INSTALLATION ASSESSMENT
OF
FORT McCLELLAN, ALABAMA
RECORDS EVALUATION REPORT NO. 110

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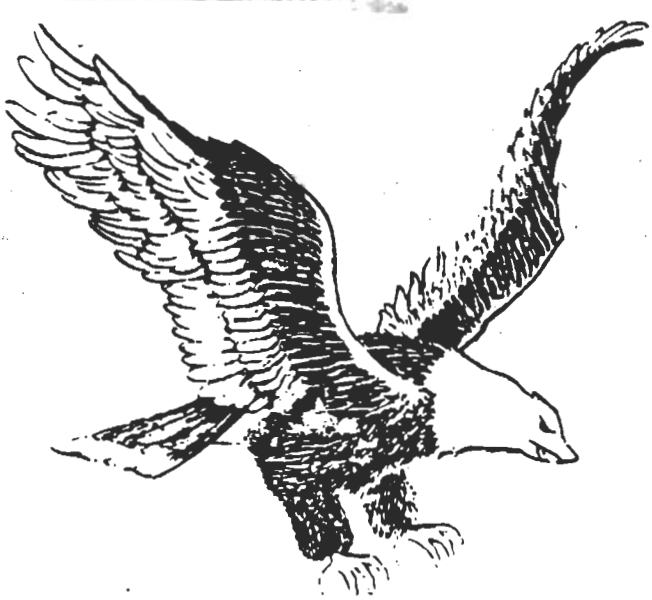
VOLUME I



APRIL 1977

DEPARTMENT OF THE ARMY
OFFICE OF THE PROJECT MANAGER
FOR
CHEMICAL DEMILITARIZATION AND INSTALLATION RESTORATION
ABERDEEN PROVING GROUND, MARYLAND 21010

INSTALLATION ASSESSMENT

OF

FORT McCLELLAN

RECORDS EVALUATION REPORT NO. 110

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ACKNOWLEDGEMENT

The Records Research Team acknowledges the dedication and cooperation displayed by the military and civilian agencies in their effort to provide information the Team desired. In particular, the wealth of information provided by present and former employees of Fort McClellan during the interviews is especially appreciated.

A special note of thanks is extended to Mr. Phil Huber and Ms. Jane Langley, Facilities Engineering Directorate, who served as points of contact for this assessment. They provided excellent liaison between the Team and personnel interviewed, assisted in locating the documents needed for the assessment and arranged for the Team's ground and aerial tours of the installation.

EXECUTIVE SUMMARY

I. GENERAL

A. A records search was conducted on Fort McClellan to determine the degree of contamination at the installation by chemical, biological and radiological material, and to assess the possibility of contaminant migration beyond the installation's boundaries.

B. The on-site phase of the assessment was initiated on 24 January 1977; however, data were collected through March 1977. In addition to this search, Team members also contacted personnel at Redstone Arsenal and Aberdeen Proving Ground who were formerly stationed at Fort McClellan.

C. The Records Research Team followed a routine procedure of:

1. Literature search for all pertinent documents on Fort McClellan, Alabama, from:

   a. Department of Defense Explosive Safety Board (DDESB).

   b. US Army Environmental Hygiene Agency (AEHA).

   c. US Geological Survey (USGS).

   d. Defense Documentation Center (DDC).

2. Collection of all on-site Fort McClellan regulations, Standard Operating Procedures and other available documents.

3. Interrogation of available former and present key employees.

II. FINDINGS

A. The main installation and Pelham Range areas of Fort McClellan:

1. Have been used for CBR training exercises.

2. Have burial grounds and training areas that are suspected of containing radiological and chemical contamination.

B. Plotted or known burial grounds have been decontaminated and certified clean. However, after interviews with personnel, it was indicated that all of the contaminated material might not have been recovered during disposal operations. These burial grounds are considered to be potentially hazardous areas.

C. Building 3192 contains a hot cell and is considered the major radiologically contaminated site at Fort McClellan.

D. Available records indicate that unexploded ordnance (UXO) may be found in many training areas.

E. Biological simulants were tested; however, degradation has eliminated all hazardous residues.

F. Analysis of surface water exiting the installation indicates good water quality, and no CBR contamination.

G. The ground water level near the sanitary landfill is within 20 feet of the surface. A potential exists for contamination of the ground water unless present landfill operations are modified to prevent deposition of sanitary wastes in or near the ground water.

III. CONCLUSIONS

A. Although Fort McClellan itself is contaminated with chemical and radiological materials, the available records (and interviews) did not reveal indications of contaminant migration beyond installation boundaries. Therefore, a Preliminary Survey is not recommended at this time.

B. Only on rare occasions, however, will the amount and quality of data uncovered during a records search be considered as totally fulfilling all of the requirements on which to base accurate, firm conclusions. In view of this, the data should be augmented by the expansion of the present surface water quality monitoring program to include radiological and arsenic analysis, and also by the initiation of a subsurface water quality monitoring program. The results of the above programs will be reviewed periodically by the Project Manager for Chemical Demilitarization and Installation Restoration (PM CDIR) in order to make a final determination, at a future date, as to the need for a Preliminary Survey.

IV. RECOMMENDATIONS

A. Advise that the surface water quality monitoring program be expanded and a subsurface water quality program be initiated.

B. Because of UXO and potential contamination, the present regulations concerning Pelham Range should be reviewed with respect to area control and access.

C. Initiate an investigation of fenced areas at the Main Post and Pelham Range which are currently identified as contaminated to ascertain the current level of CBR contamination and to assess the possibility of using the areas for more productive uses.

NOTE: The findings, conclusions, and recommendations presented in this report do not constitute a certification of facilities, equipment and/or land areas as being free of contamination. Further action for the disposition of facilities, equipment, and/or land areas must be conducted in accordance with applicable regulations.

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FIGURES (continued)

APPENDIXES

I. GENERAL

A. Purpose of the Assessment

1. To search for, identify, and assess actual or potential chemical, biological or radiological contaminate migration at Fort McClellan from available records.

2. To identify any immediate on-post safety problems.

B. Authority

Department of the Army (DA) Charter for Project Manager for Chemical Demilitarization and Installation Restoration (PM CDIR) dated 22 August 1975.

C. Introduction

1. In response to a letter from the Office of the Project Manager for Chemical Demilitarization and Installation Restoration, requesting the identification of potentially contaminated installations, the US Army Training and Doctrine Command (TRADOC) identified Fort McClellan as such an installation.

2. The Commander and his staff were briefed on the program prior to any search of on-site records.

a. The purpose of the briefing was to:

(1) Outline the assessment scope.

(2) Provide guidelines to personnel on procedures.

(3) Establish a working relationship that would enhance our records search effort.

b. Mr. Phil Huber, Facilities Engineering Directorate, was designated as the Team's point of contact.

3. Prior to review of records, efforts were directed toward obtaining pertinent documentation on Fort McClellan from:

a. Department of Defense Explosive Safety Board (DDESB).

b. US Army Environmental Hygiene Agency (AEHA).

c. US Army Engineer Waterways Experiment Station (WES).

d. Defense Documentation Center (DDC).

e. National Technical Information Service (NTIS).

f. Library of Congress.

4. The collection of documents between 24 January and 18 March 1977 and preparation of the final report was accomplished by the following personnel:

a. Mr. William Collins, Team Leader.

b. Mr. Norman Leibel, Ordnance Specialist.

c. Dr. Elmer Worthley, Environmentalist.

d. Mr. Harry Woods, Hydrogeologist.

e. Mr. John Bane, Chemist.

f. Mr. Donald Gross, Chemical Engineer.

g. Mr. James Scott, PM CDIR Representative/Chemist.

5. In addition to the review of records, interviews were conducted with more than 25 persons, including present and former employees (see Appendix A). An aerial and a ground tour of the installation were also made. Photographs taken during the tours are included in Appendix B. During the on-site phase of the assessment, Team members also contacted and interviewed personnel at Redstone Arsenal and Aberdeen Proving Ground who were either former employees at Fort McClellan or were aware of certain operations conducted there. Although an attempt was made to obtain the latest, most complete documentation, not all of the desired data were available.

6. The findings, conclusions and recommendations are founded on records made available for the search and the Team cannot vouch for their accuracy. Where conspicuous discrepancies existed within the data, attempts were made to obtain the correct information by interviewing the personnel (if available) involved in preparing the original data.

D. Summary Description of Installation

1. Location and Size

Fort McClellan consists of three main bodies of Government-owned and leased land in the foothills of the Appalachian Mountains in the northeastern part of Alabama. The main installation, consisting of

18,954 acres, is within a two-hour drive of two major metropolitan areas - Atlanta, Georgia, to the east and Birmingham, Alabama, to the south. There are also two major municipalities: Anniston adjoins the main installation on the south and east, and Gadsen lies 28 miles to the north. To the east is the Choccolocco Corridor, 4,508 acres of land leased by the US Government at $1 per year to connect Fort McClellan with the Talladega National Forest Area. The Talladega National Forest Area provides another 100,000 acres of woodland, slopes, knobs and spurs accessible for training activities. See Figures I-1 and I-2.

The Morrisville Maneuver Area, or Pelham Range, is located approximately eight miles due west of the main installation and adjoins the Anniston Army depot. These 22,272 acres provide an ideal maneuver area and the ranges permit limited artillery firing. See Figure I-3.

2. Area Description

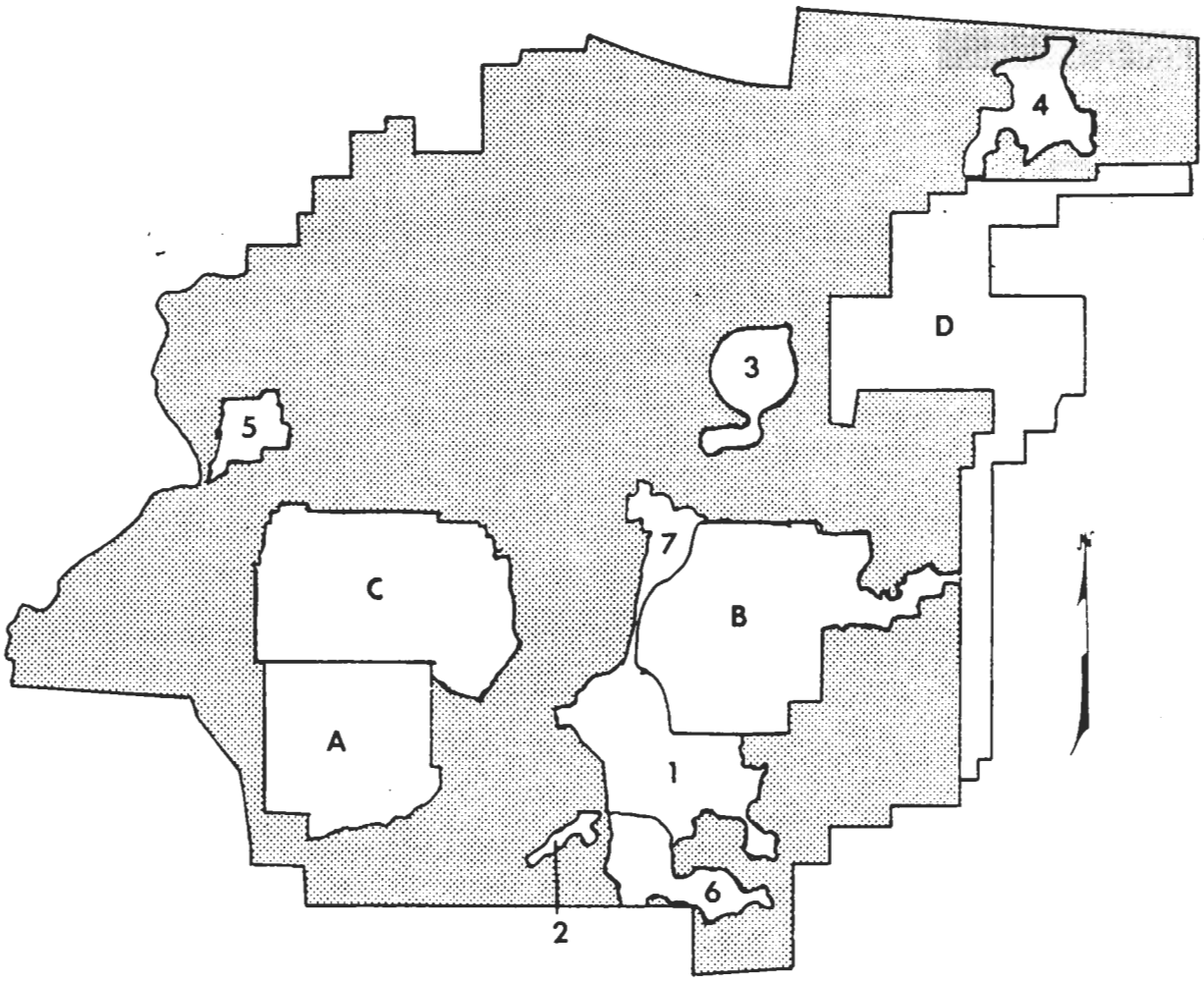
The terrain of the installation is mountainous, ranging from 1,000 to 2,074 feet above sea level. The main installation lies in a valley which is spotted with rolling hills about 100 feet in height through which small creeks flow throughout the year. These creeks are fed by springs which flow from underlying limestone strata.

3. Organization and Mission.

a. The primary mission of Headquarters, US Army Military Police School/Training Center and Fort McClellan, is to provide and support basic training of Womens Army Corps (WAC); Military Police (MP) Advanced Individual Training (Basic Law Enforcement); troop units and selected personnel of the Navy, Air Force, Marine Corps, and NATO; and the Noble Army Hospital and Dental Clinic. With the addition of basic combat training in July 1977, six training companies will be added. The secondary mission is to support training of the US Army Reserve, the Alabama National Guard, and the Reserve Officers' Training Corps, as directed.

b. Tenant units receiving logistics support are the US Army Medical Department Activity; 3rd Region US Army Criminal Investigation Division Command; 902nd Military Intelligence Group; Corps of Engineers (Resident and Apprentice); Department of Agriculture Forestry Department; Defense Investigative Service; 1151st Engineer Detachment of the Alabama National Guard; Annual Training/Weekend Training Facility of Alabama Military Academy; and the Troop Support Agency.

c. It is estimated that approximately 36,770 personnel will be provided some type of support during the year of 1977. (See Figure I-4, Organizational Chart.)



1 – ANNISTON
2 – HOBSON CITY
3 – JACKSONVILLE
4 – PIEDMONT
5 – OHATCHEE
6 – OXFORD
7 – WEAVER

A – ANNISTON ARMY DEPOT
B – FORT McCLELLAN MILITARY RESERVATION & CHOCCOLOCCO CORRIDOR
C – FORT McCLELLAN MILITARY RESERVATION PELHAM RANGE
D – TALLADEGA NATIONAL FOREST

Figure I-1. Calhoun County

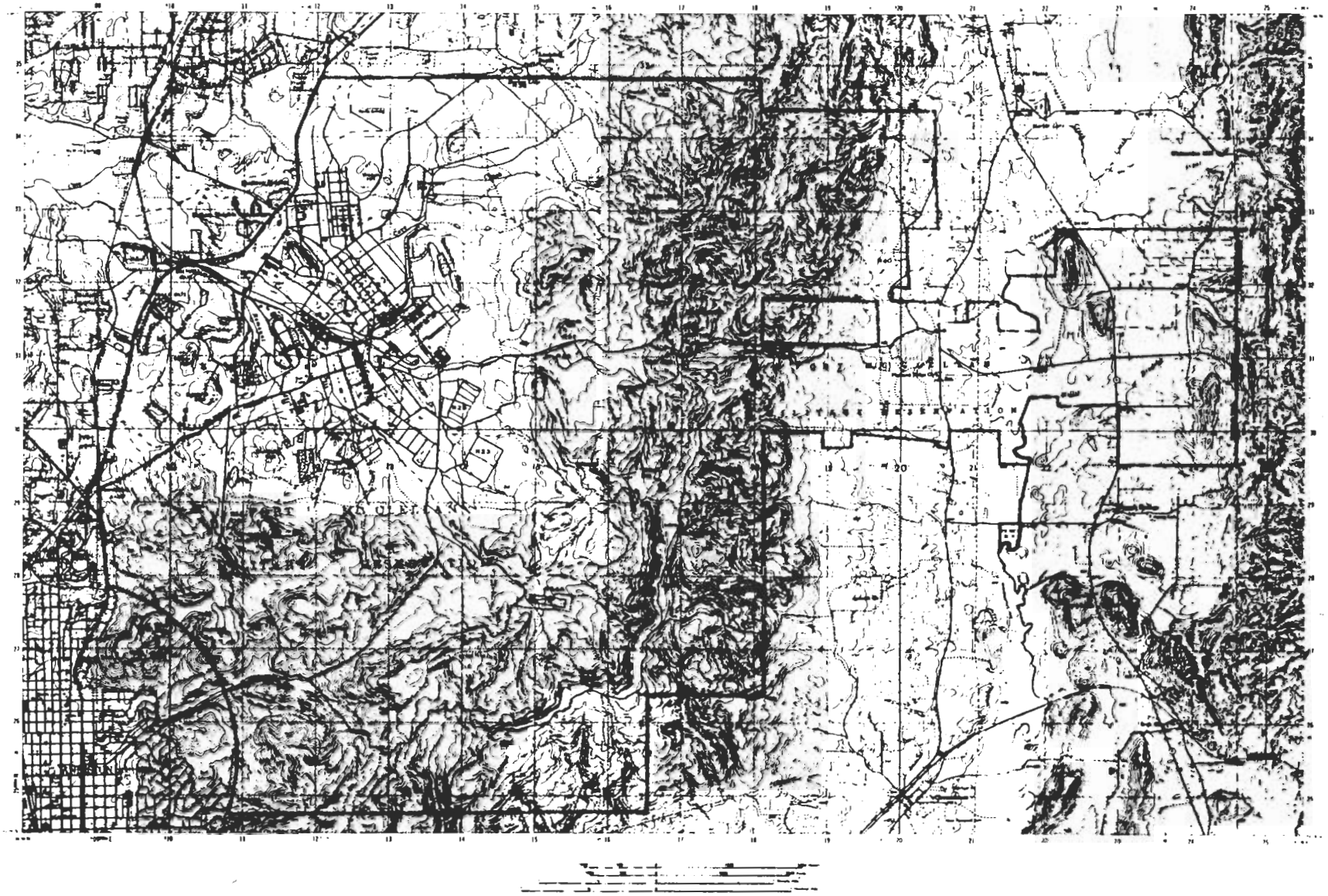


Figure I-2. Ft. McClellan – Main Post

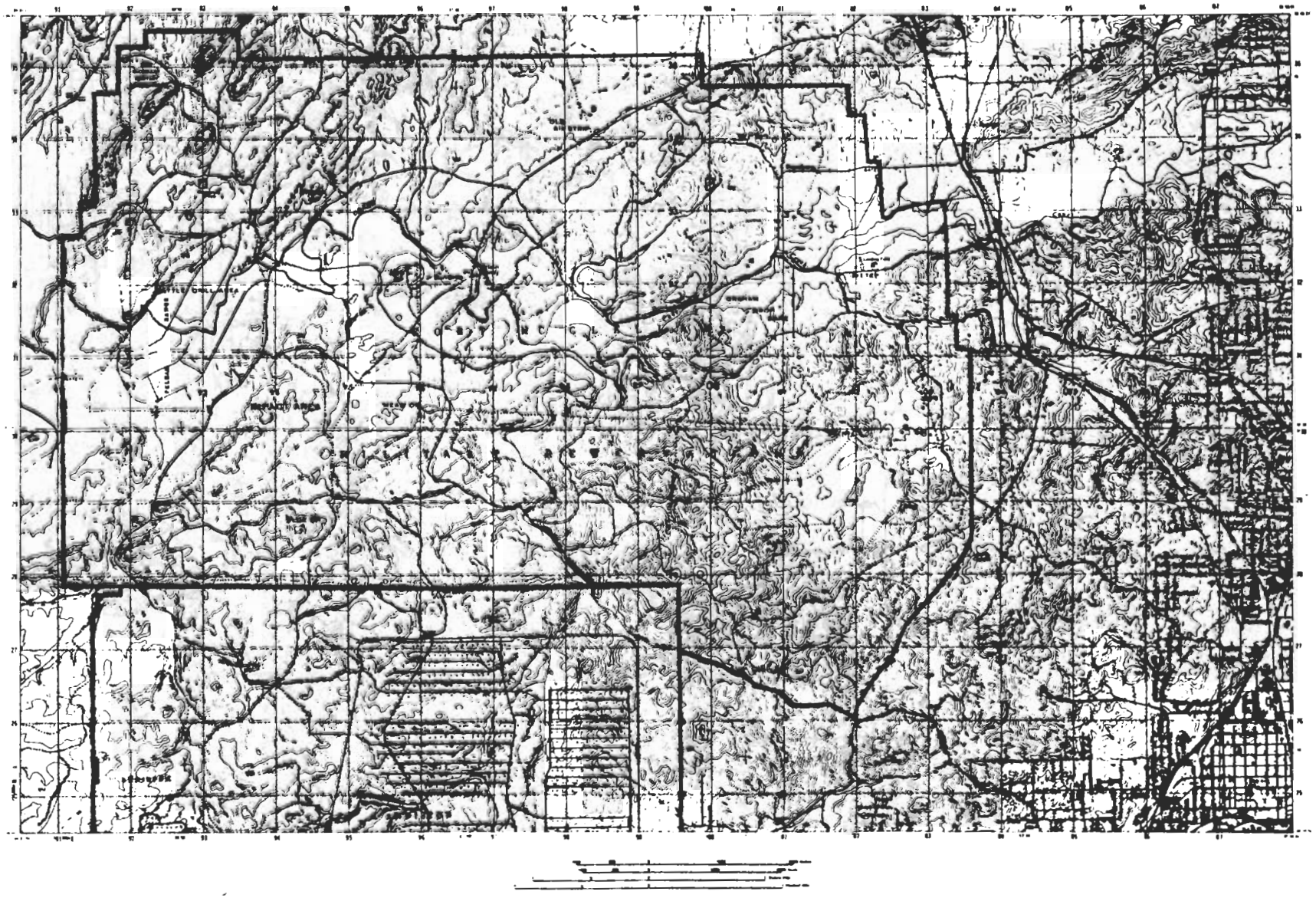


Figure I-3. Ft. McClellan – Pelham Range

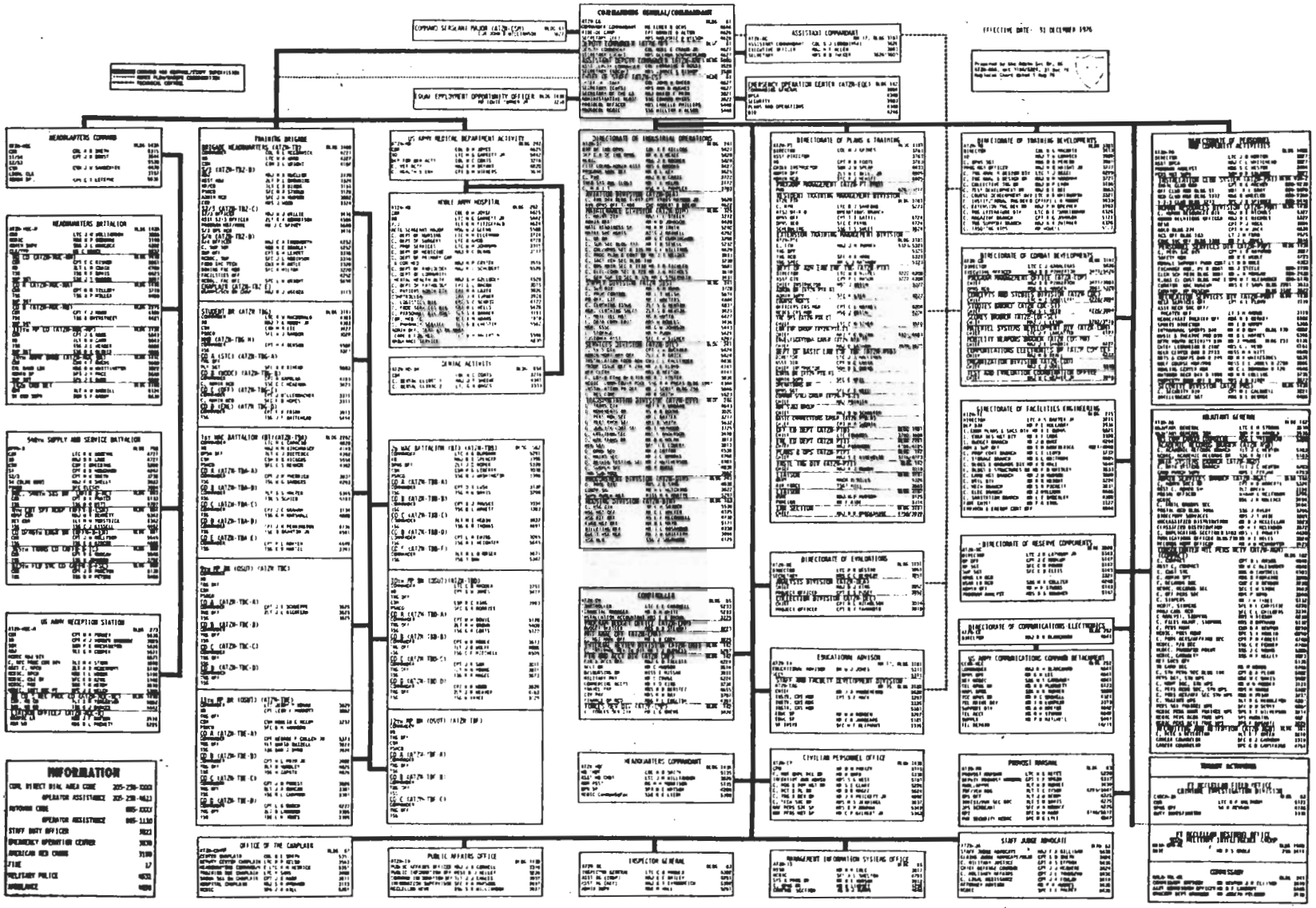


Figure I-4. US Army Military Police School/Training Center and Fort McClellan
Fort McClellan, Alabama 36205

4. History

The area known today as Fort McClellan first attracted interest among military circles when the Fourth Alabama Artillery discovered at the time of the Spanish-American War, 1898, that the Choccolocco Mountains formed an excellent background for firing shells. From 1912 to 1916, federal officials from Washington were sent to Anniston to study the possibility of locating an Army camp in this area.

In 1917, the Federal Government purchased 18,952 acres near Anniston for use as an artillery range. With the outbreak of World War I, it was decided to use the property as a training camp and named Camp McClellan in honor of Major General George B. McClellan.

In 1917, Camp McClellan was used to train troops for World War I and served in that capacity until the armistice; it was then designated as a demobilization center. Between 1919 and 1929, it served as a training area for active army units and other civilian elements. It was in July, 1929, that Camp McClellan was redesignated as Fort McClellan and continued to serve as a training area.

In October 1940, the Government acquired another 22,168 acres, due west of Fort McClellan. This tract of land was named Pelham Range in honor of Major John Pelham. In 1941, 4,160 acres were leased to the Federal Government by the Alabama State Legislature to provide an access corridor from the main post to Talladega National Park. This provided another 100,000 acres of woodland accessible for training.

August 1945, Fort McClellan served as a separation point until August 1946. After a three month closing period it was activated as a Recruit Training Center until May 1947; once again it ceased operations and was placed in an inactive status until 1951.

On 4 January 1951, the Army reactivated Fort McClellan on an unlimited basis for operation of the Chemical Corps School, and as a replacement center for the Chemical Corps. The Chemical Corps School offered advance training in all phases of chemical, biological, and radiological warfare to students from all branches of the military service until it was deactivated in 1973.

In November 1952, construction was begun at Fort McClellan for the Womens Army Corps Center. In May 1954, elements of the WAC Center began moving from Fort Lee, Virginia, where the Center had been since 1948.

In 1962, the US Army Combat Developments Command Chemical-Biological-Radiological Agency moved to Fort McClellan and performed its mission until it was deactivated in 1973.

In 1966, the mission of the installation was changed and the fort was renamed the US Army School/Training Center and Fort McClellan. To meet requirements for the Vietnam War, an Advanced Individual Training Infantry Brigade was activated in 1966. Because of continued force reductions in Vietnam, the Brigade was deactivated in 1970 after training more than 30,000 men. The 3rd Army NCO Academy was also stationed at Fort McClellan from 1967 to 1972.

On 11 July 1975, the US Army Military Police School was moved from Fort Gordon, Georgia, to Fort McClellan.

E. Environmental Setting

1. General

Fort McClellan is situated in a temperate, humid climate. Summers are hot and long, while winters are usually short and mild to moderately cold. The climate is influenced by frontal systems moving from northwest to southeast, and temperatures change rapidly from warm to cool due to inflow of northern air. The average annual temperature is 63°F. Summer temperatures usually reach 90°F or higher about 70 days per year, but temperatures above 100°F are relatively rare. Freezing temperatures are common, but are usually of short duration. By late October, the first frost may arrive. At Anniston, the average date of the first 32°F temperature is 6 November, and the last is 30 March. This provides a growing season of 221 days. Snow is rare and averages one-half to one inch. On rare occasions, several inches of snow fall from a single storm.

Average annual rainfall is about 53 inches and is fairly well distributed throughout the year as indicated by Table I-1.

TABLE I-1. AVERAGE PRECIPITATION BY MONTH
(40 Year Average)

Month	Inches	Month	Inches
January	4.95	July	5.45
February	5.26	August	4.17
March	5.77	September	3.16
April	4.93	October	2.80
May	3.83	November	3.30
June	4.02	December	5.44

The more intense rains usually occur during the warmer months and some flooding occurs nearly every year; seldom ever do they have a drought.

Approximately 80% of the flood-producing storms are usually of the frontal type and occur in the winter and spring, lasting from 2 to 4 days. Summer storms are usually thunderstorms with intense precipitation over small areas, and these sometimes result in serious local floods. Occasionally several wet years or dry years occur in series. Annual rainfall records indicate no characteristic order or pattern.

A brief study of wind velocity, duration, and direction reveals that winds in the Fort McClellan area are seldom strong and frequently blow down the valley from the northeast. However, there is no truly persistent wind direction. During the greatest part of the time, only light breezes or calm prevail except during passages of cyclonic disturbances, when destructive local windstorms develop, some into tornadoes with winds of 100 mph or more.

2. Water Quality

a. Surface Water. Fort McClellan, as mentioned earlier, is divided into two noncontiguous areas known as Main Post and Pelham Range. For convenience, each area will be discussed separately.

(1) Main Post - The major drainage divide is the northeast-southwest axis of the Choccolocco mountains located in the eastern portion of the post. East of this divide the reservation consists of a relatively narrow strip called the Choccolocco corridor. This corridor extends some 3.5 to 4 miles from the mountains across the floodplain of the Choccolocco Creek, then to the base of Rattlesnake Mountain. The headwaters of the drainage originates in the mountains with steep gradients and flatten rather quickly as they reach the floodplain, then flows into Choccolocco Creek.

West of the drainage divide lies the training areas, firing ranges, and cantonment area. The density of drainageways is much greater west of the divide than on the east as shown in Figure I-5. The entire central postion of the post is drained by three major creeks and their many tributaries. South Branch receives runoff from the south central portion then joins Cane Creek before leaving the reservation on the western boundary. Cane Creek receives surface runoff from the central part of the post. The north central sector of the post is drained by Cave Creek and leaves the post on the northwest boundary.

Drainage along the southern, western, northern, and northeastern perimeter of the main post flows offpost independently of the three major creeks.

(2) Pelham Range - The predominate drainage pattern is to the center of the range into Cane Creek, then flows in a westwardly direction where it leaves the range on the western boundary (Figure I-6).

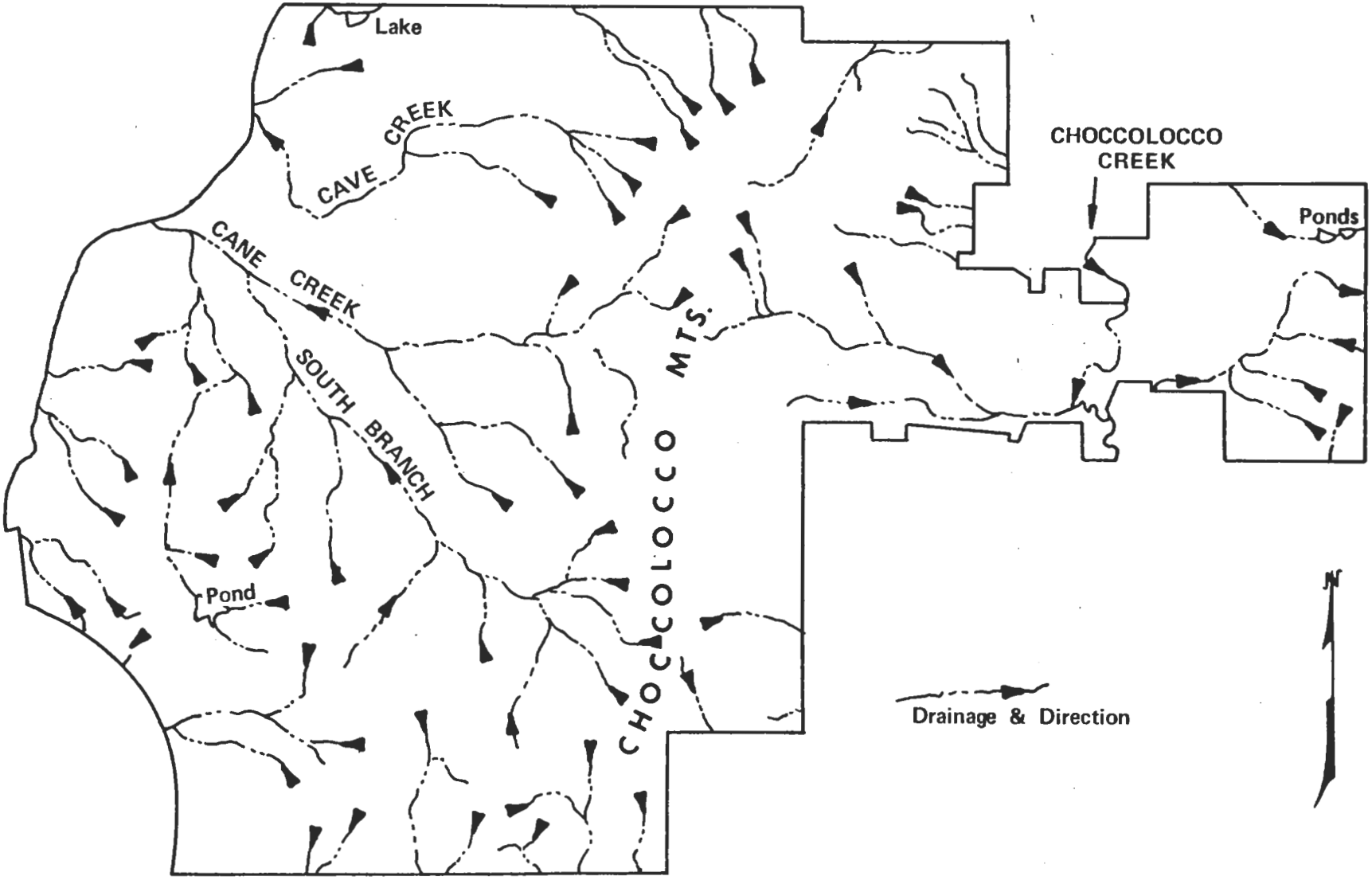


Figure I-5. Surface Drainage – Main Post

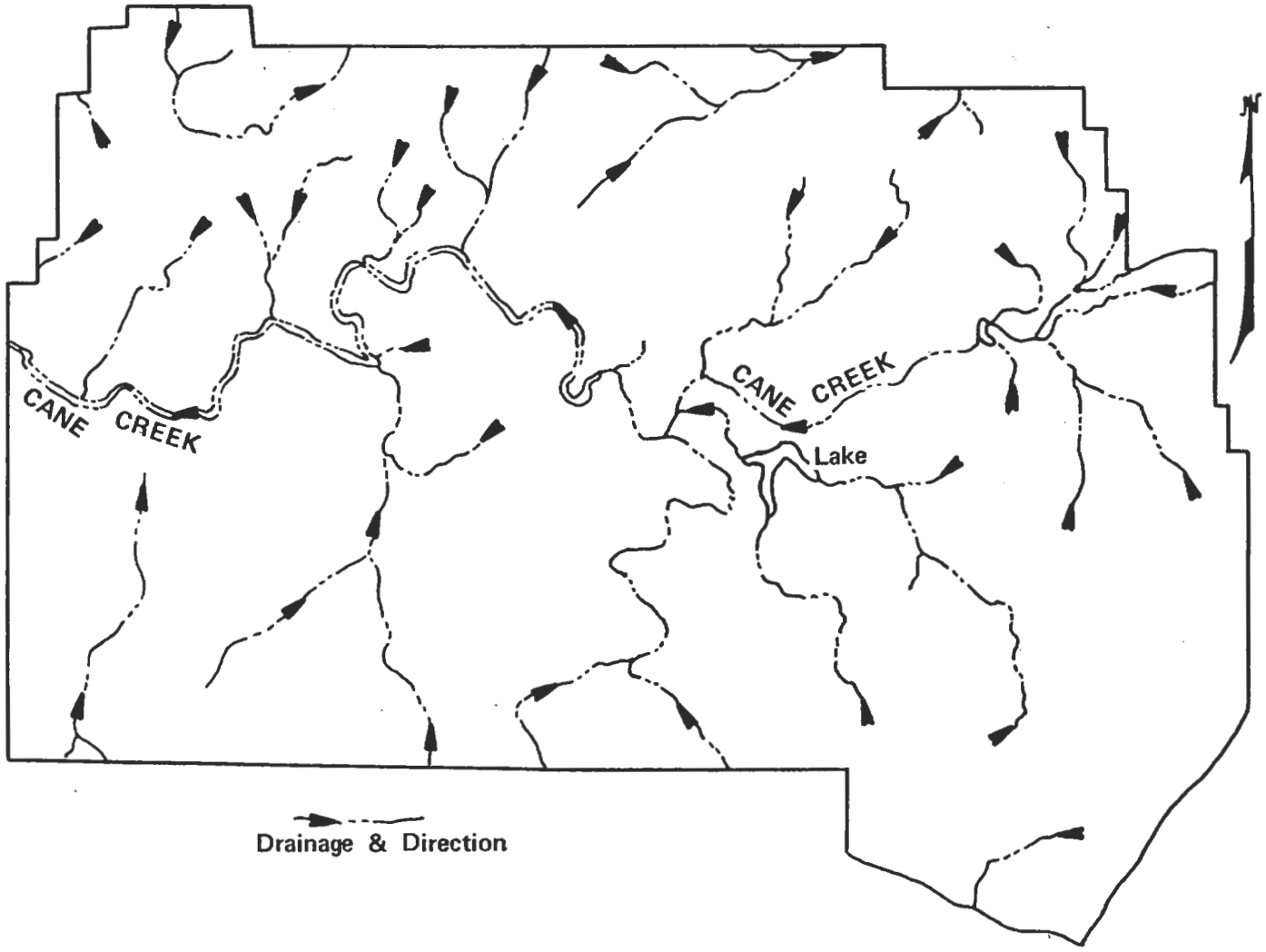


Figure I-6. Surface Drainage – Pelham Range

Cane Creek continues to the west for approximately five miles at which time it empties into the Coosa River, the western boundary of Calhoun County.

Drainage entering the range from the south and southwest originates in the Anniston Army Depot which joins Pelham Range to the south. One drainageway located in the southwest corner flows in a northerly direction and empties into a large topographic low termed Battle Drill area. Cane Creek traverses this low some 800 yards to the north and all water collected in the low eventually drains into Cane Creek.

Similar to the Main Post area, the lapse in time from training in the toxic areas to the present, coupled with the decontamination procedures and the quality of water leaving the range, no adverse effects should be subjected to the surrounding surface waters.

b. Ground Water. The interpretation of ground water data in and around Fort McClellan presents a complex situation due to the local relief differential of >1,000 feet and the nature of the subsurface geology. Previous studies indicate the general movement of ground water east of the Choccolocco Mountain is southward in the valley and then southwest around the southern end of the Choccolocco and Coldwater Mountains. West of the Choccolocco Mountain under the Main Post and Pelham Range the movement is in a west-northwest direction toward the Coosa River.

Borings drilled in the Main Post area for foundation exploration encountered ground water at several locations. This data is concentrated in the cantonment area with the ground water level varying from 12 feet below the surface in boring 5, map location 6, to 60 feet below the surface in boring 1, map location 10. From other borings at this location the ground water varied in depth from 21.5 to 57 feet, while borings of equal depth did not encounter ground water. This indicates that the depth to ground water is variable and should not be extrapolated between sites, or even between borings. All boring locations are in Figure I-7. The scale prevents the plotting of each boring; therefore, more than one boring log is available for each location. The graphic logs of borings are presented in Appendix F. Table I-2 lists the borings by building number and the depths at which ground water was encountered.

No ground water data are available for Pelham Range; however, after a ground and air reconnaissance of this area, it is highly probable that the same ground water conditions exist as those in the Main Post area.

A ground water study is in progress at the sanitary landfill located just south of the western end of Reilly Airfield. Preliminary data indicates the ground water to be within 20 feet of the surface.

TABLE I-2. DEPTH TO GROUND WATER

Map No.	Building	Boring No.	Date	Ground Water (Feet)	Total Depth (Feet)
1	292 - Hospital	2	1960	32.0	39.5
		3	1960	40.5	40.5
		4	1960	31.5	37.0
		6	1960	24.5	32.5
		7	1960	22.5	35.0
2	500 - WAC Reception and Processing	5	1974	*	50.3+
3	1012 - Gymnasium, between 4th and 5th Avenue	3	1973	*	14.3
4	1060 - WAC Headquarters	1	1973	*	10.3
5	1081 - WAC Academy Facility	2	1974	*	26.0
6	1900 - Auto Craft Shop	4	1973	16.0	30.0
		5	1973	12.0	30.0
7	1906 - Dental Clinic	2	1974	*	20.2
8	2213 - Service Club	2	1973	*	21.0
9	3133-36 - WAC BOQ	5	1974	25.0	34.7
		6	1974	20.5	30.0
		7	1974	22.8	30.0
		8	1974	34.5	36.3
		9	1974	21.0	36.0
		11	1974	23.5	29.0
		12	1974	20.0	26.0
10	EM Barracks, between 8th and 10th Avenue	1	1974	60.0	76.1
		2	1974	38.0	67.4
		3	1975	28.5	41.5
		5	1975	57.0	81.0
		8	1975	21.5	41.2
		9	1975	42.5	57.0
		10	1975	33.0	59.0
		14	1975	25.5	42.9
		18	1975	37.5	51.8
		20	1975	29.6	44.4

*No ground water encountered
+Deepest boring

TABLE I-2 (continued)

Map No.	Building	Boring No.	Date	Ground Water (Feet)	Total Depth (Feet)
11	Gymnasium and Dispensary, south of MP Barracks	1	1974	*	31.5
12	WAC Band Facility	1	1973	*	19.7
13	MP Academy Facility	12	1974	6.0	26.6
		13	1974	4.5	25.7

*No ground water encountered

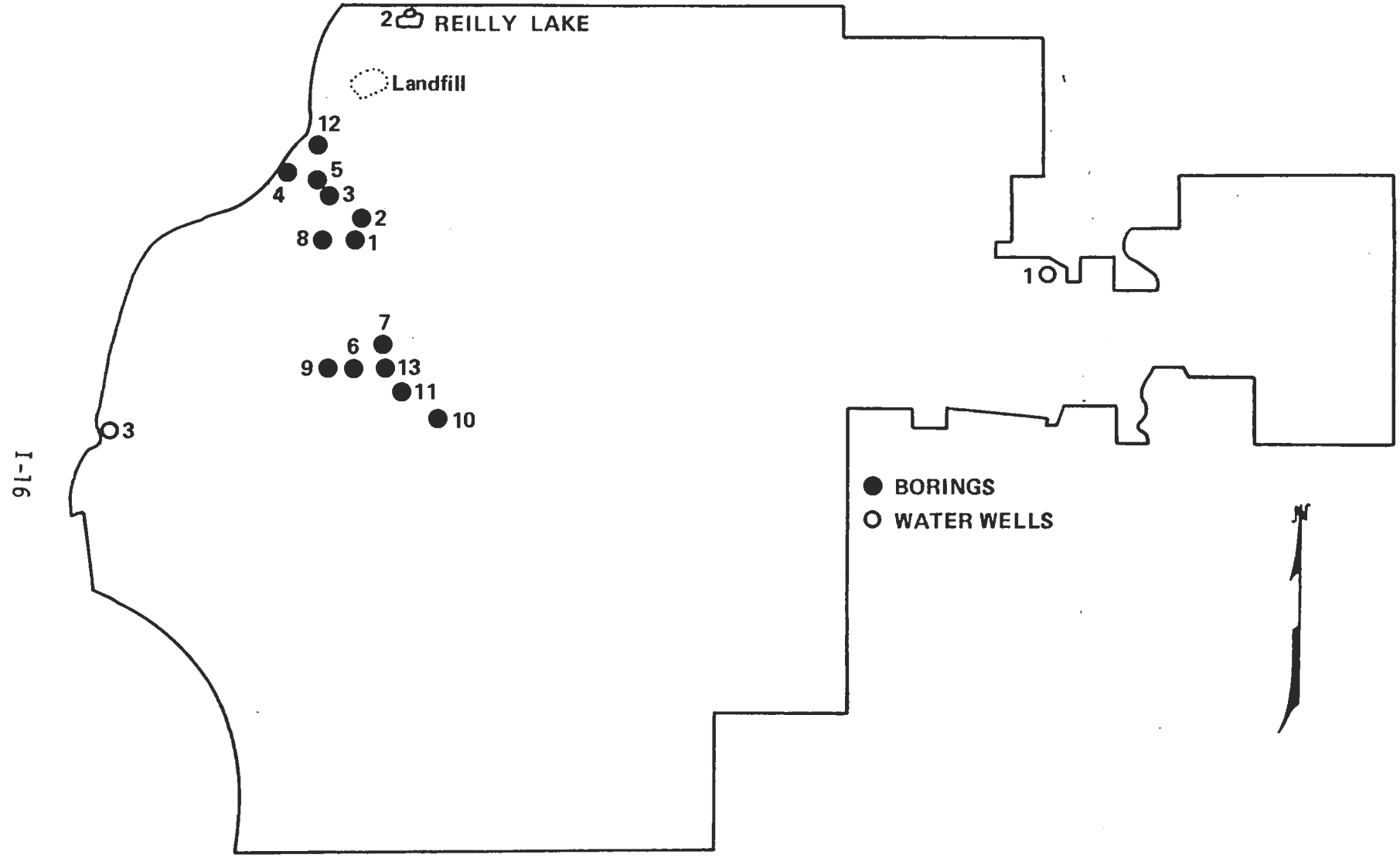


Figure I-7. Boring Locations and Water Wells — Main Post

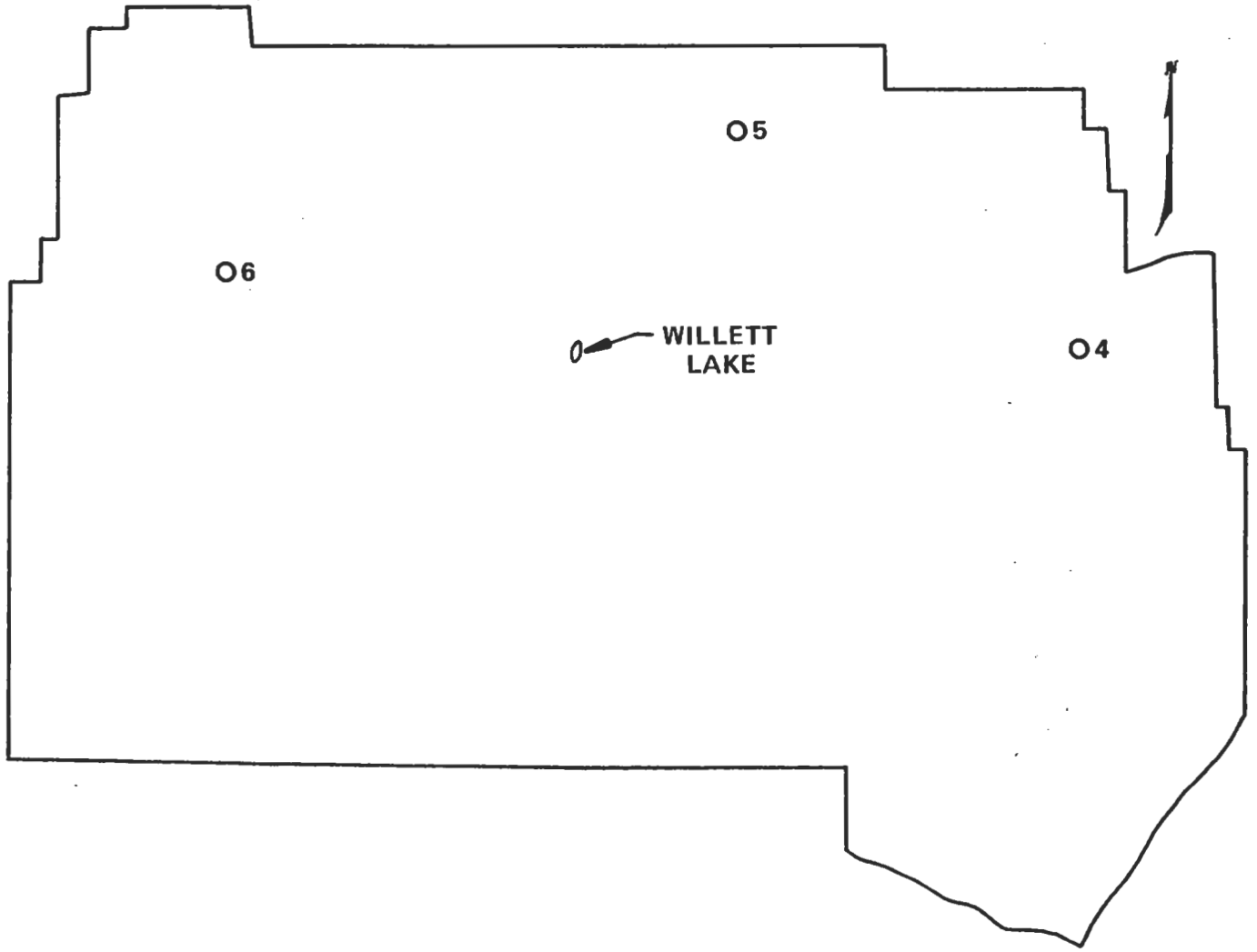


Figure I-8. Water Wells – Pelham Range

This area is topographically low and normally the ground water would be fairly high. The results of this study should provide an insight to the hydraulic gradient, depth, and vertical movement of the ground water.

Six water wells are on Fort McClellan, three in the Main Post area and three in Pelham Range as shown in Figure I-7 and I-8, respectively. Three of these wells are utilized for recreation and/or bivouac activities (well at Choccolocco Corridor, one at Reilly Lake, and one at Pelham Range). There is no data available as to their depths, geologic formations encountered, or water levels.

Many springs are present within and around Fort McClellan. The average discharge varies from small seeps to millions of gallons per day. Reilly Lake, in the Main Post area and Willett Lake in Pelham Range, are good examples of spring-fed lakes. Coldwater Spring, located six miles southwest of Fort McClellan at the foot of Coldwater Mountain, flows at a rate of 32 million gallons a day. This spring supplies water for the city of Anniston, Fort McClellan, and surrounding communities.

3. Natural Resources

a. Natural Vegetation as Well as Significant, Man-Made Landscape Additions. The installation's vegetational mosaic illustrates the functional interactions of geology, soils, climate and microclimate; also, past and present land-use on the vegetative potential of the area. Thus, both the extent and composition of the forests are dynamic. These dynamic properties are perpetuated by natural and man-induced disturbances and the forces of succession. Collectively, these processes are responsible for major changes in both the state and spatial pattern of forest communities.

Approximately 36 different plant communities exist on the lands of Fort McClellan; however, only 17 of these communities occupy significant area to be included in this discussion.

As a generalization, all the lands of the installation are classed as commercial or potential commercial forest. Obviously, there are limits to the amounts of area to be kept in forest. Approximately 3,300 acres of the cantonment are kept in parade fields, golf course, or other artificial vegetative systems. Roughly 4,000 acres of grassland, managed as food plots, are maintained on Main Post and Pelham Range portions of Fort McClellan.

At current market prices, the timber resources of the installation represent about $15,000,000 in standing inventory, growing at approximately 6 to 9% annually. Between $200,000 and $350,000 of timber is harvested yearly. Many species harvested are pine, oak, hickory, sweet gum, yellow poplar, maple, elm, and black walnut.

Since much of the installation is forested, the various communities are classified by the dominant tree (Table I-3). Significant variation between plant associations exists. More than 125 tree and shrub species have been identified along with very numerous herbaceous plants, ferns, and lower plants. Partial inventories are available in Appendix C.

b. Natural Fauna. Recognizing high seasonal variations of animal populations, irrespective of habitat, natural fauna of the installation is dependent upon vegetative associations within the ranges of the indigenous organisms. Approximately 35 species of mammals have been found on the installation. This figure is probably low, due to the crepuscular or nocturnal nature of many mammals. Roughly 240 species of birds are residents on the installation at least part of the year. Inventories of observed fauna within Calhoun County are presented in Appendix C.

Fish and wildlife management is concerned primarily with game and endangered species, operating on the assumption that non-game species will also benefit. Principal game species of mammals are white-tailed deer, swamp and cottontail rabbit, fox, and gray squirrel; while principal game birds include quail, dove, turkey, and wood duck. Game species of fish include large-mouth bass, bluegill, bream, crappie, catfish, and red-eye bass. A few of the coldwater springs are managed for rainbow trout on a put-and-take basis. Sales from permits range from $7,000 to $9,000 per year.

Potential number of populations of wild organisms are limited by various parameters: high and low temperatures, wind, relative humidity, precipitation, sunshine, soil type and fertility, fire, and vegetation. On the order of four thousand acres are kept open as dove fields, food plots, or wildlife openings. However, just complementing the natural diet with food plots may not improve either the numbers of a given population or the productivity of the individual organism.

c. Environmentally Sensitive Flora and Fauna. Although no endangered species of vegetation have been reported on the installation, there is a very real possibility that some do exist. The lands of Fort McClellan encompass several vegetative provenances and these are related to three physiographic provinces: Appalachian Ridge and Valley, Piedmont, and the Coastal Plain. As a result, various species of trees form associations that may be unique to this area. Other individuals exist as fringe representatives of their respective regions. Examples would be sweet birch, osage orange, butternut, yellow buckeye, Virginia pine, cockspur hawthorne, and slash pine. Two rare species of coneflower occur on the installation: Echinacea purpurea and Echinacea pallida.

TABLE I-3. MAJOR PLANT COMMUNITIES LOCATED ON FORT McCLELLAN

Dominants In Community	Ecotype	Main Post		Pelham Range	
		Percent	Acres	Percent	Acres
Longleaf Pine	mesic pioneer	-	-	4.5	995
Longleaf Pine	xeric pioneer	11.0	2,081	13.1	2,897
Shortleaf Pine	mesic pioneer	-	-	.6	133
Shortleaf Pine	xeric pioneer	-	-	2.2	478
Loblolly Pine	mesic pioneer	1.0	189	4.2	929
Loblolly Pine	xeric pioneer	9.0	1,703	15.1	3,344
Virginia Pine	xeric pioneer	3.0	568	-	-
Longleaf/Scrub Hardwood	edapic climax	2.0	379	3.1	685
Longleaf/Scrub Hardwood	transition	6.0	1,135	-	-
Shortleaf/Hardwood	mesic transition	-	-	1.4	309
Shortleaf/Hardwood	xeric transition	-	-	5.0	1,114
Loblolly/Hardwood	mesic transition	2.0	378	1.8	397
Loblolly/Hardwood	xeric transition	6.0	1,135	6.5	1,432
Virginia Pine/Hardwood	xeric transition	.4	76	-	-
White Oak, Red Oak, Hickory	xeric climax	26.0	4,920	13.4	2,962
Sweet Gum, Yellow Poplar	mesic climax	7.0	1,325	5.1	1,127
River Birch, Sycamore	riparian transition	.5	95	1.0	222
Sugar Berry, A. Elm, Green Ash	riparian climax	.1	20	.5	111
Grassland*		25.0	4,732	22.0	4,864
Others+		1.0	189	.5	111
					22,110

* Includes cantonment, Tank Battle Drill Area, Drop Zone, food plots, and ranges.

+ Includes isolated island communities not associated with the above.

The only identified species of endangered bird is the Red-cockaded Woodpecker (Dendrocopus borealis). Some of the unique coldwater springs are expected to contain darters and salamanders which may be endangered. Other environmentally sensitive fauna which may occur at Fort McClellan are included in Appendix C.

4. Geological Resources

a. Physiography and Topography. Fort McClellan lies in the eastern portion of the Valley and Ridge physiographic province (Figure I-9). Local relief in the Main Post is in excess of 1,320 feet. The lower elevations (700 feet mean sea level (msl)) occurs along Cane Creek near Baltzell Gate Road while the maximum elevations, 2,063 feet msl, occurs in the Choccolocco Mountain. This mountain traverses the area in a north-south direction with the steep eastern slopes grading abruptly into the Choccolocco Valley. The western slopes are more continuous with the southern extension maintaining elevations up to 900 feet msl near the western reservation boundary. The northern extension decreases in elevation in the vicinity of Reilly Airfield. The Central portion of the Main Post is characterized by flat to gently sloping land.

The elevation differential in Pelham Range is in the order of 425 feet. The minimum elevation is 500 feet msl which occurs at exit of Cane Creek from the range and the maximum is 945 feet msl near the southeastern boundary. The northern sector contains broad rolling topography capped with isolated rounded knobs rising 75 to 90 feet above the surrounding terrain. Creek floodplains up to 2,500 feet wide traverse this sector and slope toward the center of the range. The southern sector also contains the knobby terrain; however, the knobs are closer spaced, thus eliminating the broad, rolling land in between the knobs. The wide floodplains are absent in the southern portion of the range. A large, relatively flat area called Battle Drill Area is situated near the western center boundary.

b. Geology. Subsurface geologic formations occuring in the Main Post are Mississippian, Ordovician, Cambrian, and Precambrian in age (Figure I-10). The first rock formation encountered is the Floyd shale, some 2,000 feet thick. This shale is black to greenish black interbedded with minor thick-to-thin bedded greenish-grey sandstone and clayey limestone. The rocks of middle Ordovician age consist of three separate formations but are mapped as one unit. The combined thickness is around 225 feet and is identified as layers of gray crystalline limestone overlying a black, fissile shale interbedded with dark shaley limestone. The next 400 to 600 feet is characterized as lower Ordovician limestone, light to dark gray in color, medium to thick-bedded and contain some fine chert near the base. The upper-most Cambrian system is identified as the Conasauga formation and consists of 500 feet of limestone, dolomitic limestone and dolomite. The color is gray but small inclusions of weathered shale presents a greenish hue. The Conasauga formation is

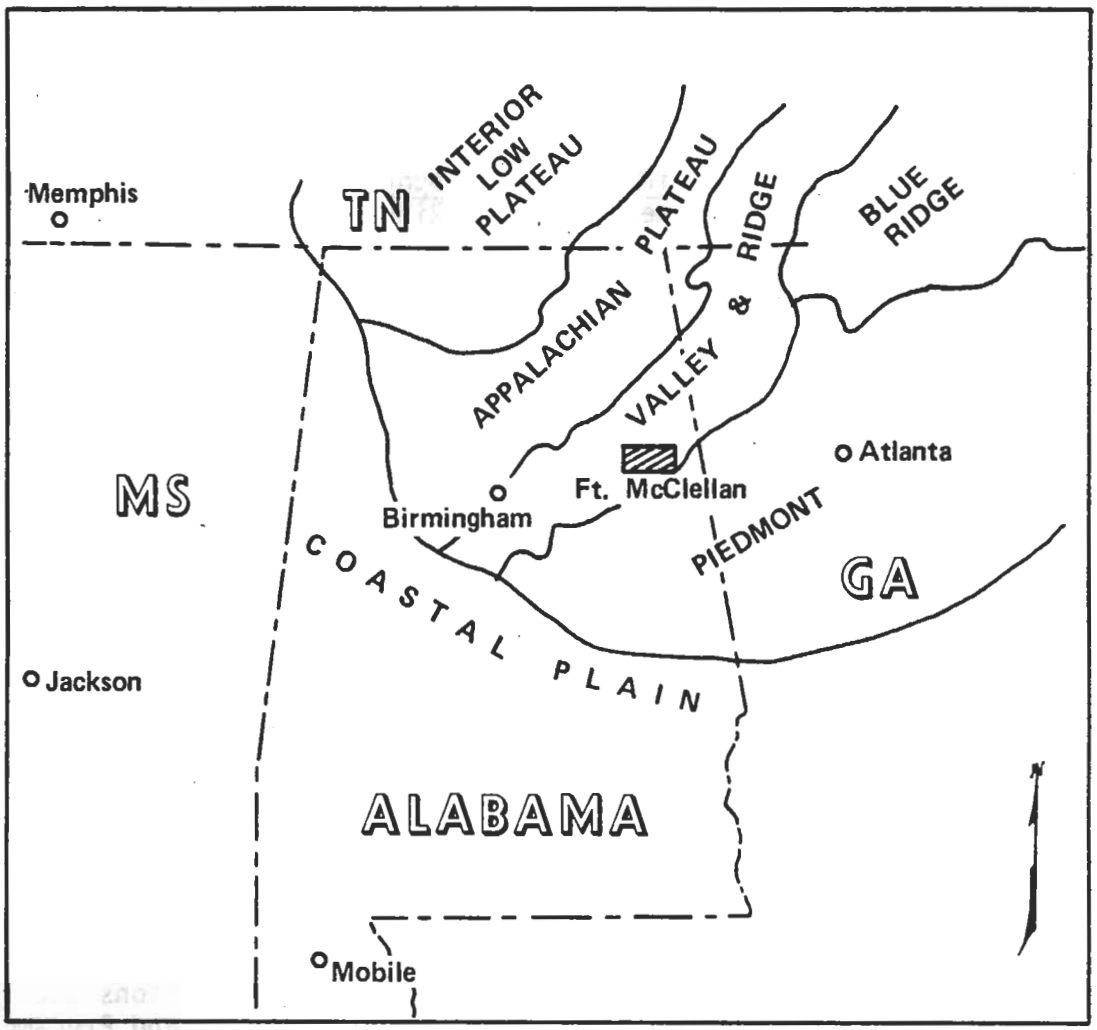
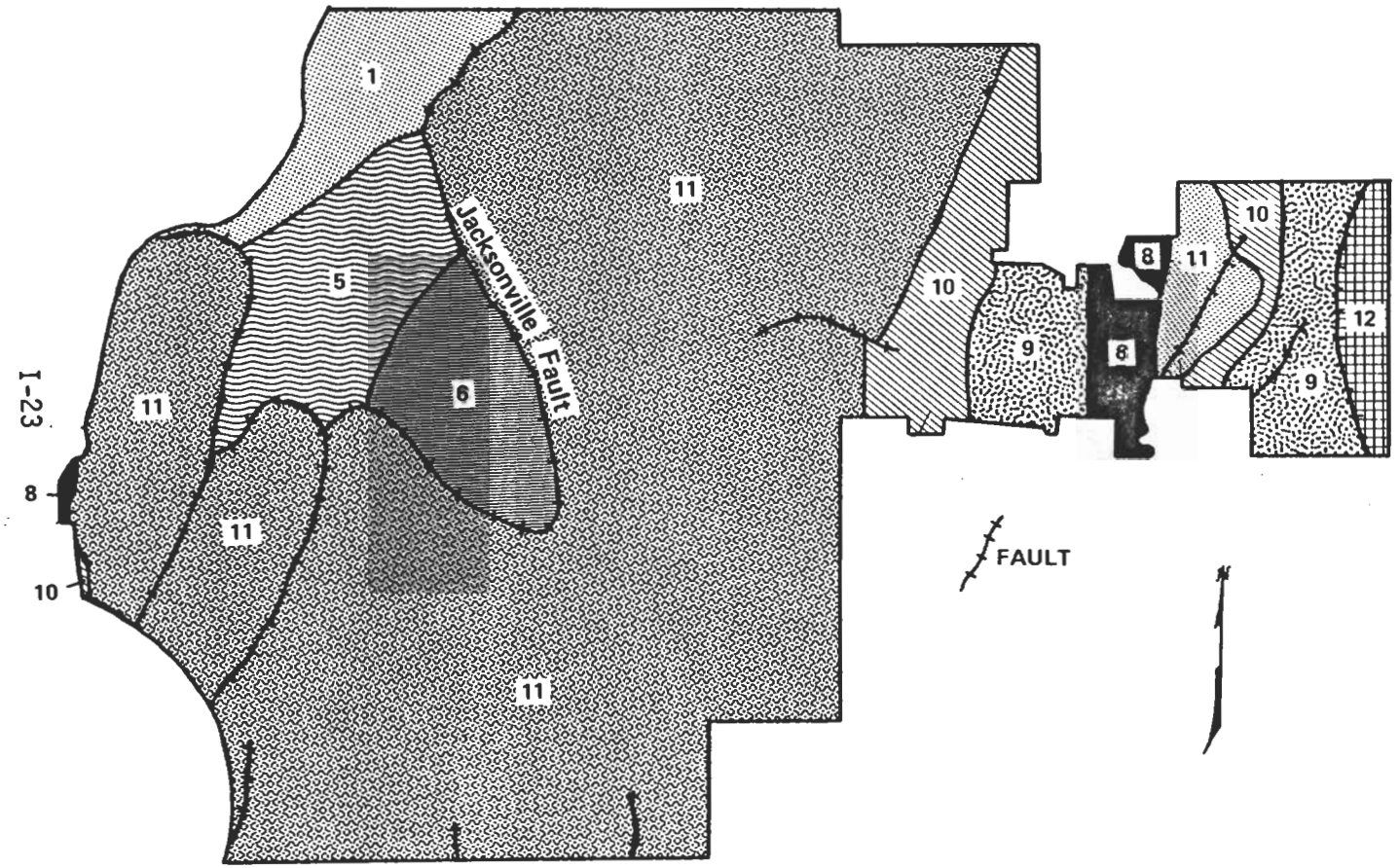


Figure I-9. Physiographic Provinces

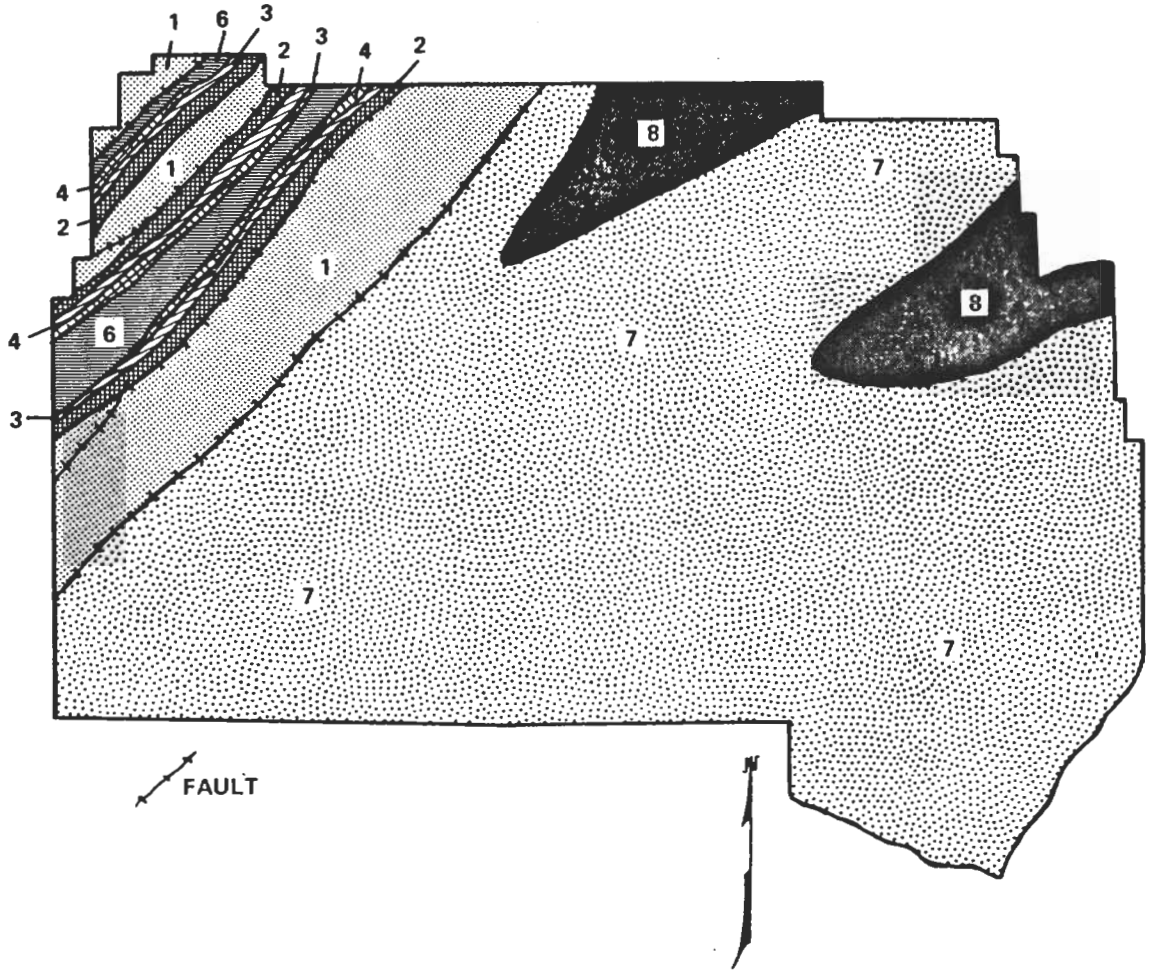


Legend:

SYSTEM	SYMBOL	STRATIGRAPHIC UNIT
MISSISSIPPIAN	NOT MAPPED	PARKWOOD FORMATION
	1 A,B*	FLOYD SHALE
	2 B	FORT PAYNE CHERT
		MAURY FORMATION
DEVONIAN	3 B	FROG MOUNTAIN SANDST
SILURIAN	NOT PRESENT	REO MOUNTAIN SANDSTO
ORDOVICIAN	4 B	CHICKAMAUGA LIMESTON
		LITTLE OAK LIMESTONE
	5 A	ATHENS SHALE
		LENOIR LIMESTONE
	6 A,B	NEWALA LIMESTONE AND LONGVIEW LIMESTONE, UNDIFFERENTIATED
ORDOVICIAN AND CAMBRIAN	7 B	CHEPULTEPEC DOLOMITE COPPER RIDGE DOLOMITE AND KETONA DOLOMITE, UNDIFFERENTIATED
CAMBRIAN	8 A,B	CONASAUGA FORMATION
	9 A	ROME FORMATION
	10 A	SHADY DOLOMITE
	11 A	WEISNER FORMATION
PRECAMBRIAN(?) TO CARBONIFEROUS(?)	12 A	TALLADEGA SLATE

* A- MAIN POST
B- PELHAM RANGE

Figure I-10. Geological Map – Main Post



Legend:

SYSTEM	SYMBOL	STRATIGRAPHIC UNIT
MISSISSIPPIAN	NOT MAPPED	PARKWOOD FORMATION
	1 A,B*	FLOYD SHALE
	2 B	FORT PAYNE CHERT
		MAURY FORMATION
DEVONIAN	3 B	FROG MOUNTAIN SANDSTONE
SILURIAN	NOT PRESENT	RED MOUNTAIN SANDSTONE
OROOVICIAN	4 B	CHICKAMAUGA LIMESTONE
		LITTLE OAK LIMESTONE
	5 A	ATHENS SHALE
		LENOIR LIMESTONE
	6 A,B	NEWALA LIMESTONE AND LONGVIEW LIMESTONE, UNDIFFERENTIATED
ORDOVICIAN AND CAMBRIAN	7 B	CHEPULTEPEC DOLOMITE COPPER RIDGE DOLOMITE, AND KETONA DOLOMITE, UNDIFFERENTIATED
CAMBRIAN	8 A,B	CONASAUGA FORMATION
	9 A	ROME FORMATION
	10 A	SHADY DOLOMITE
	11 A	WEISNER FORMATION
PRECAMBRIAN(?) TO CARBONIFEROUS(?)	12 A	TALLADEGA SLATE

* A- MAIN POST
B- PELHAM RANGE

Figure I-11. Geological Map — Pelham Range

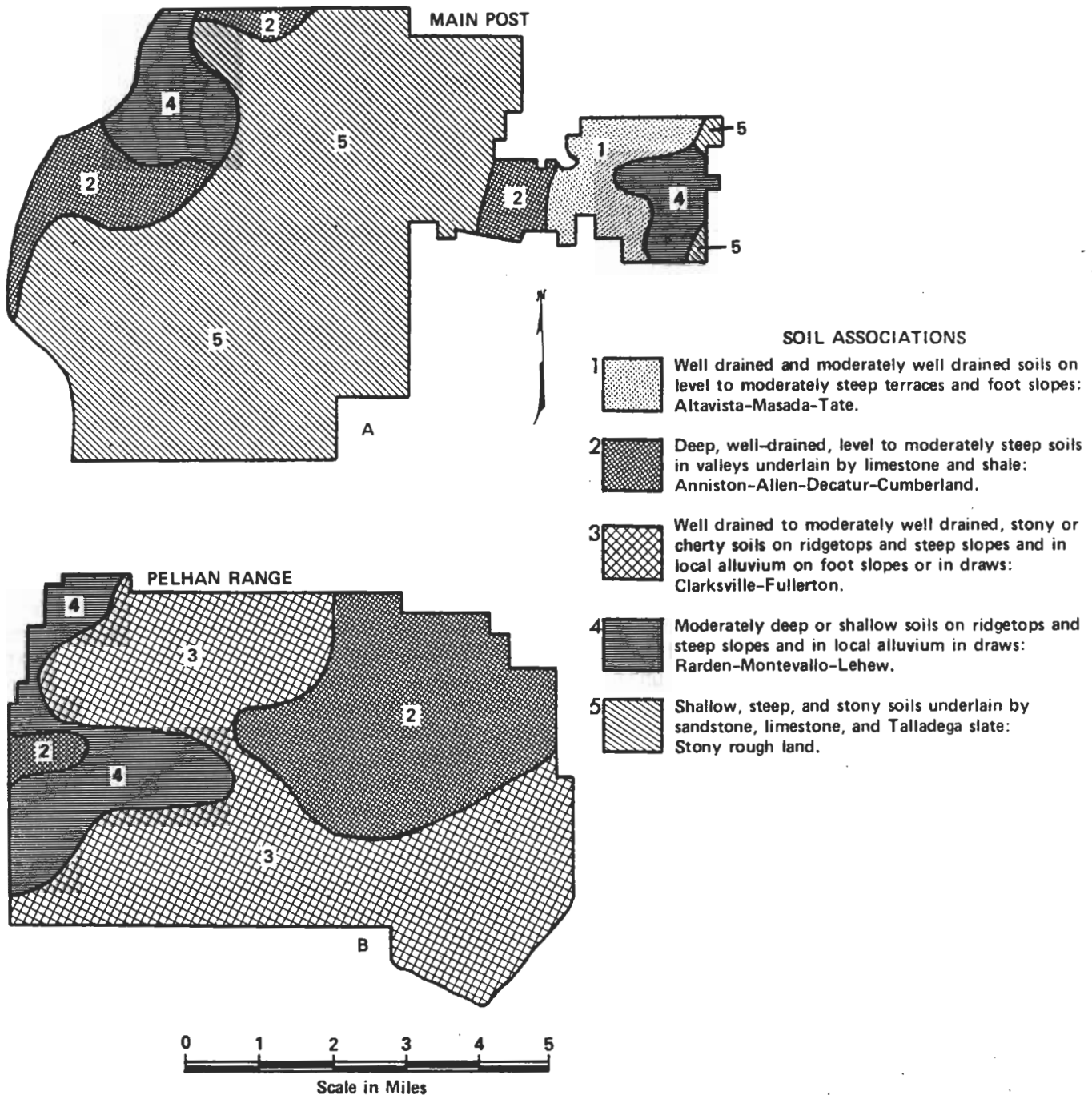


Figure I-12. Generalized Soil Associations

underlain by 1,000 feet of the Rome formation which is composed of shale and siltstone with some red to green shale and sandstone. Next in the stratigraphic column is the shaley dolomite. This formation is composed of limestone and dolomite and the color varies from a yellowish to dark gray. Clayey shale is present near the base of the 1,000 feet thickness. The lowest formation of Cambrian age is the Weisner formation. This formation underlies the major portion of the Main Post area and is identified at 2,500 feet of shale, siltstone, quartzite, and conglomerate. The eastern portion of the Choccolocco corridor is underlain by the Talladege slate, pre-Cambrian in age. The thickness is unknown but the composition is slate, dark gray to black, interbedded with light brown sandstone.

Several faults have been mapped within the Main Post, mainly in the eastern sector. The trend is north-south and the Jacksonville Fault (Figure I-10) is the major fault presently sited on geologic maps. Personnel from the Geological Survey of Alabama indicate a major fault exists on Fort McClellan which is not sited on geologic maps for this area. The trend is northwesterly and generally travels parallel to Cane Creek.

The geologic formations underlying Pelham Range are shown in Figure I-11. The uppermost rock formation, Floyd shale of Mississippian age, was described under the Main Post area. Underlying the Floyd shale are two formations, Fort Payne chert 100 to 350 feet in thickness and the Maury claystone with a maximum thickness of 3 feet. These two formations are mapped as one unit in Pelham Range. The Frog Mountain unit consists of 50 feet of sandstone. The color is brown and is coarse-grained. Dark shale and gray, very coarse-grained, thick-bedded sandstone occur locally. The next formation in sequence is the Chickamauga limestone of Ordovician age. This formation is up to 100 feet thick and is identified as a shale and thin beds of red limestone. The lower Ordovician limestone which was discussed under the Main Post area, underlies the Chickamauga limestone. Following the above limestone is a section, 2,000 feet in thickness, that consists of dolomite and chert. There is some question whether the age is lower Ordovician or upper Cambrian. This dolomite underlies approximately the eastern two-thirds of Pelham Range. The lower-most formation is the Casauga limestone which also underlies a portion of the Main Post area.

No activity is present along the northeast-southwest trending faults mapped in the northwest sector of the range (Figure I-12).

Numerous borings have been drilled in the Main Post area for subsurface exploration associated with the construction of new buildings or additions to existing buildings. At location 10, (Table I-4) boring 2 encountered brown to black shale at a depth of 50.1 feet, while 20 other borings at this location encountered limestone at depths between 14.6 to 60.3 feet. This situation could exist with the presence of unknown faults. Limestone also occurs at 12.2 feet at location 11. Rock encountered at the remaining locations consist of shale; several borings

TABLE I-4. DEPTH TO BEDROCK

Map No.	Building	Boring No.	Depth to Rock, Feet Min	Max	Rock Type
1	292 - Hospital	14	7.5		Shale
		2		37.5	Shale
2	500 - WAC Reception	1	19.5		Shale
		5		40.0	Shale
3	1012 - Gymnasium	-	-	-	Not encountered*
4	1060 - WAC Headquarters	-	-	-	Not encountered
5	1081 - WAC Academy Facility	-	-	-	Not encountered
6	1900 - Auto Craft Shop	-	-	-	Not encountered
7	1906 - Dental Clinic	1	9.2		Shale
		2		11.9	Shale
8	2213 - Service Club	-	-	-	Not encountered
9	3133-36 - WAC BOQ	-	-	-	Not encountered
10	EM Barracks, 8th - 10th Avenue	2	50.1		Shale
		19	14.6		Limestone
		1		60.3	Limestone
11	Gymnasium and Dispensary south of MP Barracks	2	12.2		Limestone
		1		18.2	Limestone
12	WAC Band Facility	-	-	-	Not encountered
13	MP Academy Facility	14	12.5		Shale
		8		27.4	Shale

* Borings where rock was not encountered does not imply rock is not present but their depths were above rock.

were too shallow to reach the rock. As stated previously, all boring logs are presented in Appendix D.

c. Soils. The surface soil occupying the entire central portion of the Main Post is the stony, rough land series. Table I-5 indicates the areal extent of this series as map item 5 and consists of a silty clay intermixed with loamy fine sand. Rock fragments occur throughout with the percentage of rock fragments increasing on the steeper slopes. The type of soil is dependent on the underlying rock and the rock has a bearing on the permeability of the soil as indicated in Table I-5. Soils originating from limestone have permeability values of 0.2 to 0.8 inches per hour, while sandstone and slate soil values range from 2 to 10 inches per hour. The remaining soil series within the Main Post are delineated in Table I-5: item 1, Altavista and Masada; item 2, Anniston-Allen-Decatur-Cumberland; and item 4, Rarden-Lehew-Montevallo. The description and estimated physical properties of these series are listed in Table I-5.

A description of the subsurface soil as determined from the boring logs indicated varying thickness of silty to sandy clays, clayey silts and lean to fat clays, all with scattered rock fragments. The thickness varies from one to greater than 30 feet and the colors are shades of yellow, tan, gray, brown, and red. No permeability data are available; however, due to the nature and thickness of the materials it is apparent that the vertical movement of water in the subsurface soil would be extremely slow.

The surface soil of Pelham Range consists of three soil series: Anniston-Allen-Decatur-Cumberland, item 2, as shown in Table I-5; item 3, Clarksville-Fullerton; and item 4, Rarden-Montevallo-Lehew. Item 3 is widespread in the southern third of the range, narrows in the central portion, then enlarges in the northern sector up to the northern boundary. This series is characterized by a loam to a silty clay loam with numerous fragments of limestone or dolomitic limestone. Test values of permeability range from 2 to 10 inches per hour down to a depth of 40 inches. With a large percentage of rock fragments, the value will most likely extend below the 40 inch test. Normally the subsurface contains silt, sand, and clay as separate zones, or in a mixture with some degree of compaction; however, this would decrease the above permeability values considerably.

The two other soil series, items 2 and 4, are delineated; their description and estimated physical properties are tabulated in Table I-5.

TABLE I-5. GENERALIZED SOIL DESCRIPTION AND ESTIMATED PHYSICAL PROPERTIES

Soil Association Series	Description	Classification USDA	Classification USCS	Depth to Water Table (Feet)	Depth to Bedrock (Feet)	Permeability Inches/Hour	pH
1. Altavista and Masada	2.5-5ft of moderately well to well drained silt loam and silty clay loam over stratified old general alluvium; underlain by shale or limestone.	0-8in silt loam 8-36in silty clay loam	ML-CL CL	2 or more	3 - 12+	0.8 - 2 0.8 - 2	5.1 - 5.5 5.1 - 5.5
2. Anniston and Allen	2-10ft of well drained stony loam or stony clay loam over stratified local alluvium; limestone or shale bedrock.	0-7in stony loam 7-72in stony clay loam	CL-GC CL or MH	20 or more	2 - 10+	0.8 - 2 0.8 - 2	5.1 - 5.4 4.5 - 5
Decatur and Cumberland	3-20ft of well drained loams to silty clays; developed in old alluvium that washed from soils developed from limestone, chert and shale; gravel and iron concretions are present below 2ft in some places.	0-6in loam 6-36in silty clay	CL CL or MH-CH	20+	3 - 20+	0.8 - 3 0.8 - 2	5.1 - 6 4.5 - 6

TABLE I-5 (continued)

Soil Association Series	Description	Classification USDA	Classification USCS	Depth to Water Table (Feet)	Depth to Bedrock (Feet)	Permeability Inches/Hour	pH
3. Clarksville and Fullerton	1-3ft of well drained stony loam to stony silty clay loam; developed from deeply weathered, cherty dolomitic limestone.	0-6in stony loam	SM,GC, GM	20+	20+	2 - 10	5.1 - 6
		6-24in stony silty clay loam	SM,GC			2 - 10	5.1 - 6
		24-40in stones, chert and silty clay loam	SM,GM or GC			2 - 10	5.1 - 6
4. Rarden	0.7-2.5ft of moderately well drained silt loam to silty clay or clay; developed from interbedded shale, platy sandstone and limestone: surface of some areas have platy sandstone gravel 3in in diameter.	0-14in silty loam to silty clay or clay	MH,CL, CH	20+	1.5 - 4	0.2 - 0.8	4.5 - 5.5
		14-44in shaly clay	MH,CH			0.2 - 0.8	4.5 - 5.5
Lehew-Montevallo	1-2.5ft of well drained shaly loam; developed from shale and platy sandstone with occasional limestone ledge; shallow, weakly developed soils.	0-12in shaly loam	ML	20+	1 - 2.5+	0.8 - 10	5.6 - 6
		12-20in shaly loam	ML-CL			0.8 - 10	5.6 - 6

TABLE I-5 (continued)

Soil Association Series	Description	Classification USDA	Classification USCS	Depth to Water Table (Feet)	Depth to Bedrock (Feet)	Permeability Inches/Hour	pH
5. Stony rough land Limestone	0-3ft of moderately well drained silty clay with ledges and boulders of limestone protruding through surface.	0-3in silty clay or clay	CH-MH	20+	0 - 3	0.2 - 0.8	5.1 - 7
Sandstone	0-2.5ft of well drained loamy fine sand with ledges and boulders of sandstone protruding through surface.	0-2.5in loamy fine sand or fine sandy loam	GM,GC or SM	20+	0 - 2.5	2 - 10	4.5 - 5
Slate	0-3ft of well drained silt loam to silty clay loam with ledges of slate protruding through surface.	0-6in silt loam	ML,CL	20+	0 - 3	2 - 10	4.5 - 5
		6-10in silty clay loam	CL,CH			0.8 - 2	4.5 - 5

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