

**Final  
Site-Specific Field Sampling Plan,  
Site-Specific Safety and Health Plan, and Site-Specific  
Unexploded Ordnance Safety Plan Attachments for  
Engineering Evaluation/Cost Analysis at  
the Baby Bains Gap Road Ranges**

**Range 18, Down Range Feedback  
(Known Distance) Range, Parcel 74Q,  
Range 20, Infiltration Course, Parcel 76Q-X,  
Range 23, Trainfire (Record) Range, Parcel 79Q,  
Range 25, Known Distance Range, Parcel 83Q,  
Range 26, Live Fire and Maneuver Range, Parcel 84Q-X,  
Main Post Impact Area, Parcel 118Q-X,  
and Former Range 25 East, Parcel 223Q**

**Fort McClellan, Calhoun County, Alabama**

**Task Order CK11  
Contract No. DACA21-96-D-0018  
IT Project No. 800486**

**January 2002**

**Revision 0**

**Final  
Site-Specific Field Sampling Plan Attachment for the  
Engineering Evaluation/Cost Analysis at  
Baby Bains Gap Road Ranges**

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Range, Parcel 74Q,  
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Main Post Impact Area, Parcel 118Q-X,  
and Former Range 25 East, Parcel 223Q**

**Fort McClellan  
Calhoun County, Alabama**

**Prepared for:**

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Task Order CK11  
Contract No. DACA21-96-D-0018  
IT Project No. 800486**

**January 2002**

**Revision 0**

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## **List of Acronyms**

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See Attachment 1, List of Abbreviations and Acronyms.

## ***Executive Summary***

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In accordance with Contract Number DACA21-96-D-0018, Task Order CK11, IT Corporation (IT) will conduct engineering evaluation/cost analysis (EE/CA) investigation activities at the Baby Bains Gap Road (BBGR) ranges located at Fort McClellan (FTMC), Calhoun County, Alabama. These ranges include:

- Range 18, Down Range Feedback (Known Distance) Range, Parcel 74Q
- Range 20, Infiltration Course, Parcel 76Q-X
- Range 23, Trainfire (Record) Range, Parcel 79Q
- Range 25, Known Distance Range, Parcel 83Q
- Range 26, Live Fire and Maneuver Range, Parcel 84Q-X
- Main Post Impact Area, Parcel 118Q-X
- Former Range 25 East, Parcel 223Q.

In August 2001, a separate work plan was issued for Range 25, Parcel 83Q and Main Post Impact Area, Parcel 118Q-X (IT, 2001). The site history and the sampling/analytical discussion for these two sites will not be repeated within this work plan; however, these sites will be included in the BBGR EE/CA scope of work by reference. This site-specific field sampling plan (SFSP) will address safety fan sampling that will be performed in Range 25. The safety fan data will supplement the data gathered under the separate August 2001 work plan for the BBGR range EE/CA report.

This EE/CA investigation will determine the presence or absence and nature and extent of potential site-specific chemicals (PSSC) at this site via ecological and human health risk assessment techniques. The data and risk assessment evaluation will be used to complete the engineering evaluation and cost analysis portions of the EE/CA report. The purpose of this SFSP is to provide technical guidance for sampling activities at the BBGR ranges.

The BBGR ranges are located in the east-central area of the Main Post of FTMC. Parcels 74Q, 76Q-X, 79Q, 83Q, 84Q-X, 118Q-X, and 223Q are primary ranges of concern for the area of investigation as defined in the environmental baseline survey (EBS). This EE/CA investigation includes sampling of the firing lines, impact zones, and safety fan areas of these ranges.

***Range 18, Down Range Feedback (Known Distance) Range, Parcel 74Q.*** The EBS states that Range 18 was constructed around 1940 or 1941 and was used as a rifle range with possible machine gun use. Neither explosives nor fuzed ordnance was reportedly used at Range 18. Range orientation has always been to the southeast with a natural hillside mainly

serving as the range impact zone. These facts were verified through aerial photograph evaluation.

**Range 20, Infiltration Course, Parcel 76Q-X.** The EBS states that Range 20 has been in use since 1980. M-60 machine guns were fired at this range. Dynamite, TNT, and C4 explosive were also used here for artillery simulation. The presence of circular pits for artillery impact simulation is documented in aerial photographs. The principle area of investigation of this range is the impact zone for the M-60 machine guns that were identified in the 1998 aerial photograph. The area of this range where the artillery impact simulation pits, the machine gun firing points, and the range tower were located was regraded and all of the structures removed by September 1999.

**Range 23, Trainfire (Record) Range, Parcel 79Q.** The EBS states that Range 23 has been in use since 1951 for M-16 automatic rifle and tracer training. Range 23 closed in September 1999. Artillery ordnance impacts have been observed at Range 23; specifically, shell fragments and an unexploded mortar round have been found here. In the *Archives Search Report (ASR)*, the Range 23 site history describes this range as starting the Inter-War period as a pistol range and later changed into rifle and machine gun training with multiple orientations and layouts utilized during this period (USACE, 1999a). An evaluation of aerial photography indicates the earliest activity in this range area was in November 1961. By 1964, the range had a distinctive pattern of roads and firing lanes present. The impact zone for this range is expected to be the target mounds present in each firing lane and the hillside area southeast of the range.

**Range 25, Known Distance Range, Parcel 83Q and Main Post Impact Area, Parcel 118Q-X.** The site history for these parcels are discussed in the referenced Range 25 work plan (IT, 2001).

**Range 26, Live Fire and Maneuver Range, Parcel 84Q-X.** The EBS states Range 26 was first displayed on the 1959 map prepared by the U.S. Army Map Service. FTMC Range Control records show that M-16 rifles were used continuously at this range from 1976 to base closure during day and night fire and maneuver training. Aerial photographs do not indicate any development of the range until December 1982. Roads and firing lanes are visible on the February 1994 and March 1998 aerial photographs. The impact zones of this range are expected to be the target mounds located in the firing lanes and the elevated area southeast of the range.

**Former Range 25 East, Parcel 223Q.** The EBS states that former Range 25 East is only shown on the General Map of FTMC from the Office of the Post Quartermaster in 1937. There is not any other existing documentation for Range 25 East and the specific use and dates of operation for this range are unknown. It was presumed in the EBS that this range had the same layout and orientation as Range 25 and that similar caliber weapons were fired here. Aerial photographs do not show any evidence of activities at Range 25 East during the late 1930s to 1944. Several documented ranges have been constructed over the former Range 25 East area.

Specifically, IT will collect 252 surface soil samples, 57 subsurface soil samples, 12 groundwater samples, 26 depositional soil samples, and 1 surface water and sediment sample at the BBGR range sites. Presumably metals from weapons firing will be the main source of contamination at Parcels 74Q, 76Q-X, 79Q, 83Q, 84Q-X, 118Q-X, and 223Q, but other unknown sources will be investigated. Chemical analyses of the samples collected during the field program will include metals (specifically lead) but on selected samples, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), herbicides, chlorinated and organophosphorous pesticides, polychlorinated biphenyls (PCB), and nitroaromatic and nitramine explosive compounds will also be included. In addition, sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with human health site-specific screening levels (SSSL) and ecological screening values (ESV) as a part of an ecological and human health risk assessment screening. These SSSLs and ESVs are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b).

The BBGR ranges fall within the “Possible Artillery Impact Areas” shown on Plate 10 of the ASR. Therefore, unexploded ordnance (UXO) surface sweeps and downhole surveys of soil borings will be required to support field activities at these parcels. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance. The U.S. Army Corps of Engineers-Huntsville Center of Excellence is conducting separate investigations at Fort McClellan to determine the presence or absence of UXO. The BBGR ranges will be investigated as part of the Bravo Area UXO EE/CA investigation which began in April 2001.

This SFSP is an attachment to the installation-wide sampling and analysis plan (SAP) and summarizes the scope of work for Parcels 74Q, 76Q-X, 79Q, 83Q, 84Q-X, 118Q-X, and 223Q. It will be used in conjunction with the site-specific safety and health plan, the site-specific UXO safety plan, the installation-wide work plan, and the SAP. The SAP includes the installation-

wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan. Site-specific hazard analyses are included in the site-specific safety and health plan.

## **1.0 Project Description**

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### **1.1 Introduction**

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for an engineering evaluation/cost analysis (EE/CA) of the ranges associated with Baby Bains Gap Road (BBGR). Specifically, the BBGR ranges include:

- Range 18, Down Range Feedback (Known Distance) Range, Parcel 74Q
- Range 20, Infiltration Course, Parcel 76Q-X
- Range 23, Trainfire (Record) Range, Parcel 79Q
- Range 25, Known Distance Range, Parcel 83Q
- Range 26, Live Fire and Maneuver Range, Parcel 84Q-X
- Main Post Impact Area, Parcel 118Q-X
- Former Range 25 East, Parcel 223Q.

This work is performed under Task Order CK11, Contract Number DACA21-96-D-0018.

In August 2001, a separate work plan was issued for Range 25, Parcel 83Q and Main Post Impact Area, Parcel 118Q-X (IT, 2001). The site history and the sampling/analytical discussion for these two sites will not be repeated within this work plan; however, these sites will be included in the BBGR EE/CA scope of work by reference. This site-specific field sampling plan (SFSP) will address safety fan sampling that will be performed in Range 25. The safety fan data will supplement the data gathered under the separate August 2001 work plan for the BBGR EE/CA report.

This SFSP is an attachment to the FTMC installation-wide sampling and analysis plan (SAP) (IT, 2000a). This SFSP provides technical guidance for sample collection and analysis at an area of investigation encompassing Parcels 74Q, 76Q-X, 79Q, 83Q, 84Q-X, 118Q-X, and 223Q, and will be used in conjunction with the installation-wide work plan (WP) (IT, 1998), the SAP, the site-specific safety and health plan (SSHP), and the site-specific unexploded ordnance (UXO) safety plan developed for Parcels 74Q, 76Q-X, 79Q, 83Q, 84Q-X, 118Q-X, and 223Q. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, ordnance and explosives management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP.

## **1.2 Site Descriptions**

Parcels 74Q, 76Q-X, 79Q, 83Q, 84Q-X, 118Q-X, and 223Q, are located in the east-central area of the Main Post of FTMC (Figure 1-1). The specific areas to be addressed by this investigation are shown on Figure 1-2. These parcels are the ranges of concern for the area of investigation. In planning this EE/CA investigation, most ranges have been divided into two main areas, the study area and the safety fan. The study area includes the range firing line(s), target line(s) and impact zone(s). Study areas are defined in this work plan and are based on the historical range use and topography. The safety fan is defined as the down range area where personnel were not allowed when training was in progress. The limits of the safety fans were originally defined by the Army and are based on the ballistics of the weapons used at the range and the range orientation.

### **1.2.1 Range 18, Down Range Feedback (Known Distance) Range, Parcel 74Q**

Range 18 is discussed in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998) and the *Archives Search Report (ASR), Fort McClellan, Anniston, Alabama* (USACE, 1999a). The study and safety fan areas of Range 18 are shown on Figure 1-3 and Figure 1-4, respectively. The EBS states Range 18 was first shown on the 1956 U.S. Army Map Service maps for FTMC. Through FTMC personnel interviews, it was established in the EBS that the range was constructed around 1940 or 1941. Weapons fired at this range were limited to M-1903 Springfield and M-1 Garand rifles, and more recently M-16 automatic rifles (5.56 millimeter) with tracers (white phosphorus). The EBS further reports the range was formerly used as a machine gun range and fuzed ordnance was not used at Range 18. The ASR calls this range the Washington Rifle Range and the Washington Known Distance Range (OA-44) and states the range was built during World War II. The ASR also reports that Range 18 had been historically used as a rifle range and that explosive ordnance was not used on the range. Range 18 appears on the ASR maps including World War II to 1950 (Plate 5), 1950 to 1973 (Plate 6), and 1974 to Present (Plate 7).

**Aerial Photographs.** From an aerial photograph taken in September 1940 (Figure 1-5), an area around Range 18 appeared to be used as a training area and is marked by a clearing surrounded by dense woods. The September 1940 photograph shows seven wide parallel roads or lanes oriented from the northwest to southeast. There was not any recorded history of site usage corresponding to this time period; however, these lanes may be evidence of the machine gun or rifle training reported in the EBS for the Range 18 area.

DWG. NO.: ... \800486es.035  
 PROJ. NO.: 800486  
 INITIATOR: R. McBRIDE  
 PROJ. MGR.: J. YACOB  
 DRAFT. CHCK. BY:  
 ENGR. CHCK. BY: S. MORAN  
 DATE LAST REV.:  
 DRAWN BY:  
 STARTING DATE: 10/23/01  
 DRAWN BY: D. BOMAR  
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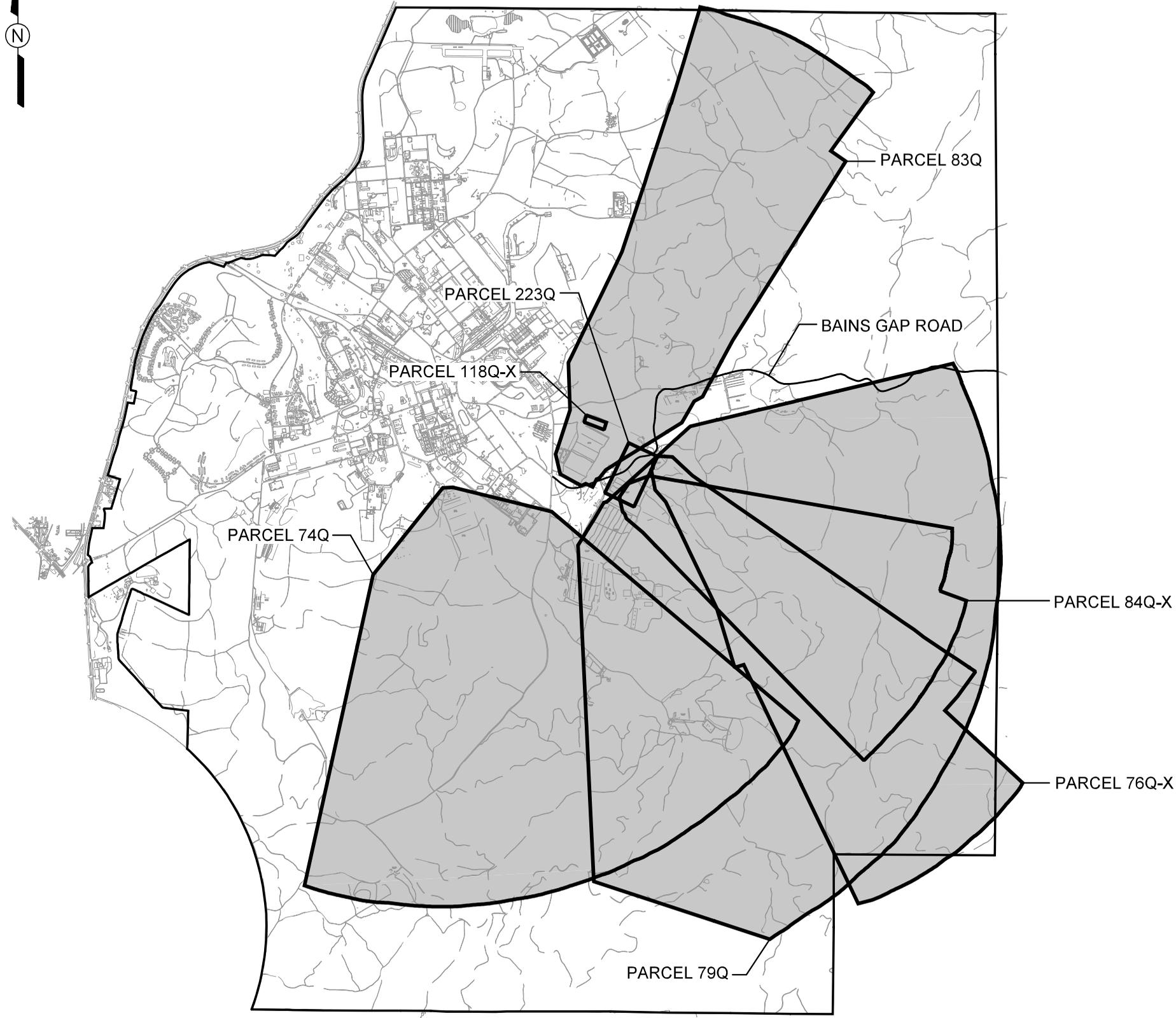


# FTMC MAIN POST

## LEGEND

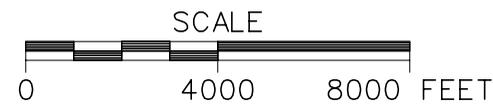
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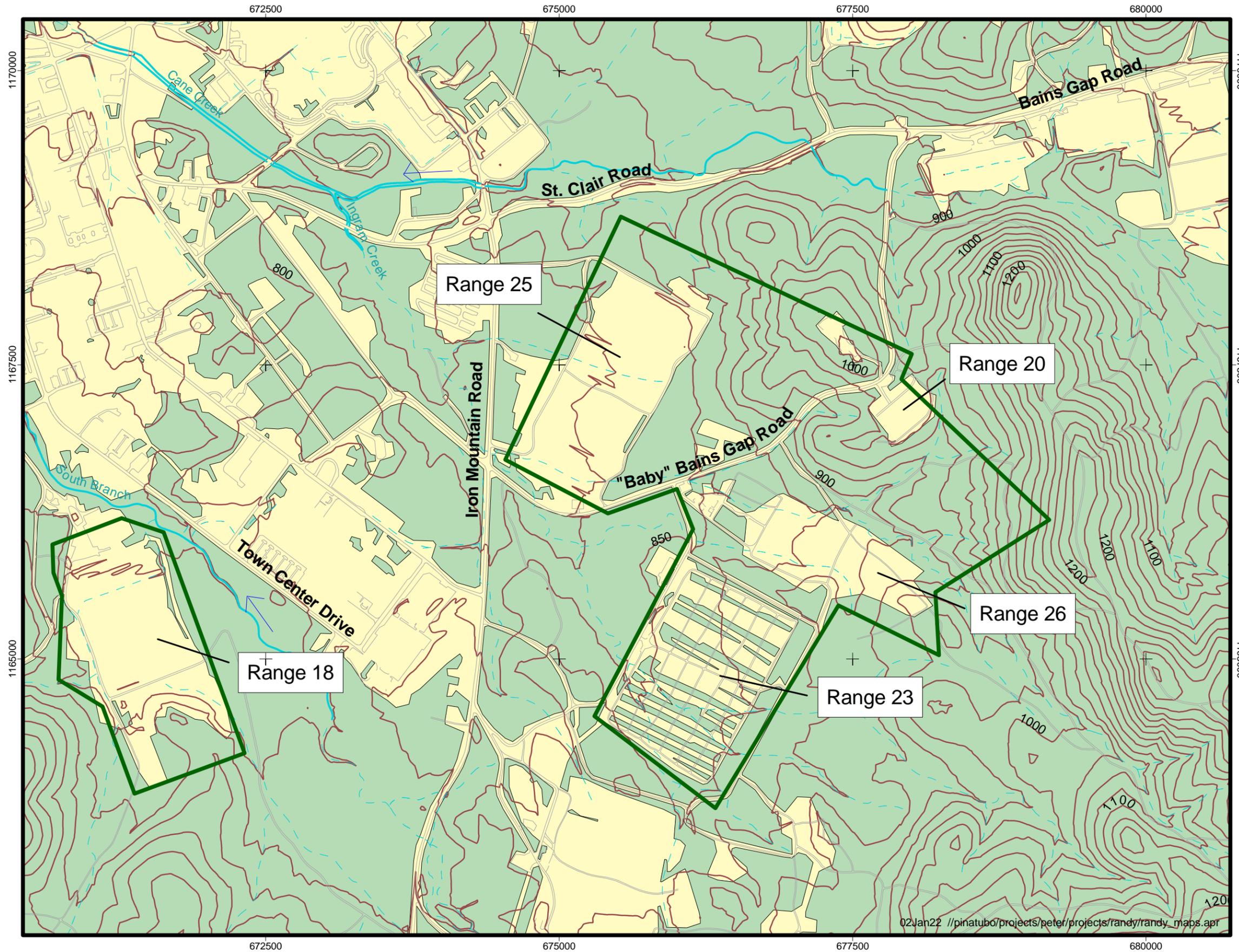
| PARCEL | PARCEL NAME  |
|--------|--|
| 74Q    | Range 18, Down Range Feedback (known distance) Range |
| 76Q-X  | Range 20, Infiltration Course                        |
| 79Q    | Range 23, Trainfire (record) Range                   |
| 83Q    | Range 25, Known Distance Range                       |
| 84Q-X  | Range 26, Live Fire and Maneuver Range               |
| 118Q-X | Main Post Impact Area                                |
| 223Q   | Former Range 25 East                                 |



**FIGURE 1-1**  
**SITE LOCATION MAP**  
**BABY BAINS GAP ROAD RANGES**

U. S. ARMY CORPS OF ENGINEERS  
 MOBILE DISTRICT  
 FORT McCLELLAN  
 CALHOUN COUNTY, ALABAMA  
 Contract No. DACA21-96-D-0018





**Figure 1-2**

**Study Area Map  
Baby Bains Gap  
Road Ranges**

*Legend*

-  Roads
-  Flow Direction
-  Creeks
-  Intermittent/  
Surface Drainage
-  25' Contour
-  Study Area
-  Woods
-  Not Wooded



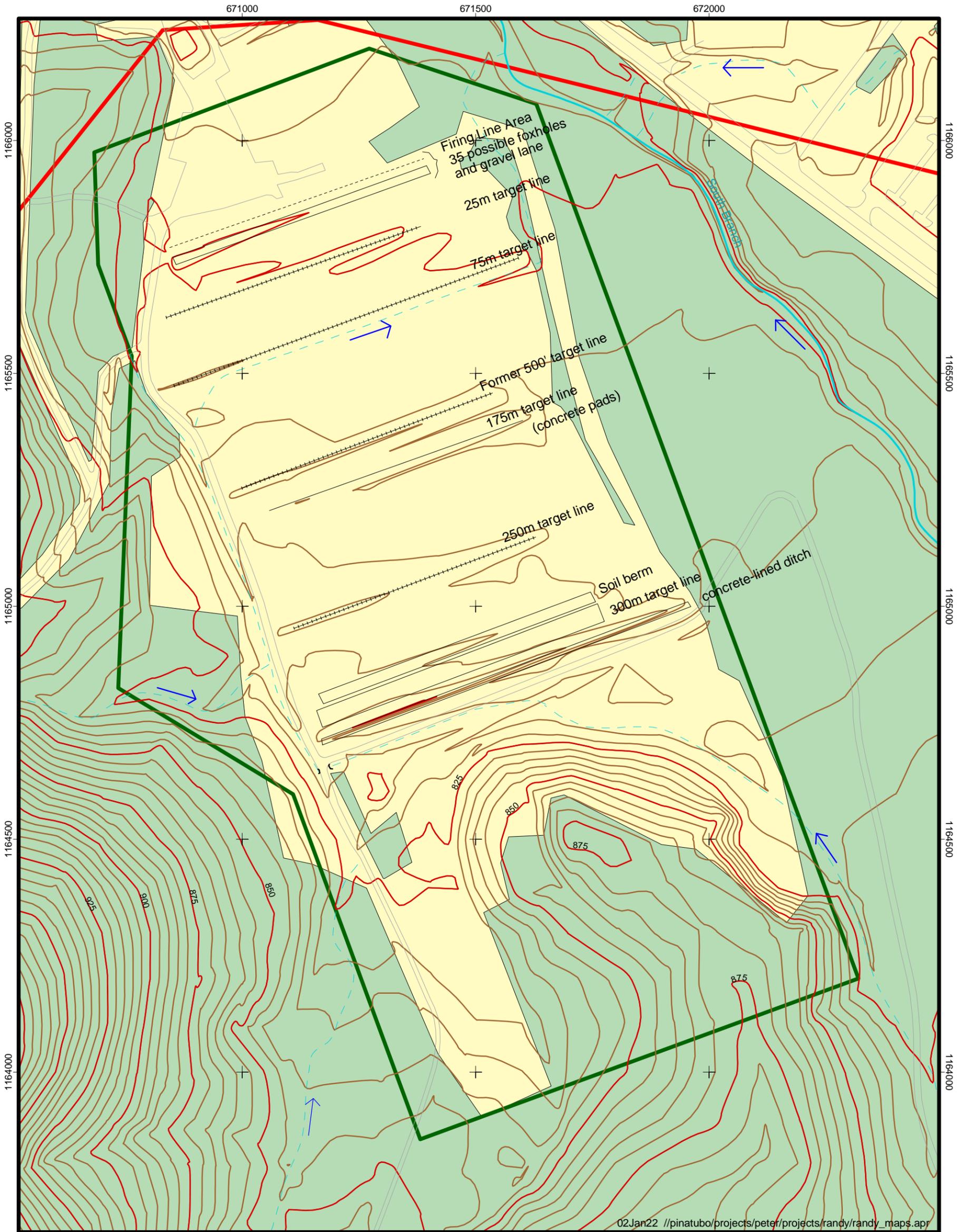
U. S. Army Corps  
of Engineers  
Mobile District



State Plane feet, NAD83

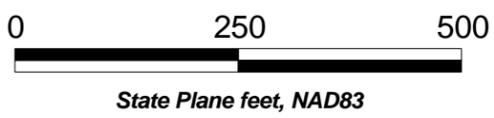
U.S. Army Corps of Engineers  
Mobile District  
Fort McClellan  
Calhoun County  
Contract No. DACA21-96-D-0018





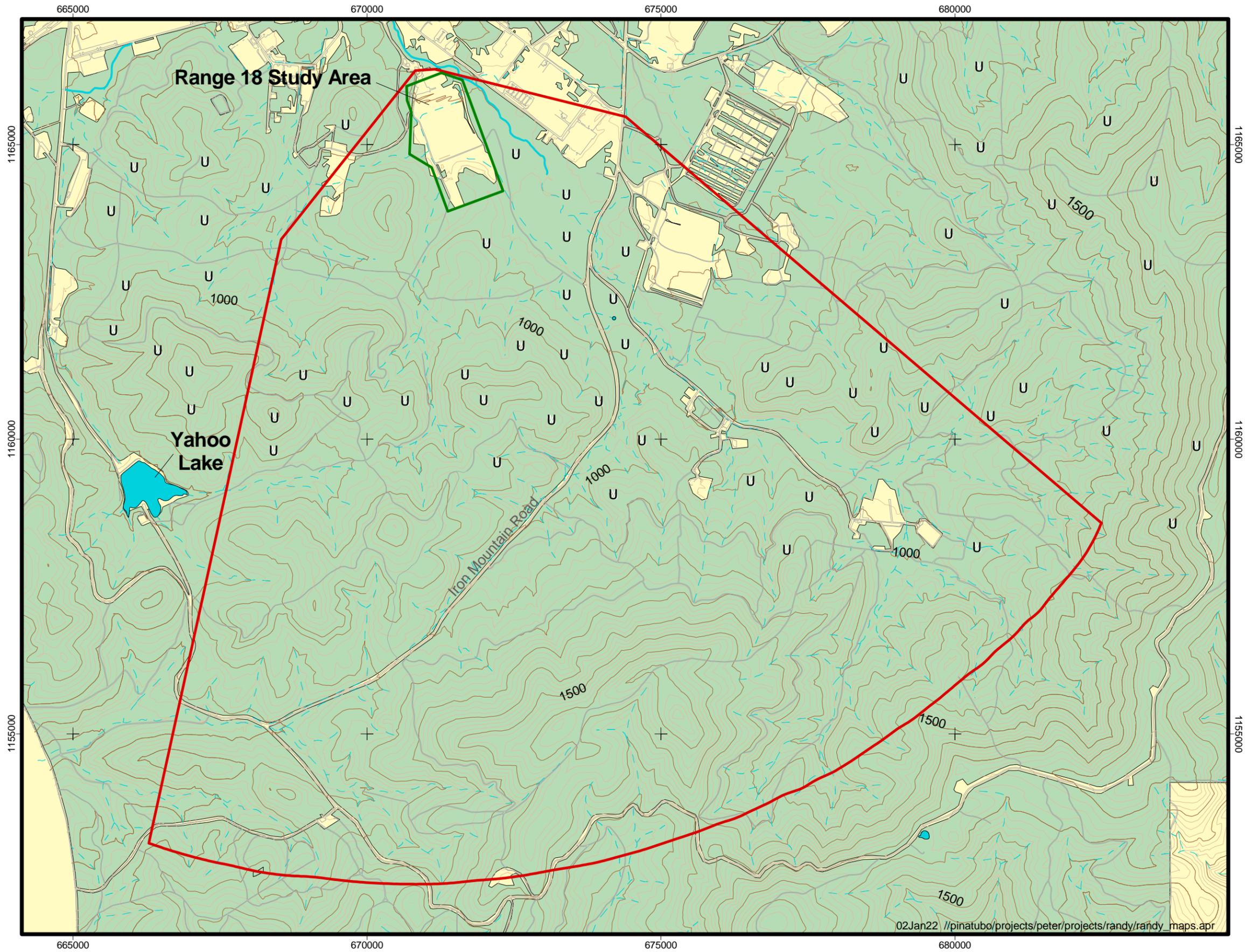
**Figure 1-3**  
**Study Area Map,**  
**Range 18, Parcel 74Q**

| Legend |                 |  |                                   |  |                     |
|--------|-----------------|--|-----------------------------------|--|---------------------|
|        | Roads           |  | Flow Direction                    |  | Safety Fan          |
|        | 5' Contours     |  | Creeks                            |  | Study Area Range 18 |
|        | 25' Contours    |  | Intermittent/<br>Surface Drainage |  | Woods               |
|        | Bullet Channels |  | Not Wooded                        |  |                     |



U.S. Army Corps of Engineers  
Mobile District  
Fort McClellan  
Calhoun County  
Contract No. DACA21-96-D-0018

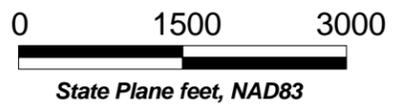




**Figure 1-4**  
**Safety Fan Map**  
**Range 18**  
**Parcel 74Q**

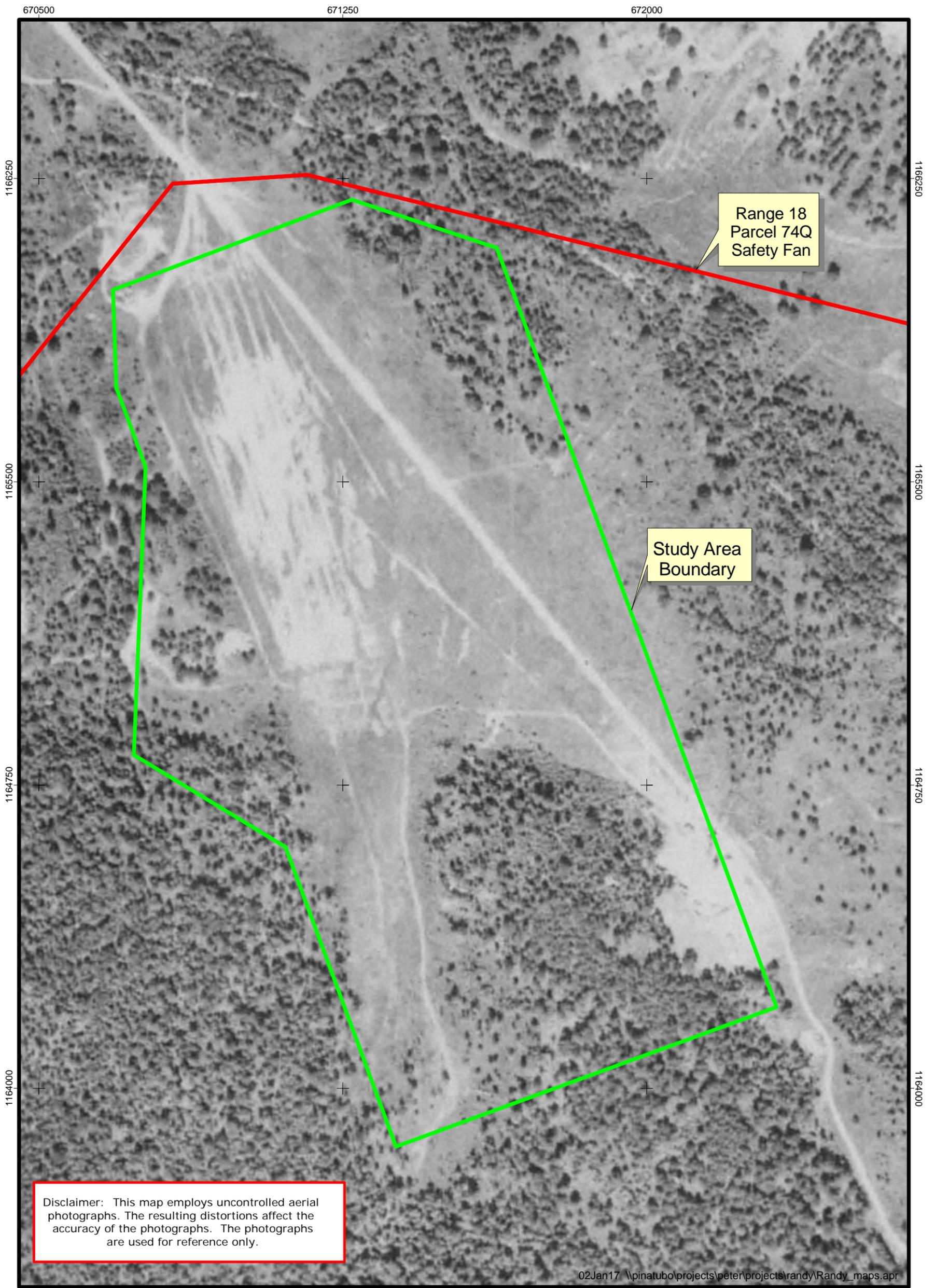
**Legend**

- U Former XRF Locations
- Roads
- Creeks
- - - Intermittent/Surface Drainage
- 25' Contour
- 100' Contour
- ▭ Study Area
- ▭ Safety Fan
- ▭ Woods
- ▭ Not Wooded



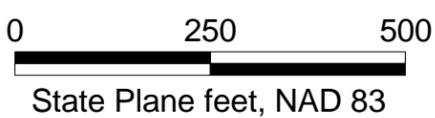
U.S. Army Corps of Engineers  
 Mobile District  
 Fort McClellan  
 Calhoun County  
 Contract No. DACA21-96-D-0018





**Figure 1-5**

**September 1940 Aerial Photograph, Range 18, Parcel 74Q**



Later photographs, starting with July 1944 (Figure 1-6), show Range 18 under construction and the 1954 photograph shows Range 18 in use. During this period, the range surface features and orientation are like those shown on Figure 1-3. Both photographs show definitive bullet channels in the north-facing hillside impact zone to the southeast.

The November 1969 and March 1973 (Figure 1-7) aerial photographs show a different range orientation at Range 18. During this time period, the range has been expanded southwest and possibly four firing points and several small structures or vehicles (possibly used as targets) are now evident. A single row of four firing points is located to the north and a "fan-shaped" target area extends nearly 250 meters to the south and east. The impact zone is less well defined and appears to possibly be under reconstruction in the 1973 photograph. By the March 1998 aerial photograph (Figure 1-8), the range orientation is linear again and is similar to representation provided on Figure 1-3. The March 1998 photograph clearly shows the bullet channels in the hillside impact zone.

**Range Features.** Based on the aerial photographs, thirty-five firing points, possibly located in foxholes, were in the firing line area. In addition, the firing line also included a 15-foot wide, gravel firing lane approximately 10 feet downrange of the possible original foxholes. Currently, only the firing lane is present.

Multiple target lines at 25 meters, 75 meters, 175 meters, 250 meters, and 300 meters (measured from the gravel firing lane) are present on the range (Figure 1-3). Bullet channels (indentions into the natural surface topography due to firing) and bullet fragments are present at these target lines. The 175-meter target line has concrete pads and an 8- to 10-inch-high concrete wall present. The 300-meter target line is constructed with a soil berm (north face) approximately 8 to 10 feet high and 12 feet wide piled in front of a 10-foot-high and 3-foot-wide concrete wall. A concrete-lined drainage ditch runs the length of the 300-meter target line, carrying runoff water east to a shallow depressed area on the eastern end of the target line area. Historical evidence indicates that the range orientation has always remained to the same with the direction of fire to the southeast, away from the main cantonment.

Downrange of the 300-meter target line is an unimproved road that traverses Range 18 immediately behind this line. On the south side of this road is a drainage ditch that carries runoff water to the west from the 50-foot high natural hill which forms the main impact zone. However, this hill only provides a partial range backstop because it slopes sharply away on the