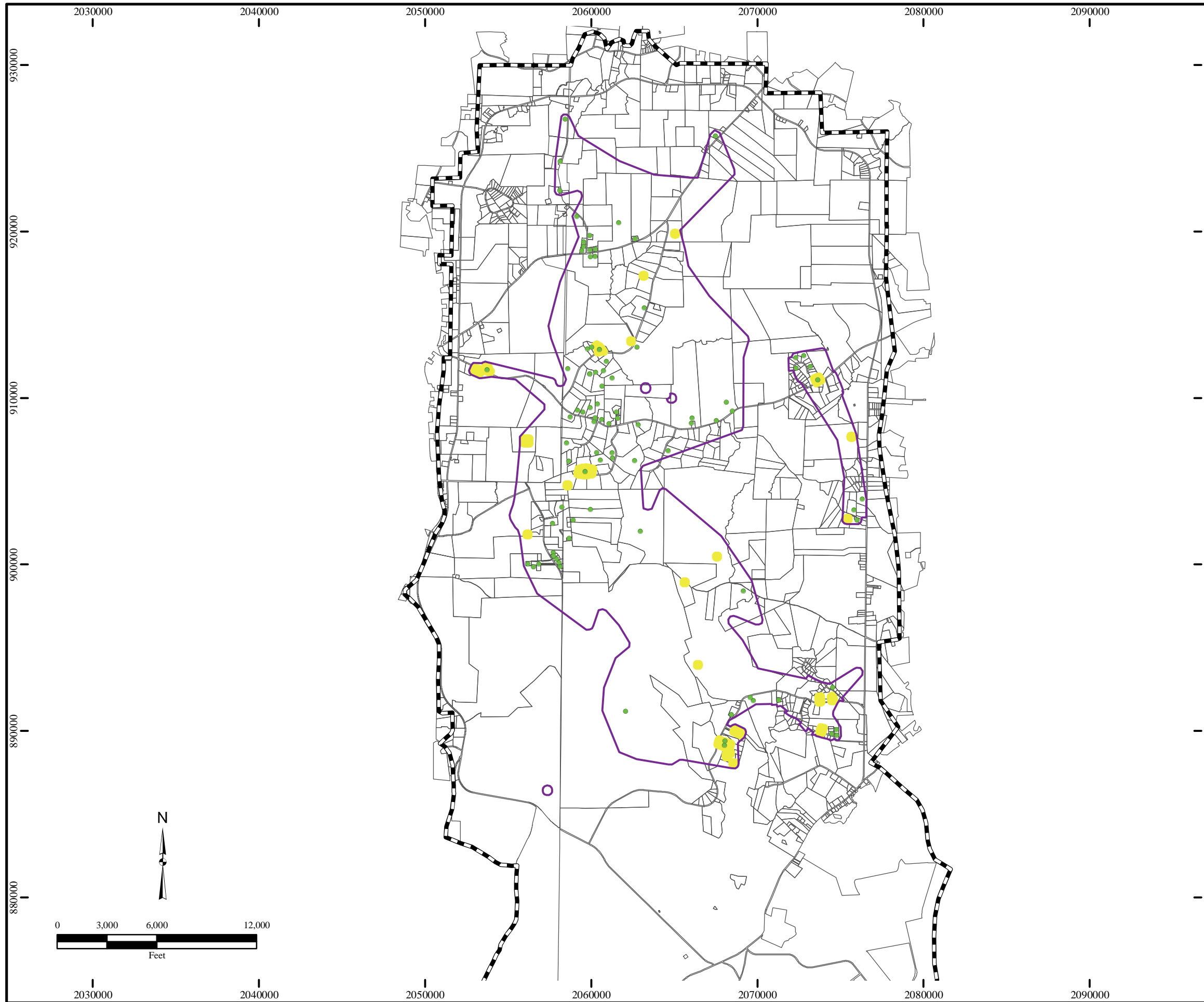
**Legend**

-  Historical MEC Findings
-  MEC Area Based on Historical MEC Findings
-  MEC Contamination
-  Parcel
-  Former Camp Butner

Notes:  
Historical result include the EE/CA data and various data from previous removal actions.

MEC=Munitions and Explosives of Concern  
mm=millimeter

\\Gst-srv-01\HGLGIS\Camp\_Butner\_MSI\WRI\_Report\  
4-04c\Historical\_Results.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery



**Figure 4.4d**  
**Removal Action Investigation Results**

**Legend**

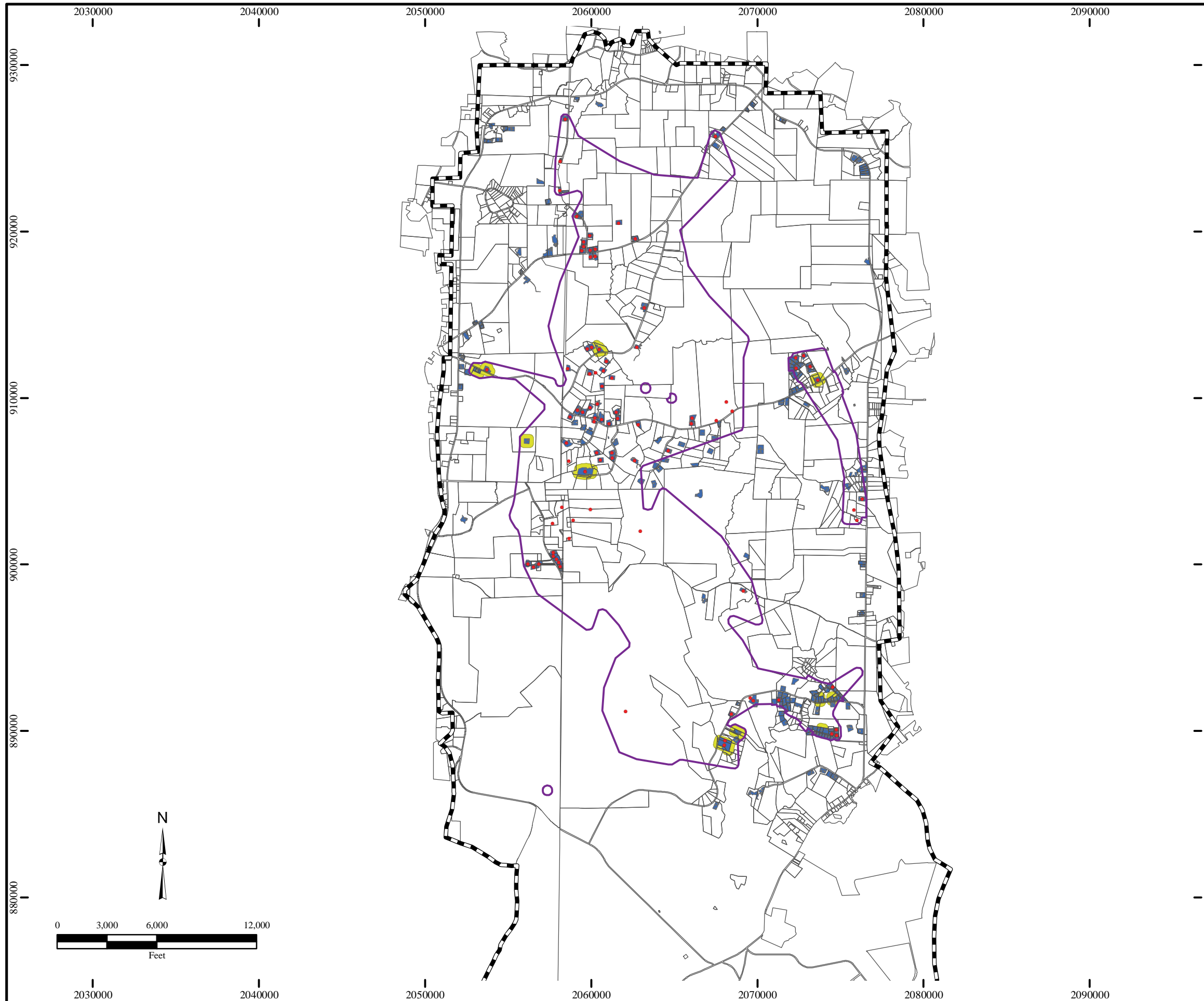
- Historical MEC Findings
- MEC Area Based on Historical MEC Findings
- Clearance Areas
- MEC Contamination
- Parcel
- Former Camp Butner

**Notes:**

Historical result include the EE/CA data and various data from previous removal actions.  
Data includes removal actions: Time Critical Removal Action (TCRA) - Lakeview Subdivision (Parsons, 2003), TCRA - Blalock and Riley Properties (USA, 2004), Removal Action Flame Trower Range (USA, 2006); and Removal Actions at Lakeview Subdivision and other Residential Parcels conducted within RC1 and RC2 (USA, 2010 and 2011).




MEC=Munitions and Explosives of Concern  
mm=millimeter

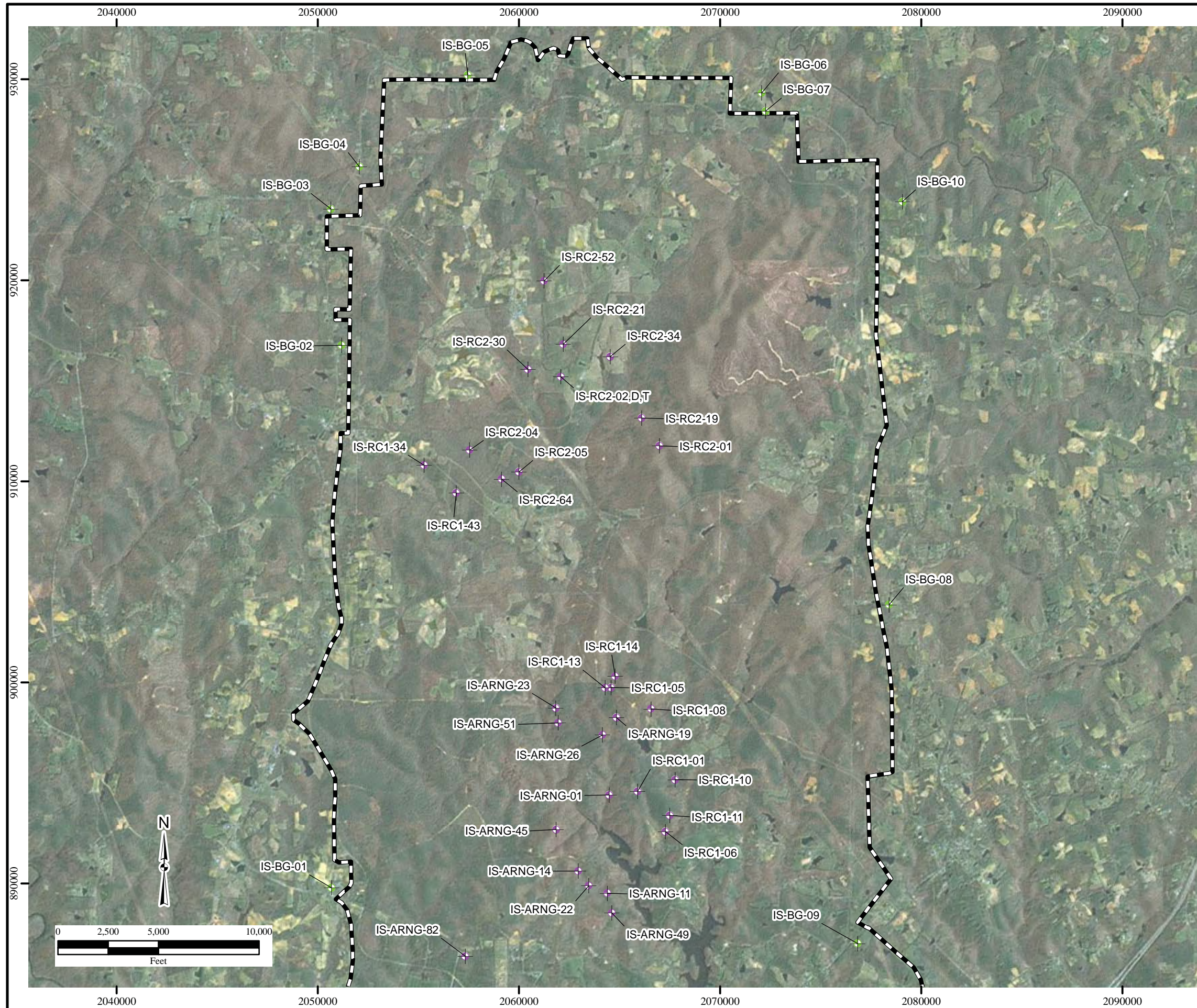
\\Gst-srv-01\HGLGIS\Camp\_Butner\MSIW\RI\_Report\  
(4-04d)Historical\_Results.mxd  
5/1/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery



**Figure 4.5**  
**Sample Locations**

Legend

-  Incremental Sample
-  Background Sample
- IS-RC2-01 Sample Identification
-  Former Camp Butner



\\Gst-srv-01\HGLGIS\Camp\_Butner\_MSIW\RI\_Report\  
(4-07)Sample\_Locs.mxd  
2/4/2014 RB  
Source: HGL, USACE  
ESRI Online Aerial Imagery

